
1. Introduction

The purpose of this Facility Plan is to evaluate the water source and supply needs of the Lake Peekskill section of the Town of Putnam Valley. Lake Peekskill is located in the southwestern corner of the Town of Putnam Valley, bounded by the Town of Philipstown to the west and the Town of Cortlandt, in Westchester County, to the south (see Figure 1-1, Location Map).

1.1. Background

The Lake Peekskill Community was conceived and marketed in the 1920's as a summer lake community. Through the years, many of the seasonal cottages have been winterized and converted to year-round use. The on-site individual wells, seasonal water system, and subsurface sewage treatment systems (SSTS's) were once adequate for short periods of occupancy with long rests during the off-season. Today, many of these systems cannot handle the constant loadings of year-round occupation. The Lake Peekskill area has a history of well and SSTS problems with the Town and the Putnam County Department of Health, and there is a need for an in-depth study for a central water treatment/distribution system.

The following factors have contributed to the decline in the ability of the Lake Peekskill area to support its water needs through individual wells: small lot size, summer cottage conversions and expansions, high population density, shallow depth to ledge rock, shallow depth to groundwater, steep slopes, substandard SSTS/well separation distances, and age of existing facilities. Refer to Section 2.2.2. for a detailed discussion of these factors.

The New York State Department of Environmental Conservation (NYSDEC) performed a stressed segment analysis on Lake Peekskill in June, 1981. This analysis depicts the general condition of Lake Peekskill. Findings include that Lake Peekskill is experiencing algae blooms and there is coliform bacteria present in the lake. Comments in the NYSDEC work are: "High density housing on small rocky lots. Some failing septic systems".

As part of the 1982 *Wastewater Facilities Planning Report*, prepared by Cashin Associates, P.C., selected residents of the Town of Putnam Valley were surveyed by a direct mail in order to obtain information relative to well and wastewater disposal facilities and problems. The Lake Peekskill area was one of the major focus areas studied, with contamination and water quality problems with wells noted. Septic system problems reported by

residents include above ground seepage, sewage backups, and/or septic odor. Many septic systems do not have adequate capacity. The conclusions drawn from the survey in the Cashin report are summarized as follows:

“The Lake Peekskill area of the Town is desirous and in need of better wastewater disposal methods. Residents of this area are using substandard systems and are experiencing a high rate of system failure. This is evidenced by the high rate of repairs, the favorable comments, and the problems with separation distances in the area.”

The previously mentioned septic system deficiencies have a direct relationship and are the primary reason for the Lake Peekskill area water supply problems.

1.2. Past Studies

Pre-Application Engineer's Report for NYS Drinking Water Revolving Fund, January 30, 1997, by Insite/O'Brien & Gere.

The purpose of the 1997 report was to accompany a pre-application form for a NYS Drinking Water State Revolving Fund (DWSRF) application. The report focused on history, population, existing and future water system infrastructure, water flows, treatment, costs and a procedural outline for permitting, approval, and construction. Lake Peekskill is currently listed on the DWSRF Intended Use Plan for a \$15.8 million water treatment plant and distribution system.

2. Existing Water Facilities

2.1. Site

The Lake Peekskill community is located in the southwestern corner of the Town of Putnam Valley. The terrain is very steep and rocky, with two lakes within the study area: Lake Peekskill and Lake Junior. Refer to Figure 1-1, Location Map, for the topography and limits of the study area. Refer to Figure 2-1, Area Map, for a more detailed map of the study area. Most parcels within the Lake Peekskill community contain single-family residential dwellings. There are several multi-family residential dwellings and several non-residential/commercial uses. The tax base in the study area is primarily generated from residential property tax. Due to the zoning, topography, geology, and other physical constraints, the Lake Peekskill area is not expected to undergo any major land use changes, and is near its maximum build-out density based on existing conditions and regulations.

2.2. Existing Facilities

Existing water facilities in the Lake Peekskill area include the summer only water system and individual wells.

2.2.1. Existing Summer Water System

The existing water system is a non-community public water system due to the system operating only during the summer months (usually from May through mid-November). The system currently is not in compliance with the Surface Water Treatment Rule. This rule requires filtration of surface water used by Public Water Systems. See sections 6.3 and 6.4 for discussion of the Surface Water Treatment Rule. The majority of the Lake Peekskill area has access to the water system, however, only approximately 300 of the 1100 +/- homes are connected to the water system. The balance of the homes are served only by individual wells. The homes that are connected to the water system are either summer residences or have their own wells for use during the winter months. The source of this system is a direct connection to the Catskill Aqueduct, with the existing pump station located at the end of Mimosa Street/Mill Road in the southwest corner of the study area.

The system was originally constructed for seasonal use such that most of the components are inadequately protected from freezing, and therefore would not be suitable for year round use. The system generally consists of a source water pump station, chlorination equipment, split distribution system (high zone and low zone), two storage tanks, and a high zone pump station. Note,

the district also has a well located on Reichert Street adjacent to the Lake Peekskill Improvement District's (LPID) maintenance garage. This well is only used in emergencies and is alleged to yield 100 gpm. Based on discussions with the system operator, this yield is very suspect. According to the operator, when the well is activated, the neighbor's well runs dry within a few minutes. Additional surrounding wells are also reported to run dry the longer the district well is in use. This well also does not meet the setback and property ownership requirements of a public water supply well.

The source water pump station draws water from the Catskill Aqueduct, at which point chlorine is added, and the water immediately enters the supply line to the low zone of the system. A 50,000 gallon wood storage tank exists between Reichert Street and Aspen Lane, which provides storage and cycling of the source water supply pump. A second pump station, which pumps water to the high zone, exists adjacent to the 50,000 gallon storage tank. A 25,000 gallon wood storage tank is located off of Ridgecrest Road at the highest point of the water system. This storage tank provides storage for the high zone and cycling for the high zone pump station. The distribution system consists of small diameter (2 inch to 6 inch) water mains. These water mains are mostly galvanized iron pipe, which are buried at shallow depths or are located on the surface.

The existing system is maintained and operated by the Lake Peekskill Improvement District (LPID). The LPID has approximately 6 employees who maintain the roads, lake facilities, water system, and collect garbage within the Lake Peekskill area. The LPID operates from a garage and yard located on Reichert Street.

Due to the previously mentioned inadequacies, the existing substandard Lake Peekskill Water System is in need of replacement.

2.2.2. Individual Wells

Most of the homes in the Lake Peekskill area have their own well for potable water supply. Many of these wells are old and substandard, as discussed below. The following are reasons for the decline in the ability for the area to support itself through individual on-site wells:

Small lot size—Typical lot sizes in the range of 0.05 to 0.5 acres were sold in the early 1900's. These lots were developed before any zoning or detailed health department regulations existed or were enforced. Many of the resulting small lots do not meet current Putnam County Health Department separation requirements for septic systems and wells, resulting in the degradation of water quality in the study area.

Summer cottage conversions—Many residences were built with the intention of being summer cottages. Many of these cottages have been expanded, winterized, and are currently used as year-round residences.

High population density—The Lake Peekskill area has one of the highest population densities in the Town of Putnam Valley. This fact, coupled with the small lot sizes and summer cottage conversions, compounds the well problem.

Ledge rock and groundwater—The shallow average depth of ledge rock and groundwater (0' to 6') in many areas makes conventional septic systems less effective in properly treating sewage effluent. This can lead to well water contamination.

Steep slopes—Much of the study area has slopes in excess of 20 percent, which is the current maximum slope allowed for a septic system, per Putnam County Health Department regulations. Placement of septic systems on steep slopes can lead to septic system failures and well water contamination.

Septic System and well separation distances—The early development and expansions in the Lake Peekskill community occurred when septic system and water well placement were not strictly regulated. Current health department regulations require septic system/well separations ranging from 100' to 200'. Further, current regulations also require septic systems to be 100' from water bodies and watercourses. Many of the septic systems in the Lake Peekskill community are placed with significantly reduced separation from wells, water bodies, and watercourses. The reduced separation has likely contributed to a decline in ground and surface water quality.

3. Service Area

The study area is defined as the limits of the Lake Peekskill Improvement District (LPID). Refer to Figure 3-1, District Map, for detail. Currently only a portion of the LPID parcels are served by a summer only central water distribution system. The intent of this facility plan is to consider a water treatment and distribution system, which would allow a year round water service connection for every occupied parcel within the study area.

3.1. Service Area - Present

The limits of the LPID coincide with the limits of the original 1929 McGorlick Realty Co. subdivision map which created the Lake Peekskill community (Putnam County Filed Map #185 A-G and Filed Map #193). The study area contains primarily small residential dwellings served by individual wells and subsurface treatment systems.

As discussed in Chapter 2, a summer-only water distribution system exists in the LPID. Due to the significant age and decrepit condition of this system, it is at the end of its useful life. The system is also inadequate because it can only be used during the summer and fall periods, due to inadequate protection from freezing. The area served is essentially the limits of LPID. Only approximately 300 of the approximately 1,100 homes in the LPID have active service connections on the system.

3.2. Service Area - Future

The distribution system for this facility plan has been designed to provide a water service connection for every occupied parcel within the LPID, as described in Section 3.1.

There are several out-of-district entities that have been considered as potential users if this proposed water treatment plant and/or distribution system is constructed. Refer to Area Map, Figure 2-1, for detail. Putnam Valley Sewer District #2 (PVSD#2) services the Peekskill Hollow Road-Oscawana Lake Road intersection (Oregon Corners) and surrounding area, which directly adjoins LPID to the east. Water supply throughout PVSD #2 is provided by individual wells; therefore making it a potential user. The Highfields townhouses on the south side of Peekskill Hollow Road have their own central water distribution system with drilled wells as their source. Connection to the proposed LPID water system may be a desirable option for

them, for economic, staffing and/or political reasons. Another potential user is the Putnam Valley High School/Middle School; also located on the south side of Peekskill Hollow Road, east of the Highfields townhouses. The schools have a water connection to the Yorktown Water District. Connection to the proposed LPID water system may be a desirable option for them, for economic, staffing, and/or political reasons. Other potential users are the residences and businesses on Oscawana Lake Road north of the Peekskill Hollow Road intersection.

4. Potable Water Flows

The planning period selected for this Facility Plan is 20 years. In order to project current flows to planning year flows, an estimate of the population growth for the planned service area is needed. Population projections were made out to the year 2021, which assumed that construction of the water facilities could be completed by the year 2001 and that the plant would have capacity to treat water flows at that time and also treat water flows to the year 2021. The existing water systems in the planned service area are individual wells and the limited summer only system. These systems do not provide a record of actual flow data. Therefore, existing water flows were estimated using the best available population and land use data.

4.1. Existing Domestic Water Flows

In order to determine existing water flows, the current population of the planned service area was quantified. This has been an issue in previous studies in that there has not been an accurate population count in the Lake Peekskill area. For this facility plan, an evaluation of dwelling unit counts and land uses was determined to be the best approach for estimating population. Tax assessment data for the Town of Putnam Valley was obtained from the Putnam County Real Property Tax Service Department. The County's database includes the assessor's information for each tax map parcel. The study area was the basis of a "query" search using the computer program "Microsoft Access 97", which extracted the official property type classification codes for each tax map parcel in the district. The land uses were sorted into four categories: Single Family Residential (SFR), Multi Family Residential (MFR), Commercial/Non-Residential, and Vacant. Refer to Figure 4-1, Land Use/Zoning Map, for detail. Each of the four categories was assigned a dwelling unit (DU) equivalent. A tax map parcel with a SFR code was counted as 1 DU. MFR parcels were counted as 2.5 DU each. Commercial/Non-Residential parcels were also counted as 2.5 DU each. It was decided to use 2.5 DU per Commercial/Non-Residential parcel after studying property codes and giving an equivalent DU value to each land use and averaging the data to give a reasonable DU value per Commercial/Non-Residential tax map parcel. By counting and adding the parcels within the four categories, the equivalent DU count for the planned service area was calculated. The existing DU count was compared to the best available data and reinforced the findings of the database search.

The following is a list of the parcels for the study area:

- Single-Family Residential (SFR) 777 parcels

- Multi-Family Residential and Commercial/Non-Residential (MFR) 127 parcels
- Vacant 566 parcels

The existing equivalent dwelling units are calculated as follows:

$$777 (1) + 127 (2.5) = 1,095 \text{ DU}$$

Therefore, the existing equivalent dwelling unit count is estimated at 1,095.

The existing population is estimated by multiplying a population factor of 3.4 people per dwelling to the dwelling unit count. 3.4 people/DU was based on statistical data from the Putnam County Division of Planning & Development.

Existing population = 1,095 DU x 3.4 people/DU = 3,723 people.

The next step in determining the existing water flows involves applying a per capita flow factor to the existing population. Putnam County Health Department Regulations specify 75 gallons per capita day (gpcd) for metered residential connections and 100 gpcd for unmetered residential connections. Although the proposed system will be metered, 100 gpcd was chosen as the conservative per capita design flow for this study.

Factoring in the 100 gpcd flow factor yields:

$$3,723 \text{ people} \times 100 \text{ gpcd} = 372,000 \text{ gpd (0.37 million gallons per day (mgd))}$$

Therefore, the estimated existing average daily flow for the planned service area is 0.37 mgd.

4.2. Future Water Flows

In order to estimate the planning year design flow, the future population and corresponding dwelling unit counts need to be determined. Following a study of each vacant parcel's size and constraints, it was concluded that approximately 50% of the remaining vacant parcels could be developed by the planning year. This conclusion is based on the fact that if central water and sewer were available, many of the existing vacant lots could be developable. Since some of the remaining parcels are non-conforming with respect to zoning and physical constraints, it is assumed that they will remain vacant. The basis of this determination consisted of reviewing tax maps, topography, lot size, and a visual observation of the study area.

Adding future growth to the existing equivalent dwelling unit count yields:

$$1,095 \text{ DU} + 566 (0.5) = 1,378 \text{ DU}$$

Therefore, the estimated planning year equivalent dwelling unit count is 1,378.

$$\text{Future population} = 1,378 \text{ DU} \times 3.4 \text{ people/DU} = 4,685 \text{ people.}$$

$$\text{Future water flow} = 4,685 \text{ people} \times 100 \text{ gpcd} = 469,000 \text{ gpd.}$$

Therefore the future average daily flow for the planned service area is estimated to be 0.47 mgd.

As previously mentioned in Chapter 3, there are some out of district users that should be included in the design flow determination for the proposed water treatment plant. The design flow for PV SD#2, the Highfields townhouses and the Putnam Valley High School/Middle School (which each have their own distribution system) is estimated at 0.06 mgd. This brings the design flow from 0.47 mgd to $0.47 + 0.06 = 0.53$ mgd.

Allocating an additional 0.07 mgd for the remaining potential users yields a future average daily design flow of $0.53 + 0.07 = 0.60$ mgd.

4.3. Fire Flows

Fire flow requirements for the Lake Peckskill Improvement District were determined by referencing the AWWA, *Manual M31, Distribution System Requirements for Fire Protection*.

Three methods for calculating fire flow requirements are presented in the manual. The three methods were developed by the following three organizations:

- Insurance Services Office (ISO)
- Illinois Institute of Technology Research Institute
- Iowa State University

The ISO method was chosen since it is a common method utilized in this area. Table 1-4 "Needed Fire Flow for one- and two-family dwellings," states that 750 gpm is needed when dwellings do not exceed two stories in height and have a distance between buildings of 31 to 100 feet. A minimum fire flow of 750 gpm was determined to be an appropriate minimum fire flow rate for the study area. While some dwellings within the service area may be less than 31 feet apart, the added expense to provide a higher minimum fire flow to all parts of the distribution system is not warranted. Note that many areas of the distribution system will have available fire

flows in excess of several thousand gpm. The required duration for the fire flow of 750 gpm is 2 hrs.

5. Source Water Supplies

5.1. Existing Water Supplies and Districts In Region

There are basically three sources of water supply in the region that could be made available for the Lake Peekskill Community; which are as follows:

- Catskill Aqueduct
- Croton System/Amawalk Reservoir
- Peekskill Hollow Creek/Wiccoppee Reservoirs

The Catskill Aqueduct and the Amawalk Reservoir are owned and controlled by New York City, while the Wiccoppee Reservoirs (located in Putnam Valley) are owned and operated by the City of Peekskill Water Board. These raw water sources provide the water supply for most of the northwestern Westchester County distribution systems. Generally, the Town of Cortlandt, Town of Yorktown, City of Peekskill, Village of Buchanan, northern portion of the Village of Croton-on-Hudson, and a portion of the western area of the Town of Somers rely on the three available sources to the region. The Catskill Aqueduct also provides a year-round unfiltered source for Continental Village in the Town of Phillipstown and a summer unfiltered source for the Lake Peekskill Improvement District, both in southwestern Putnam County.

The three available source waters (Catskill, Amawalk, Peekskill Hollow Creek/Wiccoppee Reservoirs) are currently filtered by three filtration plants; which are as follows:

- Montrose Improvement District (MID), Locust Avenue/Route 6 Catskill Aqueduct plant (source: Catskill Aqueduct)
- Westchester County Water District #2, Amawalk plant (source: Amawalk Reservoir)
- City of Peekskill plant at Campfields Reservoir (Holding Reservoir) (source: Peekskill Hollow Creek)

It is planned that the Northern Westchester Joint Water Works (NWJWW) will be taking over the operation of the MID Locust Avenue/Route 6 Catskill Aqueduct plant and the Westchester County Water District #2, Amawalk Plant.

The NWJWW is a recently formed water works consisting of the Montrose Improvement District (located in the Town of Cortlandt), the Town of Cortlandt, and the Town of Yorktown. This entity was formed as a bulk treated water supplier for many of the numerous water districts within the region. The individual water districts are responsible for the maintenance and operation of their own distribution systems.

The NWJWW consists of three constituent members as follows:

<u>Constituent Member</u>	<u>Representative</u>
Montrose Improvement District	District Chairperson
Town of Cortlandt	Town Supervisor
Town of Yorktown	Town Supervisor

Note: The Town of Somers has a contract with NWJWW which allows them the option to join NWJWW by about 2002.

The NWJWW will own and operate the following:

- Catskill Aqueduct tap and 10 mgd raw water pumping station at Locust Avenue/Route 6 (previously constructed by the Montrose Improvement District).
- New 7 mgd (under construction; expandable to 10 mgd) and existing 3 mgd (previously constructed by Montrose Improvement District) filtration plants at Locust Avenue/ Route 6. Note that the existing 3 mgd plant will be decommissioned when the new plant is expanded to 10 mgd.
- 7 mgd Amawalk Reservoir Filtration Plant (previously constructed by Westchester County Water District #2).
- 20-inch raw water transmission line between the City of Peekskill's Campfields Reservoir (adjacent to Peekskill's filtration plant) and the Locust Avenue/Route 6 treatment plants. This raw water transmission main is a 3 mgd emergency connection between the City of Peekskill and the NWJWW treatment plants. Raw water may flow in either direction depending on need.
- 24-inch treated water transmission line between the Locust Avenue/Route 6 filtration plant and the Catherine Street (Town of Yorktown) Catskill aqueduct tap (note the Catherine Street Catskill aqueduct tap is not in use and remains as a 2 mgd emergency unfiltered source). This treated water transmission line was designed to convey 4.8 mgd (average daily flow of Yorktown and Somers districts) from the NWJWW Locust Avenue/Route 6 plant to the Catherine Street line in Yorktown should the Amawalk plant be shut down. It also is intended to convey surplus Amawalk plant approx. 2.2 mgd from Catherine Street

to the Locust Avenue/Route 6 plant should the Catskill aqueduct be shut down.

- 24-inch treated water transmission/distribution line from the Catherine Street (Town of Yorktown) Catskill aqueduct tap (not in use) to the Amawalk Reservoir filtration plant.

In general, northern Westchester County communities are provided treated water by two filtration/supply entities: the recently formed Northern Westchester Joint Water Works, and the Peekskill Water Supply. The two supply entities have a combined total of three filtration plant sites—NWJWW (two) and, City of Peekskill (one). The three filtration plant sites supply filtered water to the region's water districts (distribution systems). The water districts (distribution systems) served are as follows:

WATER DISTRICT	SERVICE AREA	DESIGNATION*
Cortlandt Consolidated Water District	Majority of the Town of Cortlandt with the exception of Montrose area	M-19
Montrose Improvement District	Montrose area of the Town of Cortlandt	M-20
Buchanan Water Supply	Village of Buchanan	M-6
Croton-on-Hudson	Village of Croton-on-Hudson (Northern Portion)	M-7
Peekskill Water Supply	City of Peekskill	M-2
Continental Village Water District	Continental Village (Emergency Connection to Cortlandt Distribution System)	P-7
Yorktown Water Storage District	Majority of the Town of Yorktown	M-34
Amawalk Shenorock District	Shenorock area of the Town of Somers	M-32
Primrose Water Supply (Note: this district currently does not have a distribution system; water supply is from individual wells.)	Primrose Street area of the Town of Somers	M-33

*Refer to Figure 5-1, Existing Water Service Areas, for designation location

The following summarizes the three source waters, three filtration plant sites and districts served:

Source Water	Filtration	Districts Served
<p>Peekskill Hollow Creek/Wiccoppee Reservoirs</p> <p>(The City of Peekskill operates a raw water pump station at Pumphouse Road in the Town of Cortlandt to convey water from the Peekskill Hollow Creek to the Campfields Holding Reservoir)</p>	<p>City of Peekskill Plant at Campfields Holding Reservoir</p>	<ul style="list-style-type: none"> • City of Peekskill • Approx. 10% of Cortlandt Consolidated Water District
<p>New York City/Catskill Aqueduct</p>	<p>NWJWW-Locust Avenue/Route 6 Plants (3 mgd plant existing, 7 mgd plant under construction)</p>	<ul style="list-style-type: none"> • Montrose Improvement District • Approx. 80% of Cortlandt Consolidated Water District (Hamlet of Verplanck Via Montrose Improvement District South Low Zone Via Montrose Improvement District) • Village of Buchanan (Via Montrose Improvement District) • Northern portion of the Village of Croton-on-Hudson (Via Cortlandt Consolidated Water District and Montrose Improvement District) • Yorktown Water Storage District as required

Source Water	Filtration	Districts Served
New York City/Amawalk Reservoir	NWJWW-Amawalk Plant	<ul style="list-style-type: none"> • Yorktown Water Storage District • Approx. 10% of Cortlandt Consolidated Water District • Primrose Water Supply (This district is currently not supplied by NWJWW.) • May supply Amawalk Shenorock District in future

5.2. Source Water Options for Lake Peekskill

The Lake Peekskill Improvement District has the following basic options for connecting to the three available water sources:

Source	Connection Option
NYC Catskill Aqueduct Raw Water	Direct connection to aqueduct with existing tap, refurbished raw water pump station, and construction of a new water treatment plant
Peekskill Hollow Creek Raw Water	Direct connection to Peekskill Hollow Creek with new raw water pumping station and construction of a water treatment plant
Peekskill Hollow Creek Treated Water	Connection to Cortlandt Consolidated Water District distribution system which is supplied filtered water from the City of Peekskill (water filtration plant at Campfields Holding Reservoir)
NYC Catskill Aqueduct Treated Water	Connection to Cortlandt Consolidated Water District distribution system which is supplied filtered water from NWJWW (Locust Avenue/Route 6 water filtration plant)
NYC Croton System/Amawalk Reservoir Treated Water*	Connection to either Cortlandt Consolidated Water District or Yorktown Water Storage District distribution systems which are supplied filtered water from NWJWW (Amawalk water filtration plant)

*Note: It is unlikely this source has extra available capacity

The existing filtration plants have a limited ability to supply additional users. The following summary is based on discussions with the local water suppliers and is approximate only. Detailed discussions with the two existing supply entities (NWJWW and City of Peekskill), and Town of Cortlandt as a distribution entity, would be required to determine whether extra capacity exists and their willingness to supply Lake Peekskill. In addition, the existing agreement that the Lake Peekskill Improvement District has with New York City would need to be amended if either the Catskill Aqueduct or the Croton System/Amawalk Reservoir were used as a raw or treated source water.

Treatment Plant	Owner/Operator	Water Source	Source Max Safe Yield (MGD)	Treatment Plant Capacity (MGD)
Amawalk	NWJWW	Amawalk Reservoir	8 +/-	7 +/-
Locust Avenue/ Rt. 6	NWJWW	Catskill Aqueduct	10 +/- Aqueduct Tap Capacity	10 +/-
Peekskill	Peekskill	Peekskill Hollow Creek/Wiccoppee Reservoirs	8 +/-	6 +/-

A 3 mgd emergency raw water connection exists between the Peekskill and Locust Avenue/Rt. 6 treatment plant.

For this facility plan, the following two alternative options have been studied:

- Maintain an independent primary source of supply off Lake Peekskill's current connection to the Catskill Aqueduct and provide a new water treatment plant and establish emergency interconnections to the Cortlandt Consolidated Water District distribution system as a secondary source of supply.
- Establish connections with the Cortlandt Consolidated Water District to provide both primary and secondary sources of supply.

These two supply alternatives were chosen due to the proximity of the Catskill Aqueduct and the Cortlandt Consolidated Water District distribution system to the Lake Peekskill area. Connecting to the Cortlandt Consolidated Water District distribution system is politically complicated with respect to supplying either NWJWW treated water or City of Peekskill treated water as primary or emergency sources across county lines via the Cortlandt system. If it is later determined that water will not be supplied from neither the City of Peekskill nor NWJWW

(via Cortlandt Consolidated Water District), a new intake on the Peekskill Hollow Creek can be studied. An examination would need to be undertaken of the safe yield of the Peekskill Hollow Creek, in due consideration of the City of Peekskill's water needs, as well as examination of treatment requirements.

Use of ground water for supply was not seriously considered for several reasons. High well yields are not expected. It has been reported that wells have run dry and running of the district's large 100 gpm (reported yield) well causes adjacent wells to run dry. Upwards of 20 to 30 wells may need to be drilled to meet the required average demand and redundancy requirements. This would mean 20 to 30 disinfection facilities, or piping the wells to a common location for disinfection. Due to the density of the community and set back requirements for wells from septic systems, it would be difficult to site numerous wells. Note that the existing LPID well does not meet current setback requirements. Since there have been reported coliform in some wells, the use of ground water may force the need to provide a new sewer system and sewage treatment plant.

There are also new rules under consideration from the USEPA for ground water supplies with respect to radon, radionuclides, arsenic and disinfection. These rules have not yet been promulgated. We do not know of any data on the ground water at Lake Peekskill with respect to radon, radionuclides and arsenic to render an opinion on the impact of the proposed rules to Lake Peekskill. Regarding disinfection, a new Ground Water Rule is under consideration. USEPA is considering requiring, to identify high risk wells, sanitary surveys, hydrogeological assessments and monitoring for fecal indicators to identify vulnerable systems, may require treatment where contamination or deficiencies are not or cannot be corrected and no alternative water source is available.

Based on the above issues, Insite/O'Brien & Gere did not feel that ground water supply was a workable permanent solution for Lake Peekskill.