TOWNSHIP OF HAVELOCK-BELMONT-METHUEN

To: The Mayor and Members of Council

Prepared By: Arya Hejazi M.PL., Township Planning Assistant

Meeting Date: September 17th, 2024

Subject: **Application to Amend** Township of Havelock-Belmont-Methuen Comprehensive Zoning By-law, 1995-42 (AS AMENDED). Property owners Ronald and Betty-Anne Cousins. Part Lot 23, Concession 8, having municipal address of 56 Fire Route 85R - Methuen Ward. ARN: 1531-010-007-35100.

PURPOSE and EFFECT:

The purpose and effect of this report is to present for the consideration and requisite approval of Council, an application to amend Comprehensive Zoning By-law No. 1995-42 (as amended) in order to permit the redevelopment of a single detached recreational dwelling unit; while also introducing certain site-specific regulations.

RECOMMENDATION:

- That subject to any new information or public comments received prior to or at the statutory public meeting, the draft by-law be ***passed*** as presented; and

- That the balance of this report be received.

BACKGROUND:

As proposed, redevelopment of the subject property will consist of a complete tear and demolish of the existing seasonal recreational dwelling to construct a new seasonal recreational dwelling, alongside a new attached garage. A demolition permit is anticipated as part of the development approval process. Currently, the property is developed with

an existing recreational dwelling unit comprising a total gross floor area of 58.5 square metres (630 square feet). As indicated on the attached site plan, there are an assortment of accessory structures, inclusive of a frame boathouse, sleeping cabin and plastic shelter.

Owner: Ronald and Betty-Anne Cousins

Property Description: Part Lot 23
Concession 8
56 Fire Route 85R - Methuen Ward
Township of Havelock-Belmont-Methuen
1531-010-007-35100

Type of Planning Approval: Planning Act, Section 34

Site Visit Date: September 15th, 2023

Other Planning Applications: None.

Description of Property and Surrounding Lands

The subject lands comprise approximately 0.4 hectares (1.05 acres), with shoreline frontage maintained along the southeasterly portion of Jack Lake. Vehicular access to the property is provided via Fire Route 85R. As indicated by Appendix B, the subject property falls within the at-capacity portion of Jack Lake, often referred to as “Sharpe’s Bay”.

Historically, the Ministry of Natural Resources and Forestry (MNRF), in conjunction with the Ministry of Environment and Climate Change (MOECC), conducted a capacity assessment for Sharpe’s Bay, including an assessment of oxygen and phosphorus levels, which are critical indicators of water quality. These studies eventually concluded that Sharpe’s Bay is considered “at capacity” – No new municipal land use planning approvals for new lot creation or more intense development within 300 metres of the waterbody should be considered. The subject parcel is an existing lot of record, for which is already included in the land inventory of Sharpe’s Bay. There is an existing seasonal recreational dwelling unit subject to valid permits issued by the municipality, as well as an existing individual sewage system. The purpose of this application is to consider the redevelopment of an existing recreational dwelling unit, as well as a new individual sewage system, to an expanded footprint on the subject parcel. And while no new lot is being created as a result of the approval of this application, extra scrutiny has been

imposed on this application as a result of the at-capacity status of Sharpe's Bay. Township planning support for this application would be contingent on a scoped Environmental Impact Study (EIS) to assess whether the proposed redevelopment of the seasonal dwelling would further degrade the environmental integrity of the shoreline and the lake. The applicants retained the services of an environmental consultant (Oakridge Environmental Ltd.)

Proposed Redevelopment

As proposed, the new seasonal recreational dwelling unit and attached garage will be roughly 233 square metres (2510 square feet) with an assortment of decks/porches. Total lot coverage is being increased from 2.83% to 7.89%. The current setback from the High Water Mark to the existing recreational dwelling unit is 7.25 metres (23.8 feet). The proposed setback from the High Water Mark is expected to remain the same with no further reductions being proposed.

As previously mentioned, the existing recreational dwelling unit is presently serviced by an individual sewage system that is currently 14.4 metres (47.1 feet) from the High Water Mark of Jack Lake. The proposed seasonal recreational dwelling unit will not utilize the existing sewage system, in favor of a new system being added to the subject parcel 15 metres (50 feet) from Jack Lake.

The subject property is currently zoned "Seasonal Residential (SR)" and maintains the minimum required frontage and acreage requirements under the corresponding zone. As the allocation of lot coverage on the subject property will be slightly increased from its current standard, a vast majority of the site will be maintained in its natural state.

The overall pattern of development within the surrounding area is linear, corresponding with the waterfront. Recreational dwelling units located on adjacent and nearby properties are typically located within the 30 metre High Water Mark setback of Jack Lake. This application will have no effect on any existing accessory structure/building on the subject property.

History of Use

The current owners had purchased the property in 1989. The property has a sale history dating back to 1983.

Furthermore, data provided from the Municipal Property Assessment Corporation (MPAC) suggests that the existing seasonal recreational dwelling unit was constructed in 1948, predating the Township's 1974 Zoning By-law.

PLANNING DISCUSSION:

Provincial Policy Statement (PPS) and A Place to Grow: Growth Plan for the Greater Golden Horseshoe (Growth Plan)

Both the Growth Plan and Provincial Policy Statement (2020) permit resource-based and residential development within Rural Areas while also including policies to protect significant natural heritage features.

Section 2.2.9.4 of the Growth Plan stipulates that resource-based development within *Rural Areas* must be compatible with the surrounding rural landscape as well as the scale, character and capacity of the resource.

Section 4.2 of the Growth Plan include policies that are intended to protect key hydrological, as well as natural heritage features. Section 4.2.4.1 states that outside of settlement areas, development will not be permitted within the 30-metre vegetation protection zone (buffer) for key hydrologic features with the exception to this policy provided in Section 4.2.3.1 and 4.2.4.5 of the Growth Plan.

Section 4.2.4.5 permits infill development within the 30-metre vegetation protection zone provided that development restores to the maximum extent possible the ecological features and functions of the developed shoreline areas. The proposed redevelopment of the seasonal recreation dwelling unit will commence within the existing building footprint, with expansions being proposed towards the easterly shoreline. As per the applicant's written justification and EIS, due to topographic constraints and site-specific considerations, the proposed development is **not** anticipated to result in any negative impacts on adjacent natural heritage features, nor the ecological functions and of the lake and nearby wetlands.

On this basis, the proposed development will not conflict with the Growth Plan and will conform to the intent of the PPS.

County of Peterborough Official Plan

According to the County of Peterborough's Official Plan, the site is designated as "Shoreland Areas and the Waterfront". Policies of the County Official Plan permit residential land uses within the Shoreland area while encouraging the protection and restoration of natural heritage features.

The Plan states that the built form along the shoreline should not dominate the natural form and encourage the provision of access to the waterfront for public and private users, whichever is appropriate. To mitigate the impact of the proposed development on the shoreline, the EIS recommends a variety of measures in place to ensure that the integrity of the natural environment is not compromised by the proposed development. Some of these measures include sediment control measures, no in-water work, completion of construction outside bird-nesting season, and a variety of other measures which are attached as appendices to this report.

It is the Township's planning opinion that the application conforms to the intent of the County's Official Plan.

Township of Havelock-Belmont-Methuen Official Plan

The subject property is currently designated '***Shoreline'*** in the Township's Official Plan. The Township's Official Plan recognizes permanent and recreational (cottage) dwellings as permitted uses in the 'Shoreline' designation. Furthermore, development in the Shoreline designation is required to incorporate a minimum 30 metre setback from the High Water Mark of all inland lakes across the Township. Policies in the Township's Official Plan are aimed to preserve and protect the shoreline and its natural vegetative state.

Section 3.3.4.1(b)(ii) and (iii) of the Township's Official Plan states that minor variances and zoning changes to accommodate proposed expansions of a structurally permanent nature to existing structures that further reduce any applicable minimum water setback shall not be permitted unless it is a matter of public health. Furthermore, on existing lots of record, where it is not possible to achieve the 30 metre setback, new buildings shall be set back as far as possible from the high water mark. An EIS may be required in these situations to determine the appropriateness of the reduced setback.

As previously mentioned, the redevelopment of the existing cottage will take place within the 30 metre high water mark setback due to topographic constraints and hydro

easements. Therefore, the proposed location of the new recreational dwelling is justified from a planning perspective. Additionally, the proposed new recreational dwelling will maintain the existing setback from the shoreline of Jack Lake. Therefore, no further encroachment is being proposed as a result of the approval of this application. The applicants further engaged in the services of a qualified ecologist to assess the impact of the development on natural heritage and hydrologic features. The EIS concluded that the proposed location of the new recreational dwelling is anticipated to not result in any detrimental effects on natural heritage and hydrologic features.

It is the Township's planning opinion that the application meets the spirit and intent of the Township's Official Plan.

Township of Havelock-Belmont-Methuen Comprehensive Zoning By-law No. 1995-42 (as amended)

According to Schedule 'A1' of By-law No. 1995-42, as amended, the subject property is currently zoned 'Seasonal Residential (SR). If approved, the application will serve to rezone the subject lot to 'Special District 285(S.D. 285)' and introduce certain site-specific regulations.

As previously mentioned, the approval of this application will have no effect of altering any existing accessory structure on the subject property. This application will further serve to legally permit the existing accessory structures located within the rear yard of the subject property.

Accordingly, the proposed zoning by-law amendment being submitted for Council's consideration includes site specific setbacks and other provisions intended to legally recognize reduced setbacks for the redevelopment of the existing recreational dwelling unit.

Once the proposed development has been completed, the EIS completed by Oakridge Environmental indicates that no further development be approved. In essence the lot itself will be considered "at-capacity". Therefore, specific regulations are being imposed (i.e. lot coverage cap) to ensure that no new development is completed on the subject lot without further assessments being completed first. A holding provision is being recommended to ensure that the recommendations of the EIS are to be registered on title at the sole expense of the applicant. Once the registration of the recommendations have been completed, the applicants can apply for the removal of the hold via an application under Section 36 of the *Planning Act.*

Following our review and assessment of this application within the context of relevant land use planning policies, it is the Township's planning opinion that the subject application conforms to the Growth Plan, County of Peterborough's Official Plan, the Township of Havelock-Belmont-Methuen's Official Plan, the Township's Zoning By-law 1995-42, as amended, and is consistent with the Provincial Policy Statement.

COMMENTS:

Staff Comments:

None received at the time of report preparation.

Agency Comments:

Notice was circulated to a number of prescribed agencies for review.

None have been received thus far.

Should any additional comments be received prior to the September 17th meeting of Council they will be brought forward at that time.

Public Comments:

Notice was circulated to all property owners within 120 metres of the subject property. No comments have been received at the time of report preparation. Should any comments be received prior to the September 17th meeting of Council they will be brought forward at that time.

FINANCIAL IMPACT:

There are no financial impacts unless Council's consideration respecting the approval or refusal of the requested amendment is appealed to the Ontario Land Tribunal (OLT). In the event of an appeal, there could be costs, some of which may be recovered from the applicant.

Submitted by:

Arya Hejazi

_____

Arya Hejazi
Planning Assistant
Township of Havelock-Belmont-Methuen

Appendix A – Planning Application
Appendix B – GIS Mapping/Sharpe's Bay
Appendix C – Property Survey
Appendix D – Site Plan and Renderings
Appendix E – Pre-Con. Meeting Minutes
Appendix F – Environmental Impact Study
Appendix G – Public Meeting Notice – 56 FR 85R

RECEIVED

Date Received: AUG 0 9 2024
Fee Received: _____
Roll No.: _____

TOWNSHIP OF HAVELOCK-BELMONT-METHUEN
APPLICATION FOR AMENDMENT
TO ZONING BY-LAW 1995-42 (AS AMENDED)
(UNDER SECTIONS 34, 36 AND 39 OF THE PLANNING ACT)

1. APPLICANT/AGENT INFORMATION:

1.1 Name of Owner(s): Ronald and Betty-Anne Cousins

1.2 Address: [redacted]

[redacted] Postal Code [redacted]

Telephone Number [redacted] Fax Number: (____) _____ -_____

E-Mail Address: [redacted]

(An owner's authorization is required in Section 9.1, if the applicant is not the owner.)

1.3 Name of Applicant/Agent: _____
(if different from owner)
Address: _____

_____ Postal Code _____

Telephone Number: _____ Fax Number: (____) _____ -_____

E-Mail Address: _____

1.3 Communication should be sent to: Owner ☒ Applicant ☐ or to the following:

_____

Address: _____

_____ Postal Code _____

Telephone Number: (____) _____ -_____ Fax Number: (____) _____ -_____

E-Mail Address: _____

1.4 Mortgages, charges and other encumbrances (if known):
(Provide the following information for any mortgages, charges or other encumbrances in respect of the subject land.)

Name:_____

Address: _____

_____ Postal Code _____

Telephone Number: (____) _____ -_____ Fax Number: (____) _____ -_____

2. LOCATION OF THE SUBJECT LAND: *(Complete applicable lines)*

2.1 Geographic Municipality/Township or Village: Havelock-Belmont-Methuen

Concession Number(s) 8 Lot Number(s): PT Lot 23

Registered Plan
Number: 28258-0077 Lot(s)/Block(s): _____

Reference Plan
Number:_____Part Number(s): _____

Road/Street Number and Name: #56 Fire Route 85R

Attach survey plan, if available.

2.2 Are there any easements or restrictive covenants affecting the subject land?
Yes ☒ No ☐

If Yes, describe the easement or covenant and its effect:

Bell Canada easement and the Environmental Impact Study restriction
that the new structure cannot be any larger than the proposed concept plan

3. PURPOSE OF APPLICATION:

3.1 PROPOSED ZONING:

Change Schedule _____ from Seasonal Residential to _____ Zone(s)

Textual Change to Section(s) _____of By-Law

3.2 REASON: (*Purpose of the proposed amendment)*
The current building needs many repairs due to its age and is too small.
Therefore, it was decided to construct a new building to replace the current structure.

4. DESCRIPTION OF SUBJECT LAND:

4.1 DESCRIPTION OF LAND SUBJECT TO REZONING:

Frontage: 95.40 (311') m Depth: 88.39 (290') m
Area: 4,330.136 (1.07ac) sq. m. .4330136 ha

Existing Use(s) of the subject land: Seasonal dwelling

Length of Time the existing uses of the subject land have continued:
76 years

4.2 Date subject land was acquired by current owner: 1989

4.3 EXISTING BUILDINGS OR STRUCTURES: Please identify each existing building on the sketch and provide information for each building. (If more than one building, attach a separate sheet to this application.)

Building 1
Type Wood Frame Date Constructed 1948

Existing Use Seasonal dwelling Date Existing Use Commenced 1948

Ground Floor Area* 611 sq ft Gross Floor Area ** 611 sq ft

Front lot line setback 23' 8 1/2" Rear lot line setback 89' 2"

Interior side lot line setback 72' Exterior side lot line setback 84' 11"

Building Height 15' Dimensions 16' 3" x 37' 4"

No. of Units 1 Gross Floor Area Per Unit 611 sq ft
Loading Spaces
(commercial/industrial uses) Parking Spaces

4.5 EXISTING BUILDINGS OR STRUCTURES: Please identify each existing building on the sketch and provide information for each building. (If more than one building, attach a separate sheet to this application.)

Building 2

Type Wood Frame — Date Constructed 1997

Existing Use Sleeping Cabin — Date Existing Use Commenced 1997

Ground Floor Area* 140 sq ft — Gross Floor Area ** 140 sq ft

Front lot line setback 72' 7" — Rear lot line setback 132' 10"

Interior side lot line setback 29' 9' — Exterior side lot line setback 160' 6"

Building Height 10' 4" — Dimensions 14' x 10'

No. of Units 1 — Gross Floor Area Per Unit 140 sq ft

4.6 EXISTING BUILDINGS OR STRUCTURES: Please identify each existing building on the sketch and provide information for each building. (If more than one building, attach a separate sheet to this application.)

Building 3

Type Wood Frame — Date Constructed 1958

Existing Use Boat House — Date Existing Use Commenced 1958

Ground Floor Area* 240 sq ft — Gross Floor Area ** 240 sq ft

Front lot line setback 28' 6" — Rear lot line setback 80' 3"

Interior side lot line setback 133' 6" — Exterior side lot line setback 2' 9"

Building Height 11' — Dimensions 20' x 12'

No. of Units 1 — Gross Floor Area Per Unit 240 sq ft

4.4 NATURE OF PROPOSED DEVELOPMENT: Please provide the information for each proposed building (If more than one building, attach a separate sheet to this application. If a proposed plan showing location of proposed buildings is available, please attach.)

Proposed Use(s) of the subject land: Seasonal dwelling

Building 1
Type Wood Frame

Ground Floor Area* 2,949 sq ft

Gross Floor Area ** 2,792 sq ft
3,706 sq ft includes storage over garage

Front lot line setback 23' 8 ½"

Rear lot line setback 47' 10"

Interior side lot line setback 75' 5"

Exterior side lot line setback 56' 8"

Building Height 19' 6"

Dimensions 71' 11 ½ " x 58' 1 ½ " irreg

No. of Units 1

Gross Floor Area Per Unit 2,792 sq ft

Loading Spaces
(commercial/industrial uses) _____

Parking Spaces _____

* Ground Floor Area means the area that the building occupies on the ground.
** Gross Floor Area means the sum of the area of each floor of the building counting each floor at or above ground level (not basement or cellar) based on the exterior dimensions of the building.

5. SERVICES:

5.1 ACCESS is/will be provided to the subject land by: *(check appropriate space)*

		Maintenance	
Provincial Highway	☐	Public	☐
Municipal Road	☐	Private	☐
Private Road	☐	Year Round	☒
Right of Way	☒	Seasonal	☐
Unopened Road Allowance	☐	Unmaintained	☐
Other Public Road (specify) _____	☐		
Water Access	☐		

WATER ACCESS – where access to the subject land is only by water:

Docking Facilities (specify) _____ Parking Facilities (specify) _____
Distance from Subject Land _____ Distance from Subject Lands _____
Distance from Nearest Public Road_____

5.2 WATER SUPPLY is provided to the subject land by: *(check appropriate space)*

Publicly-owned/operated piped water system	☐
Privately-owned/operated individual well	☐
Privately-owned/operated communal well	☐
Lake or other water body	☒
Other means *(specify)* _____	☐

5.3 SEWAGE DISPOSAL is provided to the subject land by: *(check appropriate space)*

Publicly-owned/operated sanitary sewage system	☐
Private individual septic tank	☒
Public-owned/operated communal sewage system	☐
Private communal sewage system	☐
Privy	☐
Other means *(specify)* _____	☐

(A certificate of approval for the septic system from the District Health Unit submitted with this application will facilitate the review.)

5.4 STORM DRAINAGE is provided to the subject land by: *(check appropriate space)*

Sewers	☐
Ditches	☐
Swales	☐
Other means *(specify)* Land grading	☒

5.5 OTHER: *(check if the service is available)*

Electricity	☒	School Bussing	☐
Telephone	☒	Garbage Collection	☐
Recycling	☐		

6. HISTORY OF THE SUBJECT LAND:

6.1 If this application is a re-submission of a previous rezoning application, describe how it has been changed from the original application.

_____

_____

6.2 Has there ever been an industrial or commercial use on the subject land or adjacent land? Yes ☐ No ☒
Unknown ☐

If YES, please specify the use. _____

6.3 Has the grading of the subject land ever been changed by adding earth or other material? Yes ☐ No ☐ Unknown ☒

6.4 Has a gas station ever been located on the subject property or adjacent land?
Yes ☐ No ☒ Unknown ☐

6.5 Has there been gasoline or other fuel stored on the subject land or adjacent land?
Yes ☐ No ☒ Unknown ☐

6.6 Is there reason to believe the subject land may have been contaminated by former uses on the site or adjacent site? Yes ☐ No ☒ Unknown ☐

7. MINIMUM DISTANCE SEPARATION

7.1 For applications that are within 500 metres of an agricultural barn the following additional information must also be provided. Applicants should discuss this application with or obtain information from the owner/operator of the agricultural operation.

Distance from proposed lot or use to nearest barn(s): _____
Housing capacity of barn(s): _____
Type of livestock kept on farm containing nearest barn: _____
Number of tillable hectares on farm containing nearest barn: _____

7.2 NOTICE TO APPLICANTS

Should the location of the property which is the subject of this application be within the Wellhead Protection Area for the Havelock Municipal Well System then you are required to include a Section 59 Notice; in order to have your application deemed 'complete' in accordance with the Planning Act.
Please contact: Terry Cox, Otonabee Region Conservation Authority
Email: tcox@otonabeeconservation.com Tel: 705-745-5791 Ext. 219

8. AFFIDAVIT OR SWORN DECLARATION

I, R Doug Cousins of the [redacted]
Betty-Ann Cousins
in the Markham make oath and say (or solemnly declare) that the information contained in this application is true and that the information contained in the documents that accompany this application in respect of the application is true.

Sworn (or declared) before me at the Township of H-B-M, in the County of Peterborough this 9 day of August, 2024.

Commissioner of Oaths

R Doug Cousins
Applicant

B.A. Cousins
Applicant

9. AUTHORIZATIONS

9.1 CONSENT OF THE OWNER(S) FOR APPLICANT TO MAKE APPLICATION

If the applicant is not the sole owner of the land that is the subject of this application, the written authorization of the owner(s), that the applicant is authorized to make the application, must be included or the authorization set out below must be completed by the owner(s).

I/WE,_____ am/are the owner(s) of the land that is the subject of this application and I/We authorize_____ to make this application on my/our behalf and to provide any of my/our personal information that will be included in this application or collected during the processing of the application.

Date Signature of Owner

Date Signature of Owner

9.2 CONSENT OF OWNER TO ENTER UPON SUBJECT LANDS

I/WE, Ronald & Betty-Anne Cousins, HEREBY AUTHORIZE THE Township of Havelock-Belmont-Methuen Council and/or their agents/representative(s) to attend upon the lands subject of this application.

R Doug Cousins
Signature of Applicant

Signature of Witness

9.3 CONSENT OF THE OWNER(S) TO THE USE AND DISCLOSURE OF PERSONAL INFORMATION

I/WE, Ronald & Betty-Anne Cousins, am/are the owner(s) of the land that is the subject of this application for zoning amendment and for the purposes of the Freedom of Information and Protection of Privacy Act I/we authorize and consent to the use by or the disclosure to any person or public body of any personal information that is collected under the authority of the Planning Act for the purposes of processing this application.

Aug 9/24
Date

R Doug Cousins
Signature of Owner

August 9, 2024
Date

B.A. Cousins
Signature of Owner

Personal information contained on this form, collected pursuant to the *Planning Act*, will be used for the purpose of responding to the initial application. Questions should be directed to the Freedom of Information and Privacy Coordinator at the institution conducting the procedures under the Act.

10. SKETCH PLAN: The application must be accompanied by a sketch showing the following:

- the boundaries and dimensions of the subject land;
- the location, size and type of all existing and proposed buildings and structures on the subject land; indicating the distance of the buildings or structures from the front, rear and side lot lines;
- the boundaries and dimensions of land that abuts the subject property, or any land owned by the owner of the subject land and that abuts the subject land;
- the location, size and type of all existing and proposed buildings and structures on abutting lands, indicating the distance of the buildings or structures from the front, rear and side lot lines;

- the distance between the subject land and the nearest township lot line or landmark, such as a railway crossing or bridge;
- the location of all land previously severed from the parcel originally acquired by the current owner of the subject land;
- the approximate location of all natural and artificial features on the subject land and adjacent lands that in the opinion of the applicant may affect the application, such as buildings, abandoned or active railways, roads, watercourses, drainage ditches, river or stream banks, wetlands, wooded areas, wells and septic tanks and tile beds;
- the existing use(s) on adjacent lands;
- the location, width and name of any roads within or abutting the subject land, indicating whether it is an unopened road allowance, a public travelled road, a private road or a right-of-way;
- if access to the subject land is by water only, the location of the parking and boat docking facilities to be used;
- the location and nature of any easement affecting the subject land;
- all present entrances onto the subject property;
- if there are agricultural buildings capable of housing animals within 500 metres of the proposed lot, then the location of these buildings must be shown on the sketch.

Measurements on the sketch **SHALL** correspond to those identified in the application. Photocopies of your survey, if you have one, should be used. If no survey is available, a detailed hand-drawn sketch to scale is acceptable.

In some cases, it may be appropriate to obtain professional services to determine the accuracy of your property dimensions.

11. ACKNOWLEDGEMENT

Any complete submitted application must be accompanied by a deposited fee of $1,500.00 in cash or cheque made payable to the Treasurer of the Township of Havelock-Belmont-Methuen.

I/We enclose herewith the requisite deposit fee of $1,500.00 and by virtue of signature(s) hereon as the applicant agree to pay any further costs incurred by the Township in the processing of the application.

Aug 9/24
Date

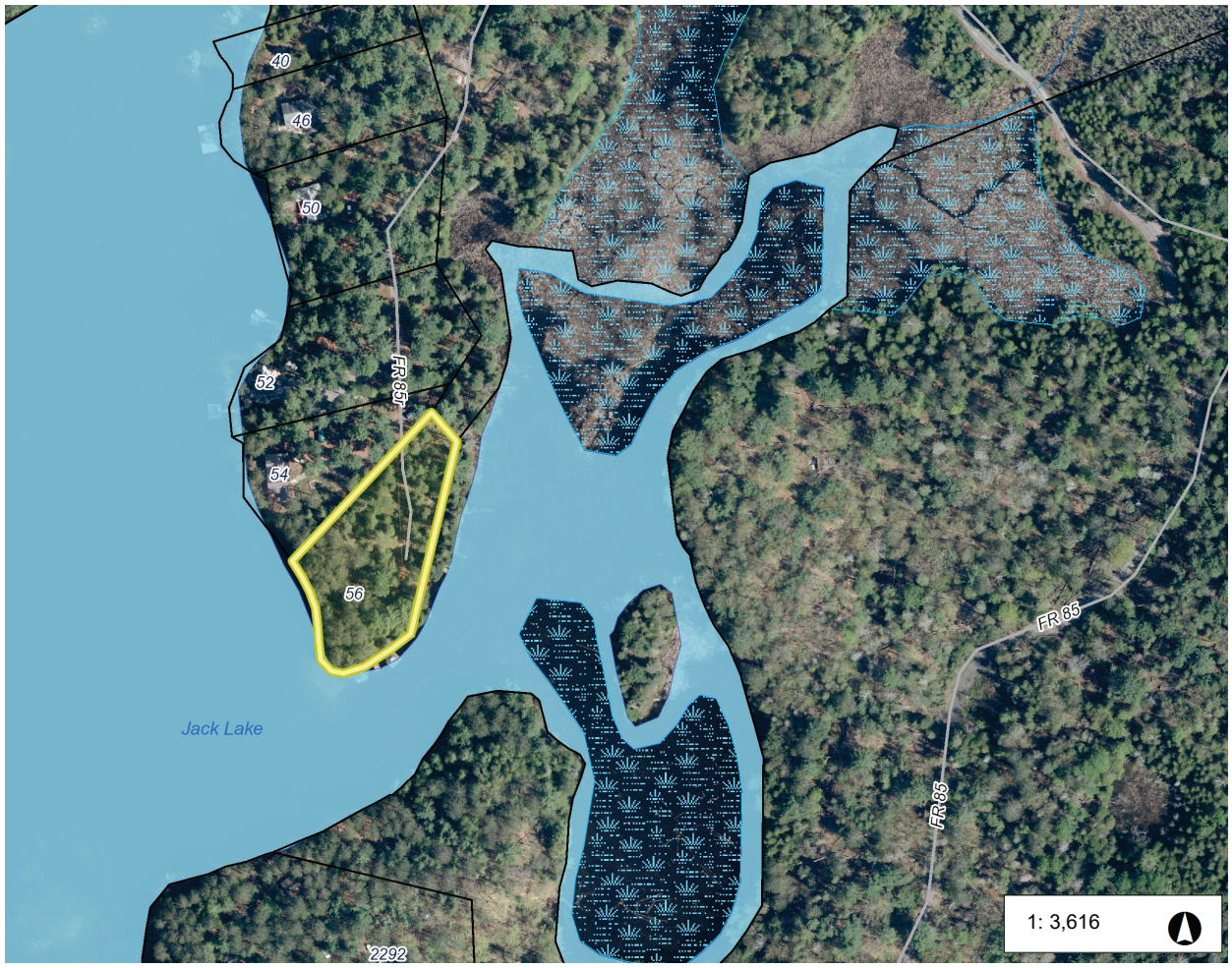
R Doug Lowrie
Signature of Owner

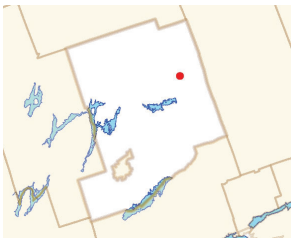
August 9, 2024
Date

B. A. Lowrie
Signature of Owner

County of Peterborough

56 FR 85R





Legend

Roads < 50,000
- PRIV ; Private; PRIV
- City Arterial
- City Collector and Local
- City Owned Unclassified
- Provincial
- County
- Township
- Water Access Only

Outside Roads < 50,000
- Major Roads
- Local Roads

- Peterborough Proposed Bypas
- First Nations
- Civic Address
- Parcel Fabric
- Parcel First Nations - Canada I

Rivers
- Intermittent
- Permanent

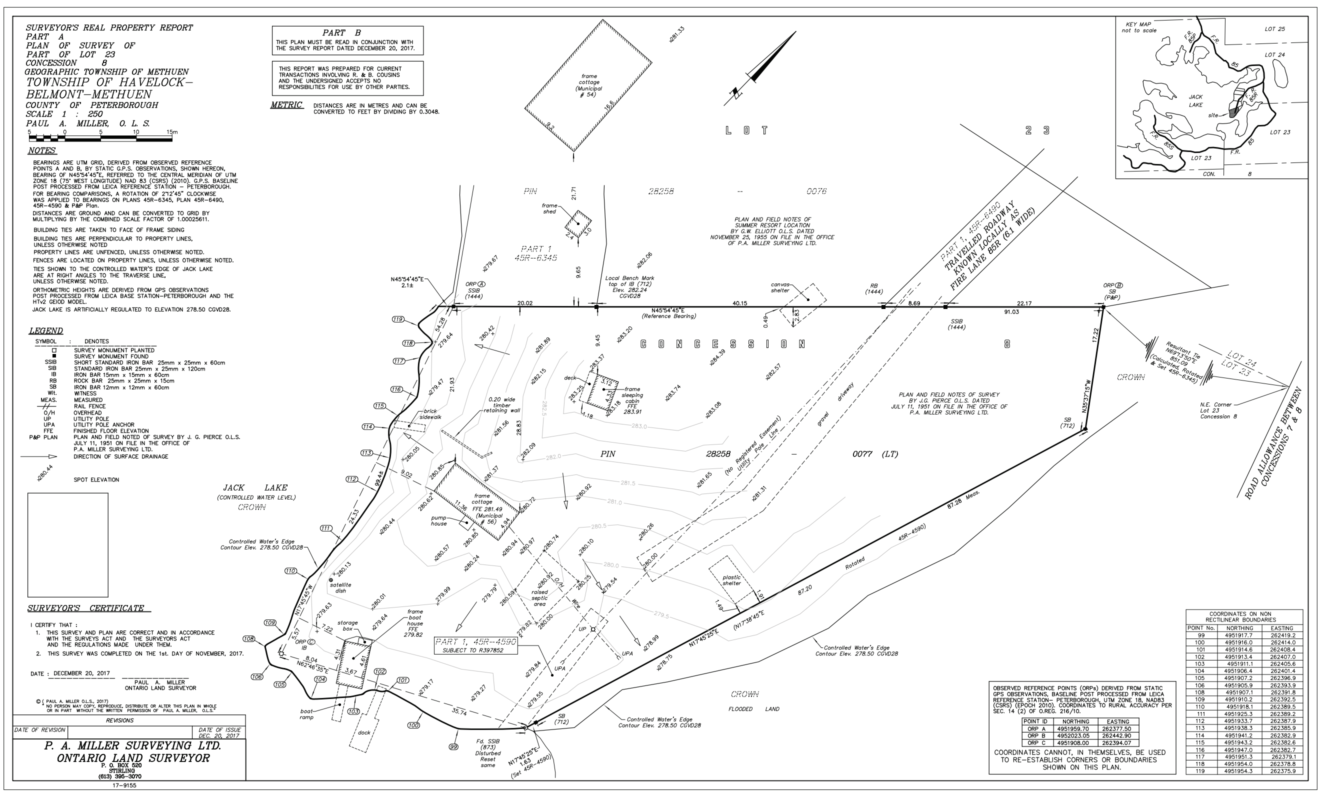
- Clean Water Act Policies Apply
- Provincially Significant Wetlanc
- Locally Significant Wetlands
- Non-evaluated Wetlands
- Lakes - Local Scale
- Municipal Boundary - Upper Ti
  - <all other values>
  - COUNTY OF PETERBOROUGH

Notes

183.7 0 91.86 183.7 Meters

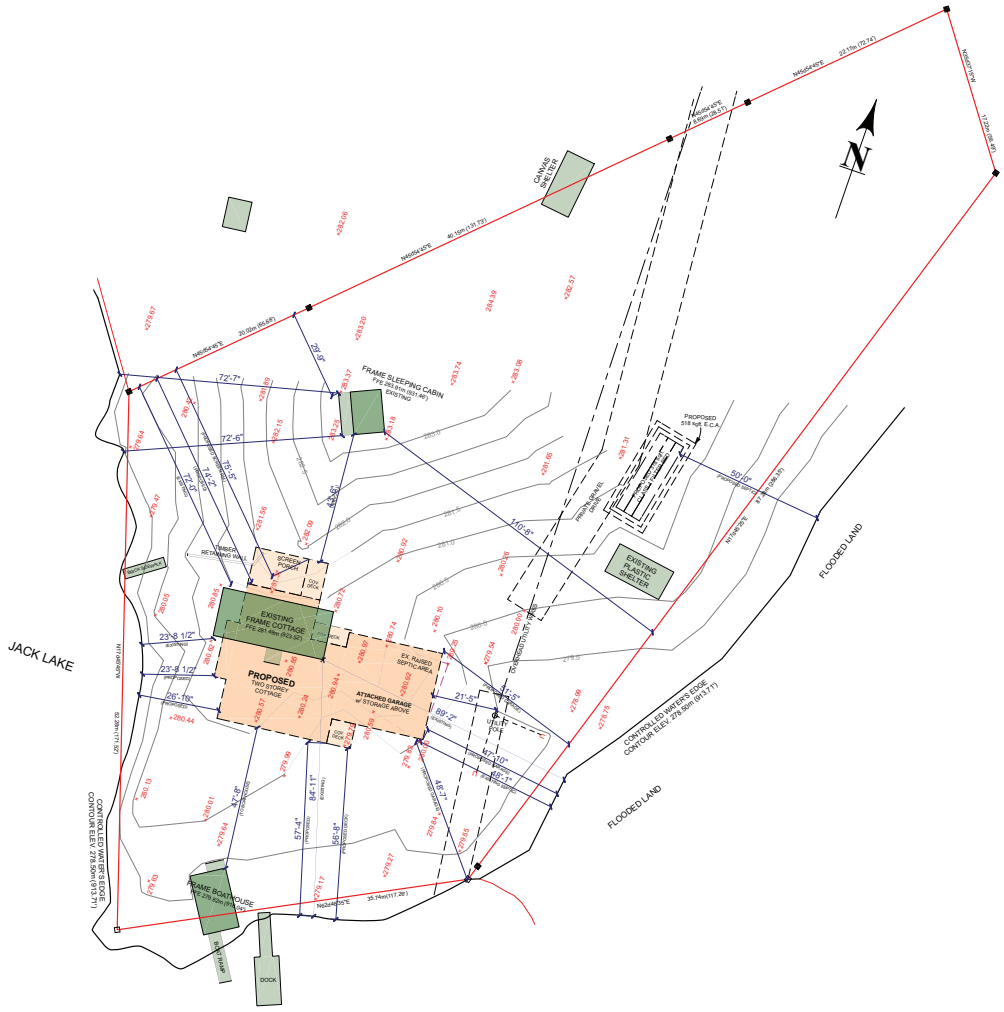
WGS_1984_Web_Mercator_Auxiliary_Sphere

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.
THIS MAP IS NOT TO BE USED FOR NAVIGATION



POINT ID	NORTHING	EASTING
ORP A	4951959.70	262377.50
ORP B	4952023.05	262442.90
ORP C	4951908.00	262394.07

POINT No.	NORTHING	EASTING
99	4951917.7	262419.2
100	4951916.0	262414.0
101	4951914.6	262408.4
102	4951913.4	262407.0
103	4951911.1	262405.6
104	4951906.4	262401.4
105	4951907.2	262396.9
106	4951905.9	262393.9
108	4951907.1	262391.8
109	4951910.2	262392.5
110	4951918.1	262389.5
111	4951925.3	262389.2
112	4951933.7	262387.9
113	4951938.3	262385.9
114	4951941.2	262382.9
115	4951943.2	262382.6
116	4951947.0	262382.7
117	4951951.3	262379.1
118	4951954.0	262378.8
119	4951954.3	262375.9



AREAS

FIRST FLOOR	1604 sqft.
SECOND FLOOR	1188 sqft.
STORAGE SPACE	914 sqft.
GARAGE	906 sqft.
PORCH	216 sqft.
SCREEN	223 sqft.

LOT COVERAGE	AREAS	//PERCENT
LOT AREA	45,850 sq.ft.	100%
EXISTING		
COTTAGE	630 sq.ft.	1.37%
DECKS/PORCHES	0 sq.ft.	0%
ACCESSORY	668 sq.ft.	1.46%
TOTAL ALL BLDGS	1,298 sq.ft.	2.83%
PROPOSED		
COTTAGE	2,510 sq.ft.	5.47%
DECKS/PORCHES	439 sq.ft.	0.95%
ACCESSORY	668 sq.ft.	1.46%
TOTAL ALL BLDGS	3,617 sq.ft.	7.89%

DWELLING DESIGN GROUP
p: 705-875-0123
e: ddgroupstudio@gmail.com
www.dwellingdesigngroup.ca

Adam Leggett BCIN #38968
Dwelling Design Group BCIN #126394

Cousins Cottage

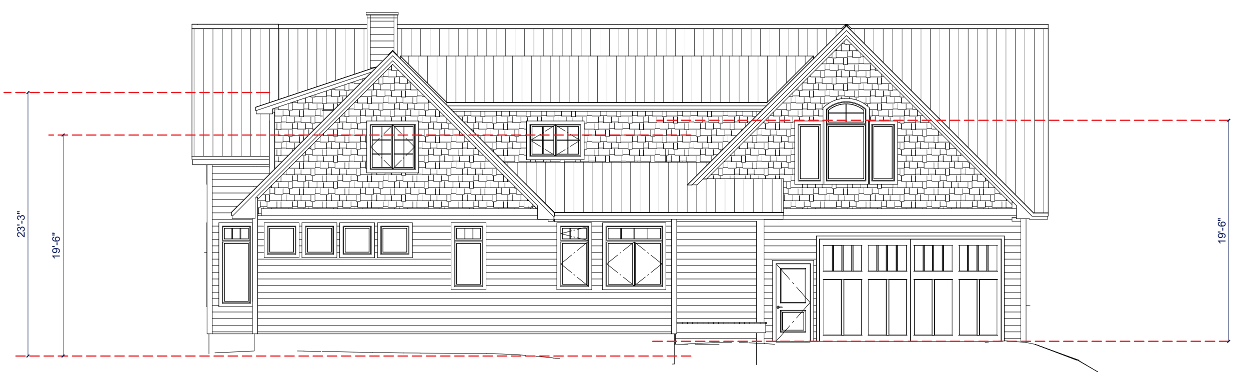
56 Fire Route 85R
Jack Lake, Apsley

Date	July 31 2024
Scale	1"=15'-0"
Project No.	22-013

SP

Print Date: August 6, 2024

MAIN LAKE ELEVATION



SIDE LAKE ELEVATION

Contractor shall check and verify all dimensions and site conditions before proceeding with construction. Any discrepancies shall be reported to Dwelling Design Group prior to commencement of work.

Dwelling Design Group is not responsible for the accuracy of the survey, engineering or other consultant information outside of Dwelling Design Group shown on these drawings or for construction started prior to the issuance of a building permit.

This drawing is an instrument of service and is provided by and is the property of Dwelling Design Group and shall not be reproduced without permission nor should drawings be scaled.

Some items may be shown on these drawings to help visualize design and layout. They are not necessarily part of or included in this design

Date	Revision Note

DWELLING DESIGN GROUP
p: 705-875-0123
e: ddgroupstudio@gmail.com
www.dwellingdesigngroup.ca

I review and take responsibility for the design work and am qualified as per 3.2.5.1. division c of the o.b.c.

Adam Leggett BCIN #38948
Dwelling Design Group BCIN #124594

Client

Cousins Cottage

Location

56 Fire Route 85R
Jack Lake, Apsley

Date	July 31 2024
Scale	1/4"=1'-0"
Project No.	22-013

Print Date: August 17, 2024

General Notes:

Property Owners:	Doug Cousins (Agent: Adam Leggett)
Property Address:	56 FR 85R
Current Uses:	Seasonal Recreational
Proposed Uses:	Seasonal Recreational
Consultation with Authorities:	Outside CVCA. Circulate to MNR
Type of Planning Approval:	ZBA w/ Hold
Zone:	SR Zone
OP Designation:	Shoreline
County OP Designation:	Shoreland Areas and the Waterfront
Property Roll Number	1531-010-007-35100
Verification of structures via building permits:	Dwelling and Boathouse permits in township records. No permits for sleeping cabin

Relevant Official Plan Policies

3.1 *Shoreline Designation*

Policy	***Regulation***	***Proposed Conform?***
3.3.2.1	Access and Occupancy	Yes. Private road leads to property.
3.3.2.2	Visual, Scenic and Aesthetic Qualities	Heavily treed and buffered from public views.
3.3.2.3	Cultural and Archaeological Heritage	Already disturbed area
3.3.3	Permitted Uses	Seasonal recreational use is a permitted use.
3.3.4.1	Development Policies	EIS was completed to assess appropriateness of the proposed setbacks.
3.3.4.9	Existing Uses	Cannot push structure outside 30m because of hydro easement.

3.1 *Shoreline Designation at Capacity Policies (applicable)*

Policy	***Regulation***	***Proposed Conform?***
3.3.4.10 (b)	At-capacity Lake	Yes. Greatest possible setback achievable is provided with an EIS and holding provision placed to implement recommendations. **This triggers the hold**

3.3.4.10 (c)	Creation of new lot	Does not apply here. **However, maintenance of vegetative buffer applies here and is the reason for the Hold**

Relevant Zoning Regulations

4.46 Special Districts

- New special district to be created.

10.0 Seasonal Residential

10.2.1 Regulations for Uses Permitted		Proposed	Proposed Conform?
a) Minimum Lot Area	3000 sq m. (0.74 acres)	Above 3000 sq m.	Yes
b) Minimum Frontage	46 m	Plenty	Yes
Minimum Front yard	**21.3 m (70 feet)**	**23.8 feet maintained**	**No. Relief required.**
Minimum Side Yard	6 m	Well beyond 6 m	Yes
Minimum Rear Yard	7.5 m	No rear yard. Only one long shoreline (front yard) and two side yards.	Yes
Maximum Height	9 m	19.6 feet.	Yes
Maximum Lot Coverage	**15 %**	**7.89%**	**Yes. But cap this.**
Minimum Floor Area	74 sq m	Well above.	Yes
Maximum Number of Dwellings per Lot	1	1	Yes.d

4.37 High Water Mark

- Will need to be amended from 30m to 7.25 m for westerly shoreline 56 feet from southerly shoreline. 47 feet from easterly shoreline.

A High Water Mark setback should be provided for the sleeping cabin as well

Planning Opinion

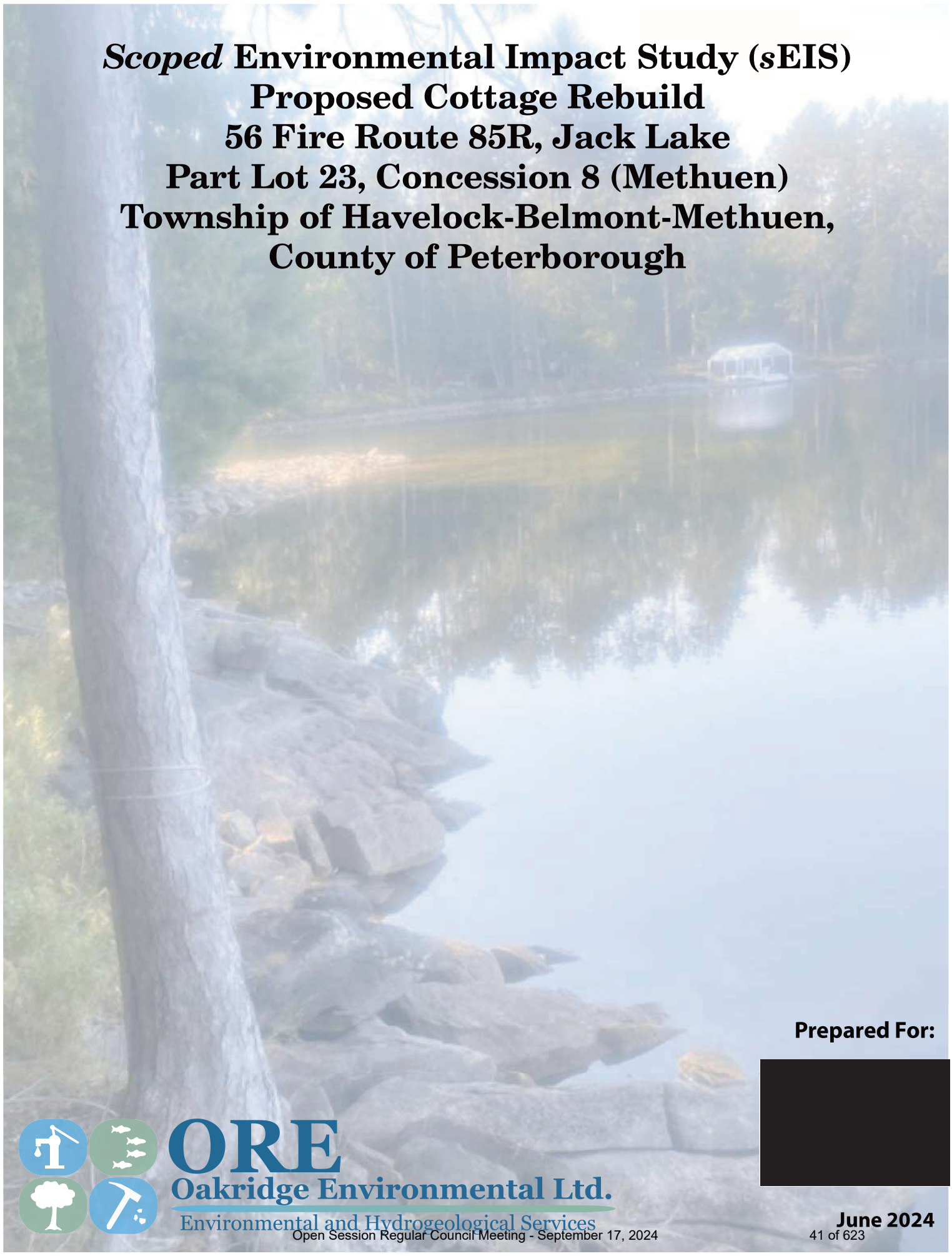
Rezoning will be required here. EIS provided w/o justification. They can provide that to us via email.

Put a holding symbol on the zone and have recommendations of EIS registered on title.

Cap lot coverage in the ZBA with a clause that future development of any structures necessitates an assessment completed by a qualified ecologist.

Have a special provisions for accessory structures: bunkie and boathouse.

Scoped Environmental Impact Study (*s*EIS)
Proposed Cottage Rebuild
56 Fire Route 85R, Jack Lake
Part Lot 23, Concession 8 (Methuen)
Township of Havelock-Belmont-Methuen, County of Peterborough



Prepared For:

[redacted]

ORE
Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

June 2024

ORE
Oakridge Environmental Limited
Environmental and Hydrogeological Services

June 25th, 2024

[redacted]

Attention: **R. Doug Cousins**

Re: *Scoped* Environmental Impact Study (*s*EIS)
Proposed Cottage Rebuild
56 Fire Route 85R, Jack Lake
Part Lot 23, Concession 8 (Methuen)
Township of Havelock-Belmont-Methuen, County of Peterborough
ORE File No. 23-3333

We are pleased to provide this *scoped* Environmental Impact Study (*s*EIS) for the above referenced property. Our report has been completed in support of your application for a Zoning By-law Amendment and subsequent Building Permit Application for the purpose of rebuilding a cottage.

Based on our review of the site conditions, Jack Lake and an adjacent wetland to the east appear to be the main environmental receptors. Provided the recommendations outlined in this report are adhered to, any potential adverse impacts to this feature should be mitigated.

We trust that this report will be sufficient for any agency reviews. Should you have any questions or require clarification, please do not hesitate to contact our office.

Yours truly,

Oakridge Environmental Ltd.

Rob West, HBSc.
Senior Ecologist

Table of Contents

Scoped Environmental Impact Study (*s*EIS)
Proposed Cottage Rebuild
56 Fire Route 85R, Jack Lake
Part Lot 23, Concession 8 (Methuen)
Township of Havelock-Belmont-Methuen,
County of Peterborough

1.0 Introduction

Oakridge Environmental Ltd. (ORE) is pleased to present this *scoped* Environmental Impact Study (*s*EIS) in support of your application for a Zoning By-law Amendment and subsequent Building Permit for the purpose of rebuilding a cottage.

The property is adjacent to Jack Lake, therefore, an *s*EIS is required to support the application and to demonstrate that the development will not result in any impacts to nearby Key Natural Heritage Features (KNHFs). The study must also include best management practices and recommendations to reduce phosphorus inputs to Jack Lake.

This study was prepared based on the Terms of Reference (ToR) that were reviewed and accepted by the Township of Havelock-Belmont-Methuen.

The following sections outline our data sources, methodologies, findings and recommendations.

2.0 Site Location and Description

The site is located at 56 Fire Route 85R (along the southeast shoreline of Jack Lake), southeast of Apsley, within Part Lot 23, Concession 8 (Methuen), Township of Havelock-Belmont-Methuen, and has an approximate area of 0.43 ha (1.07 acres), as illustrated on Figures 1 and 2.

The property is accessed by heading east on County Road 504 from Apsley, then south on McCoy Road/Fire Route 85, then right onto Fire Route 85R. The site is located at the end of the road.

The property is currently developed with a cottage, boathouse and small cabin. There are existing cottages/residences on the surrounding shoreline areas. The subject property is mapped as containing Stratum 1 White-tailed Deer Yard which is considered Significant Wildlife Habitat (Figure 2).

3.0 Proposed Development / Site Alteration

The proponent would like to tear down and rebuild a cottage, with a garage and septic system. The development will be located in the same area of the existing cottage, however, will be larger. The septic system will be located further back from Jack Lake, near the rear of the property.

The reader is referred to the proponent's conceptual development plan (Appendix A).

4.0 Township of Havelock-Belmont-Methuen

This report has been prepared to meet the requirements of the Township of Havelock-Belmont-Methuen. The following requirements from the Township were provided in the proponents email to ORE on August 10th, 2023:

> "*The property falls within an area of a Jack Lake which is currently "at capacity" – Sharpe's Bay. This means that the phosphorus levels in this region of Jack Lake are above the appropriate threshold set by the Ministry of Natural Resources. Jack Lake also does not fall within the watershed jurisdiction of Crowe Valley Conservation. Therefore, development in this region are carefully analyzed and investigated. Furthermore, there appears to be Fish Spawning along the shoreline of this property. If the development was to clear 30m of the high water mark, we likely would not be asking for an EIS, in accordance with my previous comments. However, since the development is within 30m of the shoreline and fish spawning areas, the Official Plan (s. 3.7.3.3) stipulates that all development within 30m of fish spawning will be required to complete an environmental impact study (EIS). Coupling this with the fact that this region of the lake is at-capacity would further justify the necessity for an EIS as part of a complete application. I will be diligently reviewing all of the details in the EIS report and if there are any doubts regarding the analysis, the Township does have the right to have this study peer reviewed at the expense of the applicant. I'd suggest you send me the terms of references for the EIS once you have finalized which company you are retaining. This way, we can connect with the ecologist directly and advise them on what we like to see in this EIS as it pertains to this project (I.e Fish Spawning, policy analysis, mitigation measures, etc.).*"

A proposed scope of work was provided to the Township for review. The scoped included the following tasks:

- Compile and review relevant background information regarding the site to determine if there are any obvious natural environment issues that exist on or within the vicinity of the site, particularly concerning hydrologically sensitive features.

- Conduct a high level desktop screening for Species at Risk.

- Conduct a single site inspection focussed on the proposed development envelope and the immediately surrounding area, including the shoreline and fisheries habitat.

  Terrain mapping will include an assessment of vegetation communities, habitat, surficial soils, springs, recharge zones, etc. ORE staff will confirm the presence or absence of wetland/drainage features, and if located on-site, the features will be delineated and mapped.

- Preparation of a plan illustrating the proposed development footprint superimposed on a geo-referenced air photo to determine any areas of potential concern (i.e., constraints) on the subject site.

- Preparation of a report that includes technical illustrations, constraints, vegetation mapping, photographs, and any recommendations necessary to mitigate impacts on any sensitive natural heritage features, as applicable. The report will also include recommendations and best management practices to reduce phosphorus inputs to Jack Lake.

Upon their review of the above scope of work, the Township provided the following additional requirements:

> "*I would add two things for your ecologist to include in the report:*
>
> *One being policy context and discussion to address provincial, as well as official plan, policy. This is a critical component of the report that I rely on.*
>
> *The second addition would be the ecologist's opinion that the proposed setback, as illustrated on the submitted site plan, is the appropriate setback required on this site for the development. The township needs to be comfortable supporting the setback reductions. If the ecologist provides an opinion that the proposed setback is appropriate, the township would be in a position to support the development.*"

This study has been *scoped* and formatted in accordance with the Township requirements.

5.0 Policy

This report has been prepared to meet the relevant sections from the following policies:

- Provincial Policy Statement (PPS, 2020);
- County of Peterborough Official Plan (consolidated to December 2022);
- Township of Havelock-Belmont-Methuen Zoning By-law, and
- Growth Plan for the Greater Golden Horseshoe.

This study has been *scoped* and formatted to address the policies listed above.

6.0 Topography and Drainage

The subject property occurs on the southern end of a narrow peninsula ridge that extends southward into the southeastern part of Jack Lake (McCoy Bay). The peninsula ridge is a bedrock controlled feature that has a maximum relief of approximately 6 m, although relief on the subject site is only about 3 m on the south-facing slope that overlooks the lake (Figure 2).

Other than Jack lake, there are no mapped watercourses on the subject site. In the small bay situated immediately east of the peninsula, several small unevaluated wetlands occur. According to the published mapping, none of the wetlands are connected to the site.

The peninsula ridge represents a local drainage divide, splitting runoff flows into westward and eastward runoff regimes, all eventually conveying runoff flows to the lake.

7.0 Geological Setting

As illustrated by Figure 3, the subject site occurs within an area of Precambrian bedrock outcroppings and subcroppings, mapped as having minimal soil cover, generally referred to as "Precambrian bedrock-drift complex". These soils tend to consist of a silty sand, shield-derived till (with minor gravel) that discontinuously mantle the rock. As such, their composition will reflect the composition of the bedrock in the upgradient (i.e., "up-ice") direction from which the glacial ice advanced. In this instance, the general ice direction is expected to have been from the north-northeast, as is typical in this part of the Shield. As such, the shield-derived till soil will reflect the granitic gneiss and carbonate (marble) rock composition that occurs widely in the site area. While some

regolithic soils could be derived from the weathered marble, any such accumulations would be very thin.

There are also extensive deposits of organic soils (muck) in the lower-lying areas, generally associated with bedrock valleys that contain wetlands. These wetlands are often underlain by coarse textured glaciolacustrine soils, although none are mapped in the site area.

Given the elevated conditions over the northern part of the subject property, a shallow water table condition is not expected, other than along the margins (near the lakeshore).

The thin overburden conditions are reflected in local well records from Ministry of the Environment, Conservation and Parks' database. For example, the log of nearby well No. 7203250 indicates the presence of only 0.9 m of brown sand occurring above the granite bedrock. Similar conditions are indicated at other nearby wells.

8.0 SAR Database Review

The following databases were reviewed as part of a high level screening to determine the potential for SAR to exist on or within the vicinity of the subject property:

- Natural Heritage Information Centre (NHIC);
- Ontario Breeding Bird Atlas (OBBA);
- eBird;
- iNaturalist, and
- Fish ON-Line.

The search radius ranged from 1 km^2 square (NHIC) to 10 km^2 square (OBBA), depending on the available database. Based on our review, the following SAR occurrences were noted on or within proximity of the subject property. Excerpts from the database records are found in Appendix B.

Common Name	**Scientific Name**	**SARO Status**
NHIC		
Blanding's Turtle	*Emydoidea blandingii*	Threatened
Eastern Wood-Pewee	*Contopus virens*	Special Concern
Midland Painted Turtle	*Chrysemys picta marginata*	Special Concern[1]
Snapping Turtle	*Chelydra serpentina*	Special Concern

Restricted Species[2]

1 COSEWIC status only
2 Details of the restricted species cannot be released and must remain confidential, as per direction from Ministry of Environment, Conservation and Parks.

A Colonial Waterbird Nesting Area was reported in the above database. The location is not specified.

OBBA

Barn Swallow	*Hirundo rustica*	Special Concern
Bobolink	*Dolichonyx oryzivorus*	Threatened
Canada Warbler	*Cardellina canadensis*	Special Concern
Common Nighthawk	*Chordeiles minor*	Special Concern
Eastern Meadowlark	*Sturnella magna*	Threatened
Eastern Whip-poor-will	*Antrostomus vociferus*	Threatened
Eastern Wood-Pewee	*Contopus virens*	Special Concern
Evening Grosbeak	*Coccothraustes vespertinus*	Special Concern
Least Bittern	*Ixobrychus exilis*	Threatened
Olive-sided Flycatcher	*Contopus cooperi*	Special Concern
Wood Thrush	*Hylocichla mustelina*	Special Concern

eBird

According to the eBird Geographic Information System (GIS) database, there is no hotspot within 5 km of the site.

iNaturalist

No SAR were reported in the database. The following provincially rare species were noted (not SAR but tracked by the ministry):

Common Name	**Scientific Name**	**S-Rank**
Gold-line Melanomma Moth	*Melanomma auricinctaria*	S3
Northern Tubercled Orchid	*Platanthera flava var. herbiola*	S3
Purple-stemmed Cliffbrake	*Pellaea atropurpurea*	S4
Ram's Head Lady Slipper	*Cypripedium arietinum*	S3

Fish On-Line

Database reviewed and no SAR were observed.

9.0 Inspection Methodologies

The site has been characterized by its various vegetation communities using the methodologies included in the *Ecological Land Classification (ELC) - First Approximation and Its Applications* (1998). The 1998 Ecological Land Classification - First Approximation is a guide used by Ecologists to standardize the classification of different vegetation community types across Ontario. The classification system enables an ecologist to identify vegetation communities based on the species present, soil materials and moisture regimes. In this instance, the 1998 ELC was used to identify the wetland communities as the site occurs with Ecoregion 5E and possesses Precambrian Bedrock related woodlands.

There have been a number of updates to the ELC scheme to further refine the classification of Ecosites throughout Ontario. As a result, the 2008 *Draft* ELC Guide provides a further breakdown of the 1998 ELC Guide - First Approximation communities and includes many new communities to index from. The 2008 ELC scheme also provides a cross-reference to the 1998 guide communities. This report uses a combination of both the 1998 ELC communities (which are considered the primary vegetation communities) and the 2008 Draft ELC to supplement the wetland vegetation community lists.

As for the terrestrial communities on the subject property, the Field Guide to Forest Ecosystems of Central Ontario (FG-01), 1997 was used to classify the woodland communities. This guide is used to classify vegetation types in Ecoregion 5E.

Prior to conducting the site inspection, aerial photography of the subject site was analysed to roughly delineate communities based on recognizable vegetation differences. Each identified community was subsequently inspected. Dominant vegetation types were recorded and boundaries of the various communities mapped on an air photo or utilizing a dGPS.

In addition to identifying and mapping the vegetation communities, ORE staff assessed each vegetation community from the perspective of whether they are hydrologically sensitive or a SWH for Stratum 1 Deer Wintering Habitat. The vegetation survey included examination of the development footprint and immediate surrounding areas.

10.0 Site Inspection Data

10.1 Site Inspection

ORE staff attended the site on the following date:

Date of Inspection	Temp. ^{O}C	Beaufort (Wind) Scale	Conditions Reason for Inspections
September 22nd, 2023	26	2 - Light Breeze	5% Cloud cover. Relatively clear warm fall day with very little air movement. Observed vegetation/existing site conditions, inspected for SAR, vegetation mapping - species list, wildlife detection and species list. Unevaluated wetland mapping confirmation.

Appendix C contains the list of species identified on the property during our inspection.

10.2 Ecological Land Classification (ELC)

Based on our site observations, we have determined that there are three (3) upland woodland communities/habitats on-site, and two (2) aquatic/wetland communities associated with Jack Lake and the neighbouring unevaluated wetland. The vegetation types were assessed by applying the protocols in the Ecological Land Classification for Southern Ontario (FG-02), 1998 (or draft 2008 version) and the Field Guide to Forest Ecosystems of Central Ontario (FG-01), 1997, where applicable.

Figure 4 illustrates the distribution of the on-site vegetation communities, and the off-site aquatic community. These habitats and their associated vegetation and environmental sensitivities are characterized below.

Representative photos of these communities are provided in Figure 5. Descriptions of the communities are provided below.

Upland Community:

1. Rural Property (CVR_4)

There is no description in the ELC regarding the Residential-type community.

This community includes the development footprint associated with the existing main cottage, existing bunkie, the existing septic area, the driveway/parking, and the maintained disturbed areas surrounding them. The vegetation in this ELC type contains mainly open bedrock/frequently travelled disturbed areas. These envelope areas and access road related areas are relatively tight around the buildings. The very limited frequently disturbed areas quickly transition into the mature White Pine (*Pinus strobus*), Red Pine (*Pinus resinosa*), Eastern Hemlock (*Tsuga canadensis*) and Eastern White Cedar (*Thuja occidentalis*) conifer type woodland habitat that follows.

This community encompasses the area where the existing cottage and bunkie development occur. ORE staff did not observe any SAR flora or fauna in this community, or any wetlands or watercourses that would be considered a constraint to the proposed development.

The proposed new cottage and garage are proposed to be situated overtop of the existing cottage and septic bed as illustrated on Figure 4.

2. White Pine-Red Pine: dry to moderately fresh soils (ES11.1)

The FG-01 characterizes the ES11.1 woodland community as White Pine and/or Red Pine dominated stands on dry to moderately fresh soils. The understory has moderate levels of conifer regeneration, low hardwood shrubs and feathermosses. There is a low number of herbs and the soils are typically sandy to coarse loamy.

This community dominates the majority of the upland areas of the property with mature/large diameter White Pines occurring throughout. There are low shrub species such as Common Juniper (*Juniperus communis*), Low-Bush Blueberry (*Vaccinium angustifolium*), goldenrods and asters in the small openings where the sun is able to penetrate the canopy of pines. The acidic rock barren areas beneath the pine trees possess patchy areas of bare bedrock, lichens, moss species and Poverty Oatgrass (*Danthonia spicata*).

None of the species identified within this community are Species at Risk. The White Pine does not represent Deer Wintering SWH as there is little to no undestory in this woodland type for browsing purposes. It could be suitable habitat for Osprey nesting

considering the tall pines directly adjacent to the lakeshore, however, neither Osprey nor its nest were identified on-site during the site inspection/surveys.

3. White Cedar-Other Conifer: dry to moist soils (ES22)

The FG-01 characterizes the ES22 (White Cedar-Other Conifer) dominated stands as having dry to moist soils. The main and sub canopy associates possess white cedar and can include varying amounts of balsam fir, black spruce, white birch and white spruce. The understory has moderate levels of conifer regeneration, minor hardwood shrubs, feathermosses and liverworts. There are a moderate number of herbs in the groundcover and surficial soils are typically sandy to coarse loamy.

This community corresponds to the moderately fresh Eastern White Cedar and Hemlock, White Spruce and Balsam Fir wooded areas between the shoreline/waterfront and Pine dominated upland habitats in the slightly more elevated areas of the subject property.

Wetland/Aquatic Community:

4. Open Aquatic (OAO)

The ELC (2008) describes OAO as an aquatic environment containing no macrophyte vegetation. This ecosite tends to be dominated by plankton and has a lake trophic status.

This ecosite represents the open water/offshore habitat of Jack Lake, which occurs across the entire southern edge of the subject property. The lake bottom substrate along the shoreline is comprised of exposed Precambrian Bedrock and organic sand-filled bedrock cracks and crevasses. The shoreline contains some sandy sediments, however, there appears to be a relatively significant organic/detritus matt on the bottom that covers the majority of the deeper sediments in the offshore areas, therefore, it is considered to be a relatively poor fisheries spawning habitat for most fish species, other than perhaps Centrarchid species.

ORE staff observed some minor floating leaved aquatic plant species in the near-shore environment, however, the majority of the shore is bedrock dominated and barren type habitat.

5. Submerged Shallow Aquatic (SAS1) and Water Lily and Bullhead Lily Floating-Leaved Shallow Aquatic (SAF1-1)

According to the ELC, Submerged Shallow Aquatic communities are dominated by submerged macrophytes (greater than 25%). The SAS1 community forms part of the PSW and possesses submerged aquatic plant species such as Pondweeds (primarily *Potamogeton spp.*), Common Horn-wort (*Ceratophyllum demersum*), Common Waterweed (*Elodea canadensis*), Muskgrass (*Chara ssp.*), Common Water-Milfoil (*Myriophyllum sibiricum*), and Eurasian Milfoil (*Myriophyllum spicatum*).

According to the ELC, the SAF1-1 community is dominated by floating-leaved macrophytes (greater than 25%). This community, in addition to the submerged aquatic species, forms the surficial floating aquatic plants in the PSW and is dominated by White Water-Lily (*Nymphaea alba*).

Both aquatic plant areas represent the unevaluated wetland habitat within Jack Lake that is adjacent to the terrestrial areas of the subject property (abuts the eastern shore of the property). The combination of submerged and floating leaved aquatic plant species represents good quality spawning habitat for Northern Pike (*Esox lucius*) and Muskellunge (*Esox masquinongy*), and would be considered Significant Fisheries habitat. The young-of-year of these fish species would utilize the vegetation for foraging and cover.

The floating leaved and submergent aquatic plant species in addition to the abundance of downed wood debris in the unevaluated wetland makes it ideal habitat for turtles.

10.3 Fauna

No significant fauna were observed directly on-site. Only tracks of common/secure mammals were observed on the subject parcel.

Due to the shoreline area being predominantly comprised of hard materials, there were very little potential spawning areas in the littoral zone/offshore area, other than in the area of the existing dock and boat house. The continued disturbance in these area keeps the organic/muck deposits from settling and covering Centrarchid redds.

ORE staff observed only one (1) turtle species in the unevaluated wetland during the inspections - Common Painted Turtle (*Chrysemys picta*). Therefore, there is the potential for turtles to access any developed or open disturbed areas of the subject property (e.g. the access road) and to use these areas for nesting. The property owner/contractor should install measures to prevent all turtle species from entering the

construction area/work zone.

Similar to the turtles, ORE staff observed approximately fifteen (15) Centrachids scattered along the near-shore environment during the inspection. It was not spawning season for any of these species and they were utilizing the downed woody debris, boathouse area and wetland vegetation for cover.

No SAR fish nor SAR fauna were observed during the inspections.

According to the mapping on Figure 2, the subject site contains Stratum 1 - White Tailed Deer Yard. ORE staff inspected the subject site for deer use, typically utilized by deer for overwintering purposes. ORE staff did not observe deer concentration trails nor did we observe any scat or browsed vegetation on the subject site. These types of indicators were observed several kilometres north of the subject property within the core woodland areas where no cottages occur. The deer appear to avoid the seasonal and permanent lakeshore development areas on the peninsula, where the site is situated.

The site is dominated by tall mature White Pine and Red Pine habitats which are open and airy. The cedar woodland type is a very mature open type that occurs between the existing cottage, unevaluated wetland and southeast shore of the lake. The more open airy pine and eastern white cedar dominated woodland types are not the typical setting of deer wintering/yarding habitat. Deer require a high concentration of young cedars and other browse materials in the understory, which this site does not possess. Therefore, the subject property does not appear to contain deer yard/wintering habitat and the Stratum 1 mapped boundary is, therefore, incorrect for this location. ORE staff observed concentrated trail use further north of the subject property between some of the wetlands that are well back from the shoreline development areas. This area is several kilometres to the north in more remote habitats.

Therefore, no mitigation is necessary with respect to the Stratum 1 - Deer Yarding SWH component with respect to this property.

The fauna species observed on-site are listed within Appendix C for completeness.

10.4 Flora

ORE staff inspected the subject parcel and visible areas of the properties directly adjacent to the subject property to detect any SAR plant species or wetland areas that would be sensitive to the proposed development.

Very few SAR plant species occur within Ecoregion 5E landscape; they are predominantly in Ecoregion 6E, south of the contact.

No SAR species nor wetlands (other than what is identified in the LIO mapping) were detected on-site during the site surveys.

11.0 Impact Assessment

11.1 General Considerations

Based on our assessment, it is our opinion that potential impacts related to future development of the site could include the following:

1) Potential degradation/alteration of the upland woodland vegetation communities and/or existing CVR_4 residential area that could impact Jack Lake, resulting in erosion/sedimentation and water quality deterioration.

2) Potential impacts related to construction activities (e.g., ground vegetation removal, etc.), including destabilisation and denuding of the groundcovers by track/tire equipment accessing the building construction site.

3) Potential impacts related to post-construction occupation and stabilizing of bare or disturbed/altered surficial soils.

4) Potential impacts from the new septic system proposed to occur in the northern portion of the property. There is the potential for this system to increase the phosphorus loading to Jack Lake which is near or at capacity.

These general impact considerations are further discussed in the following sections.

11.2 Development Envelope

Our field investigations have confirmed that the main concern with respect to the proposed new cottage redevelopment is its location relative to the lakeshore and unevaluated wetland (as illustrated on Figure 6). Construction of the proposed new building could result in a relatively large area of bare soils being exposed adjacent to the lakeshore/wetland, as filling and grading will undoubtedly be necessary. Notwithstanding, it is expected that the construction zone will not expand significantly beyond the footprint of the existing buildings and/or the existing opening in the forest floor. ORE also expects the majority of the construction can be completed from the

existing laneway on the north side of the existing cottage (Figure 6). As such, the construction can be mostly confined to those areas that have been historically altered/disturbed, without significantly imposing on any new natural areas on the subject property.

Overall, the gradient down to the shoreline from the proposed new cottage building is gentle. As such, the majority of runoff occurs in a radial fashion from around the proposed building location, which is a slightly elevated area. Therefore, the flows will be slowed within the nearby wooded areas and will be manageable during the construction and post construction phase, with respect to the lake. It is expected that the new building footprint will need to be filled/raised in this area. However, there is sufficient area around the entire footprint of the proposed building for runoff to continue as sheet flows in the post construction period toward the lakeshore and unevaluated wetland.

ORE staff noted that the trees in this wooded area are mostly large diameter mature trees, sporadically interspersed within the low relief areas surrounding the existing cottage. The building site possesses some tree cover and little to no groundcover vegetation. The mature trees are mainly comprised of Eastern White Pine, Eastern White Cedar, Balsam Fir, Eastern Hemlock and Red Pine. Considering the maturity of the trees, it should be possible to remove only a handful of trees to achieve the footprint for the proposed cottage.

The property owners have done well to retain and manage the woodland habitat in a natural state. Although the former practice of clearing vegetation and/or filling to the edge of the lake was considered a reasonable approach (especially to obtain vistas of the lake), this was clearly not implemented by the property owners on this property. The highly vegetated natural setting on-site has likely improved/maintained the shoreline buffering capacity, especially with respect to on-site attenuation of runoff and septic effluent in the shallow flow zone. This property would receive a good to excellent review/rating if it were subjected to the shoreline assessment criteria by any Conservation Authority.

A new septic system is proposed to be constructed in the northern portion of the property off the east side of the access road. There is an area that meets the Ontario Building Code's 15 m setback to a watercourse in this location. Maximizing the distance to the lake and/or unevaluated wetland also improves phosphorus take-up by plants and trees along the way, reducing inputs to the unevaluated wetland which would be the receiving body. The abundance of vegetation in the unevaluated wetland would also filter and take-up nutrients prior to the waters within this feature discharging to Jake Lake. Additional information regarding phosphorus impacts is provided in a following section.

Based on these findings, the proposed cottage should have undetectable adverse impacts on the lakeshore and overall water quality of Jack Lake as there will still be a good vegetation buffer between the proposed development area (including the new septic) and shoreline of the lake/wetland.

Recommendations are provided in a following section to mitigate general construction type impacts on nearby watercourse features.

11.3 Construction Related Impacts

The main potential impacts associated with construction activities could include the following:

- loss or disruption of vegetation (i.e., primarily in the construction area surrounding the footprint of the proposed new cottage building which could result in some tree, shrub and groundcover removal).
- erosion and sediment generated by exposed and/or disturbed soils while operating equipment in the area of the build site;
- presence of construction debris and waste materials as a result of constructing the building;
- fauna such as turtles potentially entering the work area, and
- sensitivity of the site with respect to imported fill materials and stockpiling of these materials during construction.

Recommendations are provided below to ensure that the potential for impacts relating to occupation and use of the new dwelling are minimized.

11.4 Impacts from Phosphorus Inputs

According to the Township, the property falls within an area of Jack Lake that is considered to be “at capacity”, where the phosphorus levels are above the appropriate threshold set by the Ministry. As such, impacts from potential phosphorus inputs must be considered.

Phosphorus export loads from developments generally result from two main streams: wasterwater and runoff/stormwater. Recommendations and Best Management

Practices (BMPs) to reduce phosphorus loadings to Jack Lake are discussed in the following section.

12.0 Recommendations

12.1 Development Envelopes and Constraints

- The proposed cottage building should generally fit within the open area footprint on-site, as illustrated by Figure 6. Figure 6 also indicates the approximate limit of the *disturbance/construction area* defined by the proponent's Site Plan. By targeting the majority of the proposed development within the majority of the existing openings, it should reduce the overall disturbed areas on the property.

- Provided the authorities are in agreement with the proposal, the new cottage building can proceed with very little additional disturbed area occurring on the subject property, other than some machinery impacts from filling/grading. ORE staff anticipate the proposed building site can be accessed from an existing track-bare access road and trail opening that occurs between the existing road access and proposed building location.

- It should be possible to construct the cottage building, while avoiding most of the mature trees. If any trees have to be removed due to their health and/or proximity to the new building, ORE staff recommend planting three (3) new native trees/shrubs in any other openings on the subject property, to offset the tree loss. Therefore, the property owner should do their best to limit the removal of large diameter at breast heigh (dbh) native tree species. Any trees that have to be removed should be marked and tallied prior to their removal.

- ORE staff did not observe any other watercourses or wetlands in the area of the subject property, other than the unevaluated wetland and Jack Lake. Therefore, these Key Hydrologic Features appear to be the only sensitive receptor downgradient of the proposed building site. The unevaluated wetland is a lacustrine-type swamp comprised of floating leaved and submerged aquatic vegetation. Recommendations to retain both the form and function of Jack Lake and the unevaluated wetland are provided below.

- To ensure the disturbed area does not advance any closer to Jack Lake, a heavy-duty silt fence shall be installed around the limit of disturbance, as illustrated by Figure 6. This will prevent the construction crew from unnecessarily increasing the overall disturbance footprint towards the lake, especially when the use of heavy equipment is necessary. The heavy-duty silt fence should be extended

around the entire building envelope perimeter to ensure turtles cannot migrate from the lake/wetland and nest within any exposed soil areas or within areas of sandy fill materials placed in the building envelope (Appendix D). The contractor can open the silt fence along the northern edge via the existing road/trail system to access the existing cottage for demolition purposes. Once the existing cottage is removed, there will be a relatively wide opening to access the new building site and continue with the day-to-day construction activities. The heavy-duty silt fencing will ensure that any loose/unconsolidated materials will not migrate beyond the cordoned construction area, thereby protecting Jack Lake and the unevaluated wetland to the east.

- As there is a potential for SAR turtles to occur within Jack Lake and/or the unevaluated wetland (e.g., Snapping Turtle, Blanding's Turtle, Northern Map Turtle, and Midland Painted Turtle), the heavy-duty silt fence will serve as a turtle exclusion fence, as recommended by Ministry of Natural Resources and Forestry (MNRF). Light-duty silt fence is not considered an acceptable exclusion fence material, as large turtles such as Snapping Turtle, could dig beneath the fence or potentially push the fence over and enter the construction zone. Nesting turtles and/or their eggs can be damaged by construction equipment. The intent is to install the fence and prevent this from happening.

- Invasive/exotic species can also be an issue with respect to recently disturbed sites. They can out-compete other native species. As such, the contractor's machinery should be cleaned according to the provincial protocols to prevent transportation of invasive/exotic species to and from the subject site[1]. If the equipment leaves the site, it should be cleaned prior to reentering the property.

- Considering construction of the proposed cottage will disrupt some of the treed vegetation within lands directly upgradient of Jack Lake and the unevaluated wetland, the property owner shall apply new vegetation to the disturbed areas as per the Healthy Shorelines Planting Guide by the Otonabee Region Conservation Authority (ORCA). The property owner should submit a plan that illustrates the vegetation types to be planted around the subject property to rehabilitate/ stabilize some of the damaged treed areas in the post construction era or target trees and shrubs in any blowdown areas on the subject property. If the property owner can avoid tree removal as much as possible, then the planting plan would be minimal. The planted vegetation's root balls/zones would become stabilizers preventing surficial sediments from eroding towards the lake/unevaluated wetland. It is in the best interest of the proponent and the lakeshore habitat to install the vegetation as per the planting guide, to somewhat naturalize any

[1] Clean Equipment Protocol for Industry - Inspecting and cleaning equipment for the purposes of invasive species prevention

disturbed areas around the building (if necessary). The tree and shrub stock could also be planted between the septic system and the shoreline of the unevaluated wetland as this would increase nutrient uptake and help with phosphorus reduction.

- The property owner can plant smaller seedling sized stock. These should be obtained from a reputable nursery as opposed to transplanting from the nearby woodland habitats. There are a variety of colourful native trees or shrubs that can be planted. ORE staff can provide recommendations in this regard. The plantings are simply a way to offset tree loss and maintain the overall biomass on the property, considering the property owner is developing closer to the lake on the point (~ 10 m - 33 ft). No additional tree removal is allowed within a few metres of the southern edge of the new cottage location. No vistas/tree removal are to be cut for views of the lake.

- Grass seed and/or sod should also be applied to any exposed/bare soils resulting from site preparation and construction activities, in addition to the recommended shrub/tree planting. The recommended shrub and/or tree plantings should be included on the Site Plan drawing/sketch. ORCA's Healthy Shorelines Planting Guide should be consulted again in this regard.

12.2 General Design Considerations

- The design/layout plan for the new build should demonstrate that the work can be completed within the confines of the u-shaped development footprint defined by the heavy-duty silt fence as illustrated on Figure 6 (Constraints). The site plan should illustrate which native trees and/or shrubs will be planted on-site within any open or disturbed areas on the property. The planted vegetation can become part of the landscaping plan, if one is proposed.

- All recommended erosion controls should be installed prior to commencing any work on the property, to ensure the sensitive hydrological features (lake and unevaluated wetland) are not impacted. The prescribed vegetation to be planted on the property will help stabilize the on-site soils and reduce shoreline erosion effects. Vegetation/seed/sod must be established on any/all bare soil areas at the end of the construction. The works cannot be considered complete until all surfaces are stable. The Site Plan/Sketch should illustrate how all surfaces/grades will be stabilized/finished.

- Passive stormwater management controls should be incorporated into the development design of the new roof area. Examples include roof leaders being directed to an area where the flows will not gouge or destabilize soils over time.

The warm flows from the roof leaders should be infiltrated into the ground, so as to reduce thermal impacts to Jack Lake and any offshore spawning areas. ORE expects the soils are sandy in the area of the proposed cottage building, therefore, it may be possible to outlet the roof leaders onto the grass/fill materials surface. Gravel can also be introduced at the end of the leaders (there are also plastic flow dissipaters that can be purchased at most hardware/landscaping retailers) to create an apron that dissipates the concentrated energy of the roof leader flows, distributing them over a larger area to enhance infiltration.

12.3 Construction Mitigation

- Proper erosion/sedimentation controls (ESC) will be required at all times while heavy equipment operates at the site. Heavy-duty silt fence (Appendix D) should be installed around the building envelope, as illustrated by Figure 6. Construction should not continue during heavy precipitation events. After these events, the fence should be checked to ensure their effectiveness.

- The heavy-duty silt fence provides a solution to mitigate sheet runoff, not concentrated flows. Therefore, if a concentrated flow results from construction (not anticipated), another type of erosion/sedimentation control, such as a rock check dam that incorporates stone and geotextile filter cloth to prevent sediment laden runoff from entering the sensitive watercourse features, should be utilized. The contractor or owner should illustrate any such interim or permanent ESC on their Site Plan. These types of concentrated flows ESC are unlikely necessary for this site due to the shallow grades, the only instance would be, if the property owner creates a concentrated flow condition due to fill placement and grading. The property owner should try to maintain the existing grades as much as possible and the more diffuse radial-type drainage in this area.

- Only clean fill should be imported to the site. The fill should not contain organic materials such as plant debris or topsoil that may contain exotic or invasive species that could out-compete native species along the lakeshore. If imported topsoil is required, screened topsoil should be the only material applied to top-dress the fill. Any imported materials that are stockpiled on-site should also be surrounded by heavy-duty silt fence until the materials are applied. The fence will prevent species such as turtles from leaving the lakeshore to nest within the loose unconsolidated materials during construction.

- To reduce potential post-construction sedimentation, the site should be quickly seeded or sodded to re-establish the root structure within the upper soils where areas have been disturbed and soils are exposed. Planting of native vegetation,

between the new cottage building and shoreline/wetland, is encouraged at this stage. Once the seeding or sodding is determined to be a success and the soils are stable, the erosion/sedimentation controls can be removed.

- Absolutely no construction equipment should be operated beyond heavy-duty silt fence limitation, nor should equipment grade any new swales or other drainage works on-site to direct water toward the lake. All equipment must remain within the area designated for construction (to be outlined by the heavy-duty silt fence).

12.4 Best Management Practices to Reduce Phosphorus Loadings

To reduce the potential for phosphorus migration in the subsurface, the proposed tile bed system should be constructed as far from the lake as is practical, while maintaining all required setbacks under the Ontario Building Code.

According to the development plan illustrated in Appendix A, the proposed tile bed system will be located as far from Jack Lake as allowable within the lot. The tile bed system will be located greater than 30 m from Jack Lake, however, will be located within 15 m of a wetland located east of the property. The wetland appears to be connected to Jack Lake. In this instance, the design and placement of the sewage system should consider phosphorus reduction.

With respect to reducing phosphorus inputs resulting from stormwater/runoff, best management practices should be implemented to help reduce the volume of runoff that enters the lake. This can be accomplished by implementing the following:

- Enhanced grass/water quality swales to capture site runoff;
- Soakaways or infiltration trenches to capture roof runoff;
- Sand/gravel driveways and walkways (as opposed to paved);
- Maintenance of a natural vegetation buffer between the development and Jack Lake, and planting of trees or shrubs if possible, and
- Limitation on, or omission of, lawn watering.

The following additional recommendations should be considered:

- Elimination of fertilizer use on lawn, and
- Use of phosphorus-free biodegradable soaps.

In addition to the above, there is evidence from historical soil testing in the north Hastings County area (conducted by the Ministry in the late 1970's) indicating that the natural granular soils have (on average) a high phosphorus retention capacity,

exceeding the Ministry's criterion of 6 mgP/100 g, above which, the phosphorus release to the lake is considered minimal.[2] Our review of surficial geology mapping for the Jack Lake area suggests similar geological conditions to that of north Hastings County. As such, we expect that the native soils will significantly attentuate phosphorus loadings from the private sewage system effluent as a result of their phosphorus retention capacity.

In the event that the materials encountered are not similar to the conditions observed in north Hastings County, it is recommended that all tile bed till materials utilized for the construction of the private sewage system be composed of soils that are verified to have a phosphorus retention capacity of at least 6 mgP/100 mg. If the supplier cannot provide verification, the source materials should be sampled and analysed under the direction of a Qualified Person. This requirement should be applied to bed till and mantle materials.

The above considerations should protect water quality in Jack Lake with respect to phosphorus exports from the development, and will address potential harmful algal blooms and improve the health of the lake

12.5 Closing Remarks

It is our opinion that the applicant should be granted the Rezoning and Building Permit for the purpose of constructing a new cottage residence with attached garage, provided the mitigation measures recommended herein are adhered to. The proponent should recognize that this *scoped* Environmental Impact Study provides recommendations pertaining only to natural environmental issues. Other issues related to Land Use Planning, servicing and/or Engineering may also need to be addressed with respect to any future application(s) and/or development plans.

If this development is approved, the property should be considered "at capacity" with respect to development and the environment. ORE staff have reviewed the site in the context of the proposed new cottage development plan and no additional floor space areas should be permitted beyond what is proposed in proponent's concept plan in Appendix A.

[2] D.F. Aikens; Ontario Ministry of the Environment; Phosphorus Retention Capability of Granular Soils on the Precambian Shield North of Kingston; 1976.

The proponent should obtain all required permits from the agencies prior to commencing any construction on-site. Failure to do so may result in delays and/or other liabilities.

End of *Scoped* EIS Report

Yours truly,
Oakridge Environmental Limited

Rob West, HBSc.
Senior Ecologist

Selected References

Argus, G.W. and K.M. Pryer. 1982-1987, *"Atlas of the Rare Vascular Plants of Ontario*". Four Parts. National Museum of Natural Sciences, Ottawa, Ontario.

Austen, M.J. et. al. 1995. "*Ontario Birds at Risk Program*". Federation of Ontario Naturalists and Long Point Observatory. 165 pp. OBAR website contacted September 2012.

Bezener.A. 2000. "*Birds of Ontario*".Lone Pine Publishing.. 376 pp.

Bakowsky, W., 1995. *"S-ranks for Southern Ontario Vegetation Communities".* OMNR, Natural Heritage Information Centre, Peterborough, ON. 11 pp.

Bellrose F.C. 1976. *"Ducks, Geese and Swans of North America".* Stackpole Books

Cadman, M.D. et. al., 1987, *"Atlas of Breeding Birds of Ontario"*, OBBA website contacted September 2012.

Cheskey, E.D. 1995. *"Towards Conserving Birds of Ontario*". Federation of Ontario Naturalists. 48 pp.

Gill F.B. 2007. *"Ornithology - Third Edition".* National Audobon Society, W.H. Freeman and Company.

Jones et. al. 2008. "*The Dragonflies and Damselfies of Algonquin Park and the Surrounding Area.*" The Friends of Algonquin Park. 263 pp.

Habib, L., Bayne, E. M. & Boutin, S. *"Chronic Industrial Noise Affects Pairing Success and Age Structure of Ovenbirds Seiurus Aurocapilla*." Journal of Applied Ecology 44 (2007): 176-84.

Holmes et. al. 1991. "*The Ontario Butterfly Atlas".* Toronto Entomologists Association, Toronto, Ontario.

Holmgren, Noel H., "*Manual of Vascular Plants of Northeastern United States and Adjacent Canada - Second Edition* ", The New York Botanical Garden, 1998.

Lee, H.D. et. al.. 1998. *Ecological Land Classification for Southern Ontario -First Approximation and it's Application - SCSS FieldGuide; FG-02*. OMNR, North Bay, Ontario.

McCracken, J.D., R.A. Reid, R.B. Renfrew, B. Frei, J.V. Jalava, A. Cowie, and A.R. Couturier. 2013. Recovery Strategy for the Bobolink (Dolichonyx oryzivorus) and Eastern Meadowlark (Sturnella magna) in Ontario. Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources, Peterborough, Ontario. viii + 88 pp.

Newcomb, L., "Nerwcomb's Wildflower Guide". Little Brown and Company(Canada) Limited, 1977.

Oldham, M.J., 1996, "*Natural Heritage Resources of Ontario, Amphibians and Reptiles"* **,**Ontario Herpetofaunal Survey (OHS),, 1996, OHS website contacted August 2012..

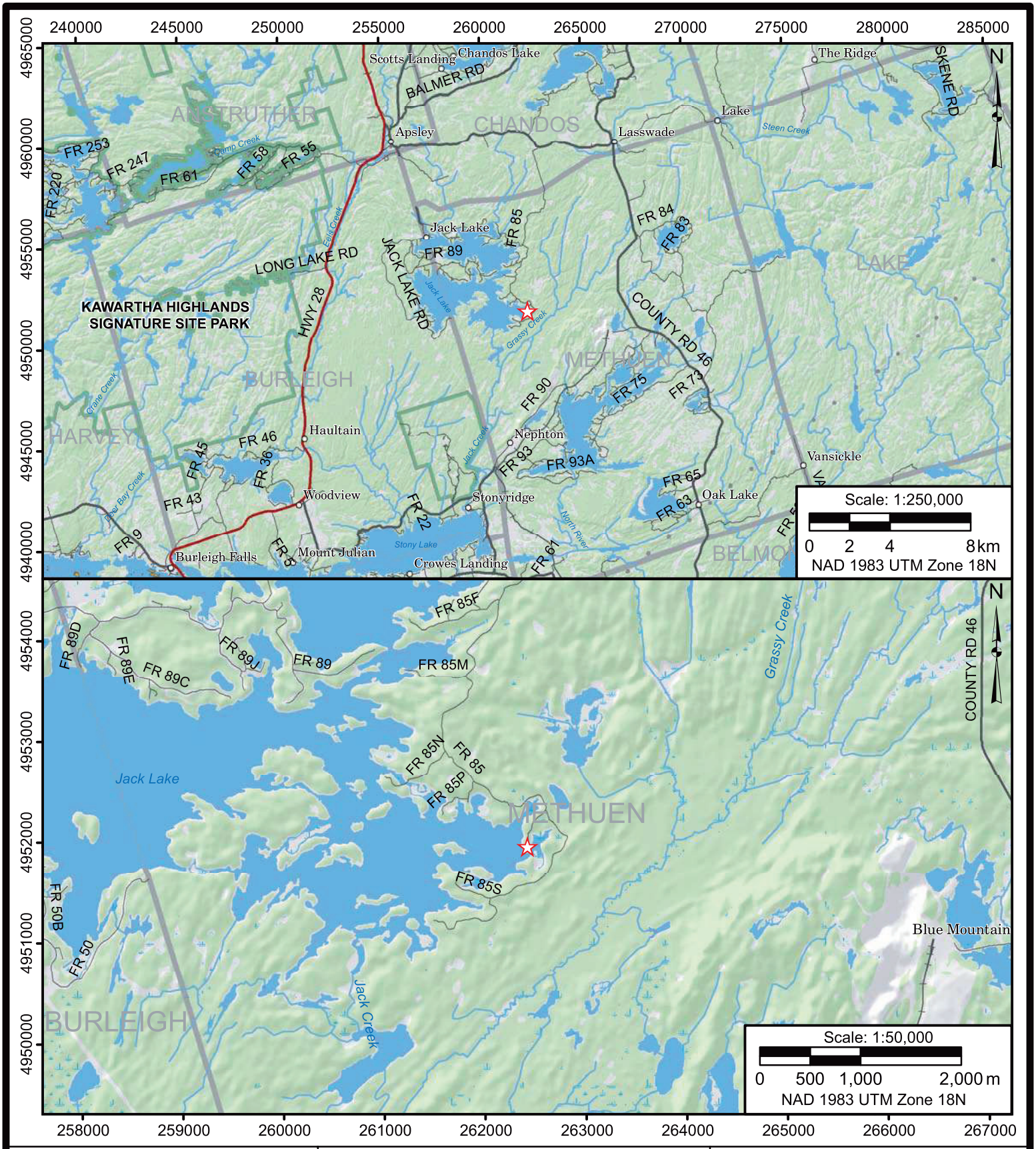
Peck G.K. & James R.D. 1983, "*Breeding Birds of Ontario Nidiology and Distribution Volume 1 : Nonpasserines and Volume 2: Passerines"*. Royal Ontario Museum, Toronto.

Royal Ontario Museum. 2009. "*Species at Risk*." ROM website contacted September 2012.

Sibley, D.A. 2003, "*The Sibley Field Guide to Birds of Eastern North America*". New York: Alfred A. Knopf.

Voss, Edward G., "*Michigan Flora - Part I to Part III*"; Cranbrook Institute of Science Bulletin 55 and The University of Michigan Herbarium, 1972.

Figures



☆ Approximate Site Location

Notes: Base maps provided by Land Information Ontario and Natural Resources Canada (2023)

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***Scoped* Environmental Impact Study (sEIS)**
Proposed Cottage Rebuild
56 Fire Route 85R, Jack Lake
Part Lot 23, Concession 8 (Methuen)
Township of Havelock-Belmont-Methuen,
County of Peterborough

North American Datum (NAD) 1983

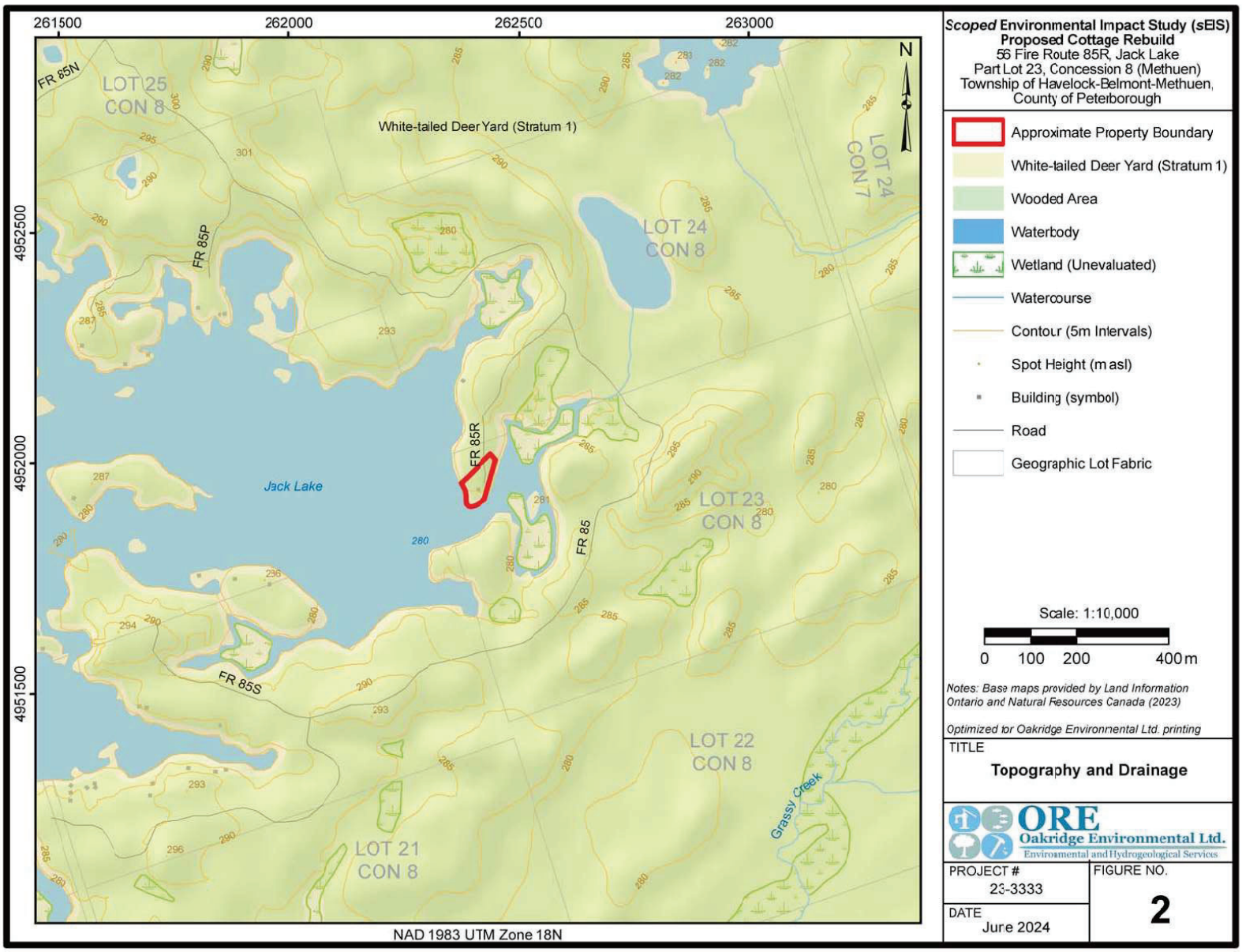
TITLE
General Location

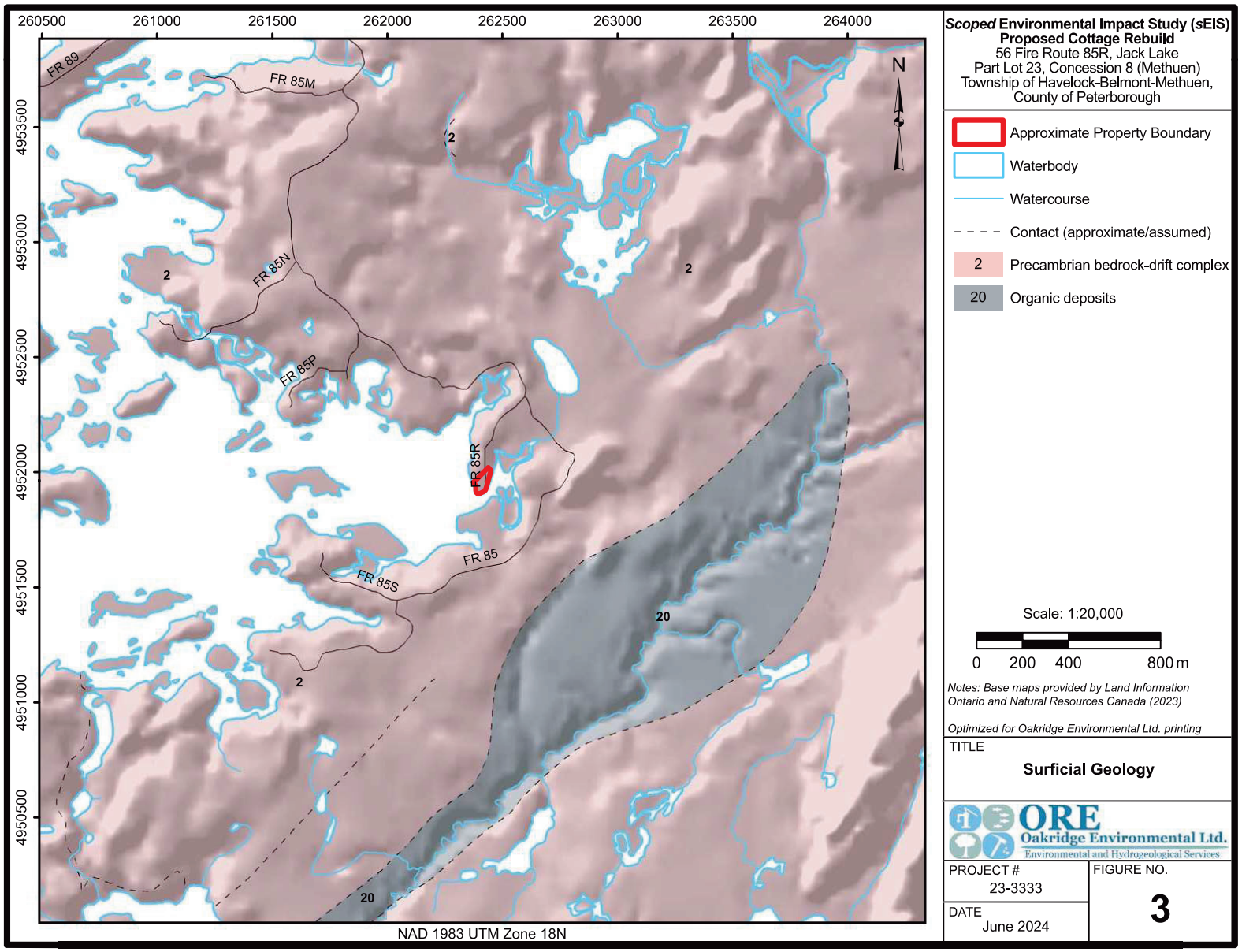
ORE Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

PROJECT # 23-3333

DATE June 2024

FIGURE NO. **1**


261500
262000
262500
263000
4952500
4952000
4951500
N
FR 85N
LOT 25
CON 8
White-tailed Deer Yard (Stratum 1)
LOT 24
CON 7
FR 85P
LOT 24
CON 8
Jack Lake
FR 85R
FR 85
LOT 23
CON 8
FR 85S
LOT 22
CON 8
Grassy Creek
LOT 21
CON 8
NAD 1983 UTM Zone 18N
Scoped Environmental Impact Study (sEIS)
Proposed Cottage Rebuild
56 Fire Route 85R, Jack Lake
Part Lot 23, Concession 8 (Methuen)
Township of Havelock-Belmont-Methuen,
County of Peterborough
Approximate Property Boundary
White-tailed Deer Yard (Stratum 1)
Wooded Area
Waterbody
Wetland (Unevaluated)
Watercourse
Contour (5m Intervals)
Spot Height (m asl)
Building (symbol)
Road
Geographic Lot Fabric
Scale: 1:10,000
0 100 200 400 m
Notes: Base maps provided by Land Information Ontario and Natural Resources Canada (2023)
Optimized for Oakridge Environmental Ltd. printing
TITLE
Topography and Drainage
ORE
Oakridge Environmental Ltd.
Environmental and Hydrogeological Services
PROJECT #
23-3333
FIGURE NO.
2
DATE
June 2024



***Scoped* Environmental Impact Study (*s*EIS)**
Proposed Cottage Rebuild
56 Fire Route 85R, Jack Lake
Part Lot 23, Concession 8 (Methuen)
Township of Havelock-Belmont-Methuen,
County of Peterborough

- Approximate Property Boundary
- Waterbody
- Watercourse
- Contact (approximate/assumed)
- 2 — Precambrian bedrock-drift complex
- 20 — Organic deposits

Scale: 1:20,000

0 200 400 800 m

Notes: Base maps provided by Land Information Ontario and Natural Resources Canada (2023)

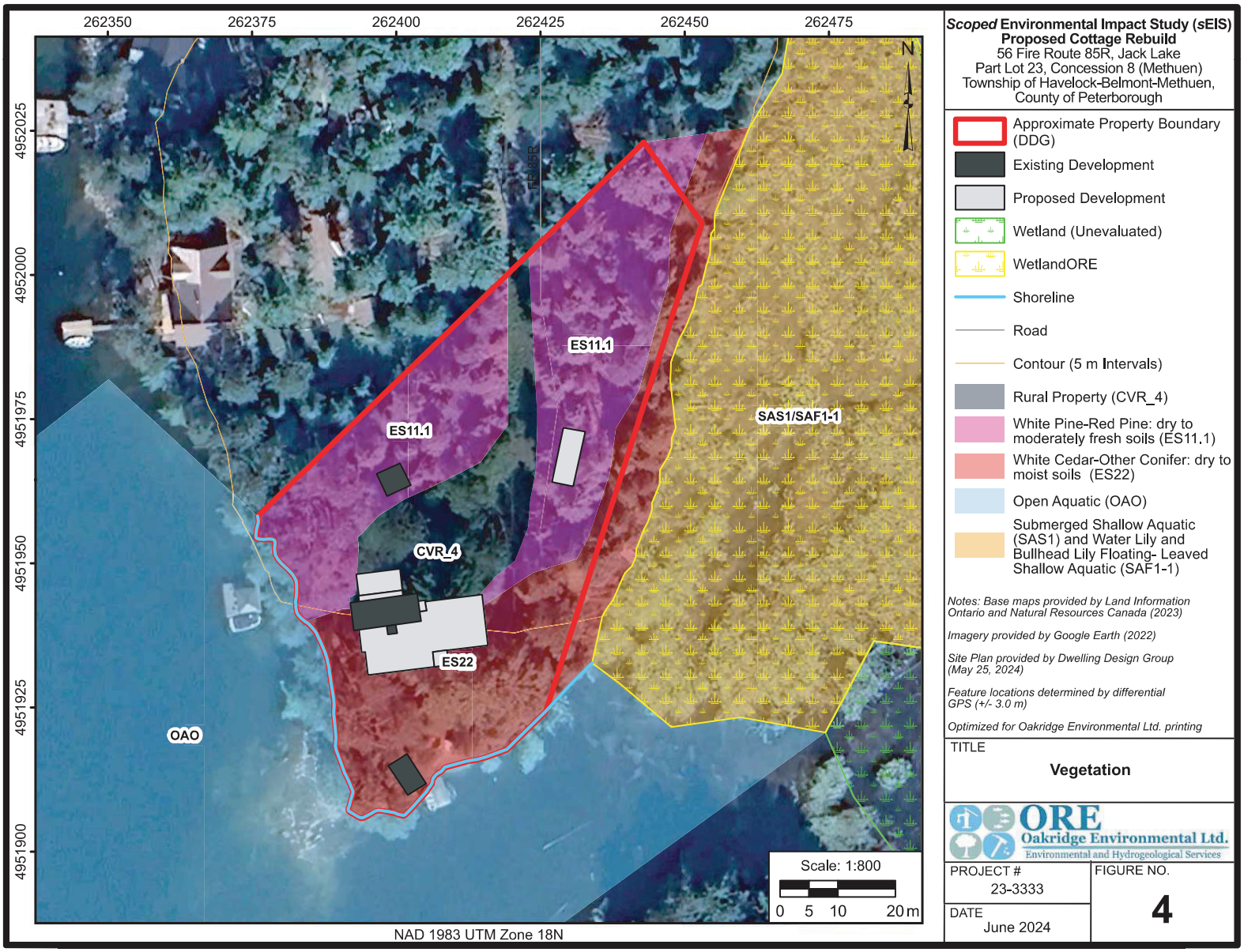
Optimized for Oakridge Environmental Ltd. printing

TITLE

Surficial Geology

ORE Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

PROJECT #	FIGURE NO.
23-3333	**3**
DATE	
June 2024	



***Scoped* Environmental Impact Study (sEIS)**
Proposed Cottage Rebuild
56 Fire Route 85R, Jack Lake
Part Lot 23, Concession 8 (Methuen)
Township of Havelock-Belmont-Methuen,
County of Peterborough

- Approximate Property Boundary (DDG)
- Existing Development
- Proposed Development
- Wetland (Unevaluated)
- WetlandORE
- Shoreline
- Road
- Contour (5 m Intervals)
- Rural Property (CVR_4)
- White Pine-Red Pine: dry to moderately fresh soils (ES11.1)
- White Cedar-Other Conifer: dry to moist soils (ES22)
- Open Aquatic (OAO)
- Submerged Shallow Aquatic (SAS1) and Water Lily and Bullhead Lily Floating- Leaved Shallow Aquatic (SAF1-1)

Notes: Base maps provided by Land Information Ontario and Natural Resources Canada (2023)

Imagery provided by Google Earth (2022)

Site Plan provided by Dwelling Design Group (May 25, 2024)

Feature locations determined by differential GPS (+/- 3.0 m)

Optimized for Oakridge Environmental Ltd. printing

TITLE

Vegetation

ORE Oakridge Environmental Ltd.
Environmental and Hydrogeological Services

PROJECT #	FIGURE NO.
23-3333	4
DATE	
June 2024	

Photo A (Above): was taken looking west towards the offshore open water habitat of Jack Lake.

Photo B (Above): was taken looking south along the bedrock-lined shoreline towards the small embayment opening (just beyond the point in the background) that corresponds to the unevaluated wetland in the following photos.

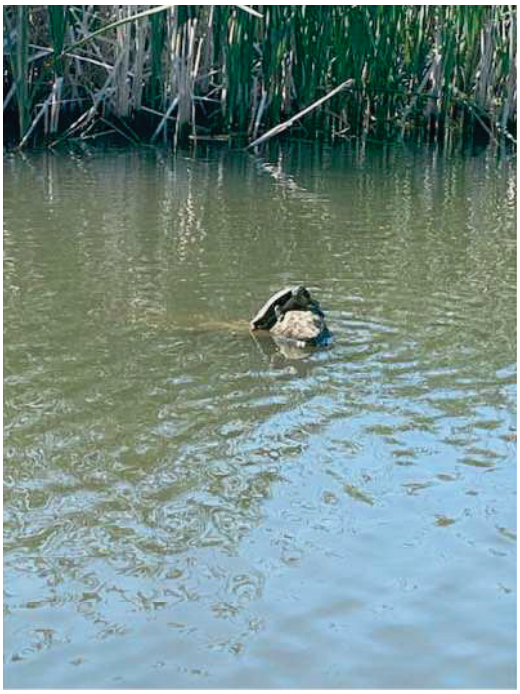


Photo C (Above): was taken looking south across the bay of the unevaluated wetland feature and is of a Common Painted Turtle sitting atop a log. There were several down logs/floating logs that contained Common Painted Turtle in the unevaluated wetland habitat. None were encountered on the subject site's shore.

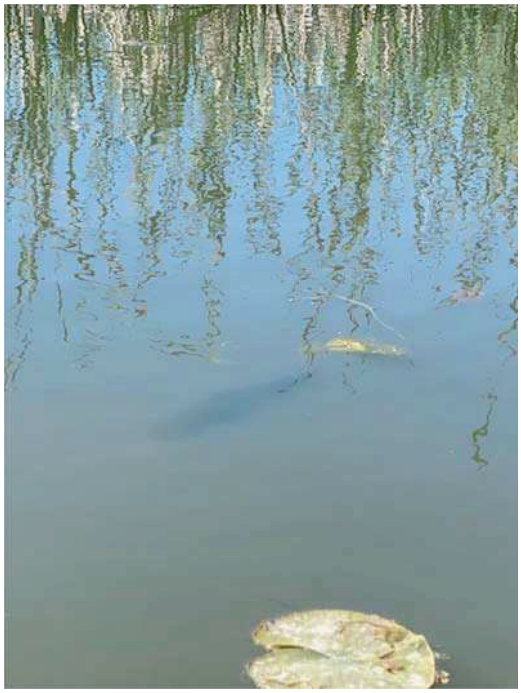
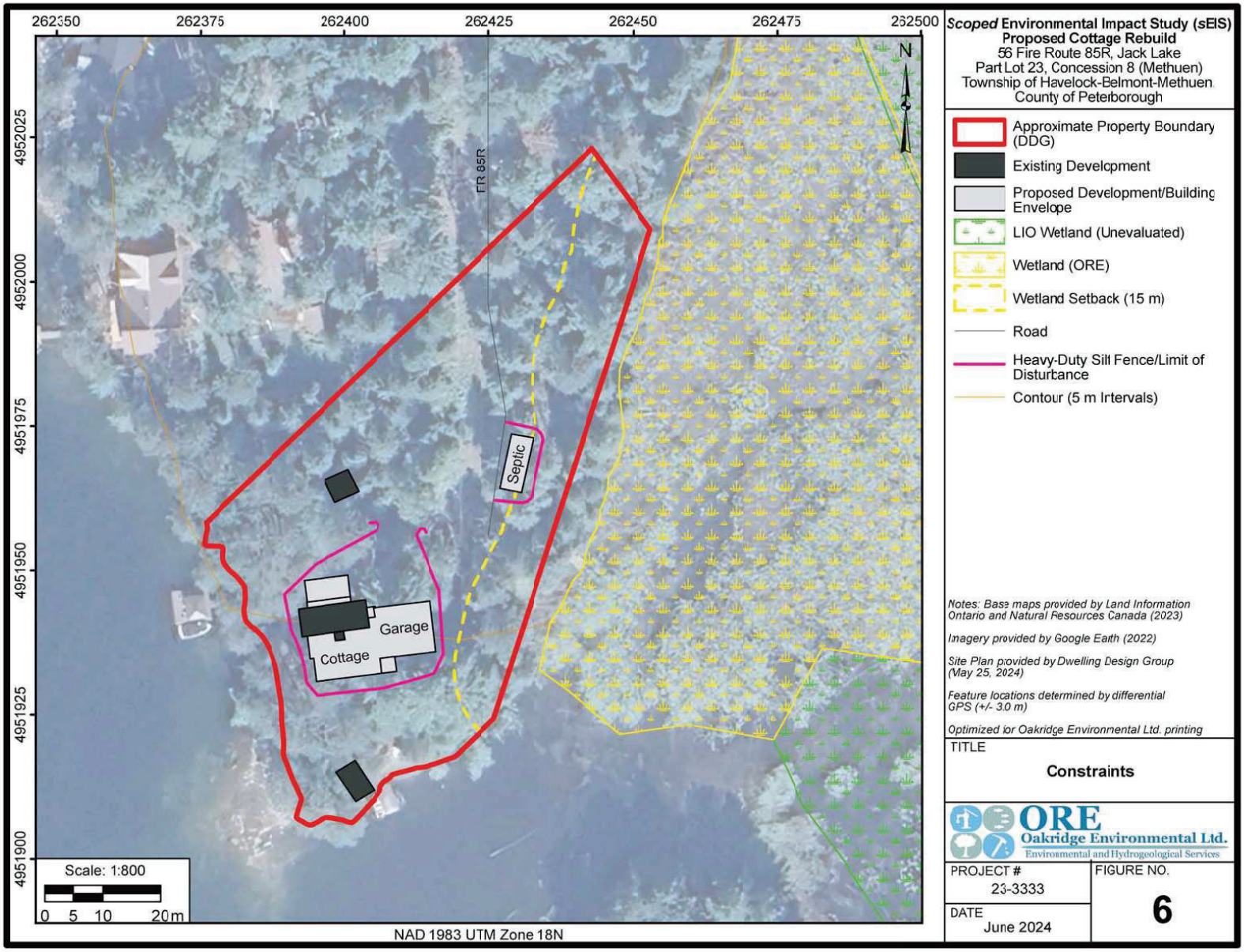


Photo D (Above): was taken in the unevaluated wetland embayment and is of a Brown Bullhead (*Ameiurus nebulosus*) near the surface of the open water component of the unevaluated wetland.

	***Scoped* Environmental Impact Study (*s*EIS)** **Proposed Cottage Rebuild** 56 Fire Route 85R, Jack Lake Part Lot 23, Concession 8 (Methuen) Township of Havelock-Belmont-Methuen, County of Peterborough	TITLE **Site Photos**	
Photos Taken: September 22, 2023	ORE Oakridge Environmental Ltd.	PROJECT # 23-3333	FIGURE NO. **5**
Optimized for Oakridge Environmental Ltd. printing		DATE June 2024	


262350
262375
262400
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262500
4952025
4952000
4951975
4951950
4951925
4951900
N
FR 85R
Septic
Garage
Cottage
Scale: 1:800
0 5 10 20m
NAD 1983 UTM Zone 18N
Scoped Environmental Impact Study (sEIS)
Proposed Cottage Rebuild
56 Fire Route 85R, Jack Lake
Part Lot 23, Concession 8 (Methuen)
Township of Havelock-Belmont-Methuen
County of Peterborough
Approximate Property Boundary (DDG)
Existing Development
Proposed Development/Building Envelope
LIO Wetland (Unevaluated)
Wetland (ORE)
Wetland Setback (15 m)
Road
Heavy-Duty Silt Fence/Limit of Disturbance
Contour (5 m Intervals)
Notes: Base maps provided by Land Information Ontario and Natural Resources Canada (2023)
Imagery provided by Google Earth (2022)
Site Plan provided by Dwelling Design Group (May 25, 2024)
Feature locations determined by differential GPS (+/- 3.0 m)
Optimized for Oakridge Environmental Ltd. printing
TITLE
Constraints
ORE
Oakridge Environmental Ltd.
Environmental and Hydrogeological Services
PROJECT #
23-3333
FIGURE NO.
6
DATE
June 2024

Appendix A

Conceptual Development Plan

Contractor shall check and verify all dimensions and site conditions before proceeding with construction. Any discrepancies shall be reported to Dwelling Design Group prior to commencement of work.

Dwelling Design Group is not responsible for the accuracy of the survey, engineering or other consultant information outside of Dwelling Design Group shown on these drawings or for construction started prior to the issuance of a building permit.

Some items may be shown on these drawings to help visualize design and layout. They are not necessarily part of or included in this design

Date	Revision Note

AREAS

FIRST FLOOR	1566 sqft.
SECOND FLOOR	1154 sqft.
UNFIN. STORAGE	914 sqft.
GARAGE	906 sqft.
PORCH	216 sqft.
SCREEN	223 sqft.

DWELLING DESIGN GROUP

p: 705-875-0123
e: ddgroupstudio@gmail.com
www.dwellingdesigngroup.ca

I review and take responsibility for the design work and am qualified as per 3.2.5.1. division c of the o.b.c.

LOT COVERAGE	AREAS	//PERCENT
LOT AREA	45,850 sq.ft.	100%
EXISTING		
COTTAGE	630 sq.ft.	1.37%
DECKS/PORCHES	0 sq.ft.	0%
ACCESSORY	668 sq.ft.	1.46%
TOTAL ALL BLDGS	1,298 sq.ft.	2.83%
PROPOSED		
COTTAGE	2,472 sq.ft.	5.39%
DECKS/PORCHES	438 sq.ft.	0.95%
ACCESSORY	668 sq.ft.	1.46%
TOTAL ALL BLDGS	3,578 sq.ft.	7.80%

Adam Leggett BCIN #38948
Dwelling Design Group BCIN #124594

Client: Cousins Cottage

Location: 56 Fire Route 85R, Jack Lake, Apsley

Date	May 25 2024
Scale	1"=15'-0"
Project No.	22-013

SP

Print Date: May 25, 2024

Appendix B

SAR Database Excerpts

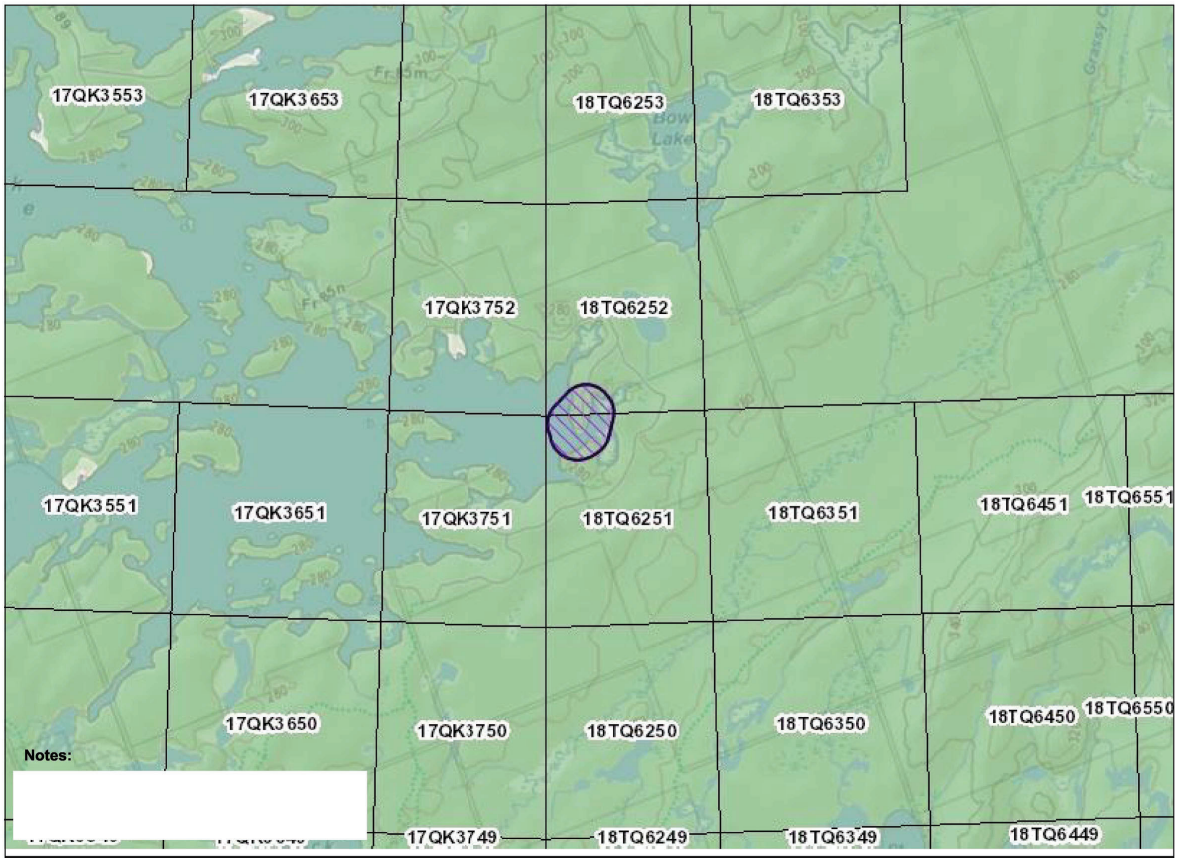
Ontario

Ministry of Natural Resources and Forestry

Make-a-Map: Natural Heritage Areas

NHIC Map

Map created:9/19/2023



Notes:

Legend

- NHIC 1 Km Grid
- ANSI
- Earth Science Provincially Significant/sciences de la terre d'importance provinciale
- Earth Science Regionally Significant/sciences de la terre d'importance régionale
- Life Science Provincially Significant/sciences de la vie d'inportance provinciale
- Life Science Regionally Significant/sciences de la vie d'inportance régionale
- Conservation Reserve
- Provincial Park
- Natural Heritage System

1.3 0 0.65 1.3 Kilometres

Absence of a feature in the map does not mean they do not exist in this area.

This map should not be relied on as a precise indicator of routes or locations, nor as a guide to navigation. The Ontario Ministry of Natural Resources and Forestry(OMNRF) shall not be liable in any way for the use of, or reliance upon, this map or any information on this map.

NHIC Data

To work further with this data select the content and copy it into your own word or excel documents.

OGF ID	Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	ATLAS NAD83 IDENT	COMMENTS
1067568	SPECIES	Midland Painted Turtle	Chrysemys picta marginata	S4		SC	18TQ6252	
1067568	SPECIES	Eastern Wood-pewee	Contopus virens	S4B	SC	SC	18TQ6252	
1067568	SPECIES	Snapping Turtle	Chelydra serpentina	S4	SC	SC	18TQ6252	
1067568	RESTRICTED SPECIES	RESTRICTED SPECIES	RESTRICTED SPECIES				18TQ6252	
1067567	WILDLIFE CONCENTRATION AREA	Colonial Waterbird Nesting Area		SNR			18TQ6251	
1067567	SPECIES	Snapping Turtle	Chelydra serpentina	S4	SC	SC	18TQ6251	
1067567	RESTRICTED SPECIES	RESTRICTED SPECIES	RESTRICTED SPECIES				18TQ6251	
1067567	SPECIES	Blanding's Turtle	Emydoidea blandingii	S3	THR	END	18TQ6251	

BIRDS CANADA
OISEAUX CANADA

Square Summary (17TQK35) [change]

	#species				#hours		#pc done	
	poss	prob	conf	total	total	peak	road	offrd
Curr.	24	43	27	94	44.4	26.1	30	0
Prev.	28	25	45	98	63.7	—	25	

Region summary (#16: Peterborough, ON)

#squares	#sq with data	#species	#squares (pc)	
			target	compl.
60	60	167	60	29
60	60	185	0	60

Target number of point counts in this square: 25 in total: 20 road side, 5 off road (Broadleaf Forest in 1, Coniferous Forest in 1, Mixed Forest in 3). Please try to ensure that each off-road station is located such that the entire 100m radius circle is within the prescribed habitat.**Predef. completed:** [01, 02, 03, 04, 05, 06, 07, 08, 09, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 27, 31, 33, 34, 39]

SPECIES	Prev.	Code	%
Canada Goose	FY		83
Mute Swan ‡			3
Trumpeter Swan			28
Wood Duck	NU	FY	81
Blue-winged Teal ‡	H		10
Northern Shoveler ‡			0
Gadwall ‡			0
American Wigeon ‡			0
Mallard	NY	H	85
American Black Duck	NE		6
Northern Pintail ‡			0
Green-winged Teal ‡			0
Redhead †			0
Ring-necked Duck	T	P	26
Lesser Scaup ‡			0
Hooded Merganser	AE	FY	63
Common Merganser ‡		H	23
Ruddy Duck ‡			0
Wild Turkey			93
Ruffed Grouse	FY	A	85
Ring-necked Pheasant ‡			0
Pied-billed Grebe		S	25
Rock Pigeon (Feral Pigeon)	AE		53
Mourning Dove	D	T	86
Yellow-billed Cuckoo			51
Black-billed Cuckoo	S	T	73
Common Nighthawk §	H		28
Eastern Whip-poor-will §	T		41
Chimney Swift ‡			11
Ruby-throated Hummingbird	FY	D	80
Virginia Rail		FY	66
Sora			21
Common Gallinule ‡			13

SPECIES	Prev.	Code	%
American Coot ‡			1
Sandhill Crane ‡			38
Killdeer §	FY		55
Upland Sandpiper †			15
American Woodcock	H	S	56
Wilson's Snipe	S	S	48
Spotted Sandpiper			46
Ring-billed Gull § ‡			1
Herring Gull §			31
Caspian Tern ‡			0
Black Tern †			1
Common Tern § ‡			0
Common Loon	FY	T	76
Double-crested Cormorant § ‡			5
American Bittern	T	S	70
Least Bittern †		S	31
Great Blue Heron §	H	NY	66
Green Heron §			48
Turkey Vulture	H	H	88
Osprey	NY	NY	56
Northern Harrier			26
Sharp-shinned Hawk	H		26
Cooper's Hawk			21
Northern Goshawk ‡	H		6
Bald Eagle ‡			11
Red-shouldered Hawk	FY	D	40
Broad-winged Hawk	AE	T	86
Red-tailed Hawk		H	50
Eastern Screech-Owl			11
Great Horned Owl ‡			21
Barred Owl	T	NY	45
Long-eared Owl ‡			6
Short-eared Owl †			0

SPECIES	Prev.	Code	%
Northern Saw-whet Owl			6
Belted Kingfisher	H	H	88
Yellow-bellied Sapsucker	FY	T	98
Red-headed Woodpecker †			15
Red-bellied Woodpecker			38
Black-backed Woodpecker ‡			3
Downy Woodpecker	FY	P	85
Hairy Woodpecker	FY	T	91
Pileated Woodpecker	N	FY	96
Northern Flicker	FY	T	95
American Kestrel §			51
Merlin		NY	51
Peregrine Falcon ‡			1
Olive-sided Flycatcher ‡	S	S	10
Eastern Wood-Pewee §	FY	T	100
Yellow-bellied Flycatcher ‡			0
Acadian Flycatcher ‡	S		0
Alder Flycatcher	S	T	93
Willow Flycatcher		S	38
Least Flycatcher	S	T	91
Eastern Phoebe	NE	T	100
Great Crested Flycatcher	FY	T	100
Eastern Kingbird	P	AE	91
Yellow-throated Vireo			40
Blue-headed Vireo	S	T	80
Philadelphia Vireo ‡			0
Warbling Vireo	S	S	75
Red-eyed Vireo	FY	CF	100
Loggerhead Shrike †			0
Canada Jay ‡			3
Blue Jay	FY	T	100
American Crow	FY	T	96
Common Raven	FY	FY	93

SPECIES	Prev.	Code	%
Black-capped Chickadee	AE	CF	100
Boreal Chickadee ‡			0
Horned Lark ‡			8
Northern Rough-winged Swallow			20
Purple Martin ‡			5
Tree Swallow	NY	H	83
Bank Swallow §			16
Barn Swallow §	NY	NB	76
Cliff Swallow §	FY		18
Ruby-crowned Kinglet ‡			0
Golden-crowned Kinglet	S	FY	40
Red-breasted Nuthatch	FY	FY	95
White-breasted Nuthatch	FY	T	88
Brown Creeper	S	S	75
Blue-gray Gnatcatcher ‡			3
House Wren	NY	A	81
Winter Wren	T	T	98
Sedge Wren ‡			10
Marsh Wren		T	48
Carolina Wren ‡			5
European Starling	CF		81
Gray Catbird	NY	T	85
Brown Thrasher	S	S	76
Northern Mockingbird ‡			3
Eastern Bluebird			56
Veery	A	A	100
Swainson's Thrush			21
Hermit Thrush	FY	NE	83
Wood Thrush §	S	S	88
American Robin	CF	NY	98
Cedar Waxwing	P	P	93
House Sparrow			38
Evening Grosbeak ‡	T		1

SPECIES	Prev.	Code	%
House Finch			20
Purple Finch	FY	T	98
Red Crossbill ‡		H	23
White-winged Crossbill ‡	P		3
Pine Siskin ‡		H	30
American Goldfinch	FY	T	95
Grasshopper Sparrow §			23
Chipping Sparrow	CF	NE	96
Clay-colored Sparrow ‡			18
Field Sparrow §			65
Dark-eyed Junco ‡	P		3
White-throated Sparrow	A	FY	98
Vesper Sparrow			33
Savannah Sparrow			58
Song Sparrow	CF	NE	100
Lincoln's Sparrow ‡	A	T	5
Swamp Sparrow	T	CF	100
Eastern Towhee §			53
Bobolink §			51
Eastern Meadowlark §			58
Orchard Oriole ‡			5
Baltimore Oriole	H	S	75
Red-winged Blackbird	CF	CF	100
Brown-headed Cowbird	P	S	68
Common Grackle	CF	CF	100
Ovenbird	T	A	100
Northern Waterthrush	S	T	95
Golden-winged Warbler †			23
Blue-winged Warbler ‡			11
Black-and-white Warbler	P	T	96
Tennessee Warbler ‡			0
Nashville Warbler	CF	T	91
Mourning Warbler	S	S	76

SPECIES	Prev.	Code	%
Common Yellowthroat	CF	CF	100
Hooded Warbler ‡			0
American Redstart	FY	CF	98
Cape May Warbler ‡			0
Cerulean Warbler †			3
Northern Parula ‡		S	26
Magnolia Warbler	S	T	75
Bay-breasted Warbler ‡			0
Blackburnian Warbler	CF	T	73
Yellow Warbler	A	D	85
Chestnut-sided Warbler	S	CF	95
Black-throated Blue Warbler	S	T	61
Pine Warbler	T	T	96
Yellow-rumped Warbler	P	T	86
Prairie Warbler †			0
Black-throated Green Warbler	S	FY	93
Canada Warbler §	S	S	66
Scarlet Tanager	A	T	95
Northern Cardinal			51
Rose-breasted Grosbeak	T	T	100
Indigo Bunting	T	T	95

This list includes all breeding species expected in the region #16 (Peterborough). Underlined species are those that you should try to add to this square (17TQK35). They have not yet been reported in this square, but have been reported in more than 50% of the squares in this region so far. "Prev." is the code for the highest breeding evidence for that species in square 17TQK35 in the previous atlas. "Code" is the code for the highest breeding evidence for that species in square 17TQK35 over the last 5 years. The % columns give the percentage of squares in that region where that species was reported (this gives an idea of the expected chance of finding that species in region #16). Rare/Colonial Species Report Forms should be completed for species marked: § (Species of interest), ‡ (regionally rare), † (provincially rare). An up-to-date version of this sheet is available from https://naturecounts.ca//nc//atlas/squaresummaryform.jsp?squareID=17TQK35&lang=EN Data current as of **18/09/2023 22:03**.

Birds

Barn Swallow (*Hirundo rustica*) is listed as "Special Concern" by SARO and is not protected under the ESA. The Barn Swallow inhabits open-rural and urban sites where buildings are situated near watercourses. Nesting is typically sporadic within loose colonies on building structures, bridges and other suitable overhanging structures. The cup-like mud nest is adhered to areas beneath the roof of the structure to conceal the nest from predators and keep it dry. The Barn Swallow feeds on insects by catching them on the wing.

Bobolink (*Dolichonyx oryzivorus*) is listed as "Threatened" by SARO and is protected under the ESA. The Bobolink prefers large tracts of tallgrass areas, either true prairies or hay fields, as it forages low to the ground in search of larvae and seeds.

Canada Warbler (*Cardellina canadensis*) is listed as "Special Concern" by SARO, and is not protected under the ESA. It prefers large tracts of mixed forests on bottomlands within wetlands or drainage courses. The species nests within the upper extremities of the canopy in deciduous and coniferous trees. The Canada Warbler feeds on beetles, caterpillars and common insects. Typically, this species prefers creeks and mixed forests with a coniferous edge along a moving creek, tributary or river system.

Common Nighthawk (*Chordeiles minor*) is listed as "Special Concern" by SARO, and is not protected under the ESA. The Common Nighthawk is part of the Nightjar family which prefers forest openings, bogs and sometimes open field/meadow areas. Nesting is on bare ground where both adults feed the young. Feeding can take place during day or night, while the species constantly forages for all types of insects.

Eastern Meadowlark (*Sturnella magna*) is listed as "Threatened" by SARO and is protected under the ESA. The Eastern Meadowlark is similar to Bobolink, as this species also prefers large tracts of agricultural fields or tallgrass prairies to nest within. Eastern Meadowlark is a ground nester, thus requires the tall grass to conceal its nest and eggs. Feeding includes beetles, crickets and spiders.

Eastern Whip-poor-will (*Anthrostomus vociferus*) is listed as "Threatened" by SARO and is protected under the ESA. The Whip-poor-will prefers a combination of large natural tracts of secondary succession forest, watercourses and edge habitat consisting of meadow areas, with open deciduous and pine woodlands. The Whip-poor-will does not construct a nest, but rather uses the soft leaf litter on the ground to form a nest and lay the eggs directly on the ground. The Whip-poor-will is a nighttime hunter, calling its own name while searching for large flying insects, beetles, moths, mosquitos and sometimes grasshoppers. The Whip-poor-will often

choose pine species adjacent to waterways to call from.

Eastern Wood-Pewee (*Contopus virens*) is listed as “Special Concern” by SARO and is not protected under the ESA. This species prefers mixed deciduous and coniferous woodlands which are open or considered edge habitat. Nesting occurs on a tree branch as the species catches insects from a perch.

Evening Grosbeak (*Coccothraustes vespertinus*) is listed as “Special Concern” by SARO and is not protected under the ESA. During the breeding season, Evening Grosbeak is generally found in open, mature mixed-wood forests dominated by fir species, White Spruce and/or Trembling Aspen. Its abundance is strongly linked to the cycle of its primary prey, the Spruce Budworm. Outside the breeding season, the species depends mostly on seed crops.

Least Bittern (*Ixobrychus exilis*) is listed as "Threatened" by SARO and is protected under the ESA. The Least Bittern inhabits freshwater marshes where tall, impenetrable stands of emergent vegetation are utilized for coverage. The Least Bittern may build up a hunting platform in search of small fish, insects, and amphibians.

Olive-sided Flylcatcher (*Contopus cooperi*) is listed as “Special Concern” by SARO and is not protected under the ESA. This species is typically found within natural forest edges and openings. Its preferred habitat is within coniferous or mixed forests adjacent to rivers or wetlands. It likes to inhabit conifers such as White/Black Spruce, Jack Pine, and Balsam Fir.

Wood Thrush (*Hylocichia mustelina*) is listed as “Special Concern” by SARO and is not protected under the ESA. The Wood Thrush enjoys relatively undisturbed, mature woodlands. Nesting occurs low in the fork of a tree as this species forages for berries and insects at ground level. Similar to the Eastern Wood-Pewee, this species prefers large tracts of woodland.

Amphibians & Reptiles

Blanding’s Turtle (*Emydoidea blandingii*) is listed as “Threatened” by SARO and is protected under the ESA. It tends to inhabit shallow waters within large wetlands or shallow lakes that have lots of aquatic plants. However, they have been known to travel hundreds of metres from a main body of water for nesting or mating. This species is most easily identified by its bright yellow throat and chin.

Common Five-lined Skink (Southern Shield Population) (*Plestiodon fasciatus*) is listed as “Special Concern” by SARO and is not protected under the ESA. This species of lizard basks on sunny rocks and logs to maintain a preferred body temperature (28 - 36°C). During the winter, they hibernate in crevices among rocks

or buried in the soil. The Southern Shield population can be found underneath rocks on open bedrock in forests.

Midland Painted Turtle (*Chrysemys picta marginata*) is listed as "Special Concern" by COSEWIC and is currently under review by COSSARO. Midland Painted Turtles spend the majority of their lives in water. They prefer shallow water with aquatic vegetation, soft mud, and leaf litter at the bottom. Typically found basking on logs, rocks, and shorelines in sunlight. Midland Painted Turtles nest between mid-spring and early summer. They tend to choose gravely, sandy and loam soils for nesting.

Snapping Turtle (*Chelydra serpentina*) is listed as "Special Concern" by SARO and is not protected under the ESA. Snapping Turtles spend most of their lives in water. They prefer shallow waters so they can hide under the soft mud and leaf litter, with only their noses exposed to the surface to breathe. During the nesting season, from early to mid summer, females travel overland in search of a suitable nesting site, usually gravelly or sandy areas along streams. Snapping Turtles often take advantage of man-made structures for nest sites, including roads (especially gravel shoulders), dam and aggregate pits.

Appendix C

Species List

Species List

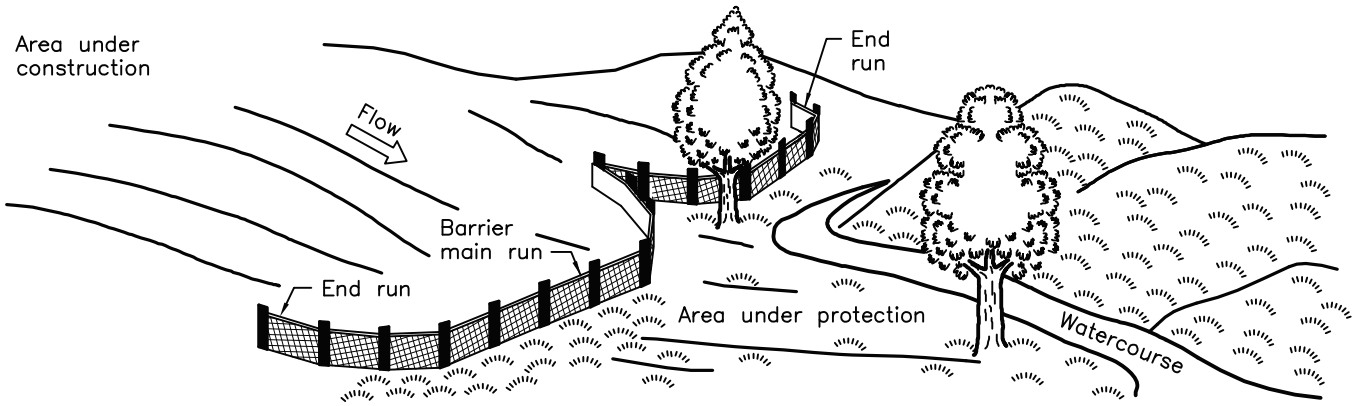
KINGDOM	Common Name	Scientific Name	SARO	SARA
Animalia				
	American Bullfrog	Lithobates catesbeianus		
	American Crow	Corvus brachyrhynchos		
	American Robin	Turdus migratorius		
	Black-capped Chickadee	Poecile atricapillus		
	Blue Jay	Cyanocitta cristata		
	Bluegill	Lepomis macrochirus		
	Brown-headed Cowbird	Molothrus ater		
	Common Grackle	Quiscalus quiscula		
	Common Loon	Gavia immer	NAR	
	Eastern Chipmunk	Tamias striatus		
	Eastern Kingbird	Tyrannus tyrannus		
	Gray Catbird	Dumetella carolinensis		
	Northern Cardinal	Cardinalis cardinalis		
	Northern Flicker	Colaptes auratus		
	Northern Raccoon	Procyon lotor		
	Painted Turtle	Chrysemys picta		
	Red-winged Blackbird	Agelaius phoeniceus		
	Song Sparrow	Melospiza melodia		
	Swamp Sparrow	Melospiza georgiana		
	Turkey Vulture	Cathartes aura		
	Veery	Catharus fuscescens		
	Yellow Warbler	Setophaga petechia		
	Yellow-bellied Sapsucker	Sphyrapicus varius		
Plantae				
	American Beech	Fagus grandifolia		
	Balsam Fir	Abies balsamea		

KINGDOM	Common Name	Scientific Name	SARO	SARA
	Black Cherry	Prunus serotina		
	Black Spruce	Picea mariana		
	Brownish Sedge	Carex brunnescens		
	Bull Thistle	Cirsium vulgare		
	Canada Goldenrod	Solidago canadensis		
	Canada Waterweed	Elodea canadensis		
	Common Boneset	Eupatorium perfoliatum		
	Common Dandelion	Taraxacum officinale		
	Common Eelgrass	Zostera marina		
	Common Evening-primrose	Oenothera biennis		
	Common Hop	Humulus lupulus		
	Common Hornwort	Ceratophyllum demersum		
	Common Juniper	Juniperus communis		
	Common Plantain	Plantago major		
	Common Ragweed	Ambrosia artemisiifolia		
	Common Reed	Phragmites australis		
	Common Self-heal	Prunella vulgaris		
	Common St. John's-wort	Hypericum perforatum		
	Common Viper's Bugloss	Echium vulgare		
	Common Yarrow	Achillea millefolium		
	Early Lowbush Blueberry	Vaccinium angustifolium		
	Eastern Bracken Fern	Pteridium aquilinum ssp. latiusculum		
	Eastern Hemlock	Tsuga canadensis		
	Eastern Hop-hornbeam	Ostrya virginiana		
	Eastern Red Maple	Acer rubrum var. rubrum		
	Eastern White Cedar	Thuja occidentalis		
	Eastern White Pine	Pinus strobus		
	Eurasian Water-milfoil	Myriophyllum spicatum		
	Fragrant Water-lily	Nymphaea odorata		
	Northern Red Oak	Quercus rubra		

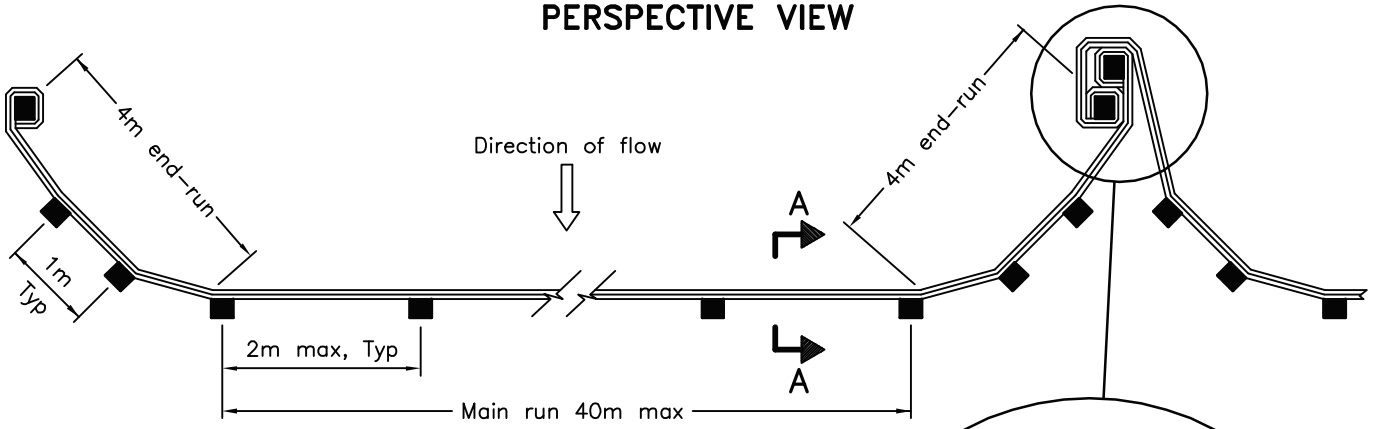
KINGDOM	Common Name	Scientific Name	SARO	SARA
	Northern Willowherb	Epilobium ciliatum		
	Paper Birch	Betula papyrifera		
	Poverty Oatgrass	Danthonia spicata		
	Red Pine	Pinus resinosa		
	Siberian Water-milfoil	Myriophyllum sibiricum		
	Speckled Alder	Alnus incana ssp. rugosa		
	Sugar Maple	Acer saccharum		
	Sweet-fern	Comptonia peregrina		
	Tussock Sedge	Carex stricta		
	Watershield	Brasenia schreberi		
	White Ash	Fraxinus americana		
	White Elm	Ulmus americana		
	Wild Lily-of-the-valley	Maianthemum canadense		

Appendix D

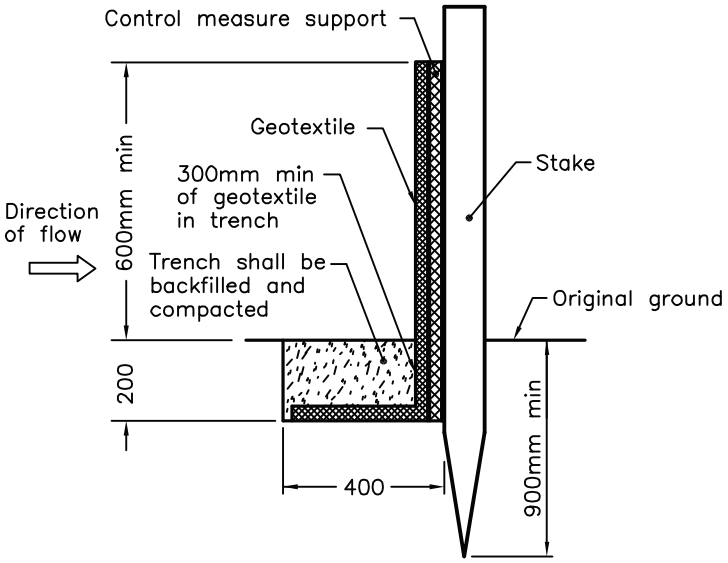
OPSD Heavy-duty Silt Fence



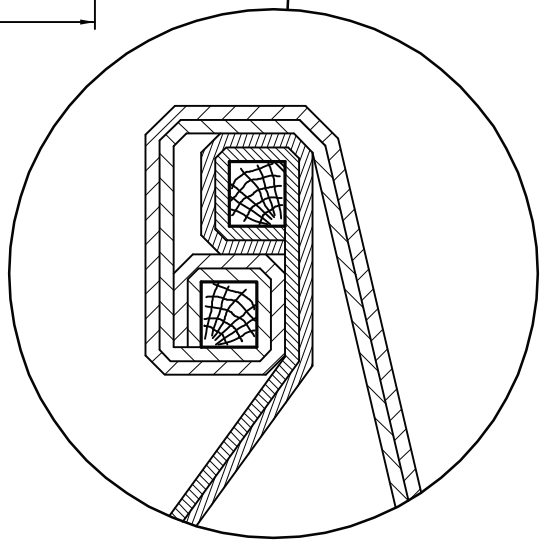
PERSPECTIVE VIEW



PLAN



SECTION A–A



JOINT DETAIL

NOTE:

A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev	2
HEAVY–DUTY SILT FENCE BARRIER			
	OPSD 219.130		

NOTICE OF COMPLETE APPLICATION AND A PUBLIC MEETING CONCERNING A ZONING BY-LAW AMENDMENT

TAKE NOTICE that the Corporation of the Township of Havelock-Belmont-Methuen is in receipt of an application for a Zoning By-law Amendment for certain lands located in Part Lot 23, Concession 8, with municipal address of 56 Fire Route 85R in the Methuen Ward, on Jack Lake; bearing the Assessment Roll Number (ARN): 1531-010-007-35100.

As required under subsection 34 (10.4) and 34 (10.7) of the *Planning Act,* R.S.O. 1990, as amended, Council of the Township of Havelock-Belmont-Methuen has deemed this application to be "Complete".

TAKE FURTHER NOTICE that the Council of the Corporation of the Township of Havelock-Belmont-Methuen will hold a public meeting on **September 17th, 2024** at **9:30 a.m.** to consider a proposed Zoning By-law Amendment under Section 34 of the *Planning Act*, R.S.O., 1990, as amended. **The Public Meeting will be held in hybrid fashion (in-person and electronically).**

If you wish to participate in the meeting in real time, please contact the Clerk, Bob Angione, by email at BAngione@hbmtwp.ca **no later than 12:00 p.m. (noon) on the day prior to the scheduled meeting** and you will be provided with an invitation to join the meeting using your computer or phone.

The Municipality is using Zoom for electronic meetings. The Zoom application can be downloaded to either a computer or cell phone. It is recommended that you test the program in advance of the meeting. Meetings will also be recorded and made available on YouTube for public viewing as soon as possible following the meeting. We would encourage you to communicate with Council by forwarding written comments in support or opposition of the application to BAngione@hbmtwp.ca or to P.O. Box 10, 1 Ottawa Street East, Havelock, ON K0L 1Z0.

PURPOSE AND EFFECT:

The subject lands are currently zoned "Seasonal Residential (SR) Zone". The application as proposed would change the zone category on the subject lands to "Special District 285 (S.D. 285) Zone" in order to permit the redevelopment of an existing seasonal recreational dwelling unit; while also introducing certain site-specific regulations.

A KEY MAP showing the lands to which this application applies is provided with this notice.

ANY PERSON may attend the public meeting and/or make verbal or written representation either in support of or in opposition to the proposed Amendment. Written submissions in respect of the proposed Amendment should be directed to the Clerk of the Township of Havelock-Belmont-Methuen.

If a person or public body would otherwise have an ability to appeal the decision of the Council of the Corporation of the Township of Havelock-Belmont-Methuen to the Ontario Land Tribunal but the person or public body does not make oral submissions at a public meeting or make written submissions to the Township of Havelock-Belmont-Methuen before the by-law is passed, the person or public body is not entitled to appeal the decision.

If a person or public body does not make an oral submission at the public meeting, or make written submissions to the Township of Havelock-Belmont-Methuen before the by-law is passed, the person or public body may not be added as a party to the hearing of an appeal before the Ontario Land Tribunal unless, in the opinion of the Tribunal, there are reasonable grounds to do so.

NOTIFICATION:

If you wish to be notified of the decision of the Council of the Township of Havelock-Belmont-Methuen on the proposed zoning by-law amendment, you must make a written request to the Clerk of the Township of Havelock-Belmont-Methuen at the address below.

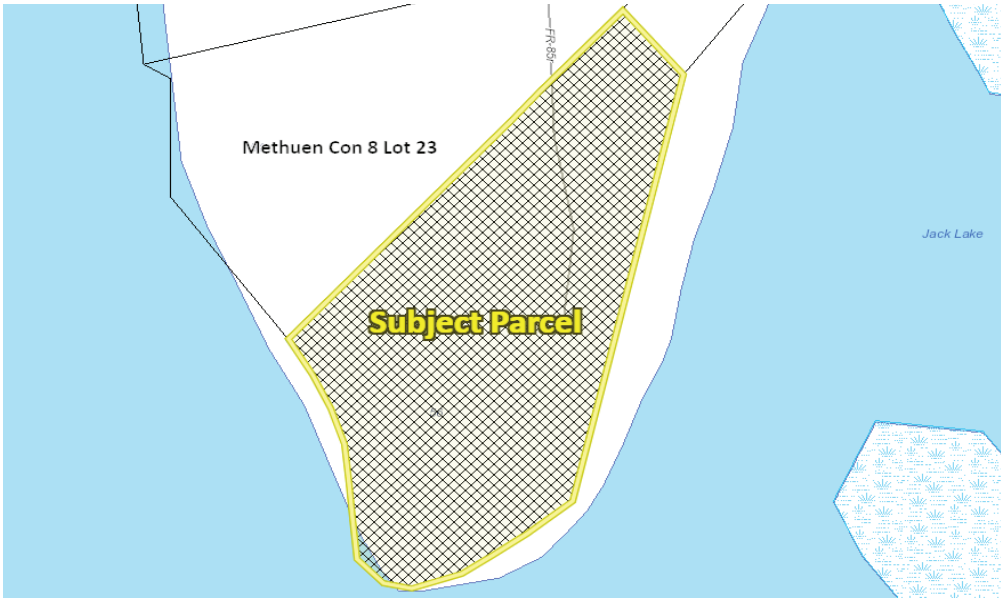
PO Box 10, 1 Ottawa St. E., Havelock, ON K0L 1Z0
P: 705.778.2308 or 1.877.767.2795 I F: 705.778.5248 I E: havbelmet@hbmtwp.ca

ADDITIONAL INFORMATION:

Additional information and material related to the proposed by-law will be available for public inspection on the Township website as of the date of the posting of this notice. Anyone wishing to obtain additional information with respect to this application is requested to direct enquiries to Arya Hejazi, Planning Assistant at planning@hbmtwp.ca or Sonia Aaltonen, Administrative Assistant at 705-778-2308 or saaltonen@hbmtwp.ca.

DATED at the Township of Havelock-Belmont-Methuen this 27th day of August, 2024.

Mr. Robert Angione, M.P.A., B. Admin,
Chief Administrative Officer
Municipal Clerk
Township of Havelock-Belmont-Methuen
P.O. Box 10, 1 Ottawa Street East
Havelock, ON K0L 1Z0
(705) 778-2308
(705) 778-5248 (fax)



HBM TOWNSHIP OF HAVELOCK - BELMONT - METHUEN INC. 1998	**KEY MAP**	TOWNSHIP OF Havelock-Belmont-Methuen (Methuen Ward)

TOWNSHIP OF HAVELOCK-BELMONT-METHUEN

To: Chairman and Members of Committee of Adjustment

Prepared By: Arya Hejazi M.PL., Planning Assistant HBM Township

Meeting Date: September 17th, 2024

Subject: **Minor Variance Application A-13-24**

Subject Property

Property Owner(s):	Shannon Cummins
Municipal Address:	421 Fire Route 25
Roll Number:	1531-010-003-32403
Lot(s):	Part Lot 15
Concession(s):	5
Area:	0.22 Hectares (0.56 Acres)
Zoning:	Seasonal Residential (SR)
Official Plan:	Shoreline
Ward:	Belmont

PURPOSE and EFFECT:

The purpose of this Minor Variance application is as follows (all required reliefs are to the Township of Havelock-Belmont-Methuen's Comprehensive Zoning By-law 1995-42, as amended):

1. Seek relief from Section 4.37 having the following effect(s):

i. Reducing the High Water Mark setback from 30 metres (100 feet) to 21.6 metres (71 feet).

The above relief(s) is to permit the following changes on the subject property:

1. Screening the westerly portion of an existing lake-side uncovered porch.

RECOMENDATION:

That Minor Variance application A-13-24 be ***approved*** with the following conditions:

- That approvals be obtain from the following agencies prior to the issuance of a building permit:
    - Crowe Valley Conservation Authority
- That a building permit be issued within **18 months** of the approval of this application and upon submission to the building department of the appropriate application, fees and supporting information as required by the Chief Building Official; and that
- The balance of the information in this report be received.

ANALYSIS:

The subject parcel is currently located on Belmont Lake with access provided via Fire Route 25. The parcel currently contains an existing seasonal recreational dwelling unit alongside a detached garage. Permits have been obtained to facilitate construction on both existing structures. The existing dwelling unit is approximately 138 square metres (1494 square feet). The purpose of this application is to permit the screening-in of an existing lake-side uncovered porch to maximum size of 11.6 square metres (125 square feet). According to property assessment records, the existing dwelling unit was constructed in 1999.

As previously, mentioned, the subject is currently located on Belmont Lake, within the watershed jurisdiction of the Crowe Valley Conservation Authority (CVCA). Consultation with the conservation authority has not commenced. Therefore, an additional condition that has been imposed to ensure that the applicant consults with the conservation authority and obtain any requisite approvals. Additionally, this application has also been circulated to Peterborough Public Health (PPH).

The property is located on Belmont Lake with the surrounding uses:

Direction	**Land Use**
North	Seasonal Recreational
South	Seasonal Recreational
East	Seasonal Recreational
West	Belmont Lake

This application is subject to the four tests of a Minor Variance, as outlined in the Planning Act. The tests are as follow:

1. **Is this application “minor” in nature?**

    The purpose of this application is to permit the screening-in of the westerly portion of an existing lake-side uncovered deck on a seasonal recreational

dwelling unit on the subject lot. No encroachment towards property line boundaries and the shoreline are being proposed as a result of the approval of this application. Aside from the reliefs being sought through this application, all other provisions of the Zoning By-law are being maintained.

Therefore, this application is considered minor in nature.

2. Is the application desirable and appropriate?

As previously mentioned above, the purpose of this application is to permit the screening-in of an existing lake-side uncovered deck, having the effect of maintaining all existing setback distances. Seasonal recreational uses are permitted within both the Zone of the subject parcel and its corresponding Official Plan designation. The approval of this application would have the effect of further enhancing the enjoyment and utility of an existing lot of record for recreational purposes.

This application is deemed both desirable and appropriate for the site.

3. Does this application conform to the Intent of the Official Plan?

The Township Official Plan designation for the subject property is ***Shoreline***. Under Section 3.3.3 – Shoreline Development, residential uses of both a permanent and recreational (cottage) nature are both permitted uses within the Shoreline Designation.

Additionally, under Section 3.3.4.1 – Development Policies – Development Considerations (a), indication is made that all new development should produce minimal visual, environmental, and navigational impacts to any abutting lake shorelines. Customarily, and in conformity with the Official Plan Shoreline Designation policies, new development is encouraged to take place outside the minimum high-water mark setback of all inland lakes across the Township. As the proposed development is taking place within the 30 metre high water mark setback, no reductions in setback standards are being proposed.

It is the Township's planning opinion that this application conforms to the spirit and intent of the Township's Official Plan.

4. Does this application conform to the Intent of the Zoning Bylaw?

The subject parcel is currently zoned as Seasonal Residential (SR). The SR Zone permits single detached recreational/vacation dwellings, inclusive of accessory structures.

All of the provisions of the By-law are being adhered to, with the exception of the items requiring relief stated in the *Purpose and Effect* section of this report. The regulation variances that are being sought are relatively minor and reflective of the current setback standards existing on the subject lot.

This application, as proposed, therefore maintains the spirit and intent of the Township's Zoning By-law.

This application satisfies the four tests of the minor variance. Additionally, this application must satisfy the Provincial Policy Statement (PPS) and the Growth Plan for the Greater Golden Horseshoe. The following policies are applicable:

Provincial Policy Statement

Section 1 of the PPS provides direction for the creation of strong, healthy and vibrant communities. The efficient use of land is supported through sustainable development patterns which consider the needs of communities, the environment, public health, safety, and economic growth. This section will address those policies which are relevant to the proposed development.

Section 1.1.1 – Healthy, liveable and safe communities are sustained by

(a) Promoting efficient development and land use patterns which sustain the financial well-being of the province and municipalities over long term

(c) Avoiding development and land use patterns which may cause environmental or public health and safety concerns

Section 1.1.4.1 – Healthy, integrated and viable rural areas should be supported by:

(a) Building upon rural character, and leveraging rural amenities and assets

The subject property is considered to be part of a rural use in the PPS, and a residential property is consistent with the policies for rural areas. The purpose of this application is to further enjoy the rural character and assets of the said property. This application conforms to the intent of the PPS.

Growth Plan for the Greater Golden Horseshoe

Growth Plan for the Greater Golden Horseshoe:

Section 2.2.1 – Managing Growth

(d) Directing development to settlement areas, except where necessary for development related to the management or use of resources, resource-based recreational activities and rural lands that cannot be located in settlement areas.

Section 2.2.9 – Rural Areas

> 2. Subject to the policies in Section 4, development outside of settlement areas may be permitted on rural lands for:
>
> c) other rural land uses that are not appropriate in settlement areas provided they:
>
> i. are compatible with the rural landscape and surrounding local land uses;
>
> ii. will be sustained by rural service levels; and
>
> iii. will not adversely affect the protection of agricultural uses and other resource-based uses such as mineral aggregate operations

This property is a rural residential property, which is considered development related to the use of a resource-based activity and as such cannot be located in the settlement area.

This application conforms to the intent of the Growth Plan for the Greater Golden Horseshoe.

At the time of writing this report, no comments have been made from rate payers. As previously mentioned in this report, the subject property falls within the watershed jurisdiction of the Crowe Valley Conservation Authority (CVCA). A permit from their office is anticipated as part of the development process. This subject application has been circulated to both the conservation authority and Peterborough Public Health (PPH) for their input and commentary.

As this application meets the four tests of a Minor Variance and conforms to the PPS and the Growth Plan, it is the recommendation of this report that this application be ***approved***.

COMMENTS

None received at the time of report preparation.

FINANCIAL IMPACT

A decision respecting the application is appealable to the Ontario Land Tribunal; for which any costs incurred by the Municipality may be recoverable from the applicant.

Respectfully submitted,

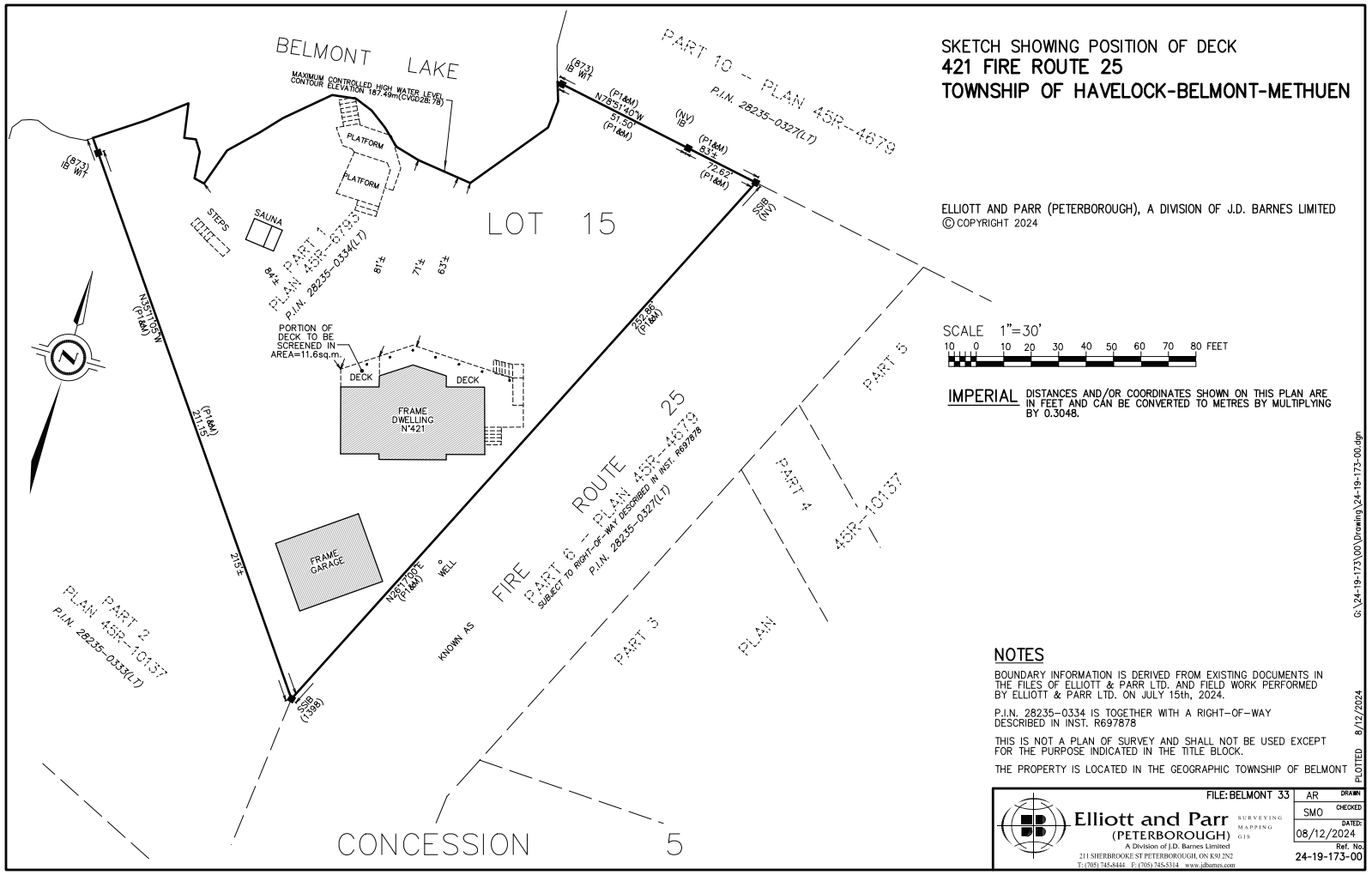
Arya Hejazi

_____

Arya Hejazi

Planning Assistant
Township of Havelock-Belmont-Methuen

Appendix A – Property Survey
Appendix B – Site Plan
Appendix C – GIS Mapping
Appendix D – Pre-Consultation



SKETCH SHOWING POSITION OF DECK
421 FIRE ROUTE 25
TOWNSHIP OF HAVELOCK-BELMONT-METHUEN

IMPERIAL DISTANCES AND/OR COORDINATES SHOWN ON THIS PLAN ARE IN FEET AND CAN BE CONVERTED TO METRES BY MULTIPLYING BY 0.3048.

G:\24-19-173\00\Drawing\24-19-173-00.dgn

PLOTTED 8/12/2024

NOTES

BOUNDARY INFORMATION IS DERIVED FROM EXISTING DOCUMENTS IN THE FILES OF ELLIOTT & PARR LTD. AND FIELD WORK PERFORMED BY ELLIOTT & PARR LTD. ON JULY 15th, 2024.

P.I.N. 28235-0334 IS TOGETHER WITH A RIGHT-OF-WAY DESCRIBED IN INST. R697878

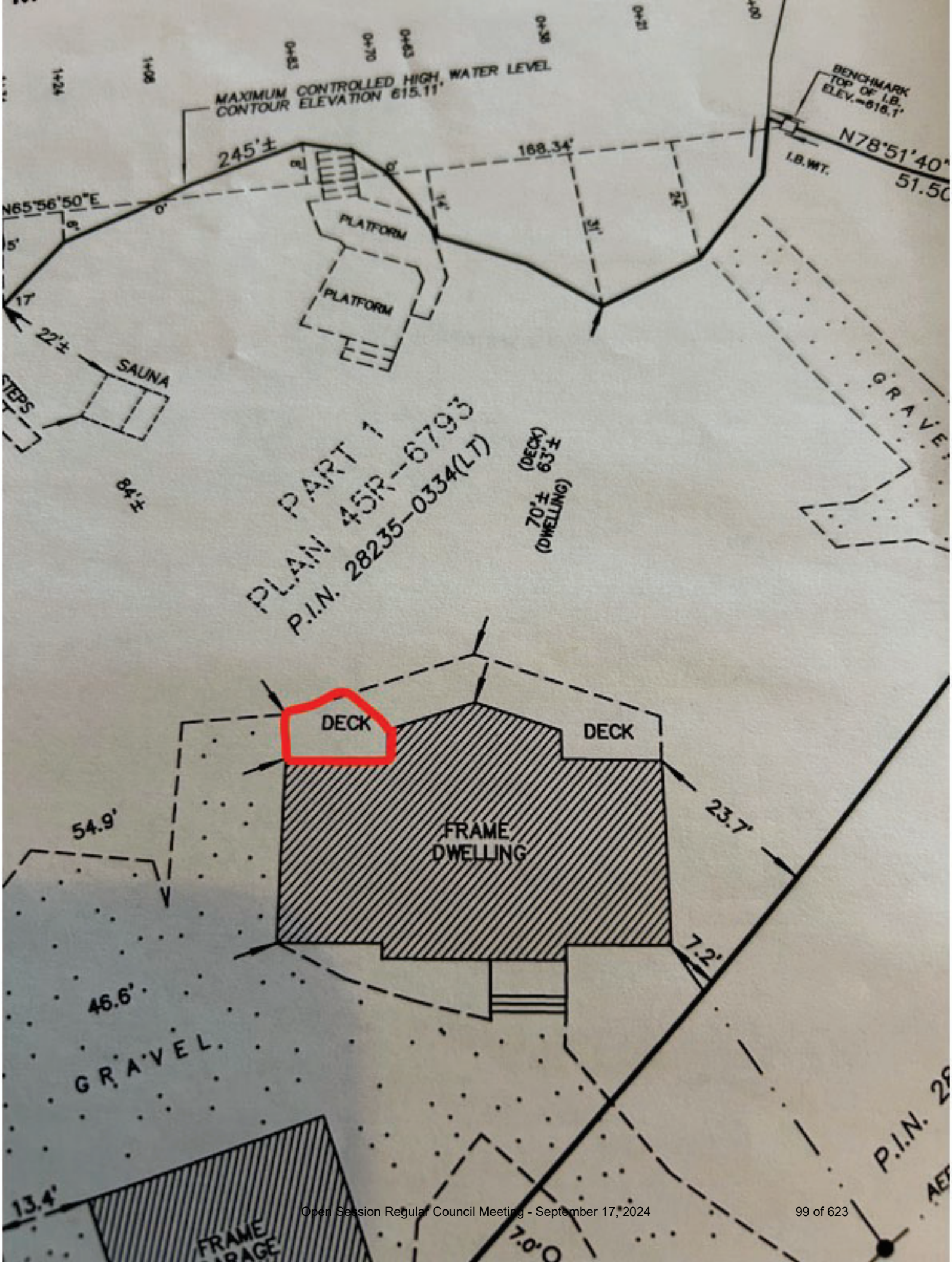
THIS IS NOT A PLAN OF SURVEY AND SHALL NOT BE USED EXCEPT FOR THE PURPOSE INDICATED IN THE TITLE BLOCK.

THE PROPERTY IS LOCATED IN THE GEOGRAPHIC TOWNSHIP OF BELMONT

FILE: BELMONT 33

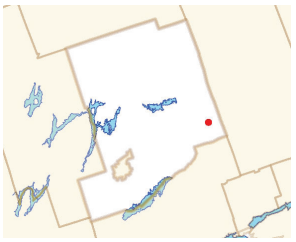
Elliott and Parr (PETERBOROUGH)
SURVEYING MAPPING GIS
A Division of J.D. Barnes Limited
211 SHERBROOKE ST PETERBOROUGH, ON K9J 2N2
T: (705) 745-8444 F: (705) 745-5314 www.jdbarnes.com

DRAWN	AR
CHECKED	SMO
DATED:	08/12/2024
Ref. No.	24-19-173-00


MAXIMUM CONTROLLED HIGH WATER LEVEL
CONTOUR ELEVATION 615.11'
BENCHMARK
TOP OF I.B.
ELEV.=618.1'
N78°51'40"
51.50
I.B.WIT.
245'±
168.34'
N65°56'50"E
PLATFORM
PLATFORM
22'±
SAUNA
STEPS
84'±
PART 1
PLAN 45R-6793
P.I.N. 28235-0334(LT)
(DECK)
63'±
70'±
(DWELLING)
GRAVEL
DECK
DECK
FRAME
DWELLING
54.9'
23.7'
7.2'
46.6'
GRAVEL
13.4'
FRAME
GARAGE
7.0'
P.I.N.

County of Peterborough

421 FR 25



Legend

Roads < 50,000
- PRIV ; Private; PRIV
- City Arterial
- City Collector and Local
- City Owned Unclassified
- Provincial
- County
- Township
- Water Access Only

Outside Roads < 50,000
- Major Roads
- Local Roads

- Peterborough Proposed Bypas
- First Nations
- Civic Address
- Parcel Fabric
- Parcel First Nations - Canada I

Rivers
- Intermittent
- Permanent

- Clean Water Act Policies Apply
- Provincially Significant Wetlanc
- Locally Significant Wetlands
- Non-evaluated Wetlands
- Lakes - Local Scale
- Municipal Boundary - Upper Ti
  - <all other values>
  - COUNTY OF PETERBOROUGH

Notes

91.9 0 45.93 91.9 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.
THIS MAP IS NOT TO BE USED FOR NAVIGATION

General Notes:

Property Owners:	Shannon Cummins
Property Address:	421 FR 25
Assessment Roll Number (ARN)	1531 010 003 32403
Current Uses:	Seasonal Residential
Proposed Development:	Screen in porch
Consultation with Authorities:	**No. Place condition.**
Type of Planning Approval:	MV
Zone:	Seasonal Residential
OP Designation:	Shoreline
County OP Designation:	Shoreland and the Waterfront
Verification of structures via building permits:	Permits obtained for seasonal dwelling unit. In property file folder.

Development

Proposal is to close and screen a portion of an existing lake-side uncovered deck.

Relevant Zoning Regulations

10.0 Seasonal Residential (SR) Zone+

10.2.1 Regulations for Uses Permitted		Proposed	Proposed Conform?
Minimum Lot Area	3000 sq m.	1 acre	Yes
Minimum Frontage	46 metres	Far exceeds	Yes
Minimum Front yard	21.3 metres	21.6 m	Yes
Minimum Side Yard	6 metres	14.6m	Yes
Minimum Rear Yard	7.5 metres	Far exceeds	Yes
Maximum Height	9 metres (30 feet)	Below 30 feet	Yes
Maximum Lot Coverage	15%	No Changes	Yes
Minimum Floor Area	74 sq m	Far exceeds	Yes
Maximum Number of Dwellings per Lot	1	1	Yes
Conclusion: No variances required to section 10.			

4.37 Regulations

High Water Mark Requirement	Proposed High Water Mark	Meet High Water Mark Setback	Minor in Nature?	Type of Relief Required
30 m	**21.6 m**	**No**	**Yes**	**Variance**
Conclusion: **Variance required to HWM**				

4.10 B Regulations

Regulation	Minor in nature?	Does it meet this regulation?
(i) Enlargement does not reduce existing yards?	Yes	Yes
(ii) Increases a deficiency?	Yes	Yes. No increase in deficiency.
(iii) Are all other applicable provisions of the bylaw met?	Yes	Yes
Conclusion: No variance required for Section 4.10 B.		

Planning Opinion

Minor Variance. High water mark setback reduction.

TOWNSHIP OF HAVELOCK-BELMONT-METHUEN

To: Chairman and Members of Committee of Adjustment

Prepared By: Arya Hejazi M.PL., Planning Assistant HBM Township

Meeting Date: September 17th, 2024

Subject: **Minor Variance Application A-11-24**

Subject Property

Property Owner(s):	Gaye McDonald & Rod Macivor
Agent:	Dave Tucker
Municipal Address:	812 – Island 27 Jack Lake
Roll Number:	1531-010-007-72300
Lot(s):	Island 4 Jack Lake
Concession(s):	8
Area:	0.24 Hectares (0.6 Acres)
Zoning:	Island Residential (IR)
Official Plan:	Shoreline
Ward:	Methuen

PURPOSE and EFFECT:

The purpose of this Minor Variance application is as follows (all required reliefs are to the Township of Havelock-Belmont-Methuen's Comprehensive Zoning By-law 1995-42, as amended):

1. Seek relief from Sections 11.2.1 (c) and (g) having the following effect(s):

i. Reducing the minimum required Front Yard setback from 21.3 metres (70 feet) to 8.1 metres (26.6 feet);

ii. Increasing the maximum required Lot Coverage from 4% to 5.27%

2. Seek relief from Section 4.37 having the following effect(s):

i. Reducing the High Water Mark setback from 30 metres (100 feet) to 8.1 metres (26.6 feet).

3. Seek relief from Section 4.10 B(a)(ii) having the following effect(s):

i. Permitting an increase in a deficiency as it relates to the height of the existing recreational dwelling unit.

The above relief is to permit the following changes on the subject property:

1. A southerly addition to the existing recreational dwelling unit having the effect of maintaining the existing deficient High Water Mark setback.

RECCOMENDATION:

That Minor Variance application A-11-24 be ***approved*** with the following conditions:

- That a 20-day appeal period lapse prior to the issuance of a building permit;
- That no portion of the proposed addition be taller than the roof line of the existing recreational dwelling unit;
- That a building permit be issued within **18 months** of the approval of this application and upon submission to the building department of the appropriate application, fees and supporting information as required by the Chief Building Official; and that
- The balance of the information in this report be received.

ANALYSIS:

The subject island parcel currently contains an existing seasonal recreational dwelling unit inclusive of a private holding tank for which is regularly pumped. The dwelling unit is approximately 156 square metres (1689 square feet). The purpose of this application is to extend the southerly portion of the existing recreational dwelling unit by 1.4 square metres (16 square feet) to produce a new ensuite to the master bedroom. According to Township records, the existing dwelling unit was constructed in 1956 with multiple additions being added over time (some of which obtained past planning approvals).

The existing recreational dwelling unit is heavily deficient in its High Water Mark setback from the shoreline of Jack Lake. However, as proposed, the addition will not have the effect of reducing any High Water Mark setback beyond the existing standards on the subject island parcel.

The property is currently on Jack Lake, outside the watershed jurisdiction of the Crowe Valley Conservation Authority. As a result, this application has been circulated to the Ministry of Natural Resources and Forestry (MNRF) for commentary. Additionally, this application has been circulated to Peterborough Public Health (PPH).

The property is located on Jack Lake with the surrounding uses:

Direction	Land Use
North	Jack Lake
South	Jack Lake

East	Jack Lake
West	Jack Lake

This application is subject to the four tests of a Minor Variance, as outlined in the Planning Act. The tests are as follow:

1. **Is this application "minor" in nature?**

   The purpose of this application is to permit the extension of a seasonal recreational dwelling unit on an island parcel of land. The proposed addition will be roughly 1.48 square metres (16 square feet) in size and will not result in any High Water Mark setback being reduced beyond the existing standards on the property. Aside from the reliefs being sought as a result of the approval of this application, the entirety of the development meets the regulations/provisions of the Zoning By-law, and the applicable policies outlined in the Township's Official Plan.

   Therefore, this application is considered minor in nature.

2. **Is the application desirable and appropriate?**

   Seasonal recreational uses are permitted within both the Zone of the subject property (*Island Residential – IR Zone*) and the Official Plan Designation (*Shoreline)*. Furthermore, while the existing recreational dwelling unit is currently deficient in its High Water Mark setback to the shoreline of Jack Lake, no setback standards are being further reduced beyond the existing zoning standards. Finally, the approval of this application will serve to increase the enjoyment and utility of an existing lot of record, that is intended on being used for seasonal recreational purposes. This use is not being changed.

   Therefore, this application is desirable and appropriate for the site.

3. **Does this application conform to the Intent of the Official Plan?**

   The Township Official Plan designation for the subject property is ***Shoreline***. Under Section 3.3.3 – Shoreline Development, residential uses of both a permanent and recreational (cottage) nature are both permitted uses within the Shoreline Designation.

   Additionally, under Section 3.3.4.1 – Development Policies – Development Considerations (a), indication is made that all new development should produce minimal visual, environmental, and navigational impacts to any abutting lake shorelines. Customarily, and in conformity with the Official Plan Shoreline

Designation policies, new development is encouraged to take place outside the minimum high-water mark setback of all inland lakes across the Township. As the proposed development is taking place within the 30 metre high water mark setback, no reductions in setback standards are being proposed.

The proposed development will be adding to an existing dwelling unit on an existing lot of record. As such, the character of the rural landscape is anticipated to be marginally impacted as a result of the approval of this application. The applicants have also showed a willingness to provide as much information as possible to adhere to all zoning requirements.

It is the planning opinion of the Township that the subject application conforms to the intent of the Township's Official Plan.

4. **Does this application conform to the Intent of the Zoning Bylaw?**

   The subject property is currently zoned as Island Residential (IR). The IR Zone permits single detached recreational/vacation dwellings, inclusive of accessory structures, subject to the provisions and regulations under both Sections 11 and 4.1.

   All of the provisions of the By-law are being adhered to, with the exception of the items requiring relief stated in the *Purpose and Effect* section of this report. The regulation variances that are being sought are relatively minor and reflective of the current setback standards existing on the subject lot.

   This application, as proposed, therefore maintains the spirit and intent of the Township's Zoning By-law.

This application satisfies the four tests of the minor variance. Additionally, this application must satisfy the Provincial Policy Statement (PPS) and the Growth Plan for the Greater Golden Horseshoe. The following policies are applicable:

Provincial Policy Statement

Section 1 of the PPS provides direction for the creation of strong, healthy and vibrant communities. The efficient use of land is supported through sustainable development patterns which consider the needs of communities, the environment, public health, safety, and economic growth. This section will address those policies which are relevant to the proposed development.

Section 1.1.1 – Healthy, liveable and safe communities are sustained by

(a) Promoting efficient development and land use patterns which sustain the financial well-being of the province and municipalities over long term

(c) Avoiding development and land use patterns which may cause environmental or public health and safety concerns

Section 1.1.4.1 – Healthy, integrated and viable rural areas should be supported by:

(a) Building upon rural character, and leveraging rural amenities and assets

The subject property is considered to be part of a rural use in the PPS, and a residential property is consistent with the policies for rural areas. The purpose of this application is to further enjoy the rural character and assets of the said property. This application conforms to the intent of the PPS.

Growth Plan for the Greater Golden Horseshoe

Growth Plan for the Greater Golden Horseshoe:

Section 2.2.1 – Managing Growth

(d) Directing development to settlement areas, except where necessary for development related to the management or use of resources, resource-based recreational activities and rural lands that cannot be located in settlement areas.

Section 2.2.9 – Rural Areas

2. Subject to the policies in Section 4, development outside of settlement areas may be permitted on rural lands for:

c) other rural land uses that are not appropriate in settlement areas provided they:

i. are compatible with the rural landscape and surrounding local land uses;

ii. will be sustained by rural service levels; and

iii. will not adversely affect the protection of agricultural uses and other resource-based uses such as mineral aggregate operations

This property is a rural residential property, which is considered development related to the use of a resource-based activity and as such cannot be located in the settlement area.

This application conforms to the intent of the Growth Plan for the Greater Golden Horseshoe.

At the time of writing this report, no comments have been made from rate payers. As previously mentioned in this report, the subject property falls outisde the watershed jurisdiction of the Crowe Valley Conservation Authority (CVCA). A permit from their office is not anticipated as part of the development process. However, this subject

application has been circulated to both Ministry of Natural Resources and Forestry (MNRF) and Peterborough Public Health (PPH) for their input and commentary.

As this application meets the four tests of a Minor Variance and conforms to the PPS and the Growth Plan, it is the recommendation of this report that this application be ***approved***.

COMMENTS

None received at the time of report preparation.

FINANCIAL IMPACT

A decision respecting the application is appealable to the Ontario Land Tribunal; for which any costs incurred by the Municipality may be recoverable from the applicant.

Respectfully submitted,

Arya Hejazi

_____

Arya Hejazi
Planning Assistant
Township of Havelock-Belmont-Methuen

Appendix A – MV Application
Appendix B – Property Survey
Appendix C – Site Plan
Appendix D – GIS Mapping
Appendix E – Pre-Consultation

Date Received: RECEIVED
Fee Received: AUG 0 6 2024
Roll No.: _____

Township of Havelock-Belmont-Methuen
Application for

☐ **Minor Variance – s. 45(1)**
☐ **Permission – s. 45(2)**

---

1. Applicant/Agent Information:

1.1 Name of Owner(s): Gaye McDonald & Rod Macivor

Address: 812 - IS 27 Jack Lake - Island 4 Jack Lake

Twp of Havelock-Belmont-Methuen Postal Code [redacted]

Telephone Nu[redacted] ax Number: (____) ____ -_____

E-Mail Address[redacted]

(An owner's authorization is required in Section 10.1 if the applicant is not the owner.)

1.2 Name of Applicant/Agent: Dave Tucker
(if different from owner)
Address: [redacted]

[redacted] Postal Code [redacted]

Telephone Number [redacted] Fax Number: (____) ____ -_____

E-Mail Address: Info@davetuckercarpentry.com

1.3 Communication should be sent to: Owner ☒ Applicant ☒ or to the following:

_____

Address: _____

_____ Postal Code _____

Telephone Number: (____) ____ -_____ Fax Number: (____) ____ -_____

E-Mail Address: _____

2. LOCATION OF THE SUBJECT LAND: *(Complete applicable lines)*

2.1 Geographic Municipality/Township or Village: Havelock-Belmont-Methuen [redacted]

Concession Number(s) _____Lot Number(s): _____

Registered Plan
Number:_____ Lot(s)/Block(s): _____

Reference Plan
Number:_____ Part Number(s): _____

Road/Street Number and Name: _____

Attach Survey Plan, if available.

2.2 Are there any easements or restrictive covenants affecting the subject land?
Yes ☐ No ☒

If yes, describe the easement or covenant and its effect:

_____

_____

3. Planning Review Information:

3.1 Official Plan Designation

Island residential

3.2 Zoning By-law

_____

4. PURPOSE OF APPLICATION:

4.1 Nature and extent of relief from the zoning by-law

_____

_____

_____

_____

4.2 REASON: (*Purpose of the proposed amendment – why proposed use is unable to comply with the zoning by-law provisions)*

_____

_____

_____

5. Description of Subject Land:

5.1 Dimensions of Land: SEE SURVEY.

Frontage: _____ m/ft. Depth: Island m/ft.

Area: 5 acre sq.m/sq. ft. _____ ha/ac

Existing Use(s) of the subject land: Rec. cottage

Summer use island

Length of Time the existing uses of the subject land have continued:
1954

5.2 Date subject land was acquired by current owner: 2001

5.3 Existing Buildings and Structures: Please identify each existing building on the sketch and provide information for each building. (If more than one building, attach a separate sheet to this application.)

Building 1

Type Framed cottage Date Constructed 1954

Existing Use Summer use

Date Existing Use Commenced 1954

Ground Floor Area* 1689 Sq Ft. Gross Floor Area ** _____

Front lot line setback See survey Rear lot line setback _____

Side lot line setback _____ Side lot line setback _____

Building Height 16' Dimensions _____

Building 2

Type Boathouse Date Constructed 1954

Existing Use Boathouse/toys

Date Existing Use Commenced 1954

Ground Floor Area* _____ Gross Floor Area ** _____

Front lot line setback See survey Rear lot line setback _____

Side lot line setback _____ Side lot line setback _____

Building Height 10 ft Dimensions 14x20 + 6x14' DECK

Building 3

Type Out building Date Constructed 1954

Existing Use Out house

Date Existing Use Commenced 1954

Ground Floor Area* 32 sq ft Gross Floor Area **

Front lot line setback SEE SURVEY. Rear lot line setback

Side lot line setback Side lot line setback

Building Height 8' Dimensions 4 x 8

5.4 Nature of Proposed Development: Please provide the information for each proposed building (If more than one building, attach a separate sheet to this application. If a proposed plan showing location of proposed buildings is available, please attach.)

Proposed Use(s) of the subject land: Recreational cottage

Building 1

Type Master bed room ensuite

Ground Floor Area* 16sq ft Gross Floor Area **

Front lot line setback See survey Rear lot line setback

Side lot line setback Side lot line setback

Building Height Dimensions 4'x4'

Building 2

Type

Ground Floor Area* Gross Floor Area **

Front lot line setback Rear lot line setback

Side lot line setback Side lot line setback

Building Height Dimensions

* Ground Floor Area means the area that the building occupies on the ground.

** Gross Floor Area means the sum of the area of each floor of the building counting each floor at or above ground level (not basement or cellar) based on the exterior dimensions of the building.

6. Services:

6.1 Access is/will be provided to the subject land by: *(check appropriate space)*

		Maintenance	
Provincial Highway	☐	Public	☐
Municipal Road	☐	Private	☐
Private Road	☐	Year Round	☐
Right of Way	☐	Seasonal	☐
Unopened Road Allowance	☐	Unmaintained	☐
Other Public Road	☐		
(Specify) _____			
Water Access	☒		

Mainland Access – where access to the subject land is only by water:
Docking Facilities (specify) Forest Glen Marina

Parking Facilities (specify) _____

Distance from Subject Land _____

Distance from Nearest Public Road _____

6.2 Water Supply is provided to the subject land by: *(check appropriate space)*

Publicly-owned/operated piped water system	☐
Privately-owned/operated individual well	☐
Privately-owned/operated communal well	☐
Lake or other water body	☒
Other means *(specify)* _____	☐

6.3 Sewage Disposal is provided to the subject land by: *(check appropriate space)*

Publicly-owned/operated sanitary sewage system	☐
Private individual septic tank	☐
Public-owned/operated communal sewage system	☐
Private communal sewage system	☐
Privy	☐
Other means *(specify)* Private holding tanks pumped regularly	☐

6.4 Storm Drainage is provided to the subject land by: *(check appropriate space)*

Sewers	☐
Ditches	☐
Swales	☐
Other means *(specify)* _____	☐

6.5 Other (Check if service is available)

☒ Electricity	☐ School bussing
☒ Telephone	☐ Garbage Collection
☐ Cable	☐ Recycling Collection

6.6 Notice to Applicants:

Should the location of the property which is the subject of this application be within the Wellhead Protection Area for the Havelock Municipal Well System then you are required to include a Section 59 Notice; in order to have your application deemed 'complete' in accordance with the Planning Act. Please Contact:
Terri Cox, Otonabee Region Conservation Authority
Email: tcox@otonabeeconservation.com
Tel: 705-745-5791 Ext 219

7. Other Applications (If known, indicate whether the subject land is a subject of application under the Act in any of the following):

7.1 Is the subject land currently the subject of a proposed official plan or official plan amendment that has been submitted to the Minister for approval?
☐ Yes #_____, Status_____ ☒ No ☐ Unknown

7.2 Is the subject land currently the subject of a zoning by-law amendment, Minister's zoning order amendment, consent or approval of plan of subdivision?
☐ Yes #_____, Status_____ ☒ No ☐ Unknown

7.3 Has the subject land been the subject of a previous minor variance application?
☒ Yes # 2017, Status Open ☐ No ☐ Unknown

8.0 History of Subject Land

8.1 If this is a re-submission of a minor variance application, explain how the proposal has changed.

_____

8.2 Has there ever been an industrial or commercial use on the subject land or adjacent land? Yes ☐ No ☒ Unknown ☐

If YES, please specify the use. _____

8.3 Has the grading of the subject land ever been changed by adding earth or other material? Yes ☐ No ☒ Unknown ☐

8.4 Has a gas station ever been located on the subject property or adjacent land?
Yes ☐ No ☒ Unknown ☐

8.5 Has there been gasoline or other fuel stored on the subject land or adjacent land?
Yes ☐ No ☒ Unknown ☐

8.6 Is there reason to believe the subject land may have been contaminated by former uses on the site or adjacent site?
Yes ☐ No ☒ Unknown ☐

9. Affidavit or Sworn Declaration

I, ~~Barbara Gayle McDonald~~ DAVE TUCKER of the ~~PETERBOROUGH~~ NORTH KAWARTHA · TOWNSHIP
(owner or applicant) (Township, City, Village)
of APSLEY in the Ontario
(County, Province)
of CANADA · make oath and say (or solemnly declare) that the information contained in this application is true and that the information contained in the documents that accompany this application in respect of the application is true.

Declared before me at the TOWNSHIP of NORTH KAWARTHA
in the COUNTY of PETERBOROUGH
this 2ND day of AUGUST, 2024.

Commissioner of Oaths
JUDY EVERETT, Treasurer
Township of North Kawartha,
a Commissioner etc.,

Applicant

Applicant

10. AUTHORIZATIONS

10.1 Consent of the Owner(s) to make Application

If the applicant is not the sole owner of the land that is the subject of this application, the written authorization of the owner(s), that the applicant is authorized to make the application, must be included or the authorization set out below must be completed by the owner(s).

I/We, Barbara Gayle McDonald + Rod MacIvor,
am/are the owner(s) of the land that is the subject of this application and I/We authorize Dave Tucker to make this application on my/our behalf and to provide any of my/our personal information that will be included in this application or collected during the processing of the application.

August 2, 2024
Date

Signature of Owner

August 2, 2024
Date

Signature of Owner

10.2 Consent of Owner(s) to Enter Upon Lands

I/We, _____, hereby authorize the Township of Havelock-Belmont-Methuen Council and/or their agents/representative(s) to attend upon the lands subject of this application.

_____ _____

Signature of Applicant Signature of Witness

Personal information contained on this form, collected pursuant to the *Planning Act*, will be used for the purpose of responding to the initial application. Questions should be directed to the Freedom of Information and Privacy Coordinator at the institution conducting the procedures under the Act.

10.3 Payment/Acknowledgement

Any complete application submission must be accompanied by a deposit fee in the amount of $1000.00 in cash, debit, online payment or cheque made payable to the Township of Havelock-Belmont-Methuen.

By virtue of signature(s) hereon, I/We as the owner(s) further agree to pay any further costs incurred by the Township associated with the processing of my/our application; including, but not restricted to Municipal costs, Professional Planning Fees, Engineering and Legal Fees.

AUG 6 2024.
Date

Signature of Owner

_____
Date

_____
Signature of Owner

11. SKETCH PLAN:

The application must be accompanied by a sketch showing the following:

- the boundaries and dimensions of the subject land;
- the location, size and type of all existing and proposed buildings and structures on the subject land; indicating the distance of the buildings or structures from the front, rear and side lot lines;
- the boundaries and dimensions of land that abuts the subject property, or any land owned by the owner of the subject land and that abuts the subject land;
- the location, size and type of all existing and proposed buildings and structures on abutting lands, indicating the distance of the buildings or structures from the front, rear and side lot lines;
- the distance between the subject land and the nearest township lot line or landmark, such as a railway crossing or bridge;
- the location of all land previously severed from the parcel originally acquired by the current owner of the subject land;
- the approximate location of all natural and artificial features on the subject land and adjacent lands that in the opinion of the applicant may affect the application, such as buildings, abandoned or active railways, roads, watercourses, drainage ditches, river or stream banks, wetlands, wooded areas, wells and septic tanks and tile beds;
- the existing use(s) on adjacent lands;
- the location, width and name of any roads within or abutting the subject land, indicating whether it is an unopened road allowance, a public travelled road, a private road or a right-of-way;
- if access to the subject land is by water only, the location of the parking and boat docking facilities to be used;
- the location and nature of any easement affecting the subject land;
- all present entrances onto the subject property;
- if there are agricultural buildings capable of housing animals within 500 metres of the proposed lot, then the location of these buildings must be shown on the sketch.

Measurements on the sketch **SHALL** correspond to those identified in the application. Photocopies of your survey, if you have one, should be used. If no survey is available, a detailed hand-drawn sketch to scale is acceptable.

In some instances, it may be necessary for a locational survey to be submitted with the application in order to accurately determine property and building dimensions, setbacks, etc. A locational survey may be required in situations where existing/proposed building or structures are in proximity to property line(s) and/or shoreline.

FOR OFFICE USE ONLY

1. Is application deemed complete? **Yes** ☐ **No** ☐

   Date: _____

   Site Visit Date:_____

2. What is the current Official Plan designation(s) of the subject lands?

   _____

3. What is the current Zoning of the subject lands?

   _____

4. Does application conform to both the County and Township Official Plan?

   Yes ☐ **No** ☐

   If no, describe nature of non-conformity.

   _____

   _____

5. Is the application consistent with the Provincial Policy Statement?

   Yes ☐ **No** ☐

6. Is the proposed Minor Variance compatible with adjacent/surrounding land uses?

   Yes ☐ **No** ☐

   If no, describe nature of incompatibility.

   _____

   _____

7. Is this considered suitable for the intended use (physical characteristics such as topography, drainage, soils and wet areas)

   Yes ☐ **No** ☐

   If no, describe nature of issues.

   _____

   _____

SURVEYOR'S REAL PROPERTY REPORT
PART A
PLAN OF SURVEY OF
ISLAND 4 IN JACK LAKE (CAMERON'S PLAN)
GEOGRAPHIC TOWNSHIP OF METHUEN

MUNICIPALITY OF HAVELOCK–BELMOUNT–METHUEN

COUNTY OF PETERBOROUGH

5m 0 1 2 3 4 5 10m

SCALE 1 : 150
KEVIN R. D. SMITH, O. L. S.

PART B

THIS PLAN MUST BE READ IN CONJUNCTION WITH THE SURVEY REPORT DATED AUGUST 1st, 2024.

THIS REPORT WAS PREPARED FOR CURRENT TRANSACTIONS INVOLVING DAVE TUCKER AND THE UNDERSIGNED ACCEPTS NO RESPONSIBILITIES FOR USE BY OTHER PARTIES.

METRIC

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

NOTES

BEARINGS ARE UTM GRID, DERIVED FROM OBSERVED REFERENCE POINTS A AND B, BY STATIC GNSS OBSERVATIONS, SHOWN HEREON, BEARING OF N66°25'00"W, REFERRED TO THE CENTRAL MERIDIAN OF UTM ZONE 17 (81° WEST LONGITUDE) NAD 83 (CSRS) v7.1 EPOCH 2010. GNSS BASELINE POST PROCESSED FROM LEICA REFERENCE STATION – LAKEFIELD.

FOR BEARING COMPARISONS, A ROTATION OF 2°08'10" COUNTERCLOCKWISE WAS APPLIED TO BEARINGS ON PLAN 45R-4502.

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 1.000248187779.

PROPERTY LINES ARE UNFENCED, UNLESS OTHERWISE NOTED.

FENCES ARE LOCATED ON PROPERTY LINES, UNLESS OTHERWISE NOTED.

SSIB'S PLANTED DUE TO INSUFFICIENT OVERBURDEN.

BUILDING TIES ARE TAKEN TO FACE OF FRAME SIDING.

CAMERON'S PLAN REFERS TO PLAN OF SURVEY SHOWING LOCATION OF SEVEN ISLAND'S IN JACK LAKE BY ALFRED J. CAMERON O.L.S., DATED SEPTEMBER 29, 1894.

BUILDING TIES ARE PERPENDICULAR TO PROPERTY LINES, UNLESS OTHERWISE NOTED.

JACK LAKE IS ARTIFICIALLY REGULATED TO ELEVATION 278.9 CGVD28. CONTOUR ELEVATION 277.09 CGVD28 IS THE BEST AVAILABLE EVIDENCE OF THE WATER'S EDGE EXISTING AT THE TIME OF THE ORIGINAL SURVEY OF THE TOWNSHIP OF METHUEN.

ORTHOMETRIC HEIGHTS ARE DERIVED FROM GNSS OBSERVATIONS POST PROCESSED FROM LEICA BASE STATION-LAKEFIELD AND THE HTv2 GEOID MODEL.

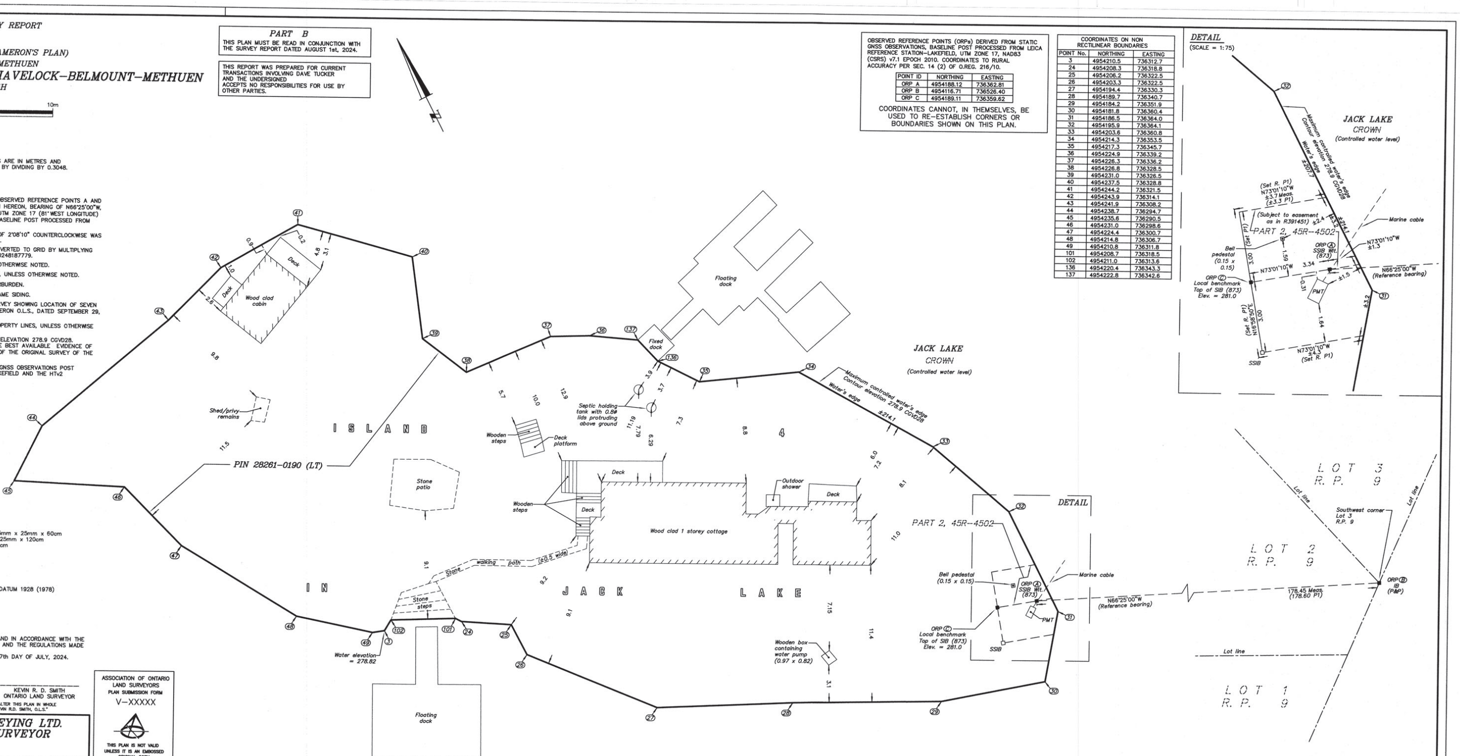
OBSERVED REFERENCE POINTS (ORPs) DERIVED FROM STATIC GNSS OBSERVATIONS, BASELINE POST PROCESSED FROM LEICA REFERENCE STATION-LAKEFIELD, UTM ZONE 17, NAD83 (CSRS) v7.1 EPOCH 2010. COORDINATES TO RURAL ACCURACY PER SEC. 14 (2) OF O.REG. 216/10.

POINT ID	NORTHING	EASTING
ORP A	4954188.12	736362.81
ORP B	4954116.71	736526.40
ORP C	4954189.11	736359.62

COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

COORDINATES ON NON RECTILINEAR BOUNDARIES

POINT No.	NORTHING	EASTING
3	4954210.5	736312.7
24	4954208.3	736318.8
25	4954206.2	736322.5
26	4954203.3	736322.5
27	4954194.4	736330.3
28	4954189.7	736340.7
29	4954184.2	736351.9
30	4954181.8	736360.4
31	4954186.5	736364.0
32	4954195.9	736364.1
33	4954203.6	736360.8
34	4954214.3	736353.5
35	4954217.3	736345.7
36	4954224.9	736339.2
37	4954226.3	736336.2
38	4954226.8	736328.5
39	4954231.0	736326.5
40	4954237.5	736328.8
41	4954244.2	736321.5
42	4954243.9	736314.1
43	4954241.9	736308.2
44	4954238.7	736294.7
45	4954235.6	736290.5
46	4954231.0	736298.6
47	4954224.4	736300.7
48	4954214.8	736306.7
49	4954210.8	736311.8
101	4954208.7	736318.5
102	4954211.0	736313.6
136	4954220.4	736343.3
137	4954222.8	736342.6



LEGEND

SYMBOL	DENOTES
□	SURVEY MONUMENT PLANTED
■	SURVEY MONUMENT FOUND
SSIB	SHORT STANDARD IRON BAR 25mm x 25mm x 60cm
SIB	STANDARD IRON BAR 25mm x 25mm x 120cm
IB	IRON BAR 15mm x 15mm x 60cm
Wit.	WITNESS
MEAS.	MEASURED
R.P.	REGISTERED PLAN
873	W.A. BENINGER O.L.S.
PMT	PAD MOUNT TRANSFORMER
P1	45R-4502
CGVD28	CANADIAN GEODETIC VERTICAL DATUM 1928 (1978)

SURVEYOR'S CERTIFICATE

I CERTIFY THAT :

1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT AND THE SURVEYORS ACT AND THE REGULATIONS MADE UNDER THEM.
2. THIS SURVEY WAS COMPLETED ON THE 17th DAY OF JULY, 2024.

DATE: AUGUST 1st, 2024

KEVIN R. D. SMITH
ONTARIO LAND SURVEYOR

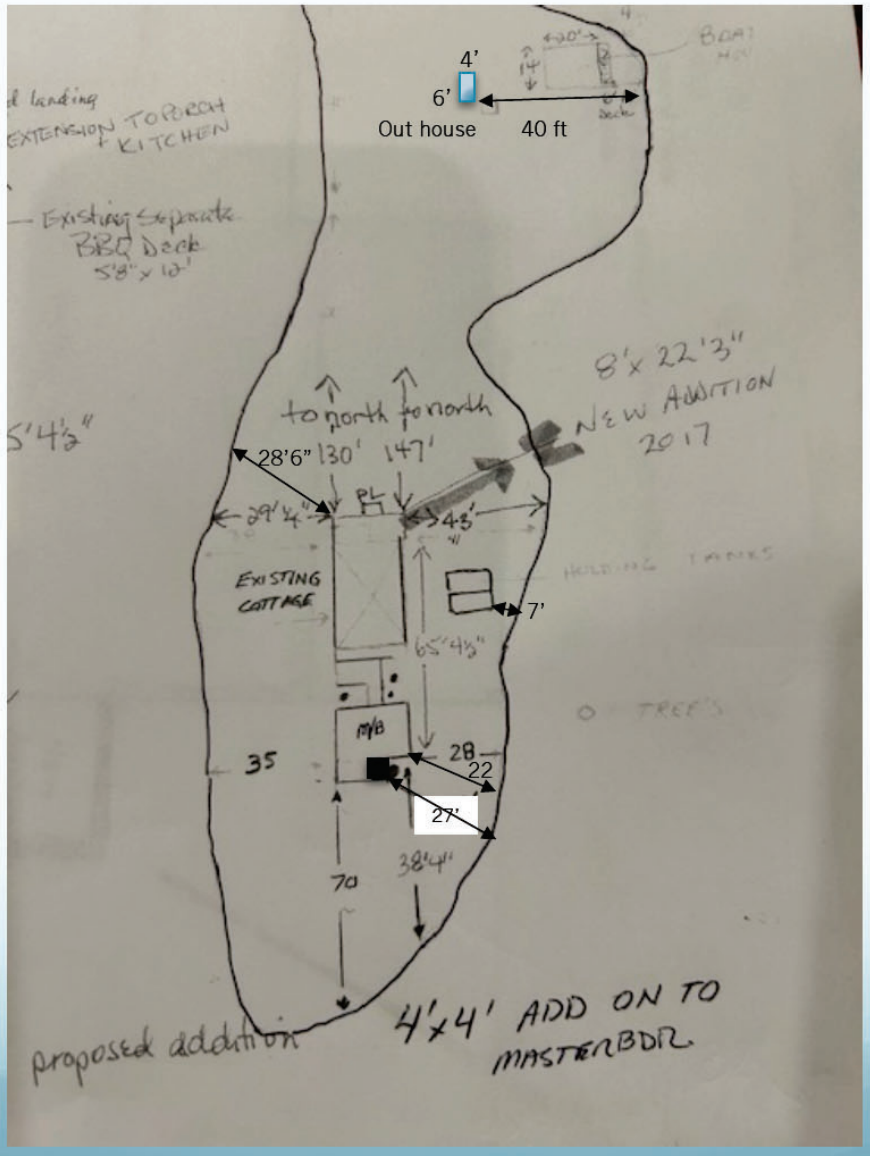
ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
V–XXXXX

THIS PLAN IS NOT VALID UNLESS IT IS AN EMBOSSED ORIGINAL COPY ISSUED BY THE SURVEYOR

In accordance with Regulation 1026, Section 29(3).

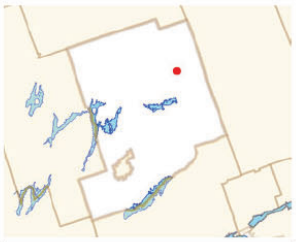
P. A. MILLER SURVEYING LTD.
ONTARIO LAND SURVEYOR
P. O. BOX 520
STIRLING
(613) 395-3070

FILE:	24-11943	CID:
DWG:	24-11943_SRPR.dwg	CHK: KRDS ?


4'
6'
Out house
40 ft
EXTENSION TO PORCH & KITCHEN
Existing Separate BBQ Deck 5'8" x 10'
5'4½"
to north
to north
28'6"
130'
147'
29'4"
PL
43'
8' x 22'3" NEW ADDITION 2017
EXISTING COTTAGE
7'
65'4½"
M/B
35
28
22
27'
38'4"
70
proposed addition
4'x4' ADD ON TO MASTER BDR

County of Peterborough

812 Is 27 Jack Lake



Legend

Roads < 50,000
- PRIV ; Private; PRIV
- City Arterial
- City Collector and Local
- City Owned Unclassified
- Provincial
- County
- Township
- Water Access Only

Outside Roads < 50,000
- Major Roads
- Local Roads

Peterborough Proposed Bypas
First Nations
Civic Address
Parcel Fabric
Parcel First Nations - Canada
Rivers
- Intermittent
- Permanent

Clean Water Act Policies Appl
Provincially Significant Wetlan
Locally Significant Wetlands
Non-evaluated Wetlands
Lakes - Local Scale
Municipal Boundary - Upper Ti
- <all other values>
- COUNTY OF PETERBOROUGH

Notes

183.7 0 91.86 183.7 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.
THIS MAP IS NOT TO BE USED FOR NAVIGATION

What is Pre-Consultation?

Prior to making an application for Planning Approval, a pre-consultation meeting with staff is recommended. The purpose of a pre-consultation meeting is to provide the applicant with an opportunity to present and review the proposed application with staff, to discuss potential issues, and determine the required elements and materials to be submitted with the application for it to be considered "complete" by Township staff.

Pre-Consultation Process

The applicant will submit the completed 'Request for Pre-Consultation Form' to the Building and Planning Department. The Township's Planning Assistant will coordinate a pre-consultation meeting.

The objective of the pre-consultation meeting is to:

- Identify any potential issues upfront and to identify any matters that could affect the approval process.
- To identify development and design considerations.
- To identify required reports/ studies and drawings to be submitted with a complete application.
- To identify potential application fees and approximate timelines associated with the application process.

The pre-consultation meeting is attended by the applicant/agent, Township staff and the Township's Planning Consultant and is intended to be an open dialogue between staff and the applicant/agent. Staff may ask questions of the applicant/agent and will provide verbal comments regarding the proposal.

Submission Requirements

- ☐ Completed Pre-consultation Request Form
- ☐ Concept plan (drawn to scale) – which includes (if applicable):
  - o Dimensions of property (frontage/ area).
  - o Location of all existing and proposed building and structures (including well and septic).
  - o Size and height of all buildings/ structures.
  - o Setbacks from existing and proposed buildings/structures to adjacent lot lines, wells, septic systems, shoreline and other buildings/structures on the property.
  - o Identify any man-made or natural features, and easements on the property (i.e. wetlands/hydro poles).
  - o Location of proposed and existing parking/loading spaces.
- ☐ Survey

For Use by Principal Authority	
Property Address:	Date Received:
Roll Number:	Pre-consultation Date:
Designation:	Zone:

Owner Information:		
Name of Owner(s):		
Address (Building/Fire Number, Street Name):		
City, Province, Postal Code:		
Phone: [redacted]	Cell:	Fax:
Email: [redacted]		

Agent Information:		
Name of Agent:		
Address (Building/Fire Number, Street Name): [redacted]		
City, Province, Postal Code: [redacted]		
Phone: [redacted]	Cell: [redacted]	[redacted]
[redacted]		

Agent Authorization (to be completed by Owner(s)):

If the applicant is not the owner of the land(s) that is subject to the application, confirmation by the owner(s) that the agent is authorized to request a pre-consultation meeting on his/her behalf must be completed below:

I/we _____ the registered owner(s) of
(Print: name of owners(s))

_____ hereby authorize

_____ to act as an agent for this Pre-consultation Request.

_____ _____

Date Signature of Owner(s)

Property Information:				
Legal Description of the Subject Land:				
Lot:	Concession:	Ward:	Registered Plan No.:	Lot/Block:
Street Address:			Reference Plan:	Part Number:

Current Land Uses:

Please describe the current uses on the property (e.g. detached year-round dwelling, seasonal cottage, hunt camp, commercial):

Proposed Land Uses:

Please describe the proposed uses on the property (e.g. detached year-round dwelling, seasonal cottage, bunkhouse, deck on side of cottage, expansion to commercial building):

Additional Information:

Please provide any additional information that may be of assistance in reviewing the proposal including location hydro lines

Has consultation with Crowe Valley Conservation Authority commenced? If so, please provide Property Information Form number.

Comparison Chart		
Please fill out chart in its entirety. If a section is not applicable, note NA. Do not leave blank.		
	Existing	**Proposed**
Lot Area		
Road Frontage		
Shoreline Frontage		
Gross Floor Area of Main Building/Principle Dwelling (Exclusive of Decks)		
Ground Floor Area of Main Building/Principle Dwelling (Exclusive of Decks)		
Height of Main Building/ Principle Dwelling		
Gross Floor Area of Open Attached Decks		
Ground Floor Area of Open Attached Decks		
Lot Coverage (%) of Main Building/Principle Dwelling		
Area of All Accessory Structures		
Lot Coverage (%) of All Accessory Structures		
Height and Ground Floor Area of Accessory Structure 1 (please indicate type of accessory structure e.g. boathouse)		
Height and Ground Floor Area of Accessory Structure 2 (please indicate type of accessory structure e.g. garage)		
Height and Ground Floor Area of Accessory Structure 3 (please indicate type of accessory structure e.g. shed)		

	Existing	Proposed
Setback to High Water Mark from Deck of Main Building/Principle Dwelling		
Setback to High Water Mark from Main Building/Principle Dwelling		
Front Yard Setback to Main Building/Principle Dwelling		
Side Yard Setback to Main Building/Principle Dwelling		
Rear Yard Setback to Main Building/Principle Dwelling		
Setback of Septic System from High Water Mark		
Setback of Septic System from Structure (accessory, main building)		
High Water Mark Setback for Accessory Structure 1		
Front Yard Setback for Accessory Structure 1		
Side Yard Setback for Accessory Structure 1		
Rear Yard Setback for Accessory Structure 1		
High Water Mark Setback for Accessory Structure 2		
Front Yard Setback for Accessory Structure 2		
Side Yard Setback for Accessory Structure 2		
Rear yard Setback for Accessory Structure 2		

	Existing	Proposed
High Water Mark Setback for Accessory Structure 3		
Side Yard Setback for Accessory Structure 3		
Rear Yard Setback for Accessory Structure 3		
Number of Parking Spaces		
Is this property a permanent, year-round residence?		

Please note:

1. **A pre-consultation is a mandatory component for both zone and official plan amendment applications. It is recognized that this is a proposal and certain elements may be subject to change. Comments provided as they relate to your proposal will be based on the information provided at pre-consultation. Requirements for submitting an application are subject to change if there are significant revisions to the proposed development.**

   Under no circumstances will a pre-consultation constitute a formal approval/disapproval of an application.

2. **There is no fee for requesting a pre-consultation, however, if you are unable to keep your scheduled appointment, please notify the planning department as soon as possible.**

3. **The information provided to the municipality may be shared with applicable agencies.**

TOWNSHIP OF HAVELOCK-BELMONT-METHUEN

To: Chairman and Members of Committee of Adjustment

Prepared By: Arya Hejazi M.PL., Planning Assistant HBM Township

Meeting Date: September 17th, 2024

Subject: **Minor Variance Application A-10-24**

Subject Property

Property Owner(s):	Brian and Shannon Tomlinson
Agent:	Kirk Figueira
Municipal Address:	105 Fire Route 75N
Roll Number:	1531-010-009-02500
Lot(s):	Part Lot 11
Concession(s):	7
Area:	0.3 Hectares (0.88 Acres)
Zoning:	Seasonal Residential (SR)
Official Plan:	Shoreline
Ward:	Methuen

PURPOSE and EFFECT:

The purpose of this Minor Variance application is as follows (all required reliefs are to the Township of Havelock-Belmont-Methuen's Comprehensive Zoning By-law 1995-42, as amended):

1. **Seek relief from Sections 10.2.1 (c), (d), (e), and (g) having the following effect(s):**

    i. Reducing the minimum required Front Yard setback from 21.3 metres (70 feet) to 0 metres (0 feet);

    ii. Reducing the minimum required Side Yard setback from 6 metres (20 feet) to 4.6 metres (15.23 feet);

iii. Reducing the minimum required Rear Yard setback from 7.5 metres (25 feet) to 6.7 metres (22 feet);

iv. Increasing the maximum required Lot Coverage from 15% to 22%

2. Seek relief from Section 4.37 having the following effect(s):

i. Reducing the High Water Mark setback from 30 metres (100 feet) to 29 metres (95 feet)

The above relief is to permit the following changes on the subject property:

1. Redevelopment of a seasonal recreational dwelling unit to a larger footprint, mainly confined to the existing foundation of the current dwelling, and increasing the High Water Mark setback from the shoreline of Kasshabog Lake. The redeveloped seasonal recreational dwelling unit will be accompanied by a new private sewage system.

RECCOMENDATION:

That Minor Variance application A-10-24 be ***approved*** with the following conditions:

- That a 20-day appeal period lapse prior to the issuance of a building permit;
- That no portion of the proposed dwelling unit be situated within the shoreline crown reserve currently owned by the Ministry of Natural Resources and Foresty (MNRF), unless permission is granted from the Ministry;
- That a building permit be issued within **18 months** of the approval of this application and upon submission to the building department of the appropriate application, fees and supporting information as required by the Chief Building Official; and that
- The balance of the information in this report be received.

ANALYSIS:

There is currently an existing seasonal recreational dwelling unit situated on the subject lot with approximately 106 square metres (1141 square feet) of habitable space. An assortment of accessory structures, inclusive of a detached garage and a frame shed, are also present on the subject parcel. According to Township records, the existing dwelling unit was constructed in 1999, while the detached garage was constructed in 2008. Both structures were subject to building permits issued by the Township of Havelock-Belmont-Methuen.

Currently, the only structure that is marginally within the 30 metre (100 foot) setback of Kasshabog lake is the existing recreational dwelling unit. Based on survey data submitted by the applicant/agent, only the lake-side uncovered deck encroaches into the High Water Mark setback to a total of 26 metres (85 feet). The approval of this

application will not serve to reduce this existing setback. In fact, the proposed development will be further pushed back from the shoreline of Kasshabog Lake.

As per the subject application, the property owners intend on demolishing and redeveloping the existing recreational dwelling unit to a larger footprint, with an assortment of decks and porches. The new recreational dwelling unit, despite its larger footprint, is being proposed beyond the 30 metre High Water Mark setback of Kasshabog Lake. The property owner also intends on constructing a new attached garage, alongside a new private sewage system to service the redeveloped recreational dwelling unit. The proposed dwelling unit, attached garage, and sewage system are proposed outside the 30 metre High Water Mark setback of Kasshabog Lake.

Consultation with Crowe Valley Conservation Authority (CVCA) has not commenced, yet. In any event, the subject application has been circulated to both CVCA and Peterborough Public Health (PPH) for further commentary.

It should be noted that the subject property contains an existing shoreline crown reserve that is currently under the ownership of the Ministry of Natural Resources and Foresty (MNRF). The Township has received written confirmation from MNRF that the owners have initiated the process to purchase the shoreline crown reserve.

The property is located on Kasshabog Lake with the surrounding uses:

Direction	**Land Use**
North	Rural and FR 75N
South	Kasshabog Lake
East	Seasonal Recreational
West	Seasonal Recreational

This application is subject to the four tests of a Minor Variance, as outlined in the Planning Act. The tests are as follow:

1. **Is this application “minor” in nature?**

   The proposed application intends on redeveloping an existing recreational dwelling unit to larger footprint, alongside a new private sewage system and attached garage. All the above changes are taking place outside the 30 metre High Water Mark setback of Kasshabog Lake, with the exception of the lake-side uncovered deck (which will be further set back from the High Water Mark in relation to the existing uncovered deck). Aside from the reliefs being sought as a result of the approval of this application, the entirety of the development meets the regulations and intent of the Zoning By-law, as well as the Official Plan.

   Therefore, this application is considered minor in nature.

2. Is the application desirable and appropriate?

Seasonal recreational uses are permitted within both the Zone of the subject property (*Seasonal Residential – SR Zone*) and the Official Plan Designation (*Shoreline)*. Furthermore, while the existing recreational dwelling unit is currently outside the 30 metre setback of Kasshabog Lake, no form of setback reduction is being proposed as a result of the approval of this application. It is intended that the proposed dwelling unit, attached garage, and individual sewage system be situated entirely outside the 30 metre setback of Kasshabog Lake. The only exception to this is the lake-side uncovered deck, which is proposed to be pushed further back from the shoreline that the existing lake-side uncovered deck.

Finally, the approval of this application will serve to increase the enjoyment and utility of an existing lot of record, that is intended on being used for seasonal recreational purposes.

Therefore, this application is desirable and appropriate for the site.

3. Does this application conform to the Intent of the Official Plan?

The Township Official Plan designation for the subject property is ***Shoreline***. Under Section 3.3.3 – Shoreline Development, residential uses of both a permanent and recreational (cottage) nature are both permitted uses within the Shoreline Designation.

Additionally, under Section 3.3.4.1 – Development Policies – Development Considerations (a), indication is made that all new development should produce minimal visual, environmental, and navigational impacts to any abutting lake shorelines. Customarily, and in conformity with the Official Plan Shoreline Designation policies, new development is encouraged to take place outside the minimum high-water mark setback of all inland lakes across the Township. As the majority of the proposed development is taking place outside the 30 metre High Water Mark setback, with the exception of the lake-side uncovered deck, no reductions in setback standards are being proposed.

It is the planning opinion of the Township that the subject application conforms to the intent of the Township's Official Plan.

4. Does this application conform to the Intent of the Zoning Bylaw?

The subject property is currently zoned as Seasonal Residential (SR). The SR Zone permits singe detached recreational/vacation dwellings, inclusive of

accessory structures, subject to the provisions and regulations under both Sections 10 and 4.1.

All of the provisions of the By-law are being adhered to, with the exception of the items requiring relief stated in the *Purpose and Effect* section of this report. The regulation variances that are being sought are relatively minor and reflective of the current setback standards existing on the subject lot.

The Township is proposing a 0 metre setback for the Front Yard due to the fact that the owners currently do not own the shoreline crown reserve. Therefore, technically, the Front Lot Line boundary begins where the shoreline crown reserve is currently situated. Since the proposed development is entirely outside this crown reserve, a 0 metre setback would be appropriate to recognize the deficient Front Yard. Once the shoreline crown reserve has been purchased, the Front Yard setback would revert to the original lot configuration in accordance with the shoreline of Kasshabog Lake.

This application, as proposed, therefore maintains the spirit and intent of the Township's Zoning By-law.

This application satisfies the four tests of the minor variance. Additionally, this application must satisfy the Provincial Policy Statement (PPS) and the Growth Plan for the Greater Golden Horseshoe. The following policies are applicable:

Provincial Policy Statement

Section 1 of the PPS provides direction for the creation of strong, healthy and vibrant communities. The efficient use of land is supported through sustainable development patterns which consider the needs of communities, the environment, public health, safety, and economic growth. This section will address those policies which are relevant to the proposed development.

Section 1.1.1 – Healthy, liveable and safe communities are sustained by

(a) Promoting efficient development and land use patterns which sustain the financial well-being of the province and municipalities over long term

(c) Avoiding development and land use patterns which may cause environmental or public health and safety concerns

Section 1.1.4.1 – Healthy, integrated and viable rural areas should be supported by:

(a) Building upon rural character, and leveraging rural amenities and assets

The subject property is considered to be part of a rural use in the PPS, and a residential property is consistent with the policies for rural areas. The purpose of this application is

to further enjoy the rural character and assets of the said property. This application conforms to the intent of the PPS.

Growth Plan for the Greater Golden Horseshoe

Growth Plan for the Greater Golden Horseshoe:

Section 2.2.1 – Managing Growth

> (d) Directing development to settlement areas, except where necessary for development related to the management or use of resources, resource-based recreational activities and rural lands that cannot be located in settlement areas.

Section 2.2.9 – Rural Areas

> 2. Subject to the policies in Section 4, development outside of settlement areas may be permitted on rural lands for:
>
> c) other rural land uses that are not appropriate in settlement areas provided they:
>
> i. are compatible with the rural landscape and surrounding local land uses;
>
> ii. will be sustained by rural service levels; and
>
> iii. will not adversely affect the protection of agricultural uses and other resource-based uses such as mineral aggregate operations

This property is a rural residential property, which is considered development related to the use of a resource-based activity and as such cannot be located in the settlement area.

This application conforms to the intent of the Growth Plan for the Greater Golden Horseshoe.

At the time of writing this report, no comments have been made from rate payers. As previously mentioned in this report, the subject property falls within the watershed jurisdiction of the Crowe Valley Conservation Authority (CVCA). A permit from their office is not anticipated as part of the development process. However, this subject application has been circulated to both CVCA and Peterborough Public Health (PPH) for their input and commentary.

As this application meets the four tests of a Minor Variance and conforms to the PPS and the Growth Plan, it is the recommendation of this report that this application be ***approved***.

COMMENTS

None received at the time of report preparation.

FINANCIAL IMPACT

A decision respecting the application is appealable to the Ontario Land Tribunal; for which any costs incurred by the Municipality may be recoverable from the applicant.

Respectfully submitted,

Arya Hejazi

_____

Arya Hejazi
Planning Assistant
Township of Havelock-Belmont-Methuen

Appendix A – MV Application
Appendix B – Property Survey
Appendix C – Site Plan
Appendix D – GIS Mapping
Appendix E – Pre-Consultation

Date Received: _____
Fee Received: _____
Roll No.: _____

Township of Havelock-Belmont-Methuen
Application for
☐ **Minor Variance – s. 45(1)**
☐ **Permission – s. 45(2)**

---

1. Applicant/Agent Information:

1.1 Name of Owner(s): Brian and Shannon Tomlinson

Address: 105 FR 75N Havelock Ont. K0L 1Z0

_____ Postal Code K0L 1Z0

Telephone Numb[redacted] Fax Number: (____) _____ -_____

E-Mail Address: [redacted]

(An owner's authorization is required in Section 10.1 if the applicant is not the owner.)

1.2 Name of Applicant/Agent: Kirk Figueira
(if different from owner)
Address: [redacted]

_____ Postal Code [redacted]

Telephone Number: ([redacted]) [redacted] -[redacted] Fax Number: (____) _____ -_____

E-Mail Address: [redacted]

1.3 Communication should be sent to: Owner ☑ Applicant ☑ or to the following:

_____

Address: _____

_____ Postal Code _____

Telephone Number: (____) _____ -_____ Fax Number: (____) _____ -_____

E-Mail Address: _____

2. LOCATION OF THE SUBJECT LAND: *(Complete applicable lines)*

2.1 Geographic Municipality/Township or Village: Havelock Belmont Methuen TSP of Methuen

Concession Number(s) 7 Lot Number(s): 11

Registered Plan Number: 28250-0217 (LT) Lot(s)/Block(s): _____

Reference Plan Number: 45R11967 Part Number(s): #1

Road/Street Number and Name: FR 105 75N

Attach Survey Plan, if available.

2.2 Are there any easements or restrictive covenants affecting the subject land?

Yes ☐ No ☑

If yes, describe the easement or covenant and its effect:

3. Planning Review Information:

3.1 Official Plan Designation

3.2 Zoning By-law

SR

4. PURPOSE OF APPLICATION:

4.1 Nature and extent of relief from the zoning by-law

front yard set back relief to high water

4.2 REASON: (*Purpose of the proposed amendment – why proposed use is unable to comply with the zoning by-law provisions)*

replacing existing Cottage built 30 years ago with bew cottage in same location.

5. Description of Subject Land:

5.1 Dimensions of Land:

Frontage: 62.2 M m/ft. Depth: 51.8m and 58.81m m/ft.

Area: 3307 m2 sq.m/sq. ft. _____ ha/ac

Existing Use(s) of the subject land: seasonal Cottage

Length of Time the existing uses of the subject land have continued: 26 + years

5.2 Date subject land was acquired by current owner**:** 30 years ago

5.3 Existing Buildings and Structures: Please identify each existing building on the sketch and provide information for each building. (If more than one building, attach a separate sheet to this application.)

Building 1

Type Lindwood Custom Home Cottage Date Constructed dec 1998

Existing Use Seasonal dwewlling

Date Existing Use Commenced 1996

Ground Floor Area* 1141 sq.ft Gross Floor Area ** 1438 sq.ft

Front lot line setback 104 ft Rear lot line setback 123 ft

Side lot line setback 63 ft Side lot line setback 64 ft

Building Height 18.8 ft Dimensions 42 ft x 32 ft

Building 2

Type Garage Date Constructed DEc 1998

Existing Use garage and storage

Date Existing Use Commenced 1998

Ground Floor Area* 1169 sq.ft Gross Floor Area ** 1500 sq.ft.

Front lot line setback 242 +/- ft Rear lot line setback 26 fft.

Side lot line setback 137 ft Side lot line setback 35 ft

Building Height 23ft Dimensions 24'6" x 36' 6"

Building 3

Type _____ Date Constructed _____

Existing Use _____

Date Existing Use Commenced _____

Ground Floor Area* _____ Gross Floor Area ** _____

Front lot line setback _____ Rear lot line setback _____

Side lot line setback _____ Side lot line setback _____

Building Height _____ Dimensions _____

5.4 Nature of Proposed Development: Please provide the information for each proposed building (If more than one building, attach a separate sheet to this application. If a proposed plan showing location of proposed buildings is available, please attach.)

Proposed Use(s) of the subject land: Single Detached Dwelling seasonal use

Building 1

Type Seasonal dwewlling

Ground Floor Area* 2874 sq.ft Gross Floor Area ** 2261 sq.ft.

Front lot line setback 115 ft. Rear lot line setback 73 ft

Side lot line setback 49 ft Side lot line setback 55 ft

Building Height 25 ft 7" Dimensions 91' x 84'

Building 2

Type Attached Garage

Ground Floor Area* 784 sq.ft. Gross Floor Area ** _____

Front lot line setback 170 ft Rear lot line setback 74 fr.

Side lot line setback 51 ft Side lot line setback 55 ft

Building Height 22 ft Dimensions 26' x 26'

* Ground Floor Area means the area that the building occupies on the ground.

** Gross Floor Area means the sum of the area of each floor of the building counting each floor at or above ground level (not basement or cellar) based on the exterior dimensions of the building.

6. Services:

6.1 Access is/will be provided to the subject land by: *(check appropriate space)*

		Maintenance	
Provincial Highway	☐	Public	☐
Municipal Road	☐	Private	☒
Private Road	☒	Year Round	☐
Right of Way	☐	Seasonal	☐
Unopened Road Allowance	☐	Unmaintained	☐
Other Public Road	☐		
(Specify) _____			
Water Access	☐		

Mainland Access – where access to the subject land is only by water:
Docking Facilities (specify) _____

Parking Facilities (specify) _____

Distance from Subject Land _____

Distance from Nearest Public Road _____

6.2 Water Supply is provided to the subject land by: *(check appropriate space)*

Publicly-owned/operated piped water system	☐
Privately-owned/operated individual well	☒
Privately-owned/operated communal well	☐
Lake or other water body	☐
Other means *(specify)* _____	☐

6.3 Sewage Disposal is provided to the subject land by: *(check appropriate space)*

Publicly-owned/operated sanitary sewage system	☐
Private individual septic tank	☒
Public-owned/operated communal sewage system	☐
Private communal sewage system	☐
Privy	☐
Other means *(specify)* _____	☐

6.4 Storm Drainage is provided to the subject land by: *(check appropriate space)*

Sewers	☐
Ditches	☐
Swales	☐
Other means *(specify)* none	☐

6.5 Other (Check if service is available)

☑ Electricity	☐ School bussing
☑ Telephone	☐ Garbage Collection
☐ Cable	☐ Recycling Collection

6.6 Notice to Applicants:

Should the location of the property which is the subject of this application be within the Wellhead Protection Area for the Havelock Municipal Well System then you are required to include a Section 59 Notice; in order to have your application deemed 'complete' in accordance with the Planning Act. Please Contact:
Terri Cox, Otonabee Region Conservation Authority
Email: tcox@otonabeeconservation.com
Tel: 705-745-5791 Ext 219

7. Other Applications (If known, indicate whether the subject land is a subject of application under the Act in any of the following):

7.1 Is the subject land currently the subject of a proposed official plan or official plan amendment that has been submitted to the Minister for approval?
☐ Yes #_____, Status_____ ☑ No ☐ Unknown

7.2 Is the subject land currently the subject of a zoning by-law amendment, Minister's zoning order amendment, consent or approval of plan of subdivision?
☐ Yes #_____, Status_____ ☑ No ☐ Unknown

7.3 Has the subject land been the subject of a previous minor variance application?
☐ Yes #_____, Status_____ ☐ No ☑ Unknown

8.0 History of Subject Land

8.1 If this is a re-submission of a minor variance application, explain how the proposal has changed.
NA

8.2 Has there ever been an industrial or commercial use on the subject land or adjacent land? Yes ☐ No ☑ Unknown ☐

If YES, please specify the use. _____

8.3 Has the grading of the subject land ever been changed by adding earth or other material? Yes ☐ No ☐ Unknown ☑

8.4 Has a gas station ever been located on the subject property or adjacent land?
Yes ☐ No ☑ Unknown ☐

8.5 Has there been gasoline or other fuel stored on the subject land or adjacent land?
Yes ☐ No ☑ Unknown ☐

8.6 Is there reason to believe the subject land may have been contaminated by former uses on the site or adjacent site?
Yes ☐ No ☑ Unknown ☐

11. SKETCH PLAN:

The application must be accompanied by a sketch showing the following:

- the boundaries and dimensions of the subject land;
- the location, size and type of all existing and proposed buildings and structures on the subject land; indicating the distance of the buildings or structures from the front, rear and side lot lines;
- the boundaries and dimensions of land that abuts the subject property, or any land owned by the owner of the subject land and that abuts the subject land;
- the location, size and type of all existing and proposed buildings and structures on abutting lands, indicating the distance of the buildings or structures from the front, rear and side lot lines;
- the distance between the subject land and the nearest township lot line or landmark, such as a railway crossing or bridge;
- the location of all land previously severed from the parcel originally acquired by the current owner of the subject land;
- the approximate location of all natural and artificial features on the subject land and adjacent lands that in the opinion of the applicant may affect the application, such as buildings, abandoned or active railways, roads, watercourses, drainage ditches, river or stream banks, wetlands, wooded areas, wells and septic tanks and tile beds;
- the existing use(s) on adjacent lands;
- the location, width and name of any roads within or abutting the subject land, indicating whether it is an unopened road allowance, a public travelled road, a private road or a right-of-way;
- if access to the subject land is by water only, the location of the parking and boat docking facilities to be used;
- the location and nature of any easement affecting the subject land;
- all present entrances onto the subject property;
- if there are agricultural buildings capable of housing animals within 500 metres of the proposed lot, then the location of these buildings must be shown on the sketch.

Measurements on the sketch **SHALL** correspond to those identified in the application. Photocopies of your survey, if you have one, should be used. If no survey is available, a detailed hand-drawn sketch to scale is acceptable.

In some instances, it may be necessary for a locational survey to be submitted with the application in order to accurately determine property and building dimensions, setbacks, etc. A locational survey may be required in situations where existing/proposed building or structures are in proximity to property line(s) and/or shoreline.

FOR OFFICE USE ONLY

1. Is application deemed complete? **Yes** ☐ **No** ☐

Date: _____

Site Visit Date:_____

2. What is the current Official Plan designation(s) of the subject lands?

_____

3. What is the current Zoning of the subject lands?

_____

4. Does application conform to both the County and Township Official Plan?

Yes ☐ **No** ☐

If no, describe nature of non-conformity.

_____

_____

5. Is the application consistent with the Provincial Policy Statement?

Yes ☐ **No** ☐

6. Is the proposed Minor Variance compatible with adjacent/surrounding land uses?

Yes ☐ **No** ☐

If no, describe nature of incompatibility.

_____

_____

7. Is this considered suitable for the intended use (physical characteristics such as topography, drainage, soils and wet areas)

Yes ☐ **No** ☐

If no, describe nature of issues.

_____

_____

10.2 Consent of Owner(s) to Enter Upon Lands

I/We, Brian and Shannon Tomlinson, hereby authorize the Township of Havelock-Belmont-Methuen Council and/or their agents/representative(s) to attend upon the lands subject of this application.

Signature of Applicant | Signature of Witness

Personal information contained on this form, collected pursuant to the *Planning Act*, will be used for the purpose of responding to the initial application. Questions should be directed to the Freedom of Information and Privacy Coordinator at the institution conducting the procedures under the Act.

10.3 Payment/Acknowledgement

Any complete application submission must be accompanied by a deposit fee in the amount of $1000.00 in cash, debit, online payment or cheque made payable to the Township of Havelock-Belmont-Methuen.

By virtue of signature(s) hereon, I/We as the owner(s) further agree to pay any further costs incurred by the Township associated with the processing of my/our application; including, but not restricted to Municipal costs, Professional Planning Fees, Engineering and Legal Fees.

July 29th 2024
Date

Signature of Owner

July 29th 2024
Date

Signature of Owner

9. Affidavit or Sworn Declaration

I, Kirk Figueira of the [redacted]
(owner or applicant) (Township, City, Village)

of [redacted] in the Ontario Canada
(County, Province)

of _____ make oath and say (or solemnly declare) that the information contained in this application is true and that the information contained in the documents that accompany this application in respect of the application is true.

Declared before me at the _____ of _____

in the _____ of _____

this _____ day of _____, 20____.

_____ _____
Commissioner of Oaths Applicant

_____
Applicant

10. AUTHORIZATIONS

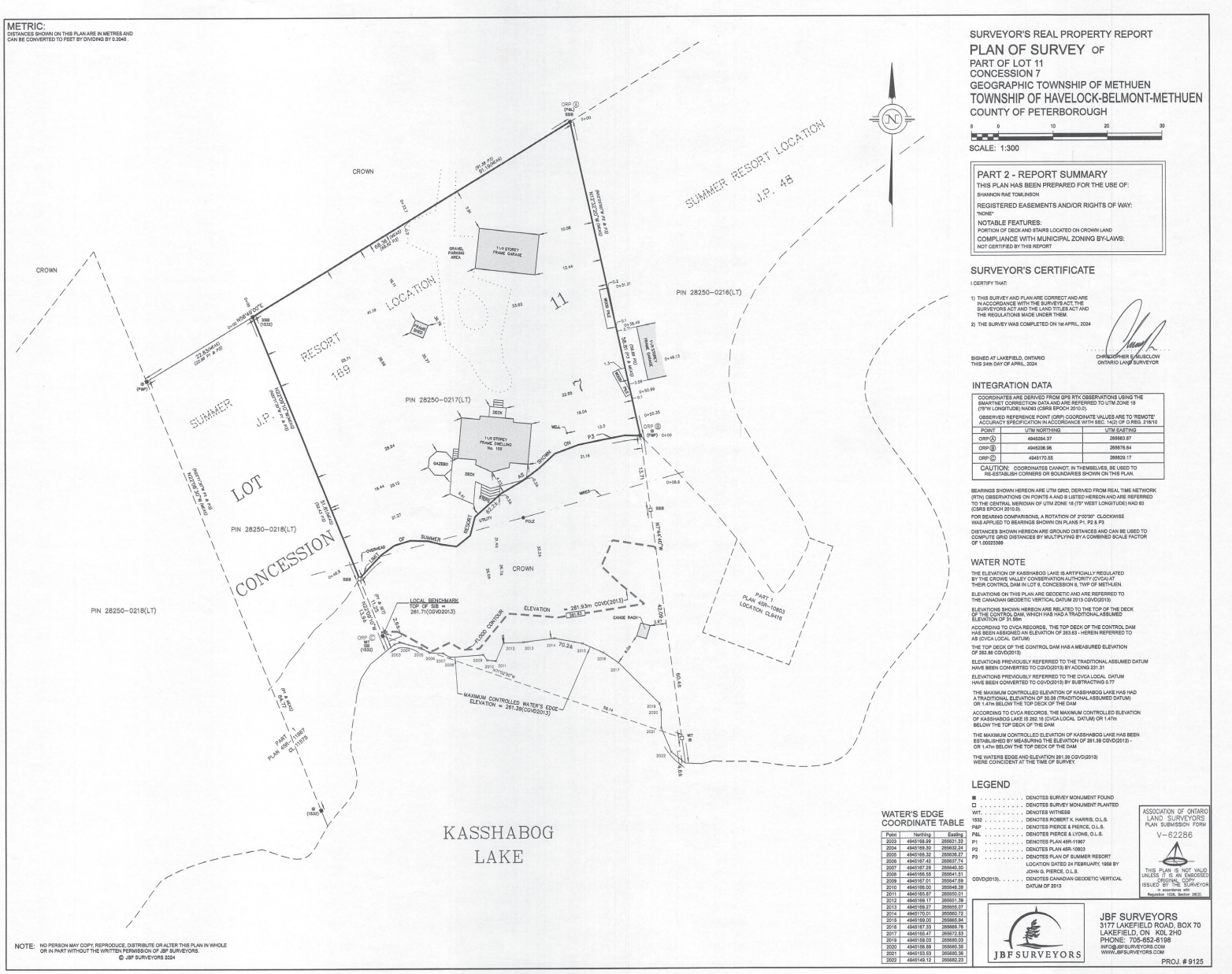
10.1 Consent of the Owner(s) to make Application

If the applicant is not the sole owner of the land that is the subject of this application, the written authorization of the owner(s), that the applicant is authorized to make the application, must be included or the authorization set out below must be completed by the owner(s).

I/We, Brian and Shannon Tomlinson,
am/are the owner(s) of the land that is the subject of this application and I/We authorize Kirk Figueira to make this application on my/our behalf and to provide any of my/our personal information that will be included in this application or collected during the processing of the application.

July 29 2024 _____
Date Signature of Owner

July 29 2024 _____
Date Signature of Owner



SURVEYOR'S REAL PROPERTY REPORT

PLAN OF SURVEY OF

PART OF LOT 11
CONCESSION 7
GEOGRAPHIC TOWNSHIP OF METHUEN
TOWNSHIP OF HAVELOCK-BELMONT-METHUEN
COUNTY OF PETERBOROUGH

SCALE: 1:300

PART 2 - REPORT SUMMARY

THIS PLAN HAS BEEN PREPARED FOR THE USE OF:
SHANNON RAE TOMLINSON

REGISTERED EASEMENTS AND/OR RIGHTS OF WAY:
"NONE"

NOTABLE FEATURES:
PORTION OF DECK AND STAIRS LOCATED ON CROWN LAND

COMPLIANCE WITH MUNICIPAL ZONING BY-LAWS:
NOT CERTIFIED BY THIS REPORT

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

1) THIS SURVEY AND PLAN ARE CORRECT AND ARE IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM.
2) THE SURVEY WAS COMPLETED ON 1st APRIL, 2024

SIGNED AT LAKEFIELD, ONTARIO
THIS 24th DAY OF APRIL, 2024

CHRISTOPHER E. MUSCLOW
ONTARIO LAND SURVEYOR

INTEGRATION DATA

COORDINATES ARE DERIVED FROM GPS RTK OBSERVATIONS USING THE SMARTNET CORRECTION DATA AND ARE REFERRED TO UTM ZONE 18 (78°W LONGITUDE) NAD83 (CSRS EPOCH 2010.0).

OBSERVED REFERENCE POINT (ORP) COORDINATE VALUES ARE TO 'REMOTE' ACCURACY SPECIFICATION IN ACCORDANCE WITH SEC. 14(2) OF O.REG. 216/10

POINT	UTM NORTHING	UTM EASTING
ORP Ⓐ	4945264.37	265563.87
ORP Ⓑ	4945206.98	265676.84
ORP Ⓒ	4945170.55	265629.17

CAUTION: COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

BEARINGS SHOWN HEREON ARE UTM GRID, DERIVED FROM REAL TIME NETWORK (RTN) OBSERVATIONS ON POINTS A AND B LISTED HEREON AND ARE REFERRED TO THE CENTRAL MERIDIAN OF UTM ZONE 18 (75° WEST LONGITUDE) NAD 83 (CSRS EPOCH 2010.0).

FOR BEARING COMPARISONS, A ROTATION OF 2°00'39" CLOCKWISE WAS APPLIED TO BEARINGS SHOWN ON PLANS P1, P2 & P3

DISTANCES SHOWN HEREON ARE GROUND DISTANCES AND CAN BE USED TO COMPUTE GRID DISTANCES BY MULTIPLYING BY A COMBINED SCALE FACTOR OF 1.00023399

WATER NOTE

THE ELEVATION OF KASSHABOG LAKE IS ARTIFICIALLY REGULATED BY THE CROWE VALLEY CONSERVATION AUTHORITY (CVCA) AT THEIR CONTROL DAM IN LOT 9, CONCESSION 8, TWP OF METHUEN.

ELEVATIONS ON THIS PLAN ARE GEODETIC AND ARE REFERRED TO THE CANADIAN GEODETIC VERTICAL DATUM 2013 CGVD(2013).

ELEVATIONS SHOWN HEREON ARE RELATED TO THE TOP OF THE DECK OF THE CONTROL DAM, WHICH HAS HAD A TRADITIONAL ASSUMED ELEVATION OF 31.58m

ACCORDING TO CVCA RECORDS, THE TOP DECK OF THE CONTROL DAM HAS BEEN ASSIGNED AN ELEVATION OF 263.63 - HEREIN REFERRED TO AS (CVCA LOCAL DATUM)

THE TOP DECK OF THE CONTROL DAM HAS A MEASURED ELEVATION OF 262.86 CGVD(2013)

ELEVATIONS PREVIOUSLY REFERRED TO THE TRADITIONAL ASSUMED DATUM HAVE BEEN CONVERTED TO CGVD(2013) BY ADDING 231.31

ELEVATIONS PREVIOUSLY REFERRED TO THE CVCA LOCAL DATUM HAVE BEEN CONVERTED TO CGVD(2013) BY SUBTRACTING 0.77

THE MAXIMUM CONTROLLED ELEVATION OF KASSHABOG LAKE HAS HAD A TRADITIONAL ELEVATION OF 30.08 (TRADITIONAL ASSUMED DATUM) OR 1.47m BELOW THE TOP DECK OF THE DAM

ACCORDING TO CVCA RECORDS, THE MAXIMUM CONTROLLED ELEVATION OF KASSHABOG LAKE IS 262.16 (CVCA LOCAL DATUM) OR 1.47m BELOW THE TOP DECK OF THE DAM

THE MAXIMUM CONTROLLED ELEVATION OF KASSHABOG LAKE HAS BEEN ESTABLISHED BY MEASURING THE ELEVATION OF 261.39 CGVD(2013) - OR 1.47m BELOW THE TOP DECK OF THE DAM

THE WATERS EDGE AND ELEVATION 261.39 CGVD(2013) WERE CONCIDENT AT THE TIME OF SURVEY.

LEGEND

- ■ . . . . . DENOTES SURVEY MONUMENT FOUND
- □ . . . . . DENOTES SURVEY MONUMENT PLANTED
- WIT. . . . . DENOTES WITNESS
- 1632 . . . . . DENOTES ROBERT K. HARRIS, O.L.S.
- P&P . . . . . DENOTES PIERCE & PIERCE, O.L.S.
- P&L . . . . . DENOTES PIERCE & LYONS, O.L.S.
- P1 . . . . . DENOTES PLAN 49R-11997
- P2 . . . . . DENOTES PLAN 49R-10803
- P3 . . . . . DENOTES PLAN OF SUMMER RESORT LOCATION DATED 24 FEBRUARY, 1958 BY JOHN G. PIERCE, O.L.S.
- CGVD(2013). . . . . DENOTES CANADIAN GEODETIC VERTICAL DATUM OF 2013

WATER'S EDGE COORDINATE TABLE

Point	Northing	Easting
2003	4945168.69	265631.33
2004	4945169.30	265632.24
2005	4945169.32	265638.27
2006	4945167.42	265637.74
2007	4945167.28	265640.30
2008	4945166.55	265641.51
2009	4945167.01	265647.69
2010	4945166.00	265648.39
2011	4945165.87	265650.01
2012	4945169.17	265651.39
2013	4945169.27	265655.07
2014	4945170.01	265660.72
2015	4945169.00	265665.84
2016	4945167.33	265669.78
2017	4945165.47	265672.53
2018	4945166.03	265680.03
2020	4945166.89	265680.36
2021	4945163.53	265680.39
2022	4945149.12	265682.23

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
V-62286

THIS PLAN IS NOT VALID UNLESS IT IS AN EMBOSSED ORIGINAL COPY ISSUED BY THE SURVEYOR
In accordance with Regulation 1026, Section 29(3).

JBF SURVEYORS
3177 LAKEFIELD ROAD, BOX 70
LAKEFIELD, ON K0L 2H0
PHONE: 705-652-6198
INFO@JBFSURVEYORS.COM
WWW.JBFSURVEYORS.COM

PROJ. # 9125

REAR PERSPECTIVE

FRONT PERSPECTIVE

PRELIMINARY DRAWINGS NOT FOR CONSTRUCTION

FLOOR AREAS (sq.ft.)

BASEMENT	
BASEMENT FLOOR	2,874
	2,874 ft²
LIVING AREAS	
MAIN FLOOR	2,261
	2,261 ft²
OTHER	
GARAGE	784
	784 ft²
PORCHES & DECKS	
ENTRY PORCH	132
OPEN DECK	1,053
SCREENED PORCH	480
	1,665 ft²
	7,584 ft²

DISCOVERY DREAM HOMES
LOG & TIMBERFRAME
Discover the difference...
Keene, Ontario, Canada
(705) 400-5647

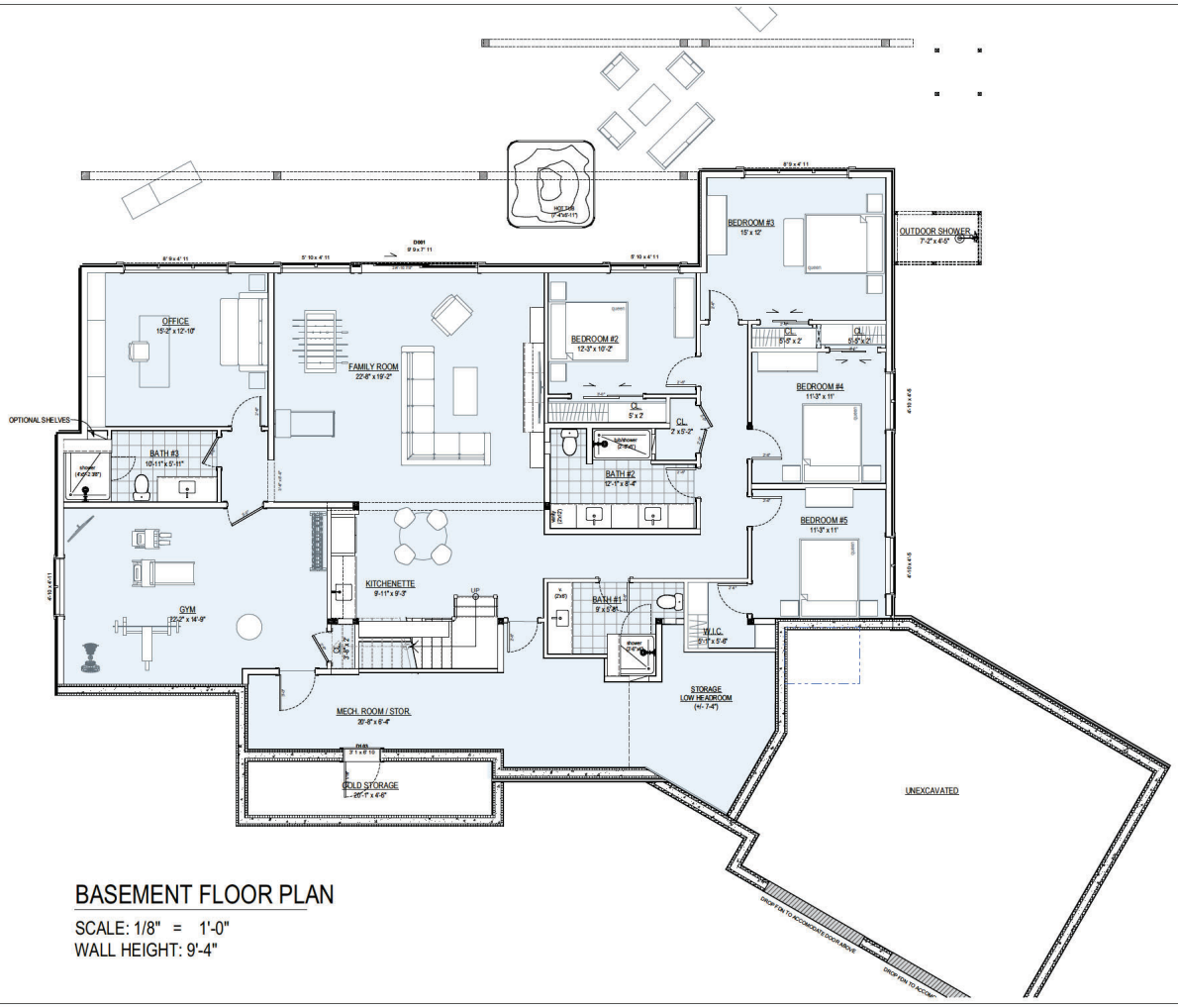
Project: *Modified Sunset Ridge*

Client: **Brian & Shannon Tomlinson**

Drawn By:	Sales Rep.:	Project No:	Revision:
JCK	KF/SS	**23-073**	**F**

Date: Thursday, May 30, 2024

Ground Snow Load:	Pg No:
3.1 kPa	1 of 6



BASEMENT FLOOR PLAN

SCALE: 1/8" = 1'-0"
WALL HEIGHT: 9'-4"

PRELIMINARY DRAWINGS NOT FOR CONSTRUCTION

FLOOR AREAS (sq.ft.)

BASEMENT	
BASEMENT FLOOR	2,874
	2,874 ft²
LIVING AREAS	
MAIN FLOOR	2,261
	2,261 ft²
OTHER	
GARAGE	784
	784 ft²
PORCHES & DECKS	
ENTRY PORCH	132
OPEN DECK	1,053
SCREENED PORCH	480
	1,665 ft²
	7,584 ft²

DISCOVERY DREAM HOMES LOG & TIMBERFRAME
Discover the difference...
Keene, Ontario, Canada
(705) 400-5647

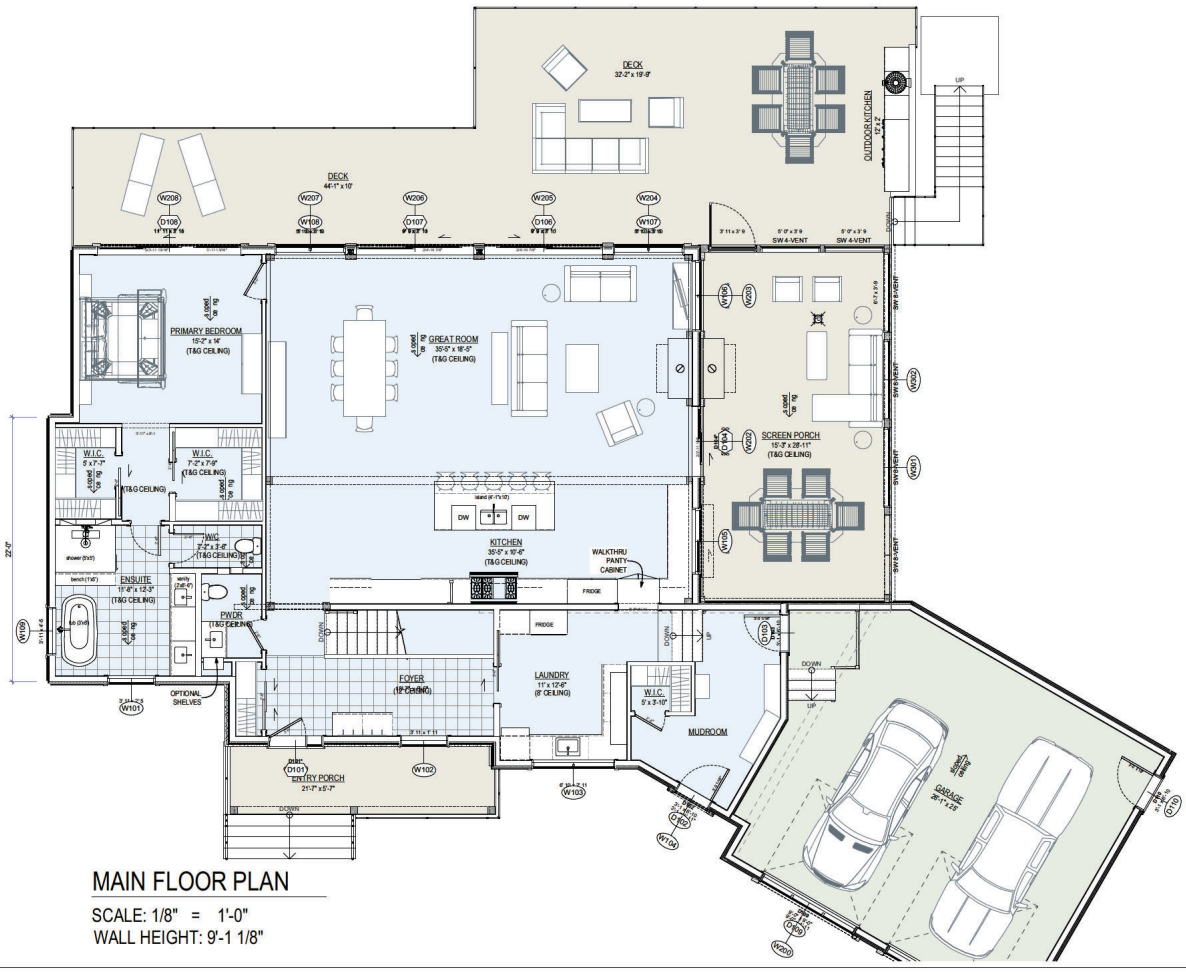
Project: *Modified Sunset Ridge*

Client: **Brian & Shannon Tomlinson**

Drawn By:	Sales Rep.:	Project No:	Revision:
JCK	KF/SS	**23-073**	**F**

Date: Thursday, May 30, 2024

Ground Snow Load:	Pg No:
3.1 kPa	2 of 6



MAIN FLOOR PLAN

SCALE: 1/8" = 1'-0"
WALL HEIGHT: 9'-1 1/8"

PRELIMINARY DRAWINGS NOT FOR CONSTRUCTION

FLOOR AREAS (sq.ft.)

BASEMENT	
BASEMENT FLOOR	2,874
	2,874 ft²
LIVING AREAS	
MAIN FLOOR	2,261
	2,261 ft²
OTHER	
GARAGE	784
	784 ft²
PORCHES & DECKS	
ENTRY PORCH	132
OPEN DECK	1,053
SCREENED PORCH	480
	1,665 ft²
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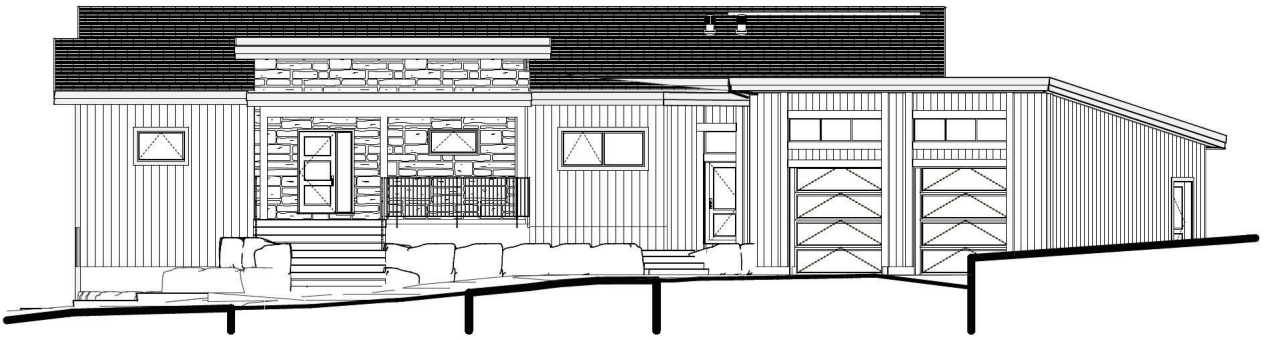
Drawn By:	Sales Rep.:	Project No:	Revision:
JCK	KF/SS	**23-073**	**F**

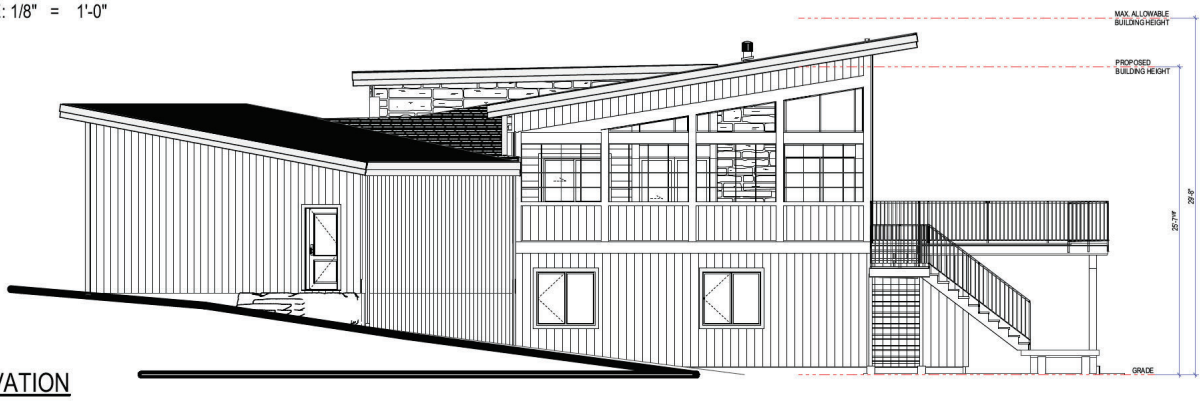
Date: Thursday, May 30, 2024

Ground Snow Load:	Pg No:
3.1 kPa	3 of 6



FRONT ELEVATION

SCALE: 1/8" = 1'-0"



IGHT ELEVATION

ALE: 1/8" = 1'-0"

PRELIMINARY DRAWINGS NOT FOR CONSTRUCTION

FLOOR AREAS (sq.ft.)

BASEMENT		
	BASEMENT FLOOR	2,874
		2,874 ft²
LIVING AREAS		
	MAIN FLOOR	2,261
		2,261 ft²
OTHER		
	GARAGE	784
		784 ft²
PORCHES & DECKS		
	ENTRY PORCH	132
	OPEN DECK	1,053
	SCREENED PORCH	480
		1,665 ft²
		7,584 ft²

DISCOVERY DREAM HOMES
LOG & TIMBERFRAME
Discover the difference...
Keene, Ontario, Canada
(705) 400-5647

Project: *Modified Sunset Ridge*

Client: **Brian & Shannon Tomlinson**

Drawn By:	Sales Rep.:	Project No:	Revision:
JCK	KF/SS	**23-073**	**F**

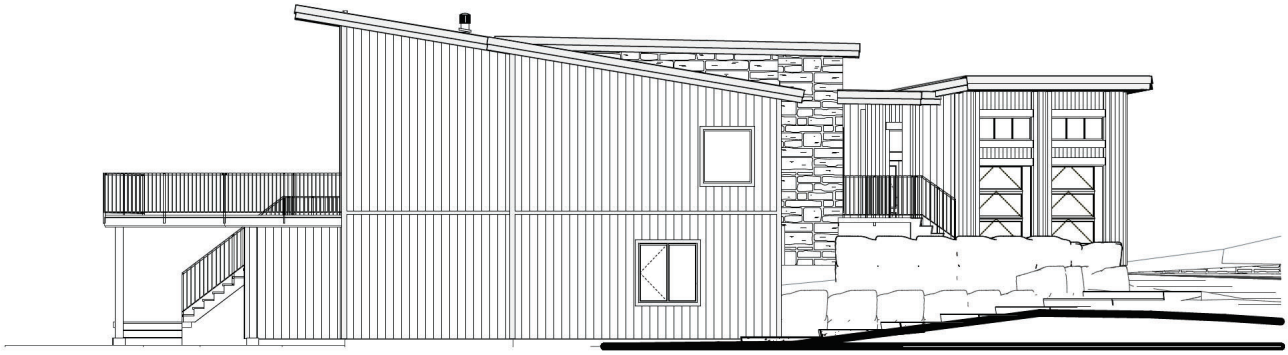
Date: Thursday, May 30, 2024

Ground Snow Load: 3.1 kPa

Pg No: 4 of 6

REAR ELEVATION

SCALE: 1/8" = 1'-0"



LEFT ELEVATION

SCALE: 1/8" = 1'-0"

PRELIMINARY DRAWINGS NOT FOR CONSTRUCTION

FLOOR AREAS (sq.ft.)

BASEMENT		
BASEMENT FLOOR	2,874	
		2,874 ft²
LIVING AREAS		
MAIN FLOOR	2,261	
		2,261 ft²
OTHER		
GARAGE	784	
		784 ft²
PORCHES & DECKS		
ENTRY PORCH	132	
OPEN DECK	1,053	
SCREENED PORCH	480	
		1,665 ft²
		7,584 ft²

DISCOVERY DREAM HOMES
LOG & TIMBERFRAME
Discover the difference...
Keene, Ontario, Canada
(705) 400-5647

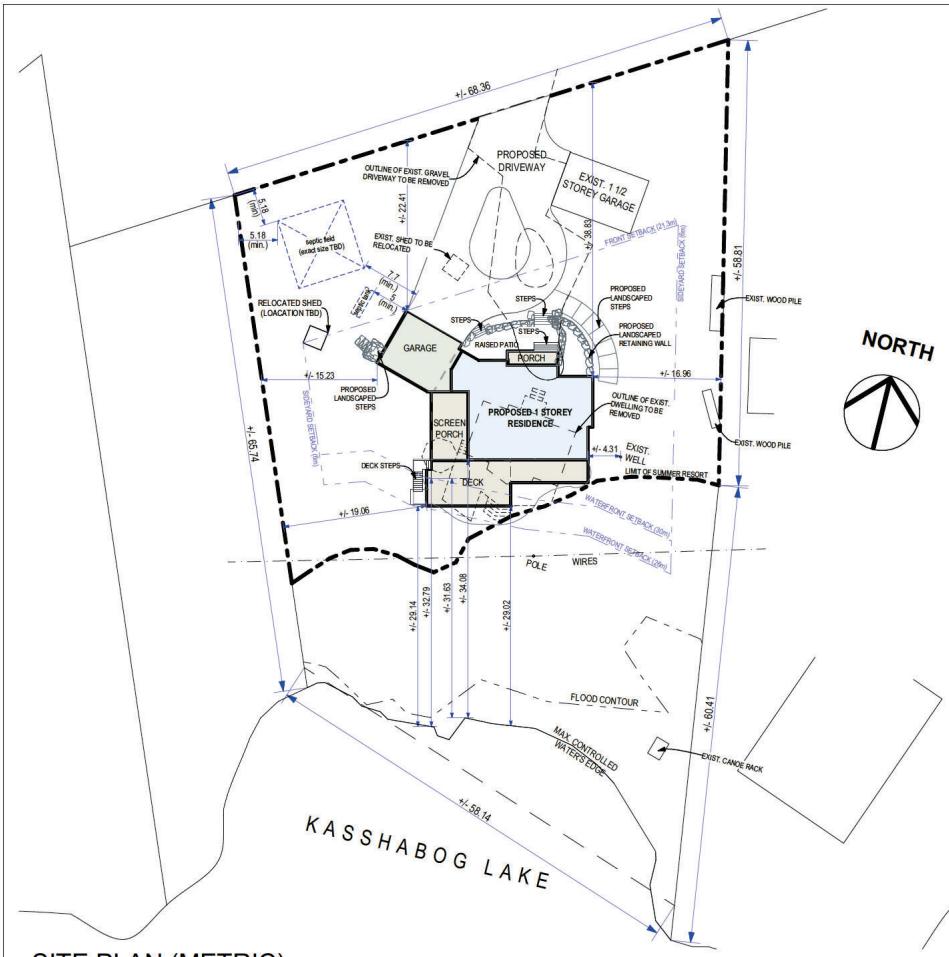
Project: *Modified Sunset Ridge*

Client: **Brian & Shannon Tomlinson**

Drawn By:	Sales Rep.:	Project No:	Revision:
JCK	KF/SS	**23-073**	**F**

Date: Thursday, May 30, 2024

Ground Snow Load:	Pg No:
3.1 kPa	5 of 6



SITE PLAN (METRIC)

SCALE: 1:500

0 10m 25m

SITE INFORMATION

SITE: 105 FR 75N, HAVELOCK ON K0L 1Z0
WATER BODY: KASSHABOG LAKE

ZONING: SEASONAL RESIDENTIAL ZONE (SR)

SETBACKS

	REQ'D	PROPOSED
FRONT YARD:	20m	20m
REAR YARD:	7.5m	<>
SIDE YARD:	6m	+/- 9.92m
MAX. HEIGHT:	9m	7.8m

PRELIMINARY DRAWINGS NOT FOR CONSTRUCTION

FLOOR AREAS (sq.ft.)

BASEMENT		
BASEMENT FLOOR	2,874	
		2,874 ft²
LIVING AREAS		
MAIN FLOOR	2,261	
		2,261 ft²
OTHER		
GARAGE	784	
		784 ft²
PORCHES & DECKS		
ENTRY PORCH	132	
OPEN DECK	1,053	
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		1,665 ft²
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DISCOVERY DREAM HOMES LOG & TIMBERFRAME
Discover the difference...
Keene, Ontario, Canada
(705) 400-5647

Project: *Modified Sunset Ridge*

Client: **Brian & Shannon Tomlinson**

Drawn By:	Sales Rep.:	Project No:	Revision:
JCK	KF/SS	**23-073**	**F**

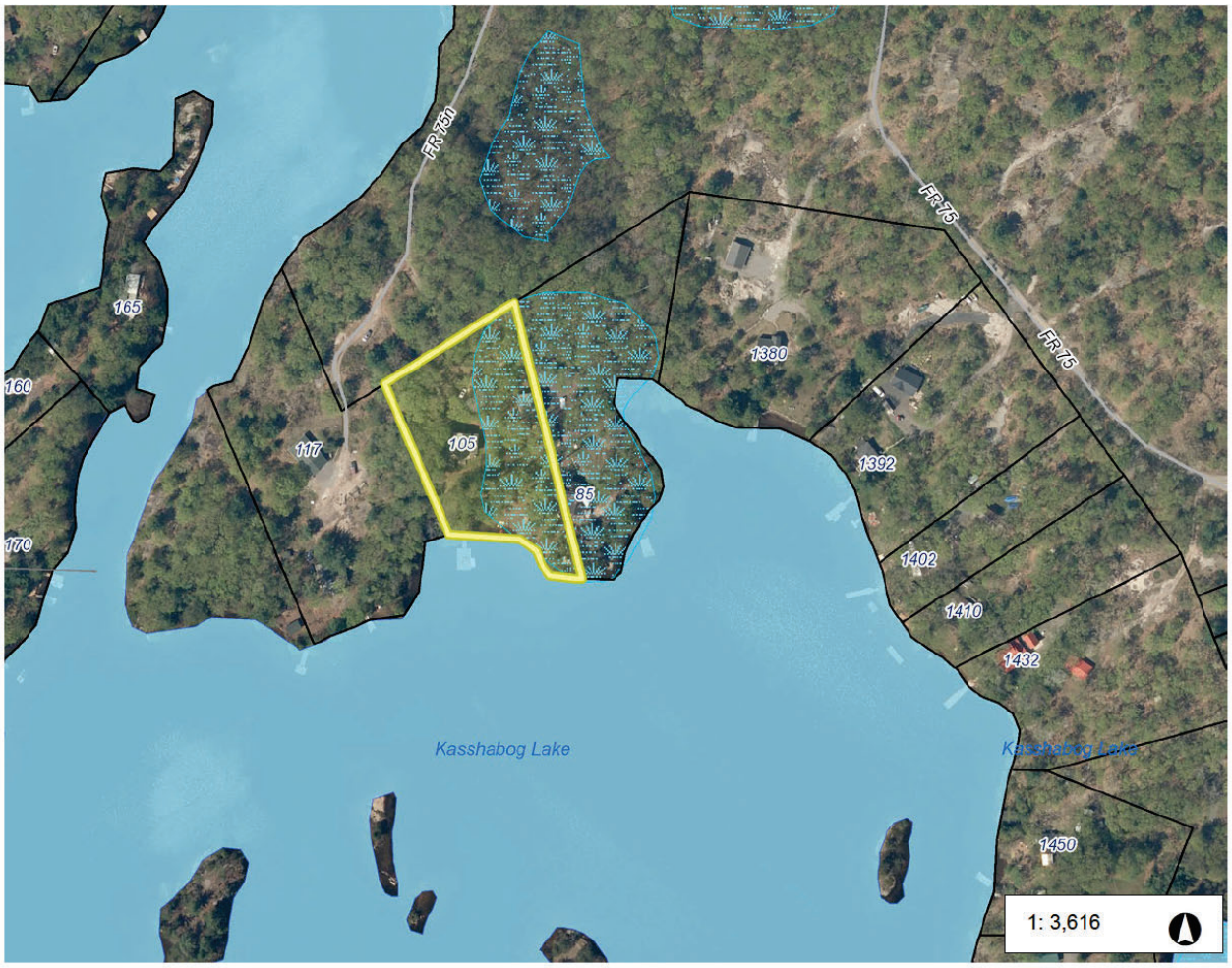
Date: Thursday, May 30, 2024

Ground Snow Load: 3.1 kPa

Pg No: 6 of 6

County of Peterborough

105 FR 75N



Legend

Roads < 50,000
- PRIV ; Private; PRIV
- City Arterial
- City Collector and Local
- City Owned Unclassified
- Provincial
- County
- Township
- Water Access Only

Outside Roads < 50,000
- Major Roads
- Local Roads

Peterborough Proposed Bypas
First Nations
Civic Address
Parcel Fabric
Parcel First Nations - Canada I
Rivers
- Intermittent
- Permanent

Clean Water Act Policies Appl
Provincially Significant Wetlan
Locally Significant Wetlands
Non-evaluated Wetlands
Lakes - Local Scale
Municipal Boundary - Upper Ti
- <all other values>
- COUNTY OF PETERBOROUGH

Notes

183.7 0 91.86 183.7 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.
THIS MAP IS NOT TO BE USED FOR NAVIGATION

General Notes:

Property Owners:	Brian and Shannon Tomlinson
Property Address:	105 FR 75N
Assessment Roll Number (ARN)	153101000902500
Current Uses:	Seasonal Residential
Proposed Development:	New Seasonal Dwelling
Consultation with Authorities:	Not. This minor variance application will be circulated to them.
Type of Planning Approval:	MV
Zone:	Season Residential (SR) Zone
OP Designation:	Shoreline
County OP Designation:	Shoreland and the Waterfront
Verification of structures via building permits:	No permits. All structures are assessed based on a 1956 built year; predating the Townships ZBL.

Development

New Cottage and Attached Garage

Relevant Zoning Regulations

4.37 HWM

11 Seasonal Residential (SR) Zone

Section 11 Regulations

Regulation under Section 11	Proposed	Proposed Conform?	Type of Relief
(a) Lot Area	1.4 acres	Yes	Nothing
(b) Lot Frontage	NA	NA	Nothing
(c) Front Yard	**0**	**No**	**Vary**
(d) Side Yard	**15.23 feet**	**No**	**Vary**
(e) Rear Yard	**22 feet**	**No**	**Vary**
(f) Height	Less than 30 ft	Yes	Nothing
(g) Lot Coverage	**22%**	**No**	**Vary**
(h) Floor Area	Well above	Yes	Nothing
(i) # of Dwellings	1	Yes	Nothing

4.37 Regulations

High Water Mark Requirement	Proposed High Water Mark	Meet High Water Mark Setback	Minor in Nature?	Type of Relief Required
30 m	**29.02 m**	**No**	**Yes**	**Vary**
Conclusion: Variance Required.				

Planning Opinion

Minor Variance. They are pushing the cottage back. Cottage is entirely outside HWM setback.

Additional Notes

Add a condition that no portion of the dwelling unit be located within the shoreline crown reserve.

TOWNSHIP OF HAVELOCK-BELMONT-METHUEN

To: Chairman and Members of Committee of Adjustment

Prepared By: Arya Hejazi M.PL., Planning Assistant HBM Township

Meeting Date: September 17th, 2024

Subject: **Minor Variance Application A-12-24**

Subject Property

Property Owner(s):	Michael Walther
Municipal Address:	247 Kasshabog Lake Water Access Only (WAO)
Roll Number:	1531-010-009-11200
Lot(s):	Part Lot 9
Concession(s):	8
Area:	0.4 Hectares (1.03 Acres)
Zoning:	Seasonal Residential (SR)
Official Plan:	Shoreline
Ward:	Methuen

PURPOSE and EFFECT:

The purpose of this Minor Variance application is as follows (all required reliefs are to the Township of Havelock-Belmont-Methuen's Comprehensive Zoning By-law 1995-42, as amended):

1. **Seek relief from Sections 4.1 (c) having the following effect(s):**

    i. **Increasing the maximum required height of an accessory structure from 4.5 metres (15 feet) to 4.6 metres (15.3 feet)**

2. **Seek relief from Section 4.37 having the following effect(s):**

    i. **Reducing the High Water Mark setback from 30 metres (100 feet) to 6.3 metres (20.9 feet).**

3. **Seek relief from Sections 10.2.1 (c) having the following effect(s):**

i. Reducing the Front Yard setback from 21.3 metres (100 feet) to 6.3 metres (20.9 feet).

The above relief is to permit the following changes on the subject property:

1. A new detached accessory structure in the form of a frame shed, with added space above for storage.

RECOMENDATION:

That Minor Variance application A-12-24 be ***approved*** with the following conditions:

- That a building permit be issued in accordance with the Site Plan submitted;
- That a building permit be issued within **18 months** of the approval of this application and upon submission to the building department of the appropriate application, fees and supporting information as required by the Chief Building Official; and that
- The balance of the information in this report be received.

ANALYSIS:

The subject parcel is currently located on the southern portion of Kasshabog Lake and is considered a Water Access Only (WAO) lot. The parcel contains an existing A-frame seasonal recreational dwelling unit with no accessory structures. The existing dwelling unit is approximately 55 square metres (596 square feet). The purpose of this application is to permit the development of an accessory structure, in the form of a frame shed. The shed is accompanied by additional space above for storage purposes. According to property assessment records, the existing dwelling unit was constructed in 1963.

As previously mentioned, the subject property is currently located on Kasshabog Lake, within the watershed jurisdiction of the Crowe Valley Conservation Authority (CVCA). As a result, this application has been circulated to the conservation authority for further commentary. Additionally, this application has also been circulated to Peterborough Public Health (PPH).

The property is located on Kasshabog Lake with the surrounding uses:

Direction	**Land Use**
North	Kasshabog Lake
South	Rural
East	Seasonal Recreational
West	Seasonal Recreational

This application is subject to the four tests of a Minor Variance, as outlined in the Planning Act. The tests are as follow:

1. **Is this application “minor” in nature?**

The purpose of this application is to permit the development of an accessory structure, in the form of a frame shed, with additional space above for storage purposes. No reduction in the High Water Mark setback of Kasshabog Lake is being proposed as a result of the approval of this application. Aside from the reliefs being sought through this application, all other provisions of the Zoning By-law are being maintained.

Therefore, this application is considered minor in nature.

2. Is the application desirable and appropriate?

The location of the proposed structure is appropriate given the clear setback deficiencies of the recreational dwelling unit in relation to the shoreline of Kasshabog Lake. In essence, the proposed frame shed will be located to the rear of a front yard (within the rear yard) and will be situated in an area free and clear of any natural vegetation. Additionally, the approval of this application would further enhance the enjoyment and utility of the subject lot for recreational purposes.

This application is deemed both desirable and appropriate for the site.

3. Does this application conform to the Intent of the Official Plan?

The Township Official Plan designation for the subject property is ***Shoreline***. Under Section 3.3.3 – Shoreline Development, residential uses of both a permanent and recreational (cottage) nature are both permitted uses within the Shoreline Designation.

Additionally, under Section 3.3.4.1 – Development Policies – Development Considerations (a), indication is made that all new development should produce minimal visual, environmental, and navigational impacts to any abutting lake shorelines. Customarily, and in conformity with the Official Plan Shoreline Designation policies, new development is encouraged to take place outside the minimum high-water mark setback of all inland lakes across the Township. As the proposed development is taking place within the 30 metre high water mark setback, no reductions in setback standards are being proposed.

Section 2.1.24 of the Township Official Plan stipulates that whenever the Plan permits uses, buildings, or structures, it is intended that accessory uses, buildings and structures also be permitted that are normally incidental or subordinate to the principal uses, buildings, and structure on the same lot. As per the application, the proposed accessory structure will be clearly subordinate to the principal dwelling and no living space is to be contained inside any portion of any new structure.

Limited residential uses, alongside accessory uses/structures, are permitted in the Shoreline designation, as well as any expansion/enlargement, as per permissions under the Zoning By-law.

It is the Township's planning opinion that this application conforms to the spirit and intent of the Township's Official Plan.

4. **Does this application conform to the Intent of the Zoning Bylaw?**

   The subject property is currently zoned as Seasonal Residential (SR). The SR Zone permits single detached recreational/vacation dwellings, inclusive of accessory structures, subject to the provisions and regulations under both Sections 11 and 4.1.

   All of the provisions of the By-law are being adhered to, with the exception of the items requiring relief stated in the *Purpose and Effect* section of this report. The regulation variances that are being sought are relatively minor and reflective of the current setback standards existing on the subject lot.

   This application, as proposed, therefore maintains the spirit and intent of the Township's Zoning By-law.

This application satisfies the four tests of the minor variance. Additionally, this application must satisfy the Provincial Policy Statement (PPS) and the Growth Plan for the Greater Golden Horseshoe. The following policies are applicable:

Provincial Policy Statement

Section 1 of the PPS provides direction for the creation of strong, healthy and vibrant communities. The efficient use of land is supported through sustainable development patterns which consider the needs of communities, the environment, public health, safety, and economic growth. This section will address those policies which are relevant to the proposed development.

Section 1.1.1 – Healthy, liveable and safe communities are sustained by

(a) Promoting efficient development and land use patterns which sustain the financial well-being of the province and municipalities over long term

(c) Avoiding development and land use patterns which may cause environmental or public health and safety concerns

Section 1.1.4.1 – Healthy, integrated and viable rural areas should be supported by:

(a) Building upon rural character, and leveraging rural amenities and assets

The subject property is considered to be part of a rural use in the PPS, and a residential property is consistent with the policies for rural areas. The purpose of this application is to further enjoy the rural character and assets of the said property. This application conforms to the intent of the PPS.

Growth Plan for the Greater Golden Horseshoe

Growth Plan for the Greater Golden Horseshoe:

Section 2.2.1 – Managing Growth

> (d) Directing development to settlement areas, except where necessary for development related to the management or use of resources, resource-based recreational activities and rural lands that cannot be located in settlement areas.

Section 2.2.9 – Rural Areas

> 2. Subject to the policies in Section 4, development outside of settlement areas may be permitted on rural lands for:
>
> c) other rural land uses that are not appropriate in settlement areas provided they:
>
> i. are compatible with the rural landscape and surrounding local land uses;
>
> ii. will be sustained by rural service levels; and
>
> iii. will not adversely affect the protection of agricultural uses and other resource-based uses such as mineral aggregate operations

This property is a rural residential property, which is considered development related to the use of a resource-based activity and as such cannot be located in the settlement area.

This application conforms to the intent of the Growth Plan for the Greater Golden Horseshoe.

At the time of writing this report, no comments have been made from rate payers. As previously mentioned in this report, the subject property falls within the watershed jurisdiction of the Crowe Valley Conservation Authority (CVCA). A permit from their office is anticipated as part of the development process. This subject application has been circulated to both the conservation authority and Peterborough Public Health (PPH) for their input and commentary.

As this application meets the four tests of a Minor Variance and conforms to the PPS and the Growth Plan, it is the recommendation of this report that this application be ***approved***.

COMMENTS

None received at the time of report preparation.

FINANCIAL IMPACT

A decision respecting the application is appealable to the Ontario Land Tribunal; for which any costs incurred by the Municipality may be recoverable from the applicant.

Respectfully submitted,

Arya Hejazi

_____

Arya Hejazi
Planning Assistant
Township of Havelock-Belmont-Methuen

Appendix A – MV Application
Appendix B – Property Survey
Appendix C – GIS Mapping
Appendix D – Pre-Consultation

Date Received: RECEIVED
Fee Received: AUG 09 2024
Roll No.:

Township of Havelock-Belmont-Methuen
Application for

☑ Minor Variance – s. 45(1)
☐ Permission – s. 45(2)

---

1. Applicant/Agent Information:

1.1 Name of Owner(s): MICHAEL [redacted] WALTHER - DAWN-MICHELE MCCRORY

Address: [redacted] Postal Cod[redacted]

Telephone Number [redacted] Fax Number: (____) ____ -_____

E-Mail Address: [redacted]

(An owner's authorization is required in Section 10.1 if the applicant is not the owner.)

1.2 Name of Applicant/Agent: SAME AS ABOVE
(if different from owner)
Address: _____

_____ Postal Code _____

Telephone Number: (____) ____ -_____ Fax Number: (____) ____ -_____

E-Mail Address: _____

1.3 Communication should be sent to: Owner ☑ Applicant ☐ or to the following:

SAME AS ABOVE

Address: _____

_____ Postal Code _____

Telephone Number: (____) ____ -_____ Fax Number: (____) ____ -_____

E-Mail Address: _____

2. LOCATION OF THE SUBJECT LAND: *(Complete applicable lines)*

2.1 Geographic Municipality/Township or Village: HAVELOCK-BELMONT-METHUEN

Concession Number(s) 8 Lot Number(s): PT LOT 9

Registered Plan Number:_____ Lot(s)/Block(s): ROLL #1531-010-009-11200-0000

Reference Plan Number:_____ Part Number(s): _____

Road/Street Number and Name: 247 KASSHABOG LAKE WAO

Attach Survey Plan, if available.

2.2 Are there any easements or restrictive covenants affecting the subject land? Yes ☐ No ☑

If yes, describe the easement or covenant and its effect:

N/A

3. Planning Review Information:

3.1 Official Plan Designation

N/A

3.2 Zoning By-law

_____

4. PURPOSE OF APPLICATION:

4.1 Nature and extent of relief from the zoning by-law

MINOR VARIANCE FOR LOCATION OF SHED

4.2 REASON: *(Purpose of the proposed amendment – why proposed use is unable to comply with the zoning by-law provisions)*

PROXIMITY OF SHED TO HIGH WATER MARK SETBACK FROM SHORELINE.

5. Description of Subject Land:

5.1 Dimensions of Land:

Frontage: 41.3m m/ft. Depth: 146.67m m/ft.

Area: _____ sq.m/sq. ft. _____ ha/ac

Existing Use(s) of the subject land: COTTAGE

Length of Time the existing uses of the subject land have continued:
1960 approximately (1963)

5.2 Date subject land was acquired by current owner: _____

5.3 Existing Buildings and Structures: Please identify each existing building on the sketch and provide information for each building. (If more than one building, attach a separate sheet to this application.)

Building 1
Type COTTAGE (A-FRAME) Date Constructed 1960 approximately
Existing Use COTTAGE
Date Existing Use Commenced 1960 approximately
Ground Floor Area* 440 ft² Gross Floor Area ** 650 ft²
Front lot line setback 8.02 mtr Rear lot line setback _____
Side lot line setback 10.69 mtr Side lot line setback _____
Building Height 17 ft Dimensions 20 ft x 22 ft

Building 2
Type N/A Date Constructed _____
Existing Use _____
Date Existing Use Commenced _____
Ground Floor Area* _____ Gross Floor Area ** _____
Front lot line setback _____ Rear lot line setback _____
Side lot line setback _____ Side lot line setback _____
Building Height _____ Dimensions _____

Building 3

Type N/A Date Constructed _____

Existing Use _____

Date Existing Use Commenced _____

Ground Floor Area* _____ Gross Floor Area ** _____

Front lot line setback _____ Rear lot line setback _____

Side lot line setback _____ Side lot line setback _____

Building Height _____ Dimensions _____

5.4 Nature of Proposed Development: Please provide the information for each proposed building (If more than one building, attach a separate sheet to this application. If a proposed plan showing location of proposed buildings is available, please attach.)

Proposed Use(s) of the subject land: SHED

Building 1

Type SHED

Ground Floor Area* (10ft x 10ft) 100ft² Gross Floor Area ** 180 ft²

Front lot line setback 20.9 mtr. Rear lot line setback _____

Side lot line setback 4.07 mtr Side lot line setback _____

Building Height 14 ft 7 in Dimensions 10ft x 10ft

Building 2

Type N/A

Ground Floor Area* _____ Gross Floor Area ** _____

Front lot line setback _____ Rear lot line setback _____

Side lot line setback _____ Side lot line setback _____

Building Height _____ Dimensions _____

* Ground Floor Area means the area that the building occupies on the ground.

** Gross Floor Area means the sum of the area of each floor of the building counting each floor at or above ground level (not basement or cellar) based on the exterior dimensions of the building.

6. Services:

6.1 Access is/will be provided to the subject land by: *(check appropriate space)*

		Maintenance	
Provincial Highway	☐	Public	☐
Municipal Road	☐	Private	☐
Private Road	☐	Year Round	☐
Right of Way	☐	Seasonal	☐
Unopened Road Allowance	☐	Unmaintained	☐
Other Public Road	☐		
(Specify) _____			
Water Access	☑		

Mainland Access – where access to the subject land is only by water:

Docking Facilities (specify) STONEY POINT MARINA

Parking Facilities (specify) STONEY POINT MARINA

Distance from Subject Land 1-2 km by boat

Distance from Nearest Public Road N/A (WAO)

6.2 Water Supply is provided to the subject land by: *(check appropriate space)*

Publicly-owned/operated piped water system	☐
Privately-owned/operated individual well	☐
Privately-owned/operated communal well	☐
Lake or other water body	☐
Other means *(specify)* BOTTLED WATER	☑

6.3 Sewage Disposal is provided to the subject land by: *(check appropriate space)*

Publicly-owned/operated sanitary sewage system	☐
Private individual septic tank	☐
Public-owned/operated communal sewage system	☐
Private communal sewage system	☐
Privy	☐
Other means *(specify)* ELECTRIC INCINERATING TOILET	☑

6.4 Storm Drainage is provided to the subject land by: *(check appropriate space)*

Sewers	☐
Ditches	☐
Swales	☐
Other means *(specify)* NATURAL RUN-OFF	☑

6.5 Other (Check if service is available)

☑ Electricity	☐ School bussing
☐ Telephone	☐ Garbage Collection
☐ Cable	☐ Recycling Collection

6.6 Notice to Applicants:

Should the location of the property which is the subject of this application be within the Wellhead Protection Area for the Havelock Municipal Well System then you are required to include a Section 59 Notice; in order to have your application deemed 'complete' in accordance with the Planning Act. Please Contact:
Terri Cox, Otonabee Region Conservation Authority
Email: tcox@otonabeeconservation.com
Tel: 705-745-5791 Ext 219

7. Other Applications (If known, indicate whether the subject land is a subject of application under the Act in any of the following):

7.1 Is the subject land currently the subject of a proposed official plan or official plan amendment that has been submitted to the Minister for approval?
☐ Yes #_____, Status_____ ☑ No ☐ Unknown

7.2 Is the subject land currently the subject of a zoning by-law amendment, Minister's zoning order amendment, consent or approval of plan of subdivision?
☐ Yes #_____, Status_____ ☑ No ☐ Unknown

7.3 Has the subject land been the subject of a previous minor variance application?
☐ Yes #_____, Status_____ ☐ No ☑ Unknown

8.0 History of Subject Land

8.1 If this is a re-submission of a minor variance application, explain how the proposal has changed.
N/A

8.2 Has there ever been an industrial or commercial use on the subject land or adjacent land? Yes ☐ No ☑ Unknown ☐

If YES, please specify the use. _____

8.3 Has the grading of the subject land ever been changed by adding earth or other material? Yes ☐ No ☑ Unknown ☐

8.4 Has a gas station ever been located on the subject property or adjacent land?
Yes ☐ No ☑ Unknown ☐

8.5 Has there been gasoline or other fuel stored on the subject land or adjacent land?
Yes ☐ No ☑ Unknown ☐

8.6 Is there reason to believe the subject land may have been contaminated by former uses on the site or adjacent site?
Yes ☐ No ☑ Unknown ☐

9. Affidavit or Sworn Declaration

I, MICHAEL WALTHER & DAWN-MICHELLE McCRORY of the [redacted]
(owner or applicant) (Township, City, Village)

of [redacted] in the ONTARIO
(County, Province)

of CANADA make oath and say (or solemnly declare) that the information contained in this application is true and that the information contained in the documents that accompany this application in respect of the application is true.

Declared before me at the Township ~~of Havelock~~ of Havelock-Belmont-Methuen
in the County of Peterborough
this 9th day of August, 2024.

Commissioner of Oaths
Leah Hutton, Acting Deputy Clerk

Applicant

Applicant

10. AUTHORIZATIONS

10.1 Consent of the Owner(s) to make Application

If the applicant is not the sole owner of the land that is the subject of this application, the written authorization of the owner(s), that the applicant is authorized to make the application, must be included or the authorization set out below must be completed by the owner(s).

I/We, MICHAEL WALTHER & DAWN-MICHELLE MCCRORY.
am/are the owner(s) of the land that is the subject of this application and I/We authorize _____ to make this application on my/our behalf and to provide any of my/our personal information that will be included in this application or collected during the processing of the application.

Date Signature of Owner

Date Signature of Owner

10.2 Consent of Owner(s) to Enter Upon Lands

I/We, MICHAEL WALTHER & DAWN-MICHELE MCCRORY hereby authorize the Township of Havelock-Belmont-Methuen Council and/or their agents/representative(s) to attend upon the lands subject of this application.

Signature of Applicant

Signature of Witness

Personal information contained on this form, collected pursuant to the *Planning Act*, will be used for the purpose of responding to the initial application. Questions should be directed to the Freedom of Information and Privacy Coordinator at the institution conducting the procedures under the Act.

10.3 Payment/Acknowledgement

Any complete application submission must be accompanied by a deposit fee in the amount of $1000.00 in cash, debit, online payment or cheque made payable to the Township of Havelock-Belmont-Methuen.

By virtue of signature(s) hereon, I/We as the owner(s) further agree to pay any further costs incurred by the Township associated with the processing of my/our application; including, but not restricted to Municipal costs, Professional Planning Fees, Engineering and Legal Fees.

9 AUGUST 2024
Date

Signature of Owner

Date

Signature of Owner

11. SKETCH PLAN:

The application must be accompanied by a sketch showing the following:

- the boundaries and dimensions of the subject land;
- the location, size and type of all existing and proposed buildings and structures on the subject land; indicating the distance of the buildings or structures from the front, rear and side lot lines;
- the boundaries and dimensions of land that abuts the subject property, or any land owned by the owner of the subject land and that abuts the subject land;
- the location, size and type of all existing and proposed buildings and structures on abutting lands, indicating the distance of the buildings or structures from the front, rear and side lot lines;
- the distance between the subject land and the nearest township lot line or landmark, such as a railway crossing or bridge;
- the location of all land previously severed from the parcel originally acquired by the current owner of the subject land;
- the approximate location of all natural and artificial features on the subject land and adjacent lands that in the opinion of the applicant may affect the application, such as buildings, abandoned or active railways, roads, watercourses, drainage ditches, river or stream banks, wetlands, wooded areas, wells and septic tanks and tile beds;
- the existing use(s) on adjacent lands;
- the location, width and name of any roads within or abutting the subject land, indicating whether it is an unopened road allowance, a public travelled road, a private road or a right-of-way;
- if access to the subject land is by water only, the location of the parking and boat docking facilities to be used;
- the location and nature of any easement affecting the subject land;
- all present entrances onto the subject property;
- if there are agricultural buildings capable of housing animals within 500 metres of the proposed lot, then the location of these buildings must be shown on the sketch.

Measurements on the sketch **SHALL** correspond to those identified in the application. Photocopies of your survey, if you have one, should be used. If no survey is available, a detailed hand-drawn sketch to scale is acceptable.

In some instances, it may be necessary for a locational survey to be submitted with the application in order to accurately determine property and building dimensions, setbacks, etc. A locational survey may be required in situations where existing/proposed building or structures are in proximity to property line(s) and/or shoreline.

FOR OFFICE USE ONLY

1. Is application deemed complete? **Yes** ☐ **No** ☐

   Date: _____

   Site Visit Date: _____

2. What is the current Official Plan designation(s) of the subject lands?

   _____

3. What is the current Zoning of the subject lands?

   _____

4. Does application conform to both the County and Township Official Plan?

   Yes ☐ **No** ☐

   If no, describe nature of non-conformity.

   _____

   _____

5. Is the application consistent with the Provincial Policy Statement?

   Yes ☐ **No** ☐

6. Is the proposed Minor Variance compatible with adjacent/surrounding land uses?

   Yes ☐ **No** ☐

   If no, describe nature of incompatibility.

   _____

   _____

7. Is this considered suitable for the intended use (physical characteristics such as topography, drainage, soils and wet areas)

   Yes ☐ **No** ☐

   If no, describe nature of issues.

   _____

   _____

Receipt

Township Of Havelock-Belmont-Methuen
1 Ottawa St E P.O. Box 10
Havelock, ON K0L 1Z0

Receipt Number: 0301785
Receipt Date: 2024-08-07
Receipt Amount: 1,000.00

MICHAEL WALTHER

Description	Item Amount	Qty	Amount
General			
MINOR VARIANCE APPLICATION	1,000.00	1.00000	1,000.00
		Receipt Amount:	1,000.00
		PAYMENT BY DEBIT	1,000.00

Official Receipt

Per _____

Tax Reg.:

Note: This receipt is not valid until the payment has cleared.

NOTE:
DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048 .

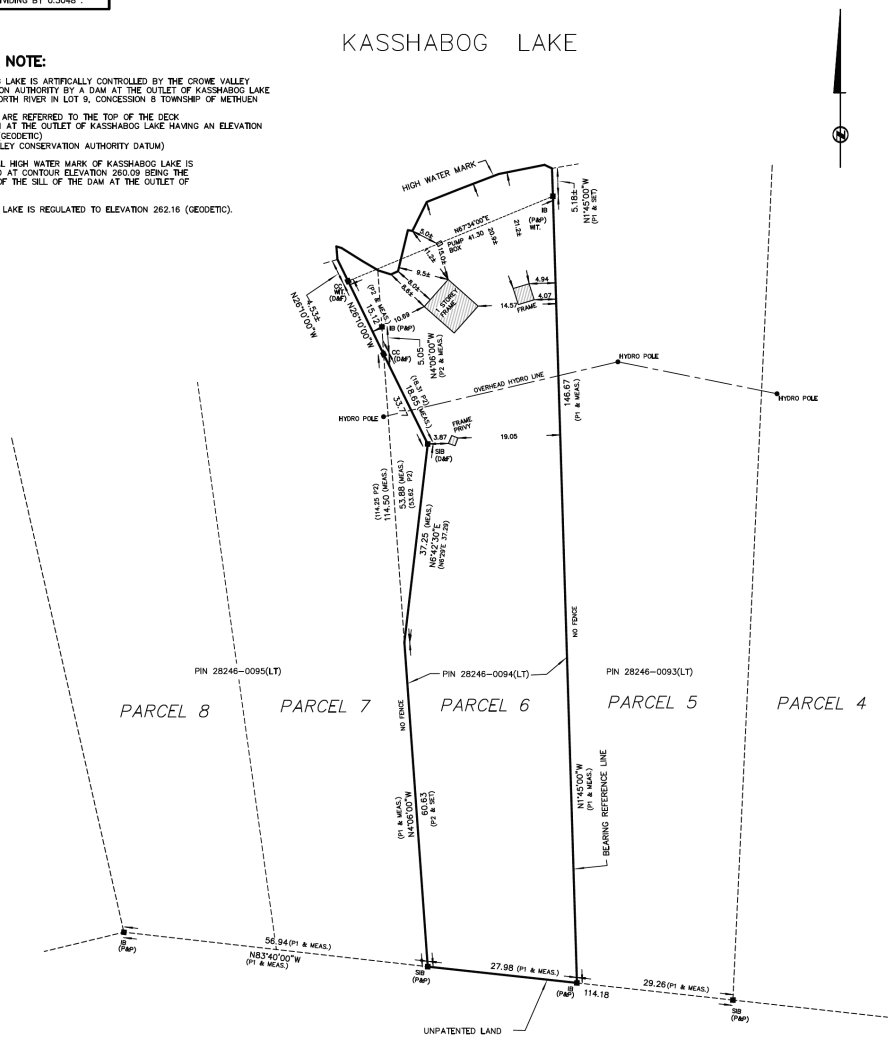
WATER NOTE:

KASSHABOG LAKE IS ARTIFICALLY CONTROLLED BY THE CROWE VALLEY CONSERVATION AUTHORITY BY A DAM AT THE OUTLET OF KASSHABOG LAKE INTO THE NORTH RIVER IN LOT 9, CONCESSION 8 TOWNSHIP OF METHUEN

ELEVATIONS ARE REFERRED TO THE TOP OF THE DECK OF THE DAM AT THE OUTLET OF KASSHABOG LAKE HAVING AN ELEVATION OF 263.63 (GEODETIC)
(CROWE VALLEY CONSERVATION AUTHORITY DATUM)

THE ORIGINAL HIGH WATER MARK OF KASSHABOG LAKE IS ESTABLISHED AT CONTOUR ELEVATION 260.09 BEING THE ELEVATION OF THE SILL OF THE DAM AT THE OUTLET OF THE LAKE.

KASSHABOG LAKE IS REGULATED TO ELEVATION 262.16 (GEODETIC).



SURVEYOR'S REAL PROPERTY REPORT
PART 1 – PLAN OF SURVEY OF PART OF LOT 9, CONCESSION 8
GEOGRAPHIC TOWNSHIP OF METHUEN
TOWNSHIP OF HAVELOCK-BELMONT-METHUEN
COUNTY OF PETERBOROUGH

20 10 0 20 40 metres

SCALE: 1 : 500

PART 2: REPORT SUMMARY
DESCRIPTION OF LAND:
PART OF LOT 9, CONCESSION 8
REGISTERED EASEMENTS and/or RIGHTS-OF-WAY:
• NONE •
BOUNDARY FEATURES:
• NONE •
COMPLIANCE WITH MUNICIPAL ZONING BY-LAWS:
• NOT CERTIFIED BY THIS REPORT •
ADDITIONAL REMARKS:
TIES SHOWN HEREON ARE MEASURED TO FRAME SIDING

BEARING NOTE:
BEARINGS ARE ASTRONOMIC, DERIVED FROM THE EASTERLY LIMIT PARCEL 6 HAVING A BEARING OF N1°45'00"W

LEGEND:

■	DENOTES SURVEY MONUMENT FOUND
□	DENOTES SURVEY MONUMENT SET
SIB	DENOTES STANDARD IRON BAR
IB	DENOTES IRON BAR
CC	DENOTES CUT CROSS
WIT.	WITNESS
(P&P)	DENOTES PIERCE & PIERCE, O.L.S.
(D&F)	DENOTES DONEVAN AND FLEISCHMANN, O.L.S.
P1	DENOTES PLAN OF SURVEY BY PIERCE AND PIERCE, O.L.S. DATED: 15 FEBRUARY, 1962
P2	DENOTES PLAN OF SURVEY BY DONEVAN AND FLEISCHMANN, O.L.S. DATED: 3 SEPTEMBER, 1964

SURVEYOR'S CERTIFICATE:

I CERTIFY THAT:
1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON 22 NOVEMBER, 2023

13 DECEMBER, 2023

SHAWN M. O'CONNOR
Ontario Land Surveyor

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
V-59626

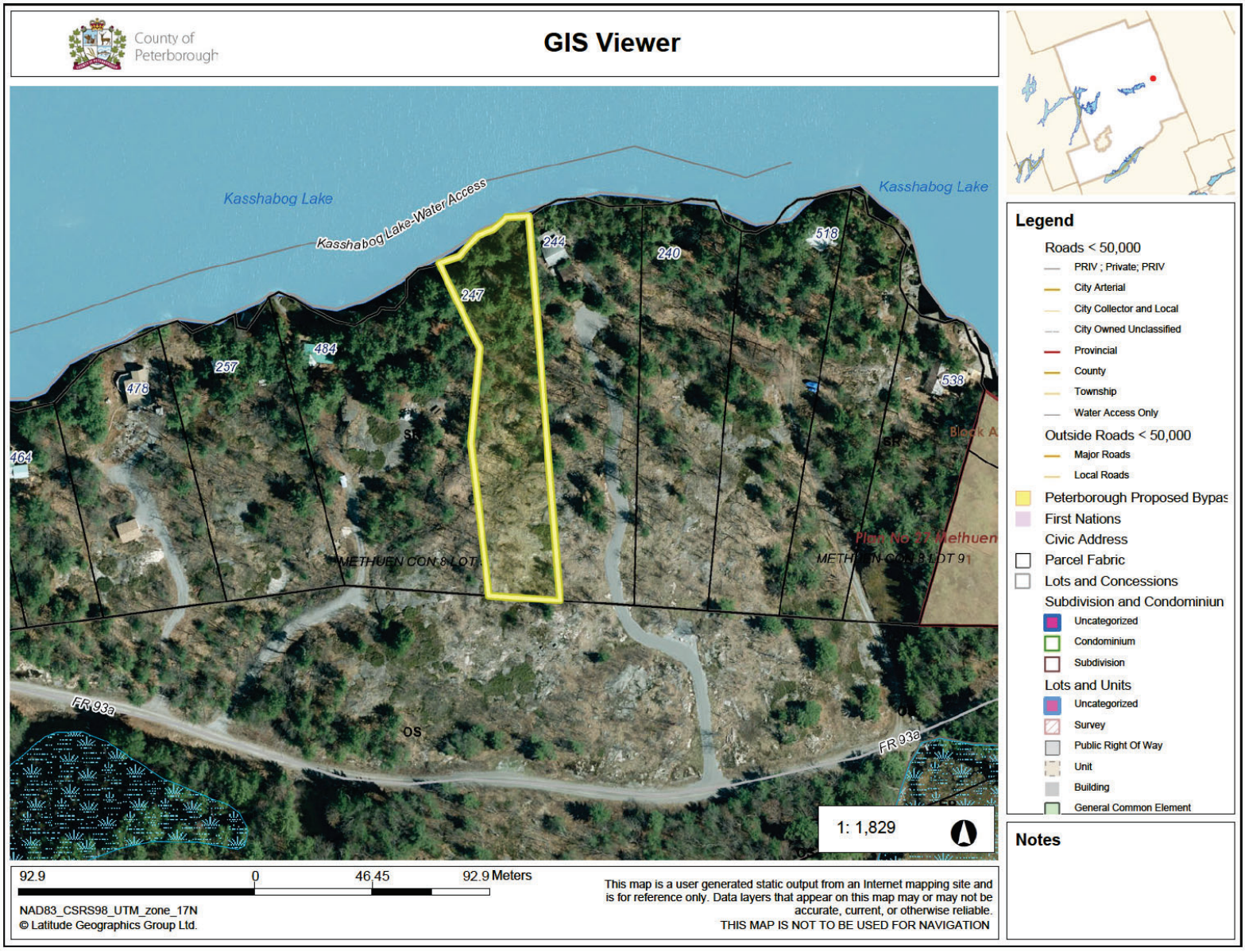
THIS PLAN IS NOT VALID UNLESS IT IS AN EMBOSSED ORIGINAL COPY ISSUED BY THE SURVEYOR in accordance with Regulation 1026, Section 29(3)

THIS REPORT WAS PREPARED FOR THE EXCLUSIVE USE OF MICHAEL WALTHER

Elliott and Parr (PETERBOROUGH) SURVEYING MAPPING GIS
A Division of J.D. Barnes Limited
211 SHERBROOKE ST PETERBOROUGH, ON K9J 2N2
T: (705) 745-8444 F: (705) 745-5314 www.jdbarnes.com

DRAWN BY:	CHECKED BY:	REFERENCE NO.:
RW	SMO	23-19-306-00
FILE: E&P METUEN 8-8 & 9		DATED: 12/13/2023

PLOTTED: 13 DECEMBER, 2023


County of Peterborough
GIS Viewer
Kasshabog Lake
Kasshabog Lake-Water Access
Kasshabog Lake
244
240
518
247
484
257
478
538
464
Block A
Plan No 27 Methuen
METHUEN CON 8 LOT
METHUEN CON 8 LOT 9
FR 93a
OS
FR 93a
1: 1,829
Legend
Roads < 50,000
PRIV ; Private; PRIV
City Arterial
City Collector and Local
City Owned Unclassified
Provincial
County
Township
Water Access Only
Outside Roads < 50,000
Major Roads
Local Roads
Peterborough Proposed Bypas
First Nations
Civic Address
Parcel Fabric
Lots and Concessions
Subdivision and Condominiun
Uncategorized
Condominium
Subdivision
Lots and Units
Uncategorized
Survey
Public Right Of Way
Unit
Building
General Common Element
Notes
92.9
0
46.45
92.9 Meters
NAD83_CSRS98_UTM_zone_17N
© Latitude Geographics Group Ltd.
This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.
THIS MAP IS NOT TO BE USED FOR NAVIGATION

General Notes:

Property Owners:	Michael Walther
Property Address:	247 Kasshabog Lake WAO
Assessment Roll Number (ARN)	153101000902500
Current Uses:	Seasonal Residential
Proposed Development:	Seasonal Residential
Consultation with Authorities:	No consultation with CVCA. Will circulate for commentary.
Type of Planning Approval:	MV
Zone:	Seasonal Residential (RR) Zone
OP Designation:	Shoreline
County OP Designation:	Shoreland and the Waterfront
Verification of structures via building permits:	Non complying structure built in 1963. No permit info found.

Development

New frame shed.

Relevant Zoning Regulations

4.37 HWM

High Water Mark Requirement	Proposed High Water Mark	Meet High Water Mark Setback	Minor in Nature?	Type of Relief Required
30 m	**20.9 m**	**No**	**Yes**	**Vary**
Conclusion: Variance Required.				

4.1 Accessory Structures

Regulation in 4.1	**Proposed**	**Proposed Conform?**	**Type of Relief**
(a) Uses Permitted	NA	NA	NA
(b) Lot Coverage	Over 1 acre.	Yes	Nothing
(c) Height	**15.3**	**No**	**Vary**
(d) Location	Rear Yard	Yes	Nothing
(e) Yards/Setbacks	Meets 3 m	Yes	Nothing
(f) Permit Req.	NA	NA	NA
(g) Joint Garage	NA	NA	NA

Planning Opinion

Minor Variance for addition. 2 variances required. Both minor in nature.

Additional Notes

Ensure that this application is forwarded to CVCA for their commentary.

TOWNSHIP OF HAVELOCK-BELMONT-METHUEN

To: Chairman and Members of Committee of Adjustment

Prepared By: Elysia Ackroyd, MCIP RPP; HBM Township Planning Consultant

Meeting Date: September 17th, 2024

Subject: **Minor Variance Application A-14-24**

Subject Property

Property Owner(s):	Kirk Thomas
Municipal Address:	9351 County Road 30
Roll Number:	1531-010-001-02100
Lot(s):	Part Lot 3
Concession(s):	9
Area:	1.98 hectares (4.89 acres)
Zoning:	Local Commercial 1 Zone (C1)
Official Plan:	Rural
Ward:	Methuen

PURPOSE and EFFECT:

The purpose of this Minor Variance application is as follows (required relief is to the Township of Havelock-Belmont-Methuen's Comprehensive Zoning By-law 1995-42, as amended):

1. **Seek relief from Section 4.27(a) having the following effect(s):**
   - **i. Reducing the minimum required number of parking spaces from 72 parking spaces to 2 parking spaces.**

The above relief is to permit the following changes on the subject property:

1. **The provision of a self-storage facility in the rear of the existing property.**

RECOMMENDATION:

That Minor Variance application A-14-24 be ***approved*** with the following conditions:

- The balance of the information in this report be received.

ANALYSIS:

The subject parcel is located on the east side of, and with frontage on, County Road 30. The parcel currently contains an existing residential dwelling. The building previously functioned as a restaurant. The existing dwelling unit is approximately 167.67 square metres (1804 square feet) in size. A detached garage is also located on the site, comprising 155 square metres. The applicant is seeking to develop a self-storage facility on the site, which is permitted by the C1 Zone. The purpose of this application is to permit a reduction to the required parking for the self-storage use from the required 72 parking spaces to 2 parking spaces.

Peterborough County was present during the pre-application meeting for the development, as the property fronts onto County Road 30. The application for minor variance has also been circulated to the County.

The property is located on County Road 30 and is surrounded by the following uses:

Direction	**Land Use**
North	Rural and Environmental Protection
South	Commercial and Agricultural
East	Rural and Environmental Protection
West	Rural

This application is subject to the four tests of a Minor Variance, as outlined in the Planning Act. The tests are as follow:

1. **Is this application "minor" in nature?**

   The purpose of this application is to permit a reduction to the required parking to support the proposed commercial use. The self storage facility is not anticipated to generate significant vehicle traffic given the anticipated intensity and frequency of the use. A site assessment brief was provided that confirms that low traffic is anticipated to be generated by the new permitted use. The determination of whether an application is minor in nature is not a mathematical calculation. Rather, it is determined by whether the cumulative impacts of the requested relief result in a minor impact on the subject and surrounding land uses. Based on the nature of the proposed use, the size and context of the site, and the results of the supporting studies submitted, staff are of the opinion that the requested relief is minor. Aside from the relief being sought through this application, all other provisions of the Zoning By-law are being maintained.

Therefore, this application is considered minor in nature.

2. Is the application desirable and appropriate?

The proposed use is permitted by the existing Local Commercial zoning on the site. County Road 30 and the surrounding area are developed with similar commercial and rural uses which are compatible with the proposed development. The continued ability to use this property for residential purposes as well as introduce a new, permitted use is a function of sufficient lot size, appropriate separation between uses, and general compliance with the zoning by-law. The development represents an efficient use of an existing parcel, and no negative impacts are anticipated to be generated as a result of the reduction in parking.

This application is deemed both desirable and appropriate for the site.

3. Does this application conform to the Intent of the Official Plan?

The Township Official Plan designation for the subject property is ***Rural***. Under Section 3.1.2., a variety of uses that are rural in nature, including rural residential uses and commercial and industrial uses, are permitted.

Section 3.1.3. provides policies that guide the development of each residential and commercial/industrial uses on lands designated Rural. Section 3.1.3.2 b) specifically includes permissions for self storage facilities on Rural lands. Section 3.1.3.2. d) continues, with provisions that relate specifically to commercial and industrial uses in the Rural designation:

> "d) The following specific policies shall apply to commercial and industrial uses in the Rural designation, in addition to conforming to the relevant policies of this Plan:
>
> i) The intended use shall be appropriate for the proposed location and compatible with surrounding land uses;
> ii) Commercial and industrial uses will be encouraged to locate in clusters adjacent to other non-residential development;
> iii) No access will be permitted from a Municipal "Local" road and any access shall be in accordance with the policies of Section 4.2.1 of this Plan;
> iv) Adequate off-street parking and loading spaces shall be provided;
> v) Advertising and signage will be appropriately controlled;
> vi) Outdoor storage of goods and materials shall be adequately screened or buffered;
> vii) Standards and requirements of the Ministry of Environment shall be maintained in respect of odour, noise or smoke emissions;

viii) All new development shall comply with the Minimum Distance Separation Formula 1, as amended;
ix) Commercial and industrial uses may be subject to site plan control."

The proposed use is permitted and compatible with the established uses surrounding the site. Access is proposed on County Road 30, and a reasonable parking minimum has been demonstrated by the supporting studies, including the site assessment brief and planning letter submitted. Outdoor storage is proposed in a reasonable and compliant manner, being located in the rear of the property. The development is subject to a site plan control application which is being reviewed concurrently with this application for minor variance. It is the Township's planning opinion that this application conforms to the spirit and intent of the Township's Official Plan.

4. **Does this application conform to the Intent of the Zoning Bylaw?**

   The subject parcel is currently zoned Local Commercial 1 (C1) Zone. The C1 Zone permits a range of commercial uses, including the proposed self storage facility.

   All of the provisions of the By-law are being adhered to, with the exception of the item requiring relief stated in the *Purpose and Effect* section of this report. The variance sought is appropriate for the proposed use.

   This application, as proposed, therefore maintains the spirit and intent of the Township's Zoning By-law.

This application satisfies the four tests of the minor variance. Additionally, this application must satisfy the Provincial Policy Statement (PPS) and the Growth Plan for the Greater Golden Horseshoe. The following policies are applicable:

Provincial Policy Statement

Section 1 of the PPS provides direction for the creation of strong, healthy and vibrant communities. The efficient use of land is supported through sustainable development patterns which consider the needs of communities, the environment, public health, safety, and economic growth. This section will address those policies which are relevant to the proposed development.

"Section 1.1.1 – Healthy, liveable and safe communities are sustained by

(a) Promoting efficient development and land use patterns which sustain the financial well-being of the province and municipalities over long term
(b) Accommodating an appropriate affordable and market-based range and mix of residential types (including single-detached, additional residential units, multi-unit

housing, affordable housing and housing for older persons), employment (including industrial and commercial), institutional (including places of worship, cemeteries and long-term care homes), recreation, park and open space, and other uses to meet long-term needs

(c) Avoiding development and land use patterns which may cause environmental or public health and safety concerns

Section 1.1.5.4 – Development that is compatible with the rural landscape and can be sustained by rural service levels should be promoted."

The subject property is a rural use per the PPS, and the existing and proposed uses are consistent with the policies for rural lands. The purpose of this application is to support the development of a commercial use that is compatible with the rural landscape of and surrounding the subject property. This application conforms to the intent of the PPS.

Growth Plan for the Greater Golden Horseshoe

"Section 2.2.9 – Rural Areas

> "1. Municipalities are encouraged to plan for a variety of cultural and economic opportunities within rural settlements to serve the needs of rural residents and area businesses."

The minor variance supports the development of a use which is appropriately located within a rural area and which supports economic activity in a manner that serves the needs of nearby residents and businesses in and surrounding the municipality.

This application conforms to the intent of the Growth Plan for the Greater Golden Horseshoe.

At the time of writing this report, no comments have been received. As previously discussed herein, the application has been circulated to the County of Peterborough given the frontage on and access from County Road 30.

As this application meets the four tests of a Minor Variance and conforms to the PPS and the Growth Plan, it is the recommendation of this report that this application be ***approved***.

COMMENTS

None received at the time of report preparation.

FINANCIAL IMPACT

A decision respecting the application is appealable to the Ontario Land Tribunal; for which any costs incurred by the Municipality may be recoverable from the applicant.

Respectfully submitted,

_____

Elysia Ackroyd, MCIP RPP
Planning Consultant
Township of Havelock-Belmont-Methuen

Appendix A – MV Application
Appendix B – Site Plan
Appendix C – GIS Mapping
Appendix D – Stormwater Management Report
Appendix E – Site Entrance Assessment Brief
Appendix F – Planning Cover Letter

Date Received: _____
Fee Received: _____
Roll No.: _____

Township of Havelock-Belmont-Methuen
Application for
☒ **Minor Variance – s. 45(1)**
☐ **Permission – s. 45(2)**

---

1. Applicant/Agent Information:

1.1 Name of Owner(s): Kirk Thomas

Address: 9531 County Rd 30, Havelock, ON

_____ Postal Code K0L 1Z0

Telephone Number: [redacted] Fax Number: (____) _____ -_____

E-Mail Address: [redacted]

(An owner's authorization is required in Section 10.1 if the applicant is not the owner.)

1.2 Name of Applicant/Agent: Marnie Saunders
(if different from owner)
Address: [redacted]

_____ Postal Code [redacted]

Telephone Number: [redacted] Fax Number: (____) _____ -_____

E-Mail Address: [redacted]

1.3 Communication should be sent to: Owner ☒ Applicant ☒ or to the following:

_____

Address: _____

_____ Postal Code _____

Telephone Number: (____) _____ -_____ Fax Number: (____) _____ -_____

E-Mail Address: _____

2. LOCATION OF THE SUBJECT LAND: *(Complete applicable lines)*

2.1 Geographic Municipality/Township or Village: Geographic Township of Belmont

Concession Number(s) 9 Lot Number(s): Pt 3

Registered Plan Number: _____ Lot(s)/Block(s): _____

Reference Plan Number: _____ Part Number(s): _____

Road/Street Number and Name: 9351 County Road 30, Havelock ON

Attach Survey Plan, if available.

2.2 Are there any easements or restrictive covenants affecting the subject land?
Yes ☐ No ☒

If yes, describe the easement or covenant and its effect:

3. Planning Review Information:

3.1 Official Plan Designation
Rural

3.2 Zoning By-law
Local Commerical C1

4. PURPOSE OF APPLICATION:

4.1 Nature and extent of relief from the zoning by-law

Seeking relief from the general provision of the parking area regulations under Section 4.27 of the zoning by-law.

4.2 REASON: (*Purpose of the proposed amendment – why proposed use is unable to comply with the zoning by-law provisions)*

Minimum parking space requirement is 72 spots due to the gross floor area of facility, however, due to the low traffic and number of vehicles, two parking spaces is sufficient to supply the demand.

5. Description of Subject Land:

5.1 Dimensions of Land:

Frontage: 75.5m m/ft. Depth: 261.6 m m/ft.

Area: 19,750.27sq.m sq.m/sq. ft. 1.975 ha ha/ac

Existing Use(s) of the subject land: Designated rural with a single detached dwelling and accessory structure

Length of Time the existing uses of the subject land have continued: Unknown

5.2 Date subject land was acquired by current owner: Unknown

5.3 Existing Buildings and Structures: Please identify each existing building on the sketch and provide information for each building. (If more than one building, attach a separate sheet to this application.)

Building 1

Type Single Detached Dwelling Date Constructed Unknown

Existing Use Residential

Date Existing Use Commenced Unknown

Ground Floor Area* _____ Gross Floor Area ** 167.67 sq,m

Front lot line setback Approx, 17m Rear lot line setback _____

Side lot line setback _____ Side lot line setback _____

Building Height _____ Dimensions _____

Building 2

Type Accessory Building Date Constructed Unknown

Existing Use Garage

Date Existing Use Commenced Unknown

Ground Floor Area* _____ Gross Floor Area ** 155 sq.m

Front lot line setback Approx. 47.8m Rear lot line setback _____

Side lot line setback _____ Side lot line setback _____

Building Height _____ Dimensions _____

Building 3

Type_____ Date Constructed_____

Existing Use _____

Date Existing Use Commenced _____

Ground Floor Area* _____ Gross Floor Area ** _____

Front lot line setback _____ Rear lot line setback _____

Side lot line setback _____ Side lot line setback _____

Building Height _____ Dimensions _____

5.4 Nature of Proposed Development: Please provide the information for each proposed building (If more than one building, attach a separate sheet to this application. If a proposed plan showing location of proposed buildings is available, please attach.)

Proposed Use(s) of the subject land: Nine Self Storage Facility buildings and associated outdoor storage.

Building 1

Type Storage Unit Buildings 1-6

Ground Floor Area* _____ Gross Floor Area ** 275.4sq.m

Front lot line setback _____ Rear lot line setback _____

Side lot line setback _____ Side lot line setback _____

Building Height _____ Dimensions 10.3 x 30.6m

Building 2

Type Storage Unit Buildings 7-9

Ground Floor Area* _____ Gross Floor Area ** 330.5sq.m

Front lot line setback _____ Rear lot line setback _____

Side lot line setback _____ Side lot line setback _____

Building Height _____ Dimensions 10.8 x 30.6m

* Ground Floor Area means the area that the building occupies on the ground.

** Gross Floor Area means the sum of the area of each floor of the building counting each floor at or above ground level (not basement or cellar) based on the exterior dimensions of the building.

6. Services:

6.1 Access is/will be provided to the subject land by: *(check appropriate space)*

		Maintenance	
Provincial Highway	☐	Public	☒
Municipal Road	☒	Private	☐
Private Road	☐	Year Round	☐
Right of Way	☐	Seasonal	☐
Unopened Road Allowance	☐	Unmaintained	☐
Other Public Road	☐		
(Specify) _____			
Water Access	☐		

Mainland Access – where access to the subject land is only by water:
Docking Facilities (specify) _____

Parking Facilities (specify) _____

Distance from Subject Land _____

Distance from Nearest Public Road _____

6.2 Water Supply is provided to the subject land by: *(check appropriate space)*

Publicly-owned/operated piped water system	☐
Privately-owned/operated individual well	☐
Privately-owned/operated communal well	☐
Lake or other water body	☐
Other means *(specify)* N/A	☐

6.3 Sewage Disposal is provided to the subject land by: *(check appropriate space)*

Publicly-owned/operated sanitary sewage system	☐
Private individual septic tank	☐
Public-owned/operated communal sewage system	☐
Private communal sewage system	☐
Privy	☐
Other means *(specify)* N/A	☐

6.4 Storm Drainage is provided to the subject land by: *(check appropriate space)*

Sewers	☐
Ditches	☐
Swales	☐
Other means *(specify)* *Please see attached Stormwater Management Report	☐

6.5 Other (Check if service is available)

☐ Electricity	☐ School bussing
☐ Telephone	☐ Garbage Collection
☐ Cable	☐ Recycling Collection

6.6 Notice to Applicants:

Should the location of the property which is the subject of this application be within the Wellhead Protection Area for the Havelock Municipal Well System then you are required to include a Section 59 Notice; in order to have your application deemed 'complete' in accordance with the Planning Act. Please Contact:
Terri Cox, Otonabee Region Conservation Authority
Email: tcox@otonabeeconservation.com
Tel: 705-745-5791 Ext 219

7. Other Applications (If known, indicate whether the subject land is a subject of application under the Act in any of the following):

7.1 Is the subject land currently the subject of a proposed official plan or official plan amendment that has been submitted to the Minister for approval?
☐ Yes #_____, Status_____ ☒ No ☐ Unknown

7.2 Is the subject land currently the subject of a zoning by-law amendment, Minister's zoning order amendment, consent or approval of plan of subdivision?
☐ Yes #_____, Status_____ ☒ No ☐ Unknown

7.3 Has the subject land been the subject of a previous minor variance application?
☐ Yes #_____, Status_____ ☒ No ☐ Unknown

8.0 History of Subject Land

8.1 If this is a re-submission of a minor variance application, explain how the proposal has changed.

_____

8.2 Has there ever been an industrial or commercial use on the subject land or adjacent land? Yes ☐ No ☒ Unknown ☐

If YES, please specify the use. _____

8.3 Has the grading of the subject land ever been changed by adding earth or other material? Yes ☐ No ☐ Unknown ☒

8.4 Has a gas station ever been located on the subject property or adjacent land?
Yes ☐ No ☒ Unknown ☐

8.5 Has there been gasoline or other fuel stored on the subject land or adjacent land?
Yes ☐ No ☒ Unknown ☐

8.6 Is there reason to believe the subject land may have been contaminated by former uses on the site or adjacent site?
Yes ☐ No ☒ Unknown ☐

9. Affidavit or Sworn Declaration

I, MARNIE SAUNDERS (D.M. WILLS) of the CITY
(owner or applicant) (Township, City, Village)

of [redacted] in the COUNTY
(County, Province)

of [redacted] make oath and say (or solemnly declare) that the information contained in this application is true and that the information contained in the documents that accompany this application in respect of the application is true.

Declared before me at the CITY of PETERBOROUGH

in the COUNTY of PETERBOROUGH

this 29TH day of AUGUST, 2024.

Commissioner of Oaths
Stephanie Rochelle Mann, a Commissioner, etc., Province of Ontario, for D.M. Wills Associates Limited. Service. Expires June 17, 2025.

Applicant

Applicant

10. AUTHORIZATIONS

10.1 Consent of the Owner(s) to make Application

If the applicant is not the sole owner of the land that is the subject of this application, the written authorization of the owner(s), that the applicant is authorized to make the application, must be included or the authorization set out below must be completed by the owner(s).

I/We, Kirk Thomas,
am/are the owner(s) of the land that is the subject of this application and I/We authorize D.M. Wills Associates Inc. - Marnie Saunders to make this application on my/our behalf and to provide any of my/our personal information that will be included in this application or collected during the processing of the application.

08 / 23 / 2024
Date

Signature of Owner

Date

Signature of Owner

10.2 Consent of Owner(s) to Enter Upon Lands

I/We, Kirk Thomas, hereby authorize the Township of Havelock-Belmont-Methuen Council and/or their agents/representative(s) to attend upon the lands subject of this application.

Signature of Applicant

Signature of Witness

Personal information contained on this form, collected pursuant to the *Planning Act*, will be used for the purpose of responding to the initial application. Questions should be directed to the Freedom of Information and Privacy Coordinator at the institution conducting the procedures under the Act.

10.3 Payment/Acknowledgement

Any complete application submission must be accompanied by a deposit fee in the amount of $1000.00 in cash, debit, online payment or cheque made payable to the Township of Havelock-Belmont-Methuen.

By virtue of signature(s) hereon, I/We as the owner(s) further agree to pay any further costs incurred by the Township associated with the processing of my/our application; including, but not restricted to Municipal costs, Professional Planning Fees, Engineering and Legal Fees.

08 / 23 / 2024

Date

Signature of Owner

Date

Signature of Owner

11. SKETCH PLAN:

The application must be accompanied by a sketch showing the following:

- the boundaries and dimensions of the subject land;
- the location, size and type of all existing and proposed buildings and structures on the subject land; indicating the distance of the buildings or structures from the front, rear and side lot lines;
- the boundaries and dimensions of land that abuts the subject property, or any land owned by the owner of the subject land and that abuts the subject land;
- the location, size and type of all existing and proposed buildings and structures on abutting lands, indicating the distance of the buildings or structures from the front, rear and side lot lines;
- the distance between the subject land and the nearest township lot line or landmark, such as a railway crossing or bridge;
- the location of all land previously severed from the parcel originally acquired by the current owner of the subject land;
- the approximate location of all natural and artificial features on the subject land and adjacent lands that in the opinion of the applicant may affect the application, such as buildings, abandoned or active railways, roads, watercourses, drainage ditches, river or stream banks, wetlands, wooded areas, wells and septic tanks and tile beds;
- the existing use(s) on adjacent lands;
- the location, width and name of any roads within or abutting the subject land, indicating whether it is an unopened road allowance, a public travelled road, a private road or a right-of-way;
- if access to the subject land is by water only, the location of the parking and boat docking facilities to be used;
- the location and nature of any easement affecting the subject land;
- all present entrances onto the subject property;
- if there are agricultural buildings capable of housing animals within 500 metres of the proposed lot, then the location of these buildings must be shown on the sketch.

Measurements on the sketch **SHALL** correspond to those identified in the application. Photocopies of your survey, if you have one, should be used. If no survey is available, a detailed hand-drawn sketch to scale is acceptable.

In some instances, it may be necessary for a locational survey to be submitted with the application in order to accurately determine property and building dimensions, setbacks, etc. A locational survey may be required in situations where existing/proposed building or structures are in proximity to property line(s) and/or shoreline.

FOR OFFICE USE ONLY

1. Is application deemed complete? Yes ☐ No ☐

   Date: _____

   Site Visit Date:_____

2. What is the current Official Plan designation(s) of the subject lands?

   _____

3. What is the current Zoning of the subject lands?

   _____

4. Does application conform to both the County and Township Official Plan?

   Yes ☐ No ☐

   If no, describe nature of non-conformity.

   _____

   _____

5. Is the application consistent with the Provincial Policy Statement?

   Yes ☐ No ☐

6. Is the proposed Minor Variance compatible with adjacent/surrounding land uses?

   Yes ☐ No ☐

   If no, describe nature of incompatibility.

   _____

   _____

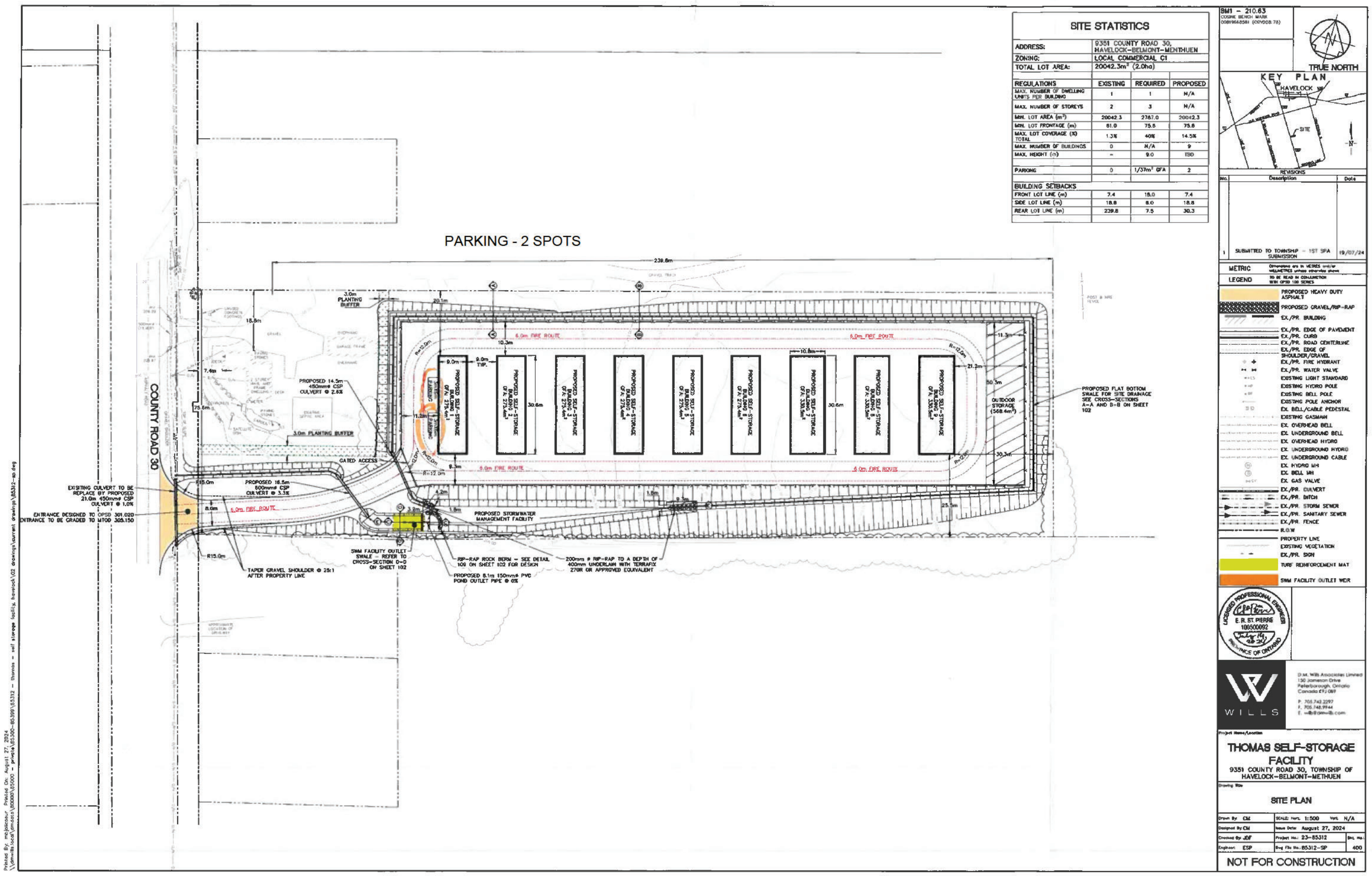
7. Is this considered suitable for the intended use (physical characteristics such as topography, drainage, soils and wet areas)

   Yes ☐ No ☐

   If no, describe nature of issues.

   _____

   _____

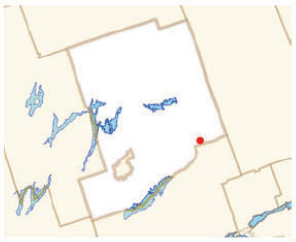


SITE STATISTICS

ADDRESS:	9351 COUNTY ROAD 30, HAVELOCK-BELMONT-MENTHUEN		
ZONING:	LOCAL COMMERCIAL C1		
TOTAL LOT AREA:	20042.3m² (2.0ha)		
REGULATIONS	EXISTING	REQUIRED	PROPOSED
MAX. NUMBER OF DWELLING UNITS PER BUILDING	1	1	N/A
MAX. NUMBER OF STOREYS	2	3	N/A
MIN. LOT AREA (m²)	20042.3	2787.0	20042.3
MIN. LOT FRONTAGE (m)	61.0	75.5	75.6
MAX. LOT COVERAGE (%) TOTAL	1.3%	40%	14.5%
MAX. NUMBER OF BUILDINGS	0	N/A	9
MAX. HEIGHT (m)	-	9.0	TBD
PARKING	0	1/37m² GFA	2
BUILDING SETBACKS			
FRONT LOT LINE (m)	7.4	15.0	7.4
SIDE LOT LINE (m)	18.8	6.0	18.8
REAR LOT LINE (m)	239.8	7.5	30.3

County of Peterborough

9351 County Rd 30



Legend

Roads < 50,000
- PRIV ; Private; PRIV
- City Arterial
- City Collector and Local
- City Owned Unclassified
- Provincial
- County
- Township
- Water Access Only

Outside Roads < 50,000
- Major Roads
- Local Roads

Peterborough Proposed Bypas
First Nations
Civic Address
Parcel Fabric
Parcel First Nations - Canada
Rivers
- Intermittent
- Permanent

Clean Water Act Policies Appl
Provincially Significant Wetlan
Locally Significant Wetlands
Non-evaluated Wetlands
Lakes - Local Scale
Municipal Boundary - Upper Ti
- <all other values>
- COUNTY OF PETERBOROUGH

Notes

91.9 0 45.93 91.9 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.
THIS MAP IS NOT TO BE USED FOR NAVIGATION

Stormwater Management Report

Thomas Self-Storage Facility

9351 County Road 30
Havelock, Ontario

D.M. Wills Project Number 21-85312

D.M. Wills Associates Limited
Partners in Engineering
Peterborough

WILLS

July 2024

Prepared for:
Kirk Thomas

Table of Contents

Figures

Tables

Appendices

1.0 Purpose

D.M. Wills Associates Limited (Wills) has been retained by Kirk Thomas (Client) to prepare a Preliminary Stormwater Management Report for the construction of a multi-unit storage rental facility located at 9351 County Road 30, in the Township of Havelock-Belmont-Methuen, Ontario (Subject Property).

The purpose of this report is to investigate the impact of the proposed development and determine applicable stormwater management (SWM) controls, if required, to maintain existing drainage patterns and ensure there will be no adverse impacts to the receiving drainage system. The following report has been prepared to address the requirements of the County of Peterborough (County).

2.0 Site Description

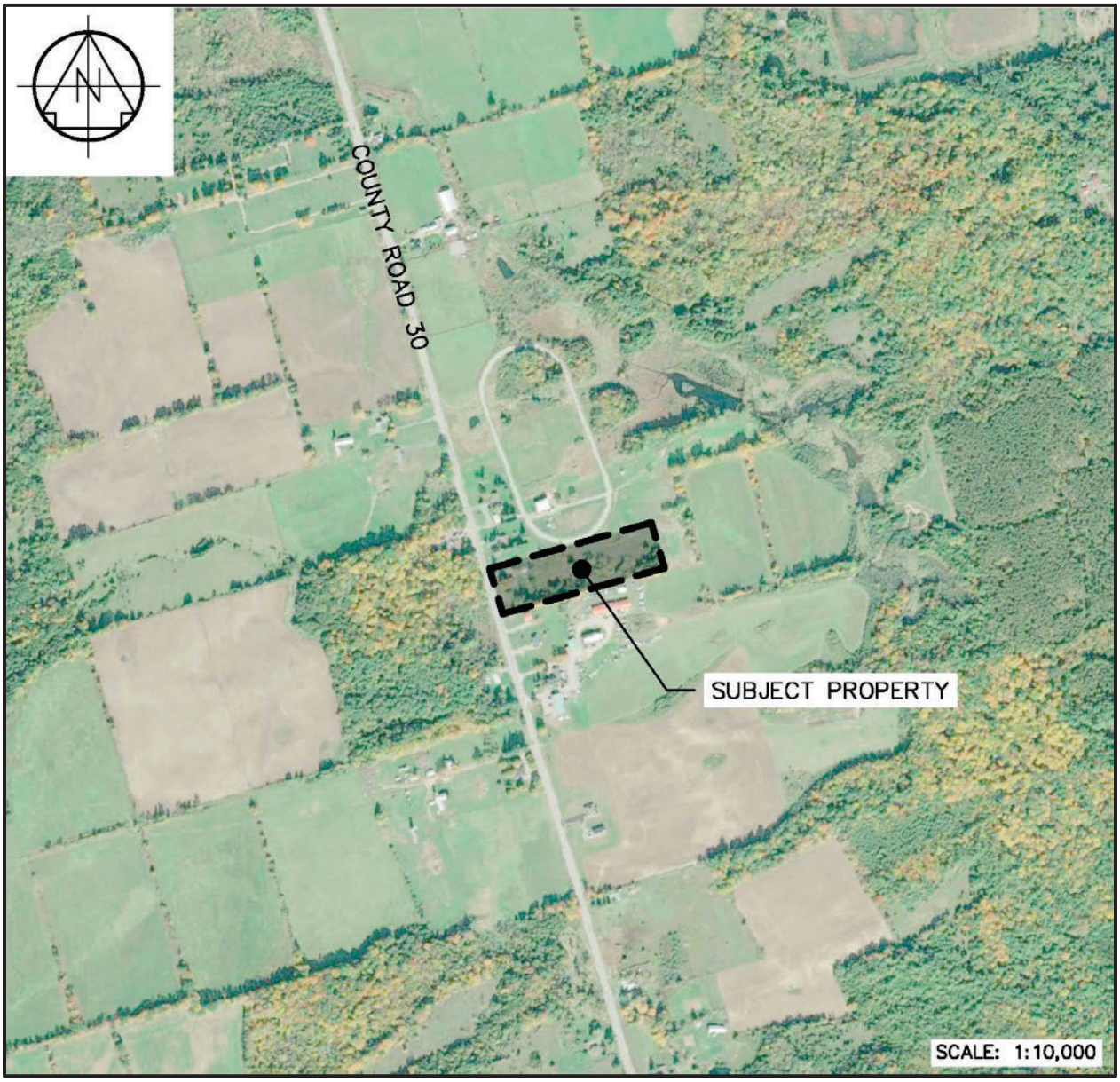
The Subject Property is legally described as part of Lot 3, Concession 9, Township of Havelock-Belmont-Methuen, Geographic Township of Belmont, County of Peterborough. The site location is shown in **Figure 1**.

The surrounding properties mainly contain agricultural lands and treed areas, with minimal imperviousness from dwellings, storage buildings and driveways / roadways. The Subject Property is 2.01 ha in area and is partially developed.

The majority of the existing Subject Property is composed of grassed-like range with a small portion adjacent to the west boundary consisting of a gravel driveway, single-family dwelling and detached garage, surrounded by grass. A high point located near the centre of the Subject Property splits the drainage east and west. Runoff directed eastward flows overland toward a wetland and runoff generated in the western half of the Subject Property flows overland westward toward the County Road 30 roadside ditch, conveying runoff toward a downstream wetland.

A topographic survey of the Subject Property has been completed by Elliot and Parr, dated September 8, 2023 (Reference No. 23-19-197-00). This survey will be referenced to determine the drainage characteristics of the Subject Property.

Figure 1 – Site Location



3.0 Methodology

The present hierarchy of watershed planning in Ontario can be described by the following in descending order: Watershed Plans, Sub-watershed Plans and Individual Stormwater Management Plans. The Subject Property is not covered by any Watershed or Sub-watershed Plans and, therefore, this report has been prepared as an Individual Stormwater Management Plan.

3.1 Site Specific Stormwater Design Criteria

Based on the typical requirements of the County of Peterborough, the following design criteria have been established for the site:

- Provide stormwater quality controls to achieve Ministry of the Environment "Enhanced" (Level 1) protection.
- Provide stormwater quantity controls to reduce post development peak flow rates to the existing peak flow rates at each outlet location, for the 2 to 100-year design storms.
- Provide low impact development features to promote infiltration and preserve the natural hydrologic conditions.

3.2 Existing Drainage Analysis

The existing condition has been analyzed as two catchments based on the runoff directed to each of the respective outlets. The pre-development catchment areas are shown in **Figure 2** and described in detail below.

- Catchment **EX-101** encompasses the western portion of the Subject Property and includes the existing single-family dwelling, detached garage, gravel driveway and grassed area adjacent to the western boundary. This catchment also includes a large area of range, in the eastern portion of **EX-101**. Runoff generated in this catchment flows westward overland from a high point along the eastern catchment boundary. Runoff is directed to the County Road 30 roadside ditch (**OUT-1**), which conveys flows to a wetland approximately 700 m downstream.
- Catchment **EX-202** represents the remaining east portion of the Subject Property. This area is strictly comprised of range. Stormwater generated within this catchment flows eastward overland from a highpoint located at the western catchment boundary. Runoff is directed to a low-lying area to the east (**OUT-2**), before ultimately flowing into a nearby wetland.

3.3 Proposed Drainage Analysis

For the proposed condition, the Subject Property has been analyzed as three catchments, based on the proposed grading plan. The proposed catchments are shown in **Figure 3** and described in detail below.

- Catchment **PR-101** encompasses the western portion of the Subject Property and includes the existing single-family dwelling, detached garage, gravel driveway and grassed area adjacent to the western boundary. A gravel driveway leading to the proposed storage facility will be constructed in this catchment. Runoff generated within **PR-101** will flow overland from east to west and outlet into the County Road 30 roadside ditch (**OUT-1**) prior to being conveyed to the downstream wetland.
- Catchment **PR-102** represents the majority of the developed area including multiple storage buildings, a gravel driveway, and a SWM facility. Runoff generated in this catchment will be directed to the perimeter swales which will convey stormwater to the SWM facility, discharging runoff to an outlet swale. The outlet swale will convey attenuated flows through **PR-101** and ultimately outlet to the County Road 30 roadside ditch (**OUT-1**).
- Catchment **PR-103** encompasses a small, grassed portion of land in the southwest corner of the Subject Property. Stormwater generated in this catchment will flow uncontrolled overland toward the County Road 30 roadside ditch (**OUT-1**).

3.4 Site Conditions Summary

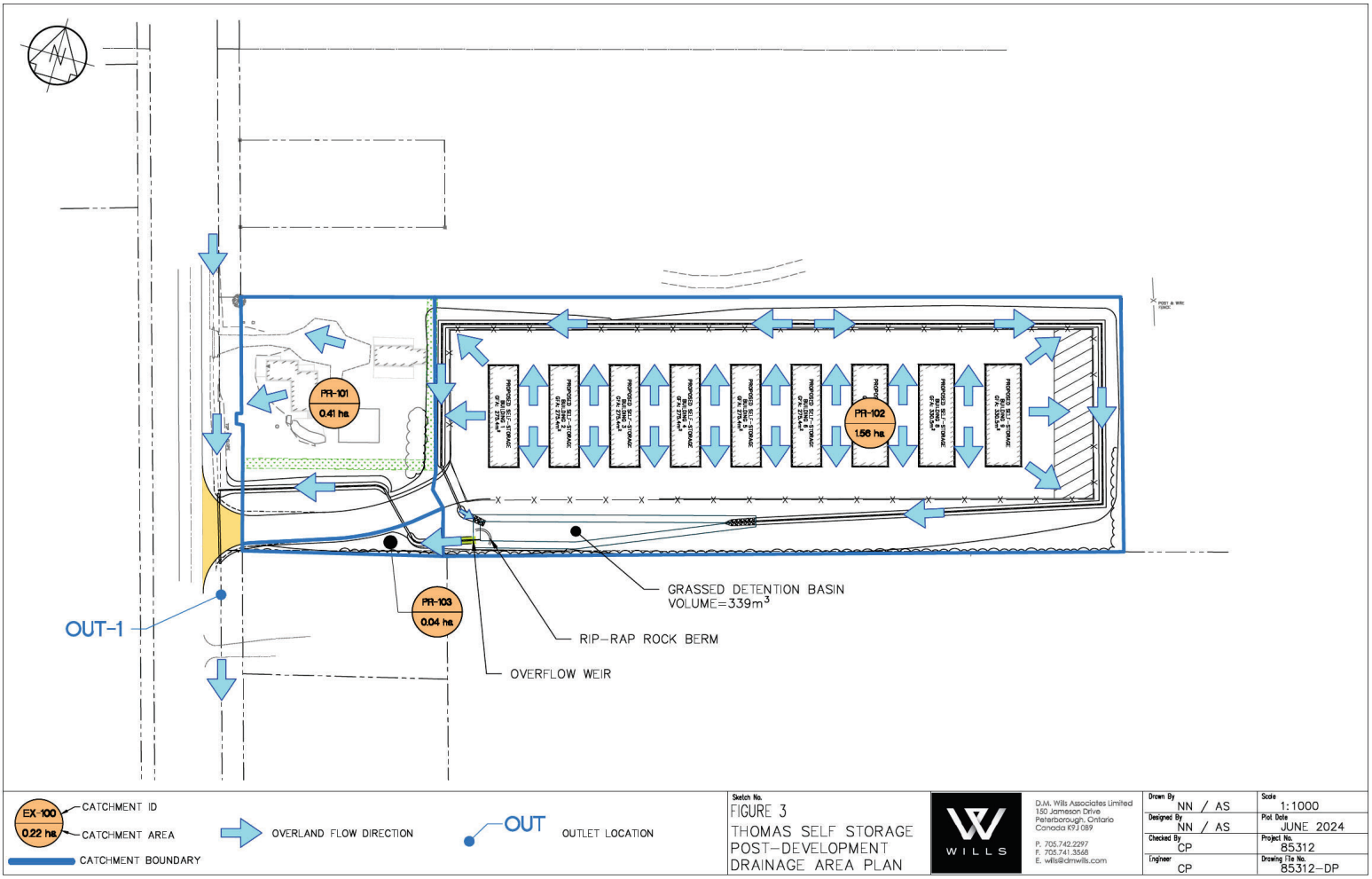
The existing and proposed runoff characteristics were analyzed using individual sub-catchments. Hydrologic parameters such as soil infiltration properties, land use and runoff response were determined based on literature review. Topographic mapping and AutoCAD Civil 3D 2024 software were used to establish sub-watershed areas, land use and slope. On-site soils were assessed as Otonabee Loam and Tioga Sandy Loam having a Hydrologic Soil Group of B and A, respectively. The hydrologic parameters for each catchment are summarized in **Table 1** and documented in **Appendix A**.

Table 1 – Existing and Proposed Hydrologic Parameters

Nashyd[1]					
Catchment ID	**Area (ha)**	**Impervious %**	**CN*[1]**	**Ia[2]**	**Tp[3] (hrs)**
EX-101	1.44	3.0	61.1	7.3	0.30
EX-201	0.57	0.0	45.7	8.4	0.27
PR-101	0.41	18.3	70.5	4.4	0.17
PR-102	1.56	15.7	69.4	3.5	0.18
PR-103	0.03	0.0	60.5	5.0	0.25
PR-102 IMP[4]	1.56	62.8	78.6	3.2	0.18

Notes:
1. CN* refers to the modified CN number adjusted to Antecedent Moisture Conditions II. Excludes Impervious Area for Nashyd.
2. Ia refers to Initial Abstraction. Excludes Impervious Area for Nashyd.
3. Tp refers to Time of Peak.
4. PR-102 IMP is identical to catchment PR-102; however, the gravel area is considered impervious. This will be referenced in the quality control design. This would typically be modelled as a Standhyd, however it is not used for any peak flow design / calculations, therefore was modelled as Nashyd for simplicity.


OUT-1
OUT-2
EX-101
1.44 ha.
EX-201
0.57 ha.
209.0
208.5
208.0
207.5
207.0
206.5
206.0
210.5
211.0
211.5
212.0
EX-100
0.22 ha.
CATCHMENT ID
CATCHMENT AREA
CATCHMENT BOUNDARY
OVERLAND FLOW DIRECTION
OUT
OUTLET LOCATION
Sketch No.
FIGURE 2
THOMAS SELF STORAGE
PRE-DEVELOPMENT
DRAINAGE AREA PLAN
WILLS
D.M. Wills Associates Limited
150 Jameson Drive
Peterborough, Ontario
Canada K9J 0B9
P. 705.742.2297
F. 705.741.3568
E. wills@dmwills.com
Drawn By NN / AS
Designed By NN / AS
Checked By CP
Engineer CP
Scale 1:1000
Plot Date JUNE 2024
Project No. 85312
Drawing File No. 85312-DP



Sketch No.
FIGURE 3
THOMAS SELF STORAGE
POST-DEVELOPMENT
DRAINAGE AREA PLAN

D.M. Wills Associates Limited
150 Jameson Drive
Peterborough, Ontario
Canada K9J 0B9
P. 705.742.2297
F. 705.741.3568
E. wills@dmwills.com

Drawn By: NN / AS	Scale: 1:1000
Designed By: NN / AS	Plot Date: JUNE 2024
Checked By: CP	Project No.: 85312
Engineer: CP	Drawing File No.: 85312-DP

4.0 Stormwater Management

4.1 Stormwater Quantity Control

The proposed development will increase the impervious areas within the Subject Property, resulting in increased runoff volumes and peak flow rates. To ensure that the receiving drainage system will not be adversely affected, a quantity control facility is required to control post-development peak flow rates to pre-development levels.

4.1.1 Peak Flow Calculations

Peak flow rates from the existing condition have been analyzed at the outlet locations based on the hydrologic parameters shown in **Figure 3.** Uncontrolled, proposed peak flow rates were also calculated at the corresponding outlet locations. A summary of the peak flow rates is shown in **Table 2**.

Peak flows were estimated using Visual Otthymo Version 3 (VO3) hydrologic modelling software for each of the 2 to 100-year storms. These calculations consider the 6-hour SCS Peterborough storm duration. The flow chart and the VO3 model results are presented in **Appendix B.**

Table 2 – Existing and Proposed Uncontrolled Peak Flow Summary

Return Period	Peak Flow Rates (m^3/s)			
	OUT-1		OUT-2	
	EX[1]	UNC[2]	EX[3]	UNC[4]
2-year	0.017	**0.046**	0.004	0.000
5-year	0.035	**0.082**	0.008	0.000
10-year	0.049	**0.109**	0.012	0.000
25-year	0.069	**0.147**	0.017	0.000
50-year	0.086	**0.178**	0.022	0.000
100-year	0.103	**0.209**	0.026	0.000

Notes:
1. EX refers to the Subject Property under existing conditions discharging to OUT-1. Refer to VO3 hydrograph NHYD (1101).
2. UNC refers to the Subject Property without any quantity controls in place, discharging to OUT-1. Refer to VO3 hydrograph NHYD (3).
3. EX refers to the site under existing conditions discharging to OUT-2. Refer to VO3 hydrograph NHYD (1201).
4. No stormwater is directed toward OUT-2 under proposed conditions, thus there are no UNC flows.

A review of **Table 2** confirms the increase in proposed peak flow rates directed to **OUT-1** compared to the existing peak flow rates leaving the site, in the absence of stormwater quantity controls. Therefore, quantity controls **are required** to attenuate the peak flow rates discharging to **OUT-1**. However, quantity controls are **not required** for **OUT-2** as no stormwater will be directed to this outlet under the proposed condition.

4.1.2 Grassed Detention Basin

In accordance with the design criteria established in **Section 3.1**, quantity controls are required for all events up to and including the 100-year storm. A grassed detention basin is proposed to attenuate peak stormwater flowrates. Based on the proposed peak flow rates calculated by the VO3 hydrologic model, a maximum of 315 m³ is required to mitigate post-development peak flow rates to pre-development levels for the 100-year storm event at **OUT-1**. A 150 mm orifice tube is proposed for the outlet structure which will be surrounded by a 0.40 m high rip-rap rock berm. This rock berm will allow influent flows, adjacent to the outlet, to have improved removal of suspended solids and avoid short circuiting to the outlet. In the event that the orifice becomes obstructed, once the grassed detention basin has filled, stormwater will outlet over a 4 m wide emergency overflow weir leading to the outlet swale. Further details of the outlet structure, rock berm and overflow weir are included in the detailed design drawings included in **Appendix E**.

The stage-storage discharge relationship is shown in **Table 3**, which outlines the existing and proposed controlled peak flow rates, with supplementary stage-storage and peak flow information included in **Appendix B**.

Table 3 – Grassed Detention Basin Stage-Storage-Discharge

Elev. (m)	Storage Depth (m)	Peak Flows (m³/s)	Storage Volume (m³)	Remarks
207.55	0.00	0.000	0	Bottom on Grassed Detention Basin
207.71	0.16	0.000	55	150 mm Orifice Tube
207.79	0.24	0.007	88	2-year (86 m³)
207.89	0.34	0.020	133	5-year (129 m³)
207.96	0.41	0.026	168	10-year (167 m³)
208.07	0.52	0.033	227	25-year (225 m³)
208.16	0.61	0.038	281	50-year (275 m³)
208.24	0.69	0.042	333	100-year (328 m³)
208.25	0.70	0.043	339	Top of Detention Basin

The proposed condition peak flow rates, with attenuation provided by the stormwater facility, are provided in **Table 4** and detailed model output is provided in **Appendix B.**

Table 4 – Post-Development Controlled Peak Flow Summary at OUT-1

Return Period	Peak Flow Rates (m^3/s)			
	OUT-1		OUT-2	
	EX[1]	PR[2]	EX[3]	PR[3]
2-year	0.017	0.013	0.004	0.000
5-year	0.035	0.028	0.008	0.000
10-year	0.049	0.043	0.012	0.000
25-year	0.069	0.062	0.017	0.000
50-year	0.086	0.075	0.022	0.000
100-year	0.103	0.089	0.026	0.000

Notes:
1. EX refers to the site under existing conditions discharging to OUT-1. Refer to VO3 hydrograph NHYD (1101).
2. PR refers to the Subject Property with quantity controls in place, discharging to OUT-1. Refer to VO3 hydrograph NHYD (1).
3. No stormwater is directed toward OUT-2 under proposed conditions, thus there are no PR flows.

4.2 Stormwater Quality Control

The proposed development may cause additional pollutants to be conveyed off-site; as such, water quality controls have been provided. The selection and sizing of the water quality measures have been based on the procedures set out in the Stormwater Management Planning and Design Manual (MOE, March 2003) for Enhanced (Level 1) protection. This level of protection requires 80% total suspended solids (TSS) removal and treatment of 90% of the annual runoff volume.

The goal of stormwater management is to preserve the natural hydrologic cycle and mitigation measures should be assessed in the following order:

- Stormwater lot level controls
- Stormwater conveyance controls
- End-of-pipe stormwater management facilities

Stormwater lot level controls represent measures that are implemented on an individual lot basis such as soak away pits, flatter grading and reduction of the impervious footprint. For the proposed development, lot level controls such as reduced grading will be used where possible to supplement the proposed SWM strategy; however, these are not intended to become the primary means for stormwater quality control.

Stormwater conveyance controls represent the conveyance systems used to transport stormwater runoff from the Subject Property to the receiving system such as pervious

pipes, catch basin treatment and grassed swales. Stormwater conveyance controls will be implemented within the Subject Property, however, are not meant to be the primary means of water quality treatment for the development.

End-of-pipe SWM facilities represent the common urban SWM measures used to service numerous lots or whole subdivisions. These facilities include Wet Ponds, Wetlands, Dry Ponds, Infiltration Basins, Infiltration Trenches, Filter Strips, Sand Filters and Oil-Grit Separators (OGS). End-of-pipe SWM facilities will be the primary means of quality control implemented for this development.

Table 3.2 of the Stormwater Management Planning and Design Manual (March 2003) identifies the infiltration volume requirements for a variety of SWM facilities. Sizing calculations were completed for the proposed infiltration facility considering gravel as impervious, therefore catchment **PR-102** has an impervious value of 62.8%, as shown in **Table 1** (PR-102 IMP). According to Table 3.2 of the Stormwater Management Planning and Design Manual (March 2003), this corresponds to 32.6 m^3/ha of required infiltration. The mandatory infiltration volume for the proposed development is calculated below.

$$\text{MOE Required Infiltration Volume} = (32.6\ m^3/ha)(\text{Catchment Area})$$

$$\text{MOE Required Infiltration Volume} = (32.6\ m^3/ha)(1.56\ ha)$$

MOE Required Infiltration Volume = 50.9 m^3

The proposed grassed detention basin will contain 55 m^3 of infiltration volume, exceeding the requirements of the MOE. It is recommended to complete a sub-surface investigation to ensure the SWM facility maintains a 1.0 m separation from groundwater and will draw down in less than 48 hours. The existing underlying soils provide sufficient drainage characteristics to support the functionality of the proposed SWM facility.

5.0 Hydraulic Elements

Hydraulic calculations were completed to ensure that the overland flows generated from the Subject Property can be appropriately conveyed toward the grassed detention basin and ultimately **OUT-1**. The proposed swales within the Subject Property have been identified as East Swale, West Swale and Outlet Swale. Two separate culverts are proposed to be installed to convey stormwater underneath the southern driveway. The proposed culverts have been identified as Inlet Culvert and Outlet Culvert. Supporting calculations are included in **Appendix C**.

5.1 East Swale

The East Swale receives runoff from a catchment area of 0.70 ha. This swale is 0.30 m deep, 0.30 m wide flat bottom swale with a maximum 3:1 side slopes and a longitudinal slope of 0.5%. Stormwater will reach a maximum depth of 0.15 m within the swale during the 100-year storm (0.053 m^3/s), leaving 0.15 m of freeboard. The maximum velocity of the swale is 0.71 m/s, which is below the recommended maximum of 1.5 m/s allotted to grassed swales; therefore, erosion measures are not required.

5.2 West Swale

The West Swale receives runoff from a catchment area of 0.38 ha. This swale is 0.30 m deep, 0.30 m wide flat bottom swale with a maximum 3:1 side slopes and a longitudinal slope of 0.5%. Stormwater will reach a maximum depth of 0.20 m within the swale during the 100-year storm (0.059 m^3/s), leaving 0.10 m of freeboard. The maximum velocity of the swale is 0.49 m/s, which is below the recommended maximum of 1.50 m/s allotted to grassed swales; therefore, erosion measures are not required.

5.3 Outlet Swale

The Outlet Swale receives runoff from a catchment area of 0.09 ha including outflows from the grassed detention basin. This swale is 0.30 m deep, 0.30 m wide flat bottom swale with a maximum 3:1 side slopes and a longitudinal slope of 1.0%. Stormwater will reach a maximum depth of 0.16 m within the swale during the 100-year storm (0.082 m^3/s), leaving 0.14 m of freeboard. The maximum velocity of the swale is 0.71 m/s, which is below the recommended maximum of 1.50 m/s allotted to grassed swales; therefore, erosion measures are not required.

5.4 Inlet Culvert

The Inlet Culvert will convey stormwater beneath the south driveway and into the grassed detention basin. In order to appropriately convey the stormwater captured during the 100-year storm (0.117 m^3/s) in the West Swale the Inlet Culvert is proposed to be a 375 mm smooth HDPE culvert.

5.5 Outlet Culvert

The Outlet Culvert will convey stormwater beneath the south driveway toward the County Road 30 roadside ditch (**OUT-1**). In order to appropriately convey the stormwater captured in the grassed detention basin during the uncontrolled 100-year storm (0.146 m^3/s) the Outlet Culvert is proposed to be a 600 mm smooth HDPE culvert.

6.0 Operation and Maintenance Considerations

The grassed detention basin may require maintenance periodically to ensure it is functioning as intended. The infiltration / detention facility shall be inspected annually, and any sediment and debris be removed to ensure the drawdown time remains below the 48-hour threshold.

7.0 Erosion and Sediment Control

When soils are exposed during construction, there is a potential for transport of relatively large amounts of sediment off-site to downstream areas. Erosion control practices prevent the soil exposed during construction from being disturbed by the erosive forces of stormwater. Typically, erosion control measures are physical barriers applied to the

surface of the soil. Vegetated filter strips, interceptor swales, and seeding / mulching are some examples of erosion control measures.

Sediment controls remove the suspended sediments within stormwater runoff. This is generally achieved by settling or filtering mechanisms through dissipating the velocity of stormwater.

Effective erosion and sediment control practices can be separated into structural and non-structural controls. Structural controls involve physical barriers that directly provide erosion and sediment mitigation, whereas non-structural controls involve diverting stormwater from potentially problematic areas to reduce the erosion and sediment impact throughout construction. In order to minimize the impacts associated with sediment transfer the following measures will be completed in the order listed:

- Install silt barrier as shown on Detailed Design Drawing and maintain as required.
- Install mud mat in the location shown on the Detailed Design Drawings.
- Remove temporary erosion and sediment control devices/measures and clean out once construction is completed and vegetation is established.

Regular inspection and maintenance of the silt fence will ensure continued protection to the downstream areas for the duration of the construction period.

Silt Fencing

Heavy duty silt fencing will be as per OPSD 219.110. The proposed silt fence shall be inspected after every rainfall to identify failed sections. Any failures shall be repaired immediately. When sediment accumulates to half the height of the geotextile, it is to be removed and disposed of in a controlled area. A supply of extra silt fence is to be kept on-site to provide quick repairs or the installation of additional fence, if required.

Mud Mat

Mud Mats remove sediment from vehicles that are entering and leaving the Subject Property. The mud mat will consist of varying types of stone at different locations of the mud mat. This includes 50 mm and 150 mm clear stone underlain with geotextile. The granular material will require periodic replacement as it becomes sedimented by vehicle traffic. Sediment shall be cleaned from public roads at the end of each day by shoveling or sweeping and disposed of properly in a controlled sediment disposal area.

8.0 Conclusion

The proposed development is located at 9351 County Road 30, in the Township of Havelock-Belmont-Methuen, and will alter the runoff characteristics of the Subject Property; therefore, stormwater quantity and quality control measures have been provided to ensure that the receiving drainage system will not be adversely affected.

A grassed detention basin is proposed to provide adequate quantity and quality control for the proposed development. This SWM facility will provide enough active storage to attenuate peak flowrates to existing levels while also providing sufficient infiltration volume to meet the "Enhanced" Level 1 protection as defined in the Stormwater Management Planning and Design Manual (March 2003).

Erosion and sediment control measures have been prepared to ensure that off-site erosion and transport of sediment is minimized through temporary measures.

The proper installation and ongoing maintenance of the erosion and sediment control measures outlined in this report will ensure that the development can proceed without adversely affecting downstream drainage conditions. The maintenance of the proposed measures will be carried out by the property owner.

Respectfully submitted,

Nate Napper, M.Eng.
Engineering Intern
Land Development Engineering

Chris Proctor, P.Eng.
Water Resources Engineer
Manager, Land Development Engineering

NN/CP/jh

Statement of Limitations

This Stormwater Management Report has been prepared by D.M. Wills Associates Limited on behalf of Kirk Thomas to address the requirements of the County of Peterborough.

The conclusions and recommendations in this report are based on available background documentation and discussions with applicable agencies at the time of preparation.

The report is intended to demonstrate the means whereby stormwater runoff originating from the site will be managed with respect to both quantity and quality control. The report is applicable only to the project described in the text, constructed substantially in accordance with the plans and details accompanying this report.

Any use which a third party makes of this brief other than a stormwater management report for the proposed development is the responsibility of such third parties. D.M. Wills Associates Limited accepts no responsibility for damages, if any, suffered by a third party as a result of decisions made or action taken based on using this report for purposes other than a stormwater management brief for the Thomas Self-Storage Facility.

D.M. Wills Associates Limited is not responsible for any changes made to the stormwater management measures which are not in accordance with the design drawings. Any person(s) relying on the "as-constructed" stormwater measures should confirm that the field conditions are in accordance with the design drawings.

Appendix A

Rainfall and Hydrology

6 Hour SCS Type II Intensity Hyetographs
2006 Peterborough Airport Weather Station
(mm/hr)

Time (min.)	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
0	0	0	0	0	0	0
15	1.6	2.1	2.5	2.9	3.3	3.6
30	1.6	2.1	2.5	2.9	3.3	3.6
45	2.3	3.2	3.7	4.4	4.9	5.4
60	2.3	3.2	3.7	4.4	4.9	5.4
75	2.3	3.2	3.7	4.4	4.9	5.4
90	2.3	3.2	3.7	4.4	4.9	5.4
105	3.9	5.2	6.2	7.3	8.1	9.0
120	3.9	5.2	6.2	7.3	8.1	9.0
135	4.6	6.3	7.4	8.8	9.8	10.8
150	4.6	6.3	7.4	8.8	9.8	10.8
165	23.2	31.4	36.9	43.7	48.9	53.9
180	60.4	81.78	95.9	113.7	127.0	140.2
195	8.5	11.5	13.5	16.0	17.9	19.8
210	8.5	11.5	13.5	16.0	17.9	19.8
225	3.9	5.2	6.2	7.3	8.1	9.0
240	3.9	5.2	6.2	7.3	8.1	9.0
255	3.1	4.2	4.9	5.8	6.5	7.2
270	3.1	4.2	4.9	5.8	6.5	7.2
285	2.3	3.2	3.7	4.4	4.9	5.4
300	2.3	3.2	3.7	4.4	4.9	5.4
315	1.6	2.1	2.5	2.9	3.3	3.6
330	1.6	2.1	2.5	2.9	3.3	3.6
345	1.6	2.1	2.5	2.9	3.3	3.6
360	1.6	2.1	2.5	2.9	3.3	3.6

Hydrologic Parameters for EX-101

Sheet 1 of 1

WILLS

Project No: 85312
Project Name: Thomas Self Storage Facility
Designed/Checked By: NN & AS / CP
Date: 10-Jul-24

Land Use

	EX-101	EX-101	
Agriculture	0.00	0.00	ha
Range	0.44	0.48	ha
Grass	0.29	0.00	ha
Woods	0.12	0.03	ha
Wetland	0.00	0.00	ha
Gravel	0.03	0.00	ha
Impervious	0.04	0.00	ha
SUM	**0.92**	**0.51**	
Hydrologic Soil Group[1]	B	A	
Soil Type	Otonabee Loam	Tioga Sandy Loam	
C	0.23	0.15	
CN (Nashyd)	65.1	48.1	

Rainfall Data

Gauging Station = Peterborough
12 hr, 100 Yr Rainfall = 90.4 mm

Drainage Area	**1.44**	ha
Impervious Area	**0.04**	ha
Percent Impervious	**3.0%**	
Connected Impervious	3.0%	

	Pervious	Impervious	
Length	180	12	m
US Elev	211.50	208.41	m
DS Elev	206.00	208.10	m
Slope	3.1	2.6	%
	Rolling	Rolling	

Parameter	Soil Group	Land Use							Weighted Value	
		Agriculture	Range	Grass	Woods	Wetland	Gravel	Impervious	Incl. Imperv. NASHYD	Not Incl. Imperv. STANDHYD
Runoff Coefficient[2], C	B	0.32	0.22	0.13	0.11	0.05	0.76	0.90	0.23	
	A	0.22	0.16	0.10	0.08	0.05	0.57	0.90	0.15	n.a.
SCS Curve No.[3], CN	B	74	65	61	58	50	85	98	65.1	63.5
	A	66	49	39	36	50	76	98	48.1	48.1
Initial Abstraction[5], mm		6.0	8.0	5.0	10.0	10.0	2.5	2.0	7.3	7.5

Time of Concentration[6]

Pervious Length	180	m	
Slope	3.1	%	
Airport	**27.2**	min.	
Bransby - Williams	7.9	min.	Flat: 0-2% Slopes Rolling: 2-6% Slopes Hilly: >6% Slopes
Applicable Minimum[7]	10.0	min.	
Time to Peak	18.2	min.	
	0.30	**hr.**	

Composite Parameters

Drainage Area	1.44 ha	
Runoff Coefficient	0.20	
SCS Curve No.	59.0	57.8
Modified Curve No.[4], CN*	**61.1**	58.7
Initial Abstraction.	**7.3**	7.5

Notes:

1. Hydrologic Soil Group obtained from Design Chart H2-6A, M.T.O. Drainage Manual, 1980.
2. Runoff coefficient obtained from M.T.O. Design Chart 1.07, M.T.O. Drainage Management Manual, 1997, Hydrologic Analysis and Design, McCuen 2004 and New Jersey Technical Manual for Stream Encroachment, 1984.
3. SCS Curve No. obtained from M.T.O. Design Chart 1.09, M.T.O. Drainage Management Manual, 1997, and Table 2-2a, TR-55, page 2-5.
4. The modified curve number is adjusted as per Paul Wisner & Associates (1982) and represents anticedent moisture conditions Type II
5. Initial Abstraction values taken from the Environmental and Engineering Services Department, The Corporation of the City of London, Dec 2005
6. Use Airport Equation to calculate time of concentration for C <= 0.4, and Bransby-Williams for C > 0.4.
7. Minimum Time of Concentration for use in the Rational Method and Hydrologic Model has been set to 10 minutes
8. All impervious areas have been assumed to be directly connected.

Hydrologic Parameters for EX-201

Sheet 1 of 1

WILLS

Project No: 85312
Project Name: Thomas Self Storage Facility
Designed/Checked By: NN & AS / CP
Date: 10-Jul-24

Land Use

	EX-201	
Agriculture	0.00	ha
Range	0.46	ha
Grass	0.00	ha
Woods	0.11	ha
Wetland	0.00	ha
Gravel	0.00	ha
Impervious	0.00	ha
SUM	0.57	

Hydrologic Soil Group[1]	A
Soil Type	Tioga Sandy Loam
C	0.09
CN (Nashyd)	46.6

Rainfall Data

Gauging Station = Peterborough
12 hr, 100 Yr Rainfall = 90.4 mm

Drainage Area	0.57	ha
Impervious Area	0.00	ha
Percent Impervious	0.0%	
Connected Impervious	0.0%	

Pervious

Length	70	m
US Elev	211.50	m
DS Elev	210.50	m
Slope	1.4	%
	Flat	

Parameter	Soil Group	Land Use							Weighted Value	
		Agriculture	Range	Grass	Woods	Wetland	Gravel	Impervious	Incl. Imperv. NASHYD	Not Incl. Imperv. STANDHYD
Runoff Coefficient[2], C	A	0.19	0.10	0.05	0.05	0.05	0.57	0.90	0.09	n.a.
SCS Curve No.[3], CN	A	66	49	39	36	50	76	98	46.6	46.6
Initial Abstraction[5], mm		6.0	8.0	5.0	10.0	10.0	2.5	2.0	8.4	8.4

Time of Concentration[6]

Pervious Length	70	m	
Slope	1.4	%	
Airport	24.5	min.	Flat: 0-2% Slopes Rolling: 2-6% Slopes Hilly: >6% Slopes
Bransby - Williams	3.9	min.	
Applicable Minimum[7]	10.0	min.	
Time to Peak	16.4	min.	
	0.27	hr.	

Composite Parameters

Drainage Area	0.57 ha	
Runoff Coefficient	0.09	
SCS Curve No.	46.6	46.6
Modified Curve No.[4], CN*	45.7	45.7
Initial Abstraction.	8.4	8.4

Notes:

1. Hydrologic Soil Group obtained from Design Chart H2-6A, M.T.O. Drainage Manual, 1980.
2. Runoff coefficient obtained from M.T.O. Design Chart 1.07, M.T.O. Drainage Management Manual, 1997, Hydrologic Analysis and Design, McCuen 2004 and New Jersey Technical Manual for Stream Encroachment, 1984.
3. SCS Curve No. obtained from M.T.O. Design Chart 1.09, M.T.O. Drainage Management Manual, 1997, and Table 2-2a, TR-55, page 2-5.
4. The modified curve number is adjusted as per Paul Wisner & Associates (1982) and represents anticedent moisture conditions Type II
5. Initial Abstraction values taken from the Environmental and Engineering Services Department, The Corporation of the City of London, Dec 2005
6. Use Airport Equation to calculate time of concentration for C <= 0.4, and Bransby-Williams for C > 0.4.
7. Minimum Time of Concentration for use in the Rational Method and Hydrologic Model has been set to 10 minutes
8. All impervious areas have been assumed to be directly connected.

Hydrologic Parameters for PR-101

Sheet 1 of 1

WILLS

Project No: 85312
Project Name: Thomas Self Storage Facility
Designed/Checked By: NN & AS / CP
Date: 10-Jul-24

Land Use

	PR-101	
Agriculture	0.00	ha
Range	0.00	ha
Grass	0.30	ha
Woods	0.01	ha
Wetland	0.00	ha
Gravel	0.03	ha
Impervious	0.08	ha
SUM	0.41	

Hydrologic Soil Group[1]	B
Soil Type	Otonabee Loam
C	0.32
CN (Nashyd)	69.5

Rainfall Data

Gauging Station = Peterborough
12 hr, 100 Yr Rainfall = 90.4 mm

Drainage Area	0.41	ha
Impervious Area	0.08	ha
Percent Impervious	18.3%	
Connected Impervious	18.3%	

	Pervious	Impervious	
Length	70	45	m
US Elev	208.00	208.33	m
DS Elev	206.00	207.00	m
Slope	2.9	3.0	%
	Rolling	Rolling	

Parameter	Soil Group	Land Use							Weighted Value	
		Agriculture	Range	Grass	Woods	Wetland	Gravel	Impervious	Incl. Imperv. NASHYD	Not Incl. Imperv. STANDHYD
Runoff Coefficient[2], C	B	0.32	0.22	0.13	0.11	0.05	0.76	0.90	0.32	n.a.
SCS Curve No.[3], CN	B	74	65	61	58	50	85	98	69.5	63.1
Initial Abstraction[5], mm		6.0	8.0	5.0	10.0	10.0	2.5	2.0	4.4	4.9

Time of Concentration[6]

Pervious Length	70	m	
Slope	2.9	%	
Airport	15.1	min.	
Bransby - Williams	3.5	min.	Flat: 0-2% Slopes Rolling: 2-6% Slopes Hilly: >6% Slopes
Applicable Minimum[7]	10.0	min.	
Time to Peak	10.1	min.	
	0.17	hr.	

Composite Parameters

Drainage Area	0.41 ha	
Runoff Coefficient	0.32	
SCS Curve No.	69.5	63.1
Modified Curve No.[4], CN*	70.5	63.2
Initial Abstraction.	4.4	4.9

Notes:

1. Hydrologic Soil Group obtained from Design Chart H2-6A, M.T.O. Drainage Manual, 1980.
2. Runoff coefficient obtained from M.T.O. Design Chart 1.07, M.T.O. Drainage Management Manual, 1997, Hydrologic Analysis and Design, McCuen 2004 and New Jersey Technical Manual for Stream Encroachment, 1984.
3. SCS Curve No. obtained from M.T.O. Design Chart 1.09, M.T.O. Drainage Management Manual, 1997, and Table 2-2a, TR-55, page 2-5.
4. The modified curve number is adjusted as per Paul Wisner & Associates (1982) and represents anticedent moisture conditions Type II
5. Initial Abstraction values taken from the Environmental and Engineering Services Department, The Corporation of the City of London, Dec 2005
6. Use Airport Equation to calculate time of concentration for C <= 0.4, and Bransby-Williams for C > 0.4.
7. Minimum Time of Concentration for use in the Rational Method and Hydrologic Model has been set to 10 minutes
8. All impervious areas have been assumed to be directly connected.

Hydrologic Parameters for PR-102 IMP

Sheet 1 of 1

WILLS

Project No: 85312
Project Name: Thomas Self Storage Facility
Designed/Checked By: NN & AS / CP
Date: 10-Jul-24

Land Use

	PR-102	PR-102	
Agriculture	0.00	0.00	ha
Range	0.00	0.00	ha
Grass	0.18	0.37	ha
Woods	0.01	0.03	ha
Wetland	0.00	0.00	ha
Gravel	0.00	0.00	ha
Impervious	0.29	0.69	ha
SUM	**0.48**	**1.08**	
Hydrologic Soil Group[1]	B	A	
Soil Type	Otonabee Loam	Tioga Sandy Loam	
C	0.58	0.59	
CN (Nashyd)	83.6	76.4	

Rainfall Data

Gauging Station = Peterborough
12 hr, 100 Yr Rainfall = 90.4 mm

Drainage Area	**1.56**	ha
Impervious Area	**0.98**	ha
Percent Impervious	**62.8%**	
Connected Impervious	62.8%	

	Pervious	Impervious	
Length	240	25	m
US Elev	209.40	210.00	m
DS Elev	208.10	209.70	m
Slope	0.5	1.2	%
	Flat	Flat	

Parameter	Soil Group	Land Use							Weighted Value	
		Agriculture	Range	Grass	Woods	Wetland	Gravel	Impervious	Incl. Imperv. NASHYD	Not Incl. Imperv. STANDHYD
Runoff Coefficient[2], C	B	0.26	0.14	0.08	0.08	0.05	0.76	0.90	0.58	n.a.
	A	0.19	0.10	0.05	0.05	0.05	0.57	0.90	0.59	
SCS Curve No.[3], CN	B	74	65	61	58	50	85	98	83.6	60.8
	A	66	49	39	36	50	76	98	76.4	38.8
Initial Abstraction[5], mm		6.0	8.0	5.0	10.0	10.0	2.5	2.0	3.2	5.3

Time of Concentration[6]

Total Length	265	m	
Average Slope	0.6	%	
Airport	32.1	min.	
Bransby - Williams	**16.0**	min.	Flat: 0-2% Slopes Rolling: 2-6% Slopes Hilly: >6% Slopes
Applicable Minimum[7]	10.0	min.	
Time to Peak	10.7	min.	
	0.18	**hr.**	

Composite Parameters

Drainage Area	1.56 ha	
Runoff Coefficient	0.59	
SCS Curve No.	78.6	45.9
Modified Curve No.[4], CN*	78.6	**42.6**
Initial Abstraction.	3.2	**5.3**

Notes:

1. Hydrologic Soil Group obtained from Design Chart H2-6A, M.T.O. Drainage Manual, 1980.
2. Runoff coefficient obtained from M.T.O. Design Chart 1.07, M.T.O. Drainage Management Manual, 1997, Hydrologic Analysis and Design, McCuen 2004 and New Jersey Technical Manual for Stream Encroachment, 1984.
3. SCS Curve No. obtained from M.T.O. Design Chart 1.09, M.T.O. Drainage Management Manual, 1997, and Table 2-2a, TR-55, page 2-5.
4. The modified curve number is adjusted as per Paul Wisner & Associates (1982) and represents anticedent moisture conditions Type II
5. Initial Abstraction values taken from the Environmental and Engineering Services Department, The Corporation of the City of London, Dec 2005
6. Use Airport Equation to calculate time of concentration for C <= 0.4, and Bransby-Williams for C > 0.4.
7. Minimum Time of Concentration for use in the Rational Method and Hydrologic Model has been set to 10 minutes
8. All impervious areas have been assumed to be directly connected.

Hydrologic Parameters for PR-102

Sheet 1 of 1

WILLS

Project No: 85312
Project Name: Thomas Self Storage Facility
Designed/Checked By: NN & AS / CP
Date: 10-Jul-24

Land Use

	PR-102	PR-102	
Agriculture	0.00	0.00	ha
Range	0.00	0.00	ha
Grass	0.18	0.37	ha
Woods	0.01	0.03	ha
Wetland	0.00	0.00	ha
Gravel	0.20	0.54	ha
Impervious	0.09	0.15	ha
SUM	**0.48**	**1.08**	
Hydrologic Soil Group[1]	B	A	
Soil Type	Otonabee Loam	Tioga Sandy Loam	
C	0.52	0.43	
CN (Nashyd)	78.1	65.5	

Rainfall Data

Gauging Station = Peterborough
12 hr, 100 Yr Rainfall = 90.4 mm

Drainage Area	**1.56**	ha
Impervious Area	**0.24**	ha
Percent Impervious	**15.7%**	
Connected Impervious	15.7%	

	Pervious	Impervious	
Length	240	25	m
US Elev	209.40	210.00	m
DS Elev	208.10	209.70	m
Slope	0.5	1.2	%
	Flat	Flat	

Parameter	Soil Group	Land Use							Weighted Value	
		Agriculture	Range	Grass	Woods	Wetland	Gravel	Impervious	Incl. Imperv. NASHYD	Not Incl. Imperv. STANDHYD
Runoff Coefficient[2], C	B	0.26	0.14	0.08	0.08	0.05	0.76	0.90	0.52	n.a.
	A	0.19	0.10	0.05	0.05	0.05	0.57	0.90	0.43	
SCS Curve No.[3], CN	B	74	65	61	58	50	85	98	78.1	73.3
	A	66	49	39	36	50	76	98	65.5	60.2
Initial Abstraction[5], mm		6.0	8.0	5.0	10.0	10.0	2.5	2.0	3.5	3.7

Time of Concentration[6]

Total Length	265	m	
Average Slope	0.6	%	
Airport	40.4	min.	
Bransby - Williams	**16.0**	min.	Flat: 0-2% Slopes Rolling: 2-6% Slopes Hilly: >6% Slopes
Applicable Minimum[7]	10.0	min.	
Time to Peak	10.7	min.	
	0.18	**hr.**	

Composite Parameters

Drainage Area	1.56 ha	
Runoff Coefficient	0.46	
SCS Curve No.	69.4	64.1
Modified Curve No.[4], CN*	69.4	63.6
Initial Abstraction.	3.5	3.7

Notes:

1. Hydrologic Soil Group obtained from Design Chart H2-6A, M.T.O. Drainage Manual, 1980.
2. Runoff coefficient obtained from M.T.O. Design Chart 1.07, M.T.O. Drainage Management Manual, 1997, Hydrologic Analysis and Design, McCuen 2004 and New Jersey Technical Manual for Stream Encroachment, 1984.
3. SCS Curve No. obtained from M.T.O. Design Chart 1.09, M.T.O. Drainage Management Manual, 1997, and Table 2-2a, TR-55, page 2-5.
4. The modified curve number is adjusted as per Paul Wisner & Associates (1982) and represents anticedent moisture conditions Type II
5. Initial Abstraction values taken from the Environmental and Engineering Services Department, The Corporation of the City of London, Dec 2005
6. Use Airport Equation to calculate time of concentration for C <= 0.4, and Bransby-Williams for C > 0.4.
7. Minimum Time of Concentration for use in the Rational Method and Hydrologic Model has been set to 10 minutes
8. All impervious areas have been assumed to be directly connected.

Hydrologic Parameters for PR-103

Sheet 1 of 1

Project No: 85312
Project Name: Thomas Self Storage Facility
Designed/Checked By: NN & AS / CP
Date: 10-Jul-24

Land Use

	PR-103	
Agriculture	0.00	ha
Range	0.00	ha
Grass	0.03	ha
Woods	0.00	ha
Wetland	0.00	ha
Gravel	0.00	ha
Impervious	0.00	ha
SUM	0.03	

Hydrologic Soil Group[1]	B
Soil Type	Otonabee Loam
C	0.08
CN (Nashyd)	61.0

Rainfall Data

Gauging Station = Peterborough
12 hr, 100 Yr Rainfall = 90.4 mm

Drainage Area	0.03	ha
Impervious Area	0.00	ha
Percent Impervious	0.0%	
Connected Impervious	0.0%	

Pervious

Length	58	m
US Elev	206.82	m
DS Elev	206.00	m
Slope	1.4	%
	Flat	

Parameter	Soil Group	Land Use							Weighted Value	
		Agriculture	Range	Grass	Woods	Wetland	Gravel	Impervious	Incl. Imperv. NASHYD	Not Incl. Imperv. STANDHYD
Runoff Coefficient[2], C	B	0.26	0.14	0.08	0.08	0.05	0.76	0.90	0.08	n.a.
SCS Curve No.[3], CN	B	74	65	61	58	50	85	98	61.0	61.0
Initial Abstraction[5], mm		6.0	8.0	5.0	10.0	10.0	2.5	2.0	5.0	5.0

Time of Concentration[6]

Pervious Length	58	m	
Slope	1.4	%	
Airport	22.6	min.	
Bransby - Williams	4.4	min.	Flat: 0-2% Slopes Rolling: 2-6% Slopes Hilly: >6% Slopes
Applicable Minimum[7]	10.0	min.	
Time to Peak	15.1	min.	
	0.25	hr.	

Composite Parameters

Drainage Area	0.03 ha	
Runoff Coefficient	0.08	
SCS Curve No.	61.0	61.0
Modified Curve No.[4], CN*	60.5	60.5
Initial Abstraction.	5.0	5.0

Notes:

1. Hydrologic Soil Group obtained from Design Chart H2-6A, M.T.O. Drainage Manual, 1980.
2. Runoff coefficient obtained from M.T.O. Design Chart 1.07, M.T.O. Drainage Management Manual, 1997, Hydrologic Analysis and Design, McCuen 2004 and New Jersey Technical Manual for Stream Encroachment, 1984.
3. SCS Curve No. obtained from M.T.O. Design Chart 1.09, M.T.O. Drainage Management Manual, 1997, and Table 2-2a, TR-55, page 2-5.
4. The modified curve number is adjusted as per Paul Wisner & Associates (1982) and represents anticedent moisture conditions Type II
5. Initial Abstraction values taken from the Environmental and Engineering Services Department, The Corporation of the City of London, Dec 2005
6. Use Airport Equation to calculate time of concentration for C <= 0.4, and Bransby-Williams for C > 0.4.
7. Minimum Time of Concentration for use in the Rational Method and Hydrologic Model has been set to 10 minutes
8. All impervious areas have been assumed to be directly connected.

Thomas Self Storage - Soils Map

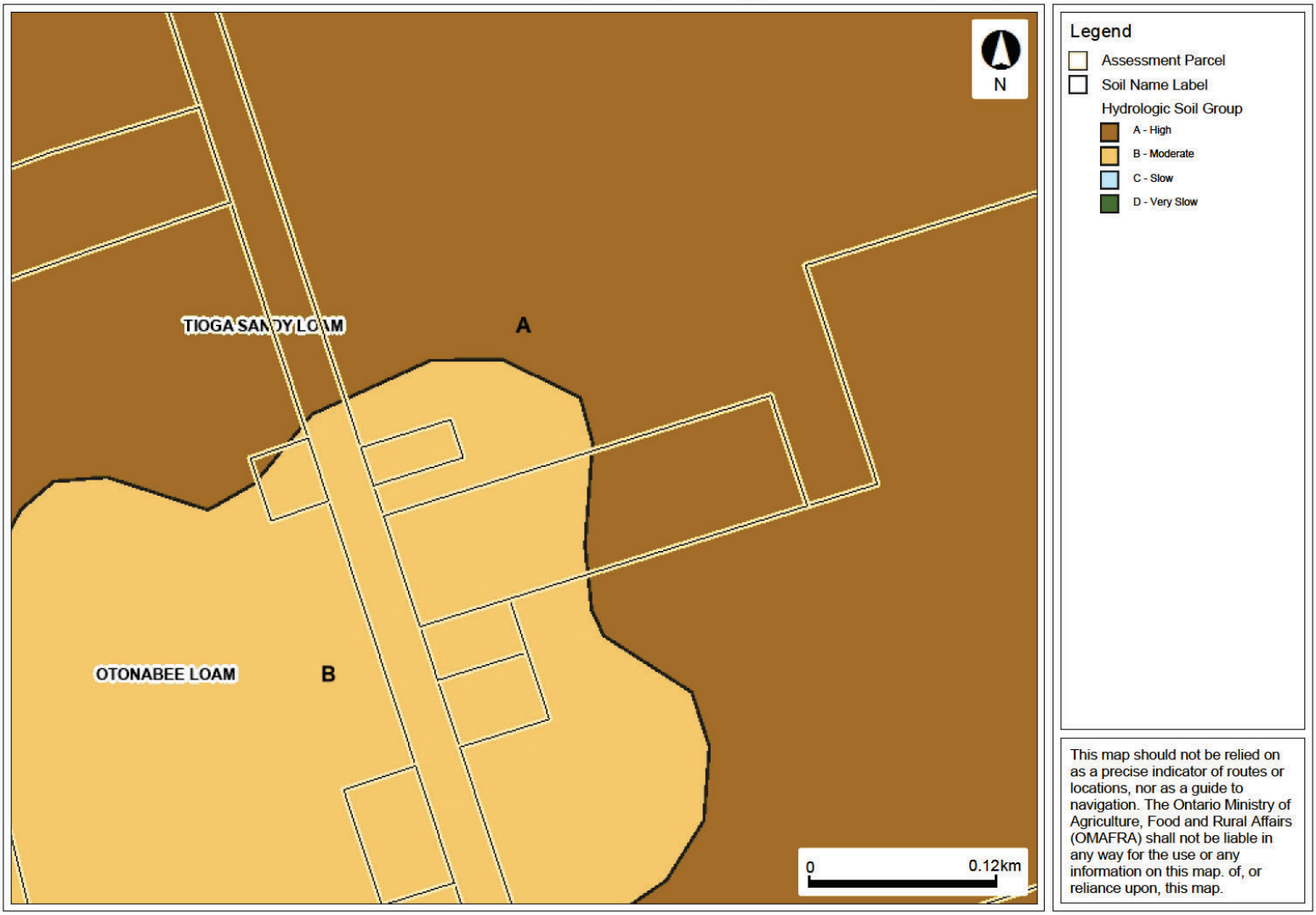
Legend

- Assessment Parcel
- Soil Name Label

This map should not be relied on as a precise indicator of routes or locations, nor as a guide to navigation. The Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) shall not be liable in any way for the use or any information on this map. of, or reliance upon, this map.

Map Created: 7/18/2024
Map Center: 44.41379 N, -77.88189 W

Thomas Self Storage - Hydrologic Soil Group Map

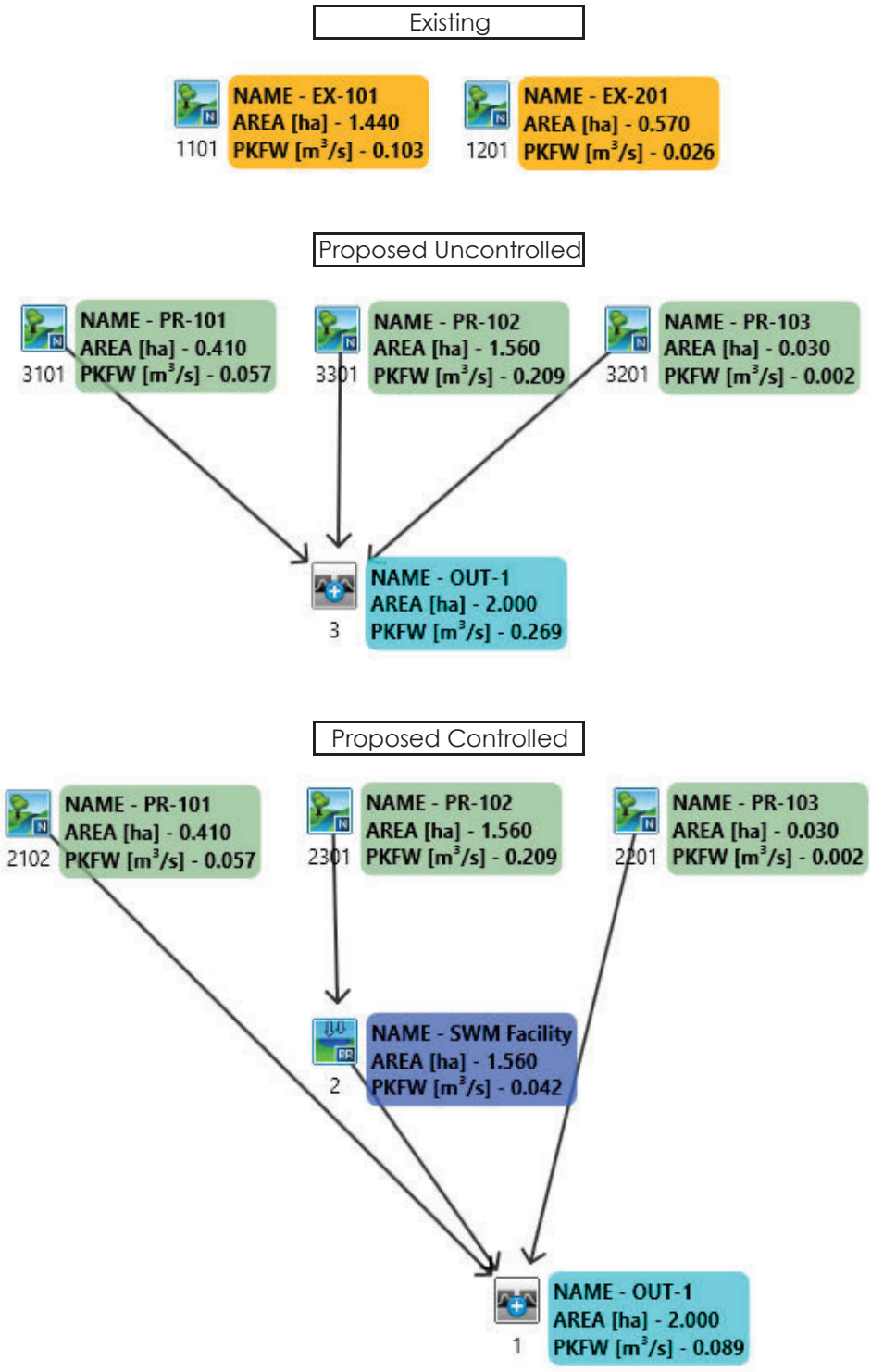


Map Created: 7/18/2024
Map Center: 44.41379 N, -77.88189 W

Appendix B

Hydrologic Model Configuration and Results

Visual Otthymo Model Configuration



```
================================================================================
============================

       V    V   I    SSSSS  U   U    A    L
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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All rights reserved.


                  *****  D E T A I L E D   O U T P U T *****


  Input   filename: C:\Program Files (x86)\VO Suite 3.0\VO2\voin.dat

  Output  filename:
C:\Users\nnapper\AppData\Local\Temp\e9dbd76a-149b-4a10-9af7-3ee318115b78\Scena
rio.out
  Summary filename:
C:\Users\nnapper\AppData\Local\Temp\e9dbd76a-149b-4a10-9af7-3ee318115b78\Scena
rio.sum


DATE: 07/18/2024                          TIME: 11:29:05

USER:



COMMENTS: _____


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  ****************************
  ** SIMULATION NUMBER:   1 **
  ****************************


--------------------
|    READ STORM    |    Filename: C:\Users\nnapper\AppD

|                  |              ata\Local\Temp\
```

```
|                  |
e9dbd76a-149b-4a10-9af7-3ee318115b78\c32d7f87
| Ptotal= 15.00 mm |    Comments: 15 mm, 6 hour SCS Type II, Custom Gauge:
--------------------
                  TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                   hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                  0.25    0.60 |  1.75    1.50 |  3.25    3.30 |  4.75    0.90
                  0.50    0.60 |  2.00    1.50 |  3.50    3.30 |  5.00    0.90
                  0.75    0.90 |  2.25    1.80 |  3.75    1.50 |  5.25    0.60
                  1.00    0.90 |  2.50    1.80 |  4.00    1.50 |  5.50    0.60
                  1.25    0.90 |  2.75    9.00 |  4.25    1.20 |  5.75    0.60
                  1.50    0.90 |  3.00   23.40 |  4.50    1.20 |  6.00    0.60

--------------------------------------------------------------------------------
-

--------------------
| CALIB            |
| NASHYD    (1101) |   Area    (ha)=   1.44   Curve Number   (CN)= 61.1
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.30   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.30

        NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.


                          ---- TRANSFORMED HYETOGRAPH ----
                 TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                   hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.083    0.60 | 1.583    1.50 | 3.083    3.30 |  4.58    0.90
                0.167    0.60 | 1.667    1.50 | 3.167    3.30 |  4.67    0.90
                0.250    0.60 | 1.750    1.50 | 3.250    3.30 |  4.75    0.90
                0.333    0.60 | 1.833    1.50 | 3.333    3.30 |  4.83    0.90
                0.417    0.60 | 1.917    1.50 | 3.417    3.30 |  4.92    0.90
                0.500    0.60 | 2.000    1.50 | 3.500    3.30 |  5.00    0.90
                0.583    0.90 | 2.083    1.80 | 3.583    1.50 |  5.08    0.60
                0.667    0.90 | 2.167    1.80 | 3.667    1.50 |  5.17    0.60
                0.750    0.90 | 2.250    1.80 | 3.750    1.50 |  5.25    0.60
                0.833    0.90 | 2.333    1.80 | 3.833    1.50 |  5.33    0.60
                0.917    0.90 | 2.417    1.80 | 3.917    1.50 |  5.42    0.60
                1.000    0.90 | 2.500    1.80 | 4.000    1.50 |  5.50    0.60
                1.083    0.90 | 2.583    9.00 | 4.083    1.20 |  5.58    0.60
                1.167    0.90 | 2.667    9.00 | 4.167    1.20 |  5.67    0.60
                1.250    0.90 | 2.750    9.00 | 4.250    1.20 |  5.75    0.60
                1.333    0.90 | 2.833   23.40 | 4.333    1.20 |  5.83    0.60
                1.417    0.90 | 2.917   23.40 | 4.417    1.20 |  5.92    0.60
                1.500    0.90 | 3.000   23.40 | 4.500    1.20 |  6.00    0.60

    Unit Hyd Qpeak  (cms)=   0.183

    PEAK FLOW       (cms)=   0.001 (i)
    TIME TO PEAK    (hrs)=   3.417
    RUNOFF VOLUME    (mm)=   0.349
```

```
     TOTAL RAINFALL   (mm)=  15.000
     RUNOFF COEFFICIENT   =   0.023

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-
--------------------
| CALIB            |
| NASHYD    (1201) |   Area    (ha)=   0.57   Curve Number   (CN)= 45.7
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.27

     Unit Hyd Qpeak  (cms)=   0.081

     PEAK FLOW       (cms)=   0.000 (i)
     TIME TO PEAK    (hrs)=   3.500
     RUNOFF VOLUME    (mm)=   0.140
     TOTAL RAINFALL   (mm)=  15.000
     RUNOFF COEFFICIENT   =   0.009

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-
--------------------
| CALIB            |
| NASHYD    (2102) |   Area    (ha)=   0.41   Curve Number   (CN)= 70.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.092

     PEAK FLOW       (cms)=   0.001 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=   0.957
     TOTAL RAINFALL   (mm)=  15.000
     RUNOFF COEFFICIENT   =   0.064

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-
--------------------
| CALIB            |
| NASHYD    (2201) |   Area    (ha)=   0.03   Curve Number   (CN)= 60.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.25

     Unit Hyd Qpeak  (cms)=   0.005

     PEAK FLOW       (cms)=   0.000 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=   0.398
     TOTAL RAINFALL   (mm)=  15.000
     RUNOFF COEFFICIENT   =   0.027

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-
--------------------
| CALIB            |
| NASHYD    (2301) |   Area    (ha)=   1.56   Curve Number   (CN)= 69.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   3.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.331

     PEAK FLOW       (cms)=   0.005 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=   1.068
     TOTAL RAINFALL   (mm)=  15.000
     RUNOFF COEFFICIENT   =   0.071

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-
--------------------
| RESERVOIR (0002) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.0277      0.0178
                          0.0001     0.0055   |   0.0310      0.0205
                          0.0029     0.0075   |   0.0346      0.0239
                          0.0115     0.0101   |   0.0373      0.0269
                          0.0183     0.0124   |   0.0403      0.0306
                          0.0238     0.0153   |   0.0427      0.0339

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (2301)      1.560     0.005      3.08       1.07
     OUTFLOW: ID= 1 (0002)      1.560     0.000      6.50       0.02

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=  0.54
                    TIME SHIFT OF PEAK FLOW         (min)=205.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=  0.0016

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```
| ADD HYD   (0001) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0002):     1.56   0.000     6.50     0.02
        + ID2= 2 (2102):     0.41   0.001     3.08     0.96
          ================================================
          ID = 3 (0001):     1.97   0.001     3.08     0.22

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-

-------------------
| ADD HYD   (0001) |
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 3 (0001):     1.97   0.001     3.08     0.22
        + ID2= 2 (2201):     0.03   0.000     3.17     0.40
          ================================================
          ID = 1 (0001):     2.00   0.001     3.08     0.22

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-
-------------------
| CALIB            |
| NASHYD    (3301) |   Area    (ha)=   1.56   Curve Number   (CN)= 69.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   3.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.331

     PEAK FLOW       (cms)=   0.005 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=   1.068
     TOTAL RAINFALL   (mm)=  15.000
     RUNOFF COEFFICIENT   =   0.071

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-------------------
| CALIB            |
| NASHYD    (3101) |   Area    (ha)=   0.41   Curve Number   (CN)= 70.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.40   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.092

     PEAK FLOW       (cms)=   0.001 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=   0.957
     TOTAL RAINFALL   (mm)=  15.000
     RUNOFF COEFFICIENT   =   0.064

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

------------------------------------------------------------------------------
-
-------------------
| CALIB            |
| NASHYD    (3201) |   Area    (ha)=   0.03   Curve Number   (CN)= 60.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.25

     Unit Hyd Qpeak  (cms)=   0.005

     PEAK FLOW       (cms)=   0.000 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=   0.398
     TOTAL RAINFALL   (mm)=  15.000
     RUNOFF COEFFICIENT   =   0.027

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

------------------------------------------------------------------------------
-

-------------------
| ADD HYD   (0003) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (3101):     0.41   0.001     3.08     0.96
        + ID2= 2 (3201):     0.03   0.000     3.17     0.40
          ================================================
          ID = 3 (0003):     0.44   0.001     3.08     0.92

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
-

-------------------
| ADD HYD   (0003) |
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 3 (0003):     0.44   0.001     3.08     0.92
        + ID2= 2 (3301):     1.56   0.005     3.08     1.07
          ================================================
          ID = 1 (0003):     2.00   0.007     3.08     1.03
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

-

****
** SIMULATION NUMBER: 2 **
****

| READ STORM | Filename: C:\Users\nnapper\AppD

| | ata\Local\Temp\

| |
e9dbd76a-149b-4a10-9af7-3ee318115b78\2bff6339
| Ptotal= 38.75 mm | Comments: 2-Year, 6 hour SCS Type II - Peterboroug
---

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	1.60	1.75	3.90	3.25	8.50	4.75	2.30
0.50	1.60	2.00	3.90	3.50	8.50	5.00	2.30
0.75	2.30	2.25	4.60	3.75	3.90	5.25	1.60
1.00	2.30	2.50	4.60	4.00	3.90	5.50	1.60
1.25	2.30	2.75	23.20	4.25	3.10	5.75	1.60
1.50	2.30	3.00	60.40	4.50	3.10	6.00	1.60

-

| CALIB |
| NASHYD (1101) | Area (ha)= 1.44 Curve Number (CN)= 61.1
|ID= 1 DT= 5.0 min | Ia (mm)= 7.30 # of Linear Res.(N)= 3.00
--- U.H. Tp(hrs)= 0.30

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.60	1.583	3.90	3.083	8.50	4.58	2.30
0.167	1.60	1.667	3.90	3.167	8.50	4.67	2.30
0.250	1.60	1.750	3.90	3.250	8.50	4.75	2.30
0.333	1.60	1.833	3.90	3.333	8.50	4.83	2.30
0.417	1.60	1.917	3.90	3.417	8.50	4.92	2.30
0.500	1.60	2.000	3.90	3.500	8.50	5.00	2.30
0.583	2.30	2.083	4.60	3.583	3.90	5.08	1.60
0.667	2.30	2.167	4.60	3.667	3.90	5.17	1.60
0.750	2.30	2.250	4.60	3.750	3.90	5.25	1.60
0.833	2.30	2.333	4.60	3.833	3.90	5.33	1.60
0.917	2.30	2.417	4.60	3.917	3.90	5.42	1.60
1.000	2.30	2.500	4.60	4.000	3.90	5.50	1.60
1.083	2.30	2.583	23.20	4.083	3.10	5.58	1.60
1.167	2.30	2.667	23.20	4.167	3.10	5.67	1.60
1.250	2.30	2.750	23.20	4.250	3.10	5.75	1.60
1.333	2.30	2.833	60.40	4.333	3.10	5.83	1.60
1.417	2.30	2.917	60.40	4.417	3.10	5.92	1.60
1.500	2.30	3.000	60.40	4.500	3.10	6.00	1.60

Unit Hyd Qpeak (cms)= 0.183

PEAK FLOW (cms)= 0.017 (i)
TIME TO PEAK (hrs)= 3.167
RUNOFF VOLUME (mm)= 5.118
TOTAL RAINFALL (mm)= 38.750
RUNOFF COEFFICIENT = 0.132

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-

| CALIB |
| NASHYD (1201) | Area (ha)= 0.57 Curve Number (CN)= 45.7
|ID= 1 DT= 5.0 min | Ia (mm)= 8.40 # of Linear Res.(N)= 3.00
--- U.H. Tp(hrs)= 0.27

Unit Hyd Qpeak (cms)= 0.081

PEAK FLOW (cms)= 0.004 (i)
TIME TO PEAK (hrs)= 3.167
RUNOFF VOLUME (mm)= 2.771
TOTAL RAINFALL (mm)= 38.750
RUNOFF COEFFICIENT = 0.071

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

-

| CALIB |
| NASHYD (2102) | Area (ha)= 0.41 Curve Number (CN)= 70.5
|ID= 1 DT= 5.0 min | Ia (mm)= 4.40 # of Linear Res.(N)= 3.00
--- U.H. Tp(hrs)= 0.17

Unit Hyd Qpeak (cms)= 0.092

PEAK FLOW (cms)= 0.012 (i)
TIME TO PEAK (hrs)= 3.083
RUNOFF VOLUME (mm)= 8.359
TOTAL RAINFALL (mm)= 38.750
RUNOFF COEFFICIENT = 0.216

```
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-
--------------------
| CALIB            |
| NASHYD    (2201) |   Area    (ha)=   0.03   Curve Number   (CN)= 60.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.25

     Unit Hyd Qpeak  (cms)=   0.005

     PEAK FLOW       (cms)=   0.000 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=   5.671
     TOTAL RAINFALL   (mm)=  38.750
     RUNOFF COEFFICIENT   =   0.146

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-
--------------------
| CALIB            |
| NASHYD    (2301) |   Area    (ha)=   1.56   Curve Number   (CN)= 69.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   3.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.331

     PEAK FLOW       (cms)=   0.046 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=   8.414
     TOTAL RAINFALL   (mm)=  38.750
     RUNOFF COEFFICIENT   =   0.217

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-
--------------------
| RESERVOIR (0002) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.0277      0.0178
                          0.0001     0.0055   |   0.0310      0.0205
                          0.0029     0.0075   |   0.0346      0.0239
                          0.0115     0.0101   |   0.0373      0.0269
                          0.0183     0.0124   |   0.0403      0.0306
                          0.0238     0.0153   |   0.0427      0.0339
```

```
                              AREA     QPEAK     TPEAK       R.V.
                              (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (2301)      1.560      0.046      3.08       8.41
     OUTFLOW: ID= 1 (0002)      1.560      0.007      4.08       4.82

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)= 14.19
                    TIME SHIFT OF PEAK FLOW         (min)= 60.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=  0.0086

--------------------------------------------------------------------------------
-

--------------------
| ADD HYD   (0001) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0002):     1.56   0.007     4.08     4.82
        + ID2= 2 (2102):     0.41   0.012     3.08     8.36
          ================================================
          ID = 3 (0001):     1.97   0.012     3.08     5.56

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-

--------------------
| ADD HYD   (0001) |
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0001):     1.97   0.012     3.08     5.56
        + ID2= 2 (2201):     0.03   0.000     3.17     5.67
          ================================================
          ID = 1 (0001):     2.00   0.013     3.08     5.56

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-
--------------------
| CALIB            |
| NASHYD    (3301) |   Area    (ha)=   1.56   Curve Number   (CN)= 69.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   3.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.331

     PEAK FLOW       (cms)=   0.046 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=   8.414
     TOTAL RAINFALL   (mm)=  38.750
```

```
     RUNOFF COEFFICIENT   =   0.217

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

------------------------------------------------------------------------------
-
--------------------
| CALIB            |
| NASHYD    (3101) |   Area    (ha)=   0.41   Curve Number   (CN)= 70.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.092

     PEAK FLOW       (cms)=   0.012 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=   8.359
     TOTAL RAINFALL   (mm)=  38.750
     RUNOFF COEFFICIENT   =   0.216

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB            |
| NASHYD    (3201) |   Area    (ha)=   0.03   Curve Number   (CN)= 60.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.25

     Unit Hyd Qpeak  (cms)=   0.005

     PEAK FLOW       (cms)=   0.000 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=   5.671
     TOTAL RAINFALL   (mm)=  38.750
     RUNOFF COEFFICIENT   =   0.146

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| ADD HYD   (0003) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (3101):     0.41   0.012     3.08     8.36
        + ID2= 2 (3201):    0.03   0.000     3.17     5.67
          ================================================
          ID = 3 (0003):    0.44   0.013     3.08     8.18

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0003) |
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 3 (0003):     0.44   0.013     3.08     8.18
        + ID2= 2 (3301):    1.56   0.046     3.08     8.41
          ================================================
          ID = 1 (0003):    2.00   0.059     3.08     8.36

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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  ****************************
  ** SIMULATION NUMBER:   3 **
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|    READ STORM    |    Filename: C:\Users\nnapper\AppD

|                  |              ata\Local\Temp\

|                  |
e9dbd76a-149b-4a10-9af7-3ee318115b78\198b3742
| Ptotal= 52.45 mm |    Comments: 5-Year, 6 hour SCS Type II - Peterboroug
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.25    2.10 |  1.75    5.20 |  3.25   11.50 |  4.75    3.20
                0.50    2.10 |  2.00    5.20 |  3.50   11.50 |  5.00    3.20
                0.75    3.20 |  2.25    6.30 |  3.75    5.20 |  5.25    2.10
                1.00    3.20 |  2.50    6.30 |  4.00    5.20 |  5.50    2.10
                1.25    3.20 |  2.75   31.40 |  4.25    4.20 |  5.75    2.10
                1.50    3.20 |  3.00   81.80 |  4.50    4.20 |  6.00    2.10

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| CALIB            |
| NASHYD    (1101) |   Area    (ha)=   1.44   Curve Number   (CN)= 61.1
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.30   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.30

        NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.
```

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	2.10	1.583	5.20	3.083	11.50	4.58	3.20
0.167	2.10	1.667	5.20	3.167	11.50	4.67	3.20
0.250	2.10	1.750	5.20	3.250	11.50	4.75	3.20
0.333	2.10	1.833	5.20	3.333	11.50	4.83	3.20
0.417	2.10	1.917	5.20	3.417	11.50	4.92	3.20
0.500	2.10	2.000	5.20	3.500	11.50	5.00	3.20
0.583	3.20	2.083	6.30	3.583	5.20	5.08	2.10
0.667	3.20	2.167	6.30	3.667	5.20	5.17	2.10
0.750	3.20	2.250	6.30	3.750	5.20	5.25	2.10
0.833	3.20	2.333	6.30	3.833	5.20	5.33	2.10
0.917	3.20	2.417	6.30	3.917	5.20	5.42	2.10
1.000	3.20	2.500	6.30	4.000	5.20	5.50	2.10
1.083	3.20	2.583	31.40	4.083	4.20	5.58	2.10
1.167	3.20	2.667	31.40	4.167	4.20	5.67	2.10
1.250	3.20	2.750	31.40	4.250	4.20	5.75	2.10
1.333	3.20	2.833	81.80	4.333	4.20	5.83	2.10
1.417	3.20	2.917	81.80	4.417	4.20	5.92	2.10
1.500	3.20	3.000	81.80	4.500	4.20	6.00	2.10

```
     Unit Hyd Qpeak  (cms)=   0.183

     PEAK FLOW       (cms)=   0.035 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=   9.850
     TOTAL RAINFALL   (mm)=  52.450
     RUNOFF COEFFICIENT   =   0.188

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| NASHYD    (1201) |   Area    (ha)=   0.57   Curve Number   (CN)= 45.7
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.27

     Unit Hyd Qpeak  (cms)=   0.081

     PEAK FLOW       (cms)=   0.008 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=   5.606
     TOTAL RAINFALL   (mm)=  52.450
     RUNOFF COEFFICIENT   =   0.107

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB            |
| NASHYD    (2102) |   Area    (ha)=   0.41   Curve Number   (CN)= 70.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.092

     PEAK FLOW       (cms)=   0.022 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  14.906
     TOTAL RAINFALL   (mm)=  52.450
     RUNOFF COEFFICIENT   =   0.284

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| NASHYD    (2201) |   Area    (ha)=   0.03   Curve Number   (CN)= 60.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.25

     Unit Hyd Qpeak  (cms)=   0.005

     PEAK FLOW       (cms)=   0.001 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=  10.514
     TOTAL RAINFALL   (mm)=  52.450
     RUNOFF COEFFICIENT   =   0.200

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB            |
| NASHYD    (2301) |   Area    (ha)=   1.56   Curve Number   (CN)= 69.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   3.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.331

     PEAK FLOW       (cms)=   0.082 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  14.845
     TOTAL RAINFALL   (mm)=  52.450
     RUNOFF COEFFICIENT   =   0.283

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
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| RESERVOIR (0002) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.0277      0.0178
                          0.0001     0.0055   |   0.0310      0.0205
                          0.0029     0.0075   |   0.0346      0.0239
                          0.0115     0.0101   |   0.0373      0.0269
                          0.0183     0.0124   |   0.0403      0.0306
                          0.0238     0.0153   |   0.0427      0.0339

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (2301)     1.560      0.082      3.08      14.84
     OUTFLOW: ID= 1 (0002)     1.560      0.019      3.67      11.25

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)= 23.39
                    TIME SHIFT OF PEAK FLOW         (min)= 35.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=  0.0129

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| ADD HYD   (0001) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0002):     1.56   0.019     3.67    11.25
        + ID2= 2 (2102):     0.41   0.022     3.08    14.91
          ================================================
          ID = 3 (0001):     1.97   0.027     3.25    12.01

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0001) |
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0001):     1.97   0.027     3.25    12.01
        + ID2= 2 (2201):     0.03   0.001     3.17    10.51
          ================================================
          ID = 1 (0001):     2.00   0.028     3.25    11.99

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| CALIB            |
| NASHYD    (3301) |   Area    (ha)=   1.56   Curve Number   (CN)= 69.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   3.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.331

     PEAK FLOW       (cms)=   0.082 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  14.845
     TOTAL RAINFALL   (mm)=  52.450
     RUNOFF COEFFICIENT   =   0.283

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| NASHYD    (3101) |   Area    (ha)=   0.41   Curve Number   (CN)= 70.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.092

     PEAK FLOW       (cms)=   0.022 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  14.906
     TOTAL RAINFALL   (mm)=  52.450
     RUNOFF COEFFICIENT   =   0.284

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| NASHYD    (3201) |   Area    (ha)=   0.03   Curve Number   (CN)= 60.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.25

     Unit Hyd Qpeak  (cms)=   0.005

     PEAK FLOW       (cms)=   0.001 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=  10.514
     TOTAL RAINFALL   (mm)=  52.450
     RUNOFF COEFFICIENT   =   0.200
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(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| ADD HYD (0003) |
| 1 + 2 = 3 |

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (3101):	0.41	0.022	3.08	14.91
+ ID2= 2 (3201):	0.03	0.001	3.17	10.51
ID = 3 (0003):	0.44	0.023	3.08	14.61

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| ADD HYD (0003) |
| 3 + 2 = 1 |

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0003):	0.44	0.023	3.08	14.61
+ ID2= 2 (3301):	1.56	0.082	3.08	14.84
ID = 1 (0003):	2.00	0.105	3.08	14.79

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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** SIMULATION NUMBER: 4 **
****

| READ STORM | Filename: C:\Users\nnapper\AppData\Local\Temp\e9dbd76a-149b-4a10-9af7-3ee318115b78\955f81f2
| Ptotal= 61.60 mm | Comments: 10-Year, 6 hour SCS Type II - Peterborou
---

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	2.50	1.75	6.20	3.25	13.50	4.75	3.70
0.50	2.50	2.00	6.20	3.50	13.50	5.00	3.70
0.75	3.70	2.25	7.40	3.75	6.20	5.25	2.50
1.00	3.70	2.50	7.40	4.00	6.20	5.50	2.50
1.25	3.70	2.75	36.90	4.25	4.90	5.75	2.50
1.50	3.70	3.00	95.90	4.50	4.90	6.00	2.50

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| CALIB |
| NASHYD (1101) | Area (ha)= 1.44 Curve Number (CN)= 61.1
|ID= 1 DT= 5.0 min | Ia (mm)= 7.30 # of Linear Res.(N)= 3.00
--- U.H. Tp(hrs)= 0.30

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	2.50	1.583	6.20	3.083	13.50	4.58	3.70
0.167	2.50	1.667	6.20	3.167	13.50	4.67	3.70
0.250	2.50	1.750	6.20	3.250	13.50	4.75	3.70
0.333	2.50	1.833	6.20	3.333	13.50	4.83	3.70
0.417	2.50	1.917	6.20	3.417	13.50	4.92	3.70
0.500	2.50	2.000	6.20	3.500	13.50	5.00	3.70
0.583	3.70	2.083	7.40	3.583	6.20	5.08	2.50
0.667	3.70	2.167	7.40	3.667	6.20	5.17	2.50
0.750	3.70	2.250	7.40	3.750	6.20	5.25	2.50
0.833	3.70	2.333	7.40	3.833	6.20	5.33	2.50
0.917	3.70	2.417	7.40	3.917	6.20	5.42	2.50
1.000	3.70	2.500	7.40	4.000	6.20	5.50	2.50
1.083	3.70	2.583	36.90	4.083	4.90	5.58	2.50
1.167	3.70	2.667	36.90	4.167	4.90	5.67	2.50
1.250	3.70	2.750	36.90	4.250	4.90	5.75	2.50
1.333	3.70	2.833	95.90	4.333	4.90	5.83	2.50
1.417	3.70	2.917	95.90	4.417	4.90	5.92	2.50
1.500	3.70	3.000	95.90	4.500	4.90	6.00	2.50

Unit Hyd Qpeak (cms)= 0.183

PEAK FLOW (cms)= 0.049 (i)
TIME TO PEAK (hrs)= 3.167
RUNOFF VOLUME (mm)= 13.644
TOTAL RAINFALL (mm)= 61.600
RUNOFF COEFFICIENT = 0.221

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB |
| NASHYD (1201) | Area (ha)= 0.57 Curve Number (CN)= 45.7

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|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.40   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.27

     Unit Hyd Qpeak  (cms)=   0.081

     PEAK FLOW       (cms)=   0.012 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=   7.967
     TOTAL RAINFALL   (mm)=  61.600
     RUNOFF COEFFICIENT   =   0.129

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB            |
| NASHYD    (2102) |   Area    (ha)=   0.41   Curve Number   (CN)= 70.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.40   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.092

     PEAK FLOW       (cms)=   0.030 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  19.941
     TOTAL RAINFALL   (mm)=  61.600
     RUNOFF COEFFICIENT   =   0.324

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-------------------
| CALIB            |
| NASHYD    (2201) |   Area    (ha)=   0.03   Curve Number   (CN)= 60.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.25

     Unit Hyd Qpeak  (cms)=   0.005

     PEAK FLOW       (cms)=   0.001 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=  14.363
     TOTAL RAINFALL   (mm)=  61.600
     RUNOFF COEFFICIENT   =   0.233

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB            |
| NASHYD    (2301) |   Area    (ha)=   1.56   Curve Number   (CN)= 69.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   3.50   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.331

     PEAK FLOW       (cms)=   0.109 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  19.788
     TOTAL RAINFALL   (mm)=  61.600
     RUNOFF COEFFICIENT   =   0.321

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| RESERVOIR (0002) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000   |   0.0277     0.0178
                         0.0001     0.0055   |   0.0310     0.0205
                         0.0029     0.0075   |   0.0346     0.0239
                         0.0115     0.0101   |   0.0373     0.0269
                         0.0183     0.0124   |   0.0403     0.0306
                         0.0238     0.0153   |   0.0427     0.0339

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (2301)      1.560      0.109      3.08      19.79
     OUTFLOW: ID= 1 (0002)      1.560      0.026      3.67      16.20

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)= 23.72
                   TIME SHIFT OF PEAK FLOW         (min)= 35.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  0.0167

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-------------------
| ADD HYD   (0001) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0002):     1.56   0.026     3.67    16.20
        + ID2= 2 (2102):     0.41   0.030     3.08    19.94
          ================================================
          ID = 3 (0001):     1.97   0.042     3.17    16.98

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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| ADD HYD   (0001) |
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0001):     1.97   0.042     3.17    16.98
        + ID2= 2 (2201):     0.03   0.001     3.17    14.36
          ================================================
          ID = 1 (0001):     2.00   0.043     3.17    16.94

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| CALIB            |
| NASHYD    (3301) |   Area    (ha)=   1.56   Curve Number   (CN)= 69.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   3.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.331

     PEAK FLOW       (cms)=   0.109 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  19.788
     TOTAL RAINFALL   (mm)=  61.600
     RUNOFF COEFFICIENT   =   0.321

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| NASHYD    (3101) |   Area    (ha)=   0.41   Curve Number   (CN)= 70.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.092

     PEAK FLOW       (cms)=   0.030 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  19.941
     TOTAL RAINFALL   (mm)=  61.600
     RUNOFF COEFFICIENT   =   0.324

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB            |
| NASHYD    (3201) |   Area    (ha)=   0.03   Curve Number   (CN)= 60.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.25

     Unit Hyd Qpeak  (cms)=   0.005

     PEAK FLOW       (cms)=   0.001 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=  14.363
     TOTAL RAINFALL   (mm)=  61.600
     RUNOFF COEFFICIENT   =   0.233

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| ADD HYD   (0003) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (3101):     0.41   0.030     3.08    19.94
        + ID2= 2 (3201):     0.03   0.001     3.17    14.36
          ================================================
          ID = 3 (0003):     0.44   0.031     3.08    19.56

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0003) |
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0003):     0.44   0.031     3.08    19.56
        + ID2= 2 (3301):     1.56   0.109     3.08    19.79
          ================================================
          ID = 1 (0003):     2.00   0.140     3.08    19.74

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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  ****************************
  ** SIMULATION NUMBER:   5 **
  ****************************


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|    READ STORM    |    Filename: C:\Users\nnapper\AppD

|                  |              ata\Local\Temp\

|                  |
e9dbd76a-149b-4a10-9af7-3ee318115b78\28adcdbb
| Ptotal= 72.90 mm |    Comments: 25-Year, 6 hour SCS Type II - Peterborou
--------------------
```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	2.90	1.75	7.30	3.25	16.00	4.75	4.40
0.50	2.90	2.00	7.30	3.50	16.00	5.00	4.40
0.75	4.40	2.25	8.80	3.75	7.30	5.25	2.90
1.00	4.40	2.50	8.80	4.00	7.30	5.50	2.90
1.25	4.40	2.75	43.70	4.25	5.80	5.75	2.90
1.50	4.40	3.00	113.70	4.50	5.80	6.00	2.90

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--------------------
| CALIB            |
| NASHYD    (1101) |   Area    (ha)=   1.44   Curve Number   (CN)= 61.1
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.30   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.30

         NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.


                          ---- TRANSFORMED HYETOGRAPH ----
```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	2.90	1.583	7.30	3.083	16.00	4.58	4.40
0.167	2.90	1.667	7.30	3.167	16.00	4.67	4.40
0.250	2.90	1.750	7.30	3.250	16.00	4.75	4.40
0.333	2.90	1.833	7.30	3.333	16.00	4.83	4.40
0.417	2.90	1.917	7.30	3.417	16.00	4.92	4.40
0.500	2.90	2.000	7.30	3.500	16.00	5.00	4.40
0.583	4.40	2.083	8.80	3.583	7.30	5.08	2.90
0.667	4.40	2.167	8.80	3.667	7.30	5.17	2.90
0.750	4.40	2.250	8.80	3.750	7.30	5.25	2.90
0.833	4.40	2.333	8.80	3.833	7.30	5.33	2.90
0.917	4.40	2.417	8.80	3.917	7.30	5.42	2.90
1.000	4.40	2.500	8.80	4.000	7.30	5.50	2.90
1.083	4.40	2.583	43.70	4.083	5.80	5.58	2.90
1.167	4.40	2.667	43.70	4.167	5.80	5.67	2.90
1.250	4.40	2.750	43.70	4.250	5.80	5.75	2.90
1.333	4.40	2.833	113.70	4.333	5.80	5.83	2.90
1.417	4.40	2.917	113.70	4.417	5.80	5.92	2.90
1.500	4.40	3.000	113.70	4.500	5.80	6.00	2.90

```
     Unit Hyd Qpeak  (cms)=   0.183

     PEAK FLOW       (cms)=   0.069 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=  18.924
     TOTAL RAINFALL   (mm)=  72.900
     RUNOFF COEFFICIENT   =   0.260

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| NASHYD    (1201) |   Area    (ha)=   0.57   Curve Number   (CN)= 45.7
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.27

     Unit Hyd Qpeak  (cms)=   0.081

     PEAK FLOW       (cms)=   0.017 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=  11.350
     TOTAL RAINFALL   (mm)=  72.900
     RUNOFF COEFFICIENT   =   0.156

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| NASHYD    (2102) |   Area    (ha)=   0.41   Curve Number   (CN)= 70.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.092

     PEAK FLOW       (cms)=   0.040 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  26.749
     TOTAL RAINFALL   (mm)=  72.900
     RUNOFF COEFFICIENT   =   0.367

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| NASHYD    (2201) |   Area    (ha)=   0.03   Curve Number   (CN)= 60.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.25
```

```
     Unit Hyd Qpeak  (cms)=   0.005

     PEAK FLOW       (cms)=   0.002 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  19.673
     TOTAL RAINFALL   (mm)=  72.900
     RUNOFF COEFFICIENT   =   0.270

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| NASHYD    (2301) |   Area    (ha)=   1.56   Curve Number   (CN)= 69.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   3.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.331

     PEAK FLOW       (cms)=   0.147 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  26.476
     TOTAL RAINFALL   (mm)=  72.900
     RUNOFF COEFFICIENT   =   0.363

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| RESERVOIR (0002) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.0277      0.0178
                          0.0001     0.0055   |   0.0310      0.0205
                          0.0029     0.0075   |   0.0346      0.0239
                          0.0115     0.0101   |   0.0373      0.0269
                          0.0183     0.0124   |   0.0403      0.0306
                          0.0238     0.0153   |   0.0427      0.0339

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (2301)     1.560      0.147      3.08      26.48
     OUTFLOW: ID= 1 (0002)     1.560      0.033      3.67      22.88

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)= 22.47
                    TIME SHIFT OF PEAK FLOW         (min)= 35.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=  0.0225
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--------------------
| ADD HYD   (0001) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0002):     1.56   0.033     3.67    22.88
        + ID2= 2 (2102):     0.41   0.040     3.08    26.75
          ================================================
          ID = 3 (0001):     1.97   0.060     3.08    23.69

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0001) |
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0001):     1.97   0.060     3.08    23.69
        + ID2= 2 (2201):     0.03   0.002     3.08    19.67
          ================================================
          ID = 1 (0001):     2.00   0.062     3.08    23.63

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-
--------------------
| CALIB            |
| NASHYD    (3301) |   Area    (ha)=   1.56   Curve Number   (CN)= 69.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   3.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.331

     PEAK FLOW       (cms)=   0.147 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  26.476
     TOTAL RAINFALL   (mm)=  72.900
     RUNOFF COEFFICIENT   =   0.363

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-
--------------------
| CALIB            |
| NASHYD    (3101) |   Area    (ha)=   0.41   Curve Number   (CN)= 70.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.40   # of Linear Res.(N)= 3.00
```

```
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.092

     PEAK FLOW       (cms)=   0.040 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  26.749
     TOTAL RAINFALL   (mm)=  72.900
     RUNOFF COEFFICIENT   =   0.367

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-
--------------------
| CALIB            |
| NASHYD    (3201) |   Area    (ha)=   0.03   Curve Number   (CN)= 60.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.25

     Unit Hyd Qpeak  (cms)=   0.005

     PEAK FLOW       (cms)=   0.002 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  19.673
     TOTAL RAINFALL   (mm)=  72.900
     RUNOFF COEFFICIENT   =   0.270

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| ADD HYD   (0003) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (3101):     0.41   0.040     3.08    26.75
        + ID2= 2 (3201):     0.03   0.002     3.08    19.67
          ================================================
          ID = 3 (0003):     0.44   0.042     3.08    26.27

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0003) |
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0003):     0.44   0.042     3.08    26.27
```

```
        + ID2= 2 (3301):     1.56   0.147     3.08    26.48
          ================================================
          ID = 1 (0003):     2.00   0.189     3.08    26.43

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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  ****************************
  ** SIMULATION NUMBER:   6 **
  ****************************


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|    READ STORM    |    Filename: C:\Users\nnapper\AppD

|                  |              ata\Local\Temp\

|                  |
e9dbd76a-149b-4a10-9af7-3ee318115b78\8fd484e4
| Ptotal= 81.47 mm |    Comments: 50-Year, 6 hour SCS Type II - Peterborou
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.25    3.30 |  1.75    8.10 |  3.25   17.90 |  4.75    4.90
                0.50    3.30 |  2.00    8.10 |  3.50   17.90 |  5.00    4.90
                0.75    4.90 |  2.25    9.80 |  3.75    8.10 |  5.25    3.30
                1.00    4.90 |  2.50    9.80 |  4.00    8.10 |  5.50    3.30
                1.25    4.90 |  2.75   48.90 |  4.25    6.50 |  5.75    3.30
                1.50    4.90 |  3.00  127.00 |  4.50    6.50 |  6.00    3.30

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--------------------
| CALIB            |
| NASHYD    (1101) |   Area    (ha)=   1.44   Curve Number   (CN)= 61.1
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.30   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.30

         NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.


                                ---- TRANSFORMED HYETOGRAPH ----
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.083    3.30 | 1.583    8.10 | 3.083   17.90 |  4.58    4.90
               0.167    3.30 | 1.667    8.10 | 3.167   17.90 |  4.67    4.90
               0.250    3.30 | 1.750    8.10 | 3.250   17.90 |  4.75    4.90
               0.333    3.30 | 1.833    8.10 | 3.333   17.90 |  4.83    4.90
               0.417    3.30 | 1.917    8.10 | 3.417   17.90 |  4.92    4.90
               0.500    3.30 | 2.000    8.10 | 3.500   17.90 |  5.00    4.90
```

```
                0.583    4.90 | 2.083    9.80 | 3.583    8.10 |  5.08    3.30
                0.667    4.90 | 2.167    9.80 | 3.667    8.10 |  5.17    3.30
                0.750    4.90 | 2.250    9.80 | 3.750    8.10 |  5.25    3.30
                0.833    4.90 | 2.333    9.80 | 3.833    8.10 |  5.33    3.30
                0.917    4.90 | 2.417    9.80 | 3.917    8.10 |  5.42    3.30
                1.000    4.90 | 2.500    9.80 | 4.000    8.10 |  5.50    3.30
                1.083    4.90 | 2.583   48.90 | 4.083    6.50 |  5.58    3.30
                1.167    4.90 | 2.667   48.90 | 4.167    6.50 |  5.67    3.30
                1.250    4.90 | 2.750   48.90 | 4.250    6.50 |  5.75    3.30
                1.333    4.90 | 2.833  127.00 | 4.333    6.50 |  5.83    3.30
                1.417    4.90 | 2.917  127.00 | 4.417    6.50 |  5.92    3.30
                1.500    4.90 | 3.000  127.00 | 4.500    6.50 |  6.00    3.30

     Unit Hyd Qpeak  (cms)=   0.183

     PEAK FLOW       (cms)=   0.086 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=  23.315
     TOTAL RAINFALL   (mm)=  81.475
     RUNOFF COEFFICIENT   =   0.286

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| NASHYD    (1201) |   Area    (ha)=   0.57   Curve Number   (CN)= 45.7
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.27

     Unit Hyd Qpeak  (cms)=   0.081

     PEAK FLOW       (cms)=   0.022 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=  14.235
     TOTAL RAINFALL   (mm)=  81.475
     RUNOFF COEFFICIENT   =   0.175

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| NASHYD    (2102) |   Area    (ha)=   0.41   Curve Number   (CN)= 70.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.092

     PEAK FLOW       (cms)=   0.048 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  32.282
     TOTAL RAINFALL   (mm)=  81.475
     RUNOFF COEFFICIENT   =   0.396

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| NASHYD    (2201) |   Area    (ha)=   0.03   Curve Number   (CN)= 60.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.25

     Unit Hyd Qpeak  (cms)=   0.005

     PEAK FLOW       (cms)=   0.002 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  24.091
     TOTAL RAINFALL   (mm)=  81.475
     RUNOFF COEFFICIENT   =   0.296

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| NASHYD    (2301) |   Area    (ha)=   1.56   Curve Number   (CN)= 69.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   3.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.331

     PEAK FLOW       (cms)=   0.178 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  31.914
     TOTAL RAINFALL   (mm)=  81.475
     RUNOFF COEFFICIENT   =   0.392

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| RESERVOIR (0002) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.0277     0.0178
                          0.0001     0.0055   |   0.0310     0.0205
```

```
                          0.0029     0.0075   |   0.0346      0.0239
                          0.0115     0.0101   |   0.0373      0.0269
                          0.0183     0.0124   |   0.0403      0.0306
                          0.0238     0.0153   |   0.0427      0.0339

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (2301)     1.560      0.178      3.08      31.91
     OUTFLOW: ID= 1 (0002)     1.560      0.038      3.67      28.32

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)= 21.25
                    TIME SHIFT OF PEAK FLOW         (min)= 35.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=  0.0275

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| ADD HYD   (0001) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0002):     1.56   0.038     3.67    28.32
        + ID2= 2 (2102):     0.41   0.048     3.08    32.28
          ================================================
          ID = 3 (0001):     1.97   0.073     3.08    29.15

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0001) |
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0001):     1.97   0.073     3.08    29.15
        + ID2= 2 (2201):     0.03   0.002     3.08    24.09
          ================================================
          ID = 1 (0001):     2.00   0.075     3.08    29.07

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| CALIB            |
| NASHYD    (3301) |   Area    (ha)=   1.56   Curve Number   (CN)= 69.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   3.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.331

     PEAK FLOW       (cms)=   0.178 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  31.914
     TOTAL RAINFALL   (mm)=  81.475
     RUNOFF COEFFICIENT   =   0.392

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| NASHYD    (3101) |   Area    (ha)=   0.41   Curve Number   (CN)= 70.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.092

     PEAK FLOW       (cms)=   0.048 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  32.282
     TOTAL RAINFALL   (mm)=  81.475
     RUNOFF COEFFICIENT   =   0.396

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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-

--------------------
| CALIB            |
| NASHYD    (3201) |   Area    (ha)=   0.03   Curve Number   (CN)= 60.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.25

     Unit Hyd Qpeak  (cms)=   0.005

     PEAK FLOW       (cms)=   0.002 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  24.091
     TOTAL RAINFALL   (mm)=  81.475
     RUNOFF COEFFICIENT   =   0.296

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| ADD HYD   (0003) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (3101):     0.41   0.048     3.08    32.28
```

```
        + ID2= 2 (3201):     0.03   0.002     3.08    24.09
          ================================================
          ID = 3 (0003):     0.44   0.050     3.08    31.72

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
-

--------------------
| ADD HYD   (0003) |
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0003):     0.44   0.050     3.08    31.72
        + ID2= 2 (3301):     1.56   0.178     3.08    31.91
          ================================================
          ID = 1 (0003):     2.00   0.228     3.08    31.87

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

------------------------------------------------------------------------------
-
  ****************************
  ** SIMULATION NUMBER:   7 **
  ****************************


--------------------
|    READ STORM    |    Filename: C:\Users\nnapper\AppD

|                  |              ata\Local\Temp\

|                  |
e9dbd76a-149b-4a10-9af7-3ee318115b78\85073aae
| Ptotal= 89.93 mm |    Comments: 100-Year, 6 hour SCS Type II - Peterboro
--------------------
                  TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                   hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                  0.25    3.60 |  1.75    9.00 |  3.25   19.80 |  4.75    5.40
                  0.50    3.60 |  2.00    9.00 |  3.50   19.80 |  5.00    5.40
                  0.75    5.40 |  2.25   10.80 |  3.75    9.00 |  5.25    3.60
                  1.00    5.40 |  2.50   10.80 |  4.00    9.00 |  5.50    3.60
                  1.25    5.40 |  2.75   53.90 |  4.25    7.20 |  5.75    3.60
                  1.50    5.40 |  3.00  140.20 |  4.50    7.20 |  6.00    3.60

------------------------------------------------------------------------------
-

--------------------
| CALIB            |
| NASHYD    (1101) |   Area    (ha)=   1.44   Curve Number   (CN)= 61.1
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.30   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.30

         NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.

                                ---- TRANSFORMED HYETOGRAPH ----
                  TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                   hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                 0.083    3.60 | 1.583    9.00 | 3.083   19.80 |  4.58    5.40
                 0.167    3.60 | 1.667    9.00 | 3.167   19.80 |  4.67    5.40
                 0.250    3.60 | 1.750    9.00 | 3.250   19.80 |  4.75    5.40
                 0.333    3.60 | 1.833    9.00 | 3.333   19.80 |  4.83    5.40
                 0.417    3.60 | 1.917    9.00 | 3.417   19.80 |  4.92    5.40
                 0.500    3.60 | 2.000    9.00 | 3.500   19.80 |  5.00    5.40
                 0.583    5.40 | 2.083   10.80 | 3.583    9.00 |  5.08    3.60
                 0.667    5.40 | 2.167   10.80 | 3.667    9.00 |  5.17    3.60
                 0.750    5.40 | 2.250   10.80 | 3.750    9.00 |  5.25    3.60
                 0.833    5.40 | 2.333   10.80 | 3.833    9.00 |  5.33    3.60
                 0.917    5.40 | 2.417   10.80 | 3.917    9.00 |  5.42    3.60
                 1.000    5.40 | 2.500   10.80 | 4.000    9.00 |  5.50    3.60
                 1.083    5.40 | 2.583   53.90 | 4.083    7.20 |  5.58    3.60
                 1.167    5.40 | 2.667   53.90 | 4.167    7.20 |  5.67    3.60
                 1.250    5.40 | 2.750   53.90 | 4.250    7.20 |  5.75    3.60
                 1.333    5.40 | 2.833  140.20 | 4.333    7.20 |  5.83    3.60
                 1.417    5.40 | 2.917  140.20 | 4.417    7.20 |  5.92    3.60
                 1.500    5.40 | 3.000  140.20 | 4.500    7.20 |  6.00    3.60

     Unit Hyd Qpeak  (cms)=   0.183

     PEAK FLOW       (cms)=   0.103 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=  27.929
     TOTAL RAINFALL   (mm)=  89.925
     RUNOFF COEFFICIENT   =   0.311

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

------------------------------------------------------------------------------
-
--------------------
| CALIB            |
| NASHYD    (1201) |   Area    (ha)=   0.57   Curve Number   (CN)= 45.7
|ID= 1 DT= 5.0 min |   Ia      (mm)=   8.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.27

     Unit Hyd Qpeak  (cms)=   0.081

     PEAK FLOW       (cms)=   0.026 (i)
     TIME TO PEAK    (hrs)=   3.167
     RUNOFF VOLUME    (mm)=  17.327
     TOTAL RAINFALL   (mm)=  89.925
     RUNOFF COEFFICIENT   =   0.193
```

```
     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-
--------------------
| CALIB            |
| NASHYD    (2102) |   Area    (ha)=   0.41   Curve Number   (CN)= 70.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.092

     PEAK FLOW       (cms)=   0.057 (i)
     TIME TO PEAK    (hrs)=   3.000
     RUNOFF VOLUME    (mm)=  37.998
     TOTAL RAINFALL   (mm)=  89.925
     RUNOFF COEFFICIENT   =   0.423

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-
--------------------
| CALIB            |
| NASHYD    (2201) |   Area    (ha)=   0.03   Curve Number   (CN)= 60.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.25

     Unit Hyd Qpeak  (cms)=   0.005

     PEAK FLOW       (cms)=   0.002 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  28.708
     TOTAL RAINFALL   (mm)=  89.925
     RUNOFF COEFFICIENT   =   0.319

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-
--------------------
| CALIB            |
| NASHYD    (2301) |   Area    (ha)=   1.56   Curve Number   (CN)= 69.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   3.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.331

     PEAK FLOW       (cms)=   0.209 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  37.536
```

```
     TOTAL RAINFALL   (mm)=  89.925
     RUNOFF COEFFICIENT   =   0.417

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-
--------------------
| RESERVOIR (0002) |
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.0277      0.0178
                          0.0001     0.0055   |   0.0310      0.0205
                          0.0029     0.0075   |   0.0346      0.0239
                          0.0115     0.0101   |   0.0373      0.0269
                          0.0183     0.0124   |   0.0403      0.0306
                          0.0238     0.0153   |   0.0427      0.0339

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (2301)      1.560      0.209      3.08      37.54
     OUTFLOW: ID= 1 (0002)      1.560      0.042      3.67      33.95

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)= 20.03
                    TIME SHIFT OF PEAK FLOW         (min)= 35.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=  0.0328

--------------------------------------------------------------------------------
-

--------------------
| ADD HYD   (0001) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0002):     1.56   0.042     3.67    33.95
        + ID2= 2 (2102):     0.41   0.057     3.00    38.00
          ================================================
          ID = 3 (0001):     1.97   0.086     3.08    34.79

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-

--------------------
| ADD HYD   (0001) |
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0001):     1.97   0.086     3.08    34.79
        + ID2= 2 (2201):     0.03   0.002     3.08    28.71
          ================================================
```

```
          ID = 1 (0001):     2.00   0.089     3.08    34.70

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-
--------------------
| CALIB            |
| NASHYD    (3301) |   Area    (ha)=   1.56   Curve Number   (CN)= 69.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   3.50   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.18

     Unit Hyd Qpeak  (cms)=   0.331

     PEAK FLOW       (cms)=   0.209 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  37.536
     TOTAL RAINFALL   (mm)=  89.925
     RUNOFF COEFFICIENT   =   0.417

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-
--------------------
| CALIB            |
| NASHYD    (3101) |   Area    (ha)=   0.41   Curve Number   (CN)= 70.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.40   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.092

     PEAK FLOW       (cms)=   0.057 (i)
     TIME TO PEAK    (hrs)=   3.000
     RUNOFF VOLUME    (mm)=  37.998
     TOTAL RAINFALL   (mm)=  89.925
     RUNOFF COEFFICIENT   =   0.423

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-
--------------------
| CALIB            |
| NASHYD    (3201) |   Area    (ha)=   0.03   Curve Number   (CN)= 60.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.25

     Unit Hyd Qpeak  (cms)=   0.005

     PEAK FLOW       (cms)=   0.002 (i)
     TIME TO PEAK    (hrs)=   3.083
```

```
     RUNOFF VOLUME    (mm)=  28.708
     TOTAL RAINFALL   (mm)=  89.925
     RUNOFF COEFFICIENT   =   0.319

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
-

--------------------
| ADD HYD   (0003) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (3101):     0.41   0.057     3.00    38.00
        + ID2= 2 (3201):     0.03   0.002     3.08    28.71
          ================================================
          ID = 3 (0003):     0.44   0.059     3.08    37.36

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-

--------------------
| ADD HYD   (0003) |
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 3 (0003):     0.44   0.059     3.08    37.36
        + ID2= 2 (3301):     1.56   0.209     3.08    37.54
          ================================================
          ID = 1 (0003):     2.00   0.269     3.08    37.50

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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 FINISH
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Appendix C

Stormwater Quality and Quantity

Stage-Storage-Discharge: Grassed Detention Basin

Project No: 85312
Project Name: Thomas Self Storage
Designed/Checked By: NN / CP
Date: July 10, 2024

Storage Summary		
Top of Dead Storage:	207.71	m
Dead Storage Volume:	55.4	m^3
Active Storage Volume:	283.9	m^3

Outlet Capacity Summary				
Type	Diameter	Slope	Peak Flow	% Full

Discharge Summary				
Stage	Type	Invert Elev (m)	Diameter / Width (mm)	(m)
1	Orifice Tube: Vertical	207.71	150	

100 Year Uncontrolled Peak Flow into the Pond = 0.15 cms, conveyed by a 4 m Broad Crested Weir
At a depth of 0.08 m (Elev. 208.33 m) assuming blockage of the outlet system

Stage-Storage-Discharge Summary Table

Elevation	Stage	Stage 1 Orifice Tube						Total Storage	Total Discharge	Notes
m	m	m^3/s						ha*m	m^3/s	
207.71	0.00	0.000						0.0055	0.000	
207.72	0.01	0.000						0.0059	0.000	
207.73	0.02	0.000						0.0063	0.000	
207.74	0.03	0.001						0.0067	0.001	
207.75	0.04	0.002						0.0071	0.002	
207.76	0.05	0.003						0.0075	0.003	
207.77	0.06	0.004						0.0080	0.004	
207.78	0.07	0.005						0.0084	0.005	
207.79	0.08	0.007						0.0088	0.007	<= 2 Yr: 86 m³ (207.79m)
207.80	0.09	0.008						0.0092	0.008	
207.81	0.10	0.010						0.0097	0.010	
207.82	0.11	0.012						0.0101	0.012	
207.83	0.12	0.013						0.0105	0.013	
207.84	0.13	0.015						0.0110	0.015	
207.85	0.14	0.016						0.0114	0.016	
207.86	0.15	0.017						0.0119	0.017	
207.87	0.16	0.018						0.0124	0.018	
207.88	0.17	0.019						0.0128	0.019	
207.89	0.18	0.020						0.0133	0.020	<= 5 Yr: 129.1 m³ (207.89m)
207.90	0.19	0.021						0.0138	0.021	
207.91	0.20	0.022						0.0143	0.022	
207.92	0.21	0.023						0.0148	0.023	
207.93	0.22	0.024						0.0153	0.024	
207.94	0.23	0.025						0.0158	0.025	
207.95	0.24	0.025						0.0163	0.025	
207.96	0.25	0.026						0.0168	0.026	<= 10 Yr: 167 m³ (207.96m)
207.97	0.26	0.027						0.0173	0.027	
207.98	0.27	0.028						0.0178	0.028	
207.99	0.28	0.028						0.0183	0.028	
208.00	0.29	0.029						0.0189	0.029	
208.01	0.30	0.030						0.0194	0.030	
208.02	0.31	0.030						0.0200	0.030	
208.03	0.32	0.031						0.0205	0.031	
208.04	0.33	0.032						0.0211	0.032	
208.05	0.34	0.032						0.0216	0.032	
208.06	0.35	0.033						0.0222	0.033	
208.07	0.36	0.033						0.0227	0.033	<= 25 Yr: 225 m³ (208.07m)
208.08	0.37	0.034						0.0233	0.034	
208.09	0.38	0.035						0.0239	0.035	
208.10	0.39	0.035						0.0245	0.035	
208.11	0.40	0.036						0.0251	0.036	
208.12	0.41	0.036						0.0257	0.036	
208.13	0.42	0.037						0.0263	0.037	
208.14	0.43	0.037						0.0269	0.037	
208.15	0.44	0.038						0.0275	0.038	
208.16	0.45	0.038						0.0281	0.038	<= 50 Yr: 275 m³ (208.16m)
208.17	0.46	0.039						0.0287	0.039	
208.18	0.47	0.039						0.0294	0.039	
208.19	0.48	0.040						0.0300	0.040	

Stage-Storage-Discharge Summary Table										
Elevation	Stage	Stage 1 Orifice Tube						Total Storage	Total Discharge	Notes
m	m	m^3/s						ha*m	m^3/s	
208.20	0.49	0.040						0.0306	0.040	
208.21	0.50	0.041						0.0313	0.041	
208.22	0.51	0.041						0.0319	0.041	
208.23	0.52	0.042						0.0326	0.042	
208.24	0.53	0.042						0.0333	0.042	<= 100 Yr: 328 m³ (208.24m)
208.25	0.54	0.043						0.0339	0.043	

3.3.2 Water Quality Sizing Criteria

The volumetric water quality criteria are presented in Table 3.2. The values are based on a 24 hour drawdown time and a design which conforms to the guidance provided in this manual. Requirements differ with SWMP type to reflect differences in removal efficiencies. Of the specified storage volume for wet facilities, 40 m³/ha is extended detention, while the remainder represents the permanent pool.

Table 3.2 Water Quality Storage Requirements based on Receiving Waters[1, 2]

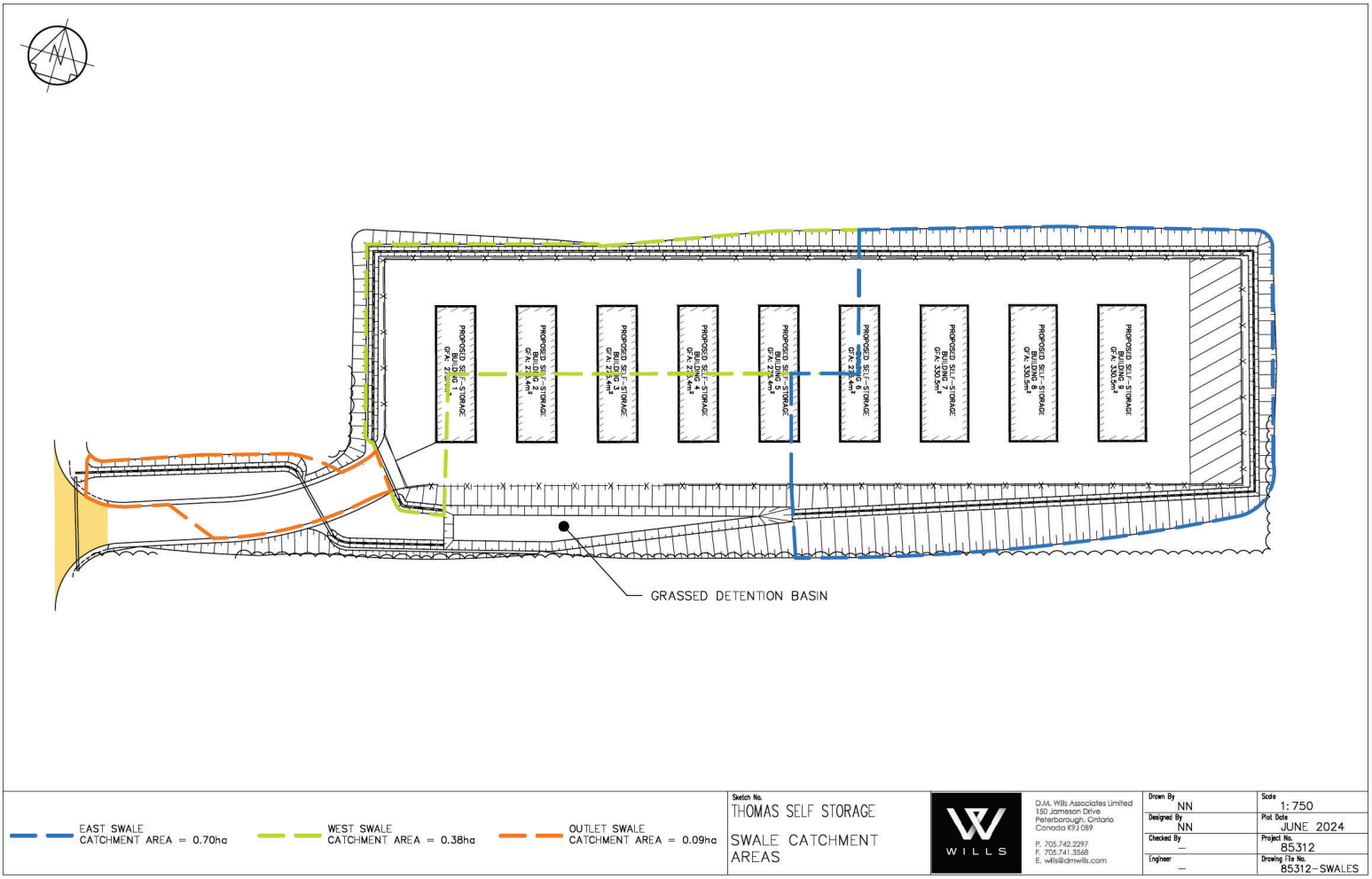
Protection Level	SWMP Type	Storage Volume (m³/ha) for Impervious Level			
		35%	55%	70%	85%
Enhanced 80% long-term S.S. removal	Infiltration	25	30	35	40
	Wetlands	80	105	120	140
	Hybrid Wet Pond/Wetland	110	150	175	195
	Wet Pond	140	190	225	250
Normal 70% long-term S.S. removal	Infiltration	20	20	25	30
	Wetlands	60	70	80	90
	Hybrid Wet Pond/Wetland	75	90	105	120
	Wet Pond	90	110	130	150
Basic 60% long-term S.S. removal	Infiltration	20	20	20	20
	Wetlands	60	60	60	60
	Hybrid Wet Pond/Wetland	60	70	75	80
	Wet Pond	60	75	85	95
	Dry Pond (Continuous Flow)	90	150	200	240

[1]*Table 3.2 does not include every available SWMP type. Any SWMP type that can be demonstrated to the approval agencies to meet the required long-term suspended solids removal for the selected protection levels under the conditions of the site is acceptable for water quality objectives. The sizing for these SWMP types is to be determined based on performance results that have been peer-reviewed. The designer and those who review the design should be fully aware of the assumptions and sampling methodologies used in formulating performance predictions and their implications for the design.*

[2]*Hybrid Wet Pond/Wetland systems have 50-60% of their permanent pool volume in deeper portions of the facility (e.g., forebay, wet pond).*

Appendix D

Hydraulic Elements



EAST SWALE
CATCHMENT AREA = 0.70ha

WEST SWALE
CATCHMENT AREA = 0.38ha

OUTLET SWALE
CATCHMENT AREA = 0.09ha

Sketch No.
THOMAS SELF STORAGE

SWALE CATCHMENT AREAS

WILLS

D.M. Wills Associates Limited
150 Jameson Drive
Peterborough, Ontario
Canada K9J 0B9

P. 705.742.2297
F. 705.741.3568
E. wills@dmwills.com

Drawn By: NN	Scale: 1: 750
Designed By: NN	Plot Date: JUNE 2024
Checked By: —	Project No.: 85312
Engineer: —	Drawing File No.: 85312-SWALES

Swale	100-Year Flowrate (m^3/s)	Shape	Bottom Width (m)	Side Slopes	Total Depth (m)	Slope (%)	Depth of 100-Year Flow (m)	Freeboard (m)	Total Capacity (m^3/s)
East Swale	0.053	Trapezoid	0.3	3:1	0.3	0.5	0.15	0.15	0.254
West Swale	0.059	Trapezoid	0.3	3:1	0.3	0.5	0.203	0.097	0.282
Outlet Swale + Pond Outflow	0.082	Trapezoid	0.3	3:1	0.3	1	0.156	0.144	0.359

Hydrologic Parameters for EAST SWALE

Sheet 1 of 1

WILLS

Project No: 85312
Project Name: Thomas Self Storage
Designed/Checked By: NN / CP
Date: 24-Jun-24

Land Use

	Swale A	
Agriculture	0.00	ha
Range	0.00	ha
Grass	0.24	ha
Woods	0.00	ha
Wetland	0.00	ha
Gravel	0.34	ha
Impervious	0.12	ha
SUM	0.70	
Hydrologic Soil Group[1]	A	
Soil Type	Tioga Sandy Loam	
C	0.45	
CN (Nashyd)	67.4	

Rainfall Data

Gauging Station = Peterborough
12 hr, 100 Yr Rainfall = 90.4 mm

Drainage Area	0.70	ha
Impervious Area	0.12	ha
Percent Impervious	17.6%	
Connected Impervious	17.6%	

	Pervious	Impervious	
Length	240	25	m
US Elev	209.43	210.11	m
DS Elev	208.30	209.77	m
Slope	0.5	1.4	%
	Flat	Flat	

Parameter	Soil Group	Land Use							Weighted Value	
		Agriculture	Range	Grass	Woods	Wetland	Gravel	Impervious	Incl. Imperv. NASHYD	Not Incl. Imperv. STANDHYD
Runoff Coefficient[2], C	A	0.19	0.10	0.05	0.05	0.05	0.57	0.90	0.45	n.a.
SCS Curve No.[3], CN	A	66	49	39	36	50	76	98	67.4	60.9
Initial Abstraction[5], mm		6.0	8.0	5.0	10.0	10.0	2.5	2.0	3.3	3.5

Time of Concentration[6]

Total Length	265	m	
Average Slope	0.6	%	
Airport	41.7	min.	
Bransby - Williams	17.6	min.	Flat: 0-2% Slopes Rolling: 2-6% Slopes Hilly: >6% Slopes
Applicable Minimum[7]	10.0	min.	
Time to Peak	11.8	min.	
	0.20	hr.	

Composite Parameters

Drainage Area	0.70 ha	
Runoff Coefficient	0.45	
SCS Curve No.	67.4	60.9
Modified Curve No.[4], CN*	67.1	58.8
Initial Abstraction.	3.3	3.5

Notes:

1. Hydrologic Soil Group obtained from Design Chart H2-6A, M.T.O. Drainage Manual, 1980.
2. Runoff coefficient obtained from M.T.O. Design Chart 1.07, M.T.O. Drainage Management Manual, 1997, Hydrologic Analysis and Design, McCuen 2004 and New Jersey Technical Manual for Stream Encroachment, 1984.
3. SCS Curve No. obtained from M.T.O. Design Chart 1.09, M.T.O. Drainage Management Manual, 1997, and Table 2-2a, TR-55, page 2-5.
4. The modified curve number is adjusted as per Paul Wisner & Associates (1982) and represents anticedent moisture conditions Type II
5. Initial Abstraction values taken from the Environmental and Engineering Services Department, The Corporation of the City of London, Dec 2005
6. Use Airport Equation to calculate time of concentration for C <= 0.4, and Bransby-Williams for C > 0.4.
7. Minimum Time of Concentration for use in the Rational Method and Hydrologic Model has been set to 10 minutes
8. All impervious areas have been assumed to be directly connected.

Hydrologic Parameters for WEST SWALE

Sheet 1 of 1

WILLS

Project No: 85312
Project Name: Thomas Self Storage
Designed/Checked By: NN / CP
Date: 24-Jun-24

Land Use

	Swale B	Swale B	
Agriculture	0.00	0.00	ha
Range	0.00	0.00	ha
Grass	0.05	0.02	ha
Woods	0.00	0.00	ha
Wetland	0.00	0.00	ha
Gravel	0.16	0.07	ha
Impervious	0.05	0.03	ha
SUM	**0.25**	**0.13**	
Hydrologic Soil Group[1]	B	A	
Soil Type	Otonabee Loam	Tioga Sandy Loam	
C	0.65	0.57	
CN (Nashyd)	82.5	75.9	

Rainfall Data

Gauging Station = Peterborough
12 hr, 100 Yr Rainfall = 90.4 mm

Drainage Area	**0.38**	ha
Impervious Area	**0.08**	ha
Percent Impervious	**21.2%**	
Connected Impervious	21.2%	

	Pervious	Impervious	
Length	112	26	m
US Elev	210.00	209.91	m
DS Elev	209.42	209.55	m
Slope	0.5	1.4	%
	Flat	Flat	

Parameter	Soil Group	Land Use							Weighted Value	
		Agriculture	Range	Grass	Woods	Wetland	Gravel	Impervious	Incl. Imperv. NASHYD	Not Incl. Imperv. STANDHYD
Runoff Coefficient[2], C	B	0.26	0.14	0.08	0.08	0.05	0.76	0.90	0.65	
	A	0.19	0.10	0.05	0.05	0.05	0.57	0.90	0.57	n.a.
SCS Curve No.[3], CN	B	74	65	61	58	50	85	98	82.5	79.1
	A	66	49	39	36	50	76	98	75.9	67.5
Initial Abstraction[5], mm		6.0	8.0	5.0	10.0	10.0	2.5	2.0	2.9	3.1

Time of Concentration[6]

Total Length	138	m	
Average Slope	0.7	%	
Airport	20.7	min.	
Bransby - Williams	9.4	min.	Flat: 0-2% Slopes Rolling: 2-6% Slopes Hilly: >6% Slopes
Applicable Minimum[7]	**10.0**	min.	
Time to Peak	6.7	min.	
	0.11	**hr.**	

Composite Parameters

Drainage Area	0.38 ha	
Runoff Coefficient	0.62	
SCS Curve No.	80.3	75.5
Modified Curve No.[4], CN*	80.0	**75.1**
Initial Abstraction.	2.9	**3.1**

Notes:

1. Hydrologic Soil Group obtained from Design Chart H2-6A, M.T.O. Drainage Manual, 1980.
2. Runoff coefficient obtained from M.T.O. Design Chart 1.07, M.T.O. Drainage Management Manual, 1997, Hydrologic Analysis and Design, McCuen 2004 and New Jersey Technical Manual for Stream Encroachment, 1984.
3. SCS Curve No. obtained from M.T.O. Design Chart 1.09, M.T.O. Drainage Management Manual, 1997, and Table 2-2a, TR-55, page 2-5.
4. The modified curve number is adjusted as per Paul Wisner & Associates (1982) and represents anticedent moisture conditions Type II
5. Initial Abstraction values taken from the Environmental and Engineering Services Department, The Corporation of the City of London, Dec 2005
6. Use Airport Equation to calculate time of concentration for C <= 0.4, and Bransby-Williams for C > 0.4.
7. Minimum Time of Concentration for use in the Rational Method and Hydrologic Model has been set to 10 minutes
8. All impervious areas have been assumed to be directly connected.

Hydrologic Parameters for OUTLET SWALE

Sheet 1 of 1

WILLS

Project No: 85312
Project Name: Thomas Self Storage
Designed/Checked By: NN / CP
Date: 24-Jun-24

Land Use

	Swale B	
Agriculture	0.00	ha
Range	0.00	ha
Grass	0.05	ha
Woods	0.00	ha
Wetland	0.00	ha
Gravel	0.04	ha
Impervious	0.00	ha
SUM	0.09	
Hydrologic Soil Group[1]	B	
Soil Type	Otonabee Loam	
C	0.42	
CN (Nashyd)	70.9	

Rainfall Data

Gauging Station = Peterborough
12 hr, 100 Yr Rainfall = 90.4 mm

Drainage Area	0.09	ha
Impervious Area	0.00	ha
Percent Impervious	0.0%	
Connected Impervious	0.0%	

	Pervious	Impervious	
Length	100	9	m
US Elev	100.00	209.93	m
DS Elev	90.00	209.66	m
Slope	10.0	2.9	%
	Steep	Rolling	

Parameter	Soil Group	Land Use							Weighted Value	
		Agriculture	Range	Grass	Woods	Wetland	Gravel	Impervious	Incl. Imperv. NASHYD	Not Incl. Imperv. STANDHYD
Runoff Coefficient[2], C	B	0.57	0.35	0.19	0.29	0.05	0.76	0.90	0.42	n.a.
SCS Curve No.[3], CN	B	74	65	61	58	50	85	98	70.9	70.9
Initial Abstraction[5], mm		6.0	8.0	5.0	10.0	10.0	2.5	2.0	4.0	4.0

Time of Concentration[6]

Total Length	109	m	
Average Slope	9.4	%	
Airport	11.0	min.	
Bransby - Williams	5.1	min.	Flat: 0-2% Slopes Rolling: 2-6% Slopes Hilly: >6% Slopes
Applicable Minimum[7]	10.0	min.	
Time to Peak	6.7	min.	
	0.11	hr.	

Composite Parameters

Drainage Area	0.09 ha	
Runoff Coefficient	0.42	
SCS Curve No.	70.9	70.9
Modified Curve No.[4], CN*	71.5	71.5
Initial Abstraction.	4.0	4.0

Notes:

1. Hydrologic Soil Group obtained from Design Chart H2-6A, M.T.O. Drainage Manual, 1980.
2. Runoff coefficient obtained from M.T.O. Design Chart 1.07, M.T.O. Drainage Management Manual, 1997, Hydrologic Analysis and Design, McCuen 2004 and New Jersey Technical Manual for Stream Encroachment, 1984.
3. SCS Curve No. obtained from M.T.O. Design Chart 1.09, M.T.O. Drainage Management Manual, 1997, and Table 2-2a, TR-55, page 2-5.
4. The modified curve number is adjusted as per Paul Wisner & Associates (1982) and represents anticedent moisture conditions Type II
5. Initial Abstraction values taken from the Environmental and Engineering Services Department, The Corporation of the City of London, Dec 2005
6. Use Airport Equation to calculate time of concentration for C <= 0.4, and Bransby-Williams for C > 0.4.
7. Minimum Time of Concentration for use in the Rational Method and Hydrologic Model has been set to 10 minutes
8. All impervious areas have been assumed to be directly connected.

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       V    V   I    SSSSS  U   U    A    L
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

        OOO   TTTTT  TTTTT  H   H  Y   Y  M   M   OOO    TM
       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  D E T A I L E D   O U T P U T *****


  Input   filename: C:\Program Files (x86)\VO Suite 3.0\VO2\voin.dat

  Output  filename:
C:\Users\nnapper\AppData\Local\Temp\e0d9f453-99ce-4d31-8f8c-f2c8c00fd6ba\Scena
rio.out
  Summary filename:
C:\Users\nnapper\AppData\Local\Temp\e0d9f453-99ce-4d31-8f8c-f2c8c00fd6ba\Scena
rio.sum


DATE: 07/16/2024                          TIME: 12:41:11

USER:



COMMENTS: _____________________________________________________________


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  ****************************
  ** SIMULATION NUMBER:   1 **
  ****************************


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|                  |              ata\Local\Temp\
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```
|                  |
e0d9f453-99ce-4d31-8f8c-f2c8c00fd6ba\3c083d71
| Ptotal= 38.75 mm |    Comments: 2-Year, 6 hour SCS Type II - Peterboroug
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.25    1.60 |  1.75    3.90 |  3.25    8.50 |  4.75    2.30
                0.50    1.60 |  2.00    3.90 |  3.50    8.50 |  5.00    2.30
                0.75    2.30 |  2.25    4.60 |  3.75    3.90 |  5.25    1.60
                1.00    2.30 |  2.50    4.60 |  4.00    3.90 |  5.50    1.60
                1.25    2.30 |  2.75   23.20 |  4.25    3.10 |  5.75    1.60
                1.50    2.30 |  3.00   60.40 |  4.50    3.10 |  6.00    1.60

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| CALIB            |
| NASHYD    (0003) |   Area    (ha)=   0.09   Curve Number   (CN)= 71.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

        NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.


                          ---- TRANSFORMED HYETOGRAPH ----
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.083    1.60 | 1.583    3.90 | 3.083    8.50 |  4.58    2.30
               0.167    1.60 | 1.667    3.90 | 3.167    8.50 |  4.67    2.30
               0.250    1.60 | 1.750    3.90 | 3.250    8.50 |  4.75    2.30
               0.333    1.60 | 1.833    3.90 | 3.333    8.50 |  4.83    2.30
               0.417    1.60 | 1.917    3.90 | 3.417    8.50 |  4.92    2.30
               0.500    1.60 | 2.000    3.90 | 3.500    8.50 |  5.00    2.30
               0.583    2.30 | 2.083    4.60 | 3.583    3.90 |  5.08    1.60
               0.667    2.30 | 2.167    4.60 | 3.667    3.90 |  5.17    1.60
               0.750    2.30 | 2.250    4.60 | 3.750    3.90 |  5.25    1.60
               0.833    2.30 | 2.333    4.60 | 3.833    3.90 |  5.33    1.60
               0.917    2.30 | 2.417    4.60 | 3.917    3.90 |  5.42    1.60
               1.000    2.30 | 2.500    4.60 | 4.000    3.90 |  5.50    1.60
               1.083    2.30 | 2.583   23.20 | 4.083    3.10 |  5.58    1.60
               1.167    2.30 | 2.667   23.20 | 4.167    3.10 |  5.67    1.60
               1.250    2.30 | 2.750   23.20 | 4.250    3.10 |  5.75    1.60
               1.333    2.30 | 2.833   60.40 | 4.333    3.10 |  5.83    1.60
               1.417    2.30 | 2.917   60.40 | 4.417    3.10 |  5.92    1.60
               1.500    2.30 | 3.000   60.40 | 4.500    3.10 |  6.00    1.60

    Unit Hyd Qpeak  (cms)=   0.031

    PEAK FLOW       (cms)=   0.004 (i)
    TIME TO PEAK    (hrs)=   3.000
    RUNOFF VOLUME    (mm)=   8.713
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     TOTAL RAINFALL   (mm)=  38.750
     RUNOFF COEFFICIENT   =   0.225

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD  (0002) |   Area    (ha)=   0.38
|ID= 1 DT= 5.0 min |   Total Imp(%)=  21.00   Dir. Conn.(%)=  21.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.08         0.30
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.38         0.52
     Length            (m)=      50.33       112.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      60.40         8.21
               over (min)        5.00        60.00
     Storage Coeff.  (min)=       1.88 (ii)   55.19 (ii)
     Unit Hyd. Tpeak (min)=       5.00        60.00
     Unit Hyd. peak  (cms)=       0.32         0.02
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.01         0.00          0.014 (iii)
     TIME TO PEAK    (hrs)=       3.00         3.83           3.00
     RUNOFF VOLUME    (mm)=      37.75         7.52          13.79
     TOTAL RAINFALL   (mm)=      38.75        38.75          38.75
     RUNOFF COEFFICIENT   =       0.97         0.19           0.36

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) HORTONS EQUATION SELECTED FOR PERVIOUS LOSSES:
            Fo   (mm/hr)= 50.00          K  (1/hr)=  2.00
            Fc   (mm/hr)=  7.50     Cum.Inf.   (mm)=  0.00
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB            |
| NASHYD    (0001) |   Area    (ha)=   0.70   Curve Number   (CN)= 67.1
|ID= 1 DT= 5.0 min |   Ia      (mm)=   3.30   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   0.134

     PEAK FLOW       (cms)=   0.018 (i)
     TIME TO PEAK    (hrs)=   3.083
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     RUNOFF VOLUME    (mm)=   7.839
     TOTAL RAINFALL   (mm)=  38.750
     RUNOFF COEFFICIENT   =   0.202

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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  ****************************
  ** SIMULATION NUMBER:   2 **
  ****************************


--------------------
|    READ STORM    |    Filename: C:\Users\nnapper\AppD

|                  |              ata\Local\Temp\

|                  |
e0d9f453-99ce-4d31-8f8c-f2c8c00fd6ba\69bf9c3c
| Ptotal= 52.45 mm |    Comments: 5-Year, 6 hour SCS Type II - Peterboroug
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.25    2.10 |  1.75    5.20 |  3.25   11.50 |  4.75    3.20
                0.50    2.10 |  2.00    5.20 |  3.50   11.50 |  5.00    3.20
                0.75    3.20 |  2.25    6.30 |  3.75    5.20 |  5.25    2.10
                1.00    3.20 |  2.50    6.30 |  4.00    5.20 |  5.50    2.10
                1.25    3.20 |  2.75   31.40 |  4.25    4.20 |  5.75    2.10
                1.50    3.20 |  3.00   81.80 |  4.50    4.20 |  6.00    2.10

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--------------------
| CALIB            |
| NASHYD    (0003) |   Area    (ha)=   0.09   Curve Number   (CN)= 71.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

        NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.


                              ---- TRANSFORMED HYETOGRAPH ----
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.083    2.10 | 1.583    5.20 | 3.083   11.50 |  4.58    3.20
               0.167    2.10 | 1.667    5.20 | 3.167   11.50 |  4.67    3.20
               0.250    2.10 | 1.750    5.20 | 3.250   11.50 |  4.75    3.20
               0.333    2.10 | 1.833    5.20 | 3.333   11.50 |  4.83    3.20
               0.417    2.10 | 1.917    5.20 | 3.417   11.50 |  4.92    3.20
               0.500    2.10 | 2.000    5.20 | 3.500   11.50 |  5.00    3.20
```

```
                0.583    3.20 | 2.083    6.30 | 3.583    5.20 |  5.08    2.10
                0.667    3.20 | 2.167    6.30 | 3.667    5.20 |  5.17    2.10
                0.750    3.20 | 2.250    6.30 | 3.750    5.20 |  5.25    2.10
                0.833    3.20 | 2.333    6.30 | 3.833    5.20 |  5.33    2.10
                0.917    3.20 | 2.417    6.30 | 3.917    5.20 |  5.42    2.10
                1.000    3.20 | 2.500    6.30 | 4.000    5.20 |  5.50    2.10
                1.083    3.20 | 2.583   31.40 | 4.083    4.20 |  5.58    2.10
                1.167    3.20 | 2.667   31.40 | 4.167    4.20 |  5.67    2.10
                1.250    3.20 | 2.750   31.40 | 4.250    4.20 |  5.75    2.10
                1.333    3.20 | 2.833   81.80 | 4.333    4.20 |  5.83    2.10
                1.417    3.20 | 2.917   81.80 | 4.417    4.20 |  5.92    2.10
                1.500    3.20 | 3.000   81.80 | 4.500    4.20 |  6.00    2.10

     Unit Hyd Qpeak  (cms)=   0.031

     PEAK FLOW       (cms)=   0.007 (i)
     TIME TO PEAK    (hrs)=   3.000
     RUNOFF VOLUME    (mm)=  15.388
     TOTAL RAINFALL   (mm)=  52.450
     RUNOFF COEFFICIENT   =   0.293

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD  (0002) |   Area    (ha)=   0.38
|ID= 1 DT= 5.0 min |   Total Imp(%)=  21.00   Dir. Conn.(%)=  21.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.08         0.30
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.38         0.52
     Length            (m)=      50.33       112.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      81.80        25.36
               over (min)        5.00        40.00
     Storage Coeff.  (min)=       1.66 (ii)   35.61 (ii)
     Unit Hyd. Tpeak (min)=       5.00        40.00
     Unit Hyd. peak  (cms)=       0.32         0.03
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.01          0.021 (iii)
     TIME TO PEAK    (hrs)=       3.00         3.50           3.00
     RUNOFF VOLUME    (mm)=      51.45        14.80          22.43
     TOTAL RAINFALL   (mm)=      52.45        52.45          52.45
     RUNOFF COEFFICIENT   =       0.98         0.28           0.43

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) HORTONS EQUATION SELECTED FOR PERVIOUS LOSSES:
```

```
            Fo   (mm/hr)= 50.00          K  (1/hr)=  2.00
            Fc   (mm/hr)=  7.50     Cum.Inf.   (mm)=  0.00
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| NASHYD    (0001) |   Area    (ha)=   0.70   Curve Number   (CN)= 67.1
|ID= 1 DT= 5.0 min |   Ia      (mm)=   3.30   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   0.134

     PEAK FLOW       (cms)=   0.033 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  13.881
     TOTAL RAINFALL   (mm)=  52.450
     RUNOFF COEFFICIENT   =   0.265

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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  ****************************
  ** SIMULATION NUMBER:   3 **
  ****************************


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|    READ STORM    |    Filename: C:\Users\nnapper\AppD

|                  |              ata\Local\Temp\

|                  |
e0d9f453-99ce-4d31-8f8c-f2c8c00fd6ba\8053e299
| Ptotal= 61.60 mm |    Comments: 10-Year, 6 hour SCS Type II - Peterborou
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.25    2.50 |  1.75    6.20 |  3.25   13.50 |  4.75    3.70
                0.50    2.50 |  2.00    6.20 |  3.50   13.50 |  5.00    3.70
                0.75    3.70 |  2.25    7.40 |  3.75    6.20 |  5.25    2.50
                1.00    3.70 |  2.50    7.40 |  4.00    6.20 |  5.50    2.50
                1.25    3.70 |  2.75   36.90 |  4.25    4.90 |  5.75    2.50
                1.50    3.70 |  3.00   95.90 |  4.50    4.90 |  6.00    2.50

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| CALIB            |
| NASHYD    (0003) |   Area    (ha)=   0.09   Curve Number   (CN)= 71.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

         NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.

                              ---- TRANSFORMED HYETOGRAPH ----
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.083    2.50 | 1.583    6.20 | 3.083   13.50 |  4.58    3.70
               0.167    2.50 | 1.667    6.20 | 3.167   13.50 |  4.67    3.70
               0.250    2.50 | 1.750    6.20 | 3.250   13.50 |  4.75    3.70
               0.333    2.50 | 1.833    6.20 | 3.333   13.50 |  4.83    3.70
               0.417    2.50 | 1.917    6.20 | 3.417   13.50 |  4.92    3.70
               0.500    2.50 | 2.000    6.20 | 3.500   13.50 |  5.00    3.70
               0.583    3.70 | 2.083    7.40 | 3.583    6.20 |  5.08    2.50
               0.667    3.70 | 2.167    7.40 | 3.667    6.20 |  5.17    2.50
               0.750    3.70 | 2.250    7.40 | 3.750    6.20 |  5.25    2.50
               0.833    3.70 | 2.333    7.40 | 3.833    6.20 |  5.33    2.50
               0.917    3.70 | 2.417    7.40 | 3.917    6.20 |  5.42    2.50
               1.000    3.70 | 2.500    7.40 | 4.000    6.20 |  5.50    2.50
               1.083    3.70 | 2.583   36.90 | 4.083    4.90 |  5.58    2.50
               1.167    3.70 | 2.667   36.90 | 4.167    4.90 |  5.67    2.50
               1.250    3.70 | 2.750   36.90 | 4.250    4.90 |  5.75    2.50
               1.333    3.70 | 2.833   95.90 | 4.333    4.90 |  5.83    2.50
               1.417    3.70 | 2.917   95.90 | 4.417    4.90 |  5.92    2.50
               1.500    3.70 | 3.000   95.90 | 4.500    4.90 |  6.00    2.50

     Unit Hyd Qpeak  (cms)=   0.031

     PEAK FLOW       (cms)=   0.009 (i)
     TIME TO PEAK    (hrs)=   3.000
     RUNOFF VOLUME    (mm)=  20.501
     TOTAL RAINFALL   (mm)=  61.600
     RUNOFF COEFFICIENT   =   0.333

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB            |
| STANDHYD  (0002) |   Area    (ha)=   0.38
|ID= 1 DT= 5.0 min |   Total Imp(%)=  21.00   Dir. Conn.(%)=  21.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.08         0.30
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.38         0.52
```

```
     Length            (m)=      50.33       112.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      95.90        41.07
               over (min)        5.00        30.00
     Storage Coeff.  (min)=       1.56 (ii)   29.56 (ii)
     Unit Hyd. Tpeak (min)=       5.00        30.00
     Unit Hyd. peak  (cms)=       0.33         0.04
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.02         0.029 (iii)
     TIME TO PEAK    (hrs)=       3.00         3.33          3.00
     RUNOFF VOLUME    (mm)=      60.60        20.81         29.13
     TOTAL RAINFALL   (mm)=      61.60        61.60         61.60
     RUNOFF COEFFICIENT   =       0.98         0.34          0.47

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) HORTONS EQUATION SELECTED FOR PERVIOUS LOSSES:
            Fo   (mm/hr)= 50.00          K  (1/hr)=  2.00
            Fc   (mm/hr)=  7.50     Cum.Inf.   (mm)=  0.00
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| NASHYD    (0001) |   Area    (ha)=   0.70   Curve Number   (CN)= 67.1
|ID= 1 DT= 5.0 min |   Ia      (mm)=   3.30   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   0.134

     PEAK FLOW       (cms)=   0.044 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  18.553
     TOTAL RAINFALL   (mm)=  61.600
     RUNOFF COEFFICIENT   =   0.301

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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  ****************************
  ** SIMULATION NUMBER:   4 **
  ****************************


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|    READ STORM    |    Filename: C:\Users\nnapper\AppD
```

```
|                  |              ata\Local\Temp\

|                  |
e0d9f453-99ce-4d31-8f8c-f2c8c00fd6ba\a6ea6999
| Ptotal= 72.90 mm |    Comments: 25-Year, 6 hour SCS Type II - Peterborou
--------------------
                  TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                   hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                  0.25    2.90 |  1.75    7.30 |  3.25   16.00 |  4.75    4.40
                  0.50    2.90 |  2.00    7.30 |  3.50   16.00 |  5.00    4.40
                  0.75    4.40 |  2.25    8.80 |  3.75    7.30 |  5.25    2.90
                  1.00    4.40 |  2.50    8.80 |  4.00    7.30 |  5.50    2.90
                  1.25    4.40 |  2.75   43.70 |  4.25    5.80 |  5.75    2.90
                  1.50    4.40 |  3.00  113.70 |  4.50    5.80 |  6.00    2.90

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| CALIB            |
| NASHYD    (0003) |   Area    (ha)=   0.09   Curve Number   (CN)= 71.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

         NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.


                          ---- TRANSFORMED HYETOGRAPH ----
                  TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                   hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                 0.083    2.90 | 1.583    7.30 | 3.083   16.00 |  4.58    4.40
                 0.167    2.90 | 1.667    7.30 | 3.167   16.00 |  4.67    4.40
                 0.250    2.90 | 1.750    7.30 | 3.250   16.00 |  4.75    4.40
                 0.333    2.90 | 1.833    7.30 | 3.333   16.00 |  4.83    4.40
                 0.417    2.90 | 1.917    7.30 | 3.417   16.00 |  4.92    4.40
                 0.500    2.90 | 2.000    7.30 | 3.500   16.00 |  5.00    4.40
                 0.583    4.40 | 2.083    8.80 | 3.583    7.30 |  5.08    2.90
                 0.667    4.40 | 2.167    8.80 | 3.667    7.30 |  5.17    2.90
                 0.750    4.40 | 2.250    8.80 | 3.750    7.30 |  5.25    2.90
                 0.833    4.40 | 2.333    8.80 | 3.833    7.30 |  5.33    2.90
                 0.917    4.40 | 2.417    8.80 | 3.917    7.30 |  5.42    2.90
                 1.000    4.40 | 2.500    8.80 | 4.000    7.30 |  5.50    2.90
                 1.083    4.40 | 2.583   43.70 | 4.083    5.80 |  5.58    2.90
                 1.167    4.40 | 2.667   43.70 | 4.167    5.80 |  5.67    2.90
                 1.250    4.40 | 2.750   43.70 | 4.250    5.80 |  5.75    2.90
                 1.333    4.40 | 2.833  113.70 | 4.333    5.80 |  5.83    2.90
                 1.417    4.40 | 2.917  113.70 | 4.417    5.80 |  5.92    2.90
                 1.500    4.40 | 3.000  113.70 | 4.500    5.80 |  6.00    2.90

     Unit Hyd Qpeak  (cms)=   0.031

     PEAK FLOW       (cms)=   0.012 (i)
```

```
     TIME TO PEAK    (hrs)=   3.000
     RUNOFF VOLUME    (mm)=  27.385
     TOTAL RAINFALL   (mm)=  72.900
     RUNOFF COEFFICIENT   =   0.376

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB            |
| STANDHYD  (0002) |   Area    (ha)=   0.38
|ID= 1 DT= 5.0 min |   Total Imp(%)=  21.00   Dir. Conn.(%)=  21.00
--------------------
                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.08         0.30
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.38         0.52
     Length            (m)=      50.33       112.00
     Mannings n            =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     113.70        66.47
               over (min)          5.00        25.00
     Storage Coeff.  (min)=       1.46 (ii)   24.55 (ii)
     Unit Hyd. Tpeak (min)=       5.00        25.00
     Unit Hyd. peak  (cms)=       0.33         0.05
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.03          0.042 (iii)
     TIME TO PEAK    (hrs)=       3.00         3.25          3.00
     RUNOFF VOLUME    (mm)=      71.90        29.59         38.46
     TOTAL RAINFALL   (mm)=      72.90        72.90         72.90
     RUNOFF COEFFICIENT   =       0.99         0.41          0.53

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) HORTONS EQUATION SELECTED FOR PERVIOUS LOSSES:
            Fo   (mm/hr)= 50.00          K  (1/hr)=  2.00
            Fc   (mm/hr)=  7.50     Cum.Inf.   (mm)=  0.00
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| NASHYD    (0001) |   Area    (ha)=   0.70   Curve Number   (CN)= 67.1
|ID= 1 DT= 5.0 min |   Ia      (mm)=   3.30   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   0.134
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```
     PEAK FLOW       (cms)=   0.059 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  24.904
     TOTAL RAINFALL   (mm)=  72.900
     RUNOFF COEFFICIENT   =   0.342

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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  ****************************
  ** SIMULATION NUMBER:   5 **
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--------------------
|    READ STORM    |    Filename: C:\Users\nnapper\AppD

|                  |             ata\Local\Temp\

|                  |
e0d9f453-99ce-4d31-8f8c-f2c8c00fd6ba\0e8bc36b
| Ptotal= 81.47 mm |    Comments: 50-Year, 6 hour SCS Type II - Peterborou
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.25    3.30 |  1.75    8.10 |  3.25   17.90 |  4.75    4.90
                0.50    3.30 |  2.00    8.10 |  3.50   17.90 |  5.00    4.90
                0.75    4.90 |  2.25    9.80 |  3.75    8.10 |  5.25    3.30
                1.00    4.90 |  2.50    9.80 |  4.00    8.10 |  5.50    3.30
                1.25    4.90 |  2.75   48.90 |  4.25    6.50 |  5.75    3.30
                1.50    4.90 |  3.00  127.00 |  4.50    6.50 |  6.00    3.30

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| CALIB            |
| NASHYD    (0003) |   Area    (ha)=   0.09   Curve Number   (CN)= 71.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

        NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.


                          ---- TRANSFORMED HYETOGRAPH ----
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.083    3.30 | 1.583    8.10 | 3.083   17.90 |  4.58    4.90
               0.167    3.30 | 1.667    8.10 | 3.167   17.90 |  4.67    4.90
               0.250    3.30 | 1.750    8.10 | 3.250   17.90 |  4.75    4.90
               0.333    3.30 | 1.833    8.10 | 3.333   17.90 |  4.83    4.90
               0.417    3.30 | 1.917    8.10 | 3.417   17.90 |  4.92    4.90
               0.500    3.30 | 2.000    8.10 | 3.500   17.90 |  5.00    4.90
               0.583    4.90 | 2.083    9.80 | 3.583    8.10 |  5.08    3.30
               0.667    4.90 | 2.167    9.80 | 3.667    8.10 |  5.17    3.30
               0.750    4.90 | 2.250    9.80 | 3.750    8.10 |  5.25    3.30
               0.833    4.90 | 2.333    9.80 | 3.833    8.10 |  5.33    3.30
               0.917    4.90 | 2.417    9.80 | 3.917    8.10 |  5.42    3.30
               1.000    4.90 | 2.500    9.80 | 4.000    8.10 |  5.50    3.30
               1.083    4.90 | 2.583   48.90 | 4.083    6.50 |  5.58    3.30
               1.167    4.90 | 2.667   48.90 | 4.167    6.50 |  5.67    3.30
               1.250    4.90 | 2.750   48.90 | 4.250    6.50 |  5.75    3.30
               1.333    4.90 | 2.833  127.00 | 4.333    6.50 |  5.83    3.30
               1.417    4.90 | 2.917  127.00 | 4.417    6.50 |  5.92    3.30
               1.500    4.90 | 3.000  127.00 | 4.500    6.50 |  6.00    3.30

     Unit Hyd Qpeak  (cms)=   0.031

     PEAK FLOW       (cms)=   0.014 (i)
     TIME TO PEAK    (hrs)=   3.000
     RUNOFF VOLUME    (mm)=  32.965
     TOTAL RAINFALL   (mm)=  81.475
     RUNOFF COEFFICIENT   =   0.405

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB            |
| STANDHYD  (0002) |   Area    (ha)=   0.38
|ID= 1 DT= 5.0 min |   Total Imp(%)=  21.00   Dir. Conn.(%)=  21.00
--------------------
                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.08         0.30
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.38         0.52
     Length            (m)=      50.33       112.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     127.00        77.94
                 over (min)        5.00        25.00
     Storage Coeff.  (min)=       1.40 (ii)   23.06 (ii)
     Unit Hyd. Tpeak (min)=       5.00        25.00
     Unit Hyd. peak  (cms)=       0.33         0.05
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.04          0.050 (iii)
     TIME TO PEAK    (hrs)=       3.00         3.25           3.00
     RUNOFF VOLUME    (mm)=      80.47        36.16          45.45
     TOTAL RAINFALL   (mm)=      81.48        81.48          81.48
     RUNOFF COEFFICIENT   =       0.99         0.44           0.56

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
```

```
       (i) HORTONS EQUATION SELECTED FOR PERVIOUS LOSSES:
            Fo   (mm/hr)= 50.00           K  (1/hr)=  2.00
            Fc   (mm/hr)=  7.50     Cum.Inf.   (mm)=  0.00
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| NASHYD    (0001) |   Area    (ha)=   0.70   Curve Number   (CN)= 67.1
|ID= 1 DT= 5.0 min |   Ia      (mm)=   3.30   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   0.134

     PEAK FLOW       (cms)=   0.071 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  30.089
     TOTAL RAINFALL   (mm)=  81.475
     RUNOFF COEFFICIENT   =   0.369

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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  ****************************
  ** SIMULATION NUMBER:   6 **
  ****************************


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|    READ STORM    |    Filename: C:\Users\nnapper\AppD

|                  |              ata\Local\Temp\

|                  |
e0d9f453-99ce-4d31-8f8c-f2c8c00fd6ba\1ded71ec
| Ptotal= 89.93 mm |    Comments: 100-Year, 6 hour SCS Type II - Peterboro
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.25    3.60 |  1.75    9.00 |  3.25   19.80 |  4.75    5.40
                0.50    3.60 |  2.00    9.00 |  3.50   19.80 |  5.00    5.40
                0.75    5.40 |  2.25   10.80 |  3.75    9.00 |  5.25    3.60
                1.00    5.40 |  2.50   10.80 |  4.00    9.00 |  5.50    3.60
                1.25    5.40 |  2.75   53.90 |  4.25    7.20 |  5.75    3.60
                1.50    5.40 |  3.00  140.20 |  4.50    7.20 |  6.00    3.60

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| CALIB            |
| NASHYD    (0003) |   Area    (ha)=   0.09   Curve Number   (CN)= 71.5
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.11

        NOTE:  RAINFALL WAS TRANSFORMED TO   5.0 MIN. TIME STEP.


                              ---- TRANSFORMED HYETOGRAPH ----
                 TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                  hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.083    3.60 | 1.583    9.00 | 3.083   19.80 |  4.58    5.40
                0.167    3.60 | 1.667    9.00 | 3.167   19.80 |  4.67    5.40
                0.250    3.60 | 1.750    9.00 | 3.250   19.80 |  4.75    5.40
                0.333    3.60 | 1.833    9.00 | 3.333   19.80 |  4.83    5.40
                0.417    3.60 | 1.917    9.00 | 3.417   19.80 |  4.92    5.40
                0.500    3.60 | 2.000    9.00 | 3.500   19.80 |  5.00    5.40
                0.583    5.40 | 2.083   10.80 | 3.583    9.00 |  5.08    3.60
                0.667    5.40 | 2.167   10.80 | 3.667    9.00 |  5.17    3.60
                0.750    5.40 | 2.250   10.80 | 3.750    9.00 |  5.25    3.60
                0.833    5.40 | 2.333   10.80 | 3.833    9.00 |  5.33    3.60
                0.917    5.40 | 2.417   10.80 | 3.917    9.00 |  5.42    3.60
                1.000    5.40 | 2.500   10.80 | 4.000    9.00 |  5.50    3.60
                1.083    5.40 | 2.583   53.90 | 4.083    7.20 |  5.58    3.60
                1.167    5.40 | 2.667   53.90 | 4.167    7.20 |  5.67    3.60
                1.250    5.40 | 2.750   53.90 | 4.250    7.20 |  5.75    3.60
                1.333    5.40 | 2.833  140.20 | 4.333    7.20 |  5.83    3.60
                1.417    5.40 | 2.917  140.20 | 4.417    7.20 |  5.92    3.60
                1.500    5.40 | 3.000  140.20 | 4.500    7.20 |  6.00    3.60

     Unit Hyd Qpeak  (cms)=   0.031

     PEAK FLOW       (cms)=   0.017 (i)
     TIME TO PEAK    (hrs)=   3.000
     RUNOFF VOLUME    (mm)=  38.717
     TOTAL RAINFALL   (mm)=  89.925
     RUNOFF COEFFICIENT   =   0.431

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB            |
| STANDHYD  (0002) |   Area    (ha)=   0.38
|ID= 1 DT= 5.0 min |   Total Imp(%)=  21.00   Dir. Conn.(%)=  21.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.08         0.30
```

```
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.38         0.52
     Length            (m)=      50.33       112.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     140.20       102.89
               over (min)        5.00        25.00
     Storage Coeff.  (min)=       1.34 (ii)   20.73 (ii)
     Unit Hyd. Tpeak (min)=       5.00        25.00
     Unit Hyd. peak  (cms)=       0.33         0.05
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.05          0.059 (iii)
     TIME TO PEAK    (hrs)=       3.00         3.25           3.00
     RUNOFF VOLUME    (mm)=      88.93        42.69          52.39
     TOTAL RAINFALL   (mm)=      89.93        89.93          89.93
     RUNOFF COEFFICIENT   =       0.99         0.47           0.58

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

       (i) HORTONS EQUATION SELECTED FOR PERVIOUS LOSSES:
            Fo   (mm/hr)= 50.00           K  (1/hr)=  2.00
            Fc   (mm/hr)=  7.50     Cum.Inf.   (mm)=  0.00
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| NASHYD    (0001) |   Area    (ha)=   0.70   Curve Number   (CN)= 67.1
|ID= 1 DT= 5.0 min |   Ia      (mm)=   3.30   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   0.134

     PEAK FLOW       (cms)=   0.084 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  35.467
     TOTAL RAINFALL   (mm)=  89.925
     RUNOFF COEFFICIENT   =   0.394

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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 FINISH
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Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Wednesday, Jun 26 2024

85312 - East Swale

Trapezoidal

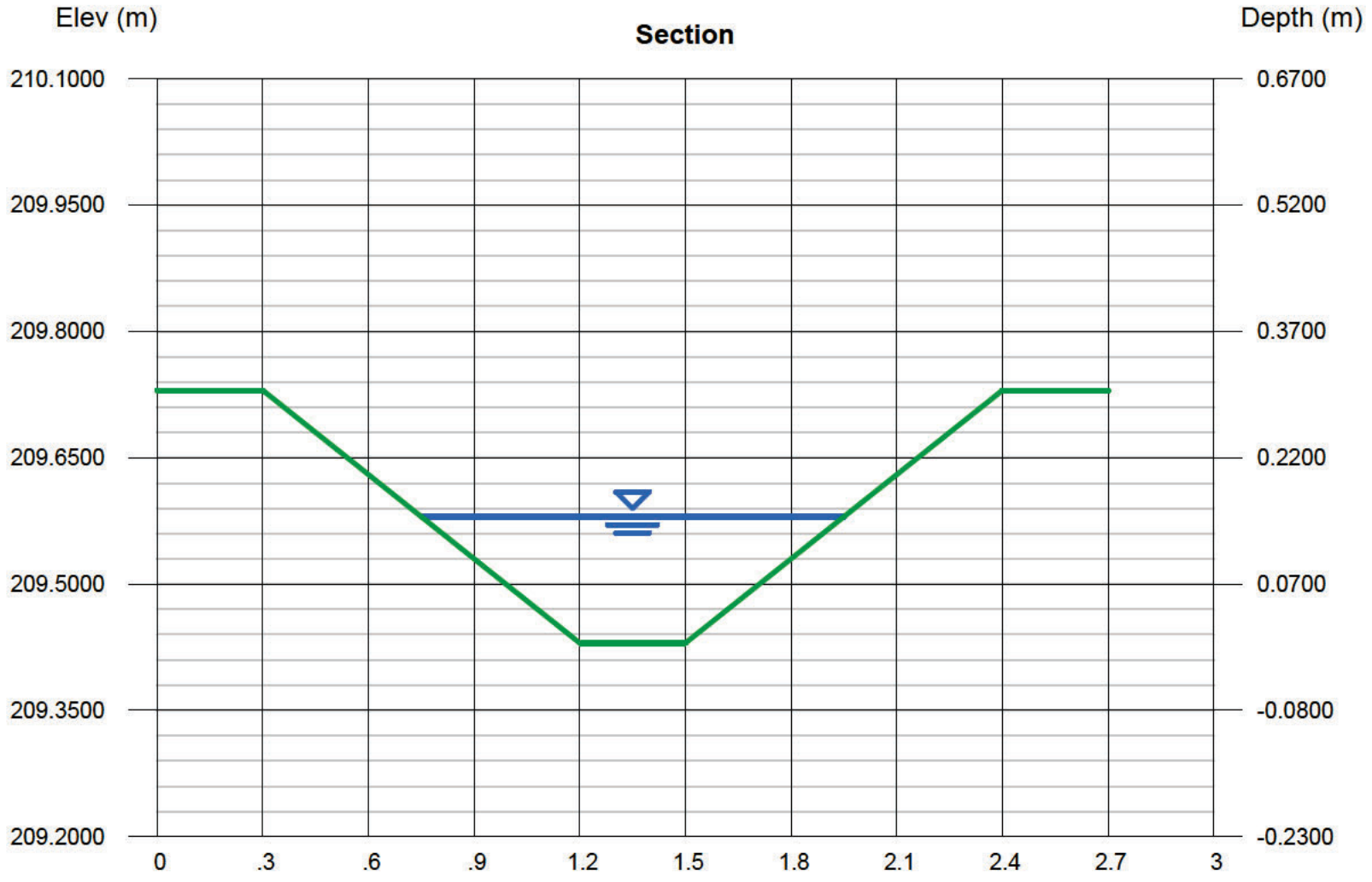
Bottom Width (m)	= 0.3000
Side Slopes (z:1)	= 3.0000, 3.0000
Total Depth (m)	= 0.3000
Invert Elev (m)	= 209.4300
Slope (%)	= 0.5000
N-Value	= 0.030

Calculations

Compute by:	Q vs Depth
No. Increments	= 20

Highlighted

Depth (m)	= 0.1500
Q (cms)	= 0.053
Area (sqm)	= 0.1125
Velocity (m/s)	= 0.4735
Wetted Perim (m)	= 1.2487
Crit Depth, Yc (m)	= 0.1067
Top Width (m)	= 1.2000
EGL (m)	= 0.1614



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Tuesday, Jul 16 2024

Outlet Swale

Trapezoidal

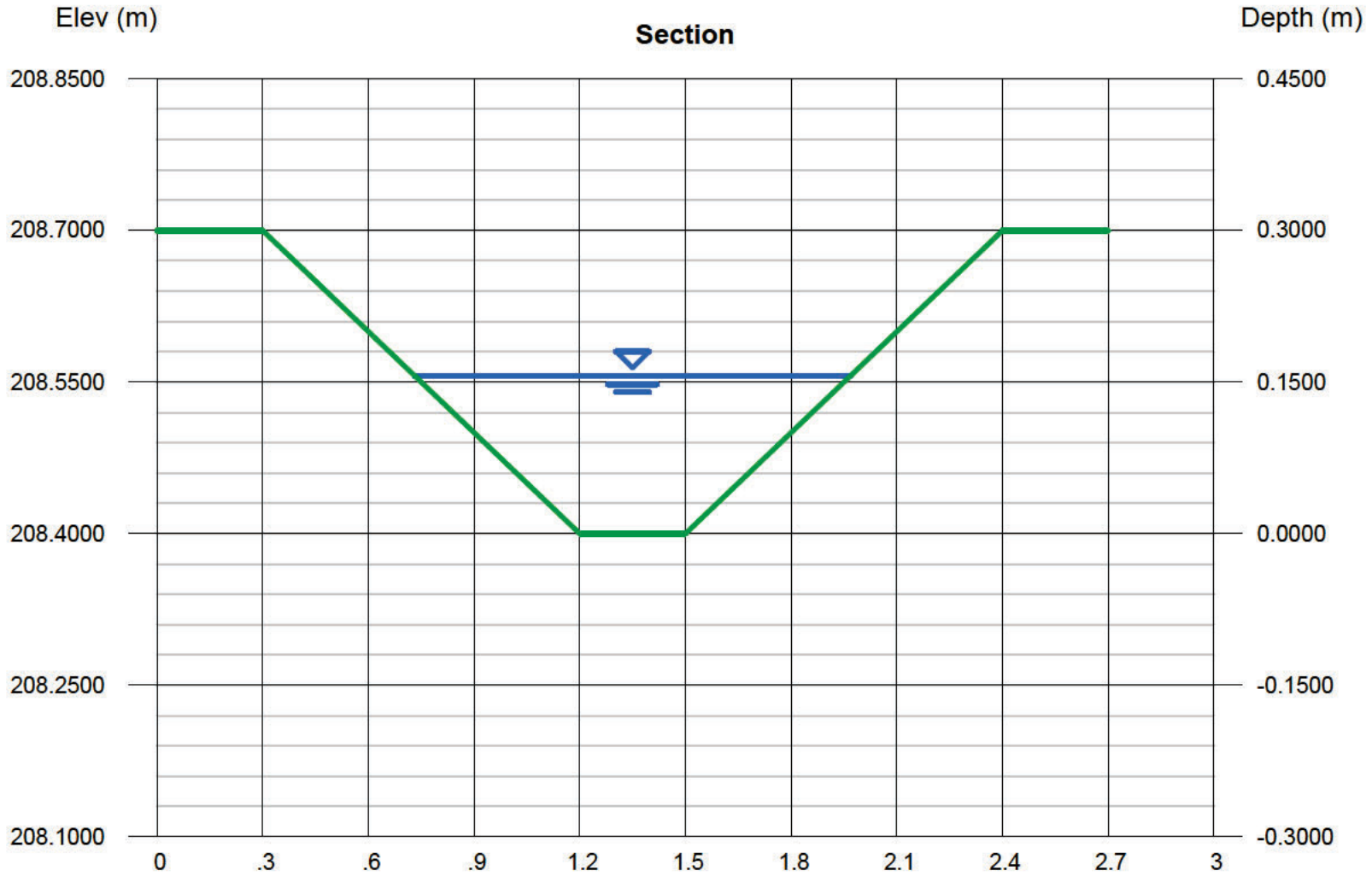
Bottom Width (m)	= 0.3000
Side Slopes (z:1)	= 3.0000, 3.0000
Total Depth (m)	= 0.3000
Invert Elev (m)	= 208.4000
Slope (%)	= 1.0000
N-Value	= 0.030

Calculations

Compute by:	Q vs Depth
No. Increments	= 50

Highlighted

Depth (m)	= 0.1560
Q (cms)	= 0.082
Area (sqm)	= 0.1198
Velocity (m/s)	= 0.6846
Wetted Perim (m)	= 1.2866
Crit Depth, Yc (m)	= 0.1311
Top Width (m)	= 1.2360
EGL (m)	= 0.1799



Channel Report

Hydraflow Express Extension for Autodesk® Civil 3D® by Autodesk, Inc. Thursday, Jul 4 2024

West Swale

Trapezoidal

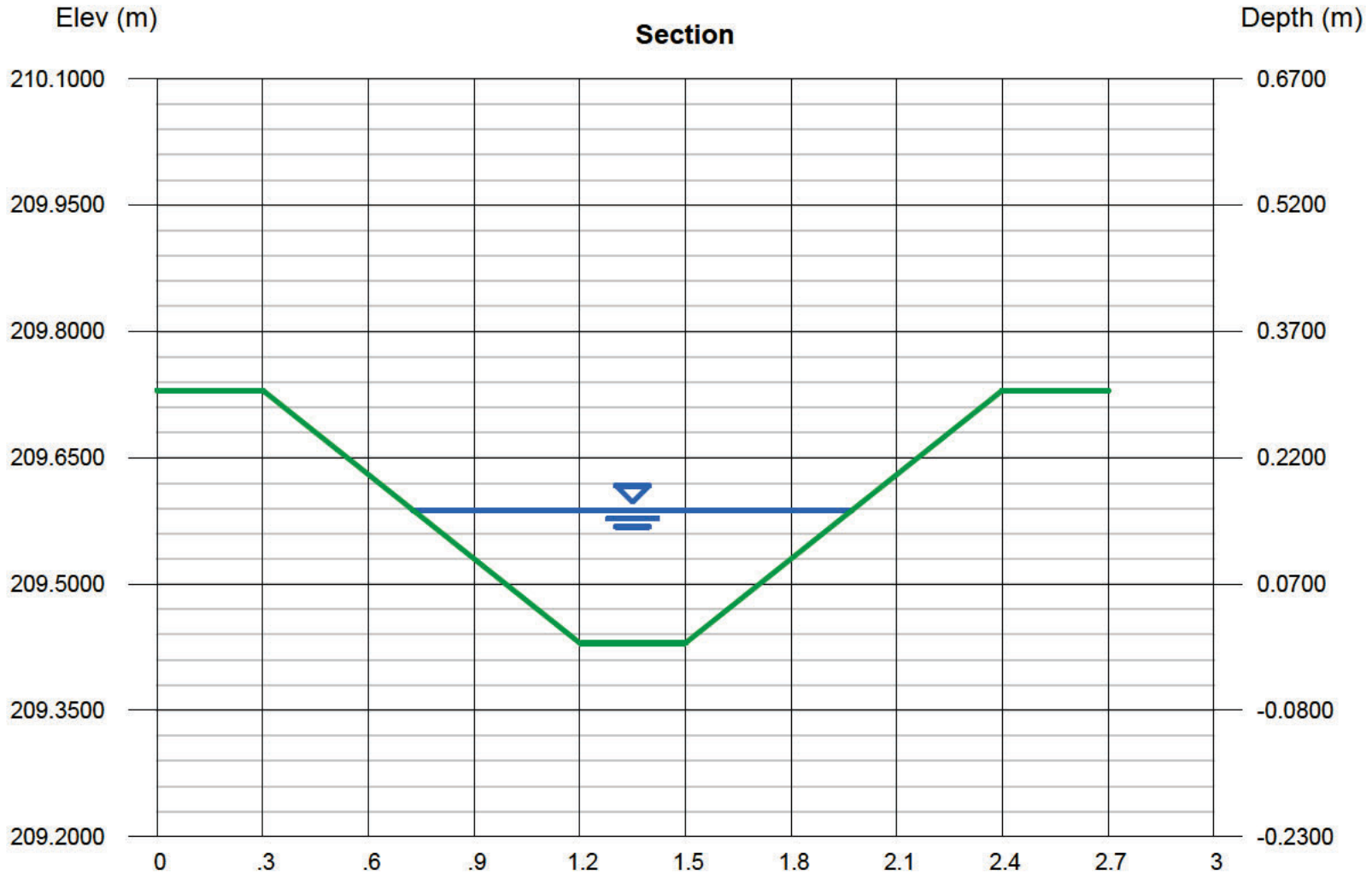
Bottom Width (m)	= 0.3000
Side Slopes (z:1)	= 3.0000, 3.0000
Total Depth (m)	= 0.3000
Invert Elev (m)	= 209.4300
Slope (%)	= 0.5000
N-Value	= 0.030

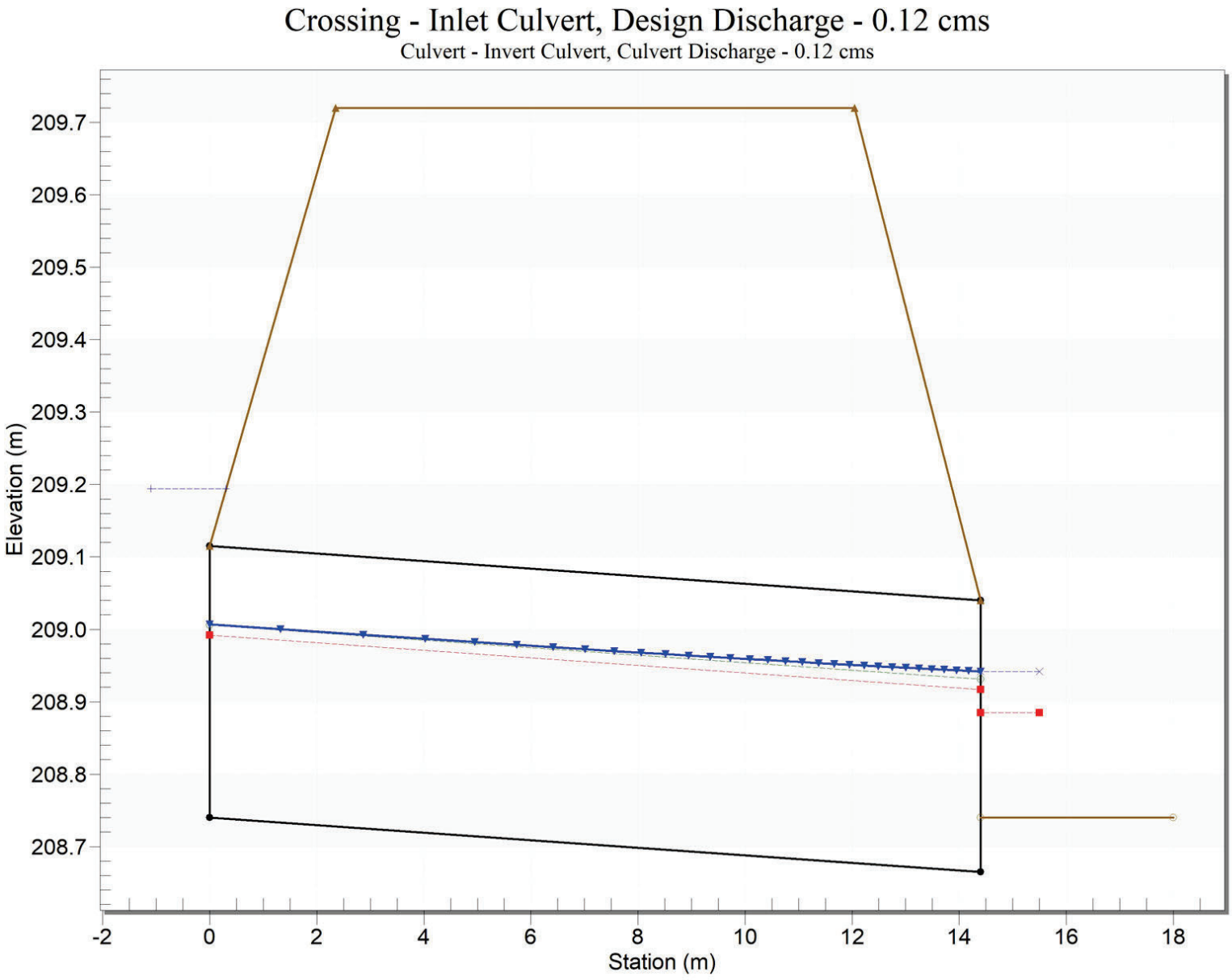
Calculations

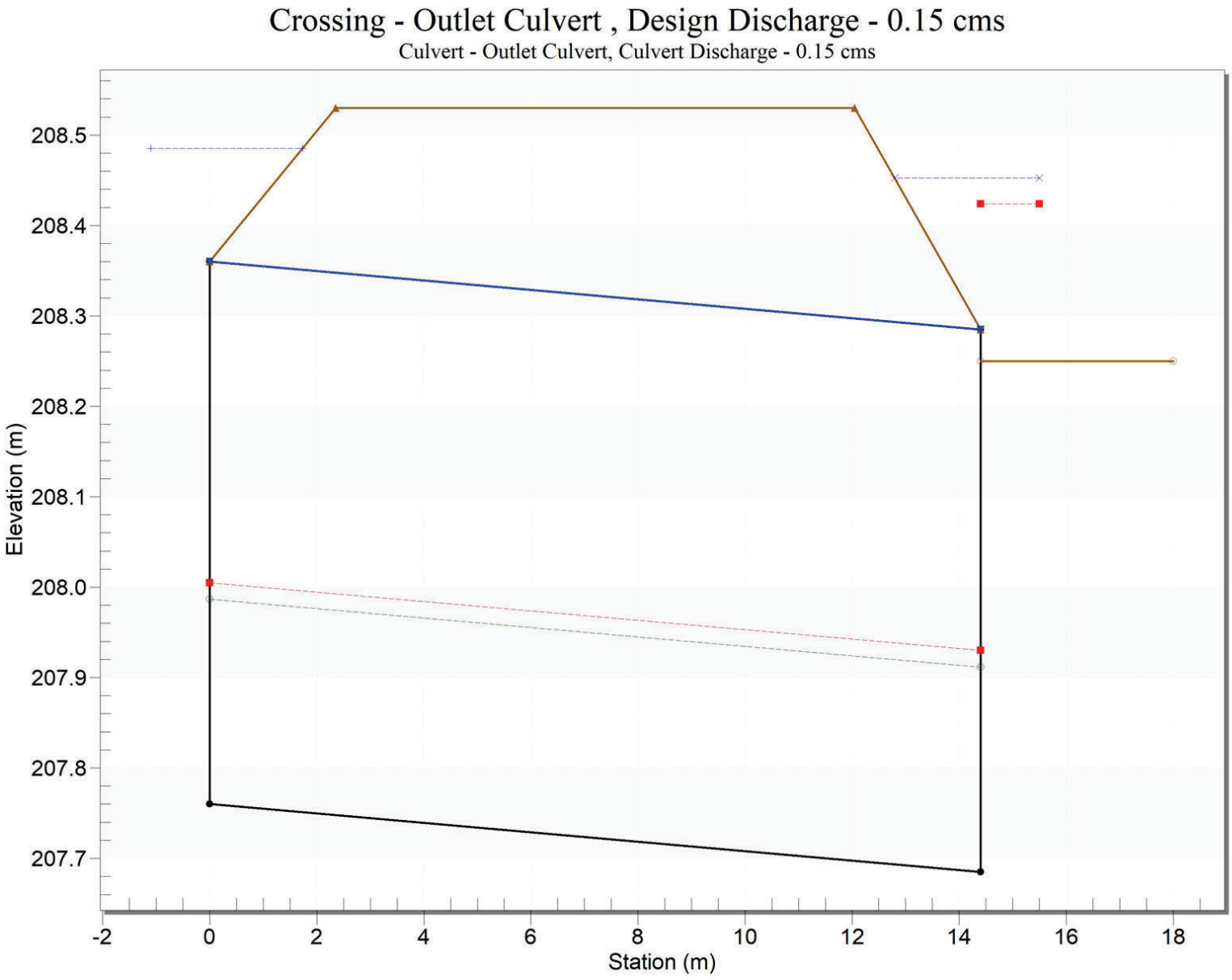
Compute by:	Q vs Depth
No. Increments	= 40

Highlighted

Depth (m)	= 0.1575
Q (cms)	= 0.059
Area (sqm)	= 0.1217
Velocity (m/s)	= 0.4867
Wetted Perim (m)	= 1.2961
Crit Depth, Yc (m)	= 0.1128
Top Width (m)	= 1.2450
EGL (m)	= 0.1696




Crossing - Inlet Culvert, Design Discharge - 0.12 cms
Culvert - Invert Culvert, Culvert Discharge - 0.12 cms
Elevation (m)
209.7
209.6
209.5
209.4
209.3
209.2
209.1
209.0
208.9
208.8
208.7
-2
0
2
4
6
8
10
12
14
16
18
Station (m)


Crossing - Outlet Culvert , Design Discharge - 0.15 cms
Culvert - Outlet Culvert, Culvert Discharge - 0.15 cms
Elevation (m)
208.5
208.4
208.3
208.2
208.1
208.0
207.9
207.8
207.7
-2
0
2
4
6
8
10
12
14
16
18
Station (m)

Appendix E

Detailed Design Drawings

LEGEND:

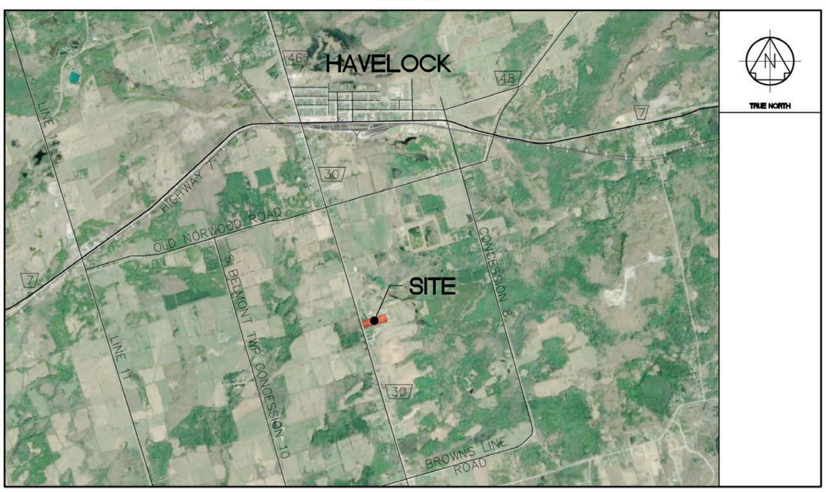
ASPHALT TO BE REMOVED
CONCRETE TO BE REMOVED
TREE AND BRUSH REMOVAL AREA
PROPOSED MUD MAT
TYPICAL ILLUSTRATION FOR REMOVAL
TYPICAL ILLUSTRATION FOR REMOVAL
PROPOSED HEAVY DUTY ASPHALT
PROPOSED RETAINING WALL
REFER TO LANDSCAPE PLAN FOR DETAILS IN THIS AREA
PROPOSED CONCRETE
EX./PR. SIDEWALK
PROPOSED GRAVEL/RIP-RAP
PROPOSED TOPSOIL AND SOD
EX./PR. BUILDING

EX./PR. EDGE OF PAVEMENT
EX./PR. CURB
EX./PR. EDGE OF SHOULDER/GRAVEL
EX./PR. ROAD CENTERLINE
SITE PROPERTY LINE
OTHER PROPERTY LINE
EX./PR. DITCH
EX./PR. FENCE
EXISTING RAILWAY
EX./PR. GUIDERAIL
EX./PR. CULVERT
EX./PR. STORM SEWER
EX./PR. SANITARY SEWER
EX./PR. WATERMAIN
PROPOSED PIPE INSULATION
G — G — EXISTING GASMAIN
O/B — O/B — EX. OVERHEAD BELL
U/B — U/B — EX. UNDERGROUND BELL
O/H — O/H — EX. OVERHEAD HYDRO
U/H — U/H — EX. UNDERGROUND HYDRO
U/C — U/C — EX. UNDERGROUND CABLE
EXISTING TREE DRIP LINE
100.0 EXISTING CONTOUR
CONSTRUCTION FENCE
PROPOSED SILT FENCE

100 YEAR PONDING
EX./PR. SANITARY MANHOLE
EX./PR. CATCH BASIN MANHOLE
EX./PR. STORM MANHOLE
EX./PR. CATCH BASIN
EX./PR. DOUBLE CATCH BASIN
EX./PR. FIRE HYDRANT
EX./PR. WATER VALVE
FIRE DEPARTMENT CONNECTION
GV EX. GAS VALVE
EX. HYDRO MH
EX. BELL MH
EX. BELL/CABLE PEDESTAL
LS EX./PR. LIGHT STANDARD
HP EXISTING HYDRO POLE
BP EXISTING BELL POLE
EXISTING POLE ANCHOR
EX./PR. SIGN
TACTILE WARNING INDICATOR
BOL BOL EX./PR. BOLLARD

215.00 214.00 EX./PR. ELEVATION
1.0% PROPOSED GRADE
CP# CONTROL POINT
BH1 BOREHOLE
54 PROPOSED PARKING NUMBER
EXISTING VEGETATION
PROPOSED TREE
EXISTING DECIDUOUS TREE
EXISTING CONIFEROUS TREE
OVERLAND FLOW ROUTE

KEY PLAN



CIVIL DRAWING LIST

SHT #	DRAWING TITLE	REV.	REV. DATE
100	LOCATION AND LEGEND	1	19/07/2024
101	GENERAL NOTES	1	19/07/2024
102	DETAILS	1	19/07/2024
200	REMOVALS, SEDIMENT AND EROSION CONTROL	1	19/07/2024
400	SITE PLAN	1	19/07/2024
500	GRADING PLAN	1	19/07/2024

BM1 – 210.63
COSINE BENCH MARK
00819668561 (CGVD28:78)

TRUE NORTH

REVISIONS

No.	Description	Date
1	SUBMITTED TO TOWNSHIP – 1ST SPA SUBMISSION	19/07/24

METRIC Dimensions are in METRES and/or MILLIMETRES unless otherwise shown

LEGEND TO BE READ IN CONJUNCTION WITH OPSD 100 SERIES

LICENSED PROFESSIONAL ENGINEER
E. R. ST. PIERRE
100500092
July 19, 2024
PROVINCE OF ONTARIO

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150 Jameson Drive
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E. wills@dmwills.com

Project Name/Location
THOMAS SELF-STORAGE FACILITY
9351 COUNTY ROAD 30, TOWNSHIP OF HAVELOCK-BELMONT-METHUEN

Drawing Title
LOCATION AND LEGEND

Drawn By: CM	SCALE: Horz. N/A Vert. N/A		
Designed By: CM	Issue Date: July 22, 2024		
Checked By: JDF	Project No.: 23-85312	Sht. No.:	
Engineer: ESP	Dwg File No.: 85312 – CS	100	

NOT FOR CONSTRUCTION

Printed By: cmakrimichalos Printed On: July 22, 2024
q:\85000 - private\85300-85399\85312 - thomas - self storage facility, havelock\02 drawings\current drawings\85312 - cs.dwg

1. SOURCE DATA

1.1. THE ENGINEERING DESIGN RELIES ON THE TOPOGRAPHIC PLAN DATED SEPTEMBER 8, 2023, PROJECT NO. 23-19-197-00, PREPARED BY ELLIOTT AND PARR (PETERBOROUGH).

1.2. THE ENGINEERING DESIGN RELIES ON THE SITE PLAN DATED JULY 10, 2024, PROJECT NO. 23-85312, PREPARED BY D.M. WILLS.

1.3. THE LOCATION OF EXISTING UNDERGROUND ELECTRIC, GAS, DATA TRANSMISSION, TELEPHONE AND CABLE TELEVISION IDENTIFIED ON THE CONTRACT DRAWINGS ARE FOR REFERENCE ONLY. THE CONTRACTOR SHALL LOCATE ALL UTILITIES HORIZONTALLY AND VERTICALLY PRIOR TO COMMENCEMENT OF CONSTRUCTION IN ACCORDANCE WITH OPSS 100 GC 7.01.09.

2. GENERAL CONSTRUCTION

2.1. REFERENCES WITHIN THESE CONTRACT DOCUMENTS TO AN OPSS SHALL BE DEEMED TO MEAN OPSS.MUNI, UNLESS USE OF A PROVINCIAL-ORIENTED SPECIFICATION IS SPECIFIED IN THE CONTRACT DOCUMENTS. WHEN THERE IS NOT A CORRESPONDING MUNICIPAL ORIENTED SPECIFICATION, THE REFERENCES BELOW SHALL BE CONSIDERED TO BE THE OPSS.COMM.

2.2. THE WORK IS TO BE COMPLETED IN ACCORDANCE WITH OPSS MUNI 100 GENERAL CONDITIONS OF CONTRACT.

2.3. THE ENGINEERING DESIGN REFERENCES THE FOLLOWING CONTROL POINTS, PROVIDED BY ELLIOTT AND PARR:

BM1 – ELEV: 210.63m – COSINE BENCHMARK 00819668561 (CGVD28: 78)

2.4. THE CONTRACTOR SHALL VERIFY ALL CONTROL POINTS WITH THE CONTRACT ADMINISTRATOR IN A FORMAT AS PRESCRIBED BY THE CONTRACT ADMINISTRATOR PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.

2.5. THE CONTRACTOR SHALL UNDERTAKE ALL LAYOUT REQUIRED TO FACILITATE THE CONSTRUCTION OF THIS CONTRACT.

2.6. WITH THE EXCEPTION OF THE REFERENCED LOCAL CONTROL POINTS SPECIFICALLY PROVIDED IN THE CONTRACT DRAWINGS, NO ELEVATION WITHIN THE CONTRACT DRAWINGS ARE TO BE USED AS A REFERENCE FOR LAYOUT.

2.7. THE REPLACEMENT OF DISTURBED OR OTHERWISE DAMAGED CONTROL POINTS BY AN OLS SURVEYOR WILL BE AT THE SOLE EXPENSE OF THE CONTRACTOR.

2.8. THE CONTRACTOR SHALL USE THE LOCAL CONTROL POINTS AS SPECIFIED ON THE CONTRACT DRAWINGS. THE USE OF AN INCORRECT CONTROL POINT BY THE CONTRACTOR, THAT RESULTS IN DEFICIENT WORK, EITHER IN VERTICAL OR HORIZONTAL ALIGNMENT, SHALL BE CORRECTED BY THE CONTRACTOR AT THE SOLE EXPENSE OF THE CONTRACTOR.

2.9. ANY DISCREPANCY BETWEEN THE SITE CONDITIONS AND THE CONTRACT DRAWINGS SHALL IMMEDIATELY BE REPORTED TO THE CONTRACT ADMINISTRATOR.

2.10. THE CONTRACTOR SHALL OBTAIN AND MAINTAIN COPIES OF ALL REFERENCED STANDARD DOCUMENTS AND DRAWINGS ON SITE FOR THE DURATION OF THE WORK.

2.11. THE CONTRACTOR SHALL KEEP RECORDS AND SUPPLY THE CONTRACT ADMINISTRATOR WITH RED-LINED AS CONSTRUCTED DRAWINGS NOTING THAT ALL SITE SERVICE INSTALLATION WORKS WERE INSTALLED AS PER THE CONTRACT DOCUMENTS, OR OTHERWISE NOTING THE ACTUAL STRUCTURE LOCATIONS, PIPE DETAILS (LENGTH, SIZE AND / OR MATERIAL), AND INVERTS AND ANY OTHER DEVIATION FROM THE CONTRACT DOCUMENTS.

2.12. NO ADDITIONAL PAYMENT WILL BE MADE FOR COSTS ASSOCIATED WITH THE SUPPORT, PRESERVATION AND / OR RELOCATION OF EXISTING UTILITIES IDENTIFIED IN THE CONTRACT DOCUMENTS, UNLESS SPECIFICALLY NOTED OTHERWISE.

3. EROSION AND SEDIMENT CONTROL

3.1. EROSION AND SEDIMENT CONTROL AND TREE PROTECTION MEASURES SHALL BE IMPLEMENTED PRIOR TO, AND MAINTAINED DURING CONSTRUCTION TO PREVENT ENTRY OF SEDIMENT LADEN WATER INTO EXISTING INFRASTRUCTURE, WATERBODIES OR ONTO ADJACENT LANDS. ALL DAMAGED EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REPAIRED OR REPLACED WITHIN 48 HOURS OF INSPECTION.

3.2. DISTURBANCE TO EXISTING VEGETATED AREAS WITHIN THE WORK AREA SHALL BE MINIMIZED TO THE EXTENT POSSIBLE. NO ADDITIONAL PAYMENT WILL BE MADE FOR RESTORATION OF AREAS DISTURBED BY CONSTRUCTION UNLESS NOTED IN THE CONTRACT DOCUMENTS.

3.3. THE EROSION AND SEDIMENT CONTROL STRATEGIES OUTLINED ON THE PLANS ARE NOT STATIC AND MAY NEED TO BE UPGRADED / AMENDED AS SITE CONDITIONS CHANGE TO MINIMIZE SEDIMENT LADEN RUNOFF FROM LEAVING THE WORK AREA. ADDITIONAL OR ALTERNATIVE CONTROL MEASURES SHALL BE IMPLEMENTED IMMEDIATELY UPON DIRECTION FROM THE CONTRACT ADMINISTRATOR. ADDITIONAL MATERIALS SHALL BE KEPT ON SITE TO BE USED AS NECESSARY.

3.4. EROSION AND SEDIMENT CONTROLS SHALL BE INSPECTED ACCORDING TO THE FOLLOWING SCHEDULE:

3.4.1. ON A WEEKLY BASIS;
3.4.2. AFTER EVERY RAINFALL (>15mm) EVENT;
3.4.3. AFTER SIGNIFICANT SNOWMELT EVENTS; AND,
3.4.4. DAILY DURING EXTENDED RAIN OR SNOWMELT PERIODS
3.4.5. DURING INACTIVE CONSTRUCTION PERIODS, WHERE THE SITE IS LEFT ALONE FOR 30 DAYS OR LONGER, A MONTHLY INSPECTION SHOULD BE CONDUCTED.

3.5. ALL ACTIVITIES, INCLUDING MAINTENANCE PROCEDURES, SHALL BE CONTROLLED TO PREVENT THE ENTRY OF PETROLEUM PRODUCTS, DEBRIS, RUBBLE, CONCRETE OR OTHER DELETERIOUS SUBSTANCES ONTO ROADS OR ADJACENT PROPERTIES, OR INTO SEWERS OR ADJACENT WATERBODIES.

3.5.1. SPILLING OF HAZARDOUS MATERIAL SHALL BE REPORTED TO THE MINISTRY OF THE ENVIRONMENT (MOE) ONLINE OR FOR EMERGENCIES CALL 1-866-MOE-TIPS (663-8477)

3.6. ALL EROSION AND SEDIMENT CONTROL AND TREE PROTECTION SHALL REMAIN IN PLACE UNTIL REMOVAL IS AUTHORIZED BY THE CONTRACT ADMINISTRATOR.

3.7. CONTRACTOR EQUIPMENT AND VEHICLES ARE PERMITTED WITHIN THE DRIPLINE OF TREES NOT DESIGNATED FOR REMOVAL.

3.8. ALL COSTS ASSOCIATED WITH THE MAINTENANCE OF EROSION AND SEDIMENT CONTROLS, INCLUDING REMOVAL OF ACCUMULATED SEDIMENT AND REPAIR / REPLACEMENT OF DAMAGED MEASURES SHALL BE INCLUDED IN THE CONTRACT PRICE. NO ADDITIONAL PAYMENT WILL BE MADE.

4. GRADING / EARTHWORKS

4.1 MANAGEMENT OF EXCESS MATERIAL BY OPEN BURNING IS NOT PERMITTED.

5. REMOVALS

5.1. NATURAL WOOD SHALL BE MANAGED AS EXCESS MATERIAL AND MAY NOT BE MANAGED AS DISPOSABLE FILL WITHIN THE CONTRACT LIMITS.

5.2. BORROW MATERIAL SHALL BE SELECT SUBGRADE MATERIAL (SSM).

5.3. IF REQUESTED BY THE CONTRACT ADMINISTRATOR, THE CONTRACTOR SHALL SUPPLY QUALITY ASSURANCE (QA) BORROW MATERIAL SAMPLES TO THE CONTRACT ADMINISTRATOR TO DELIVER TO THE QA LABORATORY.

5.4. SOURCE SITE FOR SUITABLE EARTH BORROW FILL MATERIAL TO BE DETERMINED IN CONSULTATION WITH CONTRACTOR AND CONTRACT ADMINISTRATOR

5.5. ALL UTILITY REMOVALS SHALL BE COORDINATED WITH THE RESPECTIVE UTILITY AUTHORITY FOR SPECIFIC ITEMS AND LIMITS PRIOR TO REMOVAL. THE DIRECTION FOR REMOVAL BY THE UTILITY SHALL TAKE PRECEDENCE OVER THIS DRAWING.

6. CULVERTS

6.1. CULVERTS SHALL BE FLUSHED AND CLEANED PRIOR TO INSPECTION AND ACCEPTANCE.

7. ROADWORKS / BOULEVARDS

7.1. NO PLACEMENT OF SURFACE COURSE ASPHALT SHALL OCCUR UNTIL BASE COURSE ASPHALT HAS BEEN TESTED, STRUCTURE INSPECTED AND ACCEPTED IN WRITING BY THE CONTRACT ADMINISTRATOR.

7.2. THE CONTRACT ADMINISTRATOR MUST AUTHORIZE THE STOCKPILE LOCATIONS PROPOSED BY THE CONTRACTOR, PRIOR TO THE IMPORT OF ANY MATERIAL TO BE STOCKPILED.

7.3. ALL FORMWORK SHALL BE REVIEWED BY THE CONTRACT ADMINISTRATOR PRIOR TO PLACEMENT OF CONCRETE. THE CONTRACTOR SHALL NOTIFY THE CONTRACT ADMINISTRATOR A MINIMUM OF 2 BUSINESS DAYS PRIOR TO THE SCHEDULED CONCRETE POUR TO ALLOW TIME TO COORDINATE FORMWORK REVIEW. CONCRETE PLACED PRIOR TO THE REVIEW OF THE CONTRACT ADMINISTRATOR MAY BE REQUIRED TO BE REMOVED, DISPOSED OFF-SITE AND REPLACED AT THE SOLE EXPENSE OF THE CONTRACTOR.

7.4. SITE ENTRANCE PAVEMENT STRUCTURE AND GRAVEL PARKING LOT STRUCTURE TO BE CONFIRMED BY A QUALIFIED GEOTECHNICAL ENGINEER.

7.5. TOP SOIL AND SEEDED AREAS SHALL BE TO A DEPTH OF 150mm.

7.5.1. SEED SHALL BE STANDARD ROADSIDE MIX.

8. INSPECTION AND DOCUMENTATION REQUIREMENTS

8.1. SUBMIT SHOP DRAWINGS TO THE CONTRACT ADMINISTRATOR PROMPTLY AND IN ORDERLY SEQUENCE TO NOT CAUSE DELAY IN WORK. FAILURE TO SUBMIT IN AMPLE TIME IS NOT CONSIDERED SUFFICIENT REASON FOR EXTENSION OF CONTRACT TIME AND NO CLAIM FOR EXTENSION BY REASON OF SUCH DEFAULT WILL BE ALLOWED. DO NOT PROCEED WITH WORK AFFECTED BY SUBMITTAL UNTIL REVIEW IS COMPLETE. REVIEW SHOP DRAWINGS PRIOR TO SUBMISSION. THIS REVIEW REPRESENTS THAT NECESSARY REQUIREMENTS HAVE BEEN DETERMINED AND VERIFIED, OR WILL BE, AND THAT EACH SUBMITTAL HAS BEEN CHECKED AND CO-ORDINATED WITH REQUIREMENTS OF WORK AND CONTRACT DOCUMENTS. SUBMITTALS NOT STAMPED, SIGNED, DATED AND IDENTIFIED AS TO SPECIFIC PROJECT WILL BE RETURNED WITHOUT BEING EXAMINED AND CONSIDERED REJECTED. ALLOW 5 BUSINESS DAYS FOR THE FIRST, AND 3 BUSINESS DAYS FOR RESUBMITTED SHOP DRAWING REVIEW.

8.2. THE CONTRACTOR SHALL CONTACT THE CONTRACT ADMINISTRATOR A MINIMUM OF 2 BUSINESS DAYS IN ADVANCE OF THE FOLLOWING ACTIVITIES IN ORDER FOR THE CONTRACT ADMINISTRATOR TO ARRANGE FOR THE PROPER INSPECTION OF THE RELATED CONSTRUCTION ACTIVITIES. IF THE REQUIRED NOTICE IS NOT PROVIDED, THE CONTRACTOR MAY BE REQUIRED TO UNDERTAKE ADDITIONAL WORKS, AT THE SOLE EXPENSE OF THE CONTRACTOR, TO PERMIT THE CONTRACT ADMINISTRATOR TO INSPECT AND / OR VERIFY THAT THE WORKS HAVE CONSTRUCTED IN CONFORMACE WITH THE CONTRACT DOCUMENTS.

8.2.1. MOBILIZATION DATE, PROPOSED CONSTRUCTION SCHEDULE AND CONTRACTOR CONTACT INFORMATION.
8.2.2. VERIFY SITE CONTROL POINTS PRIOR TO LAYOUT.
8.2.3. UPON COMPLETION OF ALL EROSION AND SEDIMENT CONTROL WORKS.
8.2.4. PRIOR TO THE PLACEMENT OF ANY GRANULAR ROAD OR PARKING LOT GRANULAR BASE.
8.2.5. PRIOR TO ANY CONCRETE POUR.
8.2.6. PRIOR TO THE DEMOBILIZATION OF THE SERVICING CONTRACTOR FROM THE SITE.

8.3. THE CONTRACTOR SHALL SUPPLY THE CONTRACT ADMINISTRATOR WITH COPIES OF ALL TESTING AND INSPECTION REPORTS RELATED TO THE WORK WITHIN 4 BUSINESS DAYS OF THE REPORTING.

OPSS INDEX

NUMBER	REV.	DATE	DESCRIPTION
180		NOV-21	GENERAL SPECIFICATION FOR THE MANAGEMENT OF EXCESS MATERIALS
201		APR-19	CLEARING, CLOSE CUT CLEARING, GRUBBING, AND REMOVAL OF SURFACE AND PILED BOULDERS
206		APR-19	GRADING
212		NOV-19	BORROW
301		NOV-18	RESTORING UNPAVED ROADWAY SURFACES
310		NOV-17	HOT MIX ASPHALT
314		NOV-19	UNTREATED SUB-BASE, BASE, SURFACE, SHOULDER, SELECTED SUBGRADE AND STOCKPILING
401		NOV-21	TRENCHING, BACKFILLING, AND COMPACTING
421		NOV-18	PIPE CULVERT INSTALLATION IN OPEN CUT
491		NOV-23	UNTREATED GRANULAR SUBBASE, BASE, SURFACE, SHOULDER AND STOCKPILING
501		NOV-17	COMPACTING
510		NOV-18	REMOVAL
772		APR-19	CHAIN-LINK FENCE
801		NOV-19	PROTECTION OF TREES
802		NOV-19	TOPSOIL
804		NOV-14	SEED AND COVER
805		NOV-21	TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES

OPSD INDEX

NUMBER	REV.	DATE	DESCRIPTION
102.010	1	NOV-06	REMOVALS, LEGEND
219.130	3	NOV-21	HEAVY-DUTY SILT FENCE BARRIER
301.020	2	NOV-10	RURAL ENTRANCES TO ROADS IN EARTH CUT
801.020	2	NOV-17	END SECTION DETAILS, CORRUGATED STEEL PIPE
802.010	3	NOV-14	FLEXIBLE PIPE EMBEDMENT AND BACKFILL, EARTH EXCAVATION
802.034	3	NOV-15	RIGID PIPE BEDDING AND COVER IN EMBANKMENT, ORIGINAL GROUND, EARTH OR ROCK
972.102	2	NOV-12	FENCE, CHAIN-LINK, COMPONENT – GATE
972.132	0	NOV-12	FENCE, CHAIN-LINK, DETAILS AND TABLE

MTOD INDEX

NUMBER	REV.	DATE	DESCRIPTION
MTOD 305.150	0	AUG-18	COMMERCIAL ENTRANCE, SITE PROFILE STANDARD

BM1 – 210.63
COSINE BENCH MARK
00819668561 (CGVD28: 78)

TRUE NORTH

KEY PLAN

REVISIONS

No.	Description	Date
1	SUBMITTED TO TOWNSHIP – 1ST SPA SUBMISSION	19/07/24

METRIC — Dimensions are in METRES and/or MILLIMETRES unless otherwise shown

LEGEND — TO BE READ IN CONJUNCTION WITH OPSD 100 SERIES

LICENSED PROFESSIONAL ENGINEER
E.R. ST. PIERRE
100500092
July 19, 2024
PROVINCE OF ONTARIO

WILLS

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150 Jameson Drive
Peterborough, Ontario
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P. 705.742.2297
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E. wills@dmwills.com

Project Name/Location

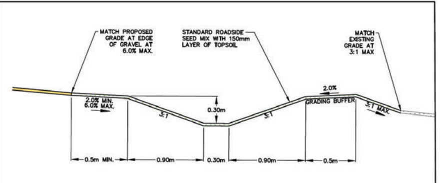
THOMAS SELF-STORAGE FACILITY
9351 COUNTY ROAD 30, TOWNSHIP OF HAVELOCK-BELMONT-METHUEN

Drawing Title

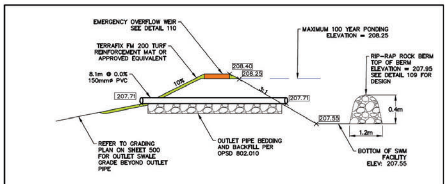
GENERAL NOTES

Drawn By: CM	SCALE: Horz. N/A Vert. N/A		
Designed By: CM	Issue Date: July 22, 2024		
Checked By: JDF	Project No.: 23-85312	Sht. No.:	
Engineer: ESP	Dwg File No.: 85312-GNDT	101	

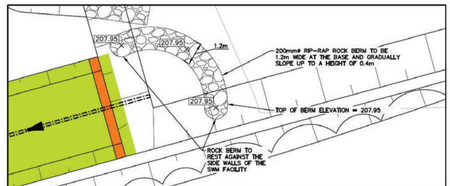
NOT FOR CONSTRUCTION



(A–A) DETAIL – TYPICAL SWALE CROSS–SECTION – FILL SCENARIO
SCALE = N.T.S.

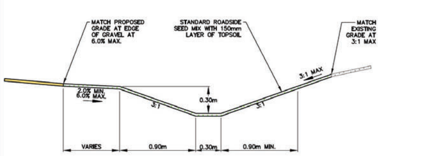


(C–C) DETAIL – SWM FACILITY EMERGENCY OVERFLOW WEIR CROSS–SECTION
SCALE = N.T.S.

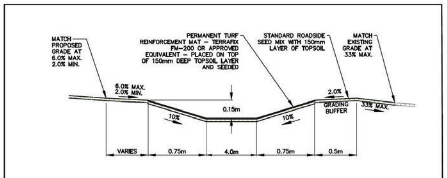


(109) RIP–RAP ROCK BERM
SCALE = N.T.S

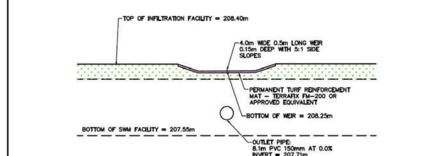
DATE JULY 2024
REV 0



(B–B) DETAIL – TYPICAL SWALE CROSS–SECTION – CUT SCENARIO
SCALE = N.T.S.

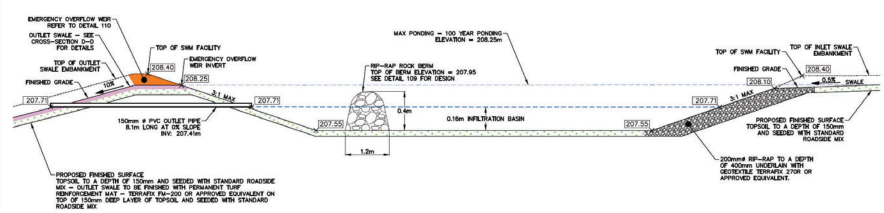


(D–D) DETAIL – EMERGENCY WEIR FLAT–BOTTOMED OUTLET SWALE
SCALE = N.T.S.



(110) EMERGENCY OVERFLOW WEIR
SCALE = N.T.S

DATE JUN 2023
REV 0



(E–E) STORMWATER INFILTRATION BASIN CROSS SECTION
SCALE = N.T.S.

DATE JULY 2024
REV 0

BM1 – 210.63
COSINE BENCH MARK
00819668561 (CGVD28:78)

TRUE NORTH

KEY PLAN

REVISIONS

No.	Description	Date
1	SUBMITTED TO TOWNSHIP – 1ST SPA SUBMISSION	19/07/24

METRIC	Dimensions are in METRES and/or MILLIMETRES unless otherwise shown
LEGEND	TO BE READ IN CONJUNCTION WITH OPSD 100 SERIES

LICENSED PROFESSIONAL ENGINEER
C.M.PROCTOR
100195369
July 19, 2024
PROVINCE OF ONTARIO

WILLS

D.M. Wills Associates Limited
150 Jameson Drive
Peterborough, Ontario
Canada K9J 0B9
P. 705.742.2297
F. 705.748.9944
E. wills@dmwills.com

Project Name/Location

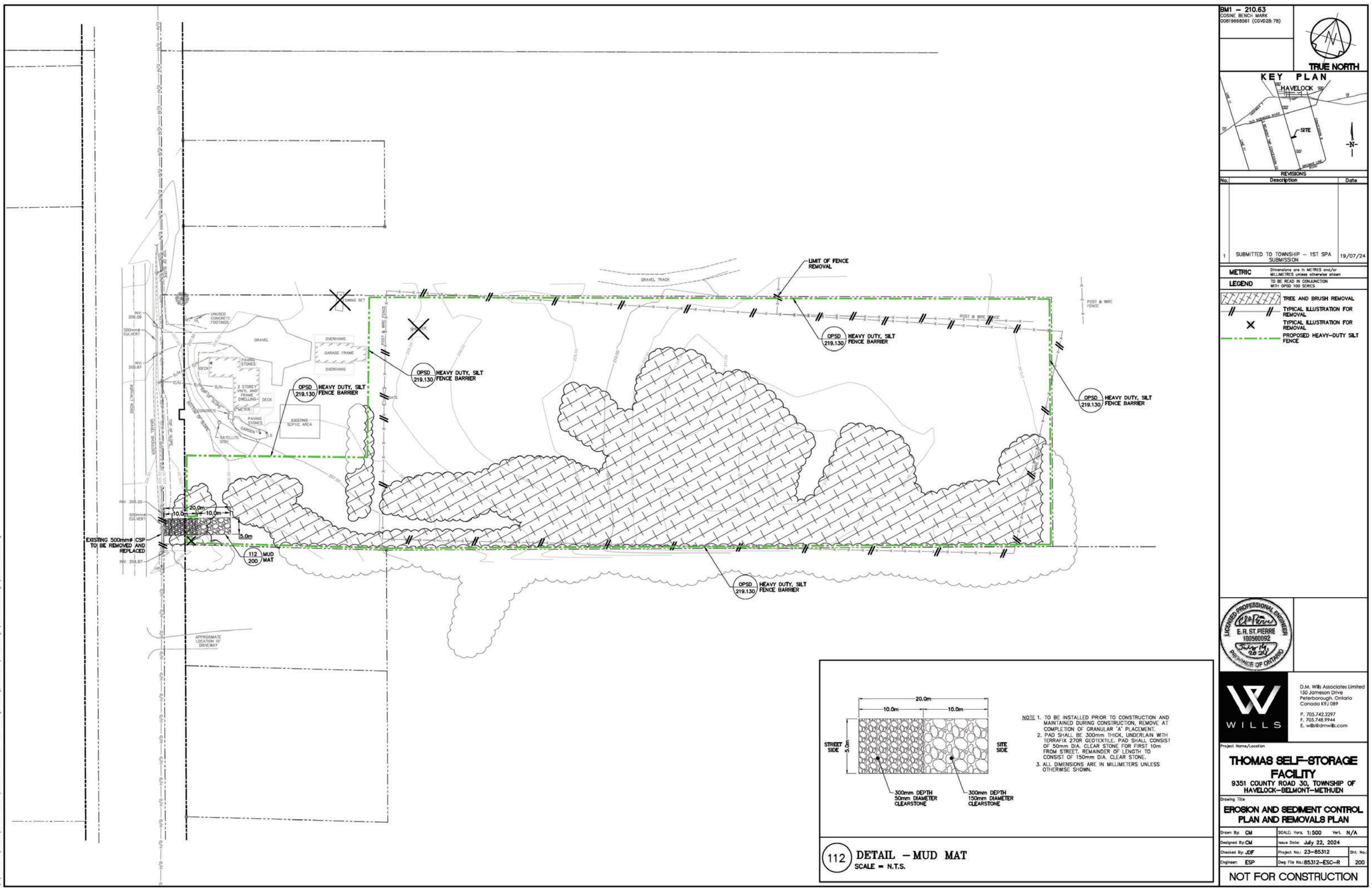
THOMAS SELF–STORAGE FACILITY
9351 COUNTY ROAD 30, TOWNSHIP OF HAVELOCK–BELMONT–METHUEN

Drawing Title

DETAILS

Drawn By: CM	SCALE: Horz. N/A Vert. N/A	
Designed By: CM	Issue Date: July 22, 2024	
Checked By: JDF	Project No.: 23–85312	Sht. No.:
Engineer: CPB	Dwg File No.: 85312–GNDT	102

NOT FOR CONSTRUCTION


BM1 – 210.63
TRUE NORTH
KEY PLAN
HAVELOCK
SITE
REVISIONS
No.
Description
Date
1
SUBMITTED TO TOWNSHIP – 1ST SPA SUBMISSION
19/07/24
METRIC
LEGEND
TREE AND BRUSH REMOVAL
TYPICAL ILLUSTRATION FOR REMOVAL
TYPICAL ILLUSTRATION FOR REMOVAL
PROPOSED HEAVY-DUTY SILT FENCE
LIMIT OF FENCE REMOVAL
GRAVEL TRACK
POST & WIRE FENCE
OPSD 219.130 HEAVY DUTY, SILT FENCE BARRIER
OPSD 219.130 HEAVY DUTY, SILT FENCE BARRIER
OPSD 219.130 HEAVY DUTY, SILT FENCE BARRIER
OPSD 219.130 HEAVY DUTY, SILT FENCE BARRIER
OPSD 219.130 HEAVY DUTY, SILT FENCE BARRIER
GRAVEL
OVERHANG
GARAGE FRAME
OVERHANG
PAVING STONES
2 STOREY VINYL AND FRAME DWELLING
DECK
PAVING STONES
EXISTING SEPTIC AREA
20.0m
10.0m
10.0m
5.0m
EXISTING 500mmø CSP TO BE REMOVED AND REPLACED
112 MUD MAT 200
20.0m
10.0m
10.0m
STREET SIDE
SITE SIDE
300mm DEPTH 50mm DIAMETER CLEARSTONE
300mm DEPTH 150mm DIAMETER CLEARSTONE
NOTE 1. TO BE INSTALLED PRIOR TO CONSTRUCTION AND MAINTAINED DURING CONSTRUCTION, REMOVE AT COMPLETION OF GRANULAR 'A' PLACEMENT.
2. PAD SHALL BE 300mm THICK, UNDERLAIN WITH TERRAFIX 270R GEOTEXTILE. PAD SHALL CONSIST OF 50mm DIA. CLEAR STONE FOR FIRST 10m FROM STREET. REMAINDER OF LENGTH TO CONSIST OF 150mm DIA. CLEAR STONE.
3. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN.
112 DETAIL – MUD MAT
SCALE = N.T.S.
PROVINCE OF ONTARIO
WILLS
D.M. Wills Associates Limited
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Canada K9J 0B9
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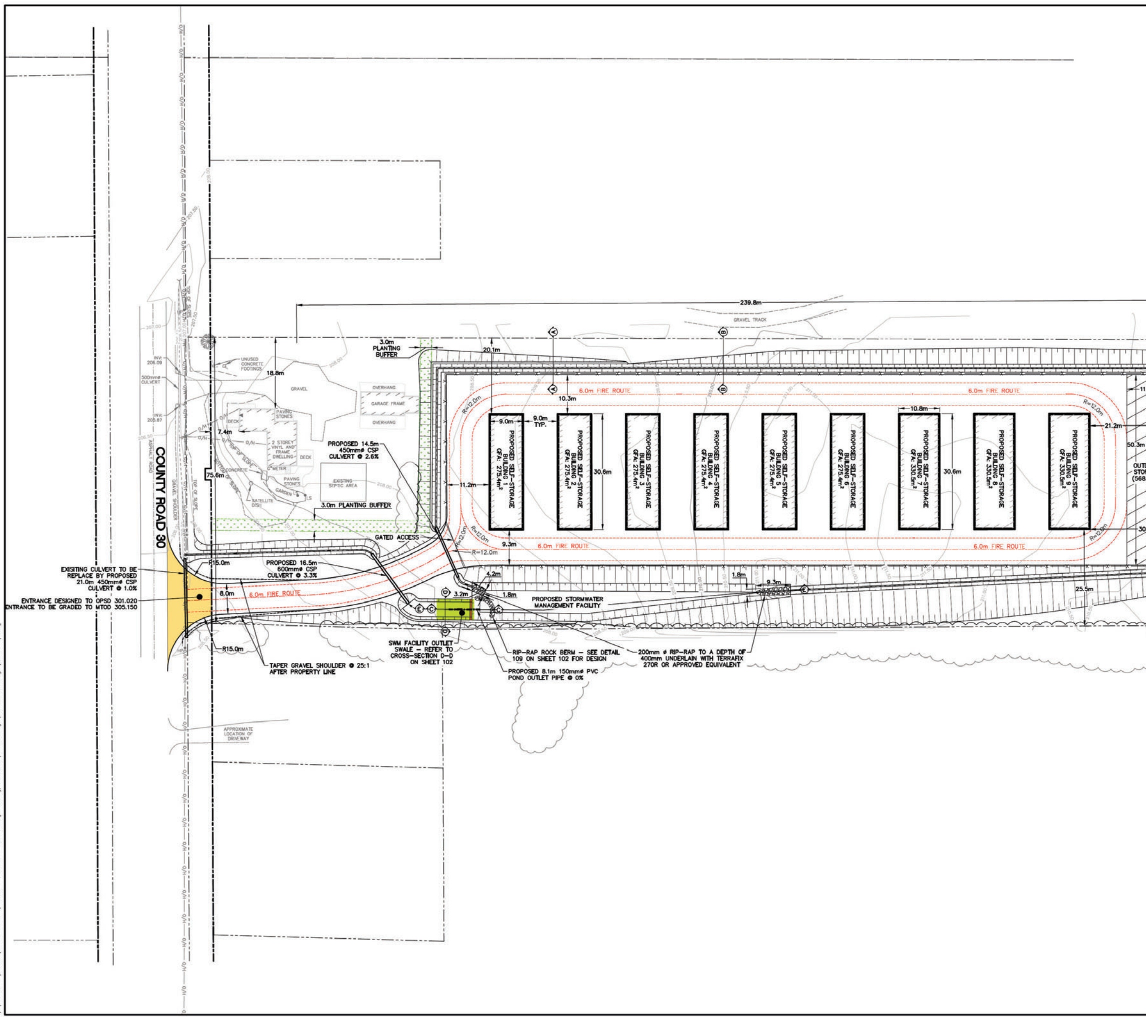
E. wills@dmwills.com
Project Name/Location
THOMAS SELF-STORAGE FACILITY
9351 COUNTY ROAD 30, TOWNSHIP OF HAVELOCK-BELMONT-METHUEN
Drawing Title
EROSION AND SEDIMENT CONTROL PLAN AND REMOVALS PLAN
Drawn By: CM
SCALE: Horz. 1:500 Vert. N/A
Designed By: CM
Issue Date: July 22, 2024
Checked By: JDF
Project No.: 23-85312
Sht. No.: 200
Engineer: ESP
Dwg File No.: 85312-ESC-R
NOT FOR CONSTRUCTION



SITE STATISTICS

ADDRESS:	9351 COUNTY ROAD 30, HAVELOCK-BELMONT-MENTHUEN
ZONING:	LOCAL COMMERCIAL C1
TOTAL LOT AREA:	20042.3m² (2.0ha)

REGULATIONS	EXISTING	REQUIRED	PROPOSED
MAX. NUMBER OF DWELLING UNITS PER BUILDING	1	1	N/A
MAX. NUMBER OF STOREYS	2	3	N/A
MIN. LOT AREA (m^2)	20042.3	2787.0	20042.3
MIN. LOT FRONTAGE (m)	61.0	75.6	75.6
MAX. LOT COVERAGE (%) TOTAL	1.3%	40%	14.5%
MAX. NUMBER OF BUILDINGS	0	N/A	9
MAX. HEIGHT (m)	–	9.0	TBD
BUILDING SETBACKS			
FRONT LOT LINE (m)	7.4	15.0	7.4
SIDE LOT LINE (m)	18.8	6.0	18.8
REAR LOT LINE (m)	239.8	7.5	30.3

BM1 – 210.63
COSINE BENCH MARK 00819668561 (CDV028/78)

TRUE NORTH

KEY PLAN

REVISIONS

No.	Description	Date
1	SUBMITTED TO TOWNSHIP – 1ST SPA SUBMISSION	19/07/24

METRIC: Dimensions are in METRES and/or MILLIMETRES unless otherwise shown

LEGEND: TO BE READ IN CONJUNCTION WITH OPSD 100 SERIES

PROPOSED HEAVY DUTY ASPHALT
PROPOSED GRAVEL/RIP-RAP
EX./PR. BUILDING
EX./PR. EDGE OF PAVEMENT
EX./PR. CURB
EX./PR. ROAD CENTERLINE
EX./PR. EDGE OF SHOULDER/GRAVEL
EX./PR. FIRE HYDRANT
EX./PR. WATER VALVE
EXISTING LIGHT STANDARD
EXISTING HYDRO POLE
EXISTING BELL POLE
EXISTING POLE ANCHOR
EX. BELL/CABLE PEDESTAL
EXISTING GASMAIN
EX. OVERHEAD BELL
EX. UNDERGROUND BELL
EX. OVERHEAD HYDRO
EX. UNDERGROUND HYDRO
EX. UNDERGROUND CABLE
EX. HYDRO MH
EX. BELL MH
EX. GAS VALVE
EX./PR. CULVERT
EX./PR. DITCH
EX./PR. STORM SEWER
EX./PR. SANITARY SEWER
EX./PR. FENCE
R.O.W
PROPERTY LINE
EXISTING VEGETATION
EX./PR. SIGN
TURF REINFORCEMENT MAT
SWM FACILITY OUTLET WEIR

LICENSED PROFESSIONAL ENGINEER
E.R. ST.PIERRE
100500092
July 19, 2024
PROVINCE OF ONTARIO

WILLS

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Project Name/Location

THOMAS SELF-STORAGE FACILITY

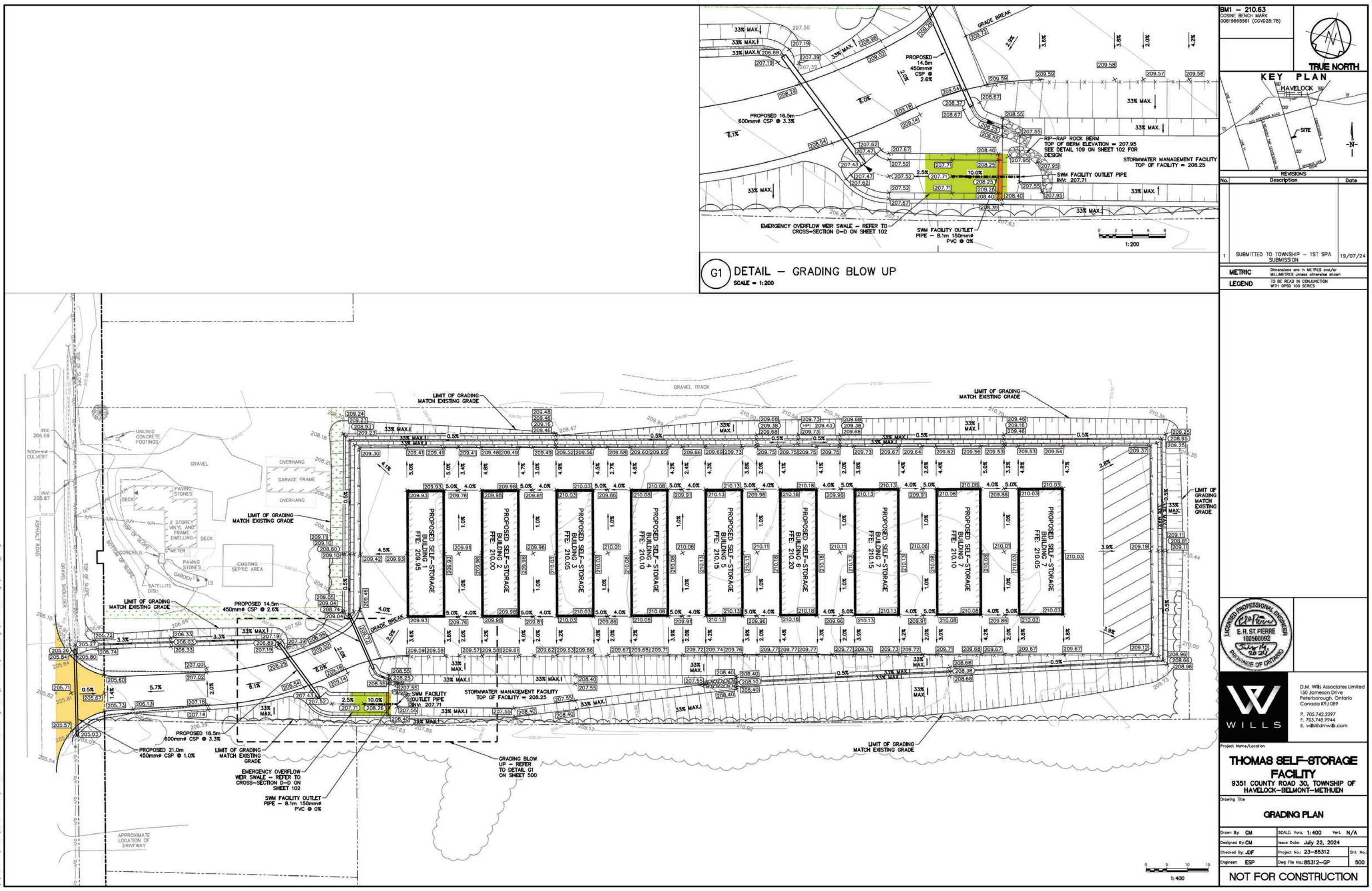
9351 COUNTY ROAD 30, TOWNSHIP OF HAVELOCK-BELMONT-METHUEN

Drawing Title

SITE PLAN

Drawn By: CM	SCALE: Horz. 1:500 Vert. N/A
Designed By: CM	Issue Date: July 22, 2024
Checked By: JDF	Project No.: 23-85312
Engineer: ESP	Dwg File No.: 85312-SP
	Sht. No.: 400

NOT FOR CONSTRUCTION



G1 DETAIL – GRADING BLOW UP
SCALE = 1:200
BM1 – 210.63
TRUE NORTH
KEY PLAN
HAVELOCK
SITE
REVISIONS
No. Description Date
1 SUBMITTED TO TOWNSHIP – 1ST SPA SUBMISSION 19/07/24
METRIC
LEGEND
PROPOSED SELF-STORAGE BUILDING 1 FFE: 209.95
PROPOSED SELF-STORAGE BUILDING 2 FFE: 210.00
PROPOSED SELF-STORAGE BUILDING 3 FFE: 210.05
PROPOSED SELF-STORAGE BUILDING 4 FFE: 210.10
PROPOSED SELF-STORAGE BUILDING 5 FFE: 210.15
PROPOSED SELF-STORAGE BUILDING 6 FFE: 210.20
PROPOSED SELF-STORAGE BUILDING 7 FFE: 210.15
PROPOSED SELF-STORAGE BUILDING 8 FFE: 210.10
PROPOSED SELF-STORAGE BUILDING 9 FFE: 210.05
LIMIT OF GRADING MATCH EXISTING GRADE
STORMWATER MANAGEMENT FACILITY TOP OF FACILITY = 208.25
SWM FACILITY OUTLET PIPE INV: 207.71
GRADING BLOW UP – REFER TO DETAIL G1 ON SHEET 500
D.M. Wills Associates Limited
150 Jameson Drive
Peterborough, Ontario
Canada K9J 0B9
WILLS
THOMAS SELF-STORAGE FACILITY
9351 COUNTY ROAD 30, TOWNSHIP OF HAVELOCK-BELMONT-METHUEN
GRADING PLAN
SCALE: Hor. 1:400 Vert. N/A
Issue Date: July 22, 2024
Project No.: 23-85312
500
NOT FOR CONSTRUCTION

WILLS

PARTNERS IN ENGINEERING, PLANNING & ENVIRONMENTAL SERVICES

April 22, 2024

Kirk Thomas
9351 County Road 30
Havelock-Belmont-Methuen, Ontario
K0L 1Z0

Attention: Kirk Thomas

Re: Site Entrance Assessment
Self Storage Facility
9351 County Road 30, Havelock-Belmont-Methuen
D.M. Wills Project No. 23-85312

D.M. Wills Associates Limited (Wills) is pleased to submit the following Site Entrance Assessment Brief to support a proposed self-storage facility (Development) on the lands known municipally as 9351 County Road 30 (Subject Property), Township Havelock-Belmont-Methuen (Township) in the County of Peterborough (County).

1.0 Roadway Existing Conditions

The Subject Property is located on the east side of County Road (CR) 30. The surrounding area is a mix of rural residential homes, agriculture lands, undeveloped lands, and some commercial uses as shown in **Appendix A**. The Subject Property is currently serviced by two unpaved driveways on CR 30.

This section of CR 30 is a two-way two-lane roadway segment with broken yellow centerline marking with a typical rural cross section with ditches and unpaved shoulders. The alignment of this section of CR 30 at the Subject Property is straight and relatively flat with no horizontal or vertical curves in the vicinity. The posted speed limit in this section is 80 km/hr.

2.0 Existing and Planned Site Conditions

Currently, the Subject Property has only one single detached house with an auxiliary building (garage) that is accessed using an existing driveway on the north side of the frontage. Nine self-storage buildings are proposed on the Subject Property with a total Gross Floor Area (GFA) of 2,634 m^2 (approximately 28,352 ft^2) and an outdoor storage area of 1142 m^2 (approximately 12,292 ft^2). This storage facility will be accessed by CR 30 through an existing driveway on the south portion of the frontage.

Professional Engineers Ontario
ASSOCIATION OF CONSULTING ENGINEERING COMPANIES ONTARIO
PGO
Health and Safety Excellence program Member wsib 2023

3.0 Existing and Future Traffic Conditions

Based on the traffic counts acquired from the County on CR 30 during different seasons, as shown in **Appendix B**, (i.e., spring, summer, and fall), the highest traffic volumes occurred during the summer season on July 6th, 2021. The peak hour is between 12:00 p.m. and 1:00 p.m. The traffic volumes during the peak hour are 159 vehicles per hour (vph) and 122 vph for the northbound and the southbound directions, respectively. Since these traffic counts were conducted during or close to COVID19 pandemic restrictions, an adjustment factor of 10% was applied to the traffic volumes. After the adjustment, the traffic volumes are 175 vph and 134 vph for the northbound and the southbound directions, respectively. Assuming an annual growth traffic factor of 2%, the traffic volumes in the horizon year of 2033 are 222 vph and 170 vph for northbound and the southbound directions, respectively.

The estimation of trips generated by the proposed development was derived from the Trip Generation Manual, 11th Edition[1], published by the Institute of Transportation Engineers (ITE). The ITE code of the land use, which closely describes a self-storage facility, and the corresponding trip generation rates are shown in **Table 1**. Also, the table shows the average trip generation rates of the generator (i.e., self-storage facility) for this land use for both the a.m. and the p.m. peaks and the percentages of entering and exiting. As a conservative assumption, the outdoor storage area is added to the self-storage building GFA in the calculations.

Table 1 – Trip Generation Rates of Generator during a.m. and p.m. Peak Hours

Land Use	ITE Code	a.m. Peak			p.m. Peak		
		Avg. Rate	Entering	Exiting	Avg. Rate	Entering	Exiting
Mini Warehouse	**151**	0.18	51%	49%	0.18	51%	49%

[1] Trip Generation Manual, Vol. 1, 2, and 3, 11th ed. ITE, Washington, D.C., 2021.

Table 2 – The Estimated Entering and Exiting Trips during a.m. and p.m. Peak Hours

Land Use	GFA (1000 ft²)	a.m. Peak			p.m. Peak		
		Avg. Rate	Entering	Exiting	Avg. Rate	Entering	Exiting
Self-Storage Facility	40.64	7	4	4	7	4	4

*Numbers may not add up due to rounding

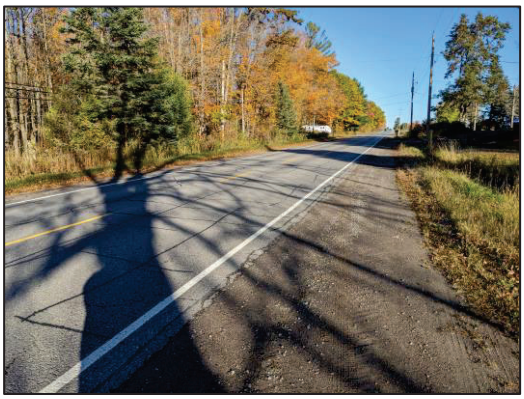
As shown in **Table 2**, the maximum number of trips to be generated is seven vph during the a.m. or p.m. peak hours including both entering and exiting trips. These seven trips are minimal and form about 3% and 4% of the anticipated northbound and southbound volumes in 2033, respectively. Accordingly, the trips generated will not have any impact on the adjacent CR 30 section and will not require any auxiliary lanes including both right and left turning lanes.

4.0 Visibility Requirements Assessment

A site visit was conducted on Thursday, October 23, 2023, to check the sight lines at the existing entrances of the Subject Property. Based on the sight line review, the available sight distance exceeds 180 m at both existing entrances, which is the required visibility distance for 80 km/hr speed limit roads according to County by-law no. 2012-26 in the visibility requirement section. The measurement of the sight lines assumed an observer's eye at 1.1 m above the shoulder of CR 18 and an object height of 1.3 m above the centreline of the on-coming lane as indicated in the County's by-law. **Figure 1** shows pictures taken in both directions at the existing south entrance of the storage facility on CR 30. The figure is for illustration purposes and not necessarily taken at the heights mentioned above.

Figure 1 - Existing South Entrance of the Development on CR 30

Looking South on CR 30



Looking North on CR 30

5.0 Conclusions and Recommendations

This brief reviewed the visibility requirements at the existing entrance of the proposed development, which is located on Peterborough CR 30. This brief assessed the trips that are anticipated to be generated from the property assuming a worst-case scenario for the trip generation. The results indicated significantly low volume (a total of seven trips during the a.m. and p.m. peak hours) of traffic is anticipated which will have no impact on the traffic operation of CR 30.

To review the visibility requirements, a field visit was conducted to collect the necessary measurements as indicated before in this brief. Based on the measurements taken in the field and County by-law no. 2012-26, the visibility requirements on CR 30 at the existing entrances of the Subject Property are satisfied based on a speed limit of 80 km/hr.

Although the low traffic volumes from the proposed development, both the existing north and south entrances are needed for the following reasons:

- The existing north entrance will be used exclusively by the existing dwelling unit.
- The existing north entrance is too narrow (about 3.14 m) to accommodate two-way traffic for the self-storage facility that will require a wider driveway. However, the existing north entrance is suitable for its existing use to accommodate passenger cars for the existing dwelling. Also, the north entrance is needed for fire truck access to the house since the only two options available for

truck access from the south entrance to the house are constrained as shown in **Appendix C:**

- The first option is that the fire truck goes from the south entrance and turn immediately left to access the west side of the house. Due to physical constraints in the front yard of the property, including steep grades, mature trees and the location of existing deck to enter the dwelling, the closest point the truck can reach is about 19.1 m from the house's entrance, more than the required 15 m, as shown in the appendix.
- The second option is that the fire truck will turn left and access the existing gravel area from the east side of the house. Due to the existing septic area and its 5 m setbacks required by the building code[2] to protect the system, the fire truck will not be able to access the house from this side without encroaching into the 5 m setback from the septic area, as shown in the appendix, which may cause damage to the septic elements.

- The existing turning radius of the north entrance, in addition to the location of the existing structures on the Subject Property will not accommodate typically longer recreational trailers (i.e., RV's, boat trailers, etc.) intended to be stored in the proposed outdoor storage area, as shown in **Appendix C**.
- There will be no road connection between the house and the storage facility in order to protect the existing septic system from any potential damage that may be caused by the site traffic.

Sincerely,

Mostafa Tawfeek

Mostafa Tawfeek Mohammed, Ph.D., P.Eng., PTOE, RSP1
Senior Traffic Engineer

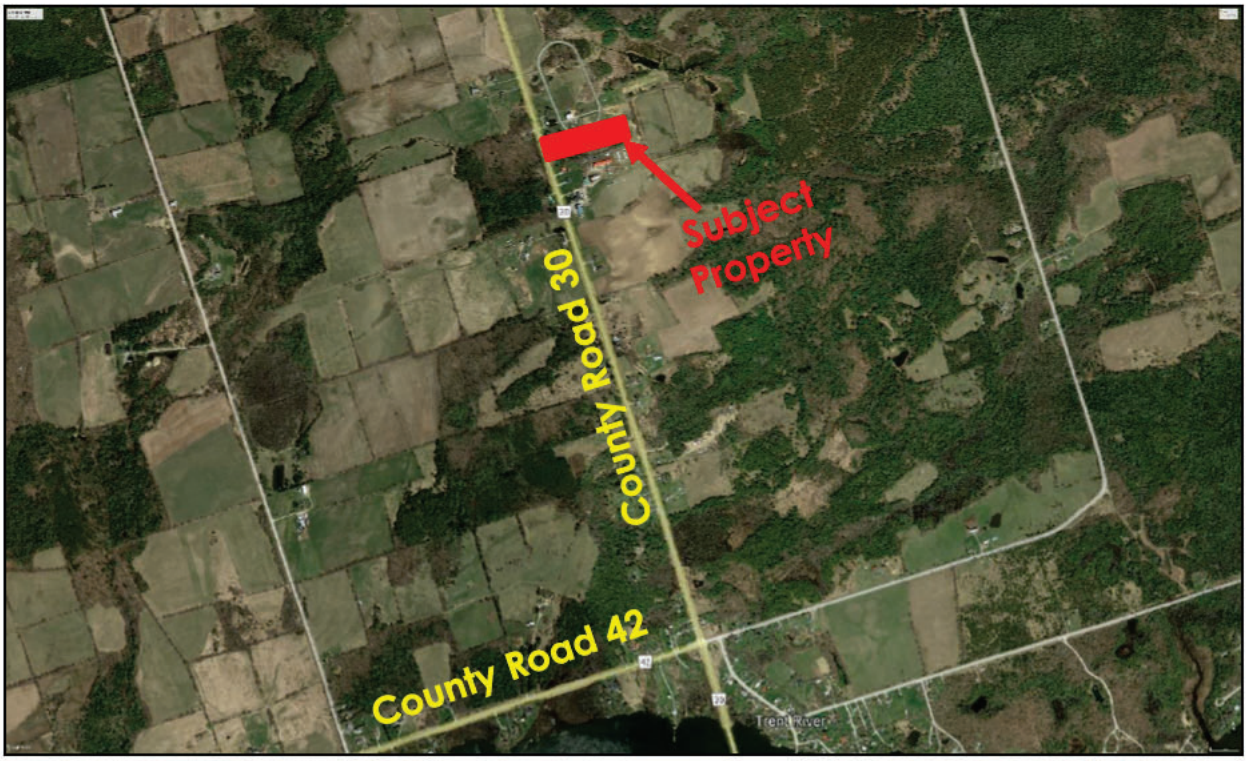
MT/af

[2] The Ontario Building Code | Clearances for a Class 4 or 5 Sewage System

Appendix A

Location Plan

Figure – Location Plan



Not to scale. Approximate location for illustration purposes only

Appendix B

Traffic Data

Basic Volume Report: 030-00940

Station ID : 030-00940
Info Line 1 : CR-30, South Limits of Haveloc
Info Line 2 : k-to-Trent River Bridge
GPS Lat/Lon :
DB File : DBFILE 060921 - 2.DB

Last Connected Device Type : Unicorn
Version Number : 4.31
Serial Number : 24130

Number of Lanes : 2
Posted Speed Limit : 0.0 kph

Lane #1 Configuration

#	Dir.	Information	Volume Mode	Volume Sensors	Divide By 2	Comment
1.	N	NB	Normal	Veh.	No	

Lane #1 Basic Volume Data From: 00:00 - 06/07/2021 To: 23:59 - 06/07/2021

Date	DW	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total
060721	M	3	4	1	5	9	40	42	58	83	86	103	111	96	110	112	134	125	114	68	58	32	17	9	7	1427
Month Total :		3	4	1	5	9	40	42	58	83	86	103	111	96	110	112	134	125	114	68	58	32	17	9	7	1427
Percent :		0%	0%	0%	0%	1%	3%	3%	4%	6%	6%	7%	8%	7%	8%	8%	9%	9%	8%	5%	4%	2%	1%	1%	0%	
ADT :		3	4	1	5	9	40	42	58	83	86	103	111	96	110	112	134	125	114	68	58	32	17	9	7	1427

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
DW Totals :	0	1427	0	0	0	0	0
# Days :	0.0	1.0	0.0	0.0	0.0	0.0	0.0
ADT :	0	1427	0	0	0	0	0
Percent :	0%	100%	0%	0%	0%	0%	0%

	Total	Percent
Weekday (Mon-Fri) :	1427	100%
ADT :	1427	
Weekend (Sat-Sun) :	0	0%
ADT :	0	

Lane #2 Configuration

#	Dir.	Information	Volume Mode	Volume Sensors	Divide By 2	Comment
2.	S	SB	Normal	Veh.	No	

Lane #2 Basic Volume Data From: 00:00 - 06/07/2021 To: 23:59 - 06/07/2021

Date	DW	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total
060721	M	3	2	1	0	8	36	73	108	105	82	94	106	113	117	111	110	124	113	54	51	31	22	10	11	1485
Month Total :		3	2	1	0	8	36	73	108	105	82	94	106	113	117	111	110	124	113	54	51	31	22	10	11	1485
Percent :		0%	0%	0%	0%	1%	2%	5%	7%	7%	6%	6%	7%	8%	8%	7%	7%	8%	8%	4%	3%	2%	1%	1%	1%	
ADT :		3	2	1	0	8	36	73	108	105	82	94	106	113	117	111	110	124	113	54	51	31	22	10	11	1485

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
DW Totals :	0	1485	0	0	0	0	0
# Days :	0.0	1.0	0.0	0.0	0.0	0.0	0.0
ADT :	0	1485	0	0	0	0	0
Percent :	0%	100%	0%	0%	0%	0%	0%

	Total	Percent
Weekday (Mon-Fri) :	1485	100%
ADT :	1485	
Weekend (Sat-Sun) :	0	0%
ADT :	0	

Basic Volume Summary: 030-00940

Grand Total For Data From: 00:00 - 06/07/2021 To: 23:59 - 06/07/2021

Total Count	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total
Lane #1	3	4	1	5	9	40	42	58	83	86	103	111	96	110	112	134	125	114	68	58	32	17	9	7	1427
Lane #2	3	2	1	0	8	36	73	108	105	82	94	106	113	117	111	110	124	113	54	51	31	22	10	11	1485
TOTAL	6	6	2	5	17	76	115	166	188	168	197	217	209	227	223	244	249	227	122	109	63	39	19	18	2912

Percents:	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
Lane #1	0%	0%	0%	0%	1%	3%	3%	4%	6%	6%	7%	8%	7%	8%	8%	9%	9%	8%	5%	4%	2%	1%	1%	0%
Lane #2	0%	0%	0%	0%	1%	2%	5%	7%	7%	6%	6%	7%	8%	8%	7%	7%	8%	8%	4%	3%	2%	1%	1%	1%
TOTAL	0%	0%	0%	0%	1%	3%	4%	6%	6%	6%	7%	7%	7%	8%	8%	8%	9%	8%	4%	4%	2%	1%	1%	1%

ADT:	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total
Lane #1	3	4	1	5	9	40	42	58	83	86	103	111	96	110	112	134	125	114	68	58	32	17	9	7	1427
Lane #2	3	2	1	0	8	36	73	108	105	82	94	106	113	117	111	110	124	113	54	51	31	22	10	11	1485
TOTAL	6	6	2	5	17	76	115	166	188	168	197	217	209	227	223	244	249	227	122	109	63	39	19	18	2912

LANE #1

	Sun	Mon	Tue	Wed	Thu	Fri	Sat		Total	Percent
DW Totals :	0	1427	0	0	0	0	0	Weekday (Mon-Fri) :	1427	100%
# Days :	0.0	1.0	0.0	0.0	0.0	0.0	0.0	ADT :	1427	
ADT :	0	1427	0	0	0	0	0	Weekend (Sat-Sun) :	0	0%
Percent :	0%	100%	0%	0%	0%	0%	0%	ADT :	0	

LANE #2

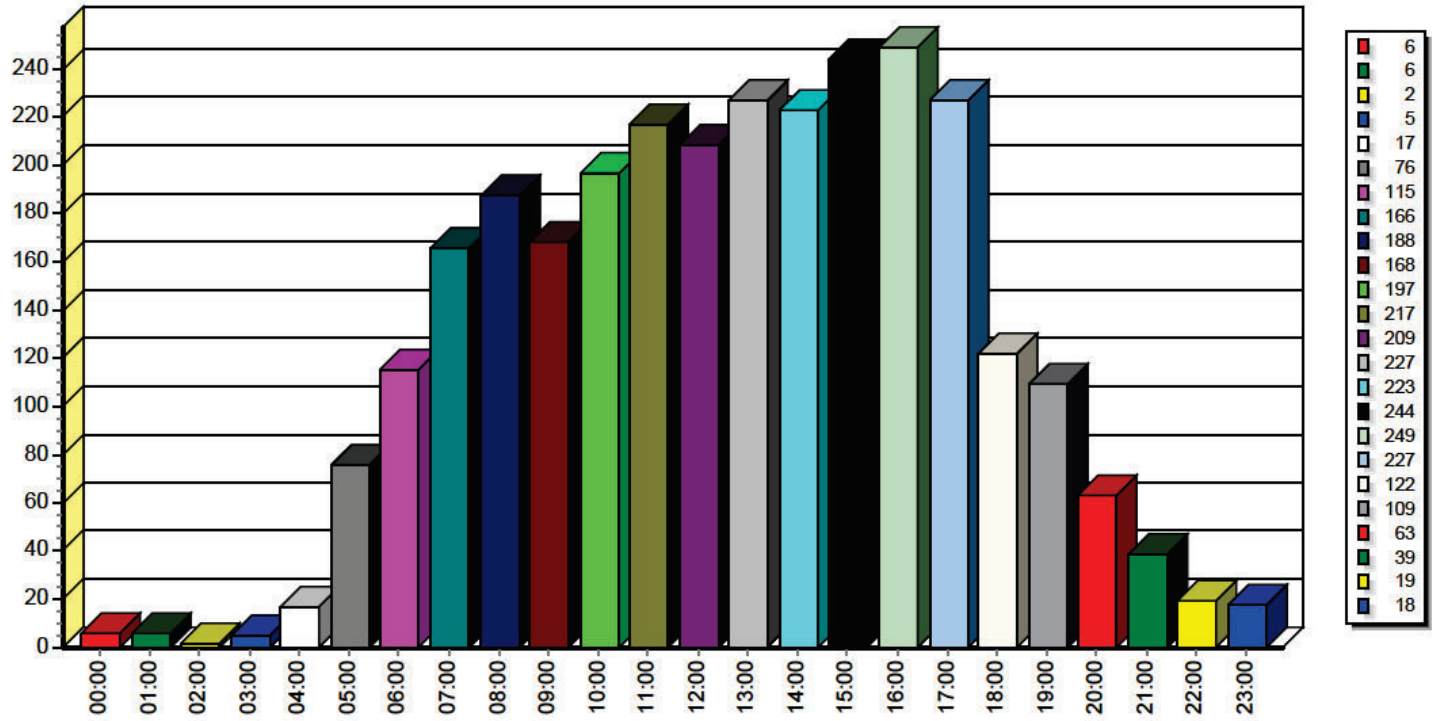
	Sun	Mon	Tue	Wed	Thu	Fri	Sat		Total	Percent
DW Totals :	0	1485	0	0	0	0	0	Weekday (Mon-Fri) :	1485	100%
# Days :	0.0	1.0	0.0	0.0	0.0	0.0	0.0	ADT :	1485	
ADT :	0	1485	0	0	0	0	0	Weekend (Sat-Sun) :	0	0%
Percent :	0%	100%	0%	0%	0%	0%	0%	ADT :	0	

ALL LANES

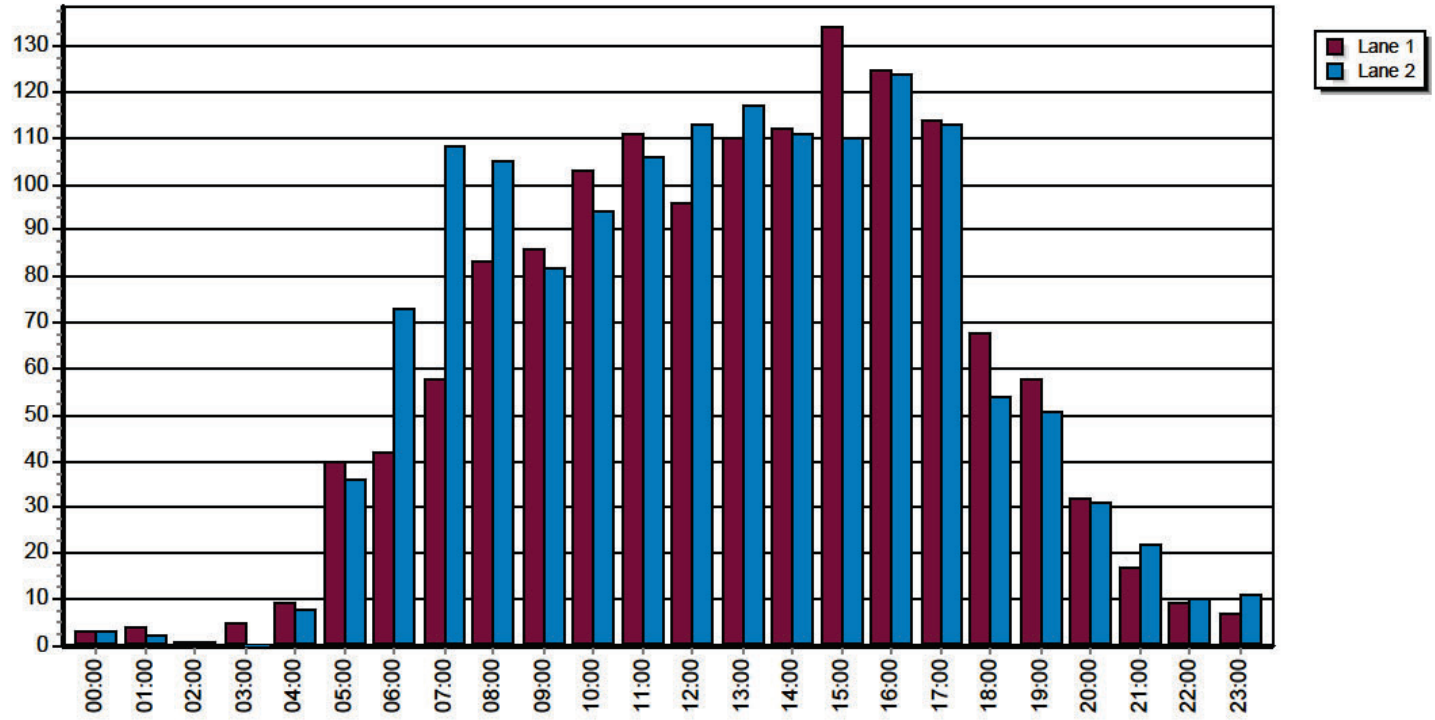
	Sun	Mon	Tue	Wed	Thu	Fri	Sat		Total	Percent
DW Totals :	0	2912	0	0	0	0	0	Weekday (Mon-Fri) :	2912	100%
# Days :	0.0	1.0	0.0	0.0	0.0	0.0	0.0	ADT :	2912	
ADT :	0	2912	0	0	0	0	0	Weekend (Sat-Sun) :	0	0%
Percent :	0%	100%	0%	0%	0%	0%	0%	ADT :	0	

030-00940 Charts For Data From: 00:00 - 06/07/2021 To: 23:59 - 06/07/2021

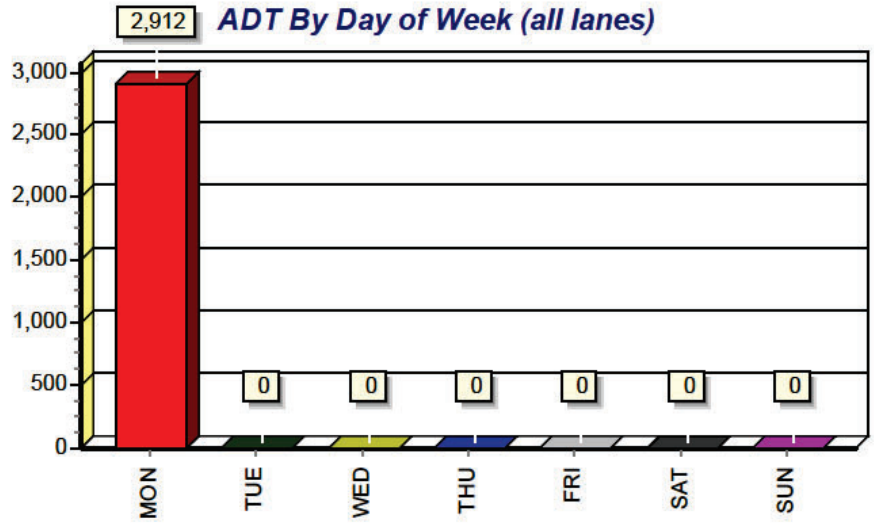
ADT Volume vs. Time (all lanes combined)



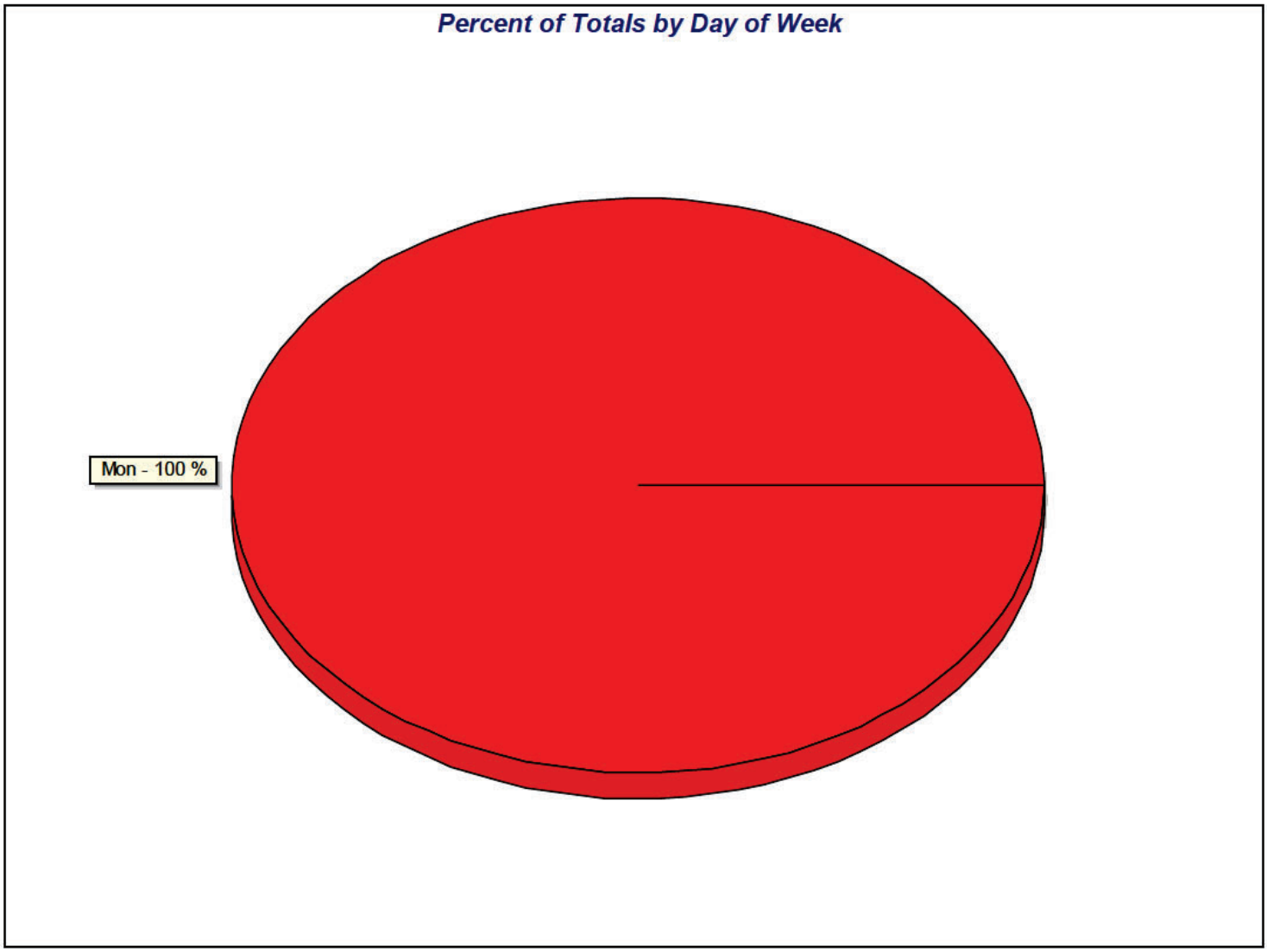
ADT Volume vs. Time (lane comparison)



030-00940 Charts For Data From: 00:00 - 06/07/2021 To: 23:59 - 06/07/2021



DAY	ADT	TOTAL	# DAYS
Mon	2912	2912	1.0
Tue	-	-	-
Wed	-	-	-
Thu	-	-	-
Fri	-	-	-
Sat	-	-	-
Sun	-	-	-



Basic Volume Report: 030-00940

Station ID : 030-00940
Info Line 1 : CR-30, South Limits of Haveloc
Info Line 2 : k-to-Trent River Bridge
GPS Lat/Lon :
DB File : DBFILE 070821 - 13.DB

Last Connected Device Type : Unicorn
Version Number : 2.94
Serial Number : 53184

Number of Lanes : 2
Posted Speed Limit : 0.0 kph

Lane #1 Configuration

#	Dir.	Information	Volume Mode	Volume Sensors	Divide By 2	Comment
1.	N	NB	Normal	Veh.	No	

Lane #1 Basic Volume Data From: 00:00 - 07/06/2021 To: 23:59 - 07/06/2021

Date	DW	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total
070621	T	8	5	5	3	11	42	57	77	102	90	129	139	159	141	138	141	128	118	82	62	43	32	13	5	1730
Month Total :		8	5	5	3	11	42	57	77	102	90	129	139	159	141	138	141	128	118	82	62	43	32	13	5	1730
Percent :		0%	0%	0%	0%	1%	2%	3%	4%	6%	5%	7%	8%	9%	8%	8%	8%	7%	7%	5%	4%	2%	2%	1%	0%	
ADT :		8	5	5	3	11	42	57	77	102	90	129	139	159	141	138	141	128	118	82	62	43	32	13	5	1730

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
DW Totals :	0	0	1730	0	0	0	0
# Days :	0.0	0.0	1.0	0.0	0.0	0.0	0.0
ADT :	0	0	1730	0	0	0	0
Percent :	0%	0%	100%	0%	0%	0%	0%

	Total	Percent
Weekday (Mon-Fri) :	1730	100%
ADT :	1730	
Weekend (Sat-Sun) :	0	0%
ADT :	0	

Lane #2 Configuration

#	Dir.	Information	Volume Mode	Volume Sensors	Divide By 2	Comment
2.	S	SB	Normal	Veh.	No	

Lane #2 Basic Volume Data From: 00:00 - 07/06/2021 To: 23:59 - 07/06/2021

Date	DW	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total
070621	T	7	0	1	3	1	34	83	106	101	127	123	141	122	138	110	124	114	129	67	48	51	27	22	12	1691
Month Total :		7	0	1	3	1	34	83	106	101	127	123	141	122	138	110	124	114	129	67	48	51	27	22	12	1691
Percent :		0%	0%	0%	0%	0%	2%	5%	6%	6%	8%	7%	8%	7%	8%	7%	7%	7%	8%	4%	3%	3%	2%	1%	1%	
ADT :		7	0	1	3	1	34	83	106	101	127	123	141	122	138	110	124	114	129	67	48	51	27	22	12	1691

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
DW Totals :	0	0	1691	0	0	0	0
# Days :	0.0	0.0	1.0	0.0	0.0	0.0	0.0
ADT :	0	0	1691	0	0	0	0
Percent :	0%	0%	100%	0%	0%	0%	0%

	Total	Percent
Weekday (Mon-Fri) :	1691	100%
ADT :	1691	
Weekend (Sat-Sun) :	0	0%
ADT :	0	

Basic Volume Summary: 030-00940

Grand Total For Data From: 00:00 - 07/06/2021 To: 23:59 - 07/06/2021

Total Count	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total
Lane #1	8	5	5	3	11	42	57	77	102	90	129	139	159	141	138	141	128	118	82	62	43	32	13	5	1730
Lane #2	7	0	1	3	1	34	83	106	101	127	123	141	122	138	110	124	114	129	67	48	51	27	22	12	1691
TOTAL	15	5	6	6	12	76	140	183	203	217	252	280	281	279	248	265	242	247	149	110	94	59	35	17	3421

Percents:	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
Lane #1	0%	0%	0%	0%	1%	2%	3%	4%	6%	5%	7%	8%	9%	8%	8%	8%	7%	7%	5%	4%	2%	2%	1%	0%
Lane #2	0%	0%	0%	0%	0%	2%	5%	6%	6%	8%	7%	8%	7%	8%	7%	7%	7%	8%	4%	3%	3%	2%	1%	1%
TOTAL	0%	0%	0%	0%	0%	2%	4%	5%	6%	6%	7%	8%	8%	8%	7%	8%	7%	7%	4%	3%	3%	2%	1%	0%

ADT:	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total
Lane #1	8	5	5	3	11	42	57	77	102	90	129	139	159	141	138	141	128	118	82	62	43	32	13	5	1730
Lane #2	7	0	1	3	1	34	83	106	101	127	123	141	122	138	110	124	114	129	67	48	51	27	22	12	1691
TOTAL	15	5	6	6	12	76	140	183	203	217	252	280	281	279	248	265	242	247	149	110	94	59	35	17	3421

LANE #1

	Sun	Mon	Tue	Wed	Thu	Fri	Sat		Total	Percent
DW Totals :	0	0	1730	0	0	0	0	Weekday (Mon-Fri) :	1730	100%
# Days :	0.0	0.0	1.0	0.0	0.0	0.0	0.0	ADT :	1730	
ADT :	0	0	1730	0	0	0	0	Weekend (Sat-Sun) :	0	0%
Percent :	0%	0%	100%	0%	0%	0%	0%	ADT :	0	

LANE #2

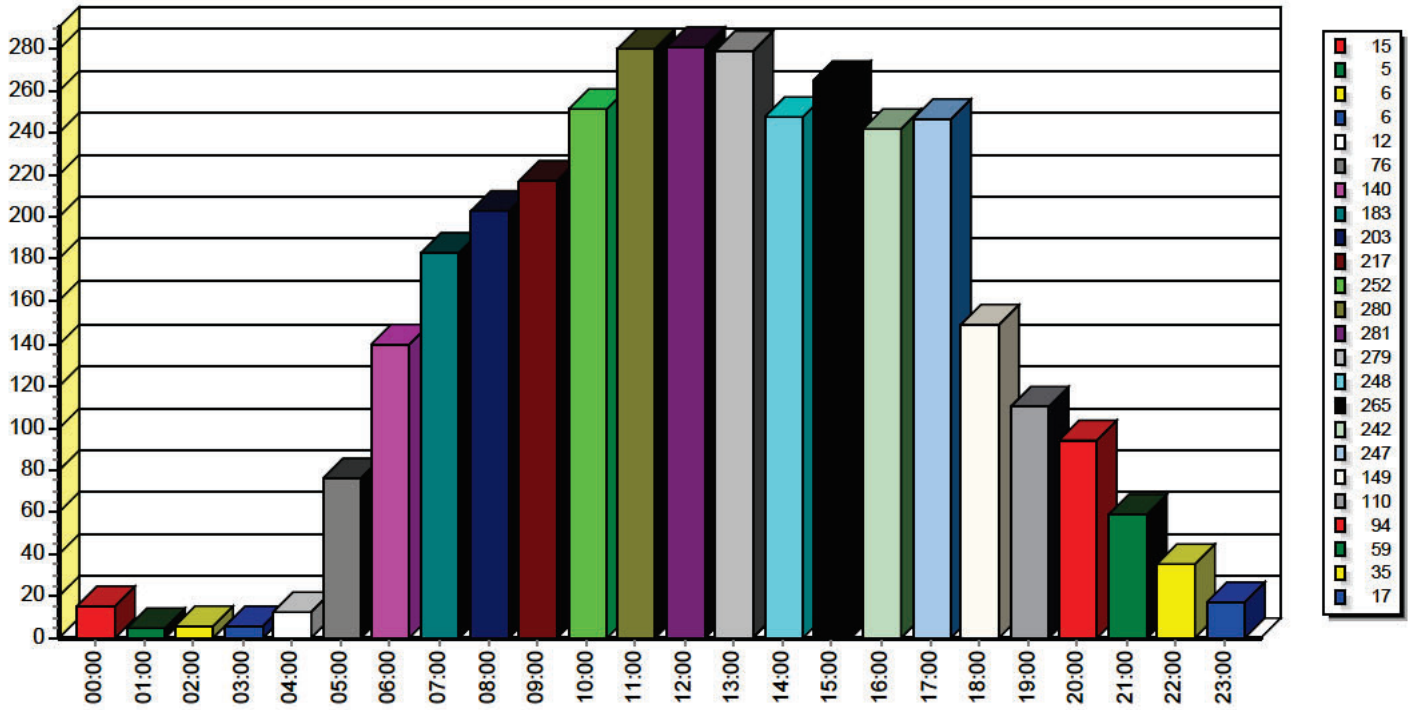
	Sun	Mon	Tue	Wed	Thu	Fri	Sat		Total	Percent
DW Totals :	0	0	1691	0	0	0	0	Weekday (Mon-Fri) :	1691	100%
# Days :	0.0	0.0	1.0	0.0	0.0	0.0	0.0	ADT :	1691	
ADT :	0	0	1691	0	0	0	0	Weekend (Sat-Sun) :	0	0%
Percent :	0%	0%	100%	0%	0%	0%	0%	ADT :	0	

ALL LANES

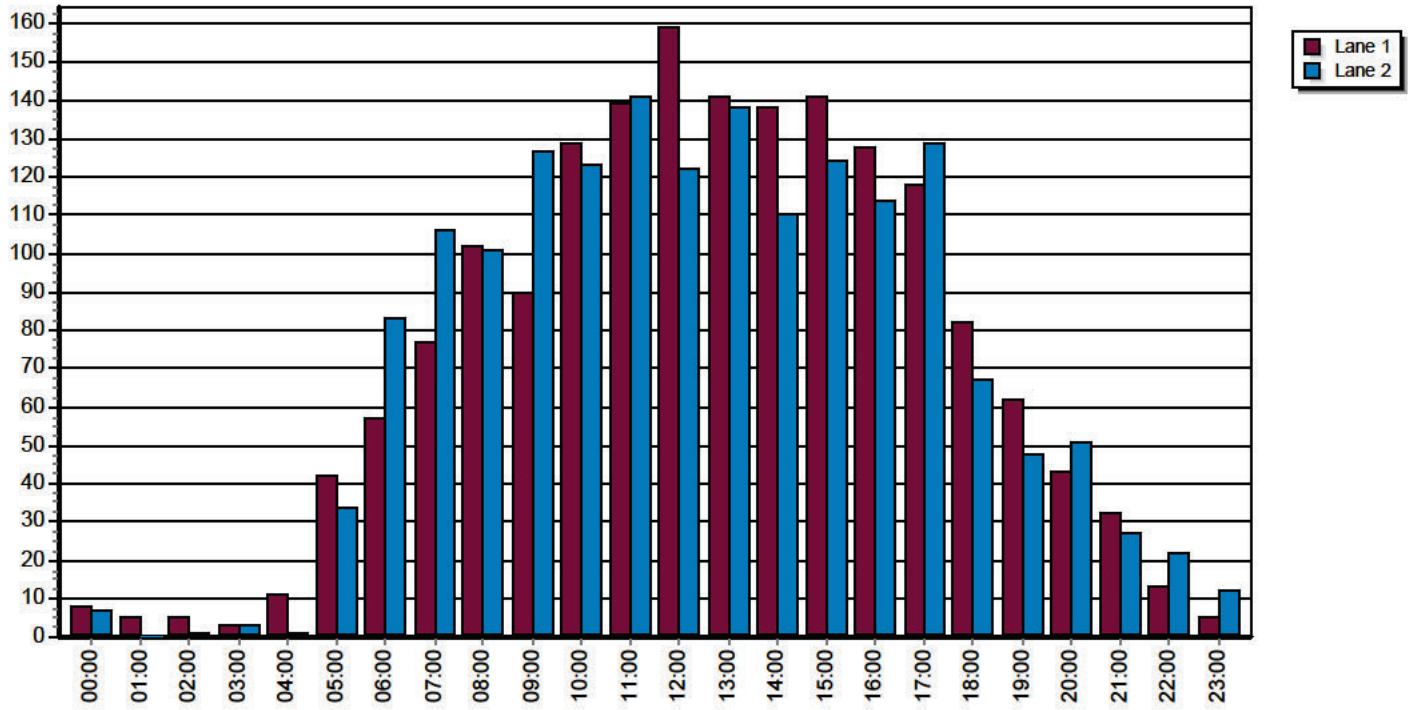
	Sun	Mon	Tue	Wed	Thu	Fri	Sat		Total	Percent
DW Totals :	0	0	3421	0	0	0	0	Weekday (Mon-Fri) :	3421	100%
# Days :	0.0	0.0	1.0	0.0	0.0	0.0	0.0	ADT :	3421	
ADT :	0	0	3421	0	0	0	0	Weekend (Sat-Sun) :	0	0%
Percent :	0%	0%	100%	0%	0%	0%	0%	ADT :	0	

030-00940 Charts For Data From: 00:00 - 07/06/2021 To: 23:59 - 07/06/2021

ADT Volume vs. Time (all lanes combined)

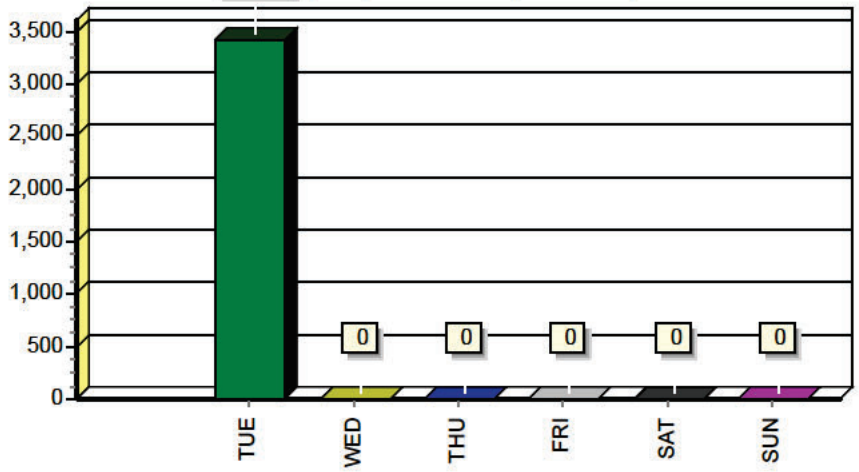


ADT Volume vs. Time (lane comparison)



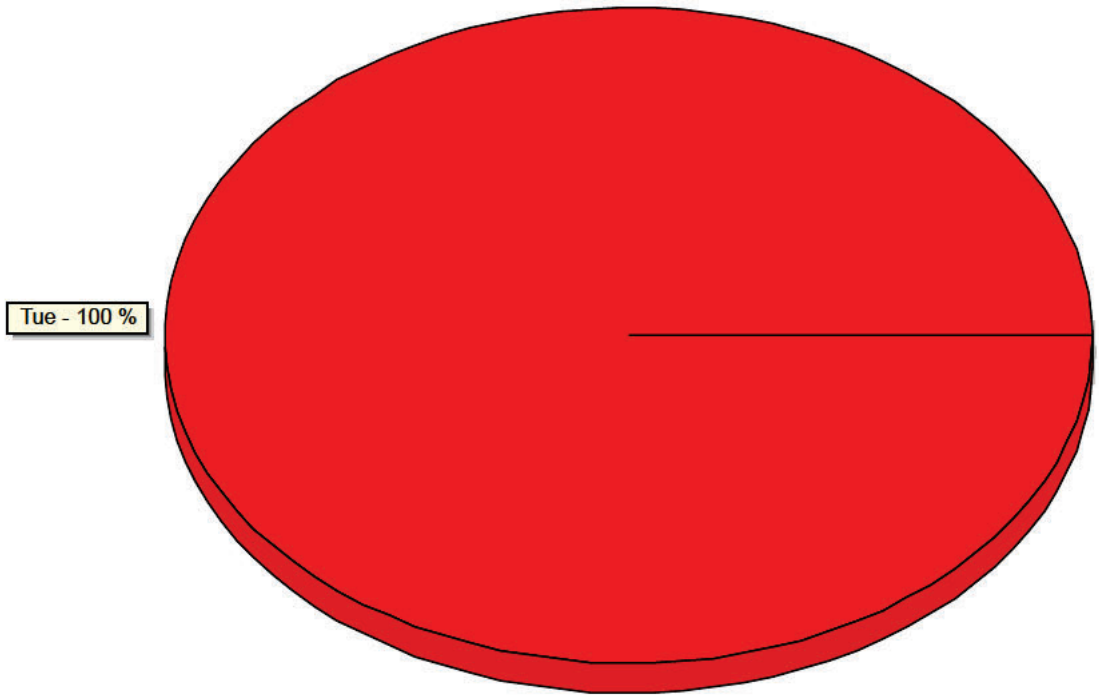
030-00940 Charts For Data From: 00:00 - 07/06/2021 To: 23:59 - 07/06/2021

ADT by Day of Week (all lanes)



DAY	ADT	TOTAL	# DAYS
Mon	-	-	-
Tue	3421	3421	1.0
Wed	-	-	-
Thu	-	-	-
Fri	-	-	-
Sat	-	-	-
Sun	-	-	-

Percent of Totals by Day of Week



Basic Volume Report: 030-00940

Station ID : 030-00940
Info Line 1 : CR-30, South Limits of Haveloc
Info Line 2 : k-to-Trent River Bridge
GPS Lat/Lon :
DB File : DBFILE 091621 - 77.DB

Last Connected Device Type : Phoenix
Version Number : 3.00
Serial Number : 37176

Number of Lanes : 2
Posted Speed Limit : 0.0 kph

Lane #1 Configuration

#	Dir.	Information	Volume Mode	Volume Sensors	Divide By 2	Comment
1.	N	NB	Normal	Veh.	No	

Lane #1 Basic Volume Data From: 00:00 - 09/14/2021 To: 23:59 - 09/14/2021

Date	DW	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total
091421	T	5	6	2	2	12	43	42	85	84	87	99	112	118	115	119	157	161	154	75	47	25	19	18	7	1594
Month Total :		5	6	2	2	12	43	42	85	84	87	99	112	118	115	119	157	161	154	75	47	25	19	18	7	1594
Percent :		0%	0%	0%	0%	1%	3%	3%	5%	5%	5%	6%	7%	7%	7%	7%	10%	10%	10%	5%	3%	2%	1%	1%	0%	
ADT :		5	6	2	2	12	43	42	85	84	87	99	112	118	115	119	157	161	154	75	47	25	19	18	7	1594

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
DW Totals :	0	0	1594	0	0	0	0
# Days :	0.0	0.0	1.0	0.0	0.0	0.0	0.0
ADT :	0	0	1594	0	0	0	0
Percent :	0%	0%	100%	0%	0%	0%	0%

	Total	Percent
Weekday (Mon-Fri) :	1594	100%
ADT :	1594	
Weekend (Sat-Sun) :	0	0%
ADT :	0	

Lane #2 Configuration

#	Dir.	Information	Volume Mode	Volume Sensors	Divide By 2	Comment
2.	S	SB	Normal	Veh.	No	

Lane #2 Basic Volume Data From: 00:00 - 09/14/2021 To: 23:59 - 09/14/2021

Date	DW	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total
091421	T	6	3	2	3	4	25	73	126	146	123	99	110	114	118	113	141	103	145	61	48	28	22	8	9	1630
Month Total :		6	3	2	3	4	25	73	126	146	123	99	110	114	118	113	141	103	145	61	48	28	22	8	9	1630
Percent :		0%	0%	0%	0%	0%	2%	4%	8%	9%	8%	6%	7%	7%	7%	7%	9%	6%	9%	4%	3%	2%	1%	0%	1%	
ADT :		6	3	2	3	4	25	73	126	146	123	99	110	114	118	113	141	103	145	61	48	28	22	8	9	1630

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
DW Totals :	0	0	1630	0	0	0	0
# Days :	0.0	0.0	1.0	0.0	0.0	0.0	0.0
ADT :	0	0	1630	0	0	0	0
Percent :	0%	0%	100%	0%	0%	0%	0%

	Total	Percent
Weekday (Mon-Fri) :	1630	100%
ADT :	1630	
Weekend (Sat-Sun) :	0	0%
ADT :	0	

Basic Volume Summary: 030-00940

Grand Total For Data From: 00:00 - 09/14/2021 To: 23:59 - 09/14/2021

Total Count	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total
Lane #1	5	6	2	2	12	43	42	85	84	87	99	112	118	115	119	157	161	154	75	47	25	19	18	7	1594
Lane #2	6	3	2	3	4	25	73	126	146	123	99	110	114	118	113	141	103	145	61	48	28	22	8	9	1630
TOTAL	11	9	4	5	16	68	115	211	230	210	198	222	232	233	232	298	264	299	136	95	53	41	26	16	3224

Percents:	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300
Lane #1	0%	0%	0%	0%	1%	3%	3%	5%	5%	5%	6%	7%	7%	7%	7%	10%	10%	10%	5%	3%	2%	1%	1%	0%
Lane #2	0%	0%	0%	0%	0%	2%	4%	8%	9%	8%	6%	7%	7%	7%	7%	9%	6%	9%	4%	3%	2%	1%	0%	1%
TOTAL	0%	0%	0%	0%	0%	2%	4%	7%	7%	7%	6%	7%	7%	7%	7%	9%	8%	9%	4%	3%	2%	1%	1%	0%

ADT:	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Total
Lane #1	5	6	2	2	12	43	42	85	84	87	99	112	118	115	119	157	161	154	75	47	25	19	18	7	1594
Lane #2	6	3	2	3	4	25	73	126	146	123	99	110	114	118	113	141	103	145	61	48	28	22	8	9	1630
TOTAL	11	9	4	5	16	68	115	211	230	210	198	222	232	233	232	298	264	299	136	95	53	41	26	16	3224

LANE #1

	Sun	Mon	Tue	Wed	Thu	Fri	Sat		Total	Percent
DW Totals :	0	0	1594	0	0	0	0	Weekday (Mon-Fri) :	1594	100%
# Days :	0.0	0.0	1.0	0.0	0.0	0.0	0.0	ADT :	1594	
ADT :	0	0	1594	0	0	0	0	Weekend (Sat-Sun) :	0	0%
Percent :	0%	0%	100%	0%	0%	0%	0%	ADT :	0	

LANE #2

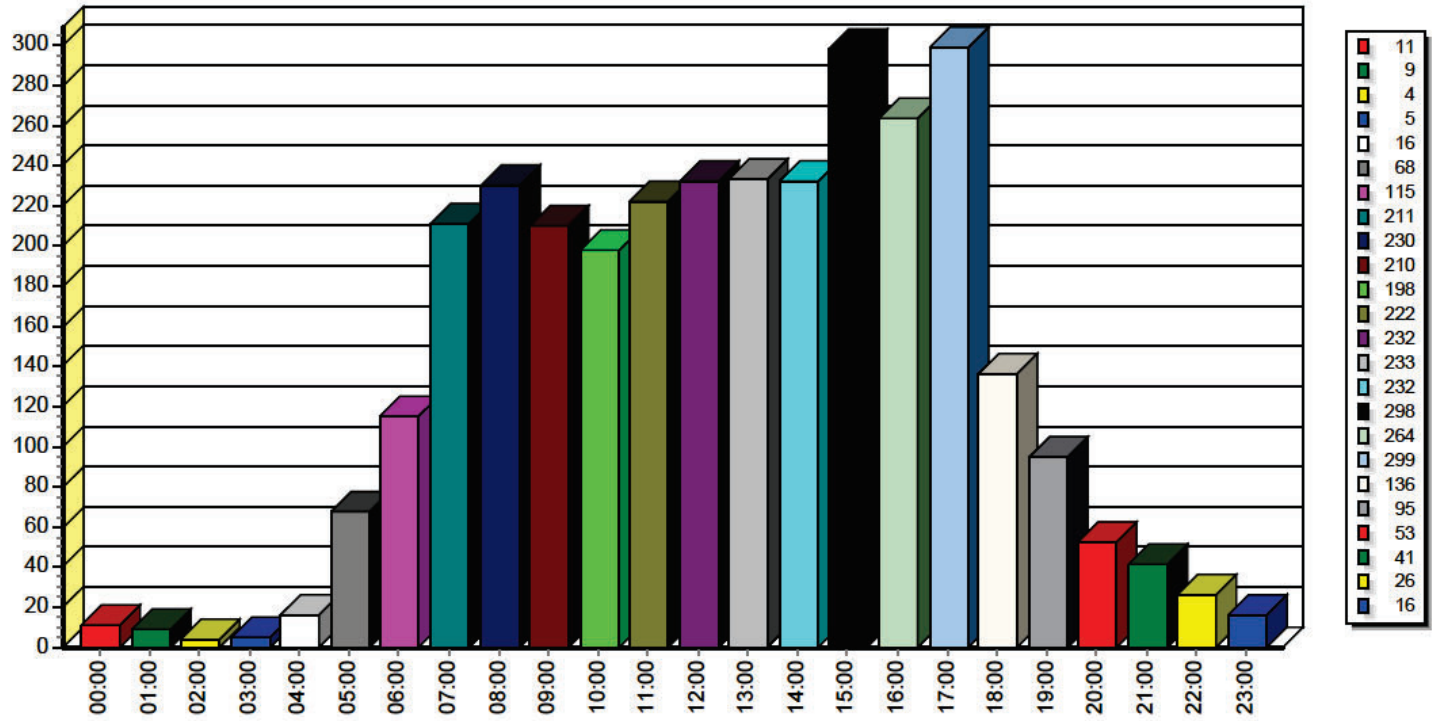
	Sun	Mon	Tue	Wed	Thu	Fri	Sat		Total	Percent
DW Totals :	0	0	1630	0	0	0	0	Weekday (Mon-Fri) :	1630	100%
# Days :	0.0	0.0	1.0	0.0	0.0	0.0	0.0	ADT :	1630	
ADT :	0	0	1630	0	0	0	0	Weekend (Sat-Sun) :	0	0%
Percent :	0%	0%	100%	0%	0%	0%	0%	ADT :	0	

ALL LANES

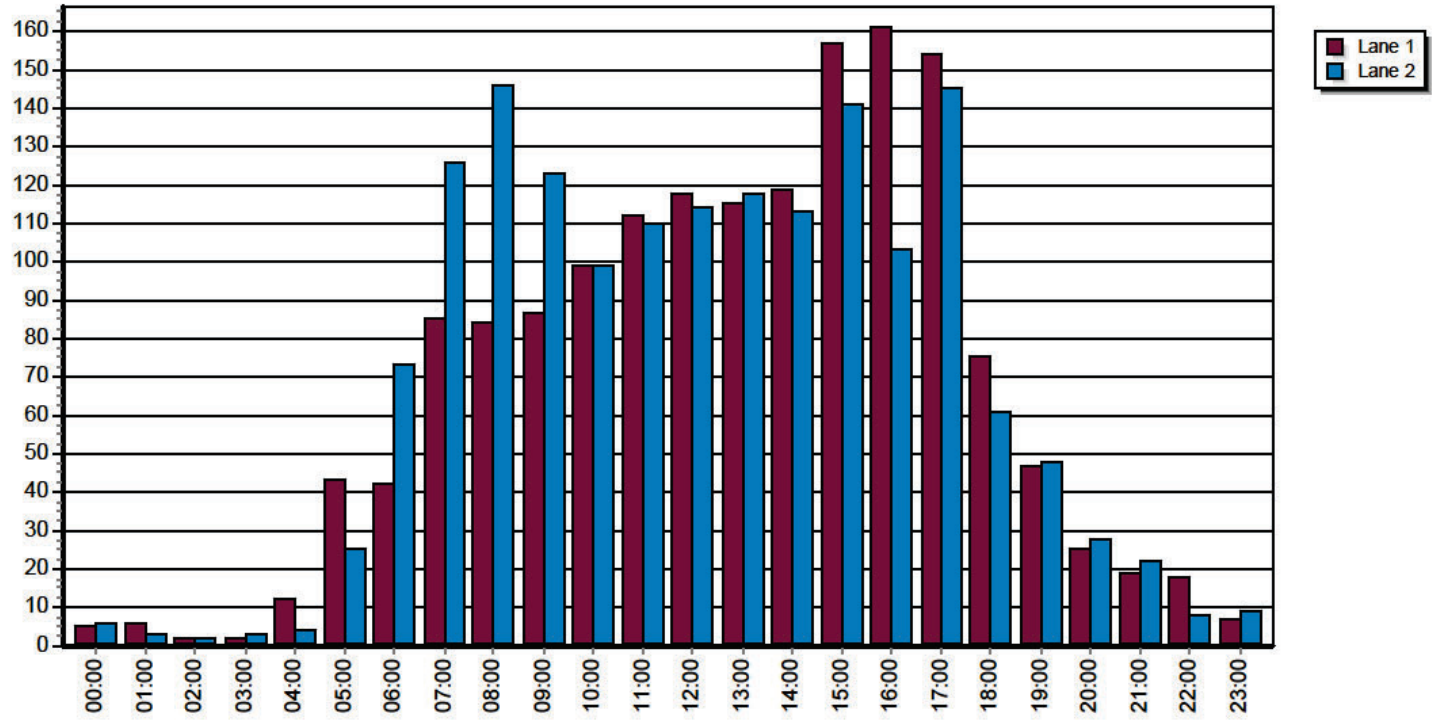
	Sun	Mon	Tue	Wed	Thu	Fri	Sat		Total	Percent
DW Totals :	0	0	3224	0	0	0	0	Weekday (Mon-Fri) :	3224	100%
# Days :	0.0	0.0	1.0	0.0	0.0	0.0	0.0	ADT :	3224	
ADT :	0	0	3224	0	0	0	0	Weekend (Sat-Sun) :	0	0%
Percent :	0%	0%	100%	0%	0%	0%	0%	ADT :	0	

030-00940 Charts For Data From: 00:00 - 09/14/2021 To: 23:59 - 09/14/2021

ADT Volume vs. Time (all lanes combined)

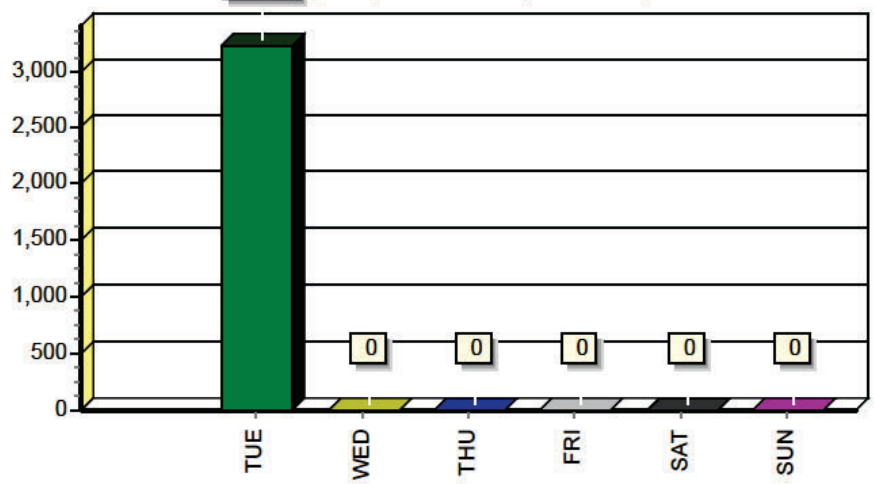


ADT Volume vs. Time (lane comparison)



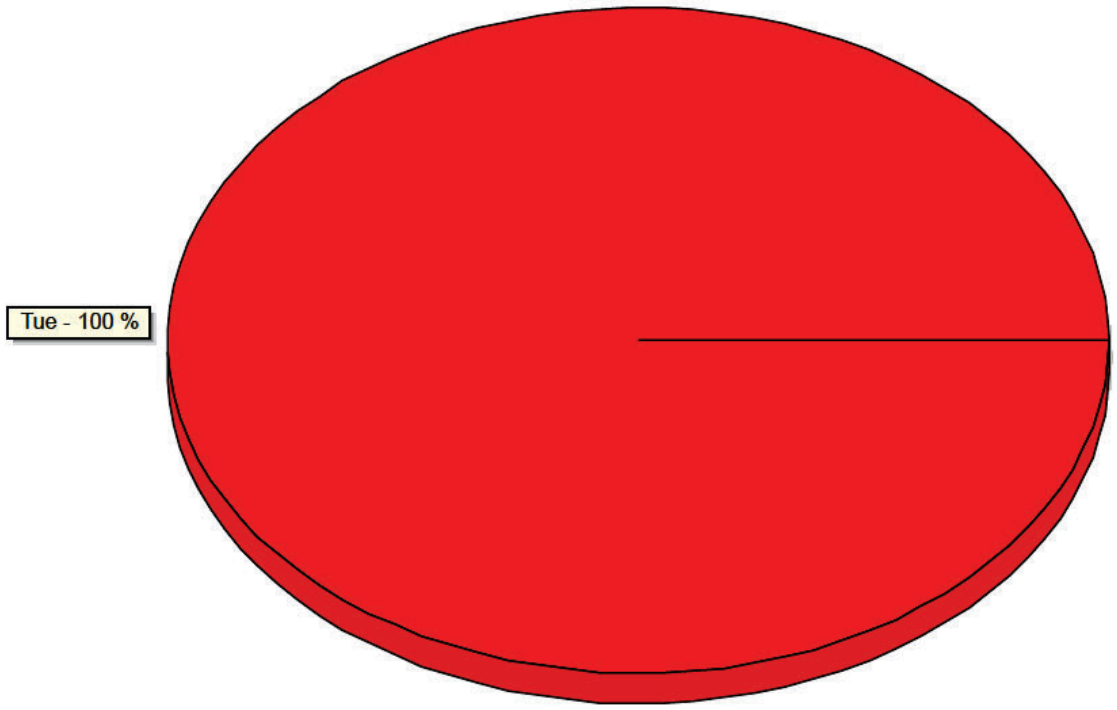
030-00940 Charts For Data From: 00:00 - 09/14/2021 To: 23:59 - 09/14/2021

Day of Week (all lanes)



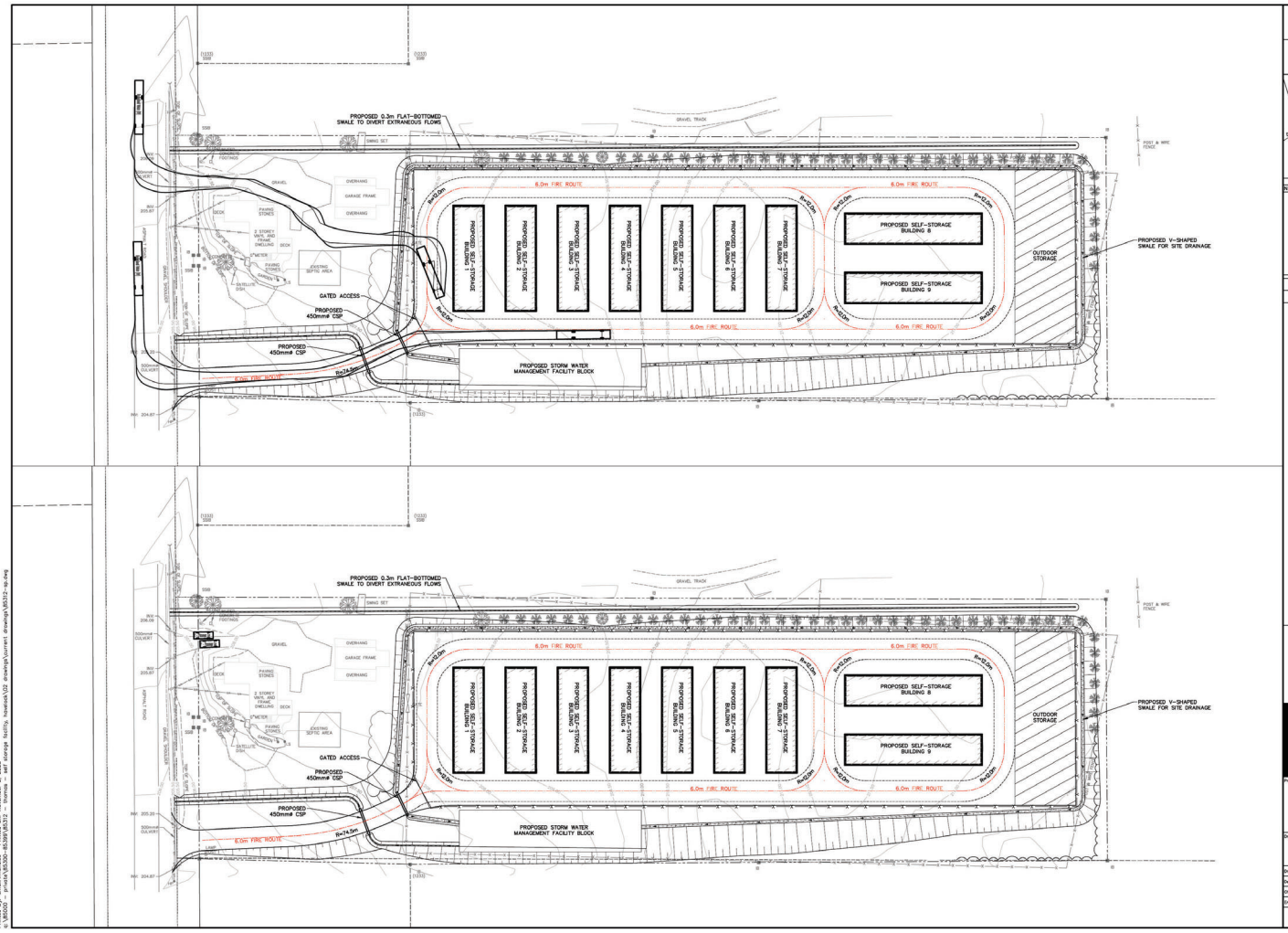
DAY	ADT	TOTAL	# DAYS
Mon	-	-	-
Tue	3224	3224	1.0
Wed	-	-	-
Thu	-	-	-
Fri	-	-	-
Sat	-	-	-
Sun	-	-	-

Percent of Totals by Day of Week



Appendix C

Vehicle Tracking Figure



TRUE NORTH

KEY PLAN

REVISIONS

No.	Description	Date

METRIC	Dimensions are in METRES and/or MILLIMETRES unless otherwise shown
LEGEND	TO BE READ IN CONJUNCTION WITH SPSD 100 SERIES

WILLS

D.M. Wills Associates Limited
120 Johnson Drive
Peterborough, Ontario
Canada K9J 0B9

T. 705.743.2297
F. 705.748.9944
E. wills@dmwills.com

Project Name/Location

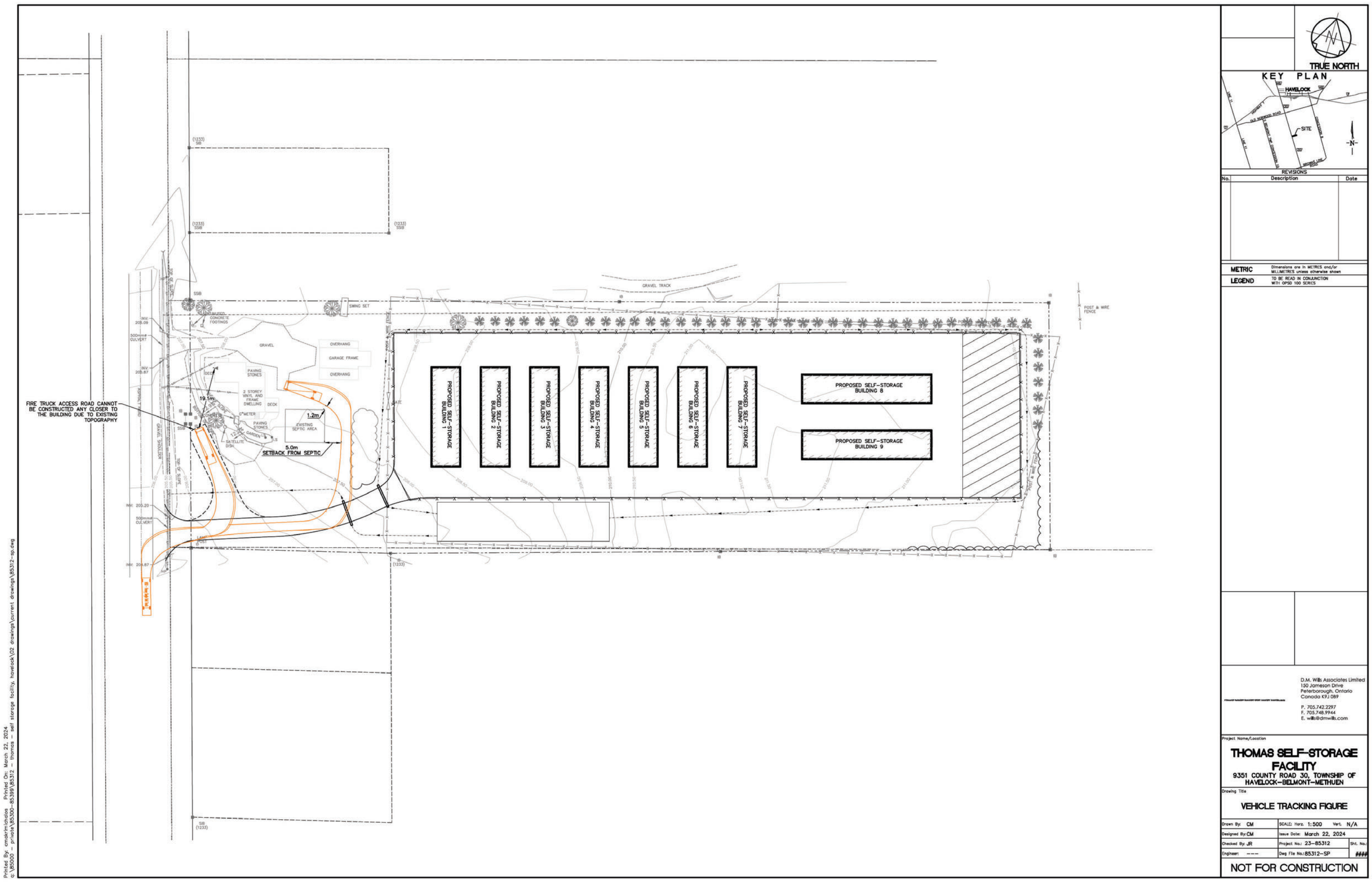
THOMAS SELF-STORAGE FACILITY
9351 COUNTY ROAD 30, TOWNSHIP OF HAVELOCK-BELMONT-METHUEN

Drawing Title

VEHICLE TRACKING FIGURE

Drawn By: CM	SCALE: Horz. 1:500	Vert. N/A	
Designed By:CM	Issue Date: November 2, 2023		
Checked By: JR	Project No: 23-85312	Dr. No.	
Engineer: ----	Dwg File No.:85312-SP	####	

NOT FOR CONSTRUCTION


TRUE NORTH
KEY PLAN
HAVELOCK
SITE
REVISIONS
No. Description Date
METRIC Dimensions are in METRES and/or MILLIMETRES unless otherwise shown
LEGEND TO BE READ IN CONJUNCTION WITH OPSD 100 SERIES
FIRE TRUCK ACCESS ROAD CANNOT BE CONSTRUCTED ANY CLOSER TO THE BUILDING DUE TO EXISTING TOPOGRAPHY
GRAVEL
OVERHANG
GARAGE FRAME
PAVING STONES
2 STOREY VINYL AND FRAME DWELLING
DECK
EXISTING SEPTIC AREA
1.2m
19.1m
5.0m
SETBACK FROM SEPTIC
GRAVEL TRACK
POST & WIRE FENCE
PROPOSED SELF-STORAGE BUILDING 1
PROPOSED SELF-STORAGE BUILDING 2
PROPOSED SELF-STORAGE BUILDING 3
PROPOSED SELF-STORAGE BUILDING 4
PROPOSED SELF-STORAGE BUILDING 5
PROPOSED SELF-STORAGE BUILDING 6
PROPOSED SELF-STORAGE BUILDING 7
PROPOSED SELF-STORAGE BUILDING 8
PROPOSED SELF-STORAGE BUILDING 9
D.M. Wills Associates Limited
150 Jameson Drive
Peterborough, Ontario
Canada K9J 0B9
P. 705.742.2297
F. 705.748.9944
E. wills@dmwills.com
Project Name/Location
THOMAS SELF-STORAGE FACILITY
9351 COUNTY ROAD 30, TOWNSHIP OF HAVELOCK-BELMONT-METHUEN
Drawing Title
VEHICLE TRACKING FIGURE
Drawn By: CM
SCALE: Horz. 1:500 Vert. N/A
Designed By: CM
Issue Date: March 22, 2024
Checked By: JR
Project No.: 23-85312
Sht. No.:
Engineer: ---
Dwg File No.: 85312-SP
NOT FOR CONSTRUCTION

WILLS

PARTNERS IN ENGINEERING, PLANNING & ENVIRONMENTAL SERVICES

August 27, 2024

Township of Havelock-Belmont-Methuen
1 Ottawa Street East, P.O. Box 10
Havelock, ON
K0L 1Z0

Re: Minor Variance Application
Thomas Self Storage Facility c/o. Thomas Kirk
9351 County Road 30, Havelock
D.M. Wills Associates Project No. 22-85312

D.M. Wills Associates Limited (Wills) is pleased to submit a Minor Variance application on behalf of Kirk Thomas (Owner) for lands described legally as Part Lot 3, Concession 9 (Subject Property), and known municipally as 9351 County Road 30 in the Township of Havelock-Belmont-Methuen (Township), in the County of Peterborough (County).

The purpose of this cover letter is to provide a summary of the proposed minor variance in the context of provincial and municipal policy as it applies to the four tests under Section 45(1) of the Planning Act and Section 5.16 of the Township of Havelock-Belmont-Methuen (TOP). The application seeks relief from the Township of Havelock-Belmont-Methuen Comprehensive Zoning By-law No. 1995-42 to reduce the number of required parking spaces for the proposed self-storage commercial use.

1.0 Subject Property and Surrounding Land Uses

1.1 Subject Property

The Subject Property is described legally as, Part of lot 3, Concession 9, as in R684846, except expropriation plan DEP2740, in the Township of Havelock-Belmont-Methuen and known municipally as 9351 County Road 30. The approximate area of the Subject Property is 1.98 ha (19,750.27 m^2) with an approximate frontage of 75.5 m.

There is an existing residential dwelling with an accessory structure located in the northwestern portion of the Subject Property. The residential dwelling has an area of approximately 167.67 m^2, and the accessory building comprises an area of approximately 155 m^2.

1.2 Surrounding Land Uses

The Subject Property is located on the east side of County Road 30, south of the intersection of Old Norwood Road and County Road 30, and north of the Trent River. The lands immediately surrounding the Subject Property

are predominantly rural in nature with some natural features identified in the area. The Village of Havelock is located further north and consists of rural and urban land uses, including restaurants, a gas station, retail store and community facilities.

1.3 Proposed Development

The applicant is proposing to develop a Self-Storage Rental Facility which consists of nine buildings and an area for accessory outdoor storage. Three of the buildings will be approximately 10.8 m by 30.6 m, each with a total area of 330.5 m², and the other six will have dimensions of 9.0 m by 30.6 m, each with an area of 275.4 m². The Subject Property is currently accessed by two existing driveways from County Road 30. The most southerly driveway is proposed to provide access to the proposed Self Storage Rental Facility. The entrance on the north side of the Subject Property will continue to provide access into the existing residential dwelling.

Uses Permitted by this By-law, other than those listed in Section 4.27, require the following parking requirements:

> *"The greater of;*
>
> *a) 1 parking space per 2 employees or fraction thereof; or*
>
> *b) 1 parking space per 4 persons design capacity or fraction thereof; or*
>
> *c) 1 parking space per 37 square metres (400 square feet) of gross floor area"*

Therefore, under Section 4.27 Parking Area Regulations of the Township's ZBL, the proposed commercial self-storage use requires 72 parking spaces to accommodate the nine new storage units. There are two parking spaces included in the proposed concept; therefore, a minor variance is required from the parking provisions to reduce the required parking and accessible parking spaces from 72 spaces to two spaces.

2.0 Planning Review

Under Section 45(1) of the Planning Act R.S.O 1990 and the Township of Havelock (TOP) Section 5.16 there are four tests a minor variance must meet:

1. Is the application minor?
2. Is the application desirable for the appropriate development or use of the lands in question?
3. Does the application maintain the general intent and purpose of the Zoning By-law?
4. Does the application maintain the general intent and purpose of the Official Plan?

The following will serve as our professional planning assessment in accordance with the aforementioned tests:

The proposed development of the property intends to build nine self-storage facility units and an accessory outdoor storage area with two parking spaces. Currently the Subject property has a residential dwelling on the most north-eastern aspect of the property which will remain and be accessed from another driveway. The proposed building will meet all other C1 zoning requirements including building coverage, lot area, and lot setbacks; therefore, the proposal will not negatively impact the land and neighbouring properties. The proposed development is currently subject to a Site Plan Approval application which will ensure that the development complies with the municipal bylaws and policies, while adequately functioning for the intended use.

There are two existing driveways to access the Subject Property, one to service the residential dwelling and the other to provide access to the Self-Storage Facility. Wills conducted a Traffic Study that concluded the Subject Property requires two entrances onto the property due to the existing conditions, location of services and access for emergency services. The Self Storage Facility will be accessed by mainly by vehicular traffic due to the lack of public transit services and active transportation (i.e. trails/bicycle network) in the area, in addition to the nature of the facility proposed.

The Traffic Study examined the existing and future traffic conditions, which included the estimated entering and exiting trips during the A.M. and P.M. Peak Hours. For a self-storage facility, the maximum number of trips generated is seven vehicles per hour during the peak hours. The likelihood

of there being more than two vehicles at the storage facility who desire to use parking spots outside of the location at their unit is low.

Since the nature of the facility proposed is self-monitored, there is no requirement for employees to be located on the property during open and closed hours. The facility will be maintained solely by the owner resulting in limited parking requirements for employees.

Due to the low amount of traffic generated at one time and the proposed development meets all other zone requirements, it is our opinion that the **requested variance is minor.**

The property is currently vacant outside of the residential dwelling and is zoned local commercial land which has the potential to be developed for a permitted use.

The surrounding uses of the property consist primarily of rural, agricultural and other commercial uses, ultimately supporting this type of development. The nine units will be located behind the residential dwelling on the land when entering the property from County Road 30. Directly south of the property is land that is utilized as a commercial ATV dealer. The neighboring business has a warehouse for storage located directly south of where the storage units are proposed. Therefore, the proposed development will be consistent with the current landscape and usage of the area.

To the east and west of the Subject Property are primarily properties used for agricultural purposes or agricultural related purposes. The majority of the land is undeveloped due to its usage for farming purposes, however, the Subject Property itself was not being utilized in such a manner. With the majority of the land surrounding being used for farming and a lack of residential homes nearby, the proposed development will have no visual or physical impact on neighboring properties.

North of the Subject Property consists of predominantly land rural in nature, with some natural features identified in the area. There are considerable amounts of rural and agricultural land, however, approximately 2 km north is the Village of Havelock. Havelock's local inhabitants will be a significant contributor to the proposed use and will be able to utilize this small business close to home.

The proposed development is suggested to be utilized on a property that is zoned for this use, has other similar uses surrounding the property, and will not create any visible disruption to the surrounding properties. Therefore, in our professional opinion this property is **considered desirable for the appropriate development and use of the lands.**

The Subject Property is zoned Local Commercial (C1) as shown on Schedule A1 of the ZBL. The C1 permits a rental storage facility (13.1.1) and an accessory single detached dwelling which are only a small number of the many permitted uses for this zone. The proposed development, as stated before, meets all the requirements and setbacks outlined in the regulations under the local commercial zoning, except for the Parking Area regulations.

The ZBL does not outline a specific regulation for Self-Storage Facilities, however, there is a general provision that applies to all uses permitted by the ZBL other than those listed. Under the general provision, there are three options as to how to calculate the number of required parking spaces.

The greater of:

a. 1 parking space per 2 employees or fraction thereof; or
b. 1 parking space per 4 persons design capacity or fraction thereof or
c. 1 parking space per 37 square metres (400 square feet) of gross floor area

The calculation under parking ratios 'a' and 'b' do not apply as they are lower than the calculation under ratio 'c'. Therefore, the gross floor area of the regulation applies. The total gross floor area of the Self-Storage facility is approximately 2,642.4 m², resulting in the minimum number of parking spaces required to be 72.

The intent of the ZBL is to ensure that there is an adequate amount of parking spaces for the proposed use of the property whether it be for the use of the owner, occupant, or other persons entering upon or making use of the premises (4.27 (a)). As outlined in the traffic report, a maximum of seven vehicles will enter or exit the property during peak hours, resulting in the required number of parking spaces being overly abundant. Therefore, since the development meets the other requirements outlined in the ZBL, the owner is willing to incorporate two parking spaces which accommodates the demand. It is our opinion **that the proposed variance maintains the general intent of the ZBL.**

The Subject Property is designated 'Rural' on the TOP Schedule 'A1-Belmont', which rural lands are characterized by a rural landscape which reinforces the historical relationship between hamlet area, shoreline communities and the surrounding farm and rural community to which the hamlet area provide basic services (3.1.1). Rural land is meant to create a balance between the many types of residential, industrial and commercial uses and allow agricultural and natural heritage to flourish.

The permitted uses as outlined in the TOP, encourage small-scale commercial, industrial and outdoor recreational uses which provide for the needs of the rural population, tourists, and the travelling public. In this case, the small-scale commercial development will provide immediate assistance to the rural and local population, providing them with a storage space for their belongings. As outlined in Section 3.1.3.2 (d) of the TOP the intended use shall be appropriate for the proposed location and compatible with the surrounding land uses, encourage to locate in clusters, provide adequate parking, and be subject to site plan control.

Based on the foregoing, it is our opinion that the proposed variance to reduce the requirement of parking **maintains the intent and purpose of the TOP** due to the proposed development complying with the development policies surrounding commercial land use in the rural designation.

3.0 Conclusion

This letter has been prepared in support of the Minor Variance Application to reduce the number of required parking spaces for the proposed commercial Self-Storage Facility. This letter provides an analysis of the development in the context of the four tests of a minor variance and finds that the variances are considered minor, desirable for the appropriate development of the Subject Property and maintain the intent and purpose of the Official Plan and Zoning By-law. The proposed development will result in a significant improvement of the Subject Property, providing usage of the currently vacant land by a permitted use in the current zone. The site has been designed in a way to be compatible with the surrounding rural, rural residential, and commercial uses, maintaining the nature of the property.

Should you have any questions or require anything further, please do not hesitate to contact the undersigned.

Respectfully submitted,

Prepared by:

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Junior Land Use Planner

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KS/jh