Appendix 9.9 Water Report

Engineering Report

Silo Ridge Resort Community

DEIS Water Supply Report

Town of Amenia
Dutchess County, New York

August 15, 2006
Last Revised October 4, 2007

THE Chazen COMPANIES

Prepared for:

Higher Ground Country Club
Management Co., L.L.C.
P.O. Box 86, Route 22
Town of Amenia, NY 12501

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Prepared by:

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1.0 EXECUTIVE SUMMARY

The proposed Silo Ridge Resort Community will be served by a community water supply consisting of groundwater wells. Water from these sources will be treated and transmitted into the distribution system where it will be stored in a 500,000 gallon atmospheric storage tank. The normal operating water level in this tank is proposed to be 805-feet above mean sea level (msl). Water from this tank will be delivered to the system through a distribution system consisting of eight (8) inch diameter water mains.

The distribution system is segmented into several distinct pressure zones to meet New York State Department of Health (NYSDOH) and Dutchess County Department of Health (DCDOH) criteria for distribution system pressure. The core zone on which the atmospheric tank will float will serve developed property between elevation 573 – 723 feet msl. Portions of the service area located at an elevation above 723 feet msl that cannot be adequately served by the atmospheric storage tank will be provided with water booster pump stations to increase pressures to acceptable working pressure levels. Areas located at an elevation below 573 feet msl which would normally experience pressure exceeding 100 psi, will be provided with pressure reducing valve (PRV) stations placed at specific locations throughout the system to reduce pressure to the desired range. Each of these pressure zones has been designed to keep normal operating pressures between 35 psi and 100 psi.

The community water system will be owned and operated by a transportation corporation under the regulatory jurisdiction of the NYSDEC for resource allocation, the NYSDOH for the sanitary aspects of the system and the New York Public Service Commission (NYSPSC) for financial and operational oversight.

2.0 INTRODUCTION

Higher Ground Country Club Management Co. L.L.C. is proposing to improve the existing 668 (+/-) acre Silo Ridge Country Club into a resort community which will include townhouses and condominium units, single-family residences, a resort hotel with banquet facilities and restaurants, a conference center, a spa and wellness center as well as improved golf course facilities. The proposed Silo Ridge Resort Community ("the project") is a master planned community complex incorporating recreational amenities, community facilities, up-scale hotel and spa and a range of residential housing types, which will be designed, developed and operated with sensitivity to environmental resources and in keeping with the character of the area and local community. A variety of housing configurations will be oriented to various lifestyles using architectural themes compatible with the natural setting of the site

and consistent with the character of the local community. The project will include all necessary infrastructure, including an on-site central water supply system, on-site sanitary sewer collection and treatment system, drainage facilities and extensive natural resource conservation, protection and enhancement areas.

The project site is located west of New York State (NYS) Route 22 in the Town of Amenia, Dutchess County and is identified as tax parcel numbers 132000-7066-00-732810, 132000-7066-00-860725, 132000-7066-00-742300, 132000-7066-00-670717 and 132000-7066-00-709177 on the Town of Amenia Tax Map. The northern portion of the site is traversed by New York State (NYS) Route 44.

The site is currently developed with a 170-acre 18-hole championship golf course, a pavilion and a clubhouse with banquet facilities. The development will take place on a 210±-acre portion of land adjacent to the existing golf course.

The project sponsor will develop an on-site community water supply system consisting of groundwater wells, water treatment facilities, a water storage tank and a water distribution system.

The proposed central water system at Silo Ridge is a "community system" as defined by 10 NYCRR Subpart 5-1 (Subpart 5-1)[1] of the New York State Sanitary Code. The design and operation of the system must be in accordance with Subpart 5-1 and the "Recommended Standards for Water Works"[2] also known as the "Ten States Standards for Water".

This water supply concept report has been prepared to support the project's State Environmental Quality Review (SEQR) evaluation. As such, design concepts are provided for sources of supply, treatment, storage and distribution facilities. This concept report is not intended to be a detailed engineering report prepared to support and accompany the design of facilities submitted for regulatory review and approval. Such detailed engineering report will only be completed after the SEQR review process is complete and preliminary design of proposed facilities are advanced beyond the conceptual level. Both the proposed action and the Traditional Neighborhood Alternative (TNA) are discussed in this concept report.

3.0 EXISTING WATER SUPPLY SYSTEM

The existing pavilion and golf clubhouse are currently served by a public water supply system consisting of a groundwater supply well, water treatment equipment

[1] 10NYCRR 5-1, New York State Code of Rules and Regulations, Title 10, Subpart 5-1, Public Water Supplies.
[2] Ten State Standards, Recommended Standards for Water Works, 2003 Edition, Great Lakes Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers.

and finished water storage. This well is located approximately 50 feet north of the clubhouse. The maintenance building near the main entrance off Route 22 is served by a separate groundwater supply well. This well is located approximately 46 feet from the northwest corner of the maintenance building.

4.0 PROPOSED WATER SUPPLY & TREATMENT FACILITIES

4.1 Projected Water Demands

4.1.1 Anticipated Domestic and Commercial Use

Projected water demand was estimated using typical hydraulic loading rate values taken from Table 3 of the New York State Department of Environmental Conservation's (NYSDEC) "*Design Standards for Wastewater Treatment Works– Intermediate Sized Sewerage Facilities* " (1988 Edition) manual[3]. The estimated water demand takes into account the allowable 20% reduction in flow due to the mandated use of water saving plumbing fixtures for new construction.

Pursuant to a meeting with Mr. John Glass, Director of Environmental Health, Dutchess County Health Department (DCDH), in November of 2005, to present and discuss the proposed Silo Ridge project, this approach to evaluate projected water demand was deemed acceptable. The anticipated water demand established in this concept report will be subject to review and eventual concurrence by DCDOH and NYSDOH at the time of the water supply application (WSA).

Proposed Action

The proposed action consists of forty-one (41) 4-bedroom single family detached residential units, three hundred twenty-eight (328) 3-bedroom attached townhouse units, a resort hotel with a total of 300 suites, banquet halls, restaurants with a total seating capacity of 225, conference facilities, spa and wellness center and a new clubhouse with retail and office space.

Table 4.1 provides a list of anticipated residential and non-residential uses and associated water demand for the proposed action. The projected average day water demand is approximately 211,020 gallons per day (gpd) or 147 gallons per minute (gpm). The anticipated maximum daily flow is 422,039 gpd (293 gpm) with a max hourly flow of 879 gpm.

[3] New York State Department of Environmental Conservation (NYSDEC) Design Standards for Wastewater Treatment Works – Intermediate Sized Sewerage Facilities (1988)

TABLE 4.1 - SILO RIDGE COUNTRY CLUB RESORT COMMUNITY
PROJECTED WATER DEMAND FOR PROPOSED ACTION

Land Use	Unit	Unit Qty	Water Usage Unit Rate (gpd/unit)	Water Saving Credit [6] (%)	Water Usage Rate w/ Credit (gpd/unit)	Average Daily Flow (gpd)
Single Family	4-Bedroom	41	475 [1]	20%	380	15,580
Townhouse	3-Bedroom	328	400 [1]	20%	320	104,960
Resort Hotel						
Studio	room	38	120 [1]	20%	96	3,648
Suites	1-Bedroom	88	150 [1]	20%	120	10,560
	2-Bedroom	104	300 [1]	20%	240	24,960
	3-Bedroom	70	400 [1]	20%	320	22,400
Banquet Hall	person	200	20 [1]	10%	18	3,600
Conference Areas	seat	200	10 [2]	20%	8	1,600
Restaurant	seat	125	35 [1]	10%	32	3,938
Spa	sf	15,000	0.40 [3]	10%	0.36	5,400
Retail store & shop	sf	2,000	0.10 [1]	20%	0.08	160
Golf Clubhouse						
Banquet Hall	person	375	20 [1]	10%	18	6,750
Restaurant	seat	100	35 [1]	10%	32	3,150
Retail store/Offices	sf	2,000	0.10 [1]	20%	0.08	160
Golfers	golfer	160	3 [4]	20%	2	384
Swimming Pool (5,000 sf) [5]	swimmer	333	10 [1]	0%	10	3,330
Wastewater Treatment Facilities	employee	2	25 [1]	20%	20	40
Maintenance Facilities	each	1	400	0%	400	400
TOTAL:						211,020

Max Day Peaking Factor[7]:	2.0
Max Daily Flow (gpd):	422,039
Max Daily Flow (gpm):	293
Max Hour Peaking Factor:	6.0
Max Hourly Flow (gpm):	879

Notes:

1. Hydraulic Loading Rates from Table 3 of the NYSDEC Design Standards for Wastewater Treatment Works 1988 unless otherwise noted below
2. Category or use not specifically listed in above referenced NYSDEC Manual. An Hydraulic Loading Rate of 10 gpd/person corresponding to a Dinner Theatre seat with hotel taken from Table 3 of the 1988 NYSDEC Design Standards is used.
3. Water usage for Spa facilities is estimated at four (4) times the typical value listed in 1988 NYSDEC Standards for shopping center/office building.
4. A maximum of 160 golfers are anticipated to be on the golf course at any time and use the restroom facilities (4 golfers/15 min/10-hour day). An Hydraulic Loading Rate of 3 gpd/golfer corresponding to an Airport Passenger taken from Table 3 of the 1988 NYSDEC Design Standards is used.
5. Number of swimmers/bathers is estimated on the basis of 15 sf of pool water surface area per patron as recommended in NYS Sanitary Code Subpart 6-1.
6. NYSDEC allows for up to 20% reduction in flows for installations equipped with certified water-saving plumbing fixtures.
7. Projected Maximum Daily peaking factor is based on a comparable small community water system with a population of 2,500 to 3,000. Information taken from article entitled "Small Rural Communities' Quest for Safe Drinking Water", Rural America, volume 17, Issue 3/Fall 2002. The information provided in this article was adapted by the Economic Research Service of the USDA from EPA, 1995 "Community Water System Survey".
8. Projected water demand assumes full occupancy of townhouses, single-family houses, hotels, spa, golf and club.

Proposed Traditional Neighborhood Alternative (TNA)

The proposed TNA consists of forty-one (41) single family detached residential units, nineteen (19) golf villas, two hundred ninety-nine (299) attached townhouses and flats, a resort hotel with a total of 300 rooms and suites, banquet halls, restaurants including café and grill with a total seating capacity of 300, conference facilities, spa and wellness center, a winery and a new clubhouse with retail store and shops.

Table 4.2 provides a list of anticipated residential and non-residential uses and associated water demand for the proposed Traditional Neighborhood Alternative (TNA). The projected average day water demand is approximately 190,420 gallons per day (gpd) or 132 gallons per minute (gpm). The anticipated maximum daily flow is 380,841 gpd (264 gpm) with a max hourly flow of 793 gpm.

4.1.2 Irrigation Usage

The existing golf course irrigation system is a separate and independent system used to irrigate the tees, greens, fairways and rough. In total, approximately 170 acres of turf is irrigated. Irrigation water is drawn from a natural spring pond on site and distributed via an intricate network of underground piping to irrigation sprinklers.

The irrigation pond is fed by a natural spring source, a small on site stream and by stormwater runoff from the site. According to the owner of the golf course, the existing irrigation pond has adequate capacity to meet current irrigation water demand.

It is anticipated that the proposed re-development of the golf course will not create additional demand for irrigation water. Therefore, golf course irrigation needs will not require the development of additional water sources to satisfy the need of this project.

4.2 Basis of Design of Source and Treatment Facilities

Standard practice in water supply design is to increase source and treatment capacities to meet the maximum expected daily demand. The anticipated maximum daily demand is 422,039 gpd or 293 gpm for the proposed action and 380,841 gpd or 264 gpm for the proposed Traditional Neighborhood Alternative (TNA).

Section 3.2.1.1 of the 2003 edition of the "*Recommended Standards for Water Works*" (a.k.a. Ten States Standards)[4], stipulates that the total developed groundwater source capacity, unless otherwise specified by the reviewing authority, shall equal or exceed the design maximum day demand with the largest producing well out of service.

TABLE 4.2 - SILO RIDGE COUNTRY CLUB RESORT COMMUNITY
PROJECTED WATER DEMAND FOR PROPOSED TRADITIONAL NEIGHORHOOD ALTERNATIVE (TNA)

Land Use	Unit	Unit Qty	Water Usage Unit Rate (gpd/unit)	Water Saving Credit [6] (%)	Water Usage Rate w/ Credit (gpd/unit)	Average Daily Flow (gpd) [9]
Single Family Homes	3-Bedroom	18	400 [1]	20%	320	5,760
	4-Bedroom	17	475	20%	380	6,460
	5-Bedroom	6	550	20%	440	2,640
Golf Villas	3-Bedroom	13	400 [1]	20%	320	4,160
	4-Bedroom	6	475	20%	380	2,280
Townhouse	3-Bedroom	146	400 [1]	20%	320	46,720
Flats	2-Bedroom	153	300 [1]	20%	240	36,720
Resort Hotel	Room/Suite	300	202 [8]	20%	161	48,412
Hotel Amenities/Spa						
Restaurant/Dining/Café	seat	180	35 [1]	20%	28	5,040
Spa & Fitness Center	sf	81,490	0.30 [3]	20%	0.24	19,558
Indoor Lap Pool (6,000 sf) [5]	swimmer	400	10 [1]	20%	8	3,200
Winery	seat	80	20 [1]	20%	16	1,280
Golf Clubhouse/Halfway Grill						
Dining/Lounge/Bar	seat	120	35 [1]	20%	28	3,360
Golf shop	sf	1,355	0.10 [1]	20%	0.08	108
Golfers	golfer	160	3 [4]	20%	2	384
Banquet Facilities	person	300	20 [1]	20%	16	4,800
Conference/Meeting Rooms	theater seat	145	10 [2]	20%	8	1,160
Retail store & shop	sf	18,700	0.10 [1]	20%	0.08	1,496
Outdoor Pool (3,000 sf) [5]	swimmer	200	10 [1]	20%	8	1,600
Wastewater Treatment Facilities	employee	2	25 [1]	20%	20	40
Maintenance Facilities	each	1	400	0%	400	400
TOTAL:						195,578
			Max Day Peaking Factor[7]:			2.0
			Max Daily Flow (gpd):			391,156
			Max Daily Flow (gpm):			272
			Max Hour Peaking Factor:			6.0
			Max Hourly Flow (gpm):			815

[4] Ten State Standards, Recommended Standards for Water Works, 2003 Edition, Great Lakes Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers.

Notes:

1. Hydraulic Loading Rates from Table 3 of the NYSDEC Design Standards for Wastewater Treatment Works 1988 unless otherwise noted below
2. Category or use not specifically listed in above referenced NYSDEC Manual. An Hydraulic Loading Rate of 10 gpd/person corresponding to a Dinner Theatre seat with hotel taken from Table 3 of the 1988 NYSDEC Design Standards is used.
3. Water usage for Spa facilities from "Calculations for Design Dry Weather Flows", City of Ann Arbor, MI, per direction from the Town of Amenia Engineer correspondence dated 9/11/07.
4. A maximum of 160 golfers are anticipated to be on the golf course at any time and use the restroom facilities (4 golfers/15 min/10-hour day). An Hydraulic Loading Rate of 3 gpd/golfer corresponding to an Airport Passenger taken from Table 3 of the 1988 NYSDEC Design Standards is used.
5. Number of swimmers/bathers is estimated on the basis of 15 sf of pool water surface area per patron as recommended in NYS Sanitary Code Subpart 6-1.
6. NYSDEC allows for up to 20% reduction in flows for installations equipped with certified water-saving plumbing fixtures.
7. Projected Maximum Daily peaking factor is based on a comparable small community water system with a population of 2,500 to 3,000. Information taken from article entitled "Small Rural Communities' Quest for Safe Drinking Water", Rural America, volume 17, Issue 3/Fall 2002. The information provided in this article was adapted by the Economic Research Service of the USDA from EPA, 1995 "Community Water System Survey".
8. The water usage unit rate for this category is a weighted hydraulic loading rate established using an average of 1.5 bedrooms per unit based on the anticipated mix of rooms, and 1-bdr, 2-bdr, 3-bdr amd 4-bdr suites.
9. Projected water demand assumes full occupancy of townhouses, single-family houses, hotels, spa, golf and club.

The application of these criteria to the Silo Ridge Development established the following basis of design:

- the source field must be capable of providing 293 gpm with the largest producing well out of service for the proposed action or 264 gpm for the proposed TNA, and

- the proposed water treatment facilities will be capable of treating up to 422,039 gpd (293 gpm) for the proposed action or 380,841 gpd (264 gpm) for the proposed TNA.

4.3 Proposed Water Supply Sources

4.3.1 Hydrogeological Investigation

In the fall of 2005 and winter of 2006, The Chazen Companies completed, on behalf of Higher Ground Country Club Management Co., L.L.C, an extensive groundwater investigation. The details of this program are provided in TCC's hydrogeological report entitled "Silo Ridge — Aquifer Pumping Test Report" which is separately bound. In March of 2006, TCC completed a 72-hour+ simultaneous pump test of each of the proposed sources of supply. During this test TCC monitored on-site and off-site water levels in nearby wells, staff gauges and piezometers to monitor effects of the water resource withdrawals. Complementary well pumping tests were also performed in April of 2007. Table 4.3 provides the characteristic of the

groundwater wells that TCC proposes to develop as a water source with their associated safe yields.

Table 4.3 Characteristics of Proposed Groundwater Wells

Well No.	Depth (ft)	Diameter (in)	Safe Yield (gpm)
PW-1	170	6	80
PW-2	345	6	100
PW-4	445	8	15
PW-5	465	6	23
PW-9	405	6	105
PW-11	605	6	65
	Total Developed Resource		388
Total Developed Resource w/Largest Well Out of Service			283

The proven water production of the combined wells listed in Table 4.3 is 283 gallons per minute with the largest well out of service.

4.3.2 Raw Water Quality Analysis

At the conclusion of the pump test, raw water samples were collected at the conclusion of the test and analyzed for constituents listed in NYSDOH Sanitary Code, Subpart 5-1 in accordance with standard laboratory procedures. The complete water quality results for all wells tested can be found in TCC's hydrogeological report.

A partial listing of those results that will influence the design and operation of the water system for the project are listed in Table 4.4 below. Initial results indicate that the raw water from the proposed sources of supply meets all state mandated drinking water quality standards except for those contaminants whose measured level exceeds the established maximum contaminant level (MCL). Those contaminants whose value exceeds MCL standards are identified by the light-gray shaded boxes shown in Table 4.4 below.

The raw water from PW-9 and PW-11 meet all state mandated water quality standards. Elevated levels of iron, turbidity and lead exceeding NYSDOH drinking water quality standards were identified in raw water from wells PW-1, PW-2, PW-4 and PW-5. In addition, elevated level of manganese exceeding NYSDOH drinking water quality standards was identified in water from wells PW-4 and PW-5.

Micro particulate analysis (MPA) testing identified well PW-11 as "low-risk" under EPA relative risk ranking guidelines for groundwater under the direct influence of surface water.

Table 4.4 Partial Water Quality Results from Proposed Wells

Contaminants	Units	NYS MCL[1]	PW-1	PW-2	PW-4	PW-5	PW-9	PW-11
Asbestos	MFL	7	ND	ND	ND	ND	ND	ND
Antimony	mg/l	0.006	ND	ND	ND	ND	ND	ND
Arsenic	mg/l	0.05	ND	ND	ND	NA	ND	ND
Barium	mg/l	2.00	0.0094	0.0061	0.0130	0.0069	ND	ND
Fluoride	mg/l	2.2	ND	0.2	ND	ND	ND	ND
Chloride	mg/l	250.0	10	2	3	2	2	3
Iron	mg/l	0.3	0.88	0.43	2.2	1.8	0.086	0.095
Manganese	mg/l	0.3	0.21	0.23	0.37	0.31	0.024	0.20
Sodium	mg/l	NDL	5.5	ND	ND	ND	ND	ND
Sulfate	mg/l	250	30	19	27	27	25	24
Zinc	mg/l	5	0.024	0.12	0.31	0.27	0.02	0.029
Color	PtCoU	15	ND	ND	ND	ND	ND	ND
Odor	Ton	3	ND	ND	ND	ND	ND	ND
Turbidity	NTU	1	3.8	1.2	3.5	5.5	0.3	ND
Corrosivity		No MCL	0.2	-0.2	-0.52	-0.57	-0.07	-0.18
Alkanility	mg/l	No MCL	126	129	102	98	107	75
Calcium, Total	mg/l	No MCL	48	41	37	35	35	29
pH		6.5-8.5	7.86	7.49	7.32	7.29	7.81	7.89
Total Dissolved Solids	mg/l	500	214	130	147	85	172	109
Lead	mg/l	0.015	0.016	0.02	0.015	0.016	0.001	0.004
Nickel, total	mg/l	0.1	ND	0.0073	ND	ND	ND	ND
Copper	mg/l	1.3	ND	ND	ND	ND	ND	ND
Nitrate	mg/l	10	ND	ND	ND	ND	ND	0.06
Nitrite	mg/l	1	ND	ND	ND	ND	ND	ND
Table 3 GOC	mg/l	0.005	ND	ND	ND	ND	ND	ND
Total Coliform		Any + sample	A	A	A	A	A	A
Escherichia Coli		Any + sample	A	A	A	A	A	A
MTBE	µg/l	10	ND	ND	ND	ND	ND	ND

Radon in water	pCu/l	40,000	ND	ND	ND	ND	ND	ND
Temperature	ºC	No MCL	19.7	19.6	19.7	18.6	18.2	18.3
MPA			A	A	A	A	A	L

(1) MCL = Maximum Contaminant Level from New York State Sanitary Code NYCRR Title 10, Part 5, Subpart 5-1

ND = Not detected above method detection limit A = Absent

MPA Risk: L = Low Risk; M = Moderate Risk; H = High Risk

NA = Not Analyzed

NDL = No designated Limits

MFL = Million fibers per liter

mg/l = milligrams per liter

µg/l = micrograms per liter

4.3.3 General Design Criteria for Wells

The following is a summary of some of the major design elements that will need to be incorporated into the construction of the wells and the overall project plan:

- Each well will be equipped with a domestic pitless unit as supplied by Baker Mfg Monitor Division or approved equal with a locking cap.
- All well heads will terminate at least 24 inches above final ground elevation or three (3) feet above the 100-year flood plain elevation or the highest known flood elevation, whichever is higher.
- Each well pump will be sized to deliver raw water to the proposed water storage or treatment facility.
- The well pump operation will be controlled by the water level in the proposed finished water storage facility.
- Each well will be equipped with a pressure transducer to provide groundwater level/drawdown information to the control panel and a low level cutoff to avoid damage to the pump.
- Each well line will include at least one check valve within the well casing.
- Well sources will be separately metered.

4.3.4 Well Head Protection

Appendix 5-D of the New York State Sanitary Code stipulates that wells serving a public water system shall be located such that the owner of the water system

possesses legal title to lands within 100 feet of the well and the owner controls by ownership, lease, easement or other legally enforceable arrangement the land use activities within 200 feet of the well to prevent contamination of the ground or groundwater.

The six (6) proposed production wells are located on property owned by the developer and will be protected with a 100-foot radius of land ownership centered on each well head. In addition, a 200-foot radius of protection centered on each production well will be provided through land ownership, lease or restrictive easement.

The conditions of the protective easements will be specified per NYSDOH requirements and will limit or control the use and storage of chemicals including fertilizers, pesticides and herbicides, road salt, petroleum products and stormwater.

4.4 Proposed Water Treatment Facilities

The water supply and treatment facilities will be constructed on lands that will be owned by the proposed transportation corporation. The source and conveyance systems will be designed to meet the project's anticipated maximum daily water demand.

The water treatment facilities will consist of a central water treatment plant which will process and treat raw water from production wells PW-1, PW-2, PW-4, PW-5, PW-9 and PW-11.

4.4.1 Proposed Water Treatment Building

The water treatment and control building will house the control and instrumentation panels for the well pumps, transfer pumps, disinfection equipment, other treatment as necessary, all the piping, gauges and valves, flow meters, sample taps and other equipment that may be required by the Department of Health.

The water treatment and control facility can generally be described as follows:

- Building will meet latest New York State building code requirements.
- The building shall be provided with:
  - Main electrical/telephone underground service.
  - Potable and raw water service with sample taps.
  - MCC/control panels with communication lines.
  - Laboratory bench space (no sink).

  - Shift operator work desk and chair.
  - Appropriate safety equipment commensurate with OSHA standards including eye wash station and fire extinguisher.
  - Front entrance door (minimum 36" wide) w/ exterior light.
  - Double access door (6' wide) at back entrance w/ exterior light.
  - Heating units to maintain a minimum temperature of 60º F and dehumidifier.
  - Appropriately sized ventilation system.
  - Intrusion alarm system

- Process/treatment equipment shall comply with Ten State Standards and NYSDOH Standards
- Each well source will be individually metered
- A master meter will be provided on the plant discharge piping
- Telemetry System will permit the water treatment plant to communicate with all facility sites including the well field, booster pump stations and the water storage tank. Operators at the treatment plant will be able to monitor well status, water level status and be able to remotely start and stop wells and pump stations.
- Piping will allow flow from each well to be blown off before and after the master meter.
- Water sampling taps will be provided to collect water samples at various locations (raw water, post-chlorine addition, post contact period).
- Adequate facilities including crane-ways, hoist beams, eyebolts, openings in floor or roof for servicing or removal of pumps, motor or other heavy equipment
- Driveway access to plant shall be designed to accommodate a service/maintenance/delivery truck of the AASHTO SU type.
- Site perimeter lighting to consist of pole mounted floodlight fixtures controlled by motion sensor/timer/photocell
- Building exterior lighting to consist of several wall mounted units controlled by motion sensor/timer/photocell.
- Emergency power with automatic start capability.

4.4.2 Proposed Water Treatment Process

Title 10NYCRR Subpart 5-1 of the New York State Code of Rules and Regulations establishes drinking water maximum contaminant levels and treatment requirements. Water from each source will meet the quality standards of Subpart 5-1 or be treated accordingly to meet these standards.

This section of this report describes the recommended treatment process that will be employed to reduce the parameters listed in Table 4.4 from their natural concentrations found in the source water to below the NYSDOH maximum contaminant levels for potable water.

Particulate Filtration

The NYSDOH requires that turbid groundwater which is not adequately filtered naturally must be provided with additional filtration to remove particulate and biological contaminants. A pressure cartridge filtration system capable of removing all particles larger than 1 micron in size is proposed for the source water in PW-1, PW-2, PW-4 and PW-5 to meet this requirement.

This will be achieved using a 3-step filtration process consisting of a preliminary filter with a 20 µm nominal pore size, an intermediate filter with a 5 µm nominal pore size and a final filter with a 1 µm nominal pore size.

Micro-Filtration

MPA testing identified well PW-11 as "low-risk" under EPA relative risk ranking guidelines for groundwater under the direct influence of surface water (GWUDI). For the purpose of this report, we have assumed that the NYSDOH will require this well source to comply with provisions of the USEPA's Surface Water Treatment Rule.

In accordance with the EPA's Surface Water Treatment Rule, all surface water systems or ground water under the direct influence of surface water systems are required to achieve 99.9% (3-log) removal/inactivation of *cryptosporidium parvum* and *giardia lambia* cysts, and 99.99% (4-log) removal/inactivation of enteric viruses. through removal (filtration) and/or inactivation (disinfection). Log removal credits are granted for filtration and vary depending on the type of treatment process (such as conventional, direct, or alternative filtration). For unfiltered systems, all four logs must be achieved through disinfection.

This will be achieved using a 2-step micro-filtration process consisting of a preliminary filter with a 5 µm nominal pore size and a final "polishing" filter with a

1 µm absolute pore size. The proposed micro-filtration system meets or exceeds the 3-log (99.9%) removal requirements described in National Sanitation Foundation (NSF) Standard 53 for cyst sized particles.

Disinfection will be provided in addition to micro-filtration to meet the 4-log (99.99%) virus removal requirement.

Iron and Manganese Reduction

Iron and manganese will be removed from the source water in PW-1, PW-2, PW-4 and PW-5 using conventional treatment methods such as particulate filtration, ion exchange, sequestering, oxidizing/adsorptive filters (greensand filters), colloidal type filter, or catalytic type filter. The actual treatment may necessitate the combination of several treatment methods to achieve required water quality standards.

Lead Reduction

Lead will be removed from the source water in PW-1, PW-2, PW-4 and PW-5 using conventional treatment methods including particulate filtration, ion exchange, activated carbon filtration, or reverse osmosis.

Disinfection

Sodium hypochlorite will be used to disinfect the raw water from each well source. A chlorine dose will be introduced into the system to provide a free chlorine residual of 2 ppm (mg/L) at the point of entry to the distribution system.

The system will be designed to provide the minimum contact time for inactivation of microorganisms to comply with provisions of the EPA's Disinfection Profiling and Benchmarking Technical Guidance Manual[5].

4.5 Proposed Water Storage Facility

Atmospheric water storage facilities are usually located at the highest possible elevation in a development in an attempt to serve the maximum number of units within the proposed service area by gravity while providing adequate working pressures. Areas that cannot be provided sufficient pressure by the atmospheric tank will be served by water booster pump stations. Pressure reducing valve stations will be installed in low lying areas with excessive water pressures.

[5] Long Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR) Disinfection Profiling and Benchmarking Technical Guidance Manual (EPA 816-R-03-004), Environmental Protection Agency (EPA), 2003, Washington, D.C.

When feasible and allowed by the site topography and proposed service area, pumping finished water into a water storage tank that is "floating on the system", whether the tank is an elevated tank, a standpipe or a ground tank on a hill, usually represents a very efficient operation by its relatively low energy power requirements.

4.5.1 Storage Requirements

Ten State Standards[6] requires a distribution storage volume equal to one average day of use. Therefore, the atmospheric finished water storage tank will be designed to store a minimum usable volume equivalent to the average day water demand of 211,020 gpd. The proposed finished water storage tank will have a nominal capacity of 500,000 gallons.

Although the water supply system is not designed to meet specific fire flow requirements (see discussion in section 4.7), the proposed tank will have a substantial reserve that could be used for fire suppression needs.

4.5.2 Storage Location

The entire project site was evaluated to establish potential suitable locations for the construction of a 500,000-gallon finished water storage tank. Several locations were considered for selection based on the following criteria:

- Relative location within the proposed water supply system
- Elevation required to provide gravity flow throughout water distribution system with adequate working pressures
- Vehicular access to tank site for operation and maintenance
- Impacts to the existing visual character and quality of the site
- Impacts to scenic resources, including, but not limited to, trees and rock outcroppings
- Constructability

The optimal location for the finished water storage tank is an open area on a hill side situated north of the NYS Route 44 hairpin curve as shown on the Overall Water Supply System Master Plan. The tank structure will be partially buried and built into the hill side near a proposed rest area and will feature an observation deck on the exposed roof. This design provides a very low profile structure with very

[6] Ten State Standards, Recommended Standards for Water Works, 2003 Edition, Great Lakes Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers.

minimal impact to the visual character and quality of the site. Properly designed landscaping at the base of the tank will also help to disguise the structure.

The elevation of the surrounding ground varies from approximately 810 feet to 802 feet msl (above mean sea level) across the tank structure. The normal full water level in the tank will be 805 feet msl.

4.5.3 Storage Tank Construction

The tank is proposed to be a circular wire-wound pre-cast concrete tank with a nominal diameter of 90 feet and a water height of 11 feet to provide a storage capacity of 500,000 gallons as manufactured by the Natgun Corporation, Wakefield, MA.

The tank will consist of a cast-in-place reinforced concrete floor, pre-cast wire-wound pre-stressed concrete walls with a continuous mechanically bonded steel diaphragm, and a pre-cast or cast-in-place pre-stressed clear span concrete roof with no interior column.

The storage tank proposed for the project can generally be described as follows:

- The materials, design, fabrication and erection of the tank shall conform to the latest AWWA standards.
- Tank coating system shall conform to ANSI/AWWA standards.
- All materials in contact with stored water shall meet ANSI/NSF Additives Standard No 61.
- The tank shall be designed to support the following loadings at a minimum:
    - Dead load consisting of the estimated weight of all permanently imposed loads.
    - Live load consisting of the weight of all the liquid when the reservoir is filled to overflowing.
    - Foundation loads such that resulting soil pressure does not exceed the allowable soil bearing capacity. Allowable soil bearing capacity to be determined by a geotechnical soil investigation.
    - Wind and snow loads as per ASCE Standard 7-02.
    - Backfill lateral pressure resulting from earth loads.
    - Surcharge live load imposed on the exposed roof.
    - Earthquake seismic design per AWWA D103.

- The exterior finish of exposed walls shall be specified by the project sponsor in conjunction with input from the Town to minimize the visible impact of the tank to the greatest extent practicable.
- The atmospheric tank shall be equipped with the following appurtenances:
  - An aluminum roof access hatch at least 42" x 42" in dimensions with diamond plate non-slip pattern and a lockable hasp.
  - Hatch intrusion alarm.
  - A venting system covered with #25 mesh stainless steel insect screen.
  - External overflow pipe with a weir structure terminating 18 to 24 inches above the ground surface.
  - Aluminum interior ladder complying with applicable OSHA standards.
- The tank will be provided with a tank mixing system to improve water circulation and water quality.
- The tank will be equipped with a liquid level pressure transducer or ultrasonic device to provide tank level information.
- Dedicated data communication lines and telemetry system will transmit tank site data to the water treatment building.
- The water storage tank and appurtenances, especially the overflow and vent pipes shall be designed to prevent freezing which will interfere with proper functioning.
- A minimum 8" diameter common inlet and outlet pipe shall be installed through the tank wall.
- A minimum 16-foot wide road will provide access to the tank site.
- Access road shall be designed to accommodate a service, maintenance or delivery truck of the AASHTO SU type.

4.6 Proposed Water Distribution System

The water distribution system will be designed and sized to deliver the required quantity of water at adequate pressure to provide a satisfactory level of service to all areas of the proposed development. The maximum daily and hourly water demands will be met through a combination of water supply and treatment capacity and water storage capacity.

4.6.1 Distribution System Piping

The proposed water distribution system will be designed to serve the entire Silo Ridge Resort Community. The water mains will be generally installed five (5) feet from the edge of the proposed paved roadway with a minimum earthen cover of five (5) feet.

The proposed water mains will be eight (8) inch diameter ductile iron cement lined (D.I.C.L.) Class 52 pipes complying with AWWA C151 and AWWA C104 standards. Main isolation valves will be installed at all water main intersections and at a maximum spacing of 800 feet between valves. Hydrants will be installed throughout the distribution system at all road intersections, dead end lines and all high points, and will be spaced at 300-foot intervals.

Proposed Action

The water distribution system for the proposed action will consist of approximately 21,800 linear feet of eight (8) inch water mains with approximately three hundred seventy-five (375) individual service connections.

Proposed Traditional Neighborhood Alternative (TNA)

The water distribution system for this alternative will consist of approximately 20,000 linear feet of eight (8) inch water mains with approximately three hundred sixty (360) individual service connections.

The water distribution system for the proposed action and Traditional Neighborhood Alternative (TNA) is shown on the attached map entitled "*Overall Water Supply System Master Plan*" located in Appendices A and B.

4.6.2 Service Area and Pressure Zones

The subject site lies in a narrow valley surmounted by an exposed rock ledge with steep cliffs covering most of the western end of the property. The ground in the valley gradually slopes downward in an easterly direction. Surface elevations on the subject site vary between 480 feet above mean sea level (msl) in the valley and 1,110 feet msl at the top of the rock ledge.

The proposed Silo Ridge development borders the existing golf course. The area to be served by the proposed water distribution system has surface elevations ranging from 495 to 795 feet msl.

The water supply system will be designed and operated to maintain a minimum residual pressure of 20 psi at ground level at all points in the distribution system under all conditions of flow. The normal working pressures in the distribution system will be approximately 60 to 80 psi at ground level and not less than 35 psi. When the static pressures in the distribution system exceed 100 psi, pressure reducing valves will be provided on the distribution mains to reduce pressure within the normal working range.

The proposed water storage tank will operate with a maximum normal water level of 805 feet msl. The tank will remain within a foot of the full level (e.g. 804 feet msl) during normal operation. This elevation represents the hydraulic grade elevation of the main atmospheric core pressure zone and will be used as a reference to establish the working pressures in the system.

The highest elevation that can be served with a minimum working pressure of 35 psi is 723 feet msl [804 – (35 psi x 2.31 feet/psi) = 723] and the lowest elevation that can be served by this tank to maintain the 100 psi maximum pressure is 573 feet msl [804 – (100 psi x 2.31 feet/psi) = 573].

The water distribution system will be designed to incorporate several distinct pressure zones to accommodate the wide range of elevations within the proposed service area (495 to 795 feet msl) and provide an acceptable level of service.

Portions of the service area located at an elevation above 723 feet msl that cannot be adequately served by the atmospheric storage tank to maintain a minimum working pressure of 35 psi, will be provided with water booster pump stations to increase pressures to acceptable working pressure levels.

Portion of the project located north of NYS Route 44 including the winery will require water booster to serve these higher elevation areas stations. The winery will be served by a small duplex water booster pump station located within a small mechanical or utility room within the building. The proposed residential units north of Route 44 will be served by a small water booster station consisting of variable frequency drive duplex pumps housed in a small utility building.

Areas located at an elevation below 573 feet msl which would normally experience pressure exceeding 100 psi, will be provided with pressure reducing valve (PRV) stations placed at specific locations throughout the system to reduce pressure to the desired range. The pressure reducing valves (PRV) stations will also balance pressure differences between the various zones. The PRV's will be located in underground concrete vaults in the road right of way or on parcels deeded to the water company. All areas of the project located south of the Golf Club house and

pavilion will be served through pressure reducing valve stations to maintain pressures within acceptable limits.

Tables 4.5 and 4.6 provide a brief description of the proposed pressure zones in the distribution system including the hydraulic grade and length of pipes installed in each zone. The boundaries of each pressure zone and the associated area served are depicted on the "Overall Water Supply System Master Plan" maps bound separately.

Table 4.5 Proposed Water Distribution System Pressure Zones for the Proposed Action

Pressure Zone	Pressure Zone Boundary Description	Water Main Length (L.F.)	Hydraulic Grade Elevation (feet)
PZ-1	Core Atmospheric	8,130	805
PZ-2	Reduced Pressure Zone between PRV-1 and PRV-4	5,870	735
PZ-3	Reduced Pressure Zone between PRV-4 and PRV-3	3,135	665
PZ-4	Reduced Pressure Zone between PRV-3 and PRV-2	3,535	724
PZ-5	Boosted Pressure Zone PS-1 & PS-2	1,085	875
	TOTAL:	21,755	

Table 4.6 Proposed Water Distribution System Pressure Zones for the Proposed Traditional Neighborhood Alternative

Pressure Zone	Pressure Zone Boundary Description	Water Main Length (L.F.)	Hydraulic Grade Elevation (feet)
PZ-1	Core Atmospheric	5,900	805
PZ-2	Reduced Pressure Zone controlled by PRV-1	3,400	735

PZ-3	Reduced Pressure Zone controlled by PRV-3	3,800	665
PZ-4	Reduced Pressure Zone between PRV-2 and PRV-3	5,000	724
PZ-5	Boosted Pressure Zone PS-1 & PS-2	1,900	875
	TOTAL:	20,000	

4.7 Fire Flow and Fire Suppression System

4.7.1 Fire Flow Requirements

Public water supply systems are not required to be designed to meet fire flow requirements. However, the proposed water distribution and storage facilities will be robust enough in many areas to provide significant fire flows in duration adequate to meet needed fire flows as recommended by the Insurance Services Office (ISO).

During the design phase of this project, a complete hydraulic model of the distribution system will be developed to provide reviewing agencies with calculations that predict flow at each hydrant. After the system is placed in operation, flow tests could be performed on selected hydrants to establish the rated capacity of hydrants in various areas of the distribution system. Tested hydrants will be color coded as to their flow capacity in accordance with the National Fire Protection Agency (NFPA) color coding requirements.

4.7.2 Fire Suppression Systems

In accordance with the Building Code of New York State, buildings including hotel, commercial retail space, offices, banquet and spa facilities requiring fire protection and suppression systems shall include all related elements in conformance with Chapter 9 "*Fire Protection Systems*" and related provisions of the Fire Code of New York State.

Buildings requiring automatic fire sprinkler systems shall comply with Section 903 of the Building Code, in required areas as defined in Section 903.2.

In conformance with Section 904 of the Building Code, alternative automatic fire extinguishing systems will be provided for certain areas where the discharge of water would be hazardous.

Where provisions of the code require that a building or portion thereof be equipped throughout with an automatic sprinkler system, sprinklers shall comply with NFPA13 except as provided for in the Building Code. Automatic sprinkler systems, where required for residential buildings, shall comply with NFPA 13R.

The proposed hotel complex will be designed and built with its own separate fire water storage facility to provide the needed fire flow and duration according to the NYS Building Code, Fire Code and applicable NFPA Standards and ISO requirements.

5.0 OPERATION AND CONTROL

5.1 Operation

The system will operate in an automatic fashion as follows:

- Raw water will be pumped from each production well, treated at the central water treatment facility, metered, conveyed into the distribution system and stored.

- Operators will visit the central water treatment facility daily. Operators will observe equipment, disinfectant dosage and finished water quality. Post contact finished water chlorine residuals will be measured and recorded each day. The level of chlorine solution will be measured and recorded. If needed, additional chlorine solution will be mixed.

- A minimum of 0.2 mg/l of free chlorine residual will be maintained throughout the water distribution system.

- Water will be pumped into the distribution system. The atmospheric storage tank will float on the system filling during pumping periods and releasing stored water during non-pumping times.

- Water level signals from the atmospheric storage tank will control the well pumps and treatment works via the primary control panel located at the central water treatment facility.

- The use of each proposed production wells will be controlled by the operators. Operators will be able to select the order in which production well will be activated and the number of wells that will operate at any given time.

5.2 Control

The primary control system for the water supply system will be installed at the central water treatment facility and will be designed to collect information from and control the production, storage, treatment and distribution systems to provide a continuous supply of operational data to the operators. The details of the control system are design considerations beyond the scope of this concept report. These system designs will be submitted with engineering documents and designs to support regulatory permit and approval submissions.

In general, the control system will continually collect and periodically store data from the following sources:

- Water level measurement in all production wells
- Water level in the atmospheric water storage tank
- Chemical feed pumps On/Off status
- Low liquid level in chlorine solution day tank
- Well pumps On/Off status
- Transfer pumps On/Off status
- Booster pumps On/Off Status
- Water Meter status

Based on the data collected from the sources described above, the control system will command the operation of the equipment and activate alarm levels as shown below:

- Well pumps Auto/On/Off status
- Chemical feed pumps On/Off status
- Water storage tank Low and High level alarms
- Chemical feed pump failure alarm
- Chlorine solution day tank low level alarm
- Well low water cut-off
- Well pump malfunction
- System on emergency power alarm
- Emergency generator operational status
- Alarm relay and notification system to 24-hour operator

The control system will be designed and programmed to operate the facilities in "emergency mode" during power outage and emergency conditions. During such conditions, the emergency auxiliary power system will be capable of operating the system to meet the projected average day water demand.

5.3 Part 5 Water Quality Monitoring

NYSDOH monitoring requirements are established by both the classification of the water supply and the number of persons served. The proposed Silo Ridge Country Club Resort Community water supply will meet the NYSDOH Part 5-1 definition of a community water supply system regularly serving an estimated population of about 2,500 people at full build-out occupancy. Based on these criteria the following minimum routine monitoring is anticipated as detailed in Table 5.1 below.

Table 5.1 Silo Ridge Resort Community Water Supply System Anticipated Monitoring Requirements

Contaminant	Sampling Frequency
Entry point and distribution chlorine residual	Daily, recorded on the monthly operating report
Metered production and sources in use	Daily, recorded on the monthly operating report
Coliform	3 distribution samples each month for total coliform 1 raw sample from each well source each year
Lead and Copper	20 sites will be sampled within 6 months of startup of new system for lead and copper
Other Metals	1 sample per entry point each 3 years
Total Trihalomethanes and Haloacetic Acids	1 sample per quarter per treatment plant
Principal Organic Contaminants	1 sample each 6 years

Group J Chemicals	1 sample each 18 months per source
Nitrate	One sample per entry point per year
Turbidity	Continuous monitoring for composite filtered finished water and individual filters
Radiological	1 sample each 4 years

5.4 Maintenance

The facilities of the Silo Ridge County Club Resort Community water supply system will be operated and maintained by a New York State licensed water treatment plant operator.

The operator will exercise daily control over the entire system and be responsible for all monitoring and reporting required by Part 5 of the New York State Sanitary Code. The operator will also visit the treatment facility daily to observe its operation.

Emergency generators will be automatically exercised weekly.

The primary control system at the water treatment plant will provide relevant operation status and data to assist the plant operator with monitoring compliance and maintenance tasks.

Operators will have on-call contractors with the equipment necessary to repair water main breaks and electronic experts capable of fixing any of the control and telemetry equipment.

The distribution system will be flushed twice a year.

5.5 Ownership

Consistent with state government policies, the Silo Ridge Country Club Resort Community on-site water supply system will be owned and operated by a New York State Transportation Corporation which will be formed under Chapter 3 Article 4 of the New York State Law to serve potable water as a privately owned community water supply system.

The purposes of the transportation corporation referred to as a Water Works Corporation are to construct, own, maintain and operate the water supply system including all the facilities incidental to the supply, treatment and distribution of water to the community. The Water Works Corporation must file a Certificate of Incorporation with the Secretary of State.

The water supply and treatment facilities will be constructed on lands that will be owned by the Water Works Corporation. The transportation corporation will also own all land within a 100-foot radius of each well source and have protective easements that control land use for an additional 100-feet around each well providing control over an area bounded by a full 200-foot radius from each well.

The proposed water storage facility will be contained within a separate water parcel to be created and owned by the Water Works Corporation. As needed, the Water Works Corporation will also acquire the necessary access easements to its facilities.

The New York State Public Service Commission (PSC) oversees the financial aspects of Water Works Corporations by reviewing the engineering plans, operational plans and financial plans. The PSC sets the water rates based on a tariff filed by the transportation corporation.

The Water Works Corporation must also obtain approval from the New York State Department of Environmental Conservation (NYSDEC) to use the water resources of New York State and for permission to deliver water to its service area. The water supply permit is issued with all other NYSDEC permits. The New York State Department of Health oversees the sanitary aspects of the Water Works Corporation. The Department of Health reviews plans and comments as to their acceptability to NYSDEC and regulates the operations, routing monitoring and reporting requirements for the Water Works Corporation.

6.0 APPROVALS & PERMITS

As a minimum, the Silo Ridge Country Club Resort Community will require the following approvals and permits from the noted agencies below:

Town of Amenia:

- Planning & Zoning Board Approvals
- Wetland Disturbance
- Endorsement of Transportation Corporation
- Building Permits

New York State Department of Environmental Conservation (NYSDEC):

- Approval of Water Supply Application (WSA)
- Wetland Disturbance Permits
- Stream Crossing and Disturbance Permits
- Water Quality Certification
- Phase II Stormwater Quality related to construction activities

New York State Department of Transportation (NYSDOT):

- Highway Work Permit for work under Route 44

New York State Department of Health:

- Endorsement of Service Area (Water Supply Application)
- Approval of Engineering Plans and Specifications for facilities

Dutchess County Department of Health:

- Endorsement of Service Area (Water Supply Application)
- Endorsement of Engineering Plans and Specifications for facilities

New York State Office of Parks, Recreation and Historic Preservation:

- Statement of no Archeological impact.

Army Corps of Engineers (ACOE):

- Wetland Disturbance Permits
- Stormwater Quality

New York State Department of State:

- Approval of Water Works Transportation Corporation

New York State Public Service Commission:

- Review and Approval of Water Tariff rates

7.0 PROJECT PHASING

The proposed water supply, treatment, storage and distribution facilities are to be constructed in phases to parallel the growth of the development project. The initial phase of the project will include the completion of the water treatment plant and associated groundwater supply sources, the water storage tank and portions of the distribution system. Subsequent project phases will include the extension and eventual completion of the remaining portions of the water distribution system.

8.0 CONCLUSION

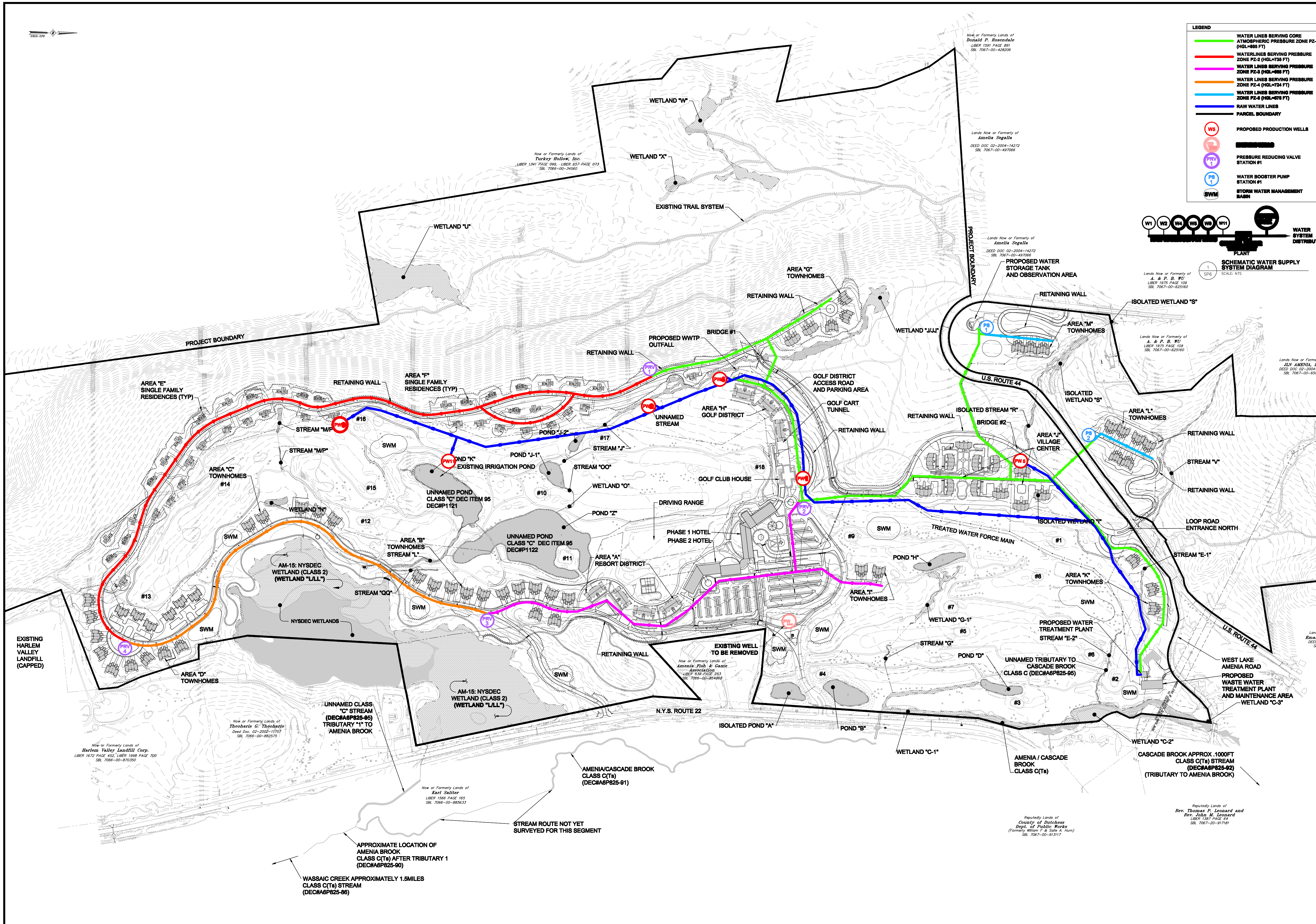
The proposed water supply system for the Silo Ridge Country Club Resort Community project is planned to provide a suitable supply of water for the project, meeting all appropriate criteria of the NYSDOH and Ten States Standards for Water. The currently available developed capacity of the well field with the best producing well out of service is 283 gpm.

The anticipated maximum daily water demand for the proposed action is 293 gpm whereas the anticipated maximum daily demand for the Traditional Neighborhood Alternative (TNA) is 264 gpm. It appears that the current developed capacity of the well field is adequate to satisfy the anticipated water demand for the Traditional Neighborhood Alternative (TNA). However, the current developed capacity of the well field is not adequate to meet the anticipated water demand for the proposed action. As a result, it is anticipated that additional water supply resources are needed to serve the proposed action.

Water treatment will include particulate filtration, micro-filtration, iron and manganese reduction, lead reduction and disinfection as a minimum.

The system will be maintained and monitored by a New York State licensed water operator with required reporting to Dutchess County Department of Health.

Appendix A:
Overall Water Supply System Master Plan for the Proposed Action



DEIS SUBMISSION

Silo Ridge Resort Community

Devereaux & Associates

CANNONDESIGN

2170 Whitehaven Road, Grand Island, New York 14072 716.773.6800

0 1 2 3 ORIGINAL SCALE IN INCHES

THE Chazen COMPANIES
Engineers/Surveyors
Planners
Environmental Scientists

CHAZEN ENGINEERING & LAND SURVEYING CO., P.C.

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Capital District Office: 547 River Street, Troy, New York 12180, Phone: (518) 273-0055
Orange County Office: 356 Meadow Avenue, Newburgh, New York 12550, Phone: (845) 567-1133
North Country Office: 100 Glen Street, Glens Falls, New York 12801, Phone: (518) 812-0513

rev.	date	description
1	6/21/07	GENERAL REVISIONS

SILO RIDGE RESORT COMMUNITY
PROPOSED ACTION

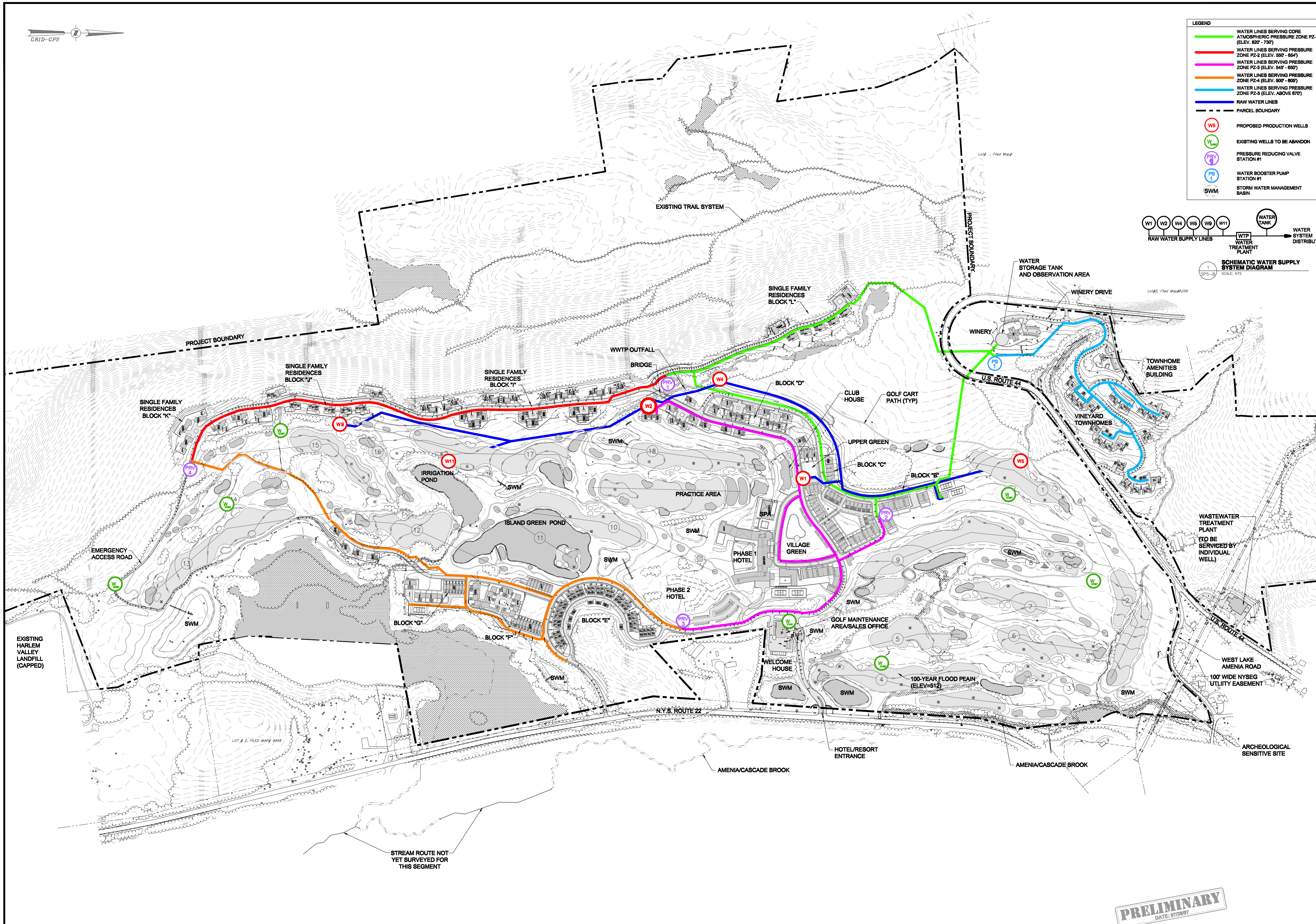
OVERALL WATER SUPPLY SYSTEM MASTER PLAN

TOWN OF AMENIA, DUTCHESS COUNTY, STATE OF NEW YORK

drawn CJB	checked PR/JAR
date 9/7/06	scale 1"=200'
project no. 10454.01	
sheet no. SP5 6 of 6	

Drawing Name: S:\0400-10499\10454.00\ENG\DWG\00_SP5_10454-00_overall WATER.dwg
Xref's Attached: XTOPO_10454-00; XTEXT-200_10454-00; XLAYOUT_10454-00; XBM_10454-00; XTB_10454-00_36X48_SEQR
Date Printed: Oct 05, 2007, 12:21pm

Appendix B:
Overall Water Supply System Master Plan for the Traditional Neighborhood Alternative (TNA)


GRID-GPS
LEGEND
WATER LINES SERVING CORE ATMOSPHERIC PRESSURE ZONE PZ-1 (ELEV. 620' - 730')
WATER LINES SERVING PRESSURE ZONE PZ-2 (ELEV. 550' - 654')
WATER LINES SERVING PRESSURE ZONE PZ-3 (ELEV. 545' - 650')
WATER LINES SERVING PRESSURE ZONE PZ-4 (ELEV. 500' - 605')
WATER LINES SERVING PRESSURE ZONE PZ-5 (ELEV. ABOVE 670')
RAW WATER LINES
PARCEL BOUNDARY
W5
PROPOSED PRODUCTION WELLS
EXISTING WELLS TO BE ABANDON
PRV
PRESSURE REDUCING VALVE STATION #1
PS 1
WATER BOOSTER PUMP STATION #1
SWM
STORM WATER MANAGEMENT BASIN
W1
W2
W4
W5
W9
W11
RAW WATER SUPPLY LINES
WTP
WATER TREATMENT PLANT
WATER TANK
WATER SYSTEM DISTRIBUTION
1
SP5-B
SCHEMATIC WATER SUPPLY SYSTEM DIAGRAM
SCALE: NTS
Lot#2, Filed Map#6259
EXISTING TRAIL SYSTEM
PROJECT BOUNDARY
WATER STORAGE TANK AND OBSERVATION AREA
WINERY DRIVE
WINERY
SINGLE FAMILY RESIDENCES BLOCK "L"
WWTP OUTFALL
BRIDGE
BLOCK "D"
CLUB HOUSE
GOLF CART PATH (TYP)
U.S. ROUTE 44
TOWNHOME AMENITIES BUILDING
VINEYARD TOWNHOMES
SINGLE FAMILY RESIDENCES BLOCK "J"
SINGLE FAMILY RESIDENCES BLOCK "I"
SINGLE FAMILY RESIDENCES BLOCK "K"
UPPER GREEN
BLOCK "C"
BLOCK "B"
IRRIGATION POND
PRACTICE AREA
ISLAND GREEN POND
SPA
VILLAGE GREEN
PHASE 1 HOTEL
PHASE 2 HOTEL
WASTEWATER TREATMENT PLANT (TO BE SERVICED BY INDIVIDUAL WELL)
EMERGENCY ACCESS ROAD
BLOCK "G"
BLOCK "F"
BLOCK "E"
GOLF MAINTENANCE AREA/SALES OFFICE
WELCOME HOUSE
EXISTING HARLEM VALLEY LANDFILL (CAPPED)
WEST LAKE AMENIA ROAD
100' WIDE NYSEG UTILITY EASEMENT
100-YEAR FLOOD PLAIN (ELEV=512)
N.Y.S. ROUTE 22
HOTEL/RESORT ENTRANCE
AMENIA/CASCADE BROOK
ARCHEOLOGICAL SENSITIVE SITE
STREAM ROUTE NOT YET SURVEYED FOR THIS SEGMENT
LOT # 2, FILED MAP# 6458

PRELIMINARY
DATE: 07/26/07

ISSUED FOR DEIS COMPLETENESS

Silo Ridge Resort Community

ERNIE ELS DESIGN

ROBERT A.M. STERN ARCHITECTS

ORIGINAL SCALE IN INCHES

THE Chazen COMPANIES
Engineers/Surveyors
Planners
Environmental Scientists

CHAZEN ENGINEERING & LAND SURVEYING CO., P.C.

rev.	date	description

SILO RIDGE RESORT COMMUNITY
TRADITIONAL NEIGHBORHOOD ALTERNATIVE

OVERALL WATER SUPPLY SYSTEM MASTER PLAN

TOWN OF AMENIA, DUTCHESS COUNTY, NEW YORK

drawn CJB	checked PR/JAR
date 6/21/07	scale 1"=200'
project no. 10454.02	
sheet no. SP5-B	8 of 9