

3.3 Public Water Supply

3.3.1 Existing Conditions

The properties surrounding the Raleigh and Heiden Properties Development in the Town of Fallsburg and parts of the site itself, are served by municipal water in the Town of Fallsburg Consolidated Water District. Groundwater in the vicinity of the project area is found in the bedrock as well as the sand and gravel aquifer that follows the Neversink River. Many of the Town of Fallsburg wells rely on this aquifer to draw water.

Shallow groundwater can be found in the glacial till material locally, but is not a reliable source of groundwater due to the relatively thin cover of glacial till in the area. Bedrock wells are installed into the sedimentary rock found below the till. Bedrock wells are generally dependent upon fractures in the rock to provide sufficient water for a reliable water supply. Therefore, depths of wells and well yields can vary considerably, depending upon the size and quantity of fractures that are intercepted by any specific well.

Depth to water table (surficial groundwater elevations) varies on the site. Typically, shallow groundwater is found at the interface of the bedrock and overlying soils or in layers of sand, gravel or silt, in the surficial glacial till material. This shallow groundwater generally follows the surface topography. Since the surface water drainage flows generally towards the southeast (on the eastern portion of the site) and southwest (on the western portion of the site), towards the Sheldrake Stream, shallow groundwater movement can be assumed to be consistent with surface water flows.

Groundwater flow direction in the bedrock aquifer is somewhat influenced by surface topography, but is also influenced by major fracture systems in the rock, faults, and surface water bodies such as the Sheldrake Stream, which flows through the property and the Neversink River, located to the south of the site. Flow direction may also be influenced by areas of wetlands, located in the northern and southeastern portions of the property. Groundwater flow direction on the site has not been documented, but, based upon local topography, groundwater is expected to generally flow towards the lower elevations in the center of the site, towards the Sheldrake Stream.

Fracture Trace Analysis

A fracture trace analysis was completed on the Raleigh and Heiden Properties development site to assist in the location and development of water supply wells on the site and is attached in Appendix E, within the Water Supply Report. A fracture trace analysis utilizes high altitude infrared photography and geologic maps to identify surface features which reflect underlying geologic structures such as faults and bedrock fractures. The number and location of bedrock fractures is dependent on the degree of deformation that the bedrock has undergone through its formation. Typically, the larger, more productive fractures tend to produce visible topographic traces. These traces can be found using aerial photography and digital terrain modeling.

The property is underlain by the Upper Devonian aged Walton Formation, primarily composed of shale, sandstone and conglomerate, which has poor permeability and better than average secondary permeability. The secondary permeability is better than average since the rock type contains low percentages of clay components. A well intercepting this type of rock formation fracture has a better chance of becoming a high yielding well. A review of the high altitude infrared photography identified twelve (12) likely well locations for suitable water development.

Five (5) of these well locations were drilled and are now bedrock water supply wells. The five supply wells are shown in Figure 3.3-1 Well Location Map. No wells drilled, encountered a sustainable unconsolidated aquifer.

Current Water Supply

At present, the existing Raleigh Hotel is served with potable drinking water from the Town of Fallsburg Consolidated water district. The Heiden Hotel parcel is also located within the Town of Fallsburg water district but does not currently use water since the hotel was demolished by a fire several years ago. The remainder of the project site is vacant land but is also located outside of the water district line.

Town of Fallsburg Water Supply System

The Town of Fallsburg Consolidated Water District consists of four (4) former water service areas that were combined into a single town-wide district, including South Fallsburg, Woodbourne, Loch Sheldrake, and Hurleyville. All areas are served by numerous drilled wells and elevated storage tanks that are situated throughout the town. All of the service areas are interconnected by 8-inch or 10-inch diameter watermains and valving to supplement specific area demands or provide an adequate supply source in an emergency situation. Water booster pump stations area also provided in Loch Sheldrake, Woodbourne, and South Fallsburg systems to supplement supply volumes and pressures to adjacent systems as necessary.

A summary of existing supply wells is as follows:

| <u>Well</u> | <u>Approximate Yield</u> |
|---------------------------|--------------------------|
| South Fallsburg 1 | 55 gpm |
| South Fallsburg 2 | 55 gpm |
| South Fallsburg 3 | 300 gpm |
| Fallsburg 4 | 200 gpm |
| Fallsburg 5 | Not Used |
| Fallsburg 6 | 100 gpm |
| Fallsburg 7 | 600 gpm |
| Woodbourne 1 | 120 gpm |
| Woodbourne 2 | 220 gpm |
| Woodbourne 3 | 300 gpm |
| Hurleyville 1 | Not Used |
| Hurleyville 2 | 120 gpm |
| Hurleyville 3 | 70 gpm |
| Loch Sheldrake 1 | Not Used |
| Loch Sheldrake 2 (Browns) | 75 gpm |

The approximate total yield of the above-noted wells is 2,215 gpm, or in excess of 3.0 millions of gallons per day. The estimated average daily demand town-wide during the 2011 peak summer season is approximately 2,150 gpm, leaving an excess capacity of approximately 65 gpm, or 94,000 gpd.

As stated above, a portion of the Raleigh Heiden Properties project area is currently served by the South Fallsburg service area, via an 8-inch watermain installed along NYS Route 42. This watermain runs in a southwesterly direction out of South Fallsburg, turning south onto Heiden Road (CR 161) and continuing one (1) mile to the Raleigh Hotel resort facility, directly opposite

the Heiden Road-Kimesha Lake Road (CR 109) intersection. The Town water district lines run parallel to and 600 feet from the centerline of Heiden Road, ending at the southerly bounds of the Raleigh Hotel, which also serves as the Towns of Thompson and Fallsburg municipal boundary. Currently, the 230 room hotel complex is connected to the water district and is proposed to remain connected to the Town water district.

3.3.2 Potential Impacts

The proposed Raleigh and Heiden Properties development will require potable drinking water for the 236 four bedroom single family homes and duplex units along with the 230 rooms that will remain at the Raleigh Hotel. The 230 rooms at the Raleigh Hotel will continue to require service from the Town water district. A total of 55 of the residential units are proposed to be supplied water from the Town of Fallsburg water district and will require approximately 21,000 gpd, or 15 gpm, of additional water. The Town of Fallsburg water district line does not include all the 55 homes on the loop road. The water district line will need to be extended to include all these homes. This extension of the water district will need to be approved by the Town Board. Based upon the above-noted estimate of at least 65 gpm of excess capacity in the Town's consolidated water district, sufficient capacity exists for the project development Cluster 1 (the 55 homes) estimated demand of 15 gpm. The remaining 181 single family homes and duplex units will be supplied water from the proposed on-site community water supply discussed below.

A sequential 72-hour pump test was conducted on all five (5) proposed water supply wells to establish a community water supply for the project. The pump test was conducted in compliance with the New York State Department of Health (NYSDOH) and New York State Department of Environmental Conservation guidelines. Prior to the start of the pump test, the pump test protocol was reviewed by the Town of Fallsburg Engineer, Mr. Will Illing, and the NYSDOH. The pump test protocol is attached in the Water Supply Report (see Appendix E).

The community water supply system will need to supply 1.5 times the average daily demand, as stated in the June 30, 2009 letter from the NYSDOH. The average daily demand has been calculated to be 72,000 gpd or 50 gallons per minute (gpm), as stated in Appendix I the Preliminary Water Supply and Distribution System Engineering Report for Raleigh and Heiden Properties Development Project. The required amount of water needed per the New York State Department of Environmental Conservation (NYSDEC) is 1.5 times the average daily demand, which is calculated to be 75 gpm. This water demand needs to be demonstrated through a pump test while removing the best well in the network from the test. The testing needs to demonstrate sufficient water for peak demand and provide back-up supply if a well were to become inoperable.

Pump Test

A pump test was completed on the Raleigh and Heiden Properties Development five (5) wells in the month of September 2009. The full Water Supply Report is provided in Appendix E of this document. Below is a summary of the pump test completed on the onsite wells.

Five (5) wells were completed on the property by Fulton & Son Well Drilling under the supervision of the project developer. The wells were designated as Well-1, Well-2, Well-3, Well-4 and Well-4A. The five wells were completed in the bedrock aquifer. The Pump Test protocol indicated that private off-site wells to be monitored, would be agreed upon by the Town of Fallsburg Engineer, Mr. Will Illing (see Water Supply Report Appendix E). A letter and questionnaire was sent to those agreed upon neighbors, surrounding the Raleigh and Heiden

Properties site. No responses were received by Tim Miller Associates and therefore Mr. Will Illing suggested expanding the request to include the Fishing and Boating Club located north of the Raleigh and Heiden Properties development. Two owners, Mr. Uhl and Mr. Bisnoff, responded positively to having their wells monitored during the pump test. The Uhl well is located on Lot 26 on the western side of Pleasure Lake and the Bisnoff well is located on Lot 52 on the eastern side of Pleasure Lake.

The pump test was completed as a “stress” test in which the four primary wells (Wells 1, 2, 3 and 4A) were pumped simultaneously for 72-hours. This test was a constant rate test with some adjustments made during the test and the pumping rates were increased. After a suitable recovery period for the primary wells, the secondary test began. The best well, Well-4, was pumped separately for 72-hours. The pumping test results and sustainable yields are shown below in Table 3.3-1. During the pump test onsite wells and the offsite Uhl and Bisnoff wells were monitored for influence.

| Table 3.3-1 Pumping Test Results | | | | | | | |
|---|----------------------------|---------------------|---------------------|---------------------|---------------|----------------------|-----------|
| Well Number | Stabilized Test Rate (gpm) | Stabilized Drawdown | Stabilized Duration | Stabilization Range | Hourly Change | Saturated Well Depth | Test |
| Well-1 | 15 | 85.59 to 85.45 ft. | 39 hours | 0.86 ft | 0.22 ft/hr | 360 ft | Primary |
| Well-2 | 15 | 159.9 to 168.7 ft. | 58.2 hours | 8.8 ft | 0.15 ft/hr | 558 ft | Primary |
| Well-3 | 30 | 109.7 to 110.5 ft | 39.3 hours | 0.8 ft | 0.02 ft/hr | 335 ft | Primary |
| Well-4 | 35 | 59.4 to 65.01 ft. | 55 hours | 5.6 ft | 0.1 ft/hr | 565 ft | Secondary |
| Well-4A | 15 | 80.5 to 85.7 ft | 42 hours | 2.2 ft | 0.05 ft/hr | 558 ft | Primary |
| Total | 110 | | | | | | |
| With best well out (Well 4) | 75 | | | | | | |

Source: SSEC Raleigh and Heiden Pump Test, September 3, 2009 through September 11, 2009.
gpm = gallons per minute

As shown above, the pump test proved a sustainable yield of 110 gpm or 75 gpm with the best well taken out of service. The logger placed in the Uhl well, north of the Raleigh and Heiden Properties development, shows that there may be a connection between the Uhl well and the project’s wells. As shown in the questionnaire completed by Mr. Uhl, the well is 310 feet deep with a water bearing fracture at approximately 210 gpm. The static water level was measured at 30 feet and the well has a yield of 15 gpm. During a conservative pumping test, the drawdown shown in the Uhl well was approximately 7 feet. Therefore, approximately 270 feet of water column remains available in the well.

Fire Flow

For residential projects served by municipal water supply districts, the former minimum required firefighting flow of 500 gpm at a residual pressure of 20 psi has generally been superseded by the Insurance Services Office of New York to require a minimum suggested flow of 250 gpm for a duration of 2 hours plus local consumption demands. A minimum storage capacity equivalent

to a flow of 750 gpm for a duration of 2 hours is suggested. Then, $750 \text{ gpm} \times 2 \text{ hours} \times 60 \text{ minutes/hour} = 90,000 \text{ gallons}$, which is equivalent to approximately 7 percent of the existing LaVista Drive storage tanks when full; and 13 percent when half full. Therefore, adequate flow volumes are available for meeting above minimum fireflow requirements at the project site.

3.3.3 Mitigation Measures

The pump test, completed in September 2009 shows that there could be a connection between the project wells and the Uhl well, located north of the site and on the west side of Pleasure Lake. As stated above, the Uhl well shows approximately 7 feet of drawdown during the pump test period. However, based upon information provided by Mr. Uhl, the well is 310 feet deep with a static water level at 30 feet and a water bearing fracture at 210 feet deep. The well has sufficient water column in the well (approximately 270 feet) to avoid problems with water supply. If water supply problems are experienced by Mr. Uhl or neighbors on the western side of Pleasure Lake, the applicant will work with the Town of Fallsburg to determine and confirm that the suspected impacts to the private wells were indeed caused by the Raleigh and Heiden Properties Development. If it is determined that the proposed development caused such impacts, the applicant will mitigate the neighbors' drinking water wells by either deepening the well or drilling a new well.

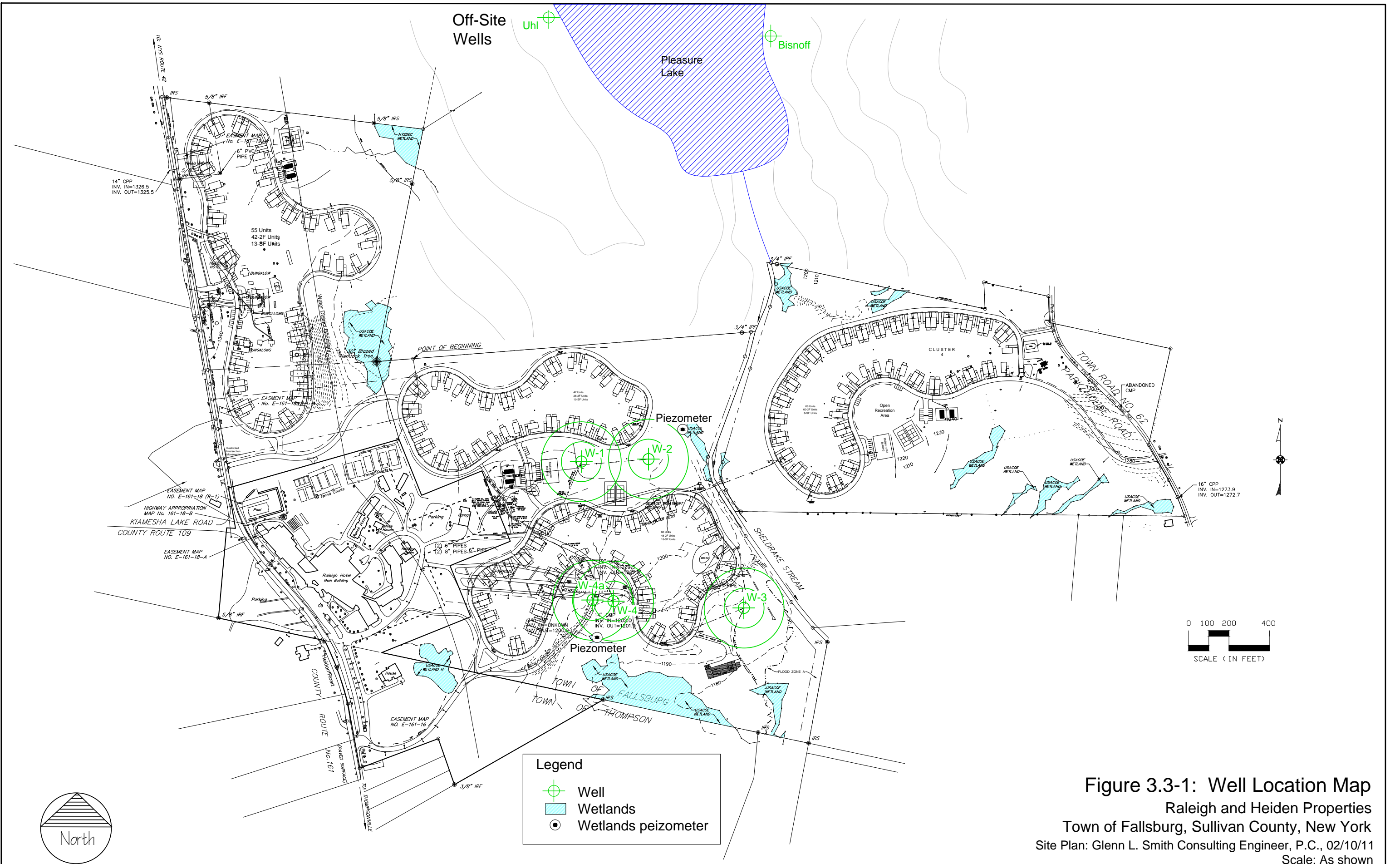


Figure 3.3-1: Well Location Map
 Raleigh and Heiden Properties
 Town of Fallsburg, Sullivan County, New York
 Site Plan: Glenn L. Smith Consulting Engineer, P.C., 02/10/11
 Scale: As shown