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Phase 1 Technical Memorandum - Traffic

March 12, 2014

Re: Phase 1 Site Access Requirements
Silo Ridge Development
Town of Amenia, NY

This technical memorandum reviews the Phase 1 design criteria for access to the proposed Silo Ridge project. While this evaluation is primarily for Phase 1 of the development, where the evaluation indicates that improvements are required on the passing roadways, an additional analysis was performed to determine whether these improvements will be sufficient to support the development upon full build out of the project. As indicated in the SEQRA Compliance Memo, dated 3/12/14 the currently proposed project will generate less than half the volume of peak-hour traffic that the 2009 approved Master Development Plan (MDP) was projected to generate, resulting in better intersection operating conditions and requiring less mitigation (a traffic signal will no longer be warranted at the site's main driveway). The following describes the currently proposed project, the associated trip generation and the results of the design criteria review.

Project Description

The currently proposed project[1] will be a private, gated, residential community, and will have almost no commercial space (just the Winery Restaurant, which will be accessed via its own driveway, and 21 hotel units, which will be available by reservation only and will require pre-announced access). The project is to consist of the following uses:

- Residential (224 dwelling units)
  - Single-family homes (159 units)
  - Condominium/Townhouse units (65 units)
- Commercial
  - Winery Restaurant (80 seats)
  - 21 Hotel Units
- Amenities
  - Existing 18-hole golf course to be renovated and clubhouse to be demolished and rebuilt.

[1] The current proposal differs slightly from the October 2013 MDP submission which had a slightly larger residential component than the current program described herein (229 units vs. the current program's 224 units).

The project will also contain recreational facilities for the development's residents. The development is to be constructed in at least two phases, with Phase 1 consisting of 75 single-family homes, 65 condominium units, the 21 hotel units and the golf course renovation with rebuilt clubhouse facility.

The Phase 1 access plan for the approved development includes two driveways on Route 22; the existing main site driveway and the existing landfill driveway (which will serve as an emergency-only access driveway); and two driveways on Route 44; the driveway for the 10 parking space overlook and the driveway to the proposed wastewater treatment plant.

Trip Generation

Trips generated by the currently proposed project were determined from trip data contained in the Institute of Transportation Engineers' (ITE) publication, *Trip Generation, Ninth Edition*. ITE Land Use Code 210 (Single-Family Detached Housing) and Code 230 (Residential Condominium/Townhouse) were used to generate trips for the single-family and condominium components. Land Use Code 310 (Hotel) was used to generate trips for the hotel units (as this resulted in slightly higher trip generation than if these units were considered as condos/townhouses). Land Use Code 931 (Quality Restaurant) was used to generate trips for the Winery restaurant and Code 430 (Golf Course) was used to project the trips to the golf course. It is anticipated that the residents of the development (including hotel residents) would represent a significant portion of the peak hour trips to the golf course and the trip generation takes into account this expected synergy between these components as well as the fact that the development is proposed as a private, gated facility. The following provides a summary of the methodology utilized to generate trips for the individual land uses.

- Restaurant – Trips for the restaurant were projected using ITE rates for land use 931, Quality Restaurant for 80 diners. No reductions for synergy between the development's components were applied to the restaurant trips.
- Golf course –Trips for the golf course were projected with the assumption that 43 percent of the golf trips would be comprised of the development's residents (internal trips) and would not travel on the external roadways. The remainder of the trips would consist of golf course staff and guests coming from outside of the development.
- Residential (Single-family, condominiums and hotel) – The 43 percent of trips made internally to or from the golf facility constitute between 9 to 12 percent of the residential trips, depending on the time of day.

The trip generations from the currently proposed project are shown in Table 1. The Table indicates the Phase 1 trips and the trips from full development of the site.

Table 1 – Peak Hour Trip Generation

Development	Size	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		Total Trips	Internal Trips	New Trips	Total Trips	Internal Trips	New Trips	Total Trips	Internal Trips	New Trips
Phase 1										
Single Family	75 du	63	-6	**57**	81	-9	**72**	76	-9	**67**
Condo/Townhouses	65 du	37	-3	**34**	42	-4	**38**	61	-6	**55**
Hotel	21 units	11	-2	**9**	13	-2	**11**	15	-3	**12**
Golf Course & Clubhouse [(1)]	18 holes	25	-11	**14**	35	-15	**20**	42	-18	**24**
Total Phase 1		***136***	***-22***	***114***	***171***	***-30***	***141***	***194***	***-36***	***158***
Full Build-out										
Single Family	159 du	121	-8	**113**	159	-13	**146**	150	-16	**134**
Condo/Townhouses	65 du	37	-5	**32**	42	-7	**35**	61	-8	**53**
Hotel	21 units	11	-3	**8**	13	-3	**10**	15	-3	**12**
Golf Course & Clubhouse	18 holes	37	-16	**21**	53	-23	**30**	62	-27	**35**
Winery Restaurant [(2)]	80 seats	2	0	**2**	21	0	**21**	14	0	**14**
Total Full Build-out		***208***	***-32***	***176***	***288***	***-46***	***242***	***302***	***-54***	***248***

Notes: (1) Phase 1 Golf Course trips estimated to be 2/7 of full build-out trips as majority of golf trips will be from residential component which is not fully built in Phase 1.

(2) Midday Saturday Winery restaurant trips are 75% of Saturday Peak generator hour (evening) trips.

As indicated in Table 1, at full build-out, the project will generate 176 new trips during the AM peak hour, 242 new trips in the PM peak hour and 248 new trips during the Saturday midday peak hour. After Phase 1, the project is projected to generate approximately 38% less traffic than it will at full build-out.

Analysis of Access Requirements

To determine the level of improvement required for access to the Site in Phase 1, an analysis was performed to identify the access needs at the site's driveways as detailed below[2].

Route 22 at Main Site Access

This intersection currently consists of one lane in each direction on Route 22 with separate left and right turn lanes exiting the driveway which currently provides access to the golf course. Virtually all of the proposed development's traffic will use this driveway in Phase 1 and the majority will use this driveway at full development (the remainder will use the two Route 44 driveways providing access to the Winery restaurant and Vineyard Cottages parcels). Traffic counts conducted in June of 2013 revealed that peak-hour traffic on Route 22 have increased by an average of 3 % since May 2007. Access improvements previously proposed for this location included signalization of the intersection as well as the construction of a northbound left turn lane and a southbound right turn lane on Route 22 (January 8, 2009 Findings Statement). To determine if these improvements would be required for Phase 1 and/or full build-out, new traffic volume projections were prepared and analyses performed. The analyses performed included intersection capacity analysis, traffic signal warrant analysis and turn lane warrant analyses. To develop new traffic volumes, Automatic Traffic Recorder (ATR) counts were conducted on Route 22 adjacent to the driveway for a one-week period from June 15 to June 22, 2013. To account for background growth not related to the project, the counted volumes were increased by 4 percent to represent No-Build volumes for Phase 1 and by a total of 8 percent to signify No-Build volumes for the fully developed site. The Phase 1 and full build-out trip generations identified in Table 1 were distributed to the intersection based on the previously approved distribution patterns and added to the No-Build volumes, resulting in the Build volumes for Phase 1 and full build-out of the project.

Capacity Analysis

Detailed unsignalized intersection capacity analyses of the Build condition for the PM peak hour for Phase 1 and for the full build-out of the project were prepared using Synchro software (version 8). The analysis was performed assuming the existing geometry and a new northbound left turn lane on Route 22, as well as the potential benefits of adding a southbound right-turn lane (per NYSDOT Highway Design Manual §5.9.8.2 D). The results of this analysis indicate that the eastbound left turn exiting the driveway will operate at Level of Service (LOS) E with delays of 45.7 seconds for Phase 1 and at LOS F (156 seconds delay) under full build-out conditions. The volume to capacity ratio (v/c) for the left turn movement will be 0.41 under Phase 1 conditions and 0.94 at full build-out.

The analyses clearly indicate that the driveway will have adequate capacity to accommodate project and non-project traffic in Phase 1. The left-turn movement will be operating at only 41 percent of capacity. Peak-hour, average delays for all vehicles, except left-turns exiting the development, will be minimal (ten seconds or less on the remaining entering and exiting movements and virtually no delay on the through movements). Delays on the left-turn movement exiting the site will be tolerable and confined to the site.

[2] The analyses are based on the development program from the October 2013 MDP submission which had a slightly larger residential component than the current program described herein (229 units vs. the current program's 224 units). The reduction in size is not expected to alter the findings of the analysis.

At full build-out, the analyses indicate that, technically, the driveway will have available capacity to accommodate project and non project traffic. The left-turn movement will be operating at 94 percent of capacity. Peak-hour, average delays for all vehicles, except left-turns exiting the development, will be minimal (eleven seconds or less on the remaining entering and exiting movements and virtually no delay on the through movements). Delays on the left-turn movement exiting the site, although lengthy, will be confined to the site.

Traffic Signal Warrant Analysis

A traffic signal warrant analysis[3] was performed at this intersection. The traffic volumes were applied to the various warrants contained in the 2009 edition of the *Manual on Uniform Traffic Control Devices* (MUTCD). The MUTCD volumes are the minimum threshold which must be reached before the NYSDOT will consider installing a traffic signal.

As detailed hereafter, the analysis indicates that the traffic volumes are not projected to reach the threshold values provided in the MUTCD at full build out of the site, therefore, signalization is not projected to be warranted at this location under the full build-out condition. Since Phase 1 volumes are projected to be 38 percent lower than full build-out volumes, a traffic signal is not warranted for Phase 1 conditions either. However, should the desire for a traffic signal persist over time, the MUTCD does have a provision wherein lower threshold values may be considered after an adequate trial of other remedial measures, should they be required (Table 4C-1, subscript d). Therefore, it is recommended that this intersection be reevaluated for signalization after each phase of development in consultation with NYSDOT. A summary of the Warrant analysis is provided below.

- Warrant 1 – Eight-Hour Vehicular Volume: Warrant 1 includes Condition A, the Minimum Vehicular Volume and Condition B, the Interruption of Continuous Traffic. The Warrant is met for Condition A or B when, for any 8 hours of an average day, the major street volumes (both approaches) and the minor street exiting volumes meet the volume thresholds provided in Table 4C-1 of the MUTCD. For the Route 22 and the Main Site driveway intersection, the 70 percent threshold values from Table 4C-1 were applied as the major street speed exceeds 40 mph. The Build traffic volumes for this intersection for a 24-hour period were developed using the 2013 ATR counts, increased by 8 percent to account for background growth and projecting the site generated volumes to each hour of the day. Table 2 summarizes the results of Warrant 1. The Table indicates that the major street threshold values are met for 15 hours for Condition A and 8 hours in Condition B; however, during those same hours, the minor street volumes do not meet the volume threshold for the required 8 hours for either condition (0 hours for condition A and 4 hours for Condition B). Therefore, the Warrant is not satisfied.

[3] The analyses are based on the development program from the October 2013 MDP submission which had a slightly larger residential component than the current program described herein (229 units vs. the current program's 224 units). The reduction in size is not expected to alter the findings of the analysis.

Table 2 – Summary of Warrant 1

				Warrant 1 - Eight-Hour Vehicular Volume			
				Condition A Minimum Vehicular Warrant		Condition B Interruption of Continuous Traffic	
	Major Street - Rt. 22 Total Both Directions		Minor Street Main Driveway	Major Street Threshold	Minor Street Threshold	Major Street Threshold	Minor Street Threshold
Time of Day	2013 Existing	2017 Build	Exiting Site Traffic (1)	70%	70%	70%	70%
				350	140	525	70
				Meets Threshold Value?		Meets Threshold Value?	
12-1 am	47	61	8	NO	NO	NO	NO
1-2 am	17	22	3	NO	NO	NO	NO
2-3 am	15	19	3	NO	NO	NO	NO
3-4 am	19	25	3	NO	NO	NO	NO
4-5 am	55	70	18	NO	NO	NO	NO
5-6 am	115	146	40	NO	NO	NO	NO
6-7 am	267	339	90	NO	NO	NO	YES
7-8 am	329	419	114	YES	NO	NO	YES
8-9 am	323	412	103	YES	NO	NO	YES
9-10 am	331	422	93	YES	NO	NO	YES
10-11 am	362	463	80	YES	NO	NO	YES
11am-12 pm	405	518	84	YES	NO	NO	YES
12-1 pm	481	616	84	YES	NO	YES	YES
1-2 pm	454	582	79	YES	NO	YES	YES
2-3 pm	517	664	63	YES	NO	YES	NO
3-4 pm	564	725	69	YES	NO	YES	NO
4-5 pm	581	746	71	YES	NO	YES	YES
5-6 pm	642	825	77	YES	NO	YES	YES
6-7 pm	525	674	64	YES	NO	YES	NO
7-8 pm	462	593	56	YES	NO	YES	NO
8-9 pm	360	462	44	YES	NO	NO	NO
9-10 pm	311	400	38	YES	NO	NO	NO
10-11 pm	205	263	25	NO	NO	NO	NO
11pm -12am	126	163	15	NO	NO	NO	NO
			Total Hours Met	***15***	***0***	***8***	***10***
			Total Same Hours Met	***0***		***4***	
			Meets Warrant?	***NO***		***NO***	

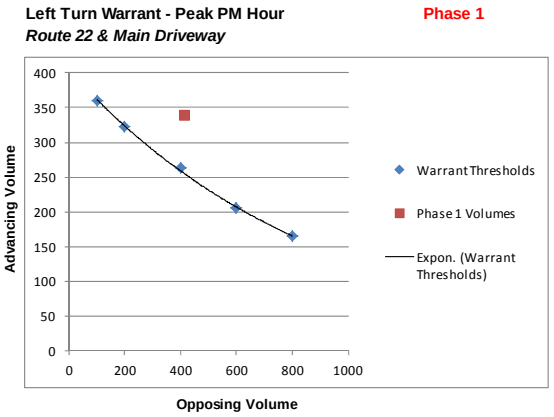
Note: (1) Site traffic based on slightly larger residential program from the October 2013 MDP submission.

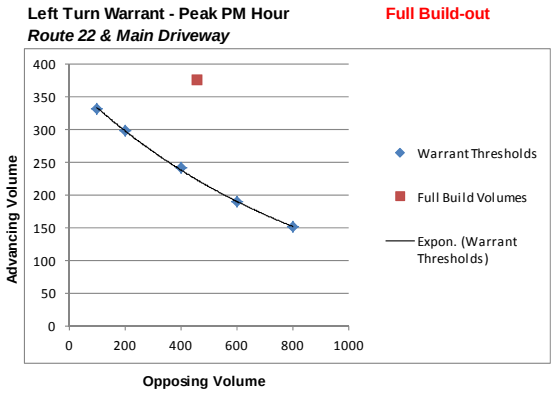
- Warrant 2 – Four-Hour Vehicular Volume: The Warrant is met when, for each of any 4 hours of an average day, the plotted points representing the hourly vehicles on the major street (total of both approaches) and the corresponding vehicles exiting the minor street approach all fall above the applicable curve in Figure 4C-1 or Figure 4C-2 (70 percent factor) of the MUTCD. For the Route 22 and the Main Site driveway intersection, Figure 4C-2 was used as the major street speed exceeds 40 mph. The minor street threshold volume for Warrant 2 is 80 vehicles per hour (vph). The Build volumes for Route 22 and the Main site driveway shown in Table 2 were applied to Figure 4C-2. The driveway approach exceeds the 80 vph threshold value during seven hours. However, during these same hours, the major street volume falls below the curve; therefore, the criteria are not met for any hour of the day and the warrant is not met.
- Warrant 3 – Peak-Hour Vehicular Volume: The Warrant is met when, for one hour of an average day, the plotted points representing the hourly vehicles on the major street (total of both approaches) and the corresponding vehicles exiting the minor street approach fall above the applicable curve in Figure 4C-3 or Figure 4C-4 (70 percent factor) of the MUTCD. For the Route 22 and the Main Site driveway intersection, Figure 4C-4 was used as the major street speed exceeds 40 mph. The minor street threshold volume for Warrant 3 is 100 vph. The Build volumes for Route 22 and the Main site driveway shown in Table 2 were applied to Figure 4C-4. The driveway approach exceeds the 100 vph threshold value for two hours. However, during these same hours, the major street volume falls below the curve; therefore, the warrant is not met for any hour of the day.
- Warrant 4 – Pedestrian Volume: To satisfy this Warrant, a minimum of 75 pedestrians per hour crossing the intersection for the four-hour pedestrian volume warrant or 93 pedestrians per hour for the pedestrian peak hour warrant is required. As the pedestrian volumes at the subject intersection are negligible, this Warrant is not met.
- Warrant 5 – School Crossing: This Warrant is intended for locations with existing school crossings and requires a minimum of 20 schoolchildren crossing the major street during the same period when the number of adequate gaps in the traffic stream is insufficient. As the subject intersection does not currently have an established school crossing and will not provide one in the future, this Warrant is not met.
- Warrant 6 – Coordinated Signal System: This Warrant is intended to maintain proper platooning of vehicles in a coordinated signal system and may necessitate signalization at an intersection that would not otherwise need signalization. This Warrant is not met at the subject intersection as it does not fall within a coordinated system.
- Warrant 7 – Crash Experience: This Warrant is intended for application at locations where the severity and frequency of crashes would be the principal reasons to install a traffic signal. There are various criteria that need to be met to satisfy the warrant, including a minimum of 5 crashes that would be of the type susceptible to correction by a traffic signal. For the Route 22 and Main Site driveway intersection, accident records for the most recent three-year period were obtained from NYSDOT. These records indicate that only one accident occurred in the vicinity of the subject intersection during the period evaluated. Therefore, the intersection does not meet the minimum criteria for number of accidents.
- Warrant 8 – Roadway Network: This Warrant is intended at the common intersection of two or more major routes that could be considered as part of a roadway network. This warrant is not applicable for the subject intersection as the site driveway is a private road.

- Warrant 9 – Intersection Near a Grade Crossing: This Warrant is for intersections adjacent to at-grade railroad crossings. This Warrant is not applicable for the subject intersection as it is not located near a grade crossing.

Left Turn Lane Warrant Analysis

A left turn lane warrant analysis was performed for the northbound approach of Route 22 at the Main Site driveway intersection with the Build volumes for Phase 1 and for the fully developed site. The analysis was based on Exhibit 9-75 (Guide for Left-Turn Lanes on Two-Lane Highways) from the 2004 edition of *A Policy on Geometric Design of Highways and Streets* published by the American Association of State Highway and Transportation Officials (AASHTO). The AASHTO publication provides values for determining whether a left-turn lane is warranted based on the operating speed, opposing volume, advancing volume and proportion of left turns. The analysis of the northbound left-turn movement indicated that a left turn lane would be warranted under Phase 1 and at full build-out. Therefore, it is recommended that a 75-foot left turn lane, with appropriate tapers, be constructed at this location in accordance with the requirements of the NYSDOT's highway work permitting process.





Right Turn Lane Warrant Analysis

NYSDOT Highway Design Manual §5.9.8.2 D simply states that "the decision to install exclusive right-turn lanes should be based on a comparison, using capacity analysis, of intersection operations with and without the turn lanes".

At the completion of Phase 1, 44 vehicles are projected to make the southbound right-turn movement into the site during the busiest hour of the day, delays on the left-turn exiting movement are projected to be 45.7 seconds and the volume-to-capacity ratio on this movement is projected to be 0.41. With the addition of a southbound right-turn lane, these values are projected to be reduced by 2.5 seconds and 0.02, respectively, which will be imperceptible and which will not result in any changes in Level of Service. It is, therefore, concluded that a right-turn lane is not warranted for Phase1 of the project.

At the completion of full build-out, 66 vehicles are projected to make the southbound right-turn movement into the site during the busiest hour of the day, delays on the left-turn exiting movement are projected to be 156 seconds and the volume-to-capacity ratio on this movement is projected to be 0.94. With the addition of a southbound right-turn lane, these values are projected to be reduced by 20 seconds and 0.06, respectively, and which will not result in any changes in Level of Service. Although this analysis indicates that constructing a

right-turn lane will not materially change the nature of operating conditions on the left-turn exiting movement, suggesting that a right-turn lane is not warranted for full build-out of the project, it is recommended that the situation be re-evaluated after the completion of Phase 1.

Route 22 at Southern Site Driveway

Route 22 consists of one lane in each direction at this existing driveway. No improvements to NY Route 44 were required at the second/southern access from the property to NY Route 22 in the 2009 Findings Statement for the approved development. Under Phase 1, this driveway will be used for emergency access only and, therefore, no improvements are proposed.

Route 44 at Proposed Site Access/Area "M" (Winery Restaurant)

This proposed unsignalized site access will be constructed during Phase 1 to provide access to approximately 10 parking spaces at the overlook (at full development, this driveway will also provide access to the proposed winery, including an 80-seat restaurant). Other than the construction of the driveway, no improvements to NY Route 44 were required at this location in the 2009 Findings Statement for the approved development.

A review of the Build capacity analyses of this intersection contained in the 2007 DEIS indicate that during the PM peak hour, the busiest hour in terms of delay, the westbound driveway approach operated at acceptable LOS C with a delay of 16.0 seconds. Since the 10-parking space overlook will generate substantially less traffic than contemplated in the Findings Statement, improvements to NYS Route 44 associated with the construction of this driveway are not required for Phase 1 of the project.

Route 44 at Proposed Access to Wastewater Treatment Plant

This proposed unsignalized site access will be constructed during Phase 1 to provide access to the wastewater treatment plant. Other than construction of the driveway, improvements to NYS Route 44 associated with the construction of this driveway were not required in the 2009 Findings Statement for the approved development.

For Phase 1 of the current project, consistent with the 2009 Findings Statement and due to the low volumes anticipated to be generated by the plant (generally less than 10 trips per day), improvements to NYS Route 44 associated with the construction of this driveway are not required.

Summary of Access Requirements

Based on the analysis performed herein, the following summarizes the site access requirements for each driveway location for Phase 1.

- Route 22 at Main Site Access
  - Maintain existing driveway geometry (separate left and right turn exiting lanes and one entering lane);
  - Construct 75-foot northbound left turn lane on Route 22;
  - A southbound right-turn lane is not required; however, reassess need for the right-turn lane in consultation with NYSDOT after Phase 1 is completed.
  - Signalization is not required; however, reassess need for signalization in consultation with NYSDOT after Phase 1 is completed.

- Route 22 and Southern Site Driveway
  - Driveway will be restricted for emergency access only, no improvements required in the public right of way.

- Route 44 and Proposed Site Access/Area “M”(Winery Restaurant)
  - Construct the site driveway to provide one entering lane and one exiting lane.

- Route 44 and Proposed Site Access to Wastewater Treatment Plant
  - Construct the site driveway to provide one entering lane and one exiting lane.

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Proposed MDP Technical Memorandum - Traffic

March 12, 2014

Re: Proposed MDP - Traffic
Silo Ridge Development
Town of Amenia, NY

VHB has prepared this technical memorandum to determine whether a proposed change in the size and land use mix of the Silo Ridge development which received SEQRA approval in 2009 will be in compliance with the 2009 SEQRA findings statement. This technical memorandum provides a comparison between the 2009 approved Master Development Plan (MDP) and the development currently proposed with regards to the trip generation, Level of Service results and required mitigation. As indicated hereafter, the currently proposed project will generate substantially less traffic than the previously approved MDP, resulting in better intersection operating conditions and requiring less mitigation (a traffic signal will no longer be warranted at the site's main driveway).

Project Description

The approved development, the Silo Ridge Resort Project, previously received MDP and SUP approvals which were subject to conditions contained in the SEQRA Findings Statement adopted January 8, 2009. That project, which was proposed as a combination public-private residential and commercial facility, consisted of the following land uses:

- Residential (338 dwelling units)
  - Single-family homes – (41 units)
  - Condominium/Townhouse units (297 units)
- Commercial
  - Resort Hotel/Condominium (300 condo units capable of being divided into 367 hotel rental rooms) including hotel amenities (banquet space, restaurant, bar/lounge and café)
  - Restaurant
  - Conference space
  - Spa and Wellness Center
  - Retail shops
- Amenities
  - Existing 18-hole golf course to be renovated and clubhouse to be demolished and rebuilt.

Access to the approved project was to be provided by two driveways on Route 44 and two driveways on Route 22. An additional access on Route 44 was to provide access to the proposed wastewater treatment plant.

The currently proposed project[1] differs from the approved project in that it will be a private, gated community, will have fewer residential units and almost no commercial space (just the Winery Restaurant, which will be accessed via its own driveway, and 21 hotel units, which will be available by reservation only and will require pre-announced access). Access to the project will differ from the approved project in that the proposed southern driveway on Route 22 will be for emergency access only. The project is to consist of the following uses:

- Residential (224 dwelling units)
    - Single-family homes (159 units)
    - Condominium/Townhouse units (65 units)
- Commercial
    - Winery Restaurant (80 seats)
    - 21 Hotel units
- Amenities
    - Existing 18-hole golf course to be renovated and clubhouse to be demolished and rebuilt.

The project will also contain recreational facilities for the development's residents. The golf course clubhouse will be rebuilt and expanded to meet the residents' needs but the golf course will no longer be open to the public (except for use by residents in the 21 hotel units).

Trip Generation

Trips generated by the currently proposed project were determined from trip data contained in the Institute of Transportation Engineers' (ITE) publication, *Trip Generation, Ninth Edition*. ITE Land Use Code 210 (Single-Family Detached Housing) and Code 230 (Residential Condominium/Townhouse) were used to generate trips for the single-family and condominium components. Land Use Code 310 (Hotel) was used to generate trips for the hotel units (as this resulted in slightly higher trip generation than if these units were considered as condos/townhouses). Land Use Code 931 (Quality Restaurant) was used to generate trips for the Winery restaurant and Code 430 (Golf Course) was used to project the trips to the golf course. It is anticipated that the residents of the development (including hotel residents) would represent a significant portion of the peak hour trips to the golf course and the trip generations take into account this expected synergy between these components as well as the fact that the development is proposed as a private, gated facility. The following provides a summary of the methodology utilized to generate trips for the individual land uses.

- Restaurant – Trips for the restaurant were projected using ITE rates for land use 931, Quality Restaurant for 80 diners. No reductions for synergy between the development's components were applied to the restaurant trips.
- Golf course –Trips for the golf course were projected with the assumption that 43 percent of the golf trips would be comprised of the development's residents (internal trips) and

[1] The current proposal differs slightly from the October 2013 MDP submission which had a slightly larger residential component than the current program described herein (229 units vs. the current program's 224 units).

would not travel on the external roadways. The remainder of the trips would consist of golf course staff and guests coming from outside of the development.

- Residential (single-family, condominiums and hotel) – The 43 percent of trips made internally to or from the golf course constitute between 9 and 12 percent of the trips generated by the residential component of the development, depending on the time of day. These trips were not added to the surrounding roadways.

Peak-hour trip generation for the currently proposed project is shown in Table 1.

Table 1 – Trip Generation

Development	Size	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		Total Trips	Internal Trips	New Trips	Total Trips	Internal Trips	New Trips	Total Trips	Internal Trips	New Trips
Full Build-out										
Single Family	159 du	121	-8	**113**	159	-13	**146**	150	-16	**134**
Condo/Townhouses	65 du	37	-5	**32**	42	-7	**35**	61	-8	**53**
Hotel	21 units	11	-3	**8**	13	-3	**10**	15	-3	**12**
Golf Course & Clubhouse	18 holes	37	-16	**21**	53	-23	**30**	62	-27	**35**
Winery Restaurant [(1)]	80 seats	2	0	**2**	21	0	**21**	14	0	**14**
Total Full Build-out		***208***	***-32***	***176***	***288***	***-46***	***242***	***302***	***-54***	***248***

Notes: (1) Midday Saturday Winery restaurant trips are 75% of Saturday Peak generator hour (evening) trips.

As indicated in Table 1, at full build-out, the currently proposed project will generate 176 new trips during the AM peak hour, 242 new trips in the PM peak hour and 248 new trips during the Saturday midday peak hour. These trips were compared to those of the approved project as indicated in Table 2.

Table 2 – Trip Generation Comparison – Full Build-out

Development	AM Peak Hour New Trips	PM Peak Hour New Trips	Saturday Peak Hour New Trips
Approved Project [(1)]	404	582	615
Currently Proposed Project	176	242	248
Reduction in Trips (% reduction)	***-228 (-56%)***	***-340 (-58%)***	***-367 (-60%)***

Notes: Trips represent full build-out of the project.

(1) Approved project trip generations are from Table 3.7-2 of the *Final Environmental Impact Statement* (dated September 16, 2008) prepared by The Chazen Companies.

As shown in Table 2, the currently proposed development will result in significantly fewer trips than the approved development. The number of trips generated will be 56 percent to 60 percent lower than the approved project.

Impact Analysis

An impact analysis[2] was performed for the currently proposed development to identify whether the reduction in development trips would require the same level of mitigation that was identified for the approved project. The impact analysis was conducted to identify mitigation required for full Build-out of the project. The following provides an impact evaluation of each study location and recommendations for mitigation.

Route 22 at Main Site Access

At the Main Site driveway on Route 22, the mitigation previously proposed included signalization of the intersection and construction of a northbound left turn lane and a southbound right turn lane on Route 22 to facilitate access into the site. Since traffic counts conducted in June of 2013 revealed that peak-hour traffic on Route 22 have increased by an average of 3 % since May 2007, to determine if these improvements would be required for full build-out, new traffic volume projections were prepared and analyses performed for the PM peak hour, which was the critical time frame. The analyses performed included intersection capacity analysis, traffic signal warrant analysis and turn lane warrant analyses. To develop new traffic volumes, Automatic Traffic Recorder (ATR) counts were conducted on Route 22 adjacent to the driveway for a one-week period from June 15 to June 22, 2013. To account for background growth not related to the project, the counted volumes were increased by a total of 8 percent to signify No-Build volumes for the fully developed site. The full build-out trip generations identified in Table 1 were distributed to the intersection based on the previously approved distribution patterns and added to the No-Build volumes, resulting in the Build volumes for full build-out of the project.

Capacity Analysis

Detailed unsignalized intersection capacity analyses of the Build condition for the full build-out of the project were prepared using Synchro software (version 8). The intersection currently consists of one lane in each direction on Route 22 and separate left and right turn lanes exiting the driveway. The analysis was performed assuming the existing geometry and a new northbound left turn lane on Route 22. The results of this analysis indicate that the eastbound left turn exiting the driveway will operate at Level of Service (LOS) F with delays of 156.0 seconds for full build-out conditions. The volume to capacity ratio (v/c) for the left turn movement will be 0.94 at full build-out, indicating that there will be available capacity to handle demand. Compared to the analyses for the approved project, the left turn delays for the currently proposed project are projected to be lower by an order of magnitude. The eastbound right turn and northbound left turn movements will operate at acceptable LOS B or better during the full build-out conditions.

[2] The analyses are based on the development program from the October 2013 MDP submission which had a slightly larger residential component than the current program described herein (229 units vs. the current program's 224 units). The reduction in size is not expected to alter the findings of the analysis.

Traffic Signal Warrant Analysis

A traffic signal warrant analysis[3] was performed at this intersection with the Build volumes for the fully developed site. The traffic volumes were applied to the various warrants contained in the 2009 edition of the *Manual on Uniform Traffic Control Devices* (MUTCD). The MUTCD volumes are the minimum threshold which must be reached before the NYSDOT will consider installing a traffic signal. The analysis indicates that the traffic volumes do not meet the threshold values provided in the MUTCD, therefore, signalization is not projected to be warranted at this location, even under the full build-out condition. However, per the MUTCD, lower threshold values may be used after an adequate trial of other remedial measures. Therefore, it is recommended that this intersection be reevaluated for signalization after each phase of development in consultation with NYSDOT. A summary of the Warrants is provided below.

- Warrant 1 – Eight-Hour Vehicular Volume: Warrant 1 includes Condition A, the Minimum Vehicular Volume and Condition B, the Interruption of Continuous Traffic. The Warrant is met for Condition A or B when, for any 8 hours of an average day, the major street volumes (both approaches) and the minor street exiting volumes meet the volume thresholds provided in Table 4C-1 of the MUTCD. For the Route 22 and Main Site driveway intersection, the 70 percent threshold values from Table 4C-1 were applied as the major street speed exceeds 40 mph. The Build traffic volumes for this intersection for a 24 hour period were developed using the 2013 ATR counts, increased by 8 percent to account for background growth and projecting the site generated volumes to each hour of the day. Table 3 summarizes the results of Warrant 1. The Table indicates that the major street threshold values are met for 15 hours for Condition A and 8 hours in Condition B; however, during those same hours, the minor street volumes do not meet the volume threshold for the required 8 of hours for either condition (0 hours for condition A and 4 hours for Condition B). Therefore, the Warrant is not satisfied.

[3] The analyses are based on the development program from the October 2013 MDP submission which had a slightly larger residential component than the current program described herein (229 units vs. the current program's 224 units). The reduction in size is not expected to alter the findings of the analysis.

Table 3 – Summary of Warrant 1

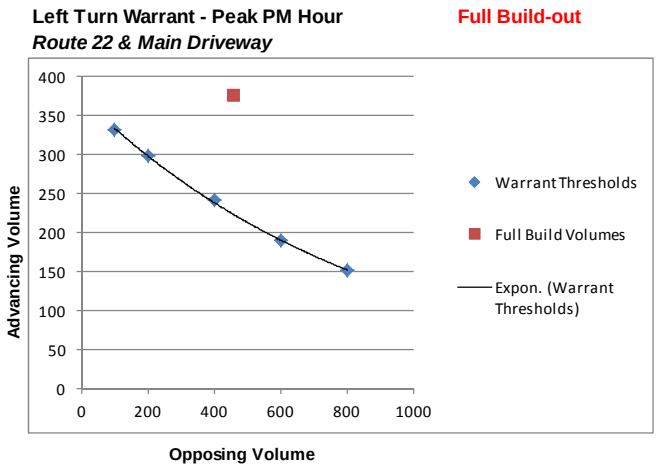
				Warrant 1 - Eight-Hour Vehicular Volume			
				Condition A Minimum Vehicular Warrant		Condition B Interruption of Continuous Traffic	
	Major Street - Rt. 22 Total Both Directions		Minor Street Main Driveway	Major Street Threshold	Minor Street Threshold	Major Street Threshold	Minor Street Threshold
Time of Day	2013 Existing	2017 Build	Exiting Site Traffic (1)	70%	70%	70%	70%
				350	140	525	70
				Meets Threshold Value?		Meets Threshold Value?	
12-1 am	47	61	8	NO	NO	NO	NO
1-2 am	17	22	3	NO	NO	NO	NO
2-3 am	15	19	3	NO	NO	NO	NO
3-4 am	19	25	3	NO	NO	NO	NO
4-5 am	55	71	18	NO	NO	NO	NO
5-6 am	115	148	40	NO	NO	NO	NO
6-7 am	267	344	90	NO	NO	NO	YES
7-8 am	329	424	114	YES	NO	NO	YES
8-9 am	323	417	103	YES	NO	NO	YES
9-10 am	331	427	93	YES	NO	NO	YES
10-11 am	362	467	80	YES	NO	NO	YES
11am-12 pm	405	522	84	YES	NO	NO	YES
12-1 pm	481	620	84	YES	NO	YES	YES
1-2 pm	454	586	79	YES	NO	YES	YES
2-3 pm	517	667	63	YES	NO	YES	NO
3-4 pm	564	728	69	YES	NO	YES	NO
4-5 pm	581	749	71	YES	NO	YES	YES
5-6 pm	642	828	77	YES	NO	YES	YES
6-7 pm	525	677	64	YES	NO	YES	NO
7-8 pm	462	596	56	YES	NO	YES	NO
8-9 pm	360	464	44	YES	NO	NO	NO
9-10 pm	311	401	38	YES	NO	NO	NO
10-11 pm	205	264	25	NO	NO	NO	NO
11pm -12am	126	163	15	NO	NO	NO	NO
Total Hours Met Each Street				***15***	***0***	***8***	***10***
Total Same Hours Met				***0***		***4***	
Meets Warrant?				***NO***		***NO***	

Note: (1) Site traffic based on slightly larger residential program from the October 2013 MDP submission.

- Warrant 2 – Four-Hour Vehicular Volume: The Warrant is met when, for each of any 4 hours of an average day, the plotted points representing the hourly vehicles on the major street (total of both approaches) and the corresponding vehicles exiting the minor street approach all fall above the applicable curve in Figure 4C-1 or Figure 4C-2 (70 percent factor) of the MUTCD. For the Route 22 and Main Site driveway intersection, Figure 4C-2 was used as the major street speed exceeds 40 mph. The minor street threshold volume for Warrant 2 is 80 vehicles per hour (vph). The Build volumes for Route 22 and the Main site driveway shown in Table 2 were applied to Figure 4C-2. The driveway approach exceeds the 80 vph threshold value during seven hours. However, during these same hours, the major street volume falls below the curve; therefore, the criteria are not met for any hour of the day.
- Warrant 3 – Peak-Hour Vehicular Volume: The Warrant is met when, for one hour of an average day, the plotted points representing the hourly vehicles on the major street (total of both approaches) and the corresponding vehicles exiting the minor street approach fall above the applicable curve in Figure 4C-3 or Figure 4C-4 (70 percent factor) of the MUTCD. For the Route 22 and Main Site driveway intersection, Figure 4C-4 was used as the major street speed exceeds 40 mph. The minor street threshold volume for Warrant 3 is 100 vph. The Build volumes for Route 22 and the Main site driveway shown in Table 2 were applied to Figure 4C-4. The driveway approach exceeds the 100 vph threshold value for two hours. However, during these same hours, the major street volume falls below the curve; therefore, the warrant is not met for any hour of the day.
- Warrant 4 – Pedestrian Volume: To satisfy this Warrant, a minimum of 75 pedestrians per hour crossing the intersection for the four-hour pedestrian volume warrant or 93 pedestrians per hour for the pedestrian peak hour warrant is required. As the pedestrian volumes at the subject intersection are negligible, this Warrant is not met.
- Warrant 5 – School Crossing: This Warrant is intended for locations with existing school crossings and requires a minimum of 20 schoolchildren crossing the major street during the same period when the number of adequate gaps in the traffic stream is insufficient. As the subject intersection does not currently have an established school crossing and will not provide one in the future, this Warrant is not met.
- Warrant 6 – Coordinated Signal System: This Warrant is intended to maintain proper platooning of vehicles in a coordinated signal system and may necessitate signalization at an intersection that would not otherwise need signalization. This Warrant is not met at the subject intersection as it does not fall within a coordinated system.
- Warrant 7 – Crash Experience: This Warrant is intended for application at locations where the severity and frequency of crashes would be the principal reasons to install a traffic signal. There are various criteria that need to be met to satisfy the warrant, including a minimum of 5 crashes that would be of the type susceptible to correction by a traffic signal. For the Route 22 and Main Site driveway intersection, accident records for the most recent three-year period were obtained from NYSDOT. These records indicate that only one accident occurred in the vicinity of the subject intersection during the period evaluated. Therefore, the intersection does not meet the minimum criteria for number of accidents.
- Warrant 8 – Roadway Network: This Warrant is intended at the common intersection of two or more major routes that could be considered as part of a roadway network. This warrant is not applicable for the subject intersection as the site driveway is a private road.

- Warrant 9 – Intersection Near a Grade Crossing: This Warrant is for intersections adjacent to at-grade railroad crossings. This Warrant is not applicable for the subject intersection as it is not located near a grade crossing.

Left Turn Warrant Analysis



A left turn warrant analysis was performed for the northbound approach of Route 22 at the Main Site driveway intersection with the 2017 Build volumes for the fully developed site. The analysis was based on Exhibit 9-75 (Guide for Left-Turn Lanes on Two-Lane Highways) from the 2004 edition of *A Policy on Geometric Design of Highways and Streets* published by the American Association of State Highway and Transportation Officials (AASHTO). The AASHTO publication provides values for determining whether a left-turn lane is warranted based on the operating speed, opposing volume, advancing volume and proportion of left turns. The analysis of the northbound left turn movement indicated that a left turn lane would be warranted. Therefore, it is recommended that a 75-foot left turn lane, with appropriate tapers, be constructed at this location in accordance with the requirements of the NYSDOT's highway work permitting process.

Right Turn Lane Warrant Analysis

NYSDOT Highway Design Manual §5.9.8.2 D simply states that "the decision to install exclusive right-turn lanes should be based on a comparison, using capacity analysis, of intersection operations with and without the turn lanes".

At the completion of full build-out, 66 vehicles are projected to make the southbound right-turn movement into the site during the busiest hour of the day, delays on the left-turn exiting movement are projected to be 156 seconds and the volume-to-capacity ratio on this movement is projected to be 0.94. With the addition of a southbound right-turn lane, these values are projected to be reduced by 20 seconds and 0.06, respectively, and which will not result in any changes in Level of Service. Although this analysis indicates that constructing a right-turn lane will not materially change the nature of operating conditions on the left-turn exiting movement, suggesting that a right-turn lane is not warranted for full build-out of the project, it is recommended that the situation be re-evaluated after the completion of Phase 1.

Route 22 at Route 44

At the signalized intersection of Route 22 and Route 44, the mitigation listed in the 2009 Findings Statement for the approved development included monitoring of the intersection with NYSDOT oversight after project completion and, if required, signal timing changes were to be implemented based upon NYSDOT input.

A review of the No Build and Build capacity analyses of this intersection contained in the 2007 DEIS indicate that during the Saturday peak hour, the busiest hour in terms of delay, the intersection operated at acceptable LOS C with a delay of 23.8 seconds for the No Build condition and 32.3 seconds under Build conditions, an increase of 8.5 seconds attributable to the project's traffic. The currently proposed development will generate approximately 60 percent fewer trips through this intersection during the Saturday peak hour than the approved development. With the 60 percent reduction in site traffic it can be expected that the Build delay would be reduced to 27.2 seconds including a 3.4 second increase associated with project traffic. As in the approved Findings Statement, it is recommended that the intersection be monitored by the NYSDOT after project completion and, if required, signal timing changes were to be implemented based upon NYSDOT input.

Route 22 at Lake Amenia Road/Dunn Road

At the unsignalized intersection of Route 22 with Lake Amenia Road/Dunn Road, the mitigation listed in the 2009 Findings Statement for the approved development included a reassessment of the intersection upon project completion, in conjunction with input from NYSDOT.

A review of the No Build and Build capacity analyses of this intersection contained in the 2007 DEIS indicate that during the PM peak hour, the busiest hour in terms of delay, the westbound Dunn Road approach operated at LOS D with a delay of 32.2 seconds for the No Build condition and at LOS E with 38.4 seconds of delay under Build conditions, an increase of 6.2 seconds attributable to the project's traffic. The currently proposed development will generate approximately 57 percent fewer trips through the intersection during the PM peak hour than the approved development. With the 57 percent reduction in site traffic it can be expected that the Build delay would be reduced to 34.9 seconds including a 2.7 second increase associated with project traffic. As in the approved Findings Statement, it is recommended that the intersection be reassessed upon project completion, in conjunction with input from NYSDOT.

Route 22 at Southern Site Driveway

At the unsignalized intersection of Route 22 and the proposed Southern Site Driveway, no mitigation was required at this location in the 2009 Findings Statement for the approved development. This driveway is proposed to be used for emergency access only and, therefore, no improvements are required or proposed as no traffic is being added to the driveway.

Route 44 at Proposed Site Access/Area "L" (Vineyard Cottages)

At the proposed unsignalized intersection of Route 44 and the Site Access, the mitigation listed in the 2009 Findings Statement for the approved development included the construction of an eastbound left turn lane on Route 44 and a requirement that the driveway be situated at a location that would provide the greatest sight lines.

A review of the Build capacity analyses of this intersection contained in the 2007 DEIS indicate that during the PM peak hour, the busiest hour in terms of delay, the southbound driveway approach operated at acceptable LOS B with a delay of 12.4 seconds. The currently proposed development will generate slightly less (a handful of trips fewer) through this intersection during the PM peak hour than the approved development. With this slight reduction in site traffic, it can be expected that the Build delay will remain approximately 12 seconds.

It is recommended that the mitigation identified in the DEIS be applied to the current project.

Route 44 at Proposed Site Access/Area "M" (Winery Restaurant)

At the proposed unsignalized intersection of Route 44 and the Site Access to the Winery Restaurant parcel, no mitigation was required at this location in the 2009 Findings Statement for the approved development.

A review of the Build capacity analyses of this intersection contained in the 2007 DEIS indicate that during the PM peak hour, the busiest hour in terms of delay, the westbound driveway approach operated at acceptable LOS C with a delay of 16.0 seconds. The currently proposed development will generate slightly less (a handful of trips fewer) through this intersection during the PM peak hour than the approved development. With this slight reduction in site traffic, it can be expected that the Build delay will remain approximately 15 seconds.

Route 44 at Proposed Site Access to Wastewater Treatment Plant

At the proposed unsignalized intersection of Route 44 and the Site Access to the proposed wastewater treatment plant, no mitigation was required at this location in the 2009 Findings Statement for the approved development.

The currently proposed development will generate a similar number of trips per day to the plant (generally 10 trips or less), therefore, consistent with the 2009 Findings Statement, no improvements are required on NYS Route 44 associated with the construction of this driveway.

Trip Generation Information
Silo Ridge Development

					Rate/Equation Used in Calculation			Actual/Equivalent Rate Used			
Land Use	**Size**	**ITE Code**	**ITE Description**	**Variable**	**AM Peak Hour**	**PM Peak Hour**	**Saturday Peak Hour**	**Variable**	**AM Peak Hour**	**PM Peak Hour**	**Saturday Peak Hour**
Single-Family Residential	159 d.u.	210	Single-Family Detached Housing	per d.u	Fitted Curve Equation	Fitted Curve Equation	Fitted Curve Equation	per d.u	0.76	1.00	0.95
				Enter/Exit %	*25/75*	*63/37*	*54/46*	*Ave/Max/Min*	*0.75/0.33/2.27*	*1.00/0.42/2.98*	*0.93/0.50/1.75*
Condo/Townhouse	65 d.u.	230	Residential Condominium/ Townhouse	per d.u	Fitted Curve Equation	Fitted Curve Equation	Fitted Curve Equation	per d.u	0.56	0.65	0.95
				Enter/Exit %	*17/83*	*67/33*	*54/46*	*Ave/Max/Min*	*0.44/0.15/1.61*	*0.52/0.18/1.24*	*0.47/0.14/0.93*
Hotel	21 units	310	Hotel	per room	Average Rate	Average Rate	Average Rate	per d.u	0.53	0.60	0.72
				Enter/Exit %	*59/41*	*51/49*	*56/44*	*Ave/Max/Min*	*0.53/0.20/1.03*	*0.60/0.21/1.06*	*0.72/0.49/1.23*
Golf Course & Clubhouse	18 holes	430	Golf Course	per 18 holes	Average Rate	Average Rate	Average Rate	per d.u	2.06	2.92	3.44*
				Enter/Exit %	*79/21*	*51/49*	*49/51*	*Ave/Max/Min*	*2.06/0.61/4.52*	*2.92/1.67/4.56*	*3.44/1.21/5.38*
Winery Restaurant	80 seats	931	Quality Restaurant	per seats	Average Rate	Average Rate	Fitted Curve Equation	per d.u	0.03	0.26	0.17*
				Enter/Exit %	*N/A*	*67/33*	*59/41*	*Ave/Max/Min*	*0.03/0.01/0.04*	*0.26/0.07/0.50*	*0.25/0.12/0.38*

Note: AM & PM rates are based on peak hour of adjacent street traffic; Saturday rates based on peak hour of generator, adjusted to reflect midday as appropriate.

* Per page 780 of ITE Trip Generation Manual, Saturday golf course traffic peaks from 5-6 pm. Traffic 25 percent lower at midday.

* Per data on page 307 of the ITE Parking Generation Manual, Saturday Quality Restaurant traffic peaks from 8:00 to 9:00 pm. Traffic 25 percent lower at midday.