SILO RIDGE RESORT COMMUNITY
WAER BUDGET REPORT FOR
COMBINED IRRIGATION POND
AMENIA, NEW YORK

Prepared For:

Silo Ridge Ventures, LLC
5021 Route 44
Amenia, NY 12501

January 2015

Prepared By:

LEGGETTE, BRASHEARS & GRAHAM, INC.
Professional Groundwater and Environmental Engineering Services
4 Research Drive, Suite 204
Shelton, CT 06484

TABLE OF CONTENTS

Page

LIST OF TABLES
(Inside report)

Table

FIGURE
(at end of report)

Figure

PLATE

(at end of report)

Plate

1 Site Map

LIST OF APPENDICES

Appendix

I Aqua Agronomic Solutions, Inc. – Irrigation Water Demand

II Precipitation Probability Analysis

III Silo Ridge and USGS Ten Mile Gage Stream Flow Correlation

SILO RIDGE RESORT COMMUNITY
WATER BUDGET REPORT FOR COMBINED IRRIGATION POND
AMENIA, NEW YORK

1.0 INTRODUCTION

The Silo Ridge Resort Community is located on Route 22 in the Town of Amenia, Dutchess County, New York (figure 1). The proposed Silo Ridge Resort Community consists of the renovation of the existing Silo Ridge Golf Course and the construction of a new residential resort community development on the property. The golf course renovation will take place first over a two year period and be followed by a two-phased construction of the residential resort community, which will take an estimated eight years to complete.

The Silo Ridge Golf Course was previously in operation until 2008. During its time in operation, irrigation water for the golf course was supplied by two irrigation ponds, which were known at that time as the Green Island Pond and the Irrigation Pond. No records of irrigation water usage during the golf course's prior operating period are available.

Under the proposed development plan, separate irrigation water and potable water-supply systems will be developed and constructed for the project. The irrigation water for the golf course and landscaped component of the residential community is proposed to be supplied by three onsite bedrock wells (Wells 1, 9, and 25) and a large centrally located pond, known as the Combined Irrigation Pond, on the golf course (Plate 1). The Combined Irrigation Pond will be created by removal of an existing land bridge between the Green Island and Irrigation Ponds to form one large irrigation pond.

The potable, public water-supply system for the development will be supplied by three separate onsite bedrock wells, Wells 2, 11 and 31 (Plate 1). There will be no interconnection between the potable and irrigation water-supply systems.

Leggette, Brashears & Graham, Inc. (LBG) has completed the following water budget assessment which includes a discussion of the irrigation water demand for the Silo Ridge Golf Course and landscaped areas within the residential community and an analysis of the available onsite groundwater and surface-water resource capacity to meet the proposed irrigation water demand of the project. This assessment was conducted based on the New York State Department of Environmental Conservation (NYSDEC) Part 601 Section 601.10 (e)(11) for Water Withdrawal Permitting, Reporting and Registration which became effect in April 2013.

2.0 IRRIGATION WATER DEMAND

Irrigation water demands for the renovated golf course and residential community's landscaped areas were calculated by Aqua Agronomic Solutions, Inc. The irrigation water demand calculations were based on the acreage of the planting areas (i.e., greens, tees, rough, residential lawn, etc.); the plant types and their water needs; and precipitation and evapotranspiration data available for the region. An assessment of the proposed Silo Ridge Resort Community's irrigation water usage has shown that the dry precipitation and normal precipitation climate scenario when the project has reached full build-out will be the highest potential water usage scenarios. Typically, the "grow-in period" for a golf course is the period of highest water usage; however, because a phased development approach is being implemented, the project does not reach its maximum potential irrigation water needs until full build-out has been achieved.

The spreadsheets used for calculation of the irrigation water demands for the dry precipitation and normal precipitation climate scenarios at full build-out are included in Appendix I. To be conservative, during dry years only 56% of the rainfall was considered usable by the turf/landscape plants and during normal precipitation years 75% of the rainfall was considered usable. In addition, the dry condition scenario irrigation water usage calculation does not consider the implementation of any water conservation measures, such as reduced irrigation of the rough areas on the golf course, in the demand calculation.

If the Silo Ridge water budget assessment demonstrates that adequate water is available to supply the irrigation water demand of the proposed development under the be the highest potential water usage scenarios, the water source will be adequate for all other remaining scenarios with lower irrigation demands, i.e., wet years and phased-grow-in period. The table below summarized the estimated monthly irrigation water usage values for normal and dry precipitation conditions at full build-out. Average daily water use has also been calculated.

Table 1: Irrigation Water Use for Normal and Dry Precipitation Conditions at Full Project Build-Out

Month	Irrigation Withdrawal – Normal Conditions (1,000 gallons)	Average Daily Withdrawal – Normal Conditions (gpd)	Irrigation Withdrawal – Dry Conditions (1,000 gallons)	Average Daily Withdrawal – Dry Conditions (gpd)
January	0	0	0	0
February	0	0	0	0
March	0	0	0	0
April	0	0	0	0
May	617	19,900	3,902	125,900
June	6,425	214,200	9,725	324,200
July	1,552	50,100	7,069	228,000
August	7,722	249,100	10,851	350,000
September	276	9,200	3,464	115,500
October	0	0	0	0
November	0	0	0	0
December	0	0	0	0
Total	**16,592**	**--**	**35,011**	**--**

gpd gallons per day

3.0 IRRIGATION WATER AVAILABILITY

Irrigation water is proposed to be withdrawn from three onsite bedrock wells and the Combined Irrigation Pond located on the golf course. Water from the bedrock wells will be pumped directly into the Combine Irrigation Pond and the pond will also act as the onsite storage for irrigation water.

LBG completed an analysis to determine whether sufficient water was available onsite to meet the proposed irrigation water demand. The analysis was completed for normal and drought precipitation conditions at full build-out of the project. Inflow values to the irrigation pond considered in this analysis include: direct precipitation to the pond's surface, storm-water runoff, bedrock well discharge into the pond, stream inflow from the existing onsite stream, and groundwater baseflow into the pond. Outflow values considered in the evaluation were: evaporation from the pond surface, water withdrawn for irrigation use, and overflow from the pond when it exceeds its full storage capacity. The assessment also considered utilization of the available water stored in the pond during periods when outflows exceeded inflows. There are no upstream water users within the Silo Ridge golf course Combined Irrigation Pond's watershed area. Therefore, this variable was not included in this assessment.

3.1 Combined Irrigation Pond Volume

The proposed pond bottom contours for the Combined Irrigation Pond were provided by the Applicant's engineer, VHB Engineering, Surveying and Landscape Architecture, P.C.

(VHB). The contours were used to determine the pond's storage volume. The total volume of the Combined Irrigation Pond at full capacity, from the top elevation of the pond's outlet at 507 ft amsl (feet above mean sea level) to 460 ft amsl (pond's total depth), is 23,900,000 gallons.

Table 2: Combined Irrigation Pond Water Storage Volume

Elevation	Pond Volume (cubic feet)	Pond Volume (gallons)	Pond Area (square feet)	Pond Area (acres)	Water Storage Above Irrigation System Intake Pipe (gallons)
507	3,200,000	23,900,000	359,000	8.24	15,230,000
506	2,840,000	21,300,000	351,000	8.05	12,600,000
505	2,500,000	18,700,000	342,000	7.85	9,980,000
504	2,160,000	16,100,000	333,000	7.65	7,450,000
503	1,830,000	13,700,000	323,000	7.43	5,000,000
502	1,510,000	11,300,000	317,000	7.27	2,620,000
501	1,410,000	10,600,000	69,900	1.61	1,890,000
500	1,350,000	10,900,000	65,200	1.50	1,390,000
499	1,280,000	9,600,000	62,900	1.44	909,000
498	1,220,000	9,140,000	60,700	1.39	447,000
497*	1,160,000	8,690,000	58,800	1.35	0
496	1,100,000	8,260,000	56,900	1.31	--
495	1,050,000	7,8400,000	55,100	1.26	--
490	794,000	5,940,000	47,000	1.08	--
480	395,000	2,950,000	32,900	0.76	--
470	137,000	1,030,000	18,700	0.43	--
460	10,600	79,200	6,060	0.14	--

* Proposed irrigation system intake pipe depth.

The intake pipe for the irrigation system is proposed to be set at a depth of 497 ft amsl, or 10 feet below the top elevation of the pond. The storage volume of the pond above the intake pipe is 15,230,000 gallons.

4.0 IRRIGATION POND INFLOWS

4.1 Bedrock Wells

The three proposed bedrock irrigation wells were yield tested in June 2014. Wells 1, 9 and 25 demonstrated yields of 87 gpm (gallons per minute), 85 gpm, and 33 gpm, respectively, for a combined yield of 205 gpm or 259,200 gpd under simultaneous pumping conditions. The wells were tested in combination with other onsite bedrock wells that are proposed for use as potable supply wells for the Silo Ridge Resort Community to demonstrate that both the irrigation and potable bedrock wells could be operated concurrently to meet their respective water demands. The details of the combined 72-hour pumping test which was conducted on the Silo Ridge wells is included in LBG's August 2014 report "Groundwater Exploration and Pumping Test Program, Silo Ridge Resort Community, Amenia, New York".

For this analysis, the bedrock irrigation wells are assumed to only be in use between May and September. The table below summarizes the available water from the bedrock irrigation wells.

Table 3: Bedrock Irrigation Well Yield

Month	Well Yield (1,000 gallons)
January	0
February	0
March	0
April	0
May	9,151
June	8,856
July	9,151
August	9,151
September	8,856
October	0
November	0
December	0
Total	**45,166**

4.2 Direct Precipitation to the Surface of the Combined Irrigation Pond

Precipitation data from the Poughkeepsie Climate Station from 1971-2000 was used to calculate the direct precipitation to the irrigation pond surface. For dry precipitation conditions, the precipitation totals were adjusted to reflect a one-year-in-thirty drought scenario based on a precipitation probability analysis. The table below is a summary of the monthly precipitation values and the graph of the precipitation probability analysis is included in Appendix II.

Table 4: Monthly Precipitation Totals

Month	Poughkeepsie (1971-2000) – Normal Precipitation (inches)	One-Year-in-Thirty Drought Precipitation (inches)
January	3.19	2.33
February	2.53	1.85
March	3.59	2.62
April	3.79	2.77
May	4.73	3.45
June	3.73	2.72
July	4.72	3.44
August	3.83	2.80
September	3.69	2.69
October	3.56	2.60
November	3.53	2.58
December	3.23	2.36
Total	**44.12**	**32.20**

The table below shows the total monthly direct precipitation contribution to the pond surface. In months were the irrigation pond level declined and the surface area decreased, the calculation was adjusted to correspond with the projected water-level height in the pond.

Table 5: Direct Precipitation Recharge to the Combined Irrigation Pond Surface

Month	Precipitation to Pond, Normal Precipitation Conditions (1,000 gallons)	Precipitation to Pond, Dry Precipitation Conditions (1,000 gallons)
January	714	521
February	566	413
March	804	586
April	848	619
May	1,059	773
June	835	609
July	1,057	771
August	857	612
September	826	603
October	797	582
November	790	577
December	723	528
Total	**9,876**	**7,208**

4.3 Stream Inflow

An existing stream flows across the golf course from the northwestern portion of the project site into the irrigation pond. As part of the pumping test program conducted by LBG on the project site in May and June 2014, flow measurements were collected from this onsite stream. These streamflow measurements were correlated to a downstream USGS stream gage (Ten Mile River at Gaylordsville, stream flow record 1930 to present) to estimate monthly streamflow contribution to the irrigation pond under normal and dry precipitation conditions (Appendix III).

Table 6: Stream Inflow to Combined Irrigation Pond

Month	Average Conditions Stream Flow (1,000 gallons)	Dry Conditions Stream Flow (1,000 gallons)
January	4,015	2,930
February	3,627	2,647
March	5,818	4,246
April	5,386	3,931
May	3,638	2,655
June	2,592	1,892
July	800	584
August	0	0
September	252	184
October	1,305	953
November	2,566	1,873
December	3,803	2,776
Total	**33,802**	**24,669**

4.4 Groundwater Baseflow

Groundwater baseflow contribution from the overburden and underlying bedrock to the Combined Irrigation Pond was calculated using the watershed for the Combined Irrigation Pond (minus the watershed area for the upgradient tributary stream which flows into the pond discussed in section 4.3 above) obtained from the New York State Geological Survey Streamstats program. The groundwater baseflow at the USGS Ten Mile River gage was estimated to be 68% using the method presented in the Journal of the American Water Resources Association article, "Automated Web GIS Based Hydrograph Analysis Tool, WHAT" by Kyoung Jae Lim, et al. 2005. This baseflow percentage was correlated to the Silo Ridge property and the baseflow contribution to the Combined Irrigation Pond was calculated using the site-specific watershed areas and streamflow data.

Table 7: Groundwater Baseflow to Combined Irrigation Pond

Month	Groundwater Baseflow - Normal Precipitation (1,000 gallons)	Groundwater Baseflow - Dry Precipitation (1,000 gallons)
January	5,688	4,151
February	5,138	3,750
March	8,243	6,016
April	7,630	5,569
May	5,153	3,761
June	3,672	2,680
July	1,133	827
August	0	0
September	357	260
October	1,849	1,350
November	3,635	2,653
December	5,388	3,932
Total	**47,885**	**34,948**

4.5 Stormwater Runoff

A TR-55 analysis was completed by VHB for the residential area of the development. The TR-55 analysis calculates the inflow contribution to the Combined Irrigation Pond from the storm-water runoff collected from the residential community area.

Table 8: Storm-Water Runoff Contribution Based on TR-55 Analysis

Month	Stormwater Runoff (TR-55 analysis using Albany Data Normal Year) (1,000 gallons)	Stormwater Runoff (TR-55 analysis using Albany Data Dry Year) (1,000 gallons)
January	0	0
February	0	0
March	0	67
April	229	0
May	27	0
June	0	135
July	2,754	269
August	1,832	0
September	458	0
October	0	0
November	81	0
December	7	0
Total	**5,387**	**471**

4.6 Total Inflows to Combined Irrigation Pond

The total monthly inflow to the Combined Irrigation Pond has been calculated by summing the available water from the direct precipitation to the pond surface, bedrock well discharge, stream inflow, groundwater baseflow, and stormwater runoff contribution. The sum of the pond inflows under normal and dry precipitation conditions are provided in the table below.

Table 9: Total Inflow to Combined Irrigation Pond

Month	Direct Precipitation Recharge (1,000 gallons)	Available Bedrock Well Water (1,000 gallons)	Stream Inflow (1,000 gallons)	Groundwater Baseflow (1,000 gallons)	Stormwater Runoff Contribution (TR-55 Analysis) (1,000 gallons)	Total Monthly Inflows to Combined Irrigation Pond (1,000 gallons)
Normal Precipitation Conditions						
January	714	0	4,015	5,688	0	10,417
February	566	0	3,627	5,138	0	9,330
March	804	0	5,818	8,243	0	14,865
April	848	0	5,386	7,630	229	14,093
May	1,059	9,151	3,638	5,153	27	19,028
June	835	8,856	2,592	3,672	0	15,954
July	1,057	9,151	800	1,133	2,754	14,895
August	857	9,151	0	0	1,832	11,840
September	826	8,856	252	357	458	10,749
October	797	0	1,305	1,849	0	3,952
November	790	0	2,566	3,635	81	7,073
December	723	0	3,803	5,388	7	9,921
Total	**9,876**	**45,166**	**33,802**	**47,885**	**5,387**	**142,116**
Dry Precipitation Conditions						
January	521	0	2,930	4,151	0	7,603
February	413	0	2,647	3,750	0	6,810
March	586	0	4,246	6,016	67	10,916
April	619	0	3,931	5,569	0	10,119
May	773	9,151	2,655	3,761	0	16,340
June	609	8,856	1,892	2,680	135	14,171
July	771	9,151	584	827	269	11,602
August	612	9,151	0	0	0	9,763
September	603	8,856	184	260	0	9,903
October	582	0	953	1,350	0	2,884
November	577	0	1,873	2,653	0	5,103
December	528	0	2,776	3,932	0	7,235
Total	**7,208**	**45,166**	**24,669**	**34,948**	**471**	**112,448**

5.0 IRRIGATION POND OUTFLOWS

5.1 Evaporation from the Combined Irrigation Pond

Evaporation from the surface of the irrigation pond has been considered as an outflow from the irrigation pond in this analysis. Monthly evaporation values are provided in the table below. The monthly evaporation values were multiplied by the pond surface area to calculate the total monthly evaporation. Note, during the month of August under the dry precipitation scenario evaporation from the pond surface is actually less than during normal precipitation conditions because the pond surface area is smaller as a result of the decline in the water-level elevation in the pond.

Table 10: Monthly Evaporation from Combined Irrigation Pond

Month	Evaporation (inches per month)	Evaporation from Pond Surface – Normal Precipitation Conditions (1,000 gallons)	Evaporation from Pond Surface Dry Precipitation Conditions (1,000 gallons)
January	0.82	184	184
February	1.01	226	226
March	1.91	427	427
April	2.22	498	498
May	4.64	1,039	1,039
June	4.78	1,069	1,069
July	5.40	1,208	1,208
August	4.91	1,098	1,073
September	3.31	742	742
October	2.09	469	469
November	2.77	620	620
December	0.63	142	142
Total	**34.50**	**7,723**	**7,698**

5.2 Irrigation Water Withdrawal from Combined Irrigation Pond

Proposed irrigation water usage was calculated by Aqua Agronomic Solutions, Inc. for the golf course and residential community's landscaped areas**.** The irrigation water demand calculation was based on the acreage of the planting areas (i.e., greens, tees, rough, residential lawn, etc.); the plant types and their water needs; and precipitation and evapotranspiration information available for the region. The calculations completed showed that the two scenarios with the highest potential water usage rates were dry precipitation conditions at full project build-out and normal precipitation conditions at full project build-out. The total monthly irrigation water use for these scenarios are provided in the table below and spreadsheets used for calculation of the irrigation water demands are included in Appendix I.

Table 11: Monthly Irrigation Water Withdrawal

Month	Irrigation Withdrawal – Normal Conditions (1,000 gallons)	Irrigation Withdrawal – Dry Conditions (1,000 gallons)
January	0	0
February	0	0
March	0	0
April	0	0
May	617	3,902
June	6,425	9,725
July	1,552	7,069
August	7,722	10,851
September	276	3,464
October	0	0
November	0	0
December	0	0
Total	**16,592**	**35,011**

5.3 Overflow from Combined Irrigation Pond

When the Combined Irrigation Pond surface-water level height exceeds its available storage capacity (i.e., water elevation above 507 ft msl), water will overflow at the weir located at the southern end of the pond. Therefore, in this analyses if the pond inflows exceed outflows and available storage volume, the excess inflow water that cannot be held in storage is considered to be lost as outflow from the pond during that month.

Table 12: Estimated Monthly Pond Overflow

Month	Pond Overflow – Normal Precipitation Conditions (1,000 gallons)	Pond Overflow - Dry Precipitation Conditions (1,000 gallons)
January	10,233	7,419
February	9,104	6,583
March	14,438	10,489
April	13,596	9,621
May	17,372	11,399
June	8,460	3,377
July	12,134	3,325
August	3,020	0
September	9,731	3,535
October	3,483	2,415
November	6,452	4,482
December	9,779	7,094
Total	**117,801**	**69,739**

6.0 RESULTS AND ANALYSIS

The water budget analysis was preformed to assess whether the water resources on the Silo Ridge property would be sufficient to meet the irrigation water demand requirements of the

Silo Ridge Resort Community. Irrigation water usage under different climate and build-out scenario was reviewed (dry, normal and wet precipitation years at full build-out and grow-in periods during the phased project construction). The calculation showed that the highest irrigation water usage scenarios were the dry and normal precipitation conditions at full project build-out.

The inflows and outflows from the Combined Irrigation Pond were compared to confirm that sufficient water was available during the two highest irrigation demand scenarios to meet the proposed irrigation water demands. The table below shows that under both dry and normal precipitation scenarios at full build-out there is sufficient water available to supply the onsite irrigation demands. In addition, the only month in which outflow exceeded inflow and the use of the Combine Irrigation Pond's storage capacity was needed was in August under the dry precipitation scenario. The withdrawal from the pond's storage capacity in August (dry scenario) would result in less than 1.0 foot of drawdown in the Combined Irrigation Pond.

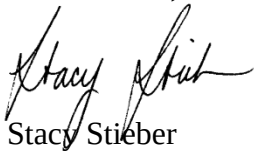
Table 13: Irrigation Water-Supply Adequacy Assessment

Month	Total Monthly Inflows (1,000 gallons)	Outflow from Pond Evaporation and Irrigation Water Use (1,000 gallons)	Surplus Inflow (i.e., Pond Overflow) (1,000 gallons)	Available Pond Storage Capacity (1,000 gallons)	Sufficient Water Available for Irrigation (Y/N)
Normal Precipitation					
January	10,417	184	10,233	15,230	Y
February	9,330	226	9,104	15,230	Y
March	14,865	427	14,438	15,230	Y
April	14,093	498	13,596	15,230	Y
May	19,028	1,656	17,372	15,230	Y
June	15,954	7,494	8,460	15,230	Y
July	14,895	2,760	12,134	15,230	Y
August	11,840	8,820	3,020	15,230	Y
September	10,749	1,018	9,731	15,230	Y
October	3,952	469	3,483	15,230	Y
November	7,073	620	6,452	15,230	Y
December	9,921	142	9,779	15,230	Y
Total	142,116	24,315	117,801	--	--
Dry Precipitation					
January	7,603	184	7,419	15,230	Y
February	6,810	226	6,583	15,230	Y
March	10,916	427	10,489	15,230	Y
April	10,119	498	9,621	15,230	Y
May	16,340	4,941	11,399	15,230	Y
June	14,171	10,794	3,377	15,230	Y
July	11,602	8,277	3,325	15,230	Y
August	9,763	11,924	0	13,070	Y
September	9,903	4,206	3,535	15,230	Y

Month	Total Monthly Inflows (1,000 gallons)	Outflow from Pond Evaporation and Irrigation Water Use (1,000 gallons)	Surplus Inflow (i.e., Pond Overflow) (1,000 gallons)	Available Pond Storage Capacity (1,000 gallons)	Sufficient Water Available for Irrigation (Y/N)
Normal Precipitation					
October	2,884	469	2,415	15,230	Y
November	5,103	620	4,482	15,230	Y
December	7,235	142	7,094	15,230	Y
Total	112,448	42,709	69,739	--	--

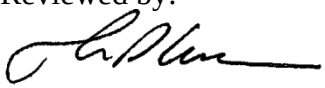
The comparison shows that there is adequate water available from the inflows and storage in the Combined Irrigation Pond to supply the project's irrigation water demands under the highest water usage scenarios, the dry and normal precipitation conditions at full project build-out. This data also indicates that under other varying conditions (wet years and during the phased construction) when irrigation water use is less and/or inflows to the pond increase, that the onsite irrigation water resources will continue to be sufficient for the project.

LEGGETTE, BRASHEARS & GRAHAM, INC.



Stacy Stieber
Associate

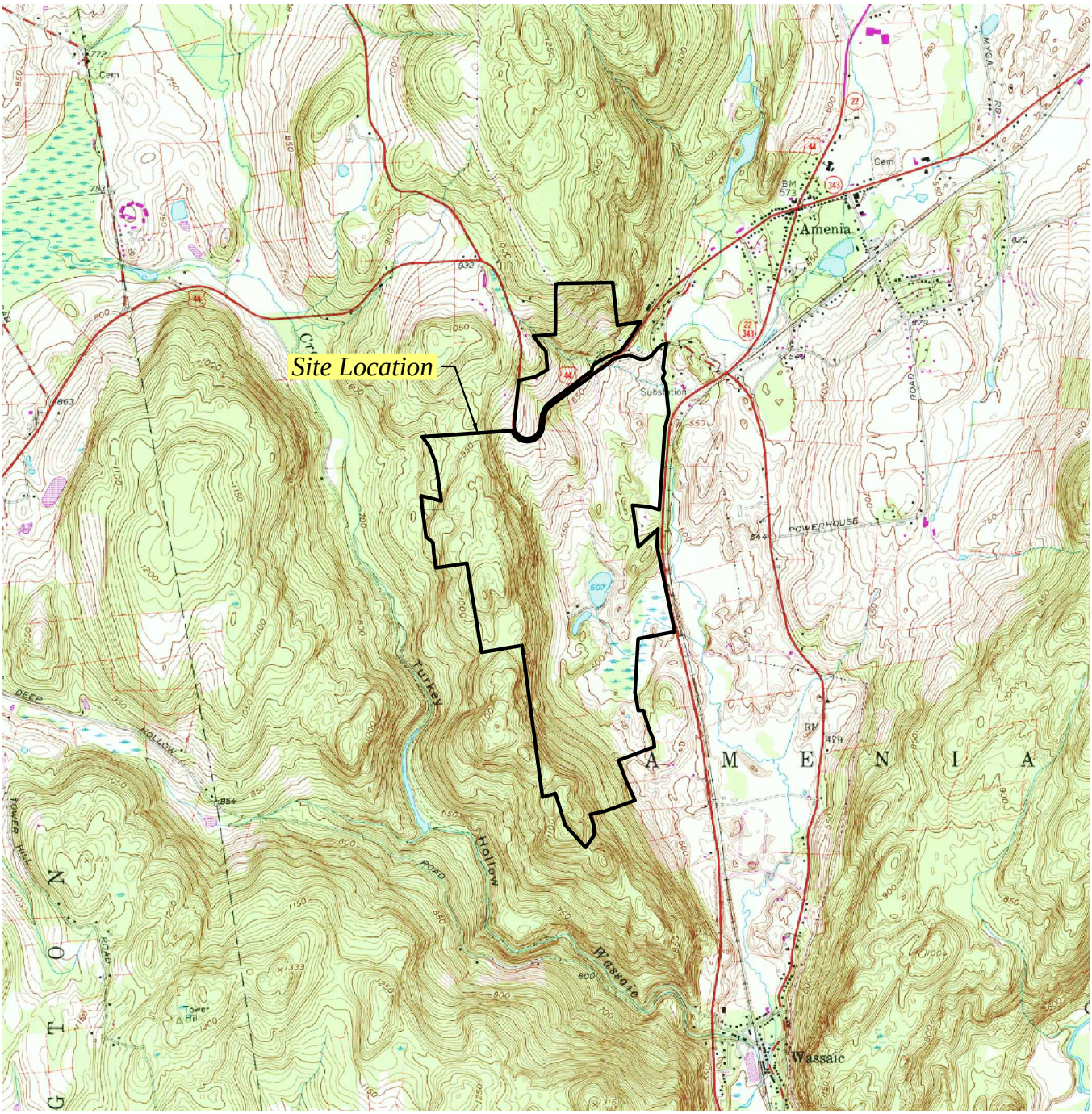
Reviewed by:



Thomas P. Cusack, CPG
Senior Vice President

etn
January 20, 2015
H:\Silo Ridge Property\Water Budget Assessment\LBG Water Budget Analysis.docx

FIGURE



SOURCE: USGS TOPOGRAPHIC QUADRANGLE AMENIA, NEW YORK (PHOTOREVISED 1984).

QUADRANGLE LOCATION

0 3000

SCALE IN FEET

SILO RIDGE RESORT COMMUNITY
AMENIA, NEW YORK

SITE LOCATION MAP

DATE	REVISED

PREPARED BY: LEGGETTE, BRASHEARS & GRAHAM, INC.
Professional Groundwater and Environmental Engineering Services
4 Research Drive
Suite 204
Shelton, Connecticut 06484
(203) 929-8555

DRAWN:	MRV	CHECKED:	SS	DATE:	01/15/15	FIGURE:	1

APPENDIX I

Aqua Agronomic Solutions, Inc. – Irrigation Water Demand

SILO RIDGE FIELD CLUB, AMENIA, NEW YORK

SILO RIDGE FIELD CLUB IRRIGATION WATER USE ESTIMATES - BASED ON 20 YEAR EVAPOTRANSPIRATION DATA FROM TORRINGTON, CT. REFERENCE ET CALCULATED USING THE FAO MODIFIED PENMAN METHOD With 56% Rainfall based on 30 year historical data from Poughkeepsie, NY

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Year
Estimated Evapotranspiration Rates (Inches) based on 56% Useful Rainfall Dry	0.00	0.00	0.00	0.00	1.00	2.48	1.80	2.77	0.88	0.00	0.00	0.00	8.93

Description of Area	Area in Square Ft.	% Irrigated Area	Irrigated Area	Plant Factor	Irrigation Efficiency	Jan. Gals. / Mo.	Feb. Gals. / Mo.	Mar. Gals. / Mo.	Apr. Gals. / Mo.	May Gals. / Mo.	Jun. Gals. / Mo.	Jul. Gals. / Mo.	Aug. Gals. / Mo.	Sep. Gals. / Mo.	Oct. Gals. / Mo.	Nov. Gals. / Mo.	Dec. Gals. / Mo.	Year Gals. / day
Silo Ridge Field Club Golf Course																		
Fairways	1,295,419	1.0000	1,295,419	1.00	0.80	0	0	0	0	1,004,649	2,503,673	1,819,892	2,793,622	891,785	0	0	0	9,013,621
	29.74	Acres	29.74	Gallons Per Day:		0	0	0	0	32,408	83,456	58,706	90,117	29,726	0	0	0	24,695
Primary Roughs	1,394,972	0.7500	1,046,229	1.00	0.80	0	0	0	0	811,392	2,022,060	1,469,813	2,256,234	720,239	0	0	0	7,279,739
	32.02	Acres	24.02	Gallons Per Day:		0	0	0	0	26,174	67,402	47,413	72,782	24,008	0	0	0	19,944
Greens	121,587	1.0000	121,587	1.00	0.80	0	0	0	0	94,296	234,993	170,814	262,207	83,702	0	0	0	846,011
	2.79	Acres	2.79	Gallons Per Day:		0	0	0	0	3,042	7,833	5,510	8,458	2,790	0	0	0	2,318
Bunkers	145,963	0.0000	0	1.00	0.80	0	0	0	0	0	0	0	0	0	0	0	0	0
	3.35	Acres	0.00	Gallons Per Day:		0	0	0	0	0	0	0	0	0	0	0	0	0
Tees	129,495	1.0000	129,495	1.00	0.80	0	0	0	0	100,428	250,277	181,923	279,261	89,146	0	0	0	901,036
	2.97	Acres	2.97	Gallons Per Day:		0	0	0	0	3,240	8,343	5,868	9,008	2,972	0	0	0	2,469
Total Silo Ridge Field Club Golf Course	**3,087,436**	**N/A**	**2,592,730**	**N/A**	**N/A**	**0**	**0**	**0**	**0**	**2,010,764**	**5,011,003**	**3,642,443**	**5,591,325**	**1,784,872**	**0**	**0**	**0**	**18,040,407**
	70.88	**Acres**	**59.52**	**Gallons Per Day:**		**0**	**0**	**0**	**0**	**64,863**	**167,033**	**117,498**	**180,365**	**59,496**	**0**	**0**	**0**	**49,426**
Silo Ridge Residential Landscape																		
Residential- Grass Condos and Town Home	139,764	1.0000	139,764	1.00	0.80	0	0	0	0	108,392	270,124	196,350	301,407	96,215	0	0	0	972,488
	3.21	Acres	3.21	Gallons Per Day:		0	0	0	0	3,497	9,004	6,334	9,723	3,207	0	0	0	2,664
Residential- Grass Village Green Homes	157,469	1.0000	157,469	1.00	0.80	0	0	0	0	122,123	304,342	221,223	339,588	108,404	0	0	0	1,095,681
	3.61	Acres	3.61	Gallons Per Day:		0	0	0	0	3,939	10,145	7,136	10,954	3,613	0	0	0	3,002
Residential- Grass South Lawn Homes	313,414	1.0000	313,414	1.00	0.80	0	0	0	0	243,065	605,739	440,305	675,890	215,759	0	0	0	2,180,758
	7.19	Acres	7.19	Gallons Per Day:		0	0	0	0	7,841	20,191	14,203	21,803	7,192	0	0	0	5,975
Residential- Grass Golf Villas	222,374	1.0000	222,374	1.00	0.80	0	0	0	0	172,460	429,785	312,406	479,558	153,085	0	0	0	1,547,295
	5.11	Acres	5.11	Gallons Per Day:		0	0	0	0	5,563	14,326	10,078	15,470	5,103	0	0	0	4,239
Residential- Grass Estate Homes	822,195	1.0000	822,195	1.00	0.80	0	0	0	0	637,645	1,589,067	1,155,075	1,773,096	566,011	0	0	0	5,720,894
	18.88	Acres	18.88	Gallons Per Day:		0	0	0	0	20,569	52,969	37,260	57,197	18,867	0	0	0	15,674
Res. Medium Water Use Shrub and Ground	463,319	1.0000	463,319	0.40	0.85	0	0	0	0	135,274	337,115	245,045	376,157	120,077	0	0	0	1,213,669
	10.64	Acres	10.64	Gallons Per Day:		0	0	0	0	4,364	11,237	7,905	12,134	4,003	0	0	0	3,325
Res. Low Water Use Shrub and Ground	463,319	1.0000	463,319	0.20	0.85	0	0	0	0	67,637	168,558	122,523	188,078	60,039	0	0	0	606,834
	10.64	Acres	10.64	Gallons Per Day:		0	0	0	0	2,182	5,619	3,952	6,067	2,001	0	0	0	1,663
Total Silo Ridge Residential	**2,581,854**	**N/A**	**2,581,854**	**N/A**	**N/A**	**0**	**0**	**0**	**0**	**1,486,597**	**3,704,731**	**2,692,928**	**4,133,774**	**1,319,590**	**0**	**0**	**0**	**13,337,619**
	59.27	**Acres**	**59.27**	**Gallons Per Day:**		**0**	**0**	**0**	**0**	**47,955**	**123,491**	**86,869**	**133,348**	**43,986**	**0**	**0**	**0**	**36,541**
Silo Ridge Common Areas																		
Common- Grass	487,784	1.0000	487,784	1.00	0.80	0	0	0	0	378,296	942,747	685,272	1,051,926	335,797	0	0	0	3,394,037
	11.20	Acres	11.20	Gallons Per Day:		0	0	0	0	12,203	31,425	22,106	33,933	11,193	0	0	0	9,299
Common Med. Water Use Shrub and Ground	60,973	1.0000	60,973	0.40	0.85	0	0	0	0	17,802	44,365	32,248	49,502	15,802	0	0	0	159,719
	1.40	Acres	1.40	Gallons Per Day:		0	0	0	0	574	1,479	1,040	1,650	527	0	0	0	5,324
Common Low Water Use Shrub and Ground	60,972	1.0000	60,972	0.20	0.85	0	0	0	0	8,901	22,182	16,124	24,751	7,901	0	0	0	79,858
	1.40	Acres	1.40	Gallons Per Day:		0	0	0	0	287	739	520	825	263	0	0	0	2,662
Total Silo Ridge Common	**487,784**	**N/A**	**609,729**	**N/A**	**N/A**	**0**	**0**	**0**	**0**	**404,999**	**1,009,293**	**733,644**	**1,126,179**	**359,501**	**0**	**0**	**0**	**3,633,615**
	11.20	**Acres**	**14.00**	**Gallons Per Day:**		**0**	**0**	**0**	**0**	**13,064**	**33,643**	**23,666**	**36,328**	**11,983**	**0**	**0**	**0**	**9,955**
Total Silo Ridge	**6,157,074**	**N/A**	**5,784,313**	**N/A**	**N/A**	**0**	**0**	**0**	**0**	**3,902,360**	**9,725,027**	**7,069,014**	**10,851,278**	**3,463,962**	**0**	**0**	**0**	**35,011,640**

SILO RIDGE FIELD CLUB, AMENIA, NEW YORK

SILO RIDGE FIELD CLUB IRRIGATION WATER USE ESTIMATES - BASED ON 20 YEAR EVAPOTRANSPIRATION DATA FROM TORRINGTON, CT. REFERENCE ET CALCULATED USING THE FAO MODIFIED PENMAN METHOD With 75% Rainfall based on 30 year historical data from Poughkeepsie, NY

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Year
Estimated Evapotranspiration Rates (Inches) based on 75% rainfall (Normal):	0.00	0.00	0.00	0.00	0.16	1.64	0.40	1.97	0.07	0.00	0.00	0.00	4.23

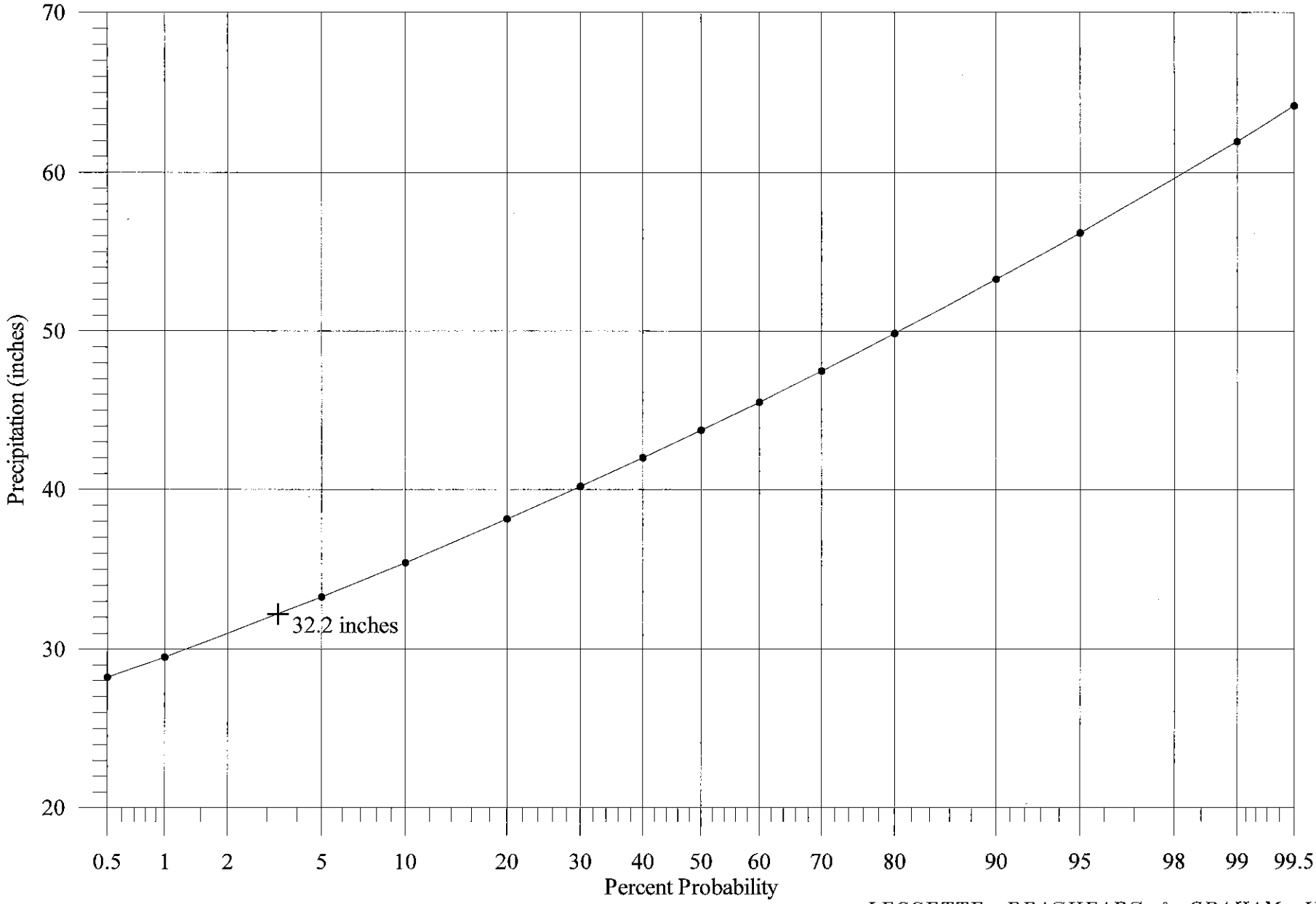
Description of Area	Area in Square Ft.	% Irrigated Area	Irrigated Area	Plant Factor	Irrigation Efficiency	Jan. Gals. / Mo.	Feb. Gals. / Mo.	Mar. Gals. / Mo.	Apr. Gals. / Mo.	May Gals. / Mo.	Jun. Gals. / Mo.	Jul. Gals. / Mo.	Aug. Gals. / Mo.	Sep. Gals. / Mo.	Oct. Gals. / Mo.	Nov. Gals. / Mo.	Dec. Gals. / Mo.	Year Gals. / day
Silo Ridge Field Club Golf Course																		
Fairways	1,295,419	1.0000	1,295,419	1.00	0.80	0	0	0	0	158,963	1,654,213	399,594	1,987,956	71,017	0	0	0	4,271,743
	29.74	Acres	29.74	Gallons Per Day:		0	0	0	0	5,128	55,140	12,890	64,128	2,367	0	0	0	11,703
Primary Roughs	1,394,972	0.7500	1,046,229	1.00	0.80	0	0	0	0	128,385	1,336,004	322,727	1,605,548	57,356	0	0	0	3,450,020
	32.02	Acres	24.02	Gallons Per Day:		0	0	0	0	4,141	44,533	10,411	51,792	1,912	0	0	0	9,452
Greens	121,587	1.0000	121,587	1.00	0.80	0	0	0	0	14,920	155,263	37,506	186,588	6,666	0	0	0	400,942
	2.79	Acres	2.79	Gallons Per Day:		0	0	0	0	481	5,175	1,210	6,019	222	0	0	0	1,098
Bunkers	145,963	0.0000	0	1.00	0.80	0	0	0	0	0	0	0	0	0	0	0	0	0
	3.35	Acres	0.00	Gallons Per Day:		0	0	0	0	0	0	0	0	0	0	0	0	0
Tees	129,495	1.0000	129,495	1.00	0.80	0	0	0	0	15,891	165,361	39,945	198,724	7,099	0	0	0	427,020
	2.97	Acres	2.97	Gallons Per Day:		0	0	0	0	513	5,512	1,289	6,410	237	0	0	0	1,170
Total Silo Ridge Field Club Golf Course	**3,087,436**	**N/A**	**2,592,730**	**N/A**	**N/A**	**0**	**0**	**0**	**0**	**318,159**	**3,310,841**	**799,772**	**3,978,816**	**142,138**	**0**	**0**	**0**	**8,549,726**
	70.88	**Acres**	**59.52**	**Gallons Per Day:**		**0**	**0**	**0**	**0**	**10,263**	**110,361**	**25,799**	**128,349**	**4,738**	**0**	**0**	**0**	**23,424**
Silo Ridge Residential Landscape																		
Residential- Grass Condos and Town Home	139,764	1.0000	139,764	1.00	0.80	0	0	0	0	17,151	178,475	43,113	214,483	7,662	0	0	0	460,883
	3.21	Acres	3.21	Gallons Per Day:		0	0	0	0	553	5,949	1,391	6,919	255	0	0	0	1,263
Residential- Grass Village Green Homes	157,469	1.0000	157,469	1.00	0.80	0	0	0	0	19,323	201,083	48,574	241,653	8,633	0	0	0	519,266
	3.61	Acres	3.61	Gallons Per Day:		0	0	0	0	623	6,703	1,567	7,795	288	0	0	0	1,423
Residential- Grass South Lawn Homes	313,414	1.0000	313,414	1.00	0.80	0	0	0	0	38,460	400,221	96,678	480,967	17,182	0	0	0	1,033,507
	7.19	Acres	7.19	Gallons Per Day:		0	0	0	0	1,241	13,341	3,119	15,515	573	0	0	0	2,832
Residential- Grass Golf Villas	222,374	1.0000	222,374	1.00	0.80	0	0	0	0	27,288	283,965	68,595	341,256	12,191	0	0	0	733,295
	5.11	Acres	5.11	Gallons Per Day:		0	0	0	0	880	9,466	2,213	11,008	406	0	0	0	2,009
Residential- Grass Estate Homes	822,195	1.0000	822,195	1.00	0.80	0	0	0	0	100,893	1,049,919	253,620	1,261,744	45,074	0	0	0	2,711,251
	18.88	Acres	18.88	Gallons Per Day:		0	0	0	0	3,255	34,997	8,181	40,701	1,502	0	0	0	7,428
Res. Medium Water Use Shrub and Ground	463,319	1.0000	463,319	0.40	0.85	0	0	0	0	21,404	222,737	53,805	267,675	9,562	0	0	0	575,183
	10.64	Acres	10.64	Gallons Per Day:		0	0	0	0	690	7,425	1,736	8,635	319	0	0	0	1,576
Res. Low Water Use Shrub and Ground	463,319	1.0000	463,319	0.20	0.85	0	0	0	0	10,702	111,368	26,902	133,837	4,781	0	0	0	287,592
	10.64	Acres	10.64	Gallons Per Day:		0	0	0	0	345	3,712	868	4,317	159	0	0	0	788
Total Silo Ridge Residential	**2,581,854**	**N/A**	**2,581,854**	**N/A**	**N/A**	**0**	**0**	**0**	**0**	**235,221**	**2,447,768**	**591,287**	**2,941,615**	**105,085**	**0**	**0**	**0**	**6,320,976**
	59.27	**Acres**	**59.27**	**Gallons Per Day:**		**0**	**0**	**0**	**0**	**7,588**	**81,592**	**19,074**	**94,891**	**3,503**	**0**	**0**	**0**	**17,318**
Silo Ridge Common Areas																		
Common- Grass	487,784	1.0000	487,784	1.00	0.80	0	0	0	0	59,857	622,886	150,465	748,556	26,741	0	0	0	1,608,505
	11.20	Acres	11.20	Gallons Per Day:		0	0	0	0	1,931	20,763	4,854	24,147	891	0	0	0	4,407
Common Med. Water Use Shrub and Ground	60,973	1.0000	60,973	0.40	0.85	0	0	0	0	2,817	29,312	7,081	35,226	1,258	0	0	0	75,694
	1.40	Acres	1.40	Gallons Per Day:		0	0	0	0	91	977	228	1,174	42	0	0	0	2,523
Common Low Water Use Shrub and Ground	60,972	1.0000	60,972	0.20	0.85	0	0	0	0	1,408	14,656	3,540	17,613	629	0	0	0	37,847
	1.40	Acres	1.40	Gallons Per Day:		0	0	0	0	45	489	114	587	21	0	0	0	1,262
Total Silo Ridge Common	**487,784**	**N/A**	**609,729**	**N/A**	**N/A**	**0**	**0**	**0**	**0**	**64,082**	**666,854**	**161,086**	**801,395**	**28,629**	**0**	**0**	**0**	**1,722,046**
	11.20	**Acres**	**14.00**	**Gallons Per Day:**		**0**	**0**	**0**	**0**	**2,067**	**22,228**	**5,196**	**25,851**	**954**	**0**	**0**	**0**	**4,718**
Total Silo Ridge	**6,157,074**	**N/A**	**5,784,313**	**N/A**	**N/A**	**0**	**0**	**0**	**0**	**617,462**	**6,425,464**	**1,552,145**	**7,721,826**	**275,851**	**0**	**0**	**0**	**16,592,748**

APPENDIX II

Precipitation Probability Analysis

SILO RIDGE RESORT COMMUNITY AND GOLF COURSE
AMENIA, NEW YORK

Precipitation Probability Graph for Poughkeepsie Climate Station Using 30-Year Month Averages 1971-2000



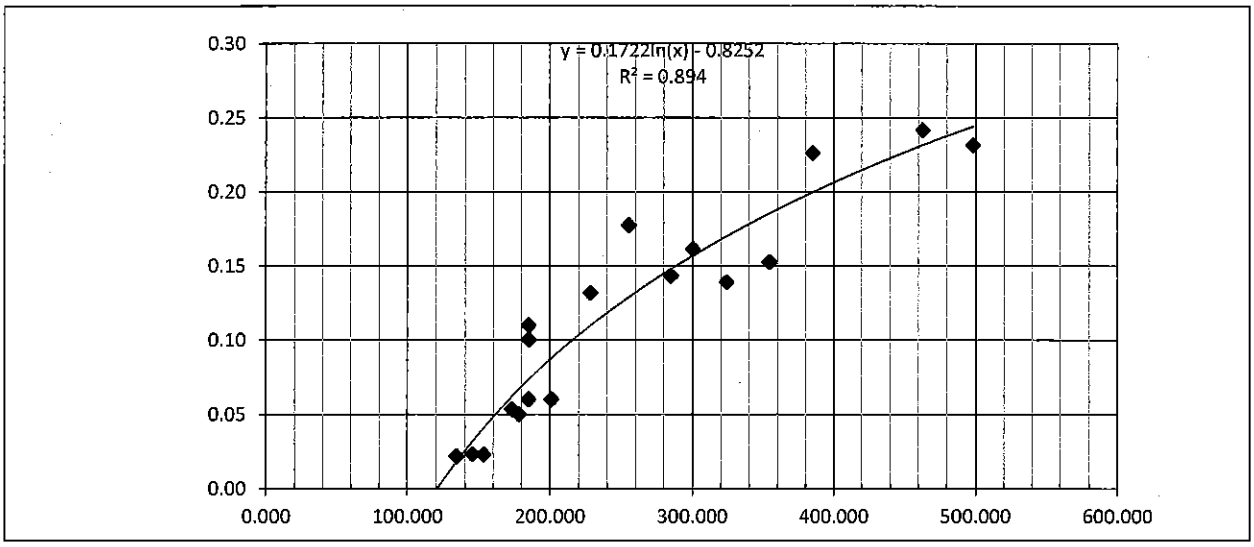
K:Jobs/Silo Ridge/NYSDEC/Irrigation System Report/Poughkeepsie Distribution Percent using 30 year.grf

LEGGETTE, BRASHEARS & GRAHAM, INC.

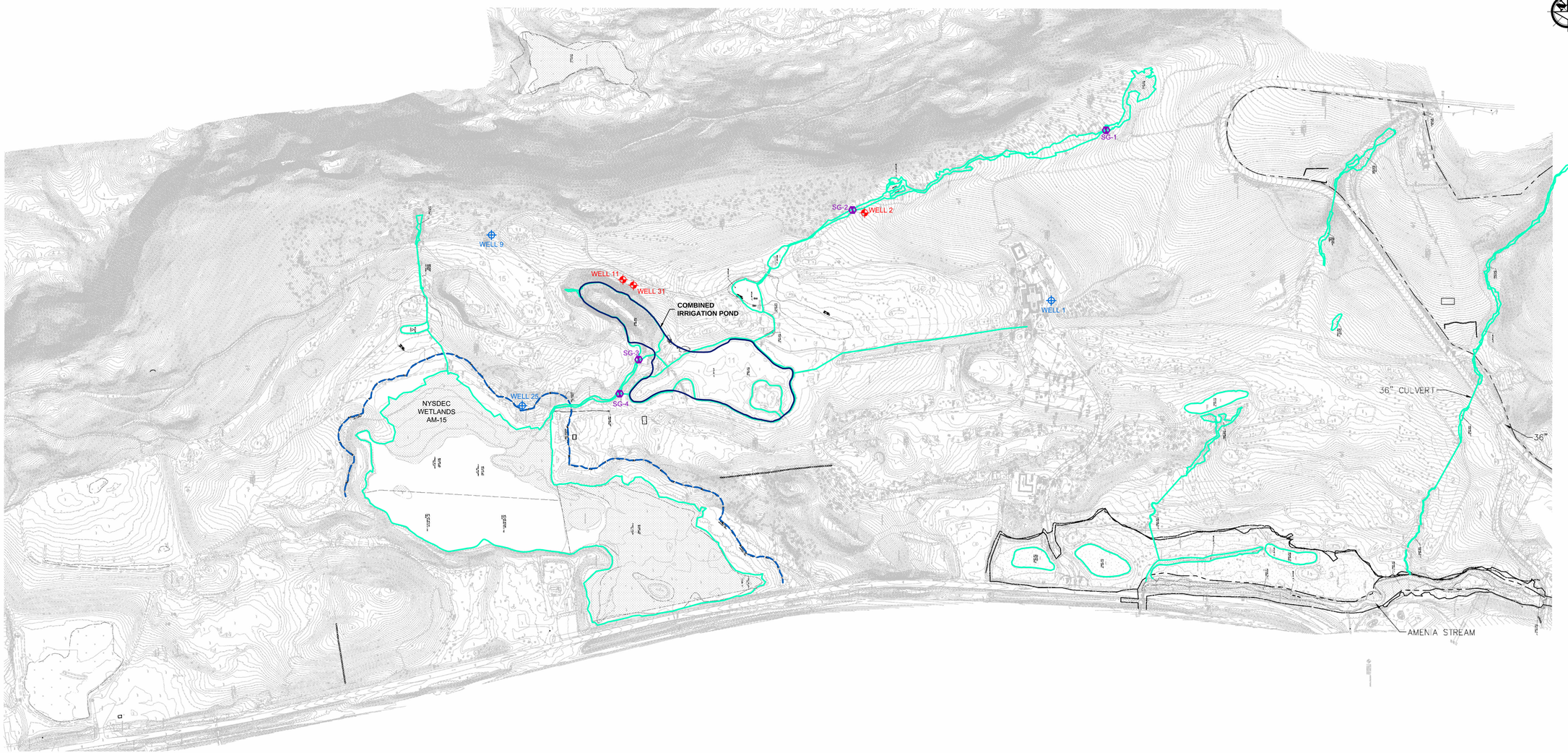
APPENDIX III

Silo Ridge and USGS Ten Mile Gage Stream Flow Correlation

Date	SG-2 Measured Flow on Silo Ridge Property (CFS)	USGS Ten Mile Gage (CFS)
5/23/2014	0.24	463.0
5/24/2014	0.23	498.0
5/27/2014	0.14	324.0
5/28/2014	0.23	385.0
5/29/2014	0.15	354.0
5/30/2014	0.16	300.0
6/2/2014	0.13	228.0
6/4/2014	0.14	285.0
6/5/2014	0.18	255.0
6/9/2014	0.10	185.0
6/10/2014	0.11	185.0
6/11/2014	0.05	178.0
6/12/2014	0.06	185.0
6/13/2014	0.06	201.0
6/16/2014	0.05	173.0
6/17/2014	0.02	153.0
6/18/2014	0.02	145.0
6/19/2014	0.02	134.0



PLATE



LEGEND

- 100-FOOT WETLAND NYSDEC ADJACENT AREA BOUNDARY
- EXISTING SURFACE WATER FEATURE/STORMWATER DRAINAGE PIPES
- PROPOSED COMBINED IRRIGATION POND
- WELL 9 — PROPOSED IRRIGATION BEDROCK SUPPLY WELL
- WELL 2 — PROPOSED POTABLE BEDROCK SUPPLY WELL LOCATION
- SG-1 — APPROXIMATE STREAM LOCATION GAGED DURING LBG'S 72-HOUR PUMPING TEST PROGRAM

0 300
SCALE IN FEET

SILO RIDGE RESORT COMMUNITY
AMENIA, NEW YORK

SITE MAP

DATE	REVISED

PREPARED BY:
LEGGETTE, BRASHEARS & GRAHAM, INC.
Professional Groundwater and Environmental Engineering Services
4 Research Drive
Suite 204
Shelton, Connecticut 06484
(203) 929-8555

DRAWN:	MRV	CHECKED:	SS	DATE:	01/15/15	PLATE:	1

O:\DWG\Silo Ridge\2015\Water Budget Plate 1.dwg, Layout1, 1/15/2015 8:54:00 AM, DWG To PDF.pc3