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January 28, 2022

GGG Project # 1927682
PEC File # OPA1-2019; Z59-19

Brad Smith
President
Redtail Vineyards
422 Partridge Hollow Road
Consecon, Ontario
K0K 1T0

Redtail East Site Servicing Report

We hereby submit our report on water and wastewater servicing for the proposed Redtail East site zoning application.

Water Supply

The following is a summary of the drilling and testing programs that the Greer Galloway Group have helped carried out at your Redtail East project located at 19574 Loyalist Parkway near Consecon, Ontario. The purpose of the work was to demonstrate the availability of groundwater supply to service the proposed resort and winery. The testing undertaken is part of a servicing assessment, intended to support the initial planning approvals for the project.

2019 Well Drilling and Testing Program

A total of 5 drilled wells were constructed on the subject property by MPI Drilling between April 4th and April 24th, 2019. Well 1 (A260532), Well 3 (Abandoned), Well 4 (A260517) and Well 5 (A260516) were drilled to end depth of 25 metres and Well 2 (A260534) to an end depth of 30 m. The previously existing well on the property (A186163) was deepened during this campaign from 16 m to 30 m of depth. Following drilling, Well 1, Well 2, Well 5 and A186183 were hydro-fractured by Holmes Hydrofracturing in an attempt to increase well yield. Well 3 and Well 4 (A260517) were determined to be dry and have no effective well yield, Well 3 was immediately abandoned and Well 4 was retained as a monitoring well.

After hydro-fracking Well 2, Well 5 and A186163 were subjected to 6-hour pumping tests carried out simultaneously on all three wells on May 9, 2019. During the 6-hour pumping tests neighbouring wells were monitored at 19624 Loyalist Parkway and 27 Partridge Hollow Road. No interference was observed in either of the neighbours wells during the 6 hour pumping test. The three wells were pumped at a collective 30 L/min including Well 2 (16 L/min) and 7 L/min for both Well 5 and A186163. An estimated 24-hr yield was reported for each well in the following table.

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Consulting Engineers of Ontario
Professional Engineers Ontario

Table 1: Summary of 2019 Test Wells

Well No.	Location on property	Depth (m)	Post-frac yield estimate (L/min)	Status
1 (A260532)	NE corner on intersecting fractures	25	Approx. 8 Note 1	Potential production or monitoring well
2 (A260534)	NE corner on intersecting fractures	30	16 Note 1	Potential production well
3	N-central	25	N/A	Abandoned in accordance with O.Reg. 903
4 (A260517)	N-central	25	N/A	Retained for monitoring purposes
5 (A260516)	S of proposed winery on intersecting fractures	25	5.0 Note 2	Potential production well
Existing well (A186163)	Proposed winery	16 as drilled Deepened to 30 m in April 2019	4.5 Note 3	Potential production well

Note 1: The yields from these wells are non-additive due to proximity to one another
Note 2: A septic system for the bunk house was later located in this area. This well is to be decommissioned.
Note 3: This well is located within the proposed main septic bed for this aera and is to be decommissioned.

2021 Test Well Drilling and Testing Program

Eight test wells were drilled between August 4-19th, 2021 in order to identify additional groundwater supplies. The test wells were 127 mm in diameter and extended to depths of between 8.2 and 22.9 m using a DTH air hammer. Plastic casing was installed between the surface and the bedrock to prevent caving of overburden and bedrock fragments into the test well. During drilling TH-01 and TH-02 were determined to have no appreciable yield, while TH-04 and TH-05 intersected a shallow aquifer with minor yield. TH-03 found water at both shallow (circa 6 m) and deeper levels within the test well. Test wells TH-06, TH-07 and TH-08 found significant water within a shallow aquifer at approximately 4 and 6 metres of depth. An aerial photograph of the site showing the well locations is attached.

Following drilling, four 1-hour pumping test were completed on each of the higher yielding wells TH-03, TH-06, TH-07 and TH-08, in order to understand well yields and to identify which wells were candidates for longer

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duration testing. TH-01, TH-02, TH-04 and TH-05 were tested with brief pumping to confirm if they were suitable for use as monitoring wells. TH-03 was pumped at a rate 64 L per minute which was found to be unsustainable. The well was allowed to recover, and pumping was re-commenced at 18 L per minute and then increased to 36 L per minute after 7 minutes which was also found to be unsustainable. TH-03 was estimated to have a short-term yield of about 19 L per minute based on analysis of the recovery curve.

Pumping of test well TH-07 commenced at 37 L per minute and then increased to 52 L per minute 14 minutes into the pumping test. The pumping rate was increased for a second time to 55 L per minute 30 minutes into the test. Following the increase to 55 L per minute the static water level remained stable for the duration of the test.

Pumping on TH-08 commenced for the first half hour at a rate of 37.5 L per minute and was increased to 70 L per minute for the last half an hour as pumping had stabilized at the lower pumping rate. Communication between wells TH-06, TH-07 and TH-07 was observed in the hydrographs during the 1-hour pumping test indicating that the aquifer in all three test well was interconnected.

Longer term Pumping test TH-08 and TH-03

The 1 hour pumping testing indicated that TH-06, TH-07 and TH-08 were connected through a shallow bedrock aquifer. Subjecting one of these three wells to a period of extended pumping would provide information on the well yield and sustainability of all three wells. TH-08 was selected as the test well as it had performed well during the 1 hour pumping at a rate of 70 L per minute. Pumping was commenced at 45.4 L per minute on September 20th, 2021 which was sustainable for a period of approximately 12 hours before the water level began to decline. The well was allowed to recover and the pumping test was recommenced at a rate of 34 L per minute. The rate of 34 L per minute was only sustainable for two hours and the test was restarted at 26.5 L per minute. The well could not sustain the rate of 26.5 L for more than 5 hours. This process was repeated at 18.9 L per minute and then 15.1 L per minute for a little less than 4 hours before the yield declined further. The well was then pumped at level of the pump intake for approximately 10.5 hours, water was discharge at approximately 9 L per minute during this period. The pumping test was ended at 11:00 am on September 22nd, 2021.

A six-hour pumping test was completed on September 22nd, 2021 on well TH-03. Pumping commenced at a rate of about 18 L per minute which was deemed unsustainable after 1 hour and 17 minutes, at which point the pumping rate was lowered to 12 L per minute and the static water level remained consistent for the duration of the pumping. A water quality sample was collected in the last hour of the test and 95 percent recovery occurred within 4 minutes of the cessation of pumping. The recovery was estimated at 15 L per minute.

A summary of the 2021 exploratory well testing is provided in the following table:

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Table 2: Summary of 2021 Test Wells with Potential Yields

Well No.	Location on property	Depth (m)	Initial yield estimate (L/min)	Status
TH-01	NE Field	18.2	Dry	To be decommissioned
TH-02	NE Field	18.2	Dry	To be decommissioned
TH-03	NE Field	22.9	15	Potential production well
TH-04	NE Field	18.2	1	Retained for monitoring purposes
TH-05	NE Field	18.2	2	Retained for monitoring purposes
TH-06	Field Near Proposed winery	18.2	*	Retained for potential monitoring well
TH-07	Field Near Proposed winery	18.2	*	Retained for monitoring well
TH-08	Proposed winery	8.2	7.5?	To be decommissioned

Note: The approximate yield in TH-08 would also apply to TH-06 and TH-07. However, the wells are interconnected, and the yields are not additive.

Based on the results of the 2019 and 2021 testing it appears that there is roughly 38 L per minute of yield (roughly 55,000 L/day) sustainable over a period of at least 24-hours between Wells 1 & 2, TH-03, and Wells TH-06, TH-07, and TH-08 in combination. However, due to recent modifications to the overall site plan, Wells TH-6, TH-07, and TH-08 are close to the proposed septic system and are to be decommissioned or potentially retained (perhaps one of them) for a monitoring well for the septic system. Therefore, the total potential 24-hour yield for the remaining wells is approximately 31 L per minute (i.e., about 44,000 L per day).

The supply requirements of the proposed development are forecasted at 44,000 Litres per day (LPD) for Phase 1, and 64,000 LPD for Phase 2. This forecast is detailed in an attachment to this letter. It should be noted that water taking in excess of 50,000 L per day requires a Permit to Take Water (PTTW) from the Ministry of Environment, Conservation, and Parks. This application process will require extensive yield testing and interference monitoring. We recommend simultaneous pumping of all production wells for a duration of 72 hours in support of the PTTW application.

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Table 3: Summary of Test Wells with Potential Yields

Well No.	Location on property	Depth (m)	Yield estimate (L/min)	Status
1 (A260532)	NE corner on intersecting fractures	25	16	Potential production or monitoring well
2 (A260534)	NE corner on intersecting fractures	30		Potential production well
TH-03	NE Field	22.9	15	Potential production well

Hydrofracturing of TH-03 may further increase yields and should be carried when the well is converted to water supply configuration. We note that yields sustainable over 24 hours will usually experience decline in yields under continuous pumping for longer periods and that additional groundwater supplies should be developed as the project moves forward.

Based on these results, it appears that there is a useful amount of groundwater supply available on the property, although additional supplies will be needed – perhaps in the area south of the EP zone. This area was not initially targeted in order to reduce the distance from the production wells to the treatment and distribution system for the site, in attempt to reduce future construction costs. To this date, less than half of the total site area has been targeted with test wells. Significant area remains, and it seems reasonable that additional groundwater supply could be identified with further exploration.

Once final well assessment including laboratory analysis of each raw water source has been completed, a full water treatment system will be designed. The system should be based on the requirements of Regulation 170/03 and the Procedure for Disinfection of Drinking Water in Ontario, although this is not a legislated requirement. Water will be pumped from each well to a central treatment building. Treatment equipment redundancy should be provided. Conditioning such as a softener or iron removal may be required. Filtration consisting of direct filtration and cartridge filtration will be required. Ultraviolet Irradiation is likely to be selected for primary disinfection, followed by chlorination and storage in a reservoir. Treated water will be pumped from the reservoir into the underground distribution system for the site.

The reservoir and distribution pumps should be sized to be able to handle the peak demands of the facility. The reservoir should also be sized to allow for receipt of transported hauled water, as an operational contingency for mechanical issues as well as a buffer against potential drought conditions. This aligns with Quinte Conservation's 2021 Drought Mitigation Plan.

Well drilling and testing to date shows that there is a viable groundwater

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supply at this site. It is reasonable to assume that further well drilling and development on other areas of the site is likely to provide an adequate water supply for the proposed use, without negatively affecting surrounding users. Further drilling and development should take place later this year, for long-term yield testing. This should be completed by the proponent and submitted for reviewed by the County as part of the Site Plan Approval stage.

Onsite Sewage Treatment and Disposal

Environmental impacts to groundwater from private sewage works permittable under the Ontario Building Code are typically assessed under the MECP's Guideline entitled "Technical Guideline for Individual On-site Sewage Systems: Water Quality Impact Risk Assessment", dated August 1996 (Guideline D-5-4). In the case of nitrate[1], the Ontario Drinking Water Standard of 10 mg/L of nitrate-nitrogen is used as an indicator of groundwater impact potential. Phosphorous is a component of domestic sewage but is largely immobile in the subsurface.

The capacity of the portion of the property accepting sewage waste to provide sufficient attenuation of the sewage derived nitrate, can be calculated by estimating the amount of dilution which will occur between the tile bed and the property boundary. The total nitrate loading to groundwater resulting from sewage disposal may be estimated by dividing the total nitrate input from sewage systems by the volume of groundwater recharge over the property, and the volume of sewage effluent. The volume of sewage effluent is calculated as 64,000 L/day (peak occupancy, both phases) x 0.75 (equivalent to 100% occupancy for six months of the year and 50% occupancy for the balance of the year) = 48,000 L/day.

Sewage effluent nitrate of 40 mg/L is assumed yielding a total nitrate (as N) load of 1,920 g/day of nitrate from sewage effluent. Total dilution is equal to the sum of the 48,000 L/day (average) generated by sewage flows and the total groundwater recharge over the 56-ha property (total 431,562 L/day). These quantities yield a nitrate concentration of 4.4 mg/L in groundwater leaving the property. This calculation is conservative as the time of peak occupancy is during the relatively warm and dry summer months when biological denitrification is substantial.

Approval of septic systems under Section 8 of the Building Code is limited to domestic-type sewage flows of less than 10,000 L/day. The development of the project will cause flows to exceed this level and will require an Environmental Compliance Approval (ECA) from the Ontario Ministry of Environment Conservation and Parks (MECP). This sometimes necessitates tertiary treatment if the MECP applies Policy B-7 (which uses

1 Nitrate is the principal contaminant of concern for "domestic" type sewage since other chemical constituents of sewage degrade quickly and are relatively immobile in the subsurface. Nitrate is formed by oxidation of the ammonia contained in human wastes and is the stable form of nitrogen in an oxidizing environment.

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25% of the difference between background concentrations and the Ontario Drinking Water Standard for a given parameter instead of the Ontario Drinking Water Standard). However, the modelled nitrate concentration in groundwater leaving the property is sufficiently low that meeting Guideline B-7 requirements should not be difficult with the provision of tertiary treatment.

Figure 2, attached, shows a preliminary location reference for the system.

Yours very truly,

THE GREER GALLOWAY GROUP INC.

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Senior Engineering Geologist

LICENSED PROFESSIONAL ENGINEER
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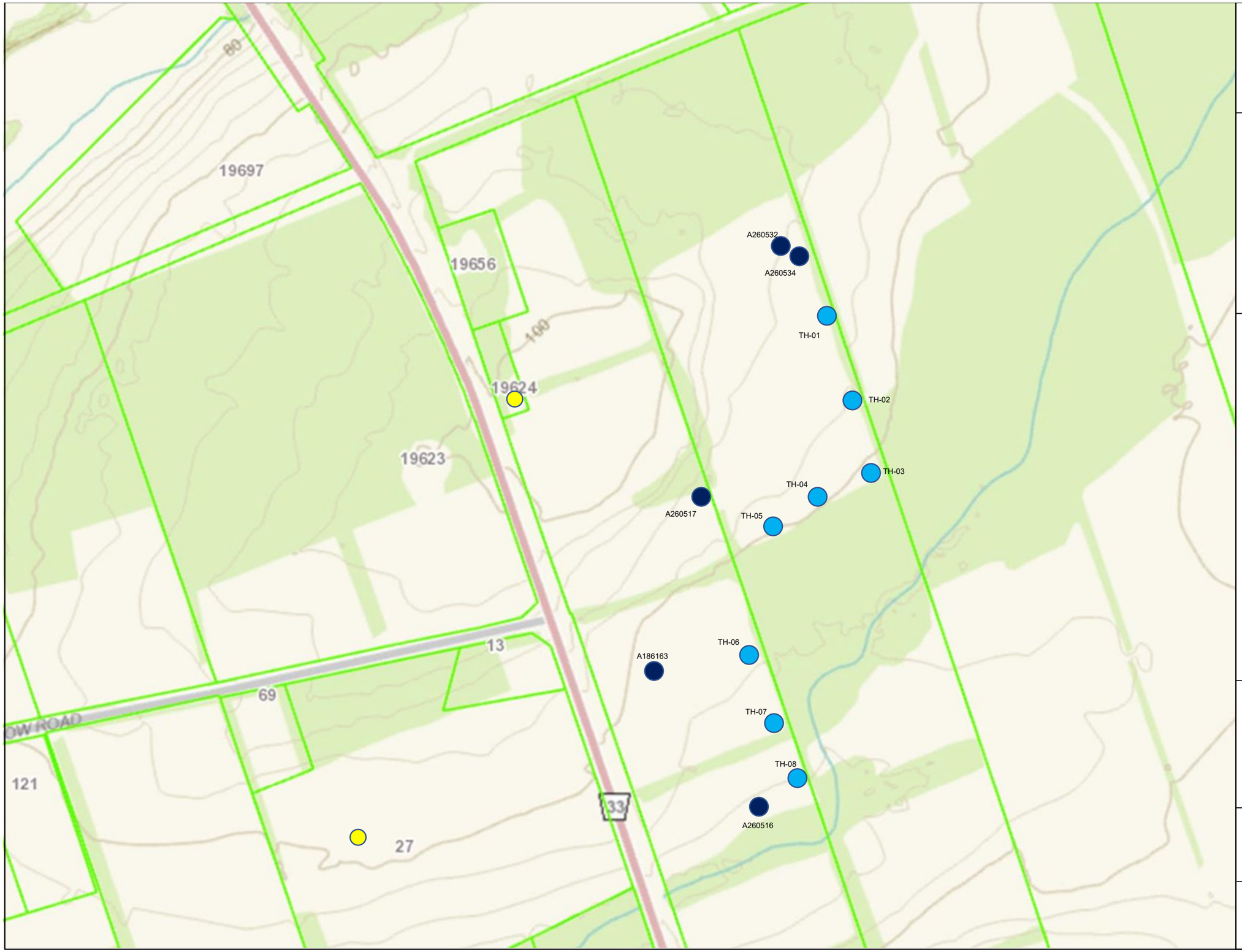

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NOTES:

1) Base drawing and information: obtained from the Ontario Ministry of Natural Resources and Forestry (MNRF); "Make a Map" Natural Heritage Areas; https://www.gisapplication.lrc.gov.on.ca/, accessed January 2021

2) Limits of the proposed severance are approximate

LEGEND:

- Neighbours Wells
- Test Well 2021
- Drilled Well

PROJECT 1937682:

REDTAIL EAST WELL TESTING 2021

FIGURE 1:

SITE PLAN SHOWING TESTING & MONITORING WELLS

Client's Anticipated Water Use Residential Occupancies		L/day/unit	Estimate	Subtotal (L/day)
2	Assembly Hall – per seat			
	a) No food service, or	8	…	…
	b) Food service provided	36	150	3,900
12	Hotels and Motels (excluding bars and restaurants)		…	…
	a) Regular, per room	250	60 60	15,000 (phase 1) 15,000 (phase 2)
	b) Resort hotel, cottage, per person	500	10 10	5000 (phase 1) 5000 (phase 2)
	c) Self service laundry, add per machine	2500	…	…

Client's Anticipated Water Use Other Occupancies		L/day/unit	Estimate	Subtotal (L/day)
12	Food service Operations		…	…
	a) Restaurant (not 24 hour), per seat	125	60	7,500
	b) Restaurant (24 hour), per seat	200	…	…
	c) Restaurant on controlled-access highway, per seat	400	…	…
	d) Paper service restaurant, per seat	60	150	9,000
	e) Donut shop, per seat	400	…	…
	f) Bar and cocktail lounge, per seat	125	…	…
	g) Drive-in restaurant per parking space	60	…	…
	h) Take-out restaurant (no seating area)		…	…
	i) per 9.25 m^2 of floor area, and	190	…	…
	ii) per employee per 8-hour shift	75	…	…
	i) Cafeteria - per meal	12	…	…
	j) Food outlet		…	…
	i) excluding delicatessen, bakery and meat department, per 9.25 m^2 of floorspace,	40	…	…
	ii) per 9.25 m^2 of delicatessen floor space,	190	…	…
	iii) per 9.25 m^2 of bakery floor space,	190	…	…
	iv) per 9.25 m^2 of meat department floor space, and	380	…	…
	v) per water closet	950	…	…
22	Stores(3)		…	…
	a) Per 1.0 m^2 of floor area, or	5	400	2000
	b) Per water closet	1230	…	…
23	Swimming and Bathing Facilities (Public) - per person	40	40	1600

Client's Anticipated Water Use Residential Occupancies	L/day/unit	Estimate	Subtotal (L/day)
		Total not including Filling of Pool (L/day)	64,000
		Total for First Phase (L/day)	44,000

EX. DRILLED WELL A260532
EX. DRILLED WELL A260534
EX. TEST WELL TH-01
EX. TEST WELL TH-02
EX. TEST WELL TH-03
EX. TEST WELL TH-04
EX. TEST WELL TH-05
EX. TEST WELL TH-06
EX. TEST WELL TH-07
EX. TEST WELL TH-08
EX. DRILLED WELL A260517
EX. DRILLED WELL A186163
EX. DRILLED WELL A260516
EX. NEIGHBOURS WELL

PROPOSED DRY SWALE
480m L x 6m W x 0.5m D
PROPOSED DRY SWALE
39m L x 6m W x 0.5m D
PROPOSED DRY SWALE
170m L x 6m W x 0.5m D
PROPOSED 15m, 600mm
Ø CSP CULVERT @ 0.5%
PROPOSED POND INLET
15m, 600mm Ø
CSP CULVERT @ 0.7%
PROPOSED STORM WATER
MANAGEMENT DRY POND
BOTTOM OF POND = 85.20m
TOP OF POND = 86.50m
TOTAL POND VOLUME = - m^3
MAX PONDING AREA = 2891m^2
POND OUTLET
INV. = 85.20m
18.5m, 525mm Ø
CSP CULVERT @ 1.1%

HOTEL ROOMS
+ VILLAS
HOTEL ROOMS
+ VILLAS
GUEST
LAUNDRY
DAY
GUEST
PARKING
OVERNIGHT
GUEST
PARKING
WALKING
TRAILS
RECREATION
AREA
FIRE
PIT
POOL
TENNIS COURTS
EXISTING
VINEYARD
WINERY +
HOTEL
LOBBY
FLOWER FIELD
3 - ACRE
SEPTICFIELD
PRODUCTION +
BACK OF HOUSE
BOARDWALK
BOARDWALK
SPA BUILDINGS
WETLAND
BUFFER
15m WATERCOURSE
BUFFER
ENVIRONMENTAL
PROTECTION 10m
SETBACK
ENVIRONMENTAL
PROTECTION
WALKING /
BIKE TRAIL
VEGETATED
FILTER STRIP
PARTRIDGE HOLLOW RD

1.0%
5.7%
3.0%
2.0%
1.3%

SCALE 1:1000 -25m 0 25m 50m

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NOTES:
1. ALL WORK SHALL BE IN ACCORDANCE WITH RELEVANT CODES AND GUIDELINES.
2. ALL DRAWINGS AND ADDENDA ARE TO BE READ AS, AND IN CONJUNCTION WITH THE SPECIFICATIONS.
3. ALL EQUIPMENT SHALL BE INSTALLED AS SPECIFIED OR APPROVED EQUIVALENT.
4. CONTRACTOR MUST CHECK AND VERIFY ALL DIMENSIONS BEFORE PROCEEDING WITH WORK AND BE RESPONSIBLE FOR SAME.
5. CONTRACTOR MUST REPORT ANY DISCREPANCIES TO ENGINEER FOR RESOLUTION BEFORE COMMENCING THE WORK.
6. ANY CHANGES MUST BE APPROVED BY THE ENGINEER.

A/B A DETAIL NO. B DRAWING NO. – WHERE DETAILED

EXISTING	LEGEND	PROPOSED
	ASPHALT	
	CONVEYANCE SWALE	
	DRY SWALE FOR QUALITY TREATMENT	
	GRAVEL	
	BUILDINGS	
	VEGETATED FILTER STRIP	
	WOODLAND 10m BUFFER	
	EP ZONE	
	WETLAND 15m BUFFER	
	WATERCOURSE 15m BUFFER	
	WATERCOURSE	
	CULVERT	
W	MONITORING WELLS	
W	POTENTIAL WATER SUPPLY WELLS	
XXXXX	ELEVATION	XXXXX

REVISION	DESCRIPTION	DATE
01	FOR REVIEW	21/10/08

NORTH

STAMP

PROJECT
REDTAIL HOTEL & WINERY SERVICING STUDY

PRINCE EDWARD COUNTY, ON

DRAWING TITLE
PROPOSED DEVELOPMENT SITE PLAN

DESIGNED BY K. HALEY
DRAWN BY E. LEBLANC
REVIEWED BY S. AMENT
APPROVED BY K. HALEY
PROJECT DATE 2021/09/27 (YYYY/MM/DD)
PROJECT # 19-3-7682

DRAWING # FIGURE 2
DRAWING SCALE (ISO A1) HOR: 1 : 1000 VER: X : XXX

(METRIC SCALE – ALL DIMS IN METERS U.N.O.)