October 17, 2023
Our File: 223113

LCDG Inc.
909 Davenport Road, 2nd Floor
Toronto, ON, M6G 2B7

Attn: Suresh Singh
Via Email: suresh@lcdg.ca

RE: Hydrogeological and Servicing Feasibility Assessment for Proposed Lot Severance of 120 Lake Woods Drive, Town of Whitchurch-Stouffville

Dear Mr. Singh

GM BluePlan Engineering Limited (GMBP) has been retained to provide hydrogeologic and amenity feasibility services to support the application for a residential lot severance near the community of Ballantrae within the Town of Whitchurch-Stouffville. The lands under consideration (i.e., the "Site"), currently constitute 120 Lake Woods Drive, immediately west of the York-Durham Line. The current property is further defined as *Part Lot 23, Whitchurch Concession 9,* Town of Whitchurch-Stouffville, Regional Municipality of York. The approximate location of the subject property is presented in Figure 1.

The entire Site is approximately 2.45 ha (6.05 acres) and contains a single household dwelling unit that is serviced with private individual site servicing (on-site well and sewage system). The proposed severance will ultimately result in one additional property, for a total of two individual lots. The retained lot (currently developed) is proposed to be reduced to a size of 1.17 ha (2.90 acres) while the severed lot (currently vacant) is proposed to have a size of 1.28 ha (3.15 acres). The retained lot is expected to continue to be used for residential usage. See Figures 1 and 2 for the site location and approximate site layout, respectively.

The severed lot is proposed to be used for residential purposes (i.e., single household dwelling) with private individual on-site servicing (i.e., well and sewage system). As part of this technical letter, a hydrogeological feasibility assessment is intended to establish whether it will be feasible to service the severed lot with a private on-site sewage system and private water supply well with no impact on existing private services for the existing house on the retained lot and no impact on other residential uses in the area. This Study is completed with reference to the Ministry of Environment, Conservation and Parks (MECP) Guideline D-5-4 and D-5-5 (the "Guideline") for water quality impact risk assessment for the on-site sewage system and for private well water supply assessments, respectively. Additionally, this scoped technical letter also serves to document adequate sight line distances for a new driveway associated with the proposed severance as well as provide confirmation of the available utilities in the area of the Site.

GEOLOGICAL SETTING

Physiographic mapping indicates that the Site lies within a Kame Moraine landform (NDMNRF, 2007). This landform consists generally of deposits of stratified drift laid down by glacial movement in curved shaped moraines. Additionally, the Site lies within the Oak Ridges Moraine physiographic region which generally consists of rolling topographic surfaces composed of sandy and gravelly materials with varying magnitudes of depth as well as outwash terraces and swampy valley floors (Chapman & Putnam, 1984).

According to maps sets available form the Ontario Ministry of Northern Development and Mines (NDMNRF, 2000; 2010; 2011), the geological materials underlying the Site are briefly summarized as comprising of glaciofluvial ice-contact deposits consisting of gravel and sand minor till deposits, as well as coarse-textured glaciolacustrine deposits described as sand, gravel, silt and clay deposits on Paleozoic terrain as the overlying overburden with sedimentary bedrock of the Georgian Bay, Blue Mountain and Billings Formations along with the Collingwood and Eastview Members.

The overlying till overburden soils have developed Brighton Series Soil which covers the area of the Site. The topography of these soil deposits is generally smooth with very gently sloping hills (Hoffman & Richards, 1955). Brighton Series soil generally features sandy loam and is typically stone-free with parent materials consisting of well sorted grey, calcareous sand, or stratified sand and gravel. As a result of the soil texture and local topography, the hydraulic conductivity is expected to be moderately high, exhibiting good natural drainage conditions.

Based on topographic mapping of the immediate area, the elevations of the Site and surrounding lands are gently rolling with smooth slopes decreasing in elevation to the to the northeast of the subject property towards low lying wetlands and watercourses. Within the site itself there is an elevation difference of approximately three metres from the southwest corner of the current property parcel towards the northeast corner, with a relatively evenly distributed elevation gradient.

A sewage system with tile bedding to service the new dwelling on the severed lot would likely be constructed adjacent to the new dwelling. It can be reasonably assumed that surface run off and drainage travels towards local drainage basins and swales that flow towards Pefferlaw River approximately 275 m north of the Site, which drains into Lake Simcoe and discharges into Lake Huron via the Severn River system. Based on Site topography, it is inferred that the direction of local groundwater flow is towards the east-northeast direction.

Nearby water well records within a 300-metre radius of the Site are shown to all be overburden wells with an average depth of 31.9 mbgs (metres below grade surface). No records indicate a recorded depth to the local bedrock, however using available mapping tools, the estimated overburden thickness in the area of the Site is expected to be in the range of 250 mbgs.

SERVICING CONSIDERATIONS

Existing Residential Development

The Study Area is within an area that includes established rural residential development. It is our understanding that the majority of rural residential properties in this area are serviced with on-site sewage systems and domestic wells and also have access to the standard suite of utilities such as electricity and telecommunications.

On-Site Sewage System – Nitrogen Attenuation

The primary concern related to on-site sewage system for development is the effect that these systems may have on the concentration of nitrate in local groundwater. The proposed development must ensure that its sewage management does not negatively impact groundwater quality and preclude its use for other purposes or by other (i.e., off-site users). The most prevalent use for groundwater use is domestic consumption and so typically this means that a given development must not result in nitrate concentrations of 10 mg/L or greater (per the Ontario Drinking Water Standards) in the groundwater going offsite.

The D-5-4 Guideline (1996) references a three-step process (Section 5.2). The need to advance to the next step depends on the conditions defined in the preceding step. This process is dependent on the first step satisfying the general requirements defined in the respective step. The first step in this process (Section 5.4) focuses on Lot Size Considerations which state, "For developments where the lot size for each private residence within the development is one hectare or larger, the risk that the boundary limits imposed by these guidelines may be exceeded by individual systems is considered acceptable in most cases". Since the Site has a reported size of approximately 2.45 hectares, it is anticipated one additional proposed residential unit will not pose any impacts to the overall groundwater quality.

To show the potential for impacts to shallow groundwater are not anticipated for the Site, attenuated nitrogen calculations have been computed as per the method given in the D-5-4 Guideline (1996) and are summarized in Table 1. The

calculations are typically completed for the site holistically (i.e., the combined lot size and with the combined use) and can be further assessed using the smallest lot. Since the calculations are based on lot area versus proposed sewage use, and the lots are different in size with the same potential usage, it follows that nitrogen attenuation calculations for each individual lot will differ from each other, with the smallest lot (i.e., the retained lot) having the greater potential of breaching the Ontario Drinking Water Standards criteria for nitrate. This is shown below in Tables 1 and 2.

Table 1: Nitrogen Attenuation for the Combined Site

Line	Item	Value	Source
1	Average Annual Precipitation (mm/yr)	858	Environment Canada (King Smoke Tree)
2	Average Annual Evapotranspiration (mm/yr)	575	MNR (1984)
3	Precipitation Run-off Factor	0.40	Estimated, for woodland rolling slopes with open sand loam usage (MTO Drainage Management Manual, Chart 1.07)
4	Lot Area (m^2)	24,465	From Conceptual Plan (see Figure No. 2)
5	Hydrologic Input (L/yr)	4,154,157	Line 4 * (Line 1 – Line 2) * (1 – Line 3), units converted
6	Number of Lots	2	Number of Proposed Developments
7	Sewage Effluent Input Rate (L/lot/day)	1,000	Specified by Procedure D-5-4
8	Annual Sewage Effluent Input (L/yr)	730,000	Line 6 * Line 7, units converted
9	Total Water Input (L/yr)	4,884,157	Line 5 + Line 8, units converted
10	Nitrate Output (g/lot/day)	40	Specified by Procedure D-5-4
11	Annual Nitrogen Loading (g/yr)	29,200	Line 6 * Line 10, units converted
12	Attenuated Nitrogen Concentration (mg/L)	5.98	Line 11 / Line 9, units converted

Table 2: Nitrogen Attenuation for the Retained Property

Line	Item	Value	Source
1	Average Annual Precipitation (mm/yr)	858	Environment Canada (King Smoke Tree (Transportation Association of Canada, 1999) (Ontario Ministry of Transportation, 2001))
2	Average Annual Evapotranspiration (mm/yr)	575	MNR (1984)
3	Precipitation Run-off Factor	0.40	Estimated, for woodland rolling slopes with open sand loam usage (MTO Drainage Management Manual, Chart 1.07)
4	Lot Area (m^2)	11,713	From Conceptual Plan (see Figure No. 2)
5	Hydrologic Input (L/yr)	1,988,867	Line 4 * (Line 1 – Line 2) * (1 – Line 3), units converted
6	Number of Lots	1	Number of Proposed Developments
7	Sewage Effluent Input Rate (L/lot/day)	1,000	Specified by Procedure D-5-4
8	Annual Sewage Effluent Input (L/yr)	365,000	Line 6 * Line 7, units converted
9	Total Water Input (L/yr)	2,353,867	Line 5 + Line 8, units converted
10	Nitrate Output (g/lot/day)	40	Specified by Procedure D-5-4
11	Annual Nitrogen Loading (g/yr)	14,600	Line 6 * Line 10, units converted
12	Attenuated Nitrogen Concentration (mg/L)	6.20	Line 11 / Line 9, units converted

Using the dilution approach, the attenuated nitrogen concentration for the entire site (i.e., retained property and proposed severance) is estimated to be 5.98 mg/L and meets the maximum allowable concentration of 10 mg/L. Additionally, the calculated attenuated nitrogen for the smallest proposed lot (i.e., the retained lot; 6.20 mg/L) is also estimated to meet

the Ontario Drinking Water Standards criteria. These calculations are considered to be a conservative estimate since they do not account for other attenuation mechanisms that are known to occur, such as dilution in groundwater and biological/geochemical attenuation processes. Consequently, the servicing of a proposed severed lot would be feasible for both retained and severed properties with a standard Class IV or equivalent sewage system constructed under the requirements of the Ontario Building Code (OBC).

On-Site Sewage System – Sewage System Sizing

The feasibility of the sewage servicing also depends on whether the lot is large enough to accommodate a Standard Class IV on-site sewage system. Based on the D-5-4 Guideline, lots of at least 1 hectare in size do not need further study, as it is clear that sufficient space exists to accommodate a sewage system including tile bedding. Based on our experience, sizing doesn't become a concern until lots are less than about 0.4 ha (1 acre).

To show the potential sizing associated with an on-site sewage system, general calculations have also been provided. The size of the leaching bed will depend on the percolation time of the native soils (T-time). As mentioned previously, the Site is understood to consist of sandy loam soils that exhibit good drainage conditions with a hydraulic conductivity that is expected to be moderately high. Using this information, the T-time of the of native soils may be reasonable assumed to be between 10 to 20 min/cm. Due to the anticipated low T-time of the native soils, a relatively small leaching bed may be sufficient to ensure proper subsurface disposal of effluent.

Based on the design guidance from the *Ontario Building Code* and assuming the proposed development will contain a 4-bedroom residence, the expected rate of sewage generation would be 2,000 L/d. For the purposes of establishing feasibility of the proposed servicing scheme, a preliminary sizing of a Conventional Leaching Bed is provided herein. It is recommended that the final design of the sewage system be completed by a licensed septic system installer in respect to the *Ontario Building Code*, the locations of other features, (i.e., buildings, property lines, water supply wells, and set-backs), and the existing soil and groundwater conditions occuring at the Site. It is recommended that the native soils found onsite be tested for on-site percolation times as well as high groundwater elevation in the general location of the proposed leaching bed be confirmed to support the bed design.

The underlying soils at the Site have a T-time greater than 15 minutes, therefore the contact area for the leaching bed will be determined by multiplying the length of each run of distribution pipe with the bed width as per Section 8.7.3.1. of the *Ontario Building Code*. Assuming a sewage generation rate ("Q") of 2,000 L/d for the development and a T-time estimate of 20 min/cm, the contact area must be at least 216 m^2 in size. The area of the leaching bed must also extend a minimum of 15 m beyond the distribution pipe in any direction that effluent may flow (this extension is often referred to as the "mantle").

Assuming a nominal length of one run of distribution pipe of 20 m, the dimensions of the leaching bed will be approximately 20 m long by 11 m wide to achieve a minimum total length of 200 m of distribution pipe while also respecting the given maximum length of one run of distribution pipe and the spacing requirements between each run. An additional buffer of 2 m would be required around the upgradient and cross-gradient sides of the bed to provide the required 4H:1V sloping for a bed raised 500 mm.

The nominal dimensions of the bed will be approximately 20 m by 28 m (560 m^2), including the required mantle space and shoulder slopes from the raised installation. Based on the proposed lot dimentions, it appears that this would be a manageable size to construct the leaching bed while still retaining some amentiy space on the lot.

Anecdotally, it is well established that standard 1 acre lots have sufficient space to support standard individual residential lots with on-site Class IV sewage systems and wells. Consideration will be required to make sure that set-back requirements of the OBC are met during development of the lot, including between neightbouring lots. In the event smaller sewage system footprints are desired, filter beds and or treatment systems with dispersal beds could alternatively be used.

Private Well and Water Supply

The D-5-5 Guideline specifies that the per person water supply requirements are 450 L/d while the peak demand rate is 3.75 L/min/person for 120 minutes a day, and a minimum rate requirement of 13.7 L/min. Assuming the development will consist of a 4-bedroom dwelling, it may be reasonable to assume a total of 5 persons residing on the property as per the Guideline which states "*the likely number of persons per well for a single family residence shall be the number of bedrooms plus one*". This means a single well to supply the entire development would need to supply 2,250 L/d with a peak demand of 18.75 L/min over the duration of 120 minutes.

Based on nearby water well records and hydrogeological literature (Singer, Cheng, & Scafe, 2003), it appears that there are aquifers capable of supplying the required flow rates in the overburden.

In the vicinity of the Site, overburden water well records generally indicate sufficient supply. There are six wells that were tested under conditions equal to or exceeding the peak demand rate and duration (i.e., 18.75 L/min for 120 mins), thus supporting the capability of the local overburden groundwater to contain sufficient yield for domestic purposes:

- Well ID: 6908462, 19.0 L/min for 240 mins
- Well ID: 6908463, 19.0 L/min for 240 mins
- Well ID: 6913235, 22.7 L/min for 240 mins
- Well ID: 6913766, 37.9 L/min for 120 mins
- Well ID: 6915657, 68.2 L/min for 120 mins
- Well ID: 6925431, 30.3 L/min for 120 mins

With respect to the bedrock, local well records indicate there are no water supply wells within the study area that draw from bedrock aquifers. Detailed information regarding the wells in the vicinity of the Site have been tabulated and can be found in Enclosure A and the approximate location map of the wells within the study area can be found in Figure 3.

A more detailed assessment of the potential water supply that can be obtained directly from the study area well records can be established using their data to estimate the hydraulic properties of the local aquifers. To do this, the estimation method for "apparent transmissivity", as described in Maathuis and van der Kamp (2006), was applied to the well records in the immediate vicinity of the subject property.

The apparent transmissivity method is roughly based on the Cooper-Jacob (1946) method of pumping test analysis and involves the iterative solution of the following system of equations:

$$T_a = \frac{Q_t}{4\pi s}\left(-0.5772 - \ln(u) + u - \frac{u^2}{2 \cdot 2!} + \frac{u^3}{3 \cdot 3!}\right)$$

$$u = \frac{{r_c}^2 S}{4 T_a t}$$

Where:

T_a	is the apparent transmissivity (m^2/d)
Q_t	is the pumping rate during the test (m^3/d)
s	is the drawndown measured at the end of the pumping test (m)
r_c	is the radius of the well casing (m)
S	is the storativity (assumed 10^{-4})
t	is the duration of the pumping test (days)

The method was applied to 14 overburden wells within 300 metres of the subject property in which there were sufficient data available to estimate transmissivity. The tabulated source data and calculation results are provided in Enclosure B. The average apparent transmissivity of the well records was 61 m^2/d. This estimate does not account for two (2) well records in which no measureable drawdown was reported during their pumping test, as well as four (4) well records that had no recorded final water level measurements.

Transmissivities on the order of 10 m^2/d and greater indicate high competency for supplying demand.

Therefore, based on the pumping rate and water column information provided in the local well records, the estimated appartent transmissivities of the available aquifers, as well as background geological mapping and reports, it is interpreted that groundwater resourcs are plentiful in the area of the Site. Information indicates that the aquifer system would be capable of providing supply to private wells for domestic use.

In the event a new water well is used to supply the proposed development, it is recommened that it be installed with respect to separation requirements set forth in the *Ontario Building Code* and that the well be constructed with a water-tight casing and annular seal extending from the surface to the approximate depth of the screened interval.

ADDITIONAL SERVICING CONSIDERATIONS

Requirements for Stopping Sight Distances

In consultation with the *Geometric Design Guide for Canadian Roads* document published by the Transportation Assocaition of Canada in September of 1999, Stopping Sight Distances for curved roads have been calculated to provide context in recommedning design speeds for the assocaited roadway. Sight Line Distances surveyed for the Site were completed by Ertl-Hunt Surveyors and provided for our review by LCDG Inc. on July 12, 2023. According the unobstructed sight lines surveyed, the minimum distance observed was reported at 160 m, spanning from a northward facing curve approached from York-Durham Line to approximately the centre of the northern property boundary of the proposed severance property.

Referncing Table 2.1.2.10 from the *Geometric Design Guide for Canadian Roads* document, a Normal Stopping Sight Distance between 130 and 170 m can support a design speed of approximately 90 km/h. It is understood the the posted speed limit in the vicinity of the Site is set at 40 km/h. Therefore, the geomtry of Lake Woods Drive at the location of the proposed severance will be able to support the existing speed limit.

Additionally, *Book 6 – Warning Signs* from the Ontario Traffic Mannual published by the MTO in 2001 was consulted for consideration of a new driveway for the residence on the propsoed property. According to Table 8 from this document, the minimum sight distance to require a hidden intersection tab sign for a two-lane roadway at 50 km/h (the minimum speed parameter provided) is 95 m. Therefore, since the shortest sight line distance observed on Site is 160 m, it is anticipated that a Hidden Driveway or Hidden Intersection sign will not be required for the use of a driveway for an onsite residence provided that the driveway be constructed west of the 160 m sight line terminus.

The surveyed sight line distances can be found in Enclosure C for your reference.

Available Utility Connections

On April 24, 2023, GMBP personnel contacted Ontario One Call for a Planning Locate Request for the area of the subject property under the context that the request was being made for design and planning work with no onsite surface indentification to be completed by notified utility companies. From the submitted request, Ontario One Call sent notifications to Bell Canada and Hydro One. Therefore, it is our understanding that the proposed severance may be servicable to telecommunication lines and electricity.

Aside from private onsite servicing for sewage and water supply, it is anticiapted the proposed property will have to plan for a private onsite heating source (i.e., propane furnace) as the planning locate request did not include gas utilities within the vicinity of the Site.

CONCLUSION

A preliminary hydrogeological and amenity feasibility services assessment has been conducted for a proposed property severance to create an additional lot from the existing property at 120 Lake Woods Drive, near the community of Ballantrae within the Town of Whitchurch-Stouffville. This study has been conducted to assess the feasibility for the Site to support the proposed severance, which will be serviced by private on-site sewage as well as a private water supply well. The retained lot and severance lot (i.e., a total of 2 lots) are proposed to have an area of approximately 1.17 ha (2.90 acres) and 1.28 ha (3.15 acres), respectively.

Based on the above analysis, the findings of this assessment indicate that:

- with respect to nitrogen attenuation, the proposed severed lot has been determined to be suitable for servicing with a standard Class IV or equivalent on-site sewage system with a low potential for impact to local water resources. Based on lot size alone (i.e., greater than 1 ha), no further study is required and the lots are considered acceptable for sewage servicing. Using the D-5-4 Guideline estimation method, the resultant nitrate concentration for the entire proposed lot layout, (i.e., one retained and one severed lot) was calculated to be 5.98 mg/L, which is below the ODWS of 10 mg/L;

- based on our review, it is reasonable to expect that the severed lot will be able to accommodate a Class IV or equivalent on-site sewage system constructed with a raised conventional leaching bed as per Section 8.7.2. of the *Ontario Building Code*;

- sufficient groundwater supply is available from the overburden aquifer system below the Site to support the severed lot;

- The water quality is expected to require a level of treatment as a conservative measure and for aesthetic purposes since the water supply will be drawn from the overburden;

- The hydrogeological conditions generally support the proposed demand necessary for the onsite residential dwelling with no impacts or interference with present water resources;

- The existing speed limit on Lake Woods Drive (i.e., 40 km/h) and associated site line distances are anticipated to support the development of a new driveway for the proposed severance property; and

- The area of the Site is serviceable by Bell Canada telecommunications and Hydro One. However, the property does not appear to be serviced by a natural gas utility.

We recommend that:

- the on-site sewage system be designed and constructed by a licensed septic system installer per the *Ontario Building Code* and in respect of the required setbacks from applicable features, including neighbouring lots and adjacent roadways;

- domestic wells be drilled to meet the requirements of O. Reg 903 and constructed with a minimum 6-metre casing;

- regardless of water quality, the water system for the proposed residence be furnished with a disinfection system; and

Yours truly,

GM BLUEPLAN ENGINEERING LIMITED

Per:

Cuirin Cantwell, M.Eng., E.I.T.

Per:

Matthew Nelson, P.Eng., P.Geo.

Enclosures:

- Figure 1 – Site Location
- Figure 2 – Site Layout
- Figure 3 – Study Area Wells
- Enclosure A: Well Information Summary
- Enclosure B: Apparent Transmissivity Calculation Table
- Enclosure C: Sight Line Distance Survey

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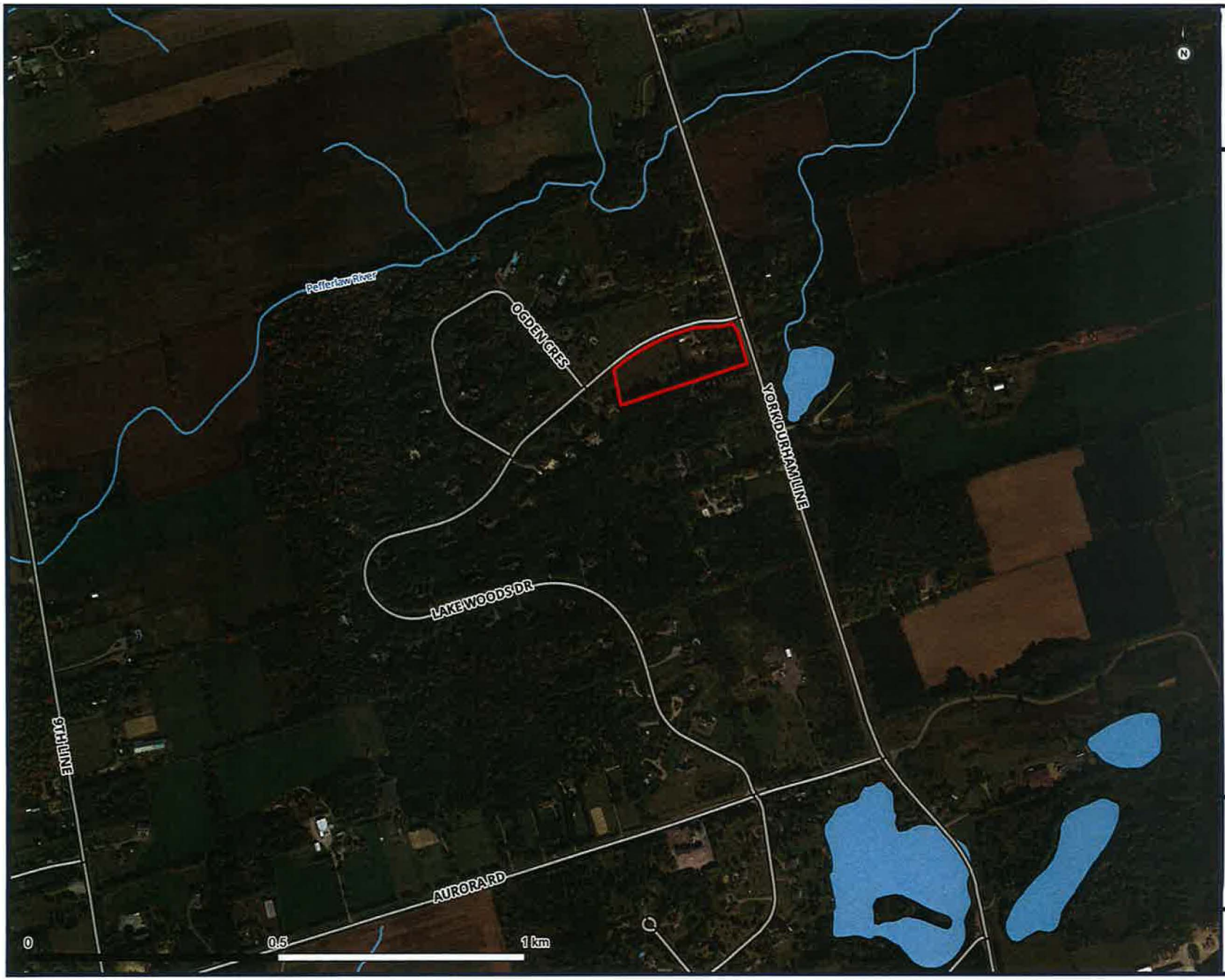
FIGURE 1:
SITE LOCATION



LCDG Inc.
Hydrogeological & Servicing Feasibility Assessment

120 Lake Woods Drive
Town of Whitchurch-Stouffville
York Region, ON

LEGEND

- Roads
- Waterbody
- Property Boundary

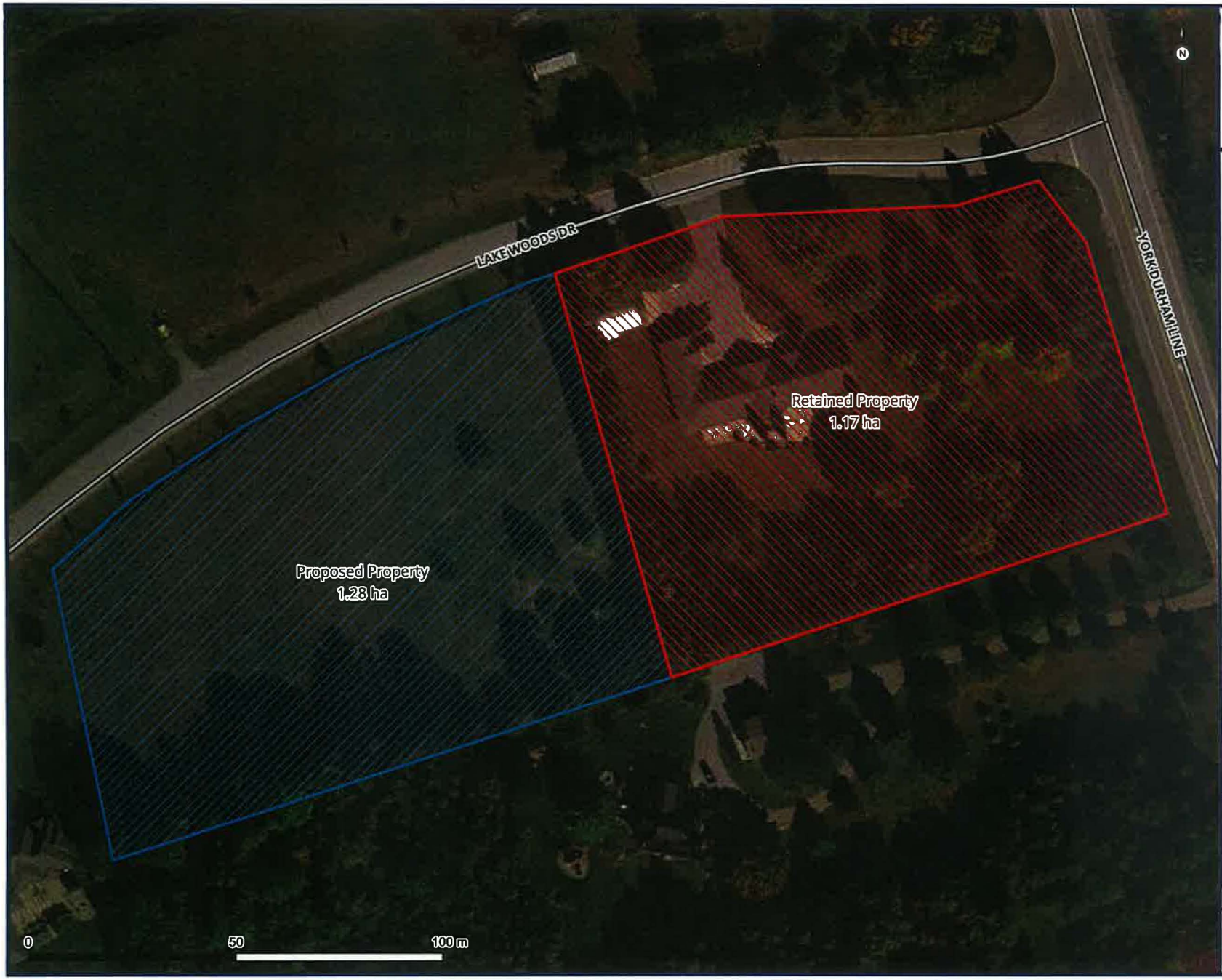
Figure 1

Site Location Map

BluePlan

April, 2023
Project No. 223113
Projection EPSG:3857

FIGURE 2:
SITE LAYOUT



LCDG Inc.

Hydrogeological & Servicing Feasibility Assessment

120 Lake Woods Drive
Town of Whitchurch-Stouffville
York Region, ON

LEGEND

- Roads
- Retained Property
- Proposed Property

Please note the illustrated property boundaries are approxiamted

Figure 2

Site Layout

BluePlan

April, 2023
Project No. 223113
Projection EPSG:3857

FIGURE 3:
STUDY AREA WELLS

LCDG Inc.
Hydrogeological & Servicing Feasibility Assessment

120 Lake Woods Drive
Town of Whitchurch-Stouffville
York Region, ON

LEGEND

- Roads
- Study Area Wells
- Study Area (300m)
- Property Boundary

Figure 3

Study Area Wells

BluePlan

April, 2023
Project No. 223113
Projection EPSG:3857

ENCLOSURE A:
WELL INFORMATION SUMMARY

Enclosure A - Detailed Well Information

WELL ID	LOT	CON	GEO. TOWNSHIP	EASTING	NORTHING	USAGE	WELL TYPE	STATIC WATER LEVEL (mbgs)	TOTAL DEPTH (mbgs)	DEPTH TO BEDROCK (mbgs)
1904948	25	1	UXBRIDGE	639714.6	4879523	Domestic	Overburden	22.86	28.96	-
1906011	25	1	UXBRIDGE	639764.6	4879673	Domestic	Overburden	18.90	41.76	-
4606024	24	1	UXBRIDGE	639891.6	4879417	Domestic	Overburden	15.54	35.36	-
6908462	23	9	WHITCHURCH-STOUFFVILLE	639612.6	4879730	Domestic	Overburden	30.48	33.53	-
6908463	23	9	WHITCHURCH-STOUFFVILLE	639648.6	4879574	Domestic	Overburden	30.48	33.53	-
6912359	23	9	WHITCHURCH-STOUFFVILLE	639498.6	4879581	Domestic	Overburden	16.76	32.00	-
6913235	23	9	WHITCHURCH-STOUFFVILLE	639344.6	4879543	Abandoned	Overburden	16.76	20.73	-
6913766	22	9	WHITCHURCH-STOUFFVILLE	639414.6	4879173	Domestic	Overburden	5.18	30.18	-
6915657	23	9	WHITCHURCH-STOUFFVILLE	639614.6	4879423	Domestic	Overburden	29.87	36.58	-
6916303	23	9	WHITCHURCH-STOUFFVILLE	639664.6	4879573	Domestic	Overburden	16.46	35.05	-
6925431	23	9	WHITCHURCH-STOUFFVILLE	639654.0	4879649	Domestic	Overburden	16.76	24.38	-
6928578	23	9	WHITCHURCH-STOUFFVILLE	639675.0	4879522	Abandoned	-	-	-	-
6929831	23	9	WHITCHURCH-STOUFFVILLE	639237.0	4879363	Domestic	Overburden	20.70	30.90	-
6930666	22	9	WHITCHURCH-STOUFFVILLE	639320.0	4879249	Domestic	Overburden	18.20	30.00	-
7101117	23	9	WHITCHURCH-STOUFFVILLE	639289.0	4879512	Domestic	Overburden	16.00	26.60	-
7124045	23	9	WHITCHURCH-STOUFFVILLE	639303.0	4879533	Domestic	Overburden	16.28	27.43	-
7130193	22	9	WHITCHURCH-STOUFFVILLE	639343.0	4879291	Domestic	Overburden	15.48	39.01	-
7134700	22	9	WHITCHURCH-STOUFFVILLE	639392.0	4879326	Domestic	Overburden	17.22	32.92	-
7136095	22	9	WHITCHURCH-STOUFFVILLE	639298.0	4879228	Domestic	Overburden	17.10	34.14	-
7147319	23	9	WHITCHURCH-STOUFFVILLE	639348.0	4879453	Domestic	Overburden	16.70	27.74	-
7173776	22	9	WHITCHURCH-STOUFFVILLE	639585.0	4879253	Domestic	Overburden	18.23	28.35	-
7247785	23	9	WHITCHURCH-STOUFFVILLE	639408.0	4879596	Domestic	Overburden	16.28	41.15	-

ENCLOSURE B:
APPARENT TRANMISSIVITY CALCULATION TABLE

Enclosure B
Apparent Transmissivity Calculation Table

WELL ID	DURATION		DRAWDOWN		RATE		DIAMETER		u	Ta*
(--)	(hours)	(days)	(ft)	m	(GPM)	(cu.m/d)	(in.)	(m)	(--)	(m^2/d)
1906011	1.5	0.0625	28	8.53	10	65.52	5	0.127	4.96E-10	12.7
4606024	1.5	0.0625	34	10.36	8	52.416	5	0.127	7.68E-10	8.2
6913766	2	0.0833	73	22.25	10	65.52	5	0.127	1.83E-09	4.6
6915657	2	0.0833	17	5.18	18	117.936	6	0.152	3.13E-10	38.6
6916303	1	0.0417	8	2.44	20	131.04	5	0.127	4.21E-11	99.7
6925431	2	0.0833	8	2.44	8	52.416	6	0.152	3.33E-10	36.3
6930666	1	0.0417	4.27	1.30	15.3	100.2456	5	0.127	2.89E-11	145.2
7124045	1	0.0417	5.6	1.71	35	229.32	5.5	0.140	1.98E-11	257.3
7130193	1	0.0417	3.2	0.98	15	98.28	6	0.152	3.20E-11	189.1
7134700	1	0.0417	10.2	3.11	15	98.28	5.5	0.140	8.96E-11	56.7
7136095	1	0.0417	11.5	3.51	23	150.696	5.5	0.140	6.49E-11	78.3
7147319	1	0.0417	7.6	2.32	20	131.04	6.25	0.159	6.37E-11	103.1
7173776	1	0.0417	5	1.52	20	131.04	5.5	0.140	3.15E-11	161.5
7247785	1	0.0417	1.7	0.52	12	78.624	6	0.152	2.09E-11	290.0
									Geometric Mean	61.1

*Ta - Apparent Transmissivity. Calculated using an assumed Storage of 10^{-4} (geometric mean Singer et al 2003).
Duration of Pumping, Drawdown, Pumping Rate, and Well Diameter all taken from the respective well records.

ENCLOSURE C:
SIGHT LINE DISTANCE SURVEY

CAUTION

THIS IS NOT A PLAN OF SURVEY AND SHALL NOT BE USED EXCEPT FOR THE PURPOSE INDICATED IN THE TITLE BLOCK. THE WORK AND DRAWINGS HEREIN WERE COMPLETED FOR THE EXCLUSIVE USE OF OUR CLIENT AND NO LIABILITY IS ASSUMED TO ANY THIRD PARTIES OR SUBSEQUENT OWNERS.

THIS PLAN IS NOT AN ORIGINAL UNLESS EMBOSSED BY A SURVEYORS SEAL

SKETCH TO ILLUSTRATE
UNOBSTRUCTED SITE LINES – PROPOSED LOT
120 LAKE WOODS DRIVE
TOWN OF WHITCHURCH–STOUFFVILLE

SCALE 1 : 750 METRES

0 15 30 60

DISTANCE NOTES – METRIC

DISTANCES ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

NOTE

POINTS OF ORIGIN FOR THE UNOBSTRUCTED SITE LINES ARE 1.8m OFFSET FROM THE EDGE OF ASPHALT – THE APPROXIMATE DISTANCE A DRIVER OF A VEHICLE WOULD BE WHEN ENTERING THE RIGHT OF WAY (LAKEWOODS DRIVE)

ERTL-HUNT
SURVEYORS
A division of IBW Surveyors Ltd.
IBWSURVEYORS.COM | 1.800.667.0696

PARTY CHIEF: • | DRAWN BY: GV | CHECKED BY: • | PLOT DATE: JUNE 6, 2023
FILE NAME: 120 LAKEWOODS | Inquire available at ProtectYourBoundaries.ca