Soil Engineers Ltd.
CONSULTING ENGINEERS
GEOTECHNICAL • ENVIRONMENTAL • HYDROGEOLOGICAL • BUILDING SCIENCE
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January 24, 2024 Reference No. 2206-W054 (Rev. 1)

Beachcroft Investments Inc.
20 Cachet Woods Court, Suite 6
Markham, Ontario
L6C 3G1

Attention: Ms. Uzo Rossouw

Re: Pre- and Post-Development Water Balance Assessment and Mitigation Plan
Proposed Residential Development
63 and 63A Trafalgar Road
Town of Erin

Dear Madam:

Soil Engineers Ltd (SEL) has previously completed a pre- and post-development water balance assessment for a proposed residential development, at the captioned site in the Town of Erin (the Subject Site), with the finding presented in a letter report, dated March 2, 2023. The current report is a revised copy of the previously issued report to include associated mitigation plan.

- **Introduction**

The Subject Site is located at 63 and 63A Trafalgar Road in the Town of Erin. **Drawing No. 1**, enclosed, shows the location of the Subject Site for which this water balance applies. Based on a review if Functional Servicing plans (drawing nos. FS-01 and FS-02) and Functional Erosion & Sediment Control plans (drawing nos. FSC-01 and FSC-02), prepared by Urbanworks Engineering Corporation, dated Dec. 19, 2023 it is understood that the proposed development at the Subject Site includes construction of residential houses, 3-storey senior apartment and associated at grade parking lot, low rise senior houses, 2 stormwater management ponds, underground services and roads. The proposed development footprint encompasses an area of approximately 523,350 m^2.

- **Background**

SEL previously completed a preliminary geotechnical soil assessment, for the Subject Site, dated February 3, 2023 (SEL Reference No. 2206-S054). The study revealed that beneath a veneer of topsoil and ploughed soil, the Subject Site is underlain by strata of sand and gravelly sand deposits. Sandy silt till and silt deposits were generally contacted within the lower stratigraphy in some boreholes.

SEL also completed a hydrogeological assessment for the Subject Site in February 2023 (SEL Reference No. 2206-W054), and revised hydrogeological assessment in January 2024. Findings of the studies reveal that the highest measured groundwater level elevation across the Subject Site ranges from

441.98 to <421.51 metres above sea level (masl) over a one year groundwater monitoring program between December 1, 2022 and November 28, 2023.

The results of the completed hydrogeological assessment, indicates that the estimated permeability for the gravelly sand is 5.2 x 10^{-7}, the K estimate for the sandy gravel is 5.7 x 10^{-7} m/sec, the K estimate for the silt and sand till is 3.6 x 10^{-6} m/sec. This confirms the presence of moderate permeability for the shallow native subsoil that would be considered for the proposed infiltration infrastructure to redirect the precipitation and runoff to the subsurface.

A review of the local topography and the ground surface elevations at the borehole and monitoring wells shows that the Subject Site descends towards the southeast to Trafalgar Road.

Runoff from the Subject Site is expected to drain in southerly and easterly directions. Based on review of the topographic map for the area, and from review of the ground surface elevations at the borehole and monitoring well locations, the elevation relief across the Subject Site is about 15.0 m.

- **Water Balance Assessment**

The water balance for this proposed infill development site is based on the following equation:

$$P = ET + R + I + \Delta S$$

Where:

P -- Average Annual Precipitation
ET -- Evapotranspiration
R -- Surface Water Runoff
I -- Infiltration
Δs -- Change in Groundwater Storage, taken as 0

- **Precipitation**

The long-term records (30-year average from 1981 to 2010) for monthly and annual precipitation depths received at the site were adopted from the Environment Canada's Orangeville Station (Climate ID. 6155790), located about 15 km north of the Subject Site. The 30-year, mean annual precipitation record of 901.50 mm/year was adopted from this station. The 30-year records for average annual, and monthly temperatures were also adopted from this station. The water balance calculations for the pre- and post-developed assessments for the Subject Site are summarized in the **Appendix A**.

- **Interception**

Based on the review of the SWM Planning and Design Manual (MOECC, 2003), evapotranspiration includes the evaporation from all sources; including; precipitation, water, snow, vegetation and from water droplets on plant surfaces plus the transpiration from plants, not involving water droplets retained on leaves. As such, interception was not included for the current pre- and post-development water balance assessments as it is included in the estimate for evapotranspiration.

- **Groundwater Storage**

Although groundwater storage experiences gains and losses on a short-term basis, the net change in groundwater storage (□s) over the long-term is generally zero. For this reason, the change in

groundwater storage is shown as zero (0) which has not been included in the water balance calculations.

- **Evapotranspiration**

In general, evapotranspiration (ET) refers to the transfer of water from vegetation and from the soil surface to the atmosphere in the form of water vapour. The term considers evaporation from the soil surface, man-made infrastructure surfaces (asphaltic and concrete roads, and from building roofs), and from the transpiration from plants and trees together because of the difficulties in separating these processes. Potential evapotranspiration (PET) refers to the transfer/loss of water from vegetated surfaces to the atmosphere, under the condition of unlimited water supply.

The actual rate of evapotranspiration (AET) is generally less than PET, under dry conditions (i.e., during the summer season when there is a soil moisture deficit). Variation in water holding capacity, which affects ET, depends on the soil type and rooted vegetation. The gravelly sand, sandy gravel, silt and sand till, and silty sand surface soil at the site, as revealed from the subsurface drilling program, has been assigned a water holding capacity of -150 mm (Soil and Water Conservation Table 18.2 PP 392 G. Schwab et. al.).

Chart 40 from the Climate of the Great Lakes Basin (Environment Canada 1972) suggests that the PET for the Orangeville EC Weather Station should ranges from about 558.8 to 609.6 mm/year (22 to 24 in/year). Simulations using Thornthwaite and Mather model developed by US Geological Survey (USGS) indicates that the amount of ET (PET) for the Subject Site ranges from about 526.60 to 530.20 mm/year, which agrees well with the mapped ET values for the general area; therefore, the average AET value of 528.4 mm/year has been applied to the pre- and post-water balance assessments for the Subject Site.

- **Infiltration and Runoff**

According to the Ministry of the Environment, Conservation and Parks (MECP) Guidance Manual (MECP 1995), a series of infiltration components can be applied to the Subject Site based on its slope, soil and vegetation coverage. The cumulative value of these sub-components is referred to as the infiltration factor, with the values ranging from 0 to 1. The difference between the value 1 and the infiltration factor is referred to as the runoff factor.

Slope has an influence on both infiltration and runoff. The topography for the Subject Site is considered flat to gently rolling land, based on its elevation relief, and from a review of available topographic mapping for the area. The elevation relief across the Subject Site is about 15.0 m.

Surficial soil and vegetation coverage and/or cropping practices also contribute to the infiltration and runoff factors. The Subject Site is primarily farm field, and is partially wooded and the surficial soil consists mainly of gravelly sand, sandy gravel, silt and sand till, and silty sand. The selected, cumulative infiltration and corresponding runoff factors for the Subject Site, based on its topography, predominant surface soil and vegetation coverage are provided in **Table 1**.

The difference between the average annual precipitation and actual evapo-transpiration is termed the water surplus. As mentioned, above, the long-term annual precipitation value of 878.78 mm/year has been adopted for the site. Subtracting the averaged, Thornthwaite and Mather derived AET estimate of 528.4 mm/year from the annual precipitation gives a water surplus estimate of 350.38 mm/year. The

site's average annual infiltration depth estimate was calculated by multiplying the cumulative infiltration factor by the water surplus estimate, and the site's runoff was calculated by applying its difference from 1, or 1 minus the cumulative infiltration factor multiplied by the water surplus estimate. Based on the MECP infiltration factors, a cumulative infiltration factor of 0.70 was considered for the water balance assessment. The average annual depth estimates for infiltration and runoff at the undeveloped site are given in **Table 1**.

Table 1 - Summary of Infiltration and Runoff Depth Estimates

Land Characteristics	MECP Infiltration Factors	Water Surplus Estimate (mm/yr.)	Infiltration Estimate (mm/yr.)	Runoff Estimate (mm/yr.)
Cover: (Grass, pavement)	0.15	**350.38**	I = 0.70×350.38	R = (1-0.70) ×350.38
Slope: (Rolling land)	0.25			
Soil: (gravelly sand, sandy gravel, silt and sand till, and silty sand)	0.3			
Cumulative Infiltration Factor	**0.7**		**245.27**	**105.11**

Runoff from impervious surfaces is calculated differently than for pervious soil/ vegetated covered surfaces. As a general rule, the ET for impervious surfaces on an average annualized basis is calculated by taking 10% of the average annual precipitation, while runoff is calculated by taking 90% of the average annual precipitation. There are existing impervious surfaces on the site, prior to site development, consisting of an existing car dealership and its associated paved, asphalt parking area. Based on this approach, the ET and runoff estimates for the site's impervious surfaces, on an average annualized depth basis are 87.88 mm/year and 790.90 mm/year, respectively.

- **Pre-Development Water Balance**

The pre-development water balance for the site is calculated by multiplying the existing site areas by the various, averaged annualized depth estimates for Precipitation, ET, Infiltration and Runoff. The average volumetric water balance estimates for each water balance component are given in **Table 2**.

Table 2 - Summary of Pre-Development Volumetric Water Balance Components

Pre-Development Site Areas	Approximate Area Coverage (m^2)	Precipitation (m^3/year)	AET (m^3/year)	Infiltration (m^3/year)	Runoff (Pervious) (m^3/year)
Existing Pervious Areas (Grass)	523,240.00	459,812.85	276,480.02	128,332.98	54,999.85
Existing Impervious Areas (Asphalt)	110.00	96.67	9.67	0.00	87.00
Total Area/Volume	**523,350.00**	**459,909.51**	**276.489.68**	**128,332.98**	**55,086.85**

The pre-development water balance for the Subject Site is calculated on an annualized depth basis by dividing the volumetric estimates for each water balance component from above by the total site area.

Furthermore, there are existing impervious areas on site, including a commercial building, an associated parking lot and paved areas. The anticipated AET and runoff for the existing impervious areas were estimated by taking 10% of the average annual precipitation after correction for interception, while runoff is calculated by taking 90% of the average annual precipitation. Based on this approach, the depth-based water balance components for the pre-developed site are presented as follows:

$$P\ (878.78) = ET\ (528.31) + I\ (245.21) + R\ (105.26)$$

- **Post-Development Water Balance**

Based on the data provided by Urbanworks Engineering Corporation indicates that the Subject Site comprised a total area of 523,350 m². of this, the developed impervious areas will include the building footprints and paved areas, covering about 47.49% of the developed site area, or an area of about 248,514 m². Pervious developed areas, including landscaped areas, will comprise the remaining 52.51% of the site, or an area of 274,835 m².

The post-development water balance was calculated using the same water balance depth estimate components that were used for the pre-development water balance calculations, i.e., average annual precipitation and average annual ET. After development, with no infiltration through the impervious areas, the depth estimates for runoff and become 90% and 10% of the corrected average annual precipitation, respectively. The estimated post-development water balance volumes are provided in **Table 3**:

Table 3 - Summary of Post-Development Volumetric Water Balance Components

Post-Development Site Areas	Area Coverage (m^2)	Precipitation (m^3/year)	AET (Pervious) (m^3/year)	AET (Impervious) (m^3/year)	Infiltration (m^3/year)	Runoff (Pervious) (m^3/year)	Runoff (Impervious) (m^3/year)
Pervious Area (505-Mixed Block)	1,705.0	1,498.32	900.92	0.00	418.18	179.22	0.00
Pervious Areas (Front Yard)	31,708.0	27,864.36	16,754.51	0.00	7,776.89	3,332.95	0.00
Pervious Areas (Rear Yards)	95,124.0	83,593.07	50,263.52	0.00	23,330.68	9,998.86	0.00
Pervious Areas (ROW)	24,600.0	21,617.99	12,998.64	0.00	6,033.54	2,585.80	0.00
Pervious Areas (Parks)	121,697.0	106,944.89	64,304.69	0.00	29,848.14	12,792.06	0.00
Impervious Area (Buildings)	110,889.2	97,447.21	0.00	9,744.72	0.00	0.00	87,702.49
Impervious Areas (Patios)	2,543.70	2,235.35	0.00	223.54	0.00	0.00	2,011.82
Impervious Ares (Driveways)	14,025.8	12,325.59	0.00	1,232.56	0.00	0.00	11,093.03
Impervious Areas (BROW Sidewalks)	18,450.0	16,213.49	0.00	1,621.35	0.00	0.00	14,592.14

Post-Development Site Areas	Area Coverage (m^2)	Precipitation (m^3/year)	AET (Pervious) (m^3/year)	AET (Impervious) (m^3/year)	Infiltration (m^3/year)	Runoff (Pervious) (m^3/year)	Runoff (Impervious) (m^3/year)
Impervious Areas (Roads)	79,950.0	70,258.46	0.00	7,025.85	0.00	0.00	63,232.61
Impervious Area (Block 505-Mixed)	22,657.3	19,910.78	0.00	1,991.08	0.00	0.00	17,919.70
Total Area/Volume	**523,350.0**	**459,909.51**	**145,222.29**	**21,839.09**	**67,407.44**	**28,888.90**	**196,551.80**

Based on the volumetric water balance estimates shown in **Table 3**, the depth-based post-development water balance estimates are presented as follows:

$$P\ (878.78) = ET\ (319.22) + I\ (128.80) + R\ (430.76)$$

The volumetric comparisons for evapotranspiration, infiltration and runoff between the pre-developed and post-developed site are summarized in **Table 4**. A review of the findings indicates a decrease of 209.09 mm/year, or 39.58 %, in annual evapo-transpiration, a decrease of 116.41 mm/year, or 47.47 %, in annual infiltration, and a gain in runoff of 325.51 mm/year or 309.24 %.

Table 4 - Comparison Summary of Pre- and Post-Development Water Balance/ Budget Volumetric Components

	Precipitation (m^3/year)	ET (m^3/year)	Infiltration (m^3/year)	Runoff (m^3/year)
Pre-Development	459,909.51	276,489.68	128,332.98	55,086.85
Post- Development	459,909.51	167,061.37	67,407.44	225,440.70
Volumetric Change in Pre- and Post-Development Water Balance Parameters	0.0	-109,428.31	-60,925.54	+ 170,353.85

Notes: ***-- loss*** ***+ gain***

The volumetric comparisons in evapotranspiration, infiltration and runoff between the pre-developed and post-developed site are summarized in Table 4. A review of the findings indicates that decreases of 109,428.31 m^3/year and 60,925.54 m^3/year are anticipated for ET and infiltration, respectively. An increase of 170,353.85 m^3/year is expected for runoff at the post-developed site compared with the pre-developed site.

- **Water Balance Mitigation Plan**

The difference between the pre- and post- development water balances can be attributed to establishment of impervious surfaces, such as; building rooftops, driveways, roads/walkways. Proposed LID measures to maintain the pre-development water balance should consider the moderate permeability for the underlying subsoil, comprised, mainly of silty clay till and silty sand till, with some clay which will promote moderate amounts of infiltration and groundwater recharge to the subsurface.

The proposed development will consist of the construction of residential houses, 3-storey senior apartment and associated at grade parking lot, low rise senior houses, 2 stormwater management ponds, underground services and roads. An area of 110,889.20 m^2 has been considered as rooftop/building area, and an area of 112,425.80 m^2 has been considered as driveways sidewalks and roads respectively, following construction. The anticipated runoff, derived from the rooftop and paved areas (i.e. 90% of

annual precipitation), is provided in **Table 5**.

Table 5 – Anticipated Volumetric Runoff from Proposed Rooftop and Paved Areas

Proposed Building Rooftop/Paved Areas	Approximate Area Coverage(m^2)	Runoff Rate (mm/year)	Runoff (m^3/year)
Proposed Building Rooftop	97,447.21	790.9	87,702.49
Proposed Paved Areas	98,797.54	790.9	88,917.79
Total	**196,244.75**	**790.9**	**176,620.28**

Given that about 196,244.75 m^2 of the Subject Site will be developed as building, roads, sidewalks and driveways area, the estimated runoff could reach to maximum of 87,702.49 m^3/year, and 88,917.79 m^3/year, for each proposed buildings and remaining paved areas, respectively.

A proposed mitigation plan to maintain the site's water balance following site development includes infiltration trenches, as well as bioretention facilities that are proposed in the downstream of the proposed Stormwater Management (SWM) Ponds' outlets, acting as an infiltration basin and will provide meandering low flow channel to allow for a by-pass to the existing site outlet, in the event of larger storm events (Functional Servicing and Stormwater Management Report, prepared by Urbanworks, dated January 2024).

Based on a review of the LID Design Sizing Summary provided to SEL, it is understood that two (2) types of infiltration trenches with footprints of 1,665.0 m^2 and 1,182.0 m^2 are proposed at a depth of 0.8 m that can manage an annual runoff volume of 12,976.0 m^3 and 8,847.2 m^3 with a total rate of 21,823.2 m^3/yr. Additionally, based on an email received from Urbanworks on January 24, 2024, it is understood that rear yard infiltration trenches are proposed to mitigate the generated runoff. Details of the proposed infiltration trenches are not available for review at the time of preparation of the current report. However, it is understood that generated runoff from the proposed rooftop area will be partially directed into the proposed infiltration trenches to increase the infiltration rate for the post development site.

A review of the LID Design Sizing Summary also indicates that 2 sets of bio-retention facilities with footprint area of 476.0 m^2 and 456.0 m^2 are proposed to manage annual runoff flow of 55,563.8 m^3 and 43,844.3 m^3 with a total rate of 99,408.1 m^3/yr.

Considering above and assuming only two (2) infiltration trenches based on the available details, mitigated runoff that will increase infiltration and ET for the post-development condition are summarized in **Table 6**.

Table 6 - Summary of Pre- and Post-Development Water Balance, and Mitigated Flow

	Precipitation (m^3/year)	ET (m^3/year)	Infiltration (m^3/year)	Runoff (m^3/year)
Pre-development	459,909.51	276,489.68	128,332.98	55,086.85
Post- development	459,909.51	167,061.37	67,407.44	225,440.70
Mitigated Annual Volumes (infiltration trenches and bio-retention facilities)	-	-	+21,823.2	-121,231.3
Water Balance after Mitigation	459,909.51	-109,428.31	-39,102.34	+104,209.4

A review of the **Table 6** shows that implicating the proposed LID measures will increase the infiltration rate and decrease the generated runoff. Considering the location of the Subject Site within the Significant Groundwater Recharge Area (SGRA) and Highly Vulnerable Area (HVA), it is recommended generated runoff from rooftops is directed to the proposed infiltration trenches.

The above mitigated rates are considered as a part of the entire mitigation plan. The final design of the LID measures and mitigation plan will be provided in later stages of the project.

We trust the above satisfies your present requirements. Should you have any further queries, please feel free to contact this office.

Yours truly,
SOIL ENGINEERS LTD.

Tarek Agha, B. Eng., EIT.

Narjes Alijani, M.Sc., P.Geo
TA/NA

ENCLOSURES

Site Location Plan ..... Drawing No. 1
Pre- and Post-Development Water Balance Assessment ..... Appendix A

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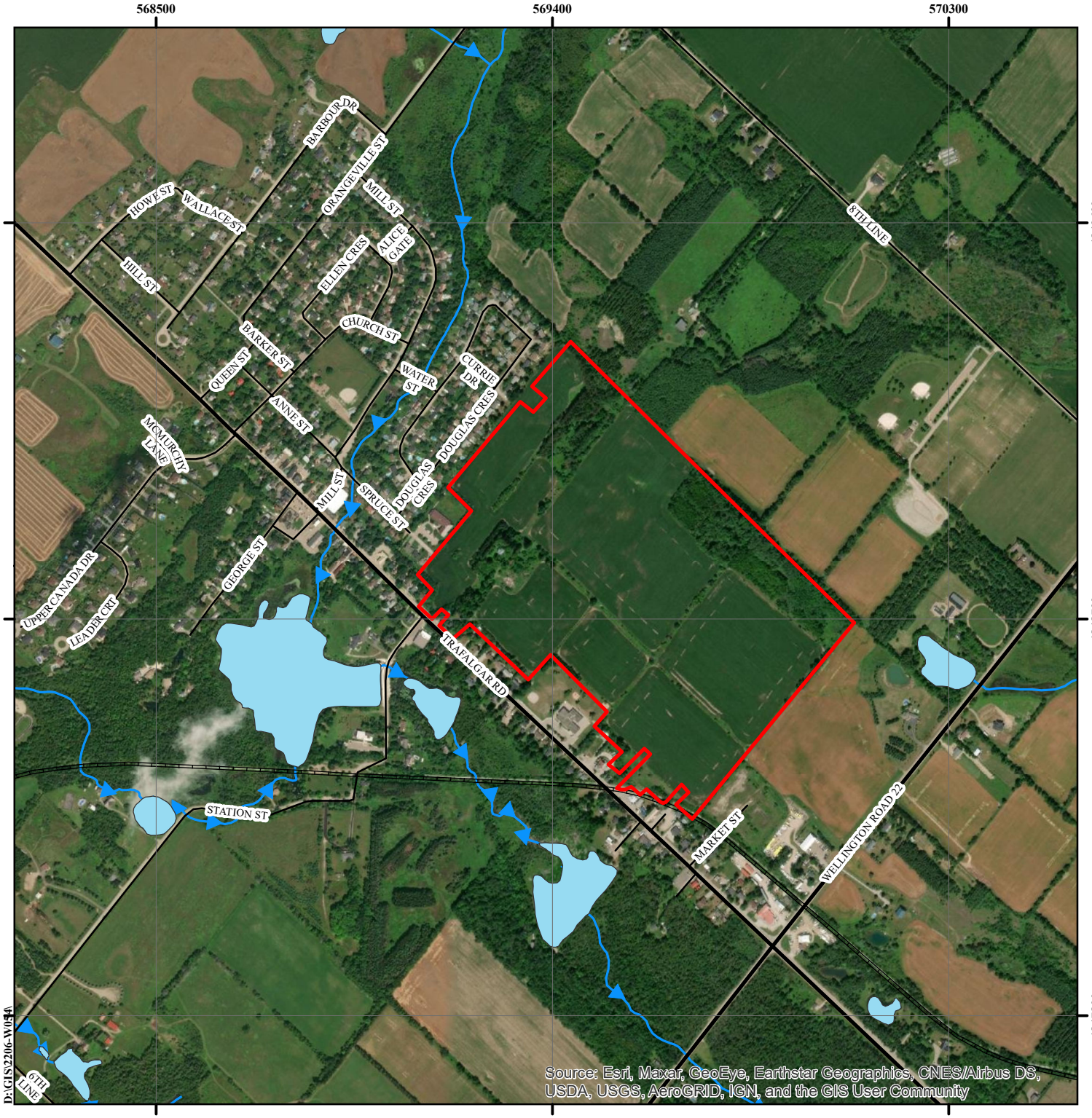
DRAWING 1

REFERENCE NO. 2206-W054



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Legend

- Approximate Boundary of Subject Site
- Waterbody
- Road
- Railway
- Watercourse

Soil Engineers Ltd.

Title: Site Location Plan

Project:

Pre- and Post-Development Water Balance Assessment
Proposed Residential Development
Address: 63 and 63A Trafalgar Road, Town of Erin, ON

Reference No. 2206-W054

Date: December 21, 2022

Scale:

0 50 100 200 300 400 500
Metres

Drawing No. 1

D:\GIS\2206-W054\

Source: Ontario Ministry of Natural Resources and Forestry

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APPENDIX 'A'

Pre- and Post-Development Water Balance Assessment

REFERENCE NO. 2206-W054

Pre-Development Water Balance/Budget

ET Estimates

Average for 150 mm gravelly sand, sandy gravel, silt and sand till, and silty sand 43 and 44 deg N. lat from USGS model: **528.4 mm/yr**

Avg Annual Precipitation: **878.78 mm/yr** after removing 4% for interception; **901.60 mm/yr** prior to removal of 4% for interception

gravelly sand and siltysand 150 mm 44 lat
530.20 mm/yr ET

gravelly sand and silty sand 150 mm 43 lat
526.60 mm/yr

Site Area **523,350.00 m^2**

ET	impervious surfaces	0.1	10%
R	impervious surfaces	0.9	90%

Type	MOE factors: Grass covered and wood Lot	
cover	0.15	grassland, woodlot
slope	0.25	Flat to Rolling land
soil texture	0.3	gravelly sand and silty sand
MOECC Inf. F.	0.70	

Site Areas	Areas m^2	Impervious factor	Cum. Infilt	Assigned ET mm/yr	Water Surplus mm/yr	Infiltration mm/yr
Grass covered Area (Pervious)	**523,240.00**	**0**	**0.70**	**528.4**	**350.38**	**245.27**
Road, Buildings (impervious)	**110.00**	**1**	**0.00**	**87.88**	**790.90**	**0.00**
Total Area	**523,350.00**					

Runoff mm/yr	precipitation m^3/yr	Infilt Vol m^3/yr	RO Vol m^3/yr	ET Vol m^3/yr	
105.11	**459,812.85**	**128,332.98**	**54,999.85**	**276,480.02**	
790.90	**96.67**	**0.00**	**87.00**	**9.67**	
	459,909.51	**128,332.98**	**55,086.85**	**276,489.68**	check
percentages	459,909.51	**0.28**	**0.12**	**0.60**	1.00

Parcel A: Pre Development Water Balance/Budget (mm/year)

P	=	ET	+	I	+	R	+	ΔS		Check
878.78	=	**528.31**	+	**245.21**	+	**105.26**	+	0.00		**878.78**

Total Area **523350.00 m^2**

Post-Development Water Balance/Budget

Average for 150 mm gravelly sand, sandy gravel, silt and sand till, and silty sand 43 and from USGS model: **528.4 mm/yr**

Avg Annual Precipitation: **878.78 mm/yr** after removing 4% for interception; **901.60 mm/yr** prior to removal of 4% for interception

gravely sand and silty sand 150 mm 44 lat
530.20 mm/yr ET

gravely sand and silty sand 150 mm 43 lat
526.60 mm/yr

Site Area **523,350.00 m²**

ET	impervious surfaces	0.1	10%
R	impervious surfaces	0.9	90%

Type	former MOE factors	
	Grass covered and wood Lot	
cover	0.15	grassland, woodlot
slope	0.25	Flat to Rolling Land
soil texture	0.3	gravely sand and silty sand
MOECC Inf. F.	0.70	

Future Developed Site Areas	Areas	Impervious factor	Cum. Infiltration	Assigned ET Pervious Portion	Water Surplus	Infiltration - Pervious Portion	ET - Impervious Portion	Runoff - Impervious Areas	Runoff Pervious Portion	precipitation	Pervious Area: Infilt Vol. Pervious Areas	Pervious Area: RO Vol. Pervious Areas	Pervious Area: ET Vol Pervious Areas	Impervious Area: RO Vol. Impervious Areas	Impervious Area: ET Vol Imperv Areas	Total Et and Ro.: Total ET	Total Et and Ro.: Total RO
	m^2			mm/yr	mm/yr	mm/yr	mm/yr	mm/yr	mm/yr	m^3/yr	m^3/yr	m^3/yr	m^3/yr	m^3/yr	m^3/yr	m^3/yr	m^3/yr
Pervious Areas (Block 505- Mixed Use)	1,705.00	0	0.70	528.40	350.38	245.27	0.00	0.00	105.11	1,498.32	418.18	179.22	900.92	0.00	0.00	900.92	179.22
Pervious Areas (Front yards)	31,708.00	0	0.70	528.40	350.38	245.27	0.00	0.00	105.11	27,864.36	7,776.89	3,332.95	16,754.51	0.00	0.00	16,754.51	3,332.95
Pervious Areas (Rear yards)	95,124.00	0	0.70	528.40	350.38	245.27	0.00	0.00	105.11	83,593.07	23,330.68	9,998.86	50,263.52	0.00	0.00	50,263.52	9,998.86
Perviosu Areas (ROW)	24,600.00	0	0.70	528.40	350.38	245.27	0.00	0.00	105.11	21,617.99	6,033.54	2,585.80	12,998.64	0.00	0.00	12,998.64	2,585.80
Pervious Areas (Parks)	121,697.00	0	0.70	528.40	350.38	245.27	0.00	0.00	105.11	106,944.89	29,848.14	12,792.06	64,304.69	0.00	0.00	64,304.69	12,792.06
Impervious Areas (Buildings)	110,889.20	1	0.00	0.00	790.90	0.00	87.88	790.90	0.00	97,447.21	0.00	0.00	0.00	87,702.49	9,744.72	9,744.72	87,702.49
Impervious Areas (Patios)	2,543.70	1	0.00	1.00	790.90	0.00	87.88	790.90	0.00	2,235.35	0.00	0.00	0.00	2,011.82	223.54	223.54	2,011.82
Impervious Areas (Driveways)	14,025.80	1	0.00	1.00	790.90	0.00	87.88	790.90	0.00	12,325.59	0.00	0.00	0.00	11,093.03	1,232.56	1,232.56	11,093.03
Impervious Areas (BROW Sidewalks)	18,450.00	1	0.00	1.00	790.90	0.00	87.88	790.90	0.00	16,213.49	0.00	0.00	0.00	14,592.14	1,621.35	1,621.35	14,592.14
Impervious Areas (roads)	79,950.00	1	0.00	1.00	790.90	0.00	87.88	790.90	0.00	70,258.46	0.00	0.00	0.00	63,232.61	7,025.85	7,025.85	63,232.61
Impervious Areas (Block 505-Mixed)	22,657.30	1	0.00	1.00	790.90	0.00	87.88	790.90	0.00	19,910.78	0.00	0.00	0.00	17,919.70	1,991.08	1,991.08	17,919.70
Total Area	523,350.00								Total	459,909.51	67,407.44	28,888.90	145,222.29	196,551.80	21,839.09	167,061.37	225,440.70
										Totals				Total RO	225,440.70	Total ET	167,061.37

Post Development Water Balance/Budget (mm/year)

P	=	ET	+	I	+	R	+	ΔS		Check
878.78	=	319.22	+	128.80	+	430.76	+	0		878.78

Pre Development Water Balance/Budget (mm/year)

P	=	ET	+	I	+	R	+	ΔS		Check
878.78	=	528.31	+	245.21	+	105.26	+	0		878.78

	ET	I	R	DS
Loss/Gain in Post	loss: 209.09	loss: 116.41	gain: 325.51	0
	% loss: 39.58	%loss: 47.47	%gain 309.246	