

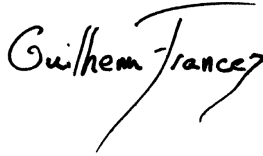
**Southeast Planning Review and Adjustment Committee /  
Comité de révision de la planification de la Commission du Sud-Est**  
Wednesday, December 18, 2024 / Le mercredi 18 décembre, 2024

**Staff Report / Rapport du personnel**

**Subject / Objet :** Conditional Use / Usages Conditionnel

**File number / Numéro du fichier** 24-1669

**From / De :**



Guilhem Francez  
Development Officer / Agent d'aménagement

**Reviewed by / Révisé par :**



Lori Bickford  
Planning Manager/Planner / Gestionnaire de  
planification/Urbaniste

**General Information / Information générale**

**Applicant / Requéant :**

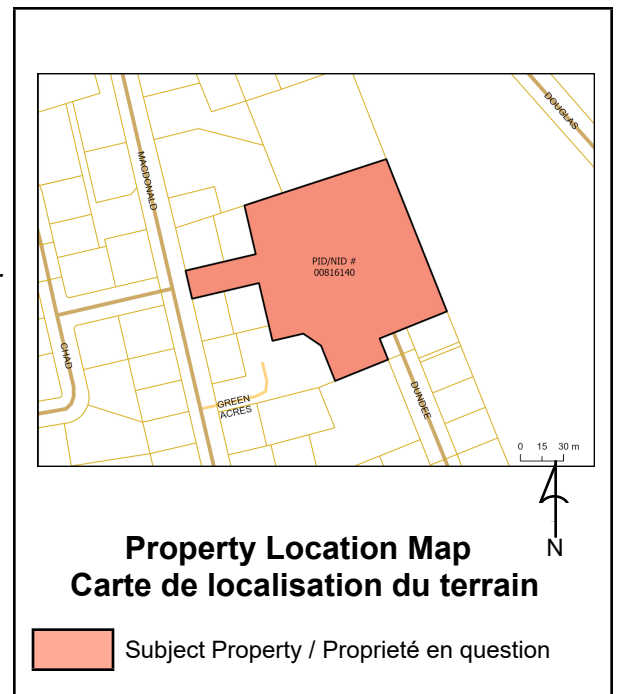
Wesley Michaud Michaud Capital Corp

**Landowner / Propriétaire :**

Wesley Michaud Michaud Capital Corp.

**Proposal / Demande :**

Conditional use application to permit an 8-unit multiple dwelling building. / *Demande d'utilisation conditionnelle pour permettre la construction d'un bâtiment résidentiel à plusieurs logements de 8 unités.*



**Site Information / Information du site**

**PID / NID:** 00816140

**Lot Size / Grandeur du lot:** 14,386.20 m<sup>2</sup>

**Location / Endroit :**

Dundee street, Town of Salisbury / Village de Salisbury

**Current Use / Usage présent :**

Vacant

**Zoning / Zonage :**

VC

**Future Land Use Designation / Désignation de l'utilisation future du sol :**

VC

**Surrounding Use & Zoning / Usage des environs & Zonage :**

Surrounding zone: Residential Use (RU) & Village Centre (VC) / *Zone environnante : Usage résidentiel (RU) et Centre villageois (VC)*

Surrounding use: Residential, Institutional, park/recreation and commercial. / *Résidentiel, institutionnel, parc/recréation et commercial.*

**Municipal Servicing / Services municipaux:**

Public sewer, public street, private water / *Égout public, rue publique, eau privée.*

## Policies / Politiques

### 4.4 VILLAGE CENTRE DESIGNATION (VC) / 4.4 DÉSIGNATION DU CENTRE VILLAGEOIS (VC)

4.4.2 It is a policy to permit higher density residential development within the Village Centre subject to terms and conditions imposed by the Planning Review and Adjustment Committee. When considering the imposition of terms and conditions the following shall be considered, but not limited to:

- a) the location and access to off-street parking and the design of the parking lot layout;
- b) provisions for the preservation of the existing landscape by minimizing tree and soil removal;
- c) buffering from adjacent properties;
- d) drainage; and
- e) water supply assessment. /

*4.4.2 Il est de la politique de permettre un développement résidentiel à densité plus élevée dans le Centre Villageois, sous réserve des termes et conditions imposés par le CRP. Lors de l'examen de l'imposition de ces modalités et conditions, les éléments suivants seront pris en compte, sans s'y limiter :*

- a) l'emplacement et l'accès au stationnement hors rue ainsi que la conception du plan de stationnement ;*
- b) les mesures de préservation du paysage existant, en minimisant l'abattage des arbres et l'enlèvement de terre ;*
- c) l'isolement par rapport aux propriétés adjacentes ;*
- d) le drainage ; et*
- e) l'évaluation de l'approvisionnement en eau.*

4.4.3 It is a policy of Council to strengthen the Village Centre by encouraging businesses servicing the local population to locate within this area and by promoting mixed use development which incorporates institutional, commercial and residential land uses, as well as cultural and recreational activities. /

*4.4.3 Parmi les politiques du Conseil, il est mis en avant la volonté de renforcer le Centre Villageois en encourageant les entreprises desservant la population locale à s'y établir et en promouvant un développement à usage mixte qui intègre des usages fonciers institutionnels, commerciaux et résidentiels, ainsi que des activités culturelles et récréatives.*

### 7.3 WATER, SEWER AND STORM / 7.3 EAU, ÉGOUT ET EAUX PLUVIALES

7.3.1 It is a policy that it shall be the intention of Council to adhere to sustainable standards with regards to protecting the underground water source within the Village. / 7.3.1 *Il est de la politique que le Conseil ait l'intention de respecter des normes durables en ce qui concerne la protection de la source d'eau souterraine au sein du Village.*

7.3.2 It is policy that a Water Assessment Study shall be carried out when the following uses are requested:

- a) multiple unit residential development. /

*7.3.2 Il est de la politique qu'une étude d'évaluation de l'eau soit réalisée lorsque les usages suivants sont demandés :*

- a) développement résidentiel à unités multiples.*

7.3.4 It is a policy that all commercial, industrial, institutional and medium and high density residential development shall require a storm drainage plan prepared by a licensed New Brunswick professional Engineer. /

*7.3.4 Il est de la politique que tous les développements commerciaux, industriels, institutionnels et résidentiels à densité moyenne et élevée nécessitent un plan de drainage des eaux pluviales préparé par un ingénieur professionnel agréé du Nouveau-Brunswick.*

## Zoning and/or Subdivision Regulation / Réglementations de zonage et/ou de lotissement

### PART 8 – VILLAGE CENTRE (VC) ZONE / PARTIE 8 – ZONE CENTRE VILLAGEOIS (VC)

#### 8.1 Permitted Uses

Any land, building or structure may be used for the purpose of, and for no other purpose:

d) The following uses are permitted subject to such terms and conditions as may be imposed by the Planning Review and Adjustment Committee:

(i) multiple unit dwelling. /

### 8.1 Usages Permis

*Tout terrain, bâtiment ou structure peut être utilisé à des fins spécifiques et uniquement à ces fins :*

*d) Les usages suivants sont permis sous réserve des modalités et conditions pouvant être imposées par le Comité de révision de la planification :*

*(i) bâtiment résidentiel à unités multiples.*

### 8.2 Zone Requirements

a) Any permitted use, or new lot, in the Village Centre zone shall comply with the following regulations:

\*Minimum Lot Area: 1545 sq m +102 sq m in excess of 4.

\*Minimum Lot Frontage: 36 m (118 ft) + 1.5 m (4.9 ft)/ dwelling unit over 4.

\*Minimum Rear Yard: 7.6 m (25 ft)

\*Minimum Side Yard 4.6 m (15 ft) or ½ height of the main building (the greater of)

\*Maximum Building Height: 15 m (50 ft)

\*Maximum Lot Coverage: 50% /

### 8.2 Exigences de la Zone

*a) Tout usage permis ou tout nouveau terrain dans la zone du Centre Villageois doit respecter les réglementations suivantes :*

*\*Surface minimale du lot : 1545 m<sup>2</sup> + 102 m<sup>2</sup> par unité au-delà de 4.*

*\*Façade minimale du lot : 36 m (118 pi) + 1,5 m (4,9 pi) par unité d'habitation au-delà de 4.*

*\*Cour arrière minimale : 7,6 m (25 pi)*

*\*Cour latérale minimale : 4,6 m (15 pi) ou la moitié de la hauteur du bâtiment principal (selon la valeur la plus élevée).*

*\*Hauteur maximale du bâtiment : 15 m (50 pi)*

*\*Superficie maximale de lot occupée : 50 %*

### 3.12 Parking

The following provisions shall apply to all parking requirements:

a) no building or structure shall be placed, erected, altered or used unless vehicular off-street parking spaces are provided and maintained in accordance with the requirements of this section, except where any parking requirement is specifically included elsewhere in this By-law;

b) all parking shall be provided on the same lot as the use for which parking is required;

d) an off-street parking space shall measure 5.5 metres (18 feet) in length and 2.7 metres (9 feet) in width;

e) off street parking spaces by use, shall be provided as follows:

Multiple unit dwellings 1.5 per dwelling unit.

g) in addition to subsection 3.12 e), accessible parking spaces shall be provided as per the requirements of the Barrier-Free Design Building Code Regulation 2011-61;

h) where a parking lot for more than 10 vehicles, except in the case of a home occupation, is required or proposed, the following provisions apply:

i) the parking lot, entrances and exits, and aisles shall be paved;

ii) parking lots shall be accessible by a maximum of 2 entrances/exits (driveways) with each having a minimum width of 6 metres (20 feet). No driveway shall meet the travelled portion of the street at an angle of less than 60 degrees;

iii) parking lot aisles shall maintain a minimum width of 6 metres (20 feet) if parking spaces are 90 degree angles, or 3.5 metres (12 feet) if parking spaces are angled at 45 degrees;

iv) all parking lots shall contain clearly delineated parking spaces;

v) the location of approaches or driveways shall be a minimum of 15.2 metres (50 feet) from the limits of the right-of-way at a street intersection;

vi) all entrance/exits and parking lot aisles shall be located at least 3 metres (9.8 feet) from the rear lot line or side lot line;

vii) no gasoline pumps or other service station equipment shall be located or maintained on the parking lot;

viii) the parking lot shall be graded and drained in such a manner as to ensure that the surface water is directed to the Village's storm water system or will not drain onto neighboring lands or public streets or sidewalks;

ix) the parking lot shall have a 1.5 meter (5 feet) wide buffer strip along any public right- of-way; and

x) if the parking lot is in a residential zone, parking shall be provided in the side or rear yard of the lot, but shall not be located in the front yard; /

### 3.12 Stationnement

*Les dispositions suivantes s'appliquent à toutes les exigences de stationnement :*

- a) Aucun bâtiment ou structure ne peut être placé, érigé, modifié ou utilisé à moins que des places de stationnement hors rue pour véhicules ne soient fournies et entretenues conformément aux exigences de cette section, sauf si une exigence particulière de stationnement est incluse ailleurs dans cet arrêté.*
- b) Tout stationnement doit être fourni sur le même terrain que l'usage pour lequel le stationnement est requis.*
- d) Une place de stationnement hors rue doit mesurer 5,5 mètres (18 pieds) de longueur et 2,7 mètres (9 pieds) de largeur.*
- e) Les places de stationnement hors rue, par usage, doivent être fournies comme suit : logements à unités multiples : 1,5 place par unité d'habitation.*
- g) En plus de l'article 3.12 e), des places de stationnement accessibles doivent être fournies conformément aux exigences du Règlement sur la conception sans obstacle des bâtiments (2011-61).*
- h) Lorsque le stationnement pour plus de 10 véhicules est requis ou proposé, à l'exception d'une occupation à domicile, les dispositions suivantes s'appliquent :*
  - i) Le stationnement, les entrées et sorties, ainsi que les allées doivent être pavés ;*
  - ii) Les aires de stationnement doivent être accessibles par un maximum de deux entrées ou sorties, chacune d'une largeur minimale de 6 mètres (20 pieds);*
  - iii) Les allées des aires de stationnement doivent avoir une largeur minimale de 6 mètres (20 pieds) si les places de stationnement sont à angle droit, ou 3,5 mètres (12 pieds) si les places sont inclinées à 45 degrés ;*
  - iv) Toutes les aires de stationnement doivent comporter des places de stationnement clairement délimitées ;*
  - v) L'emplacement des accès ou des allées doit être situé à au moins 15,2 mètres (50 pieds) des limites du droit de passage à une intersection de rue ;*
  - vi) Toutes les entrées/sorties et allées de l'aire de stationnement doivent être situées à au moins 3 mètres (9,8 pieds) de la ligne arrière du lot ou de la ligne latérale du lot ;*
  - vii) Aucune pompe à essence ni autre équipement de station-service ne doit être installé ou entretenu dans l'aire de stationnement ;*
  - viii) L'aire de stationnement doit être nivelée et drainée de manière à garantir que les eaux de surface soient dirigées vers le système d'eaux pluviales du village ou qu'elles ne s'écoulent pas sur les terrains voisins ou les rues publiques ou trottoirs ;*
  - ix) L'aire de stationnement doit comporter une bande tampon de 1,5 mètre (5 pieds) le long de toute voie publique ;*
  - x) Si l'aire de stationnement se trouve dans une zone résidentielle, elle doit être située dans la cour latérale ou arrière du lot, mais ne doit pas être située dans la cour avant.*

### 3.23 Landscaping Requirements:

- ii) in the case of a multiple unit dwelling, the owner shall landscape the front yard of the main building and any yard that abuts a street, and any part of the lot within 4.5 metres (15 feet) of each building thereon,*
- iii) the landscaping mentioned in i) and ii):*
  - a) may include partial devotion to driveways, paths, patios, walkways, ornamental shrubbery or trees, and*
  - b) shall be completed not later than one (1) year from the date of the expiration of the building permit for the main building located thereon. /*

### 3.23 Exigences en matière d'aménagement paysager :

- ii) Dans le cas d'une habitation à plusieurs unités, le propriétaire doit aménager la cour avant du bâtiment principal, ainsi que toute cour qui borde une rue, et toute partie du terrain située à moins de 4,5 mètres (15 pieds) de chaque bâtiment qui s'y trouve.*
- iii) L'aménagement paysager mentionné aux points i) et ii) :*
  - a) peut inclure l'aménagement partiel des allées, chemins, patios, trottoirs, arbustes ornementaux ou arbres, et*
  - b) doit être achevé dans un délai maximal d'un (1) an après l'expiration du permis de construire pour le bâtiment principal situé sur le terrain*

### Internal Consultation & External Consultation / Consultations internes et externes

Planning and development staff discussed internally. / Le personnel de l'urbanisme et du développement a discuté en interne.

The CAO and Public Works staff were contacted regarding the proposal, and answer / *Le DG et le personnel des Travaux publics ont été contactés concernant la proposition, et voici leur réponse :*

The Town is supportive of this proposal. The Town has received engineering drawings which includes a detailed stormwater drainage plan. The Town sees this information as exceeding minimum guidelines and is satisfied upon preliminary review. This report outlines confirmation that the post-development drainage will be improved, and, it will not overwhelm the existing capacity. The Town looks at this overall proposed project favourably, given its location to amenities, the fact that it will be rental units, and the fact that it will include at least one affordable unit per building, per CMHC standards. The Town is pleased to have additional confirmation that provincial hydrologists have confirmed the water study to be totally satisfactory.

The town saw the proposed undisturbed vegetation in the proposed plan has a good way to address some issue that neighbor landowner has express.

The Town is exploring the possibility to extend the trail network behind the buildings/between the school. This will provide a physical delineation, but the Town may also consider trees on that easement as a visual buffer between the building and the trail. This would provide further vegetative buffers.

adequate parking is proposed. /

*La municipalité soutient cette proposition. La municipalité a reçu des dessins techniques, comprenant un plan détaillé de drainage des eaux pluviales. La municipalité considère que ces informations vont au-delà des lignes directrices minimales et est satisfaite après un examen préliminaire. Ce rapport confirme que le drainage post-développement sera amélioré et qu'il ne surcharge pas la capacité existante. La municipalité considère ce projet globalement favorablement, en raison de son emplacement par rapport aux commodités, du fait qu'il s'agira de logements locatifs et qu'il inclura au moins une unité abordable par bâtiment, selon les normes de la SCHL. La municipalité est également heureuse d'avoir la confirmation supplémentaire que les hydrologues provinciaux ont jugé l'étude de l'eau totalement satisfaisante. La municipalité a remarqué que la végétation non perturbée proposée dans le plan est une bonne solution pour répondre à certains problèmes exprimés par des propriétaires voisins. La municipalité explore la possibilité d'étendre le réseau de sentiers derrière les bâtiments, entre l'école. Cela permettrait de créer une délimitation physique, mais la municipalité pourrait également envisager l'ajout d'arbres sur cette servitude en tant que tampon visuel entre le bâtiment et le sentier, offrant ainsi des protections végétales supplémentaires. En fin, un nombre adéquat de places de stationnement est proposé.*

New-Brunswick Department of Environment and Local Government, Healthy Environments Branch was contacted and answer: / *Le ministère de l'Environnement et des Gouvernements locaux du Nouveau-Brunswick, Direction des Environnements en Santé, a été contacté et répond :*

I'm totally satisfied by the WSSA report prepared by Craig HydroGeoLogic, May 2024.

The report states that a 24h pump testing was conducted on a new drilled well (PW1, total depth (TD) of 91.4m) with two observation wells: OBS1 (new well, 53m apart from PW1, TD of 87.5m) and OBS2 (existing well, 256m apart from PW1, TD of 19m).

the submitted WSSA report May 2024 was done for the first 8-unit building which is proposed. / *Je suis totalement satisfait du rapport WSSA préparé par Craig HydroGeoLogic, mai 2024. Le rapport indique qu'un test de pompage de 24 heures a été effectué sur un nouveau puits foré (PW1, profondeur totale (TD) de 91,4 m) avec deux puits d'observation : OBS1 (nouveau puits, à 53 m de PW1, TD de 87,5 m) et OBS2 (puits existant, à 256 m de PW1, TD de 19 m). Le rapport WSSA soumis en mai 2024 a été réalisé pour le premier bâtiment de 8 unités proposé.*

New-Brunswick Department of Environment and Local Government Environmental Impact Assessment (EIA) Branch was contacted and answer: / *Le ministère de l'Environnement et des Gouvernements locaux du Nouveau-Brunswick, branche de l'Évaluation de l'impact environnemental (EIE), a été contacté et répond :*

the The Department of Environment and Local Government's (DELG) Environmental Impact Assessment (EIA) Branch has determined that the proposed development is not considered to be an undertaking under Schedule A of the EIA Regulation, therefore it does not need to be registered for an EIA review before it can proceed. / *La branche de l'Évaluation de l'impact environnemental (EIE) du ministère de l'Environnement et des Gouvernements locaux (DELG) a déterminé que le projet proposé n'est pas considéré comme un développement soumis à*

*l'annexe A du Règlement sur l'EIE, il n'a donc pas besoin d'être enregistré pour un examen de l'EIE avant de pouvoir procéder.*

## **Discussion**

The request concerns a vacant property located at the junction of Dundee Drive and MacDonald Road, near public community services, shops, and recreational spaces. This property borders the urban core and is close to community amenities. As such, it was rezoned this year to the Village Centre (VC) Zone. / *La demande concerne un terrain vacant situé à l'intersection de la promenade Dundee et du chemin MacDonald, à proximité des services communautaires publics, des commerces et des espaces récréatifs. Ce terrain est adjacent au noyau urbain et proche des commodités communautaires. Par conséquent, il a été rezoné cette année en zone du centre-village (VC).*

The Zoning By-law stipulates that multiple-unit dwellings are an allowed use, but are permitted subject to terms and conditions imposed by PRAC. The Municipal Plan provides criteria that the Committee should consider when imposing conditions on this use, including: a) the location and access to off-street parking and the design of the parking lot layout; b) provisions for the preservation of the existing landscape by minimizing tree and soil removal; c) buffering from adjacent properties; d) drainage; and e) water supply assessment. / *Le règlement de zonage stipule que les habitations à plusieurs unités sont un usage autorisé, mais sous réserve des modalités et conditions imposées par le CRP. Le Plan municipal fournit des critères que le Comité doit prendre en compte lorsqu'il impose des conditions sur cet usage, notamment : a) l'emplacement et l'accès au stationnement hors rue et la conception son aménagement; b) les dispositions pour la préservation du paysage existant, en minimisant l'abattage d'arbres et l'enlèvement de sol ; c) la protection contre les nuisances pour les propriétés adjacentes ; d) le drainage ; et e) l'évaluation de l'approvisionnement en eau.*

Currently, the project would have access through the existing public street of Dundee Drive, with an intention to extend the public street to develop the remainder of the lot. The application for a new street will be reviewed by the SE PRAC as a separate process. / *Actuellement, le projet disposerait d'un accès par la rue publique existante de la promenade Dundee, avec l'intention d'étendre cette rue publique pour aménager le reste du terrain. La demande pour une nouvelle rue sera examinée par le CRP du Sud-Est dans le cadre d'un processus distinct.*

An 8-unit multi-dwelling requires 13 parking spots. To minimize the amount of impervious surfaces and maintain a townhouse character, it is proposed to create two driveways leading to four interior garages. These driveways will accommodate an additional 9 parking spots to meet the required parking space requirements. / *Un bâtiment à 8 unités nécessite 13 places de stationnement. Afin de minimiser la surface imperméable et de préserver un caractère de maisons en rangée, il est proposé de créer deux allées menant à quatre garages intérieurs. Ces allées permettraient d'ajouter 9 places de stationnement supplémentaires afin de répondre aux exigences en matière de stationnement.*

The goal of the project is to preserve undisturbed areas and trees to create continuity with neighboring hedges and opaque fences. During construction, the applicant intends to plant trees through an iterative process to strengthen the proposed layout. Landscaping will be provided around the dwelling and in front of the parking spaces to maintain the overall character of the neighborhood. / *L'objectif du projet est de préserver les zones et arbres non perturbés afin de créer une continuité avec les haies et clôtures opaques voisines. Pendant la construction, le demandeur prévoit de planter des arbres selon un processus itératif pour renforcer l'aménagement proposé. Un aménagement paysager sera réalisé autour de l'habitation et devant les places de stationnement pour maintenir le caractère général du quartier.*

A drainage plan was prepared by a licensed New Brunswick engineer and approved by municipal staff. In addition to Salisbury zoning by-law requirement, the drainage plan follows the net zero practice, said otherwise the drainage will be built to maintain predevelopment storm runoff from the site. / *Un plan de drainage a été préparé par un ingénieur agréé du Nouveau-Brunswick et approuvé par le personnel municipal. En plus de l'exigence du règlement de zonage de Salisbury, le plan de drainage suit la pratique du « zéro net », c'est-à-dire que le drainage sera conçu pour maintenir les ruissellements d'eau de pluie à leur niveau pré-aménagement sur le site.*

A hydrologist has confirmed that the water supply will be able to support the proposed development. They have also confirmed that the water quality is good. This was also corroborated by provincial experts on the matter. / *Un hydrologue a confirmé que l'approvisionnement en eau pourra soutenir l'aménagement proposé. Il a également confirmé que la qualité de l'eau est bonne. Ces conclusions ont également été corroborées par des experts provinciaux en la matière.*

### **Public Notice / Avis public**

Public notices have been circulated to neighbours within 60 m of the property on December 4th, 2024. Due to the postal strike, these notices were delivered in person to surrounding landowners. To date no response from surrounding landowners has been received. / *Des avis publics ont été envoyés aux voisins à l'intérieur de 60 mètres de la propriété le 4 décembre 2024. À l'heure actuelle, aucune réponse n'a été reçue des propriétaires immobiliers environnants.*

### **Legal Authority / Autorité légale**

The **Community Planning Act (2017)** states as follows: / *La Loi sur l'urbanisme (2017) stipule ce qui suit:*

**“53(3)** In prescribing the purposes for which land, buildings and structures in a zone may be used, a zoning by-law may: ... / *En prescrivant les fins auxquelles des terrains, des bâtiments et des constructions dans une zone quelconque peuvent être affectés, l'arrêté de zonage peut prévoir l'une quelconque des dispositions suivantes :*

**(c)** prescribe particular purposes ... / *y désigner des fins particulières :*

**(i)** in respect of which the advisory committee or regional service commission, subject to subsection (5), may impose terms and conditions, and / *pour lesquelles le comité consultatif ou la commission de services régionaux peut, sous réserve du paragraphe (5), imposer des modalités et des conditions,*

**(ii)** that may be prohibited by the advisory committee or regional service commission if compliance with the terms and conditions imposed under subparagraph (i) cannot reasonably be expected. / *que peuvent interdire le comité consultatif ou la commission de services régionaux lorsqu'il apparaît raisonnable de s'attendre qu'il ne sera pas satisfait aux modalités et aux conditions imposées en vertu du sous-alinéa (i).*

The Act also provides parameters for the PRAC when imposing conditions: / *La loi fournit également des paramètres pour le CRP lorsqu'il impose des conditions:*

**53(4)** Terms and conditions imposed under paragraph (3)(c) shall be limited to those considered necessary by the advisory committee or regional service commission to protect: / *Les modalités et les conditions imposées en vertu de l'alinéa (3)c) se limitent à celles que le comité consultatif ou la commission de services régionaux juge nécessaires pour protéger :*

**(a)** properties within the zone or in abutting zones, or / *soit les biens situés dans la zone ou dans des zones y attenantes;*

**(b)** the health, safety and welfare of the general public. / *soit la santé, la sécurité et le bien-être du grand public.*

### **Recommendation / Recommandation**

Staff respectfully recommends that the Planning Advisory Committee APPROVE the conditional use application to permit an 8-unit multiple dwelling building in the VC zone on PID 00816140, subject to the following conditions: /

*Le personnel recommande respectueusement que le Comité de révision de la planification du Sud-Est APPROUVE la demande d'utilisation conditionnelle afin de permettre la construction d'un bâtiment résidentiel à plusieurs logements de 8 unités dans la zone VC sur le NID 00816140, sous réserve des conditions suivantes :*

The proposed development shall be generally in conformity with the site plans and floor plans as proposed as the site plan, water supply assessment, and drainage plan ensure that the criteria outlined in the Municipal Plan are addressed. /

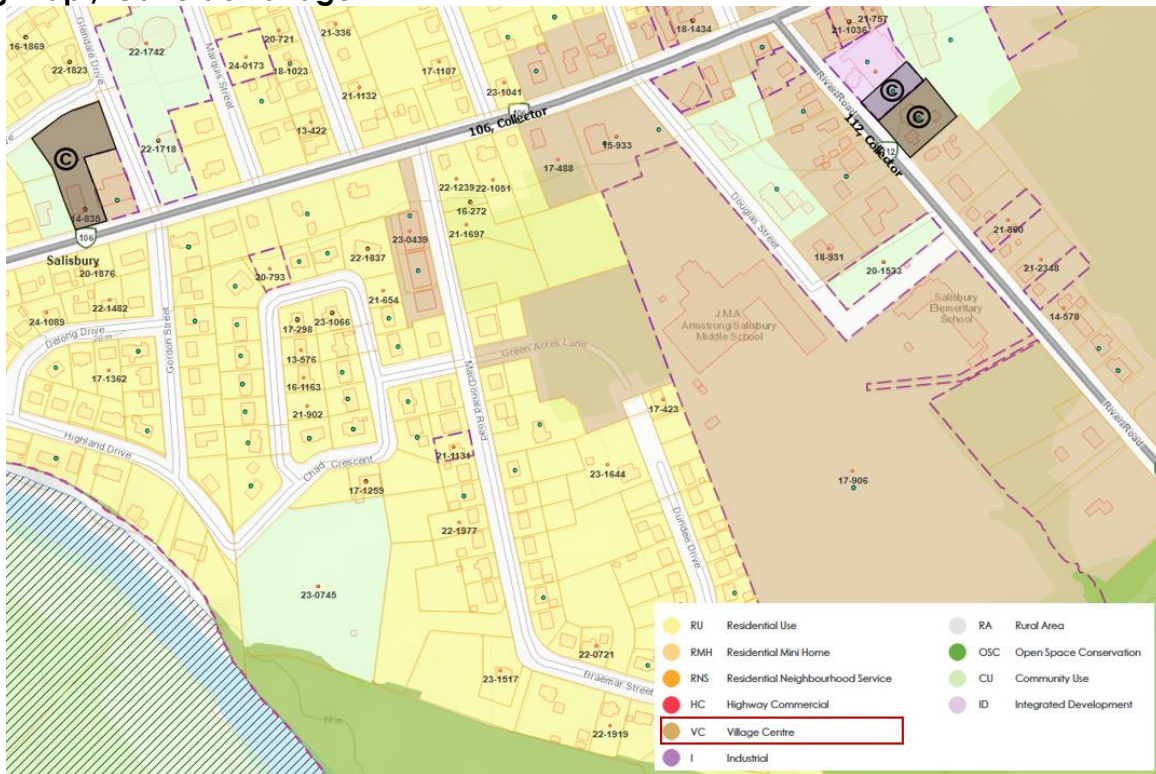
*Le projet de développement doit être généralement conforme aux plans de site et aux plans d'étage proposés, étant donné que le plan de site, l'évaluation de l'approvisionnement en eau et le plan de drainage garantissent que les critères énoncés dans le Plan municipal sont respectés.*

**Note:** This report was written in english and translated to a bilingual document. Where a conflict exists between the two languages, the language the report was written shall prevail. / **Note:** *ce rapport a été rédigé en anglais et traduit en version bilingue. En cas de conflit entre les deux langues, la langue dans laquelle le rapport a été rédigé a préséance.*

**Aerial Map / Carte Aérienne**



**Zoning map / Carte de zonage**



**Main / Principal**  
1234 rue Main Street, Suite 200  
Moncton, NB E1C 1H7  
(506) 238-5386

**Shediac**  
815A rue Bombardier Street  
Shediac, NB E4P 1H9  
(506) 533-3637

**Tantramar**  
112C rue Main Street  
Sackville, NB E4L 0C3  
(506) 364-4701

**Riverview**  
Operations Centre d'opérations  
300 rue Robertson Street  
Riverview, NB E1B 0T8  
(506) 382-3574

**Google street view from Dundee drive, november 2022 / Vue par Google Street depuis Dundee Drive, novembre 2022**



**Main / Principal**  
1234 rue Main Street, Suite 200  
Moncton, NB E1C 1H7  
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Operations Centre d'opérations  
300 rue Robertson Street  
Riverview, NB E1B 0T8  
(506) 382-3574

Dundee Drive (PID/NID 00816140)

Town of Salisbury

Date: 11/29/2024



# WES MICHAUD - DUNDEE DRIVE

## SALISBURY - WESTMORLAND COUNTY, NB

**DON-MORE**  
SURVEYS &  
ENGINEERING LTD.



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- NEW BUILDING AREAS
- NEW ASPHALT AREAS
- NEW CONCRETE AREAS
- NEW GRAVEL AREAS
- NEW GRASS AREAS
- NEW WOODED AREAS

No.	DATE Y/M/D	DESCRIPTION
3	2024-12-05	CIVIL UPDATE
2	2024-10-08	ISSUED FOR REVIEW
1	2024-09-27	ISSUED FOR REVIEW

DWG: 23382ESP2 - Parking Up DATED: 2024-08-30  
 DESIGNED BY: A. Toole IF THIS BAR IS NOT 25mm LONG, ADJUST YOUR PLOTTING SCALE  
 DRAWN BY: S. Danbaba  
 CHECKED BY: A. Toole

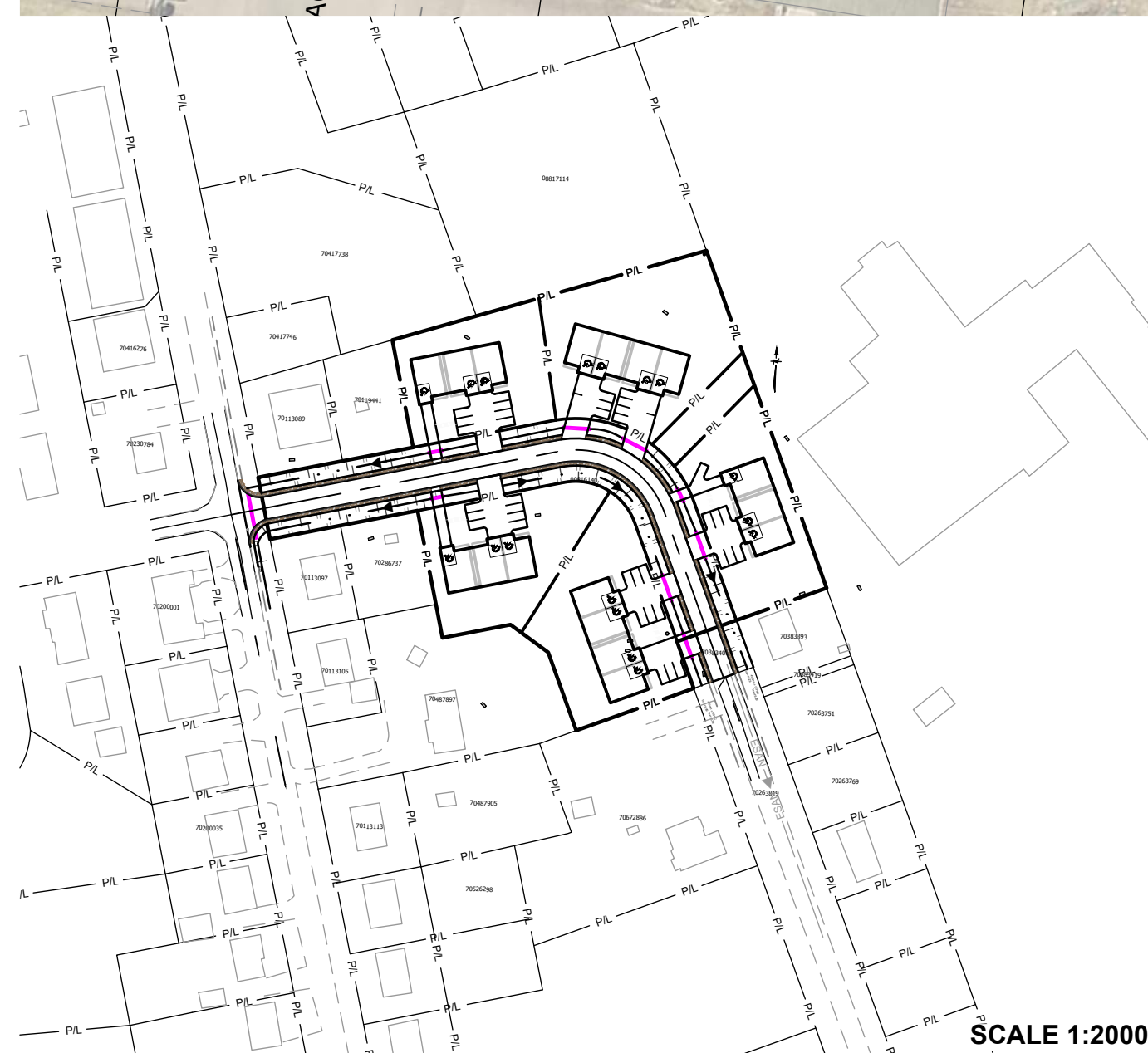
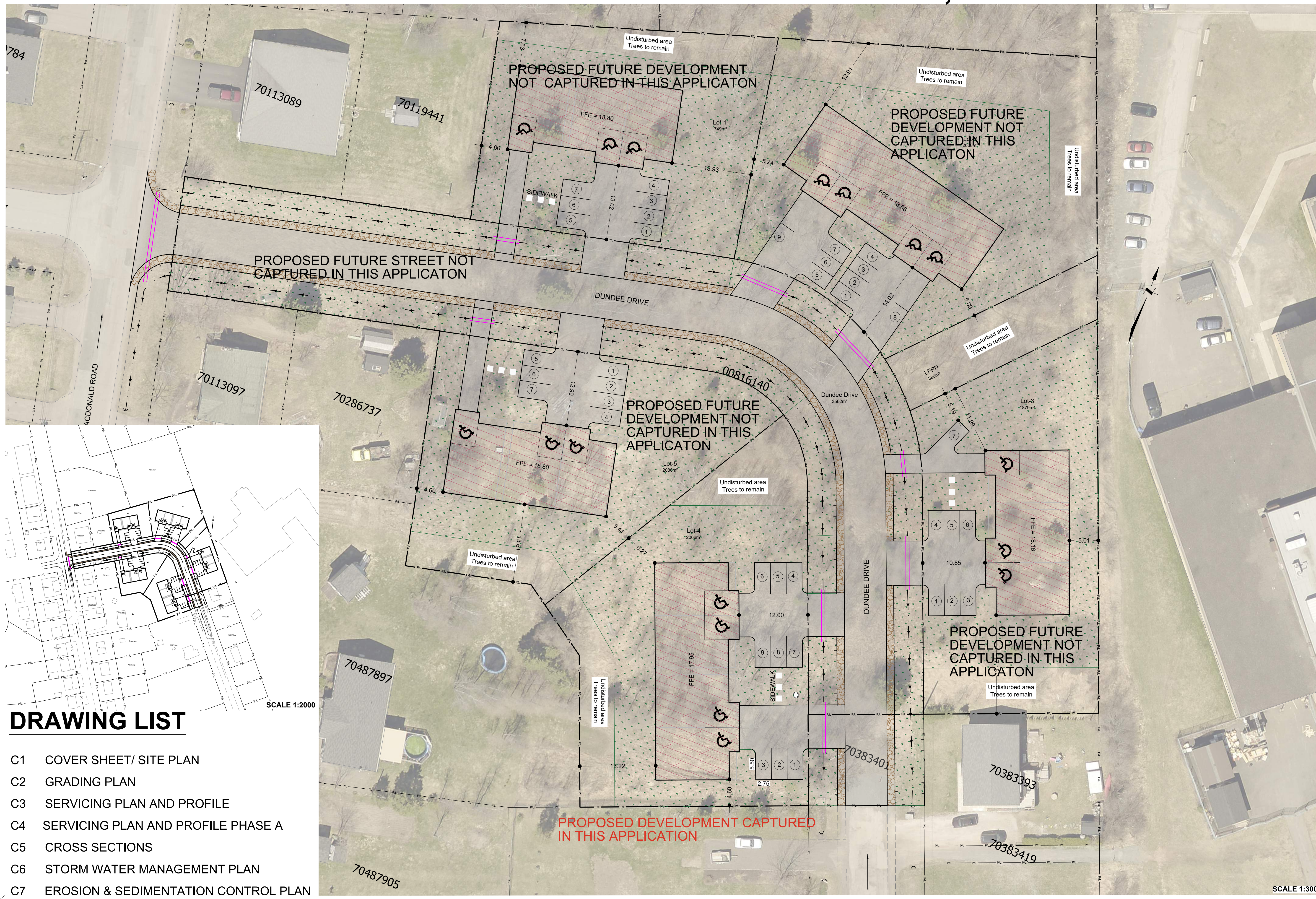
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 Horizontal 1300 Vertical N/A  
 SCALE: 1:300 METRIC

CLIENT:  
**WES MICHAUD**

PROJECT:  
**DUNDEE DRIVE**

TITLE:  
**COVER SHEET**  
 SHEET C1 of 7

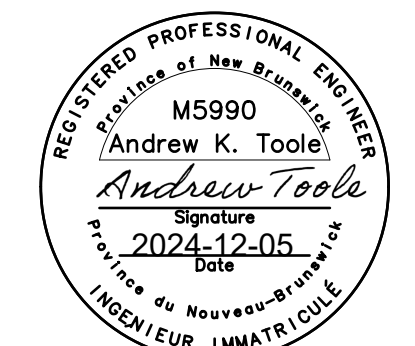
ISSUE: ISSUED FOR REVIEW	REV # 3
DATE OF: 2024-12-05	



**DRAWING LIST**

C1	COVER SHEET/ SITE PLAN
C2	GRADING PLAN
C3	SERVICING PLAN AND PROFILE
C4	SERVICING PLAN AND PROFILE PHASE A
C5	CROSS SECTIONS
C6	STORM WATER MANAGEMENT PLAN
C7	EROSION & SEDIMENTATION CONTROL PLAN

SCALE 1:300



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LEGEND	NEW	EXISTING
EDGE OF PAVEMENT		
CURB		
SURFACE PROFILE		
TOP OF SLOPE		
SWALE / DITCH		
SPOT ELEVATION		+8.71
BUILDING		
SIDEWALK		
PARKING MARKING		
PROPERTY BOUNDARY		
PROPERTY LINE		
EASEMENT		
CURB & DRIVEWAY CUT		
FLOW ARROW		
GRADE ARROW		
CULVERT		
HEADWALL		
FENCE		
CATCH BASIN		
SIDEWALK		
PHASE BNDY		

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DRAWN BY:	S. Danbaba		
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**CLIENT:**

**WES MICHAUD**

**PROJECT:**

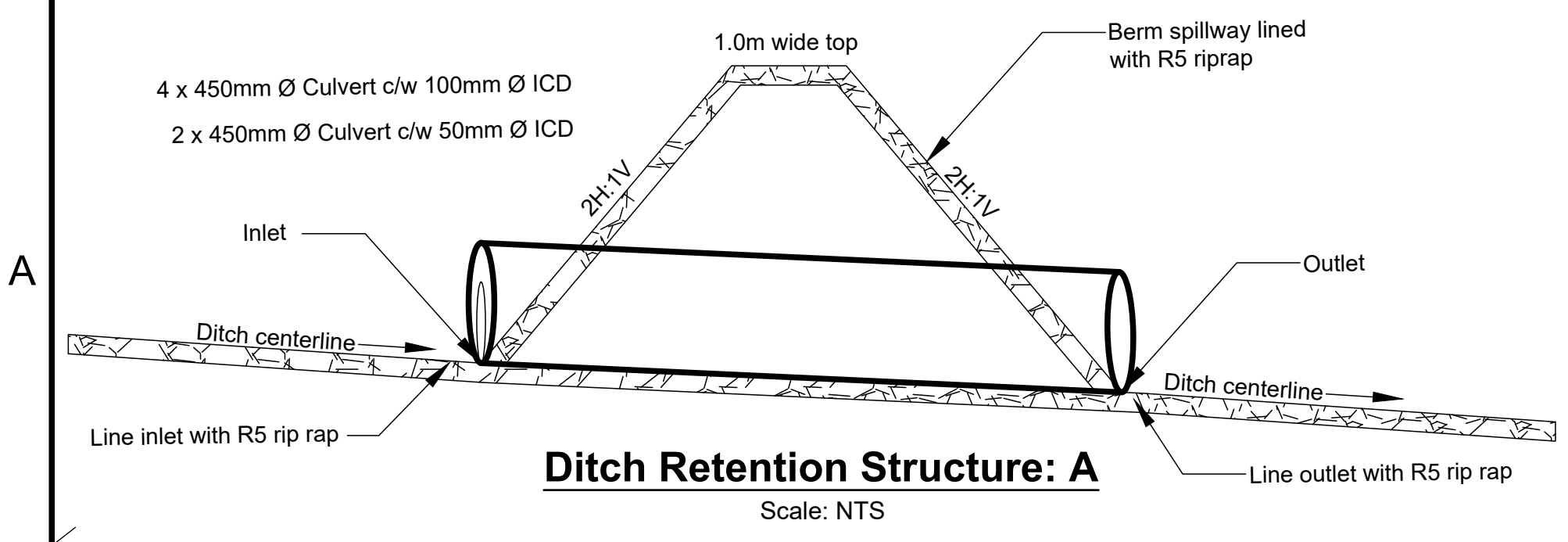
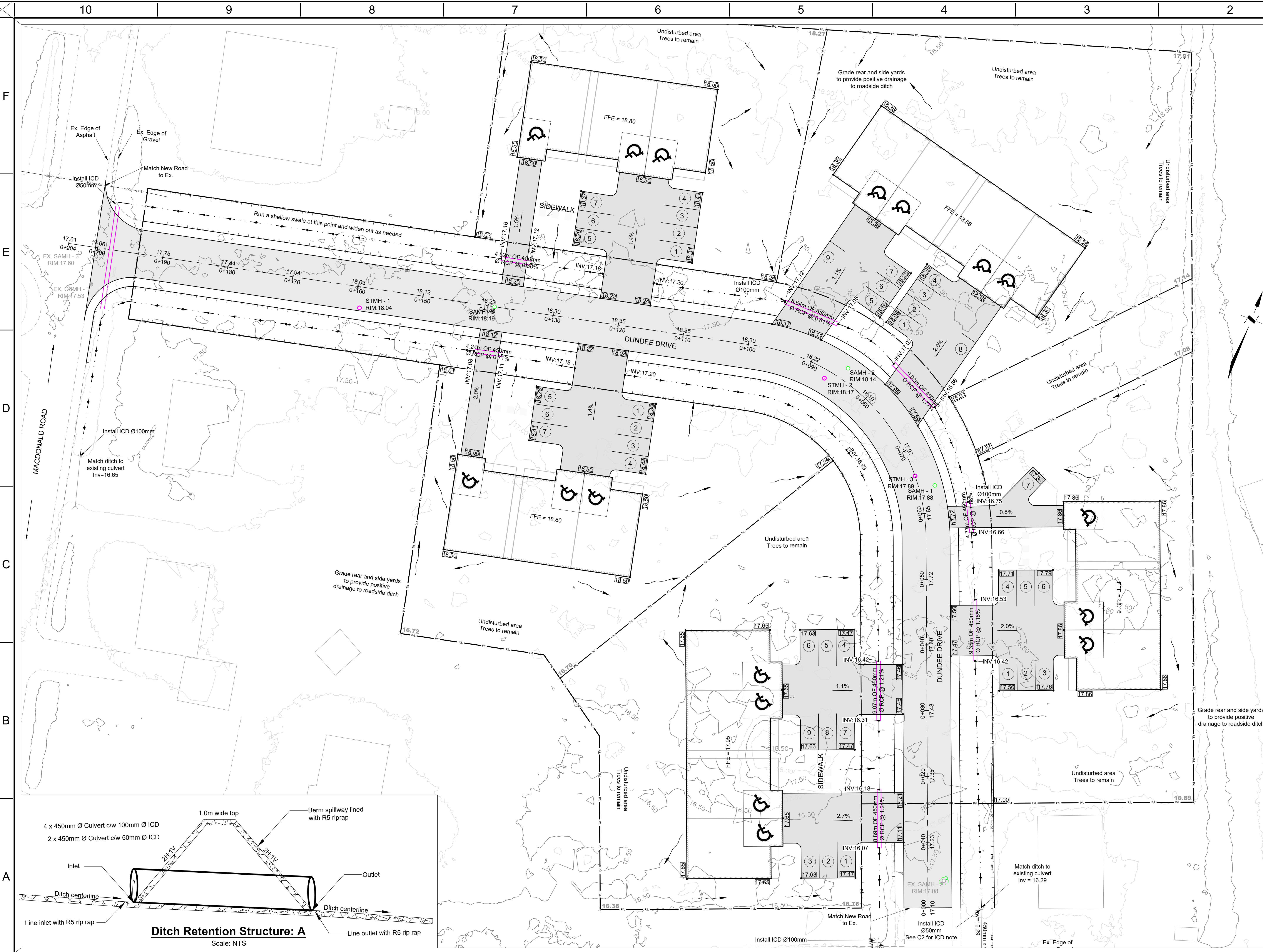
**DUNDEE DRIVE**

**TITLE:**

**GRADING PLAN**

**SHEET C2 of 7**

ISSUE:	REV #
ISSUED FOR REVIEW	3
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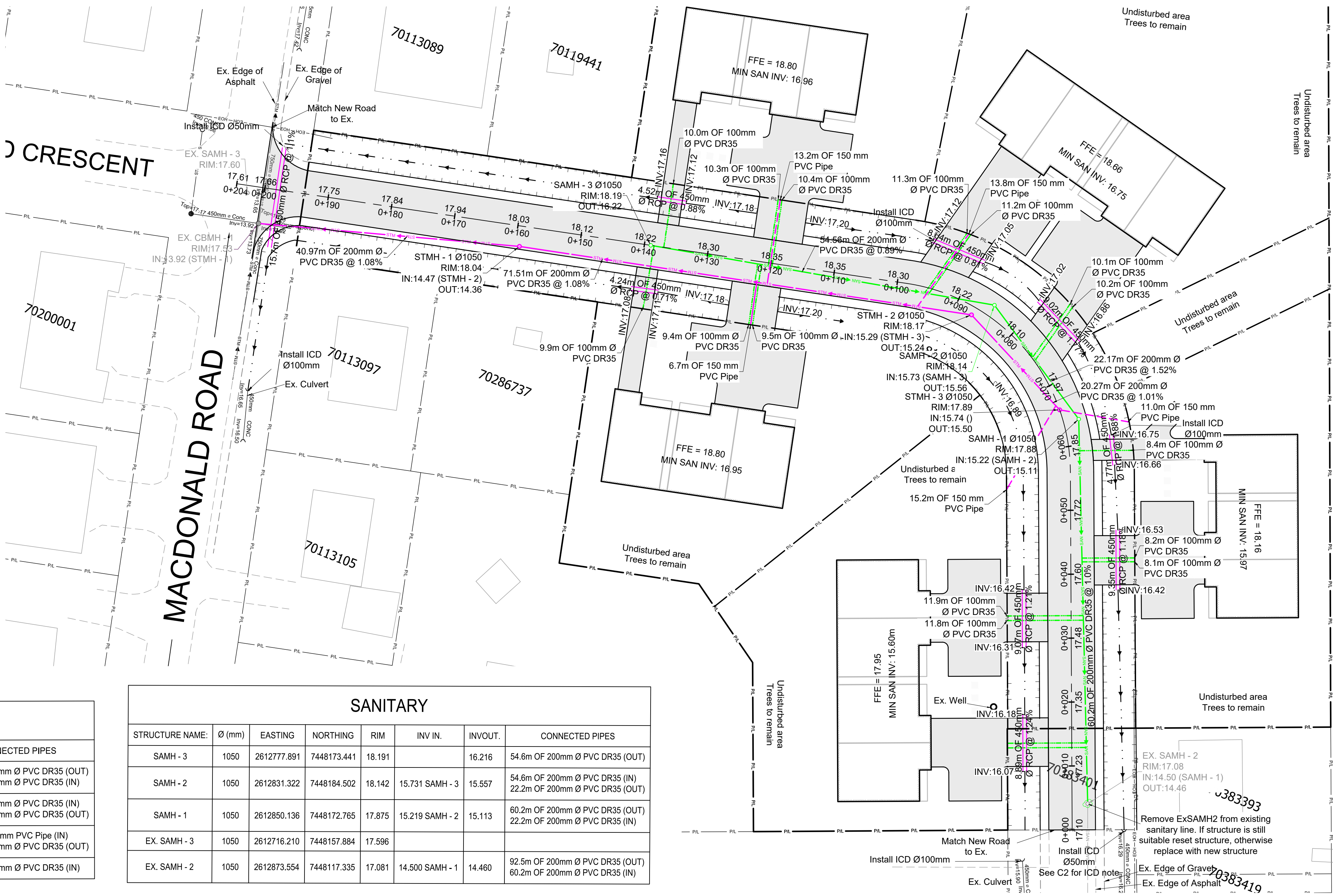




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- ### STORM
1. ALL STORM PIPE TO BE IN ACCORDANCE WITH THE TOWN OF SALISBURY SPECIFICATIONS AND OF THE DIAMETER NOTED ON THE DRAWINGS.
  2. STORM LATERALS TO BE 100mm Ø PVC DR35 (WHITE) IN ACCORDANCE WITH THE TOWN OF SALISBURY SPECIFICATIONS UNLESS OTHERWISE NOTED.
  3. CATCH BASIN LATERALS TO BE 200mm Ø PVC DR35 AT MINIMUM 2.0% UNLESS OTHERWISE DIRECTED BY ENGINEER.
  4. ALL JOINTS TO BE BELL AND SPIGOT TYPE WITH RUBBER GASKETS TO CSA A257.3.
  5. ALL STORM MANHOLES TO BE PRE-CAST TO CSA A257.4 AND ASTM C478 OF THE DIAMETER NOTED ON THE DRAWINGS OR BASED ON MANUFACTURER'S RECOMMENDATIONS.
  6. ALL MANHOLES TO BE 1050Ø UNLESS OTHERWISE NOTED.
  7. ALL STORM MANHOLES TO BE CONSTRUCTED IN ACCORDANCE WITH THE TOWN OF SALISBURY SPECIFICATIONS.
  8. ALL STORM MANHOLE FRAMES AND COVERS TO BE CAST IRON TO ASTM A48, CLASS 30 B AS PER TOWN OF SALISBURY SPECIFICATIONS.
  9. ALL CATCH BASINS TO BE OF THE TYPE SPECIFIED IN THE CATCH BASIN SCHEDULE AND INSTALLED IN ACCORDANCE WITH THE TOWN OF SALISBURY SPECIFICATIONS. CATCH BASINS TO BE EQUIPPED WITH INLET CONTROL.
  10. ALL CATCH BASINS AND STORM MANHOLES TO HAVE MINIMUM 100mm GRADE RING AND 12mm RUBBER RISER BETWEEN FRAME & CONCRETE COVER.
  11. ALL STORM STUBS TO BE PLUGGED/CAPPED. LOCATION TO BE MARKED WITH A 38mm X 89mm WOOD STAKE FROM INVERT OF PIPE TO 300mm BELOW FINISH GRADE.
  12. ONLY FOUNDATION DRAIN TO BE CONNECTED TO THE NEW STORM.

- ### SANITARY
1. ALL SANITARY PIPE TO BE IN ACCORDANCE WITH THE TOWN OF SALISBURY SPECIFICATIONS AND OF THE DIAMETER NOTED ON THE DRAWINGS.
  2. SANITARY LATERALS TO BE 100mm Ø PVC DR35 (GREEN) IN ACCORDANCE WITH THE TOWN OF SALISBURY SPECIFICATIONS UNLESS OTHERWISE NOTED.
  3. ALL JOINTS TO BE IN ACCORDANCE WITH THE TOWN OF SALISBURY SPECIFICATIONS.
  4. ALL SANITARY MANHOLES TO BE PRE-CAST TO CSA A257.4 AND ASTM C478 OF THE DIAMETER NOTED ON THE DRAWINGS OR BASED ON MANUFACTURER'S RECOMMENDATIONS.
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  6. ALL SANITARY MANHOLES TO BE CONSTRUCTED IN ACCORDANCE WITH THE TOWN OF SALISBURY SPECIFICATIONS.
  7. ALL STORM MANHOLE FRAMES AND COVERS TO BE CAST IRON TO ASTM A48, CLASS 30 AS PER TOWN OF SALISBURY SPECIFICATIONS.
  8. ALL SANITARY MANHOLES TO HAVE MINIMUM 100mm RISER BETWEEN FRAME & CONCRETE COVER. TOP RISER TO BE MADE OF RUBBER.
  9. ALL SANITARY STUBS TO BE PLUGGED/CAPPED. LOCATION TO BE MARKED WITH A 38mm X 89mm WOOD STAKE FROM INVERT OF PIPE TO 300mm BELOW FINISH GRADE.
  10. CONTRACTOR SHALL PLACE RIGID FOAM INSULATION (AS PER TOWN OF SALISBURY SPECIFICATIONS) AT DIRECTION OF ENGINEER BETWEEN THE SANITARY LINE AND ANY CROSSING PIPES WHERE THE SEPARATION IS LESS THAN 450mm, OR, OVER THE SANITARY LINE WHERE DEPTH OF COVER IS LESS THAN 1.5m.
  11. CONTRACTOR IS RESPONSIBLE FOR TESTING OF SANITARY MAINS TO THE TOWN OF SALISBURY STANDARDS.



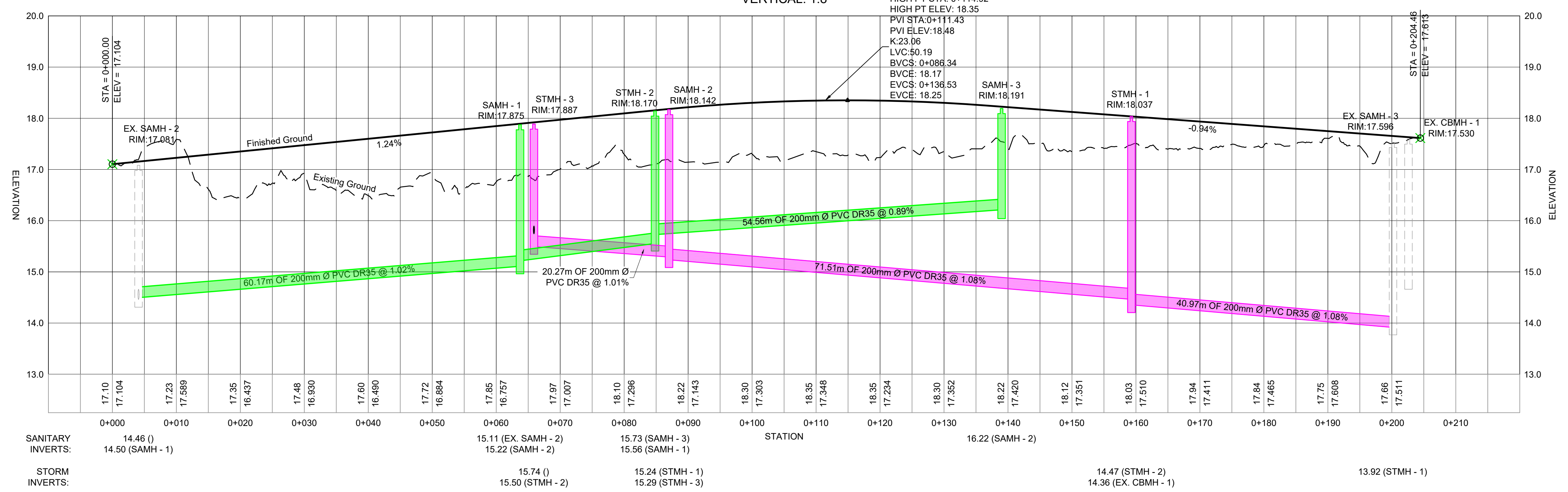
### STORM

STRUCTURE NAME:	Ø (mm)	EASTING	NORTHING	RIM	INV. IN.	INV. OUT.	CONNECTED PIPES
STMH - 2	1050	2612828.543	7448181.766	18.170	15.295 STMH - 3	15.241	71.5m OF 200mm Ø PVC DR35 (OUT) 20.3m OF 200mm Ø PVC DR35 (IN)
STMH - 1	1050	2612758.852	7448165.734	18.037	14.469 STMH - 2	14.361	71.5m OF 200mm Ø PVC DR35 (IN) 41.0m OF 200mm Ø PVC DR35 (OUT)
STMH - 3	1050	2612846.831	7448173.015	17.887	15.744	15.500	11.0m OF 150mm PVC Pipe (IN) 20.3m OF 200mm Ø PVC DR35 (OUT)
EX. CBMH - 1	1050	2612719.577	7448154.071	17.530	13.920 STMH - 1		41.0m OF 200mm Ø PVC DR35 (IN)

### SANITARY

STRUCTURE NAME:	Ø (mm)	EASTING	NORTHING	RIM	INV. IN.	INV. OUT.	CONNECTED PIPES
SAMH - 3	1050	2612777.891	7448173.441	18.191	16.216	16.216	54.6m OF 200mm Ø PVC DR35 (OUT)
SAMH - 2	1050	2612831.322	7448194.502	18.142	15.731 SAMH - 3	15.557	54.6m OF 200mm Ø PVC DR35 (IN) 22.2m OF 200mm Ø PVC DR35 (OUT)
SAMH - 1	1050	2612850.136	7448172.765	17.875	15.219 SAMH - 2	15.113	60.2m OF 200mm Ø PVC DR35 (OUT) 22.2m OF 200mm Ø PVC DR35 (IN)
EX. SAMH - 3	1050	2612716.210	7448157.884	17.596			
EX. SAMH - 2	1050	2612873.554	7448117.335	17.081	14.500 SAMH - 1	14.460	92.5m OF 200mm Ø PVC DR35 (OUT) 60.2m OF 200mm Ø PVC DR35 (IN)

DUNDEE ROAD EXTENSION PROFILE  
VERTICAL: 1:8



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DWG: 23382ESP2 - Parking Up DATED: 2024-08-30

DESIGNED BY: A. Toole  
 DRAWN BY: S. Danbaba  
 CHECKED BY: A. Toole

IF THIS BAR IS NOT 25mm LONG, ADJUST YOUR PLOTTING SCALE

Scale:  
Horizontal 1:400 Vertical 1:50  
SCALE: 1:400 METRIC

CLIENT:  
**WES MICHAUD**

PROJECT:  
**DUNDEE DRIVE**

TITLE:  
**SERVICING PLAN & PROFILE**

SHEET **C3** of 7

ISSUE:  
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REV #  
3



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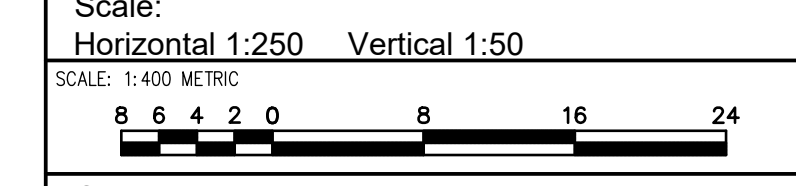
LEGEND		NEW	EXISTING
SANITARY MAIN	—	—	—
SANITARY LATERAL	—	—	—
WATER MAIN	—	—	—
WATER LATERAL	—	—	—
STORM MAIN	—	—	—
STORM LATERAL	—	—	—
CULVERT	—	—	—
UTILITY OVER HEAD	—	—	—
NATURAL GAS	—	—	—
UTILITY UNDERGROUND	—	—	—
PROPERTY BOUNDARY	—	—	—

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CLIENT:

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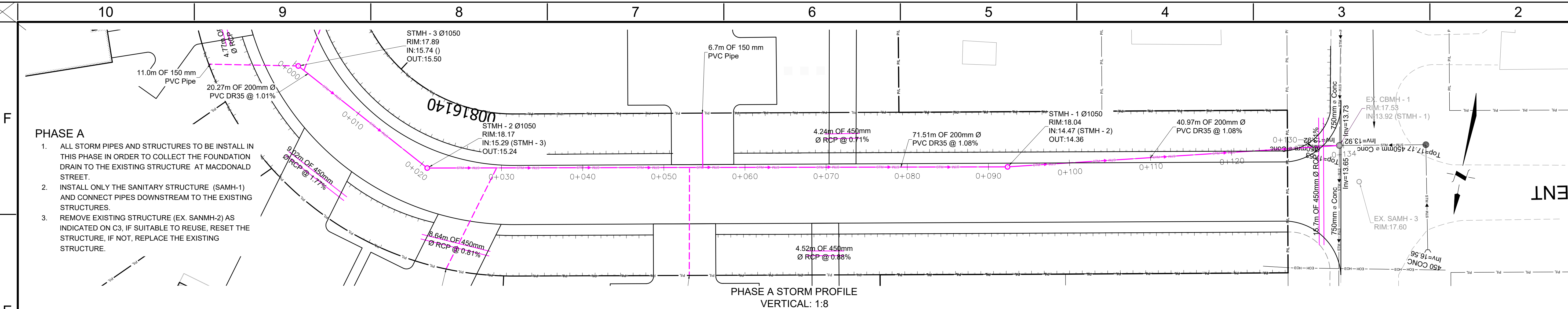
**DUNDEE DRIVE**

TITLE:

**SERVICING PLAN & PROFILE PHASE A**

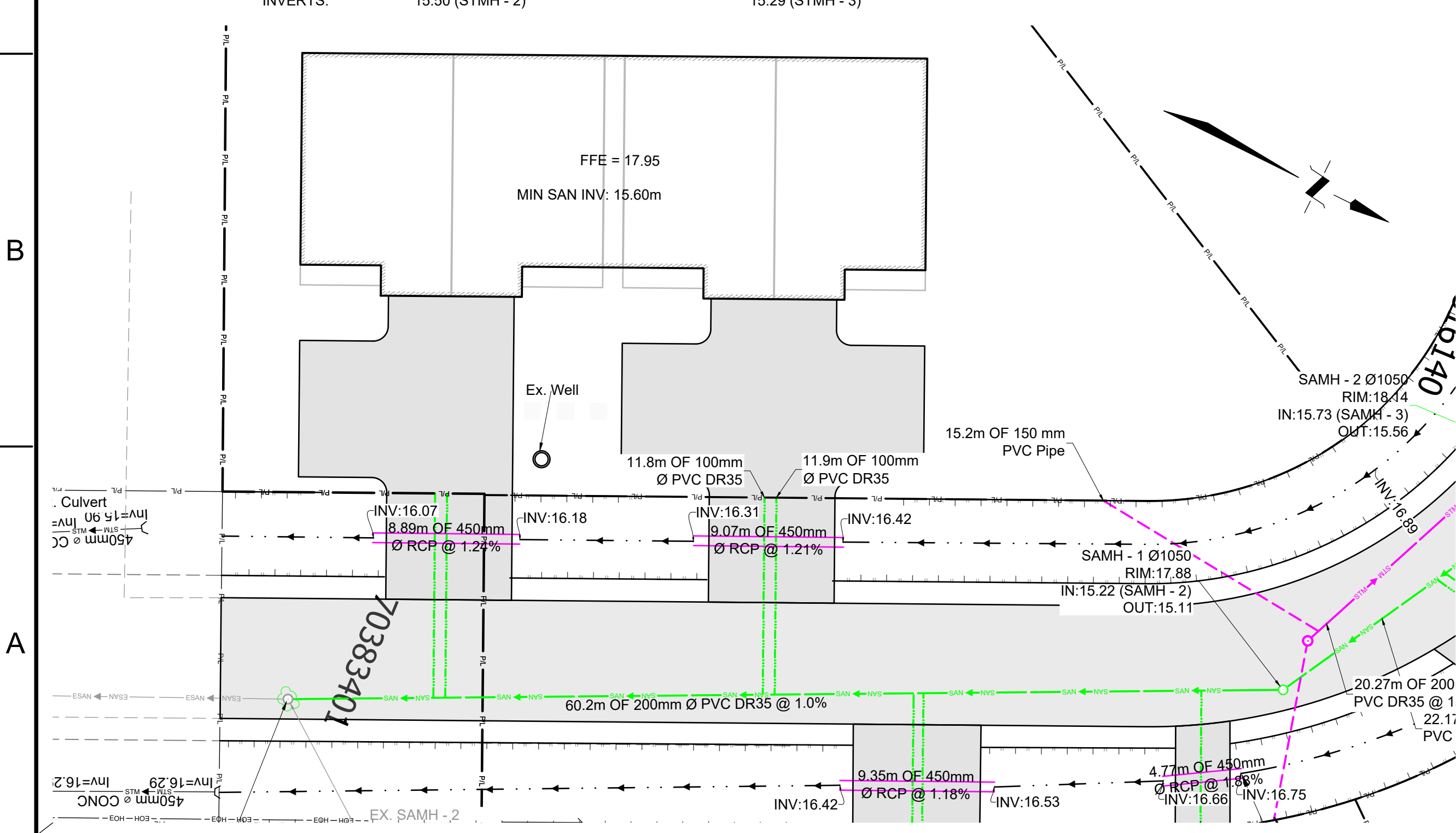
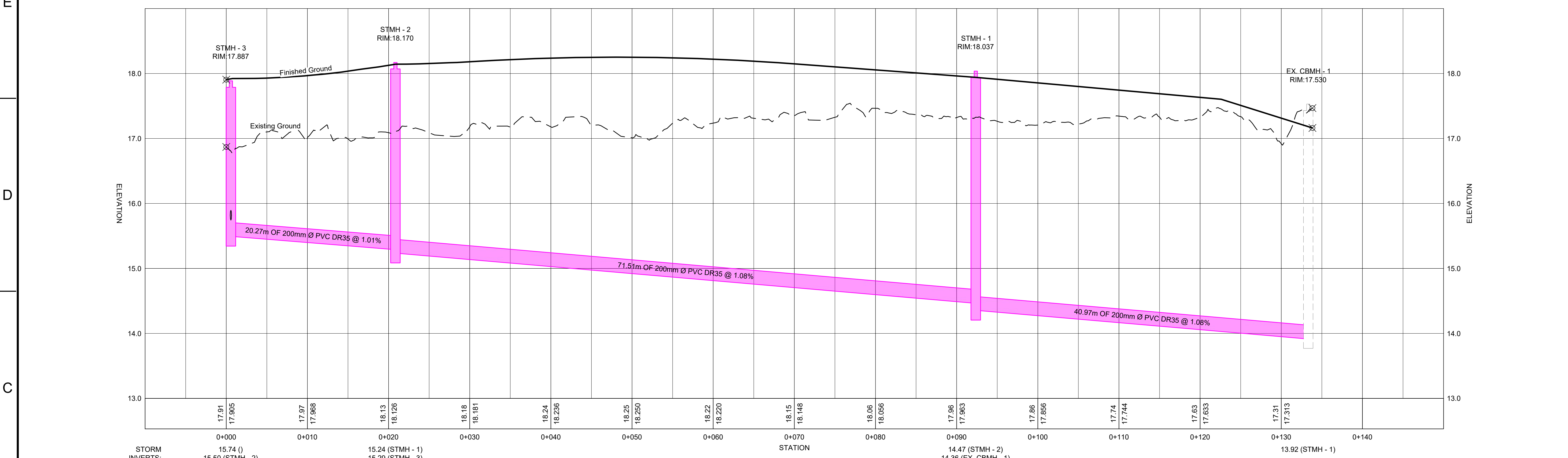
**SHEET C4 of 7**

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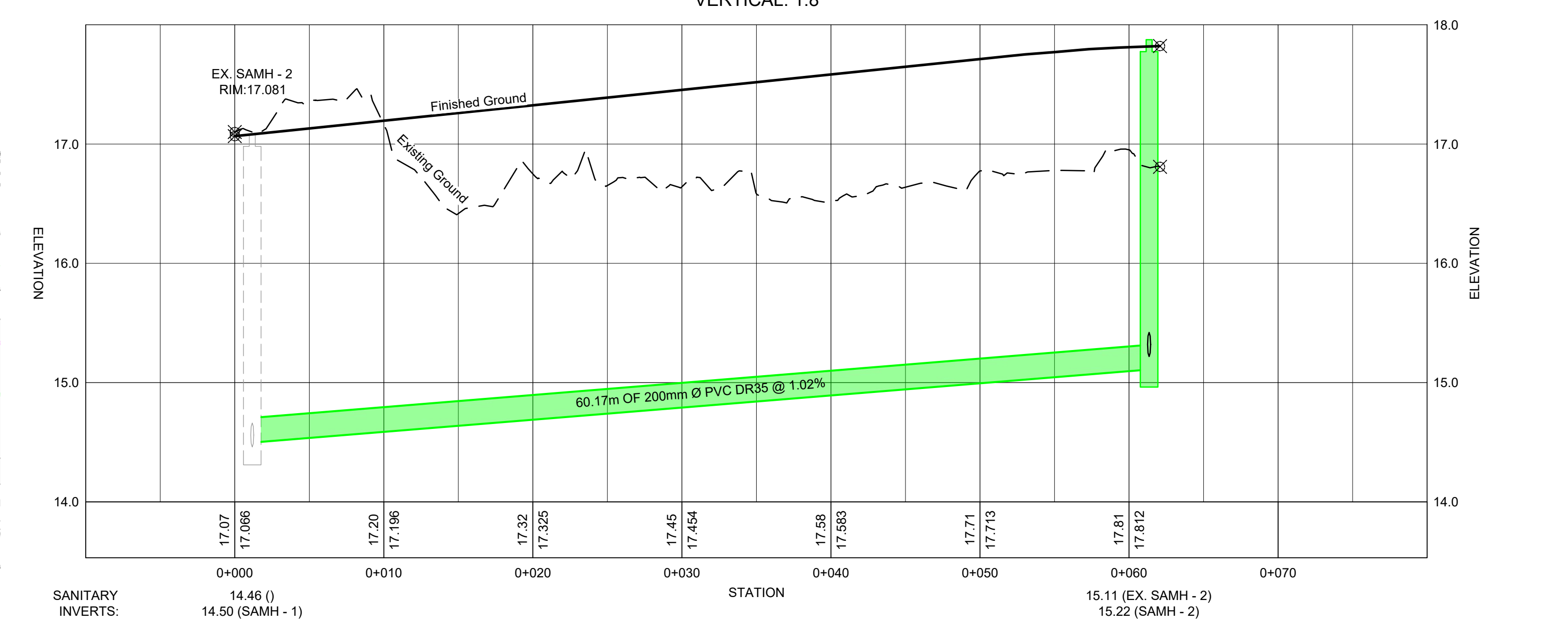


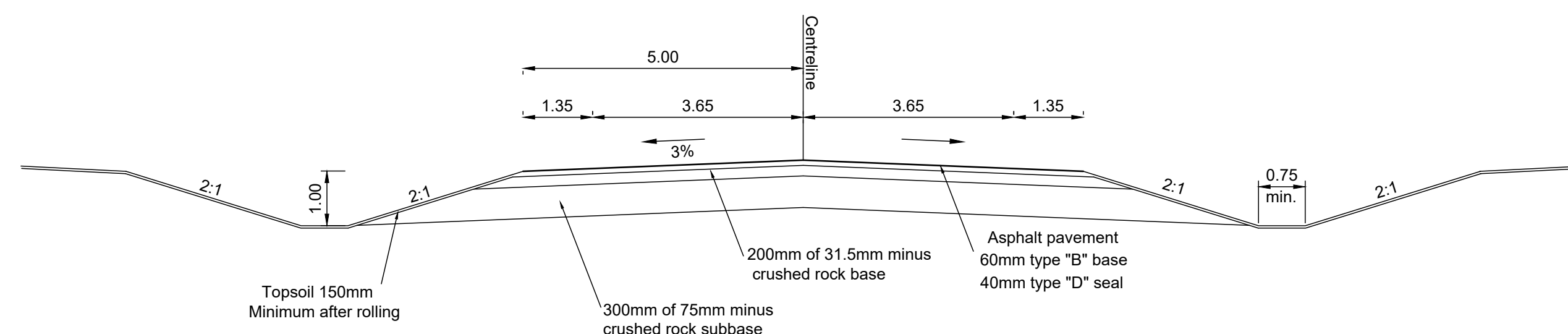
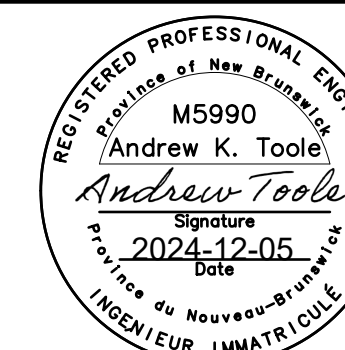
- PHASE A**
- ALL STORM PIPES AND STRUCTURES TO BE INSTALL IN THIS PHASE IN ORDER TO COLLECT THE FOUNDATION DRAIN TO THE EXISTING STRUCTURE AT MACDONALD STREET.
  - INSTALL ONLY THE SANITARY STRUCTURE (SAMH-1) AND CONNECT PIPES DOWNSTREAM TO THE EXISTING STRUCTURES.
  - REMOVE EXISTING STRUCTURE (EX. SANMH-2) AS INDICATED ON C3, IF SUITABLE TO REUSE, RESET THE STRUCTURE, IF NOT, REPLACE THE EXISTING STRUCTURE.

PHASE A STORM PROFILE VERTICAL: 1:8



PHASE A SANITARY PROFILE VERTICAL: 1:8



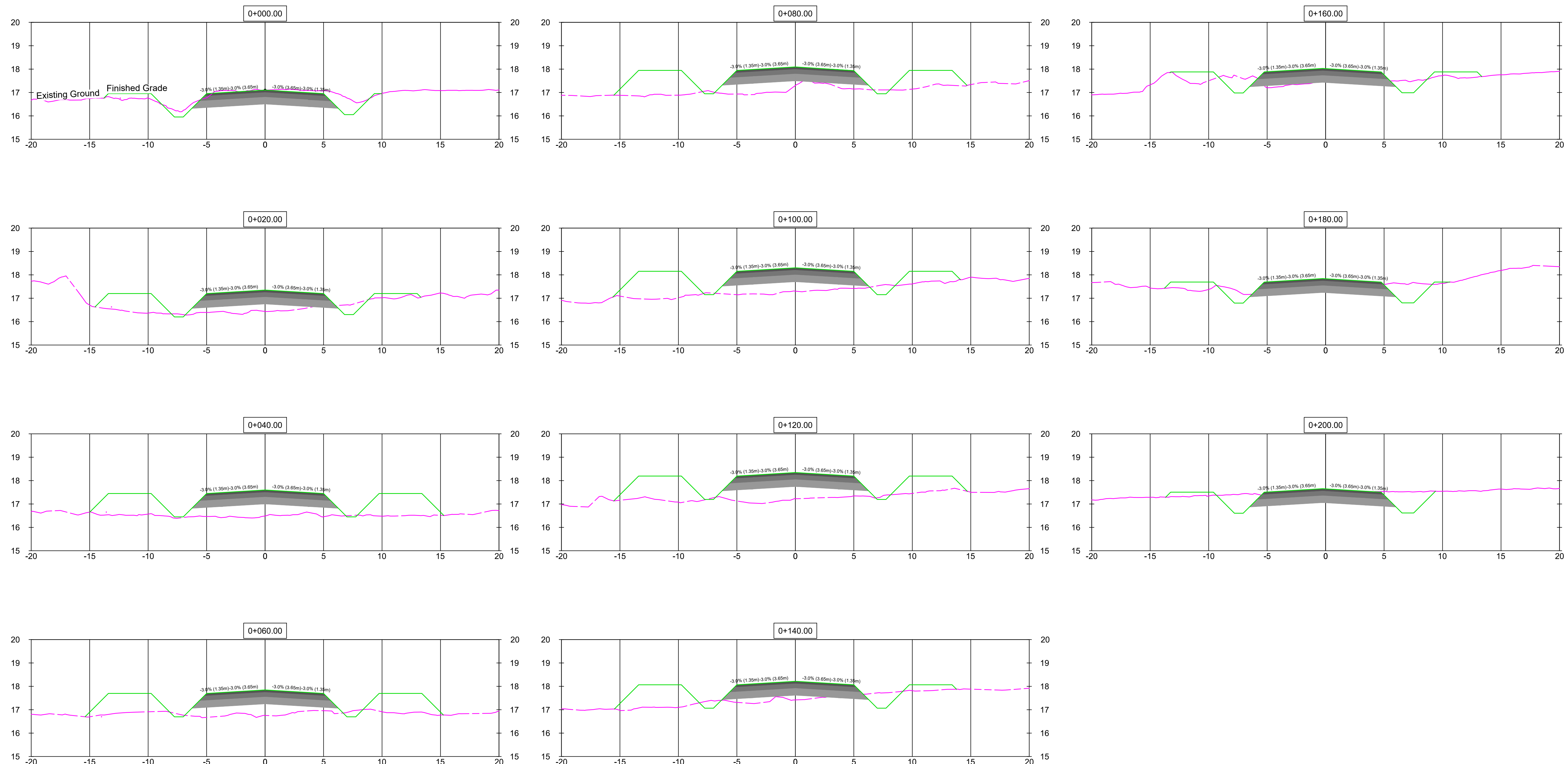


**Typical road section**

Scale: NTS

**Notes:**

1. To tie the typical section to existing swales, widen out as needed.
2. Ditches to be finished with 150mm of topsoil and hydroseeded.
3. Asphalt crown to be carried to centreline of culvert.
4. Gravel driveways to match to edge of gravel shoulder.
5. Asphalt driveways to match to edge of asphalt.



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**WES MICHAUD**

PROJECT:  
**DUNDEE DRIVE**

TITLE:  
**CROSS SECTIONS**

SHEET **C5** of 7

ISSUE:  
 ISSUED FOR REVIEW  
 DATE OF: 2024-12-05

REV #  
**3**

**STORMWATER MANAGEMENT NOTES**

STORM WATER MODELED USING HYDROCAD V10.20 SOFTWARE, USING THE USDA NATURAL RESOURCES CONSERVATION SERVICE METHOD (FORMALLY SCS).  
 1. WORK COMPLETED IN ACCORDANCE WITH THE CITY OF MONCTON STORM DRAINAGE DESIGN CRITERIA MANUAL, MARCH 7, 2016 VERSION.  
 2. 2 AND 24HR CHICAGO STORM DISTRIBUTION USED.  
 • 100 YEAR STORM (24HR) - TOTAL RAINFALL: 140mm  
 • 5 YEAR STORM (24HR) - TOTAL RAINFALL: 84mm  
 3. I.A/S RATIO = 0.2  
 4. ANTECEDENT MOISTURE CONDITION = 2 (AVERAGE (NORMAL) CONDITIONS)  
 5. PRE-DEVELOPMENT CATCHMENT DRAINAGE BOUNDARIES MATCH POST-DEVELOPMENT BOUNDARIES.

**USSCS METHOD HYDROLOGIC SOIL GROUP CLASSIFICATION**

- A. SOIL GROUP A: VERY LOW RUNOFF POTENTIAL AND VERY HIGH INFILTRATION RATE, CONSISTENT WITH WELL DRAINED SAND AND GRAVEL.
- B. SOIL GROUP B: MODERATE RUNOFF POTENTIAL AND INFILTRATION RATE, CONSISTENT WITH SAND AND SILT.
- C. SOIL GROUP C: HIGH RUNOFF POTENTIAL AND LOW INFILTRATION RATE, CONSISTENT WITH CLAY AND SAND.
- D. SOIL GROUP D: VERY HIGH RUNOFF POTENTIAL AND VERY LOW INFILTRATION RATE, CONSISTENT WITH SATURATED CLAYS AND HIGH WATER TABLES.

PRE DEVELOPMENT CATCHMENT AREAS (A.#)			
CATCHMENT ID	AREA (m <sup>2</sup> )	CN	TC (min)
A.1	14847	65	17.500

POST DEVELOPMENT CATCHMENT AREAS (B.#)			
CATCHMENT ID	AREA (m <sup>2</sup> )	CN	TC (min)
B.1	2622	77	5.000
B.2	2,579	75	5.000
B.3	3947	74	5.000
B.4	2,144	80	5.000
B.5	2,122	80	5.000
B.6	1,431	63	5.000
TOTAL	14,847	% IMPERVIOUS	32.33%

PEAK FLOW SUMMARY			
RAIN EVENT	PRE	POST W/O SWM	POST W/ SWM
1:5 YR (m <sup>3</sup> /s)	0.0384	0.1406	0.0353
1:100 YR (m <sup>3</sup> /s)	0.1617	0.3896	0.0612



**DON-MORE SURVEYS & ENGINEERING LTD.**



• ALL WORK TO BE PERFORMED IN ACCORDANCE WITH THE TOWN OF SALISBURY GENERAL SPECIFICATIONS, LATEST REVISION.  
 • ALL ELEVATIONS ARE SPECIFIC BASED ON SERVICE NEW BRUNSWICK ACTIVE CONTROL UTILIZING GEOID MODEL CGVD2013.  
 • THE APPROXIMATE LOCATION OF KNOWN INFRASTRUCTURE IS SHOWN ON THE PLANS BASED ON THE BEST AVAILABLE INFORMATION AT THE TIME. HOWEVER, THE CONSULTANT ACCEPTS NO RESPONSIBILITY FOR THE ACCURACY OR COMPLETENESS OF THIS INFORMATION.  
 • CONTRACTOR TO CONFIRM HORIZONTAL LOCATION AND VERTICAL ELEVATION OF ALL EXISTING SERVICES PRIOR TO COMMENCING WORK. CONTRACTOR TO IMMEDIATELY REPORT ANY DISCREPANCIES TO THE ENGINEER.  
 • IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO BECOME FAMILIAR WITH AND UNDERSTAND THE NATURE AND EXTENT OF THE WORK TO BE EXECUTED, THE NATURE OF THE SOIL SURFACE WATER DRAINAGE, THE GENERAL FORM OF THE SURFACE OF THE GROUND, AND GENERALLY OF ALL MATTERS WHICH CAN IN ANY WAY INFLUENCE THE CONSTRUCTION OF THIS PROJECT.  
 • ALL REQUIRED PERMITS MUST BE OBTAINED IN ADVANCE OF CONSTRUCTION.  
 • ALL APPLICABLE CITY, BYLAWS, PROVINCIAL AND FEDERAL STATUTES AND REGULATIONS MUST BE ADHERED TO.  
 • CONTRACTOR MAY NOT SUBSTITUTE ANY MATERIALS UNLESS APPROVED BY THE ENGINEER.  
 • CONTRACTOR TO NOTIFY THE TOWN OF SALISBURY REGARDING CONSTRUCTION SCHEDULE PRIOR TO COMMENCING CONSTRUCTION.  
 • CONTRACTOR SHALL BE RESPONSIBLE FOR TRAFFIC CONTROL AND SAFETY MEASURES DURING THE WORK.  
 • THE CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND UTILITY LOCATIONS AND REPORT ALL ERRORS AND OMISSIONS PRIOR TO COMMENCING WORK.  
 • ALL THE TOWN OF SALISBURY INFRASTRUCTURE, PUBLIC UTILITIES, NATURAL GAS MAINS AND OTHER INFRASTRUCTURE MUST BE LOCATED IN THE FIELD PRIOR TO THE START OF EXCAVATION.  
 • CONTRACTOR TO ENSURE PROPER EROSION AND SEDIMENTATION CONTROL METHODS ARE USED TO CONTROL SITE RUNOFF DURING CONSTRUCTION.

LAND USE	PRE	POST
ASPHALT	[Color]	[Color]
GRASS	[Color]	[Color]
GRAVEL	[Color]	[Color]
ROOF	[Color]	[Color]
WOODS	[Color]	[Color]
WETLAND	[Color]	[Color]
LOTS	[Color]	[Color]
SUBCATCHMENT	[Color]	[Color]
SUBCATCHMENT ID	A.#	B.#
FLOW DIRECTION	[Arrow]	[Arrow]
APPROX. 5YR FLOOD	[Line]	[Line]
APPROX. 100YR FLOOD	[Line]	[Line]

REVISION:

3	2024-12-05	CIVIL UPDATE
2	2024-10-08	ISSUED FOR REVIEW
1	2024-09-27	ISSUED FOR REVIEW

No. [DATE Y/M/D] DESCRIPTION

DWG: 23382ESP2 - Parking Up DATED: 2024-08-30

DESIGNED BY: A. Toole IF THIS BAR IS NOT 25mm LONG, ADJUST YOUR PLOTTING SCALE

DRAWN BY: S. Danbaba

CHECKED BY: A. Toole

Scale:  
 Horizontal 1:250 Vertical N/A  
 SCALE: 1:250 METRIC

CLIENT:  
**WES MICHAUD**

PROJECT:  
**DUNDEE DRIVE**

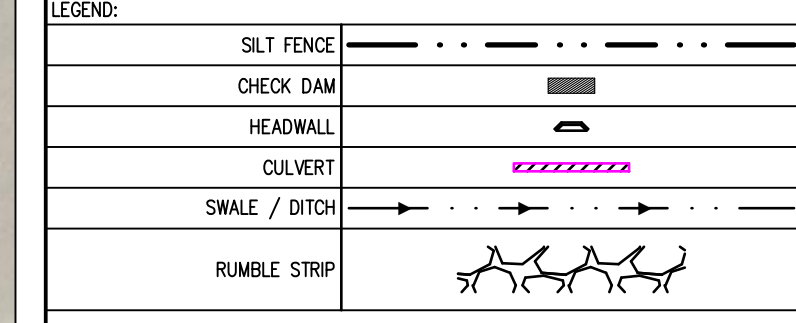
TITLE:  
**STORMWATER MANAGEMENT PLAN**

SHEET **C6** of 7

ISSUE:	REV #
ISSUED FOR REVIEW	3
DATE OF: 2024-12-05	



• ALL WORK TO BE PERFORMED IN ACCORDANCE WITH THE TOWN OF SALISBURY GENERAL SPECIFICATIONS, LATEST EDITION.  
 • ALL ELEVATIONS ARE DECIMETRIC BASED ON SERVICE NEW BRUNSWICK ACTIVE CONTROL UTILIZING GEOID MODEL CGVD2013.  
 • THE APPROXIMATE LOCATION OF KNOWN INFRASTRUCTURE IS SHOWN ON THE PLANS BASED ON THE BEST AVAILABLE INFORMATION AT THE TIME. HOWEVER, THE CONSULTANT ACCEPTS NO RESPONSIBILITY FOR THE ACCURACY OR COMPLETENESS OF THIS INFORMATION.  
 • CONTRACTOR TO CONFIRM HORIZONTAL LOCATION AND VERTICAL ELEVATION OF ALL EXISTING SERVICES PRIOR TO COMMENCING WORK. CONTRACTOR TO IMMEDIATELY REPORT ANY DISCREPANCIES TO THE ENGINEER.  
 • IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO BECOME FAMILIAR WITH AND UNDERSTAND THE NATURE AND EXTENT OF THE WORK TO BE EXECUTED, THE NATURE OF THE SOIL, SURFACE WATER DRAINAGE, THE GENERAL FORM OF THE SURFACE OF THE GROUND, AND GENERALLY OF ALL MATTERS WHICH CAN IN ANY WAY INFLUENCE THE CONSTRUCTION OF THIS PROJECT.  
 • ALL REQUIRED PERMITS MUST BE OBTAINED IN ADVANCE OF CONSTRUCTION.  
 • ALL APPLICABLE CITY, BY-LAWS, PROVINCIAL AND FEDERAL, STATUTES AND REGULATIONS MUST BE ADHERED TO.  
 • CONTRACTOR MAY NOT SUBSTITUTE ANY MATERIALS UNLESS APPROVED BY THE ENGINEER.  
 • CONTRACTOR TO NOTIFY THE TOWN OF SALISBURY REGARDING CONSTRUCTION SCHEDULE PRIOR TO COMMENCING CONSTRUCTION.  
 • CONTRACTOR SHALL BE RESPONSIBLE FOR TRAFFIC CONTROL AND SAFETY MEASURES DURING THE WORK.  
 • THE CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND UTILITY LOCATIONS AND REPORT ALL ERRORS AND OMISSIONS PRIOR TO COMMENCING WORK.  
 • ALL THE TOWN OF SALISBURY INFRASTRUCTURE, PUBLIC UTILITIES, NATURAL GAS MAINS AND OTHER INFRASTRUCTURE MUST BE LOCATED IN THE FIELD PRIOR TO THE START OF EXCAVATION.  
 • CONTRACTOR TO ENSURE PROPER EROSION AND SEDIMENTATION CONTROL METHODS ARE USED TO CONTROL SITE RUNOFF DURING CONSTRUCTION.



REVISION:

3	2024-12-05	CIVIL UPDATE
2	2024-10-08	ISSUED FOR REVIEW
1	2024-09-27	ISSUED FOR REVIEW

No.	DATE Y/M/D	DESCRIPTION	DATED:
			DWG: 23382ESP2 - Parking Up
			2024-08-30
DESIGNED BY:	IF THIS BAR IS NOT 25mm LONG, ADJUST YOUR PLOTTING SCALE		
DRAWN BY:			
CHECKED BY:			
Scale:	Horizontal 1:300 Vertical N/A		
SCALE:	1:250 METRIC		

CLIENT:

**WES MICHAUD**

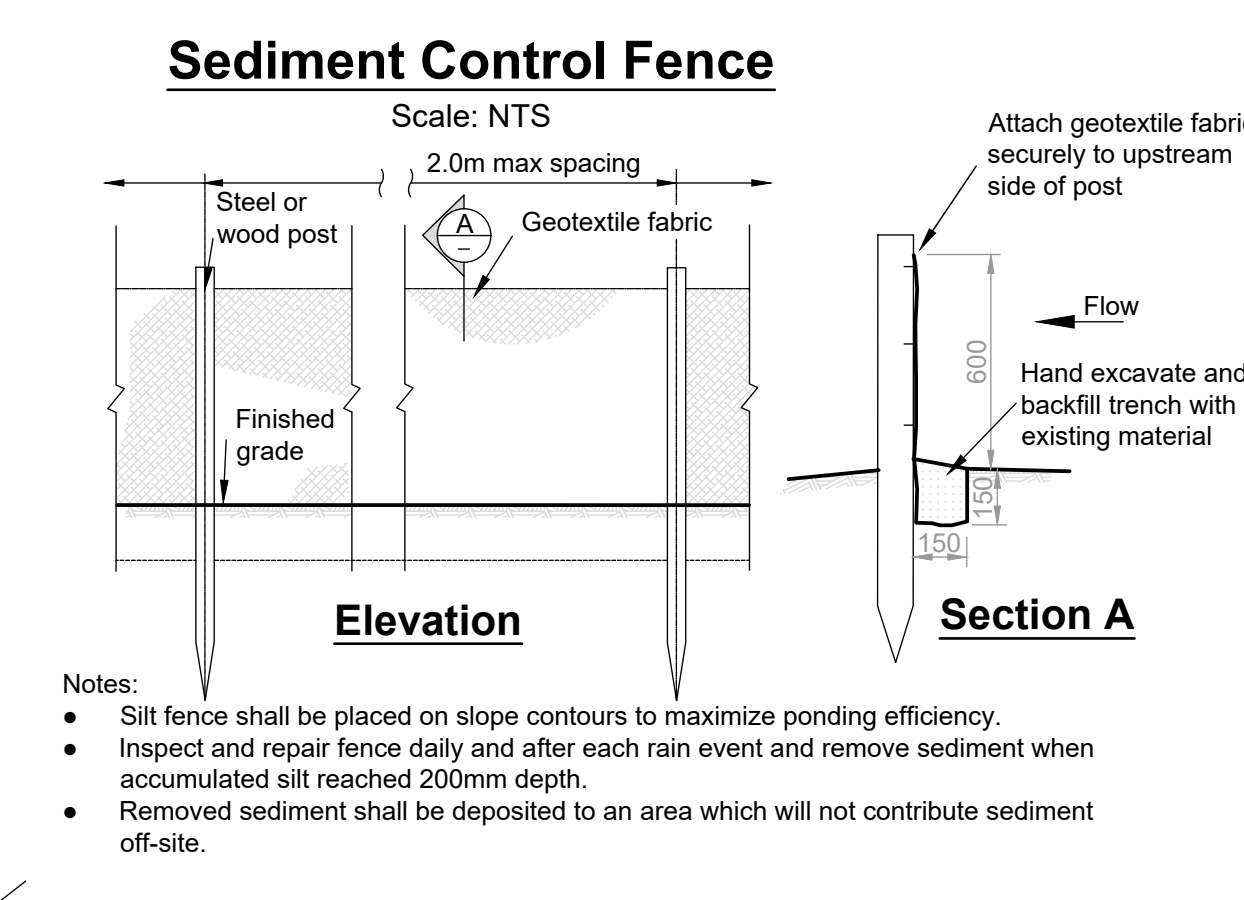
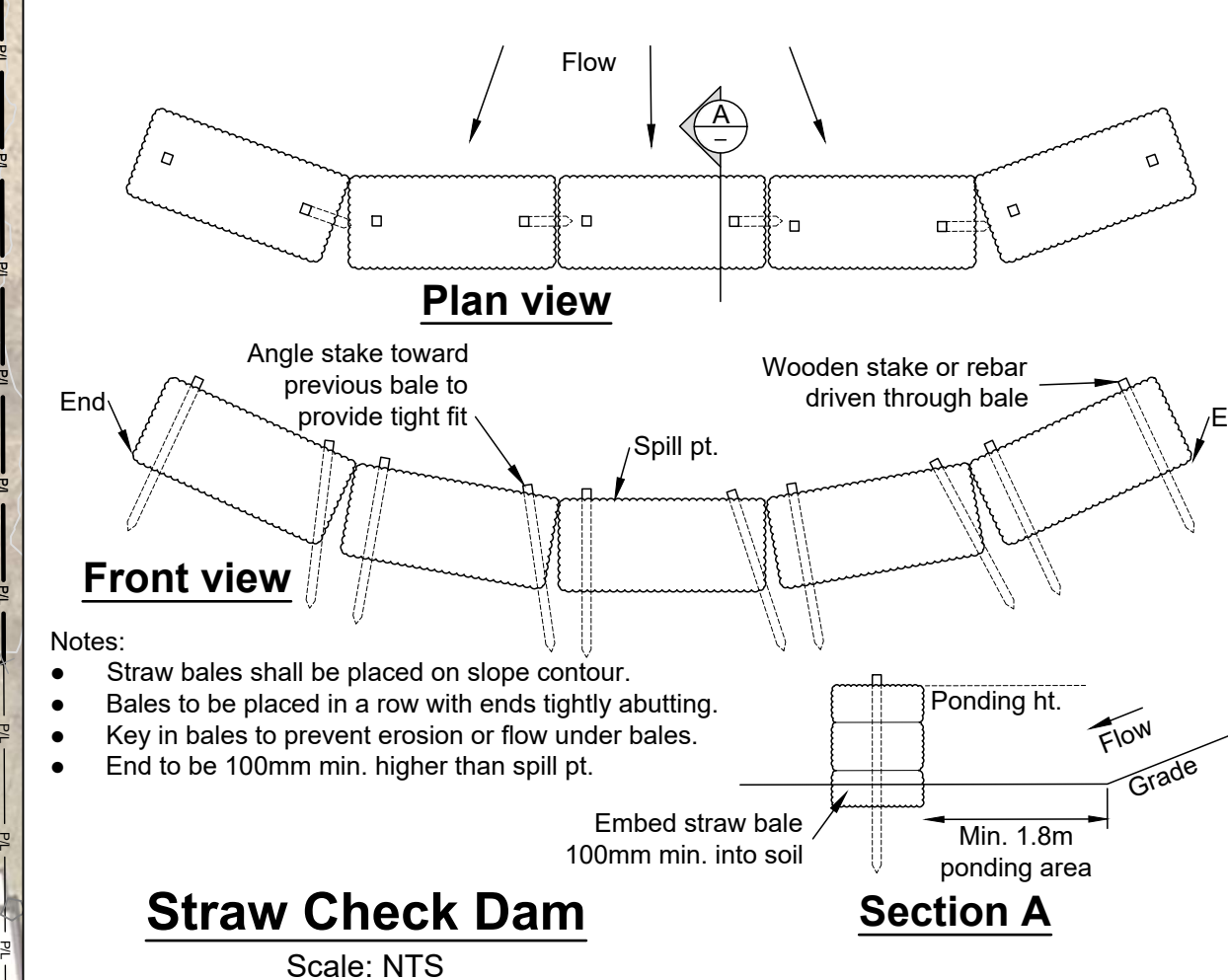
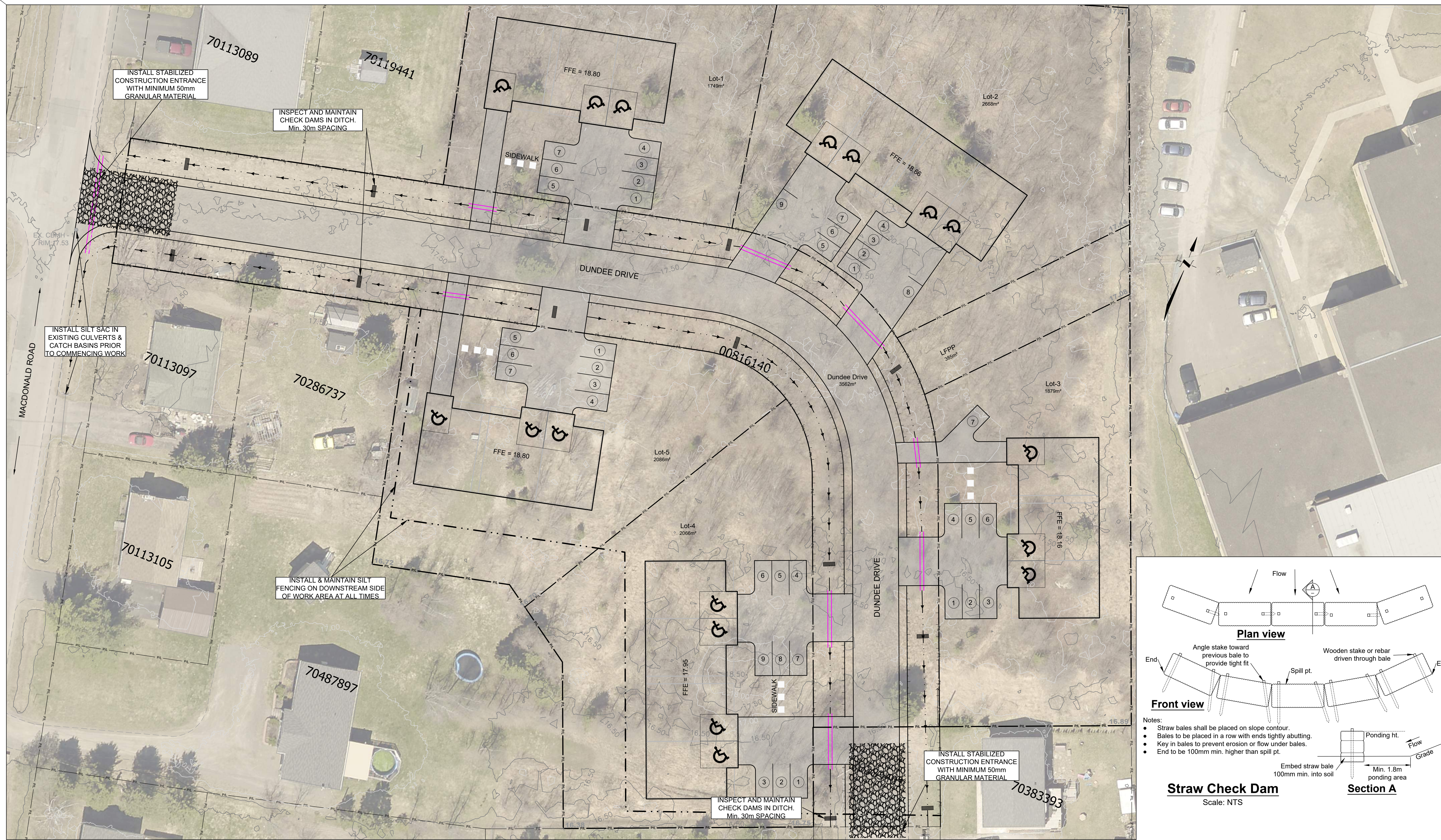
PROJECT:

**DUNDEE DRIVE**

TITLE:  
**EROSION AND SEDIMENTATION CONTROL PLAN**

SHEET **C7** of 7

ISSUE:	REV #
ISSUED FOR REVIEW	3
DATE OF: 2024-12-05	



**EROSION AND SEDIMENTATION SCHEDULE**

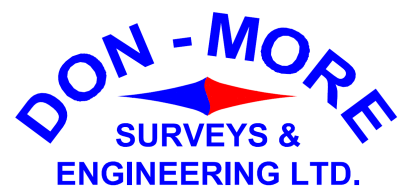
- CLEAR SITE WHERE REQUIRED. DO NOT GRUB.
- INSTALL EROSION AND SEDIMENTATION CONTROL MEASURES SUCH AS SILT FENCE, CHECK DAMS AND OTHER MEASURES.
- INSTALL SILT SACS IN ALL DOWN STREAM CULVERTS WITHIN 30 METERS OF CONSTRUCTION ENTRANCE.
- COMPLETE GRUBBING. GRUB ONLY THE AREAS REQUIRED.
- COMPLETE MASS EXCAVATION AND DITCH CONSTRUCTION.
- COMPLETE ROAD WORK. STABILIZE EXPOSED SOIL TO PREVENT EROSION. SUBJECT TO RAINFALL FORECASTS, EXPOSED SOIL MAY REQUIRE TARPING, INCLUDING STOCK PILE AREAS.
- COMPLETE ROAD AND DITCH AREA CONSTRUCTION, INSTALL TOPSOIL AND SOD OR HYDROSEED ANY REMAINING AREAS.

**EROSION AND SEDIMENT CONTROL GENERAL NOTES**

- CONSTRUCTION ACTIVITY TO BE CARRIED OUT BASED ON THE PRINCIPLE THAT PREVENTION OF SEDIMENT LADEN RUN-OFF IS THE FOCUS RATHER THAN RELYING ON TREATMENT AT OUTFALL. THIS IS TO BE ACCOMPLISHED BY MINIMIZING EXPOSED SOIL. ONCE EXCAVATION HAS BEGUN IN A PARTICULAR AREA, THE WORK IS TO BE COMPLETED IN THAT AREA, INCLUDING FINAL GRADING AND STABILIZATION.
- TRIBUTARY STORMWATER FROM SITE TO BE DIRECTED TO SEDIMENTATION CONTROL DEVICES AT ALL TIMES DURING CONSTRUCTION.
- COVER AND STABILIZE EXPOSED SURFACES WITH HAY, MULCH, WOOD CHIPS OR IMPERMEABLE MEMBRANE (SUCH AS A TARP) AS REQUIRED TO PREVENT SEDIMENT RUN-OFF. MAINTAIN COVERAGE THROUGHOUT CONSTRUCTION PERIOD.
- CONTRACTOR TO LEAVE SEDIMENTATION CONTROL MEASURES IN SERVICE UNTIL ENGINEER OR THE MUNICIPALITY REQUESTS THAT THEY BE TAKEN OUT OF SERVICE.
- CONTRACTOR TO HAVE ADDITIONAL SILT FENCE, BAILED HAY, HAY AND/OR MULCH ON SITE FOR MAINTENANCE AND INSTALLATION OF ADDITIONAL MEASURES AS REQUIRED.

- ALL EXPOSED SURFACES TO BE STABILIZED WITH HAY OR MULCH ON AN ON-GOING BASIS. IT WILL NOT BE ACCEPTABLE TO LEAVE EXPOSED SURFACES TO THE END OF THE JOB AND STABILIZE ALL EXPOSED SURFACES AS ONE LARGE JOB.
- ALL EXPOSED AREAS NOT FINISHED WITH ASPHALT, GRAVEL, SOD OR RIPRAP TO BE HYDROSEED.
- ALL WORKS TO BE PERFORMED IN ACCORDANCE WITH REQUIREMENTS OF THE NEW BRUNSWICK DEPARTMENT OF THE ENVIRONMENT AND THE Municipality.
- CONTRACTOR TO INSPECT SEDIMENT CONTROL STRUCTURES AND MAKE NECESSARY REPAIRS WEEKLY AND BEFORE AND AFTER ALL RAINFALL EVENTS EXCEEDING 10mm.
- CONTRACTOR TO OBTAIN COPIES OF ALL NECESSARY PERMITS REQUIRED TO PERFORM WORKS AND SHALL COMPLY WITH ALL PERMIT REQUIREMENTS AND CONDITIONS.
- THE SEDIMENT AND EROSION CONTROL MEASURES OUTLINED ON THIS PLAN ARE RECOMMENDATIONS ONLY. DEPENDING ON SITE CONDITIONS DURING CONSTRUCTION, ADDITIONAL MEASURES MAY BE REQUIRED.

506.433.4427 (Sussex)  
506.652.7358 (Saint John)  
[info@dmse.ca](mailto:info@dmse.ca)  
[www.dmse.ca](http://www.dmse.ca)



Ref: 23382ESP2-DesignReport-R3  
Dec 5th, 2024

Trevor Douthwright  
Manager, Infrastructure & Public Works  
56 Douglas Street,  
Salisbury, NB E4J 3E3

Via E-Mail: [works@salisburynb.ca](mailto:works@salisburynb.ca)

## **DUNDEE DRIVE - TOWN OF SALISBURY**

Don-More Surveys & Engineering Ltd. (Don-More) has been engaged to provide surveying and engineering services related to the development of a street extension and five townhouses located on PID 00816140.

The parcel is currently an undeveloped property and is mostly trees. The property is located at the end of Dundee Drive, off of Macdonald Road in Salisbury, NB. The project's full development will consist of the extension of Dundee Drive to connect MacDonald Road and the development of five townhouse buildings with a total of 34 units.

### **Water Servicing**

The units will be serviced by on-site wells and as such this is considered to be outside the scope of this report.

### **Sanitary Servicing**

The existing 200mm Ø sanitary line in Dundee Drive will be extended through the development to service the new units. The existing manhole located at the end of Dundee Drive is far off level and in high flow situations, solids are pooling on the uphill side of the structure. This structure will be removed from the existing line, inspected and if the structure is still serviceable, will be re-installed prior to the new sanitary line being installed.

The new sanitary line will be an extension of the existing 200mm Ø line. Three new sanitary manholes will be installed.

The new units will be serviced by individual 100mm Ø laterals connected to the main at a minimum slope of 2%.

The development was modelled using a population of 119 persons (3.5 persons per unit).

This results in an average daily flow of 45220 liters per day with a peak flow 2.418 liters per second.

This new flow was then compared to the existing length of pipe at the end of Dundee Drive. This last section of existing pipe is a 200mm Ø pipe at 1.1% slope. This has a theoretical capacity of 34 liters per second. The new flow would represent 4% of this theoretical flow.

See appendix A for additional calculations.

## **Stormwater Analysis**

The existing site today is mostly wooded and slopes south towards Dundee Drive. There are minor swales at the south end of the site that direct sheet flow from the site into the roadside ditches adjacent to Dundee Drive.

The development of the site will result in a change of land use to more impervious surfaces. The new road through the site will have roadside ditches. Lots on the upper side (north and east of the new road), will be graded so the entire lot area drains to the roadside ditch. Lots on the lower side (south and west of the new road), will be graded so the front half of the lot drains to the roadside ditch, and the rear portion of the lot continues to sheet drain to the south of the site.

The roadside ditches will act as retention ponds for the development. The culverts under the driveways will be equipped with Inlet Control Devices (ICD's), to slow down the rate of flow in the ditches. The connection of the new ditch to the existing ditch on Dundee will also incorporate a berm with a control device in it to slow down the release of the water from the roadside ditch.

## **Stormwater Modelling**

Stormwater modelling was completed using HydroCAD V10.20 software using the USDA Natural Resources Conservation Service method (formerly the SCS method). Time of Concentration was calculated using the Curve Number/Lag Method which utilizes an overall CN value as well as the average land slope and hydraulic length. An antecedent moisture condition of 2 or average normal conditions was used. Rainfall data was modelled based on Moncton-NB data and using a 2hr and 24-hour Chicago storm distribution using a total rainfall of 140 mm for a 1:100 year 24-hour event, and 84 mm total rainfall for a 1:5 year 24-hour event.

In determining the curve numbers for the various catchment areas we need to consider soil groups and land uses. The site was modelled as USCS soil class "B" which characterizes the

soil with moderate infiltration rates when thoroughly wetted, and consists of sand and silt. Soil classes were chosen based on a visual inspection of various parts of the site during initial excavation.

The land uses and any upstream area that would direct water onto the development site were identified for the site. Once the catchment areas were defined, curve numbers were calculated. Land uses and catchment areas can be found on sheet C6 for both pre and post-development. The pre-development catchment areas are identified by A.# and post-development catchment areas are identified by B.#. Full calculations and results are shown in Appendix B, only key findings will be highlighted here.

### Pre-Development Analysis

The pre-development condition is considered to be the state of the land before any construction takes place. Today the property is an undeveloped wooded lot. The elevation change over the site ranges from 18.50m at rear to 16.50m in the front. The catchment area consists of the property and the upstream drainage area.

Pre-Development Catchments			
Area Label	Area (m2)	CN	Tc(min)
A.1	14,847	65	17.5

### Post-Development Analysis

The post-development sub catchment is identical in size to that of the pre catchment. The post development changes in the land uses of the site is enough to control the peak flows below the pre-development levels. See the table below for the summary.

Post-Development Catchments			
Area Label	Area (m2)	CN	Tc(min)
B.1	2,622	77	5.0
B.2	2,579	75	5.0
B.3	3,947	74	5.0
B.4	2,144	80	5.0
B.5	2,122	80	5.0
B.6	1,431	63	5.0
TOTAL	14,847	% IMPERVIOUS	32.33%

## Results of Stormwater Management

Following the results of the storm water model, we find there is no negative impact on peak flows. To ensure this, the undeveloped property must be upgraded with topsoil and sod / hydroseed. New culverts along Dundee Road must be controlled by an ICD as specified on the design. The existing culverts on the South of Dundee road and on the west of Macdonald road is the point where our design will be tied into, as such it must be an ICD too, in order to maintain a stable drainage system.

A summary table of the resulting balanced flows can be found below. For additional details please refer to Appendix B and the design drawings.

Return Period	Pre-Development	Post-Development
1:5 yr (m3/s)	0.0384	0.0353
1:100 yr (m3/s)	0.1617	0.0612

## Closing

We trust this is sufficient for your present needs. Please feel free to contact the undersigned at 506.652.7258 or at@dmse.ca for any additional information or clarification.

Yours truly,

Don-More Surveys & Engineering



# Appendix A

## Supplementary Sanitary Calculation

T 506.433.4427  
T 506.652.1522

4-60 Maple Avenue, Sussex, NB E4E 2N5  
520 Somerset Street, Saint John, NB E2K 2Y7

[www.dmse.ca](http://www.dmse.ca)  
[info@dmse.ca](mailto:info@dmse.ca)

## Sanitary Calculations

Project 23382 Wes Michaud

### Proposed Development

Units	34 Units	
Population	119 Persons	(at 3.5 persons/unit)
Site area	14,847 m <sup>2</sup>	

### Peak daily domestic flow

$$PDF = P q M / 86.4 + I A$$

PDF

P

q

M

I

A

Notes:

Peak Design flow including extraneous flows (l/s)

0.119 Design population in thousands

Average daily domestic flow (380 L/cap.day)

**380 (Updated May 2022)**

4.222 Peaking factor (Using Harman Equation)

0.140 Peak extraneous flow (L/s.ha)

1.485 Tributary area (ha)

Average Daily Flow (new building)

45220 l/day

**Peak Flow (new building)**

**2.418 l/s**

### % of existing pipe capacity

Pipe size (diameter)	200 mm
Pipe slope	1.1 %
Manning's 'n'	0.013
Pipe Capacity	34 l/s
% of existing pipe capacity contributed by development	7.03%

Pipe velocity

$$Q = aV$$

Q	2.418 l/s
pipe diameter	200 mm
V=	0.077 m/s

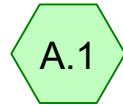
# Appendix B

## Supplementary Storm Calculation

T 506.433.4427  
T 506.652.1522

4-60 Maple Avenue, Sussex, NB E4E 2N5  
520 Somerset Street, Saint John, NB E2K 2Y7

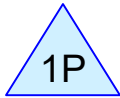
[www.dmse.ca](http://www.dmse.ca)  
[info@dmse.ca](mailto:info@dmse.ca)



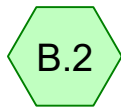
Subcat A.1



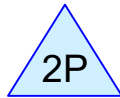
Subcat B.1



Swale 1



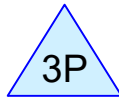
Subcat B.2



Swale 2



Subcat B.3



Swale 3



Subcat B.4



Swale 4



Subcat B.5



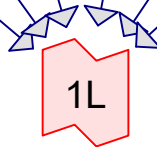
Swale 5



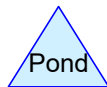
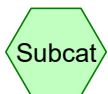
Subcat B.6



Swale 6



OVA



**Routing Diagram for 23382ESP2-R2**

Prepared by Don-More Surveys & Engineering, Printed 2024-12-05  
HydroCAD® 10.20-5c s/n 09824 © 2023 HydroCAD Software Solutions LLC

### Summary for Subcatchment A.1: Subcat A.1

Runoff = 0.0384 m<sup>3</sup>/s @ 12.25 hrs, Volume= 197.7 m<sup>3</sup>, Depth> 13 mm

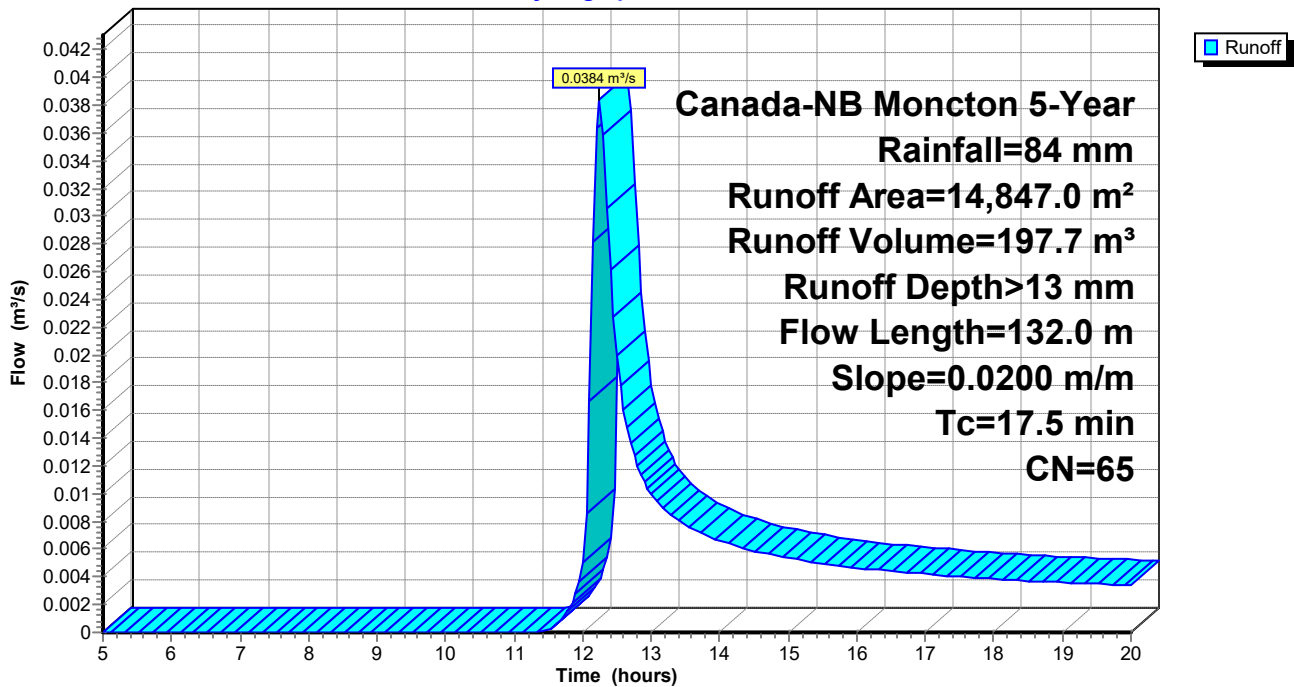
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Canada-NB Moncton 5-Year Rainfall=84 mm

Area (m <sup>2</sup> )	CN	Description
14,847.0	65	Woods/grass comb., Fair, HSG B
14,847.0		100.00% Pervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m <sup>3</sup> /s)	Description
17.5	132.0	0.0200	0.13		Lag/CN Method,

### Subcatchment A.1: Subcat A.1

Hydrograph



**Summary for Subcatchment B.1: Subcat B.1**

Runoff = 0.0278 m<sup>3</sup>/s @ 12.11 hrs, Volume= 73.7 m<sup>3</sup>, Depth> 28 mm  
 Routed to Pond 1P : Swale 1

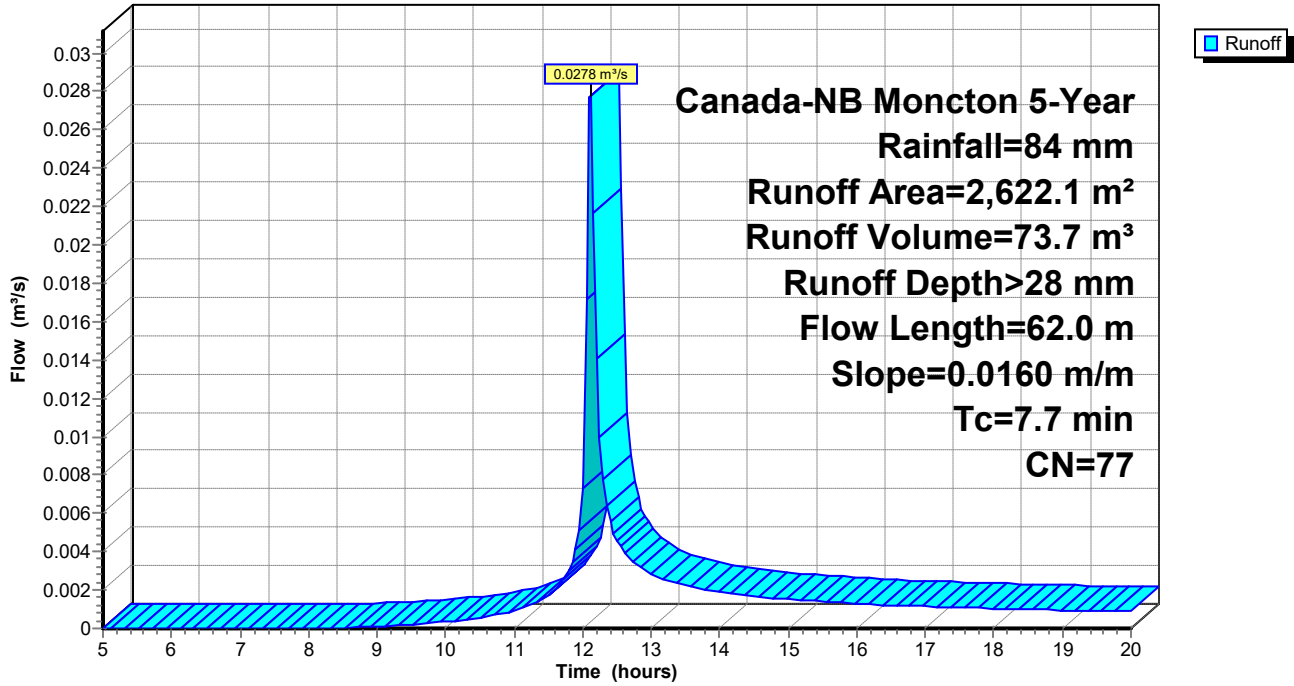
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Canada-NB Moncton 5-Year Rainfall=84 mm

Area (m <sup>2</sup> )	CN	Description
744.0	65	Woods/grass comb., Fair, HSG B
121.0	61	>75% Grass cover, Good, HSG B
45.0	61	>75% Grass cover, Good, HSG B
10.0	96	Gravel surface, HSG B
16.0	96	Gravel surface, HSG B
6.0	98	Unconnected pavement, HSG B
6.0	98	Unconnected pavement, HSG B
6.0	98	Unconnected pavement, HSG B
6.0	98	Unconnected pavement, HSG B
211.1	98	Paved parking, HSG B
202.0	98	Paved parking, HSG B
515.0	98	Roofs, HSG B
123.0	89	Paved roads w/open ditches, 50% imp, HSG B
0.0	61	>75% Grass cover, Good, HSG B
611.0	61	>75% Grass cover, Good, HSG B
2,622.1	77	Weighted Average
1,608.5		61.34% Pervious Area
1,013.6		38.66% Impervious Area
24.0		2.37% Unconnected

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m <sup>3</sup> /s)	Description
7.7	62.0	0.0160	0.13		<b>Lag/CN Method,</b>

### Subcatchment B.1: Subcat B.1

Hydrograph



**Summary for Subcatchment B.2: Subcat B.2**

Runoff = 0.0262 m<sup>3</sup>/s @ 12.09 hrs, Volume= 65.2 m<sup>3</sup>, Depth> 25 mm  
 Routed to Pond 2P : Swale 2

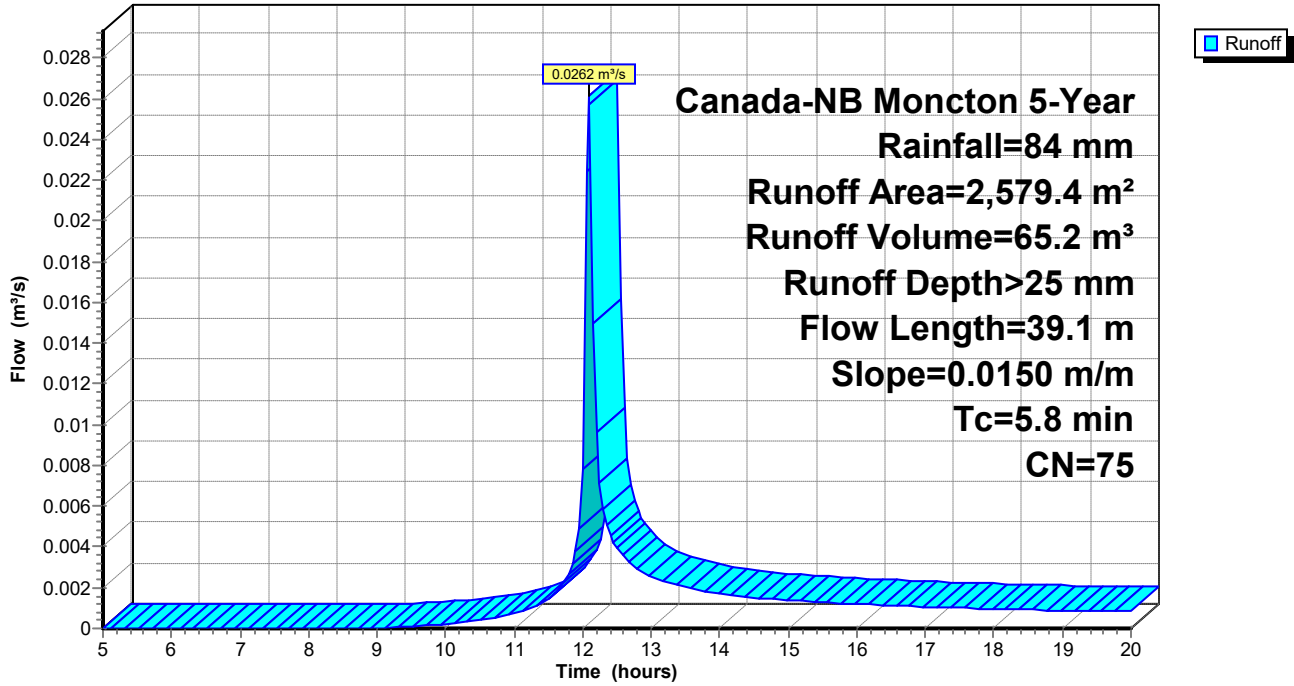
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Canada-NB Moncton 5-Year Rainfall=84 mm

Area (m <sup>2</sup> )	CN	Description
20.2	65	Woods/grass comb., Fair, HSG B
242.6	65	Woods/grass comb., Fair, HSG B
0.2	65	Woods/grass comb., Fair, HSG B
39.1	61	>75% Grass cover, Good, HSG B
152.2	61	>75% Grass cover, Good, HSG B
1,098.9	61	>75% Grass cover, Good, HSG B
51.7	96	Gravel surface, HSG B
15.9	96	Gravel surface, HSG B
8.8	96	Gravel surface, HSG B
5.9	98	Unconnected pavement, HSG B
5.9	98	Unconnected pavement, HSG B
5.9	98	Unconnected pavement, HSG B
77.1	98	Paved parking, HSG B
221.3	98	Paved parking, HSG B
390.7	98	Roofs, HSG B
243.0	89	Paved roads w/open ditches, 50% imp, HSG B
2,579.4	75	Weighted Average
1,751.1		67.89% Pervious Area
828.3		32.11% Impervious Area
17.7		2.14% Unconnected

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m <sup>3</sup> /s)	Description
5.8	39.1	0.0150	0.11		<b>Lag/CN Method,</b>

### Subcatchment B.2: Subcat B.2

Hydrograph



**Summary for Subcatchment B.3: Subcat B.3**

Runoff = 0.0316 m³/s @ 12.12 hrs, Volume= 94.2 m³, Depth> 24 mm  
 Routed to Pond 3P : Swale 3

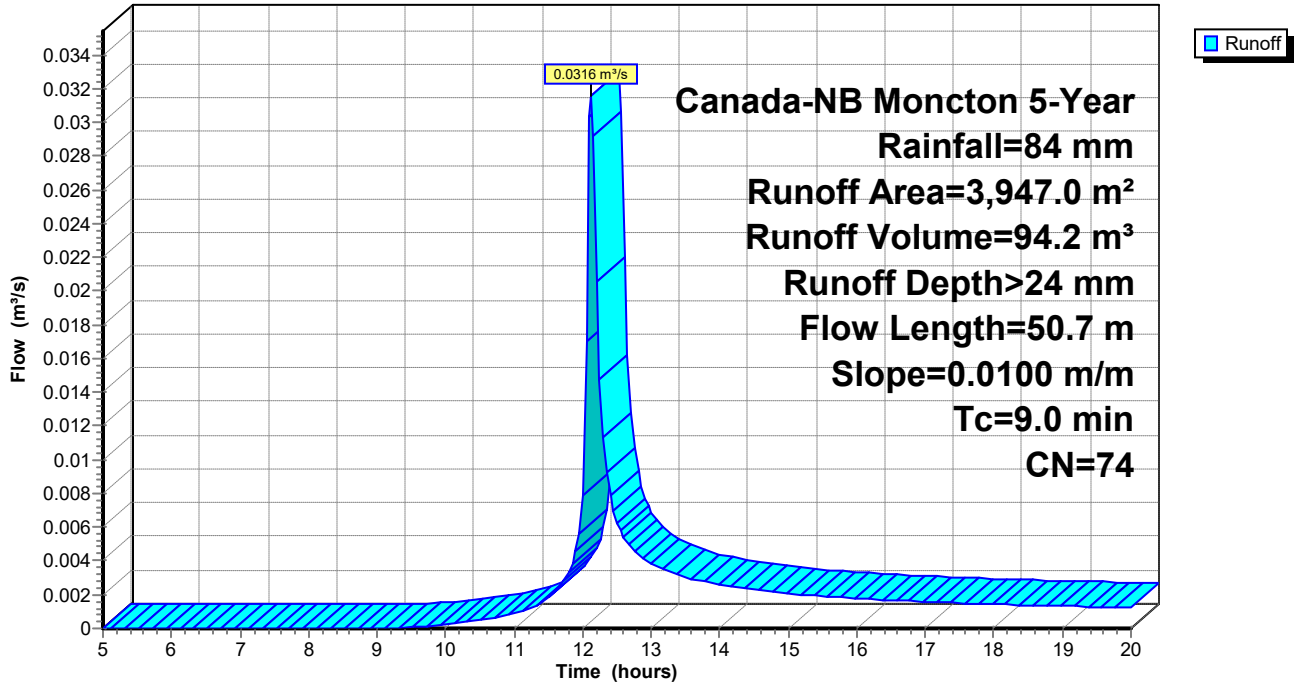
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Canada-NB Moncton 5-Year Rainfall=84 mm

Area (m²)	CN	Description
* 0.1	65	Woods/grass comb., Fair, HSG B
* 205.3	65	Woods/grass comb., Fair, HSG B
* 263.3	65	Woods/grass comb., Fair, HSG B
* 166.2	61	>75% Grass cover, Good, HSG B
* 117.5	61	>75% Grass cover, Good, HSG B
* 782.6	61	>75% Grass cover, Good, HSG B
* 936.4	61	>75% Grass cover, Good, HSG B
* 93.7	96	Gravel surface, HSG B
* 16.0	96	Gravel surface, HSG B
* 13.4	96	Gravel surface, HSG B
* 401.6	89	Paved roads w/open ditches, 50% imp, HSG B
* 5.9	98	Unconnected pavement, HSG B
* 5.9	98	Unconnected pavement, HSG B
* 5.9	98	Unconnected pavement, HSG B
* 5.9	98	Unconnected pavement, HSG B
* 183.9	98	Paved parking, HSG B
* 228.3	98	Paved parking, HSG B
* 515.1	98	Roofs, HSG B
3,947.0	74	Weighted Average
2,795.3		70.82% Pervious Area
1,151.7		29.18% Impervious Area
23.6		2.05% Unconnected

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
9.0	50.7	0.0100	0.09		<b>Lag/CN Method,</b>

### Subcatchment B.3: Subcat B.3

Hydrograph



**Summary for Subcatchment B.4: Subcat B.4**

Runoff = 0.0313 m³/s @ 12.07 hrs, Volume= 70.3 m³, Depth> 33 mm  
 Routed to Pond 4P : Swale 4

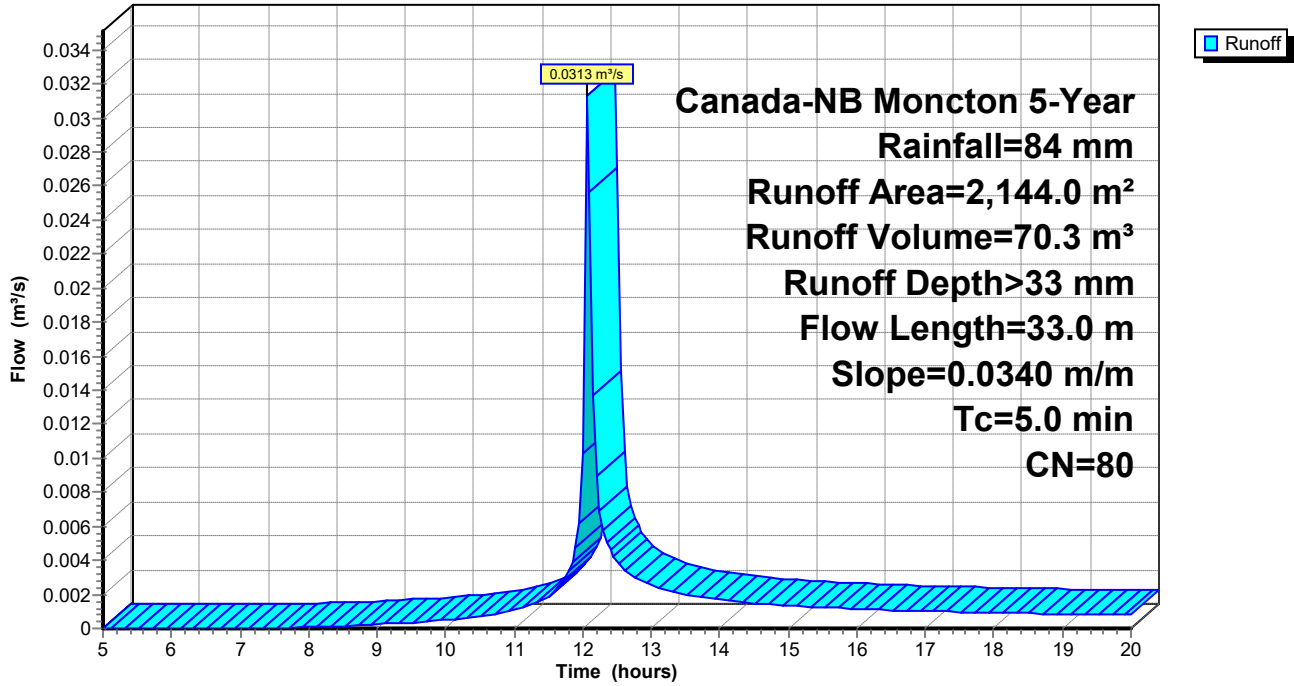
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Canada-NB Moncton 5-Year Rainfall=84 mm

Area (m²)	CN	Description
0.1	65	Woods/grass comb., Fair, HSG B
0.1	65	Woods/grass comb., Fair, HSG B
142.7	65	Woods/grass comb., Fair, HSG B
177.1	61	>75% Grass cover, Good, HSG B
15.7	96	Gravel surface, HSG B
83.9	96	Gravel surface, HSG B
6.0	98	Unconnected pavement, HSG B
5.9	98	Unconnected pavement, HSG B
5.9	98	Unconnected pavement, HSG B
250.9	98	Paved parking, HSG B
64.5	98	Paved parking, HSG B
390.7	98	Roofs, HSG B
7.2	96	Gravel surface, HSG B
619.8	61	>75% Grass cover, Good, HSG B
9.3	61	>75% Grass cover, Good, HSG B
32.0	61	>75% Grass cover, Good, HSG B
332.2	89	Paved roads w/open ditches, 50% imp, HSG B
2,144.0	80	Weighted Average
1,254.0		58.49% Pervious Area
890.0		41.51% Impervious Area
17.8		2.00% Unconnected

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m³/s)	Description
2.9	33.0	0.0340	0.19		<b>Lag/CN Method,</b>
2.9	33.0	Total, Increased to minimum Tc = 5.0 min			

Subcatchment B.4: Subcat B.4

Hydrograph



**Summary for Subcatchment B.5: Subcat B.5**

Runoff = 0.0272 m<sup>3</sup>/s @ 12.10 hrs, Volume= 69.5 m<sup>3</sup>, Depth> 33 mm  
 Routed to Pond 5P : Swale 5

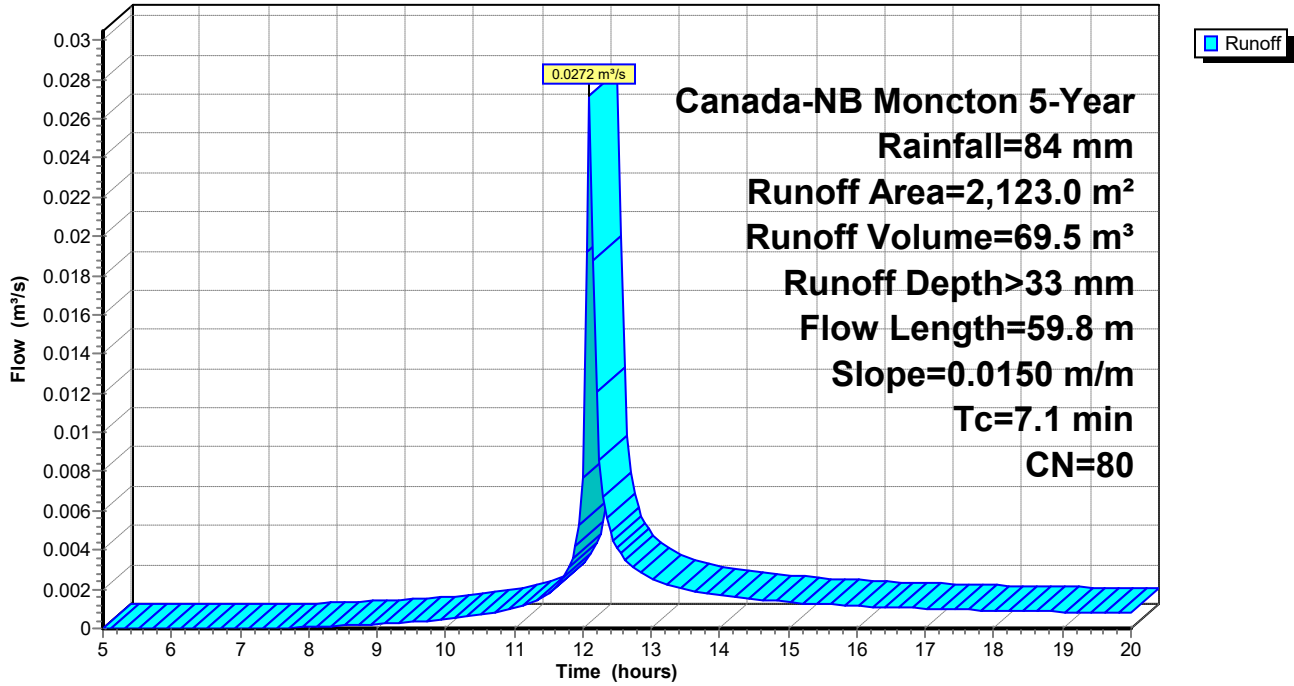
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Canada-NB Moncton 5-Year Rainfall=84 mm

Area (m <sup>2</sup> )	CN	Description
146.8	65	Woods/grass comb., Fair, HSG B
178.3	61	>75% Grass cover, Good, HSG B
15.9	96	Gravel surface, HSG B
7.2	96	Gravel surface, HSG B
87.1	96	Gravel surface, HSG B
5.7	98	Unconnected pavement, HSG B
5.7	98	Unconnected pavement, HSG B
5.7	98	Unconnected pavement, HSG B
64.6	98	Paved parking, HSG B
250.8	98	Paved parking, HSG B
390.7	98	Roofs, HSG B
340.1	89	Paved roads w/open ditches, 50% imp, HSG B
9.6	61	>75% Grass cover, Good, HSG B
582.9	61	>75% Grass cover, Good, HSG B
31.9	61	>75% Grass cover, Good, HSG B
2,123.0	80	Weighted Average
1,229.8		57.93% Pervious Area
893.3		42.07% Impervious Area
17.1		1.91% Unconnected

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m <sup>3</sup> /s)	Description
7.1	59.8	0.0150	0.14		<b>Lag/CN Method,</b>

### Subcatchment B.5: Subcat B.5

Hydrograph



### Summary for Subcatchment B.6: Subcat B.6

Runoff = 0.0042 m<sup>3</sup>/s @ 12.14 hrs, Volume= 16.5 m<sup>3</sup>, Depth> 12 mm  
 Routed to Pond 6P : Swale 6

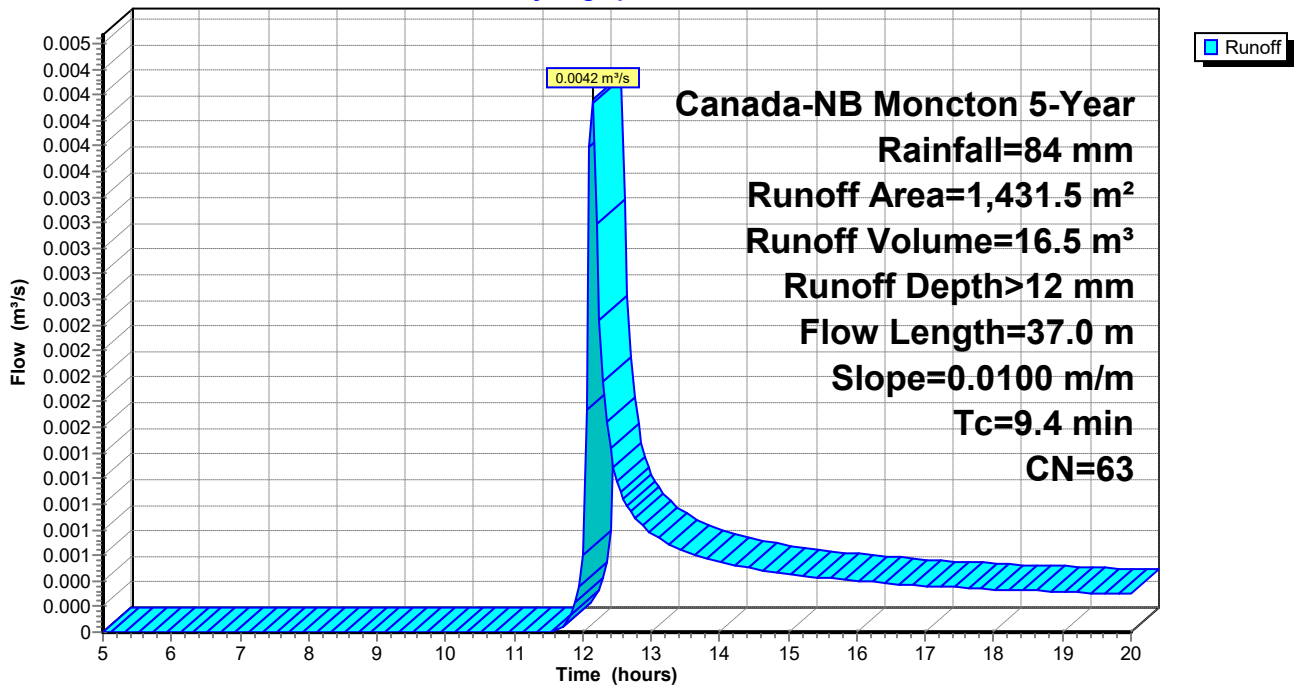
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Canada-NB Moncton 5-Year Rainfall=84 mm

Area (m <sup>2</sup> )	CN	Description
403.3	65	Woods/grass comb., Fair, HSG B
444.5	61	>75% Grass cover, Good, HSG B
519.1	61	>75% Grass cover, Good, HSG B
18.4	96	Gravel surface, HSG B
46.0	89	Paved roads w/open ditches, 50% imp, HSG B
0.2	98	Paved parking, HSG B
1,431.5	63	Weighted Average
1,408.3		98.38% Pervious Area
23.2		1.62% Impervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m <sup>3</sup> /s)	Description
9.4	37.0	0.0100	0.07		Lag/CN Method,

### Subcatchment B.6: Subcat B.6

Hydrograph



### Summary for Pond 1P: Swale 1

Inflow Area = 2,622.1 m<sup>2</sup>, 38.66% Impervious, Inflow Depth > 28 mm for 5-Year event  
 Inflow = 0.0278 m<sup>3</sup>/s @ 12.11 hrs, Volume= 73.7 m<sup>3</sup>  
 Outflow = 0.0105 m<sup>3</sup>/s @ 12.25 hrs, Volume= 72.9 m<sup>3</sup>, Atten= 62%, Lag= 8.6 min  
 Primary = 0.0105 m<sup>3</sup>/s @ 12.25 hrs, Volume= 72.9 m<sup>3</sup>  
 Routed to Link 1L : OVA

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs / 2  
 Peak Elev= 17.051 m @ 12.25 hrs Surf.Area= 52.9 m<sup>2</sup> Storage= 10.8 m<sup>3</sup>

Plug-Flow detention time= 12.5 min calculated for 72.9 m<sup>3</sup> (99% of inflow)  
 Center-of-Mass det. time= 8.7 min ( 838.9 - 830.1 )

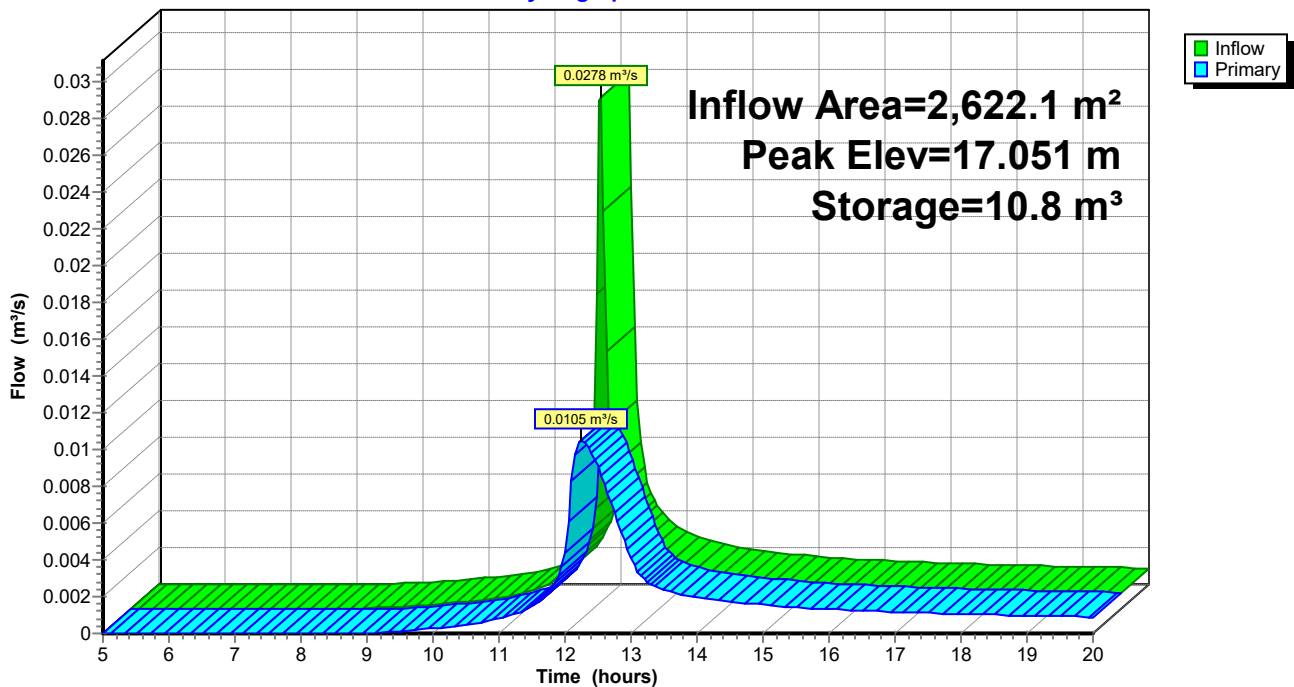
Volume	Invert	Avail.Storage	Storage Description
#1	16.750 m	46.8 m <sup>3</sup>	<b>0.75 mW x 25.89 mL x 0.75 mH Prismatic Z=2.0</b>

Device	Routing	Invert	Outlet Devices
#1	Primary	16.750 m	<b>100 mm Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads

**Primary OutFlow** Max=0.0105 m<sup>3</sup>/s @ 12.25 hrs HW=17.051 m (Free Discharge)  
 ←1=Orifice/Grate (Orifice Controls 0.0105 m<sup>3</sup>/s @ 1.33 m/s)

### Pond 1P: Swale 1

Hydrograph



### Summary for Pond 2P: Swale 2

Inflow Area = 2,579.4 m<sup>2</sup>, 32.11% Impervious, Inflow Depth > 25 mm for 5-Year event  
 Inflow = 0.0262 m<sup>3</sup>/s @ 12.09 hrs, Volume= 65.2 m<sup>3</sup>  
 Outflow = 0.0025 m<sup>3</sup>/s @ 13.02 hrs, Volume= 60.6 m<sup>3</sup>, Atten= 90%, Lag= 56.2 min  
 Primary = 0.0025 m<sup>3</sup>/s @ 13.02 hrs, Volume= 60.6 m<sup>3</sup>  
 Routed to Link 1L : OVA

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 16.447 m @ 13.02 hrs Surf.Area= 121.0 m<sup>2</sup> Storage= 21.9 m<sup>3</sup>

Plug-Flow detention time= 108.8 min calculated for 60.6 m<sup>3</sup> (93% of inflow)  
 Center-of-Mass det. time= 84.8 min ( 920.4 - 835.6 )

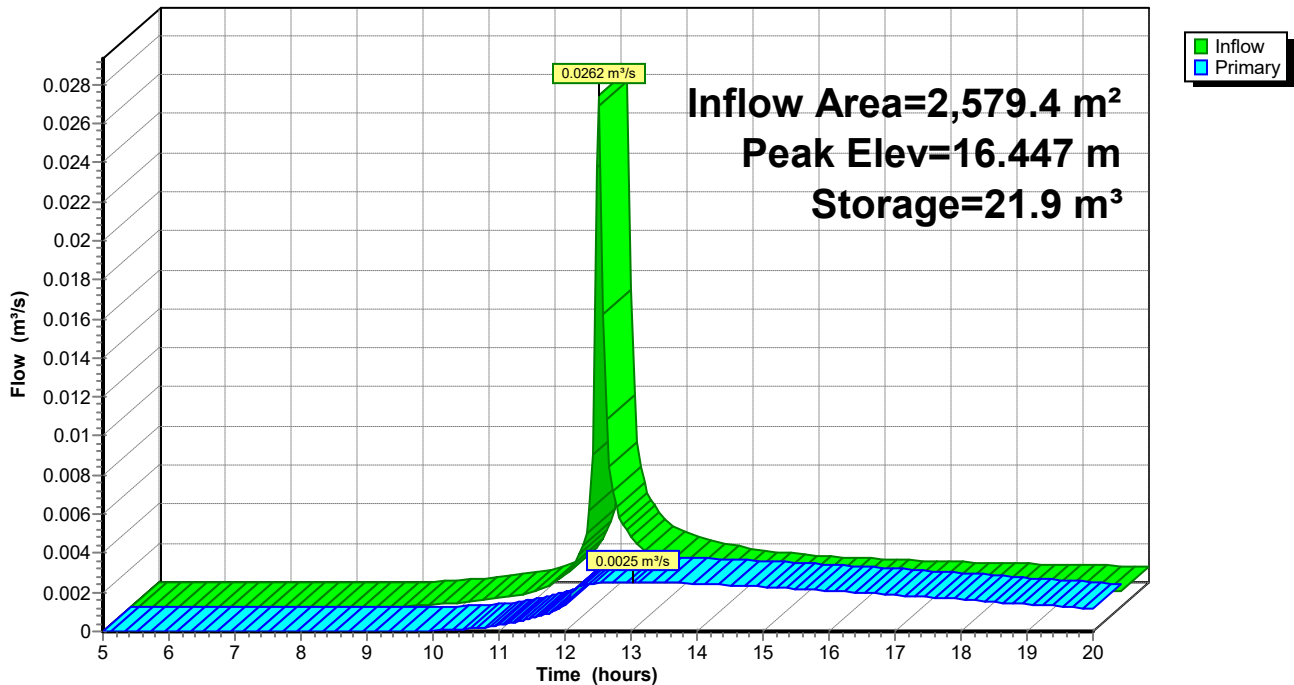
Volume	Invert	Avail.Storage	Storage Description
#1	16.190 m	116.2 m <sup>3</sup>	<b>0.75 mW x 67.03 mL x 0.75 mH Prismatoid Z=2.0</b>

Device	Routing	Invert	Outlet Devices
#1	Primary	16.190 m	<b>50 mm Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads

**Primary OutFlow** Max=0.0025 m<sup>3</sup>/s @ 13.02 hrs HW=16.447 m (Free Discharge)  
 ←1=Orifice/Grate (Orifice Controls 0.0025 m<sup>3</sup>/s @ 1.28 m/s)

### Pond 2P: Swale 2

Hydrograph



### Summary for Pond 3P: Swale 3

Inflow Area = 3,947.0 m<sup>2</sup>, 29.18% Impervious, Inflow Depth > 24 mm for 5-Year event  
 Inflow = 0.0316 m<sup>3</sup>/s @ 12.12 hrs, Volume= 94.2 m<sup>3</sup>  
 Outflow = 0.0082 m<sup>3</sup>/s @ 12.39 hrs, Volume= 91.0 m<sup>3</sup>, Atten= 74%, Lag= 16.1 min  
 Primary = 0.0082 m<sup>3</sup>/s @ 12.39 hrs, Volume= 91.0 m<sup>3</sup>  
 Routed to Link 1L : OVA

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 16.105 m @ 12.39 hrs Surf.Area= 141.6 m<sup>2</sup> Storage= 21.3 m<sup>3</sup>

Plug-Flow detention time= 36.8 min calculated for 90.6 m<sup>3</sup> (96% of inflow)  
 Center-of-Mass det. time= 24.8 min ( 866.0 - 841.1 )

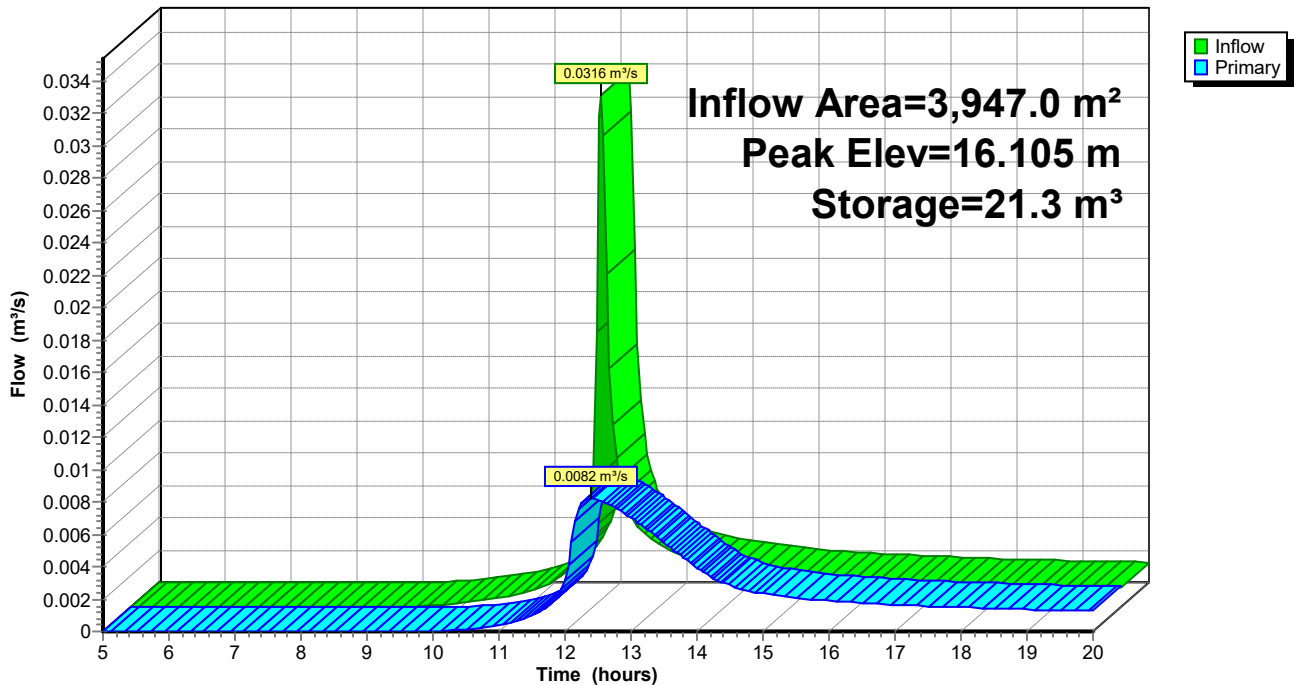
Volume	Invert	Avail.Storage	Storage Description
#1	15.900 m	154.1 m <sup>3</sup>	<b>0.75 mW x 89.46 mL x 0.75 mH Prismatic Z=2.0</b>

Device	Routing	Invert	Outlet Devices
#1	Primary	15.900 m	<b>100 mm Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads

**Primary OutFlow** Max=0.0082 m<sup>3</sup>/s @ 12.39 hrs HW=16.105 m (Free Discharge)  
 ←1=Orifice/Grate (Orifice Controls 0.0082 m<sup>3</sup>/s @ 1.04 m/s)

### Pond 3P: Swale 3

Hydrograph



### Summary for Pond 4P: Swale 4

Inflow Area = 2,144.0 m<sup>2</sup>, 41.51% Impervious, Inflow Depth > 33 mm for 5-Year event  
 Inflow = 0.0313 m<sup>3</sup>/s @ 12.07 hrs, Volume= 70.3 m<sup>3</sup>  
 Outflow = 0.0094 m<sup>3</sup>/s @ 12.20 hrs, Volume= 69.2 m<sup>3</sup>, Atten= 70%, Lag= 8.3 min  
 Primary = 0.0094 m<sup>3</sup>/s @ 12.20 hrs, Volume= 69.2 m<sup>3</sup>  
 Routed to Link 1L : OVA

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs / 2  
 Peak Elev= 16.542 m @ 12.20 hrs Surf.Area= 68.6 m<sup>2</sup> Storage= 12.2 m<sup>3</sup>

Plug-Flow detention time= 17.9 min calculated for 69.2 m<sup>3</sup> (99% of inflow)  
 Center-of-Mass det. time= 12.4 min ( 830.1 - 817.8 )

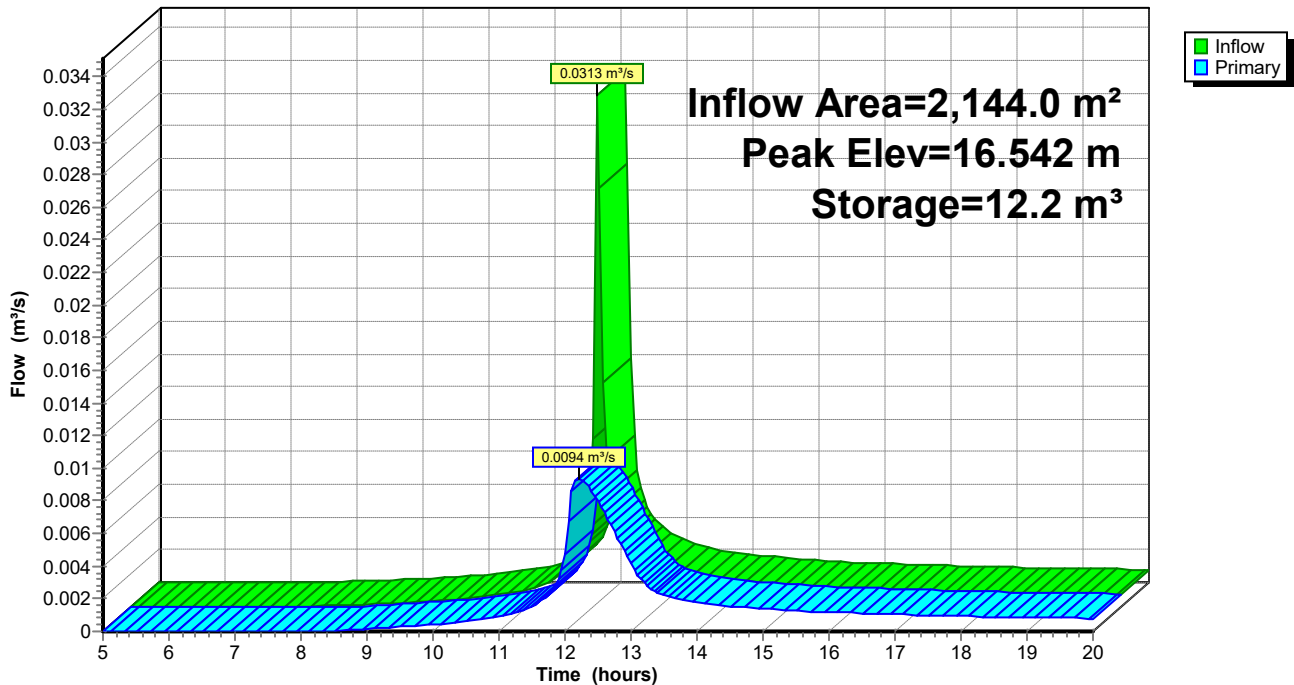
Volume	Invert	Avail.Storage	Storage Description
#1	16.290 m	67.2 m <sup>3</sup>	<b>0.75 mW x 38.01 mL x 0.75 mH Prismatic Z=2.0</b>

Device	Routing	Invert	Outlet Devices
#1	Primary	16.290 m	<b>100 mm Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads

**Primary OutFlow** Max=0.0094 m<sup>3</sup>/s @ 12.20 hrs HW=16.542 m (Free Discharge)  
 ←1=Orifice/Grate (Orifice Controls 0.0094 m<sup>3</sup>/s @ 1.19 m/s)

### Pond 4P: Swale 4

Hydrograph



### Summary for Pond 5P: Swale 5

Inflow Area = 2,123.0 m<sup>2</sup>, 42.07% Impervious, Inflow Depth > 33 mm for 5-Year event  
 Inflow = 0.0272 m<sup>3</sup>/s @ 12.10 hrs, Volume= 69.5 m<sup>3</sup>  
 Outflow = 0.0026 m<sup>3</sup>/s @ 12.99 hrs, Volume= 64.6 m<sup>3</sup>, Atten= 91%, Lag= 53.6 min  
 Primary = 0.0026 m<sup>3</sup>/s @ 12.99 hrs, Volume= 64.6 m<sup>3</sup>  
 Routed to Link 1L : OVA

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs / 2  
 Peak Elev= 16.900 m @ 12.99 hrs Surf.Area= 130.0 m<sup>2</sup> Storage= 24.6 m<sup>3</sup>

Plug-Flow detention time= 115.9 min calculated for 64.6 m<sup>3</sup> (93% of inflow)  
 Center-of-Mass det. time= 91.0 min ( 910.2 - 819.2 )

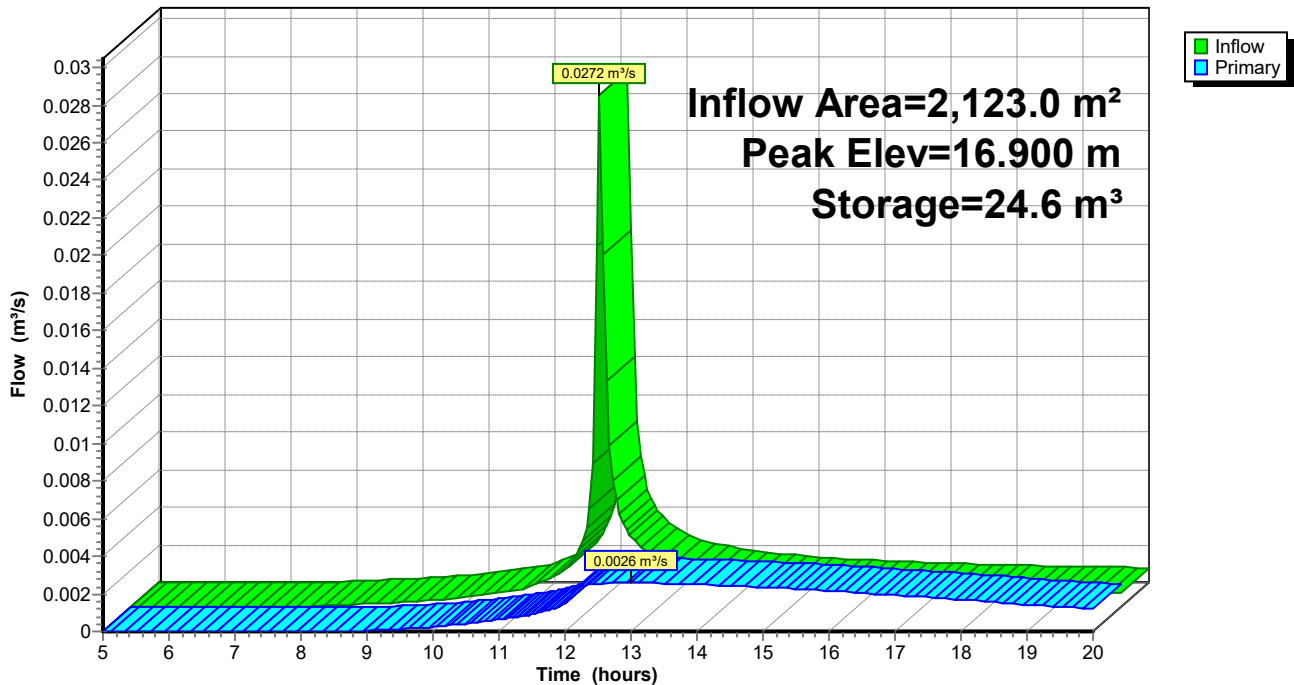
Volume	Invert	Avail.Storage	Storage Description
#1	16.630 m	121.1 m <sup>3</sup>	<b>0.75 mW x 69.94 mL x 0.75 mH Prismatic Z=2.0</b>

Device	Routing	Invert	Outlet Devices
#1	Primary	16.630 m	<b>50 mm Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads

**Primary OutFlow** Max=0.0026 m<sup>3</sup>/s @ 12.99 hrs HW=16.900 m (Free Discharge)  
 ←1=Orifice/Grate (Orifice Controls 0.0026 m<sup>3</sup>/s @ 1.32 m/s)

### Pond 5P: Swale 5

Hydrograph



### Summary for Pond 6P: Swale 6

Inflow Area = 1,431.5 m<sup>2</sup>, 1.62% Impervious, Inflow Depth > 12 mm for 5-Year event  
 Inflow = 0.0042 m<sup>3</sup>/s @ 12.14 hrs, Volume= 16.5 m<sup>3</sup>  
 Outflow = 0.0030 m<sup>3</sup>/s @ 12.22 hrs, Volume= 16.2 m<sup>3</sup>, Atten= 28%, Lag= 4.9 min  
 Primary = 0.0030 m<sup>3</sup>/s @ 12.22 hrs, Volume= 16.2 m<sup>3</sup>  
 Routed to Link 1L : OVA

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs / 2  
 Peak Elev= 17.191 m @ 12.22 hrs Surf.Area= 21.2 m<sup>2</sup> Storage= 1.3 m<sup>3</sup>

Plug-Flow detention time= 12.9 min calculated for 16.1 m<sup>3</sup> (98% of inflow)  
 Center-of-Mass det. time= 6.8 min ( 888.3 - 881.5 )

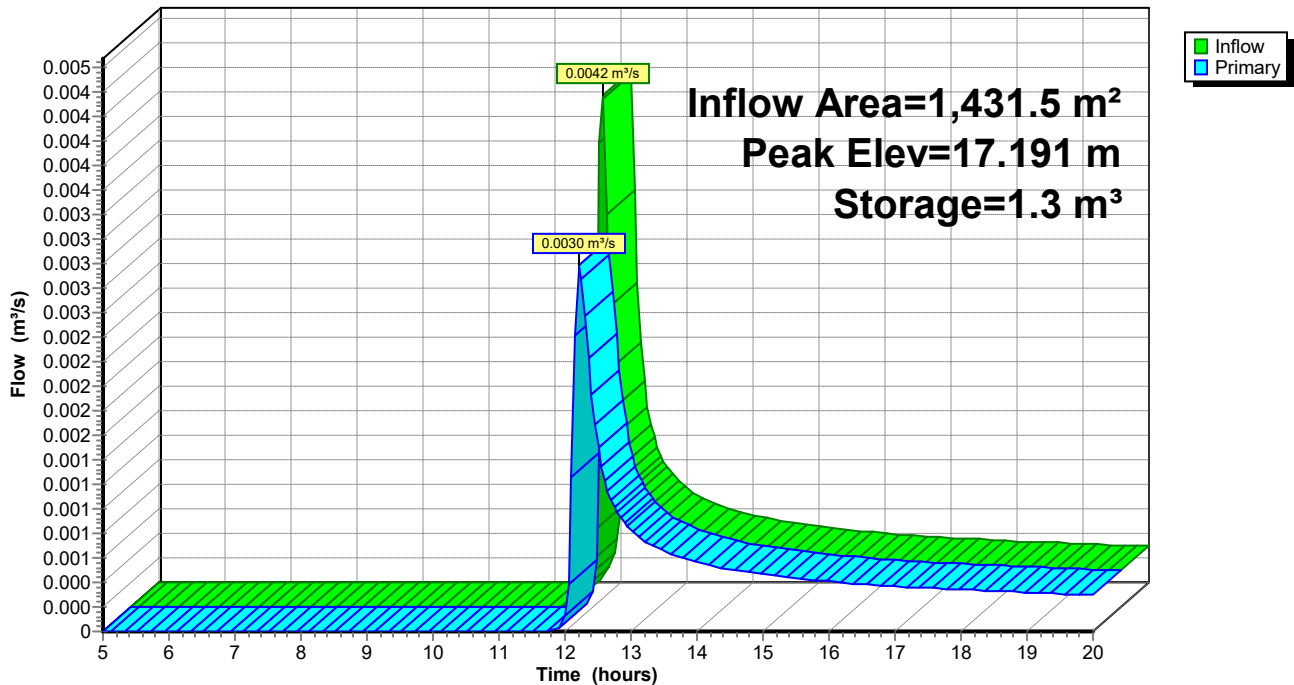
Volume	Invert	Avail.Storage	Storage Description
#1	17.120 m	37.2 m <sup>3</sup>	<b>0.75 mW x 20.22 mL x 0.75 mH Prismatic Z=2.0</b>

Device	Routing	Invert	Outlet Devices
#1	Primary	17.120 m	<b>100 mm Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads

**Primary OutFlow** Max=0.0029 m<sup>3</sup>/s @ 12.22 hrs HW=17.190 m (Free Discharge)  
 ←1=Orifice/Grate (Orifice Controls 0.0029 m<sup>3</sup>/s @ 0.50 m/s)

### Pond 6P: Swale 6

Hydrograph



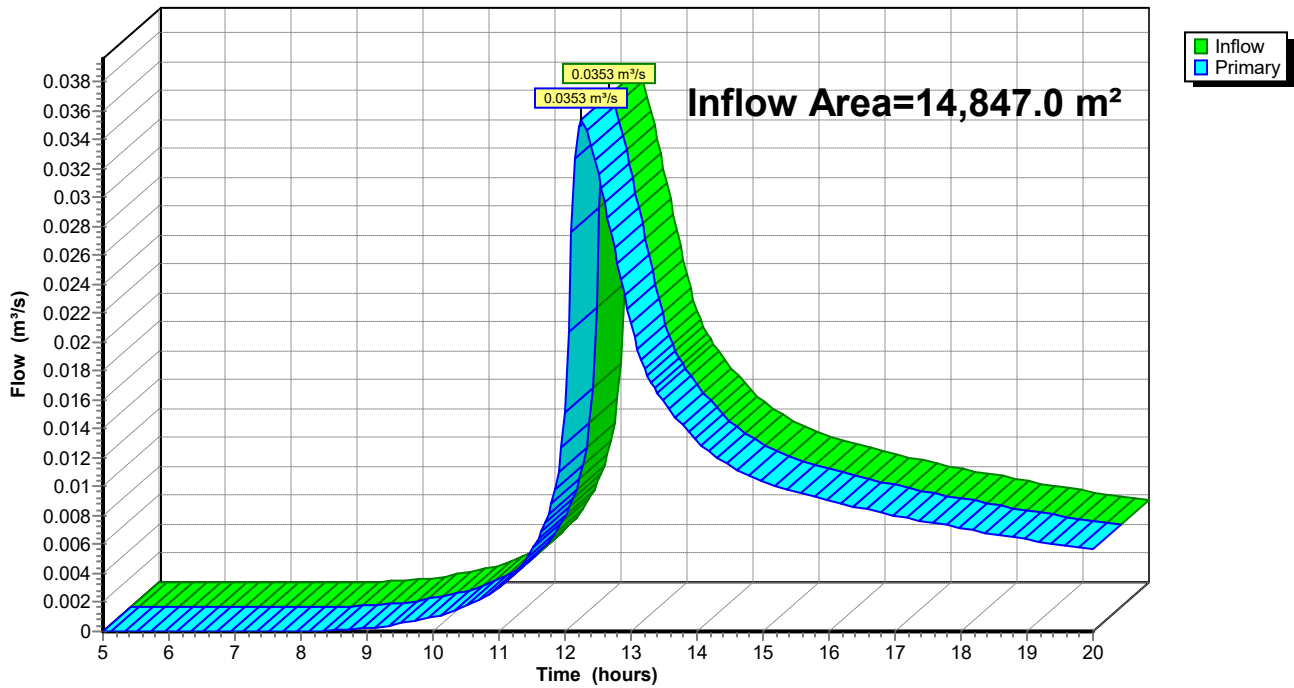
### Summary for Link 1L: OVA

Inflow Area = 14,847.0 m<sup>2</sup>, 32.33% Impervious, Inflow Depth > 25 mm for 5-Year event  
Inflow = 0.0353 m<sup>3</sup>/s @ 12.25 hrs, Volume= 374.5 m<sup>3</sup>  
Primary = 0.0353 m<sup>3</sup>/s @ 12.25 hrs, Volume= 374.5 m<sup>3</sup>, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

### Link 1L: OVA

Hydrograph



**Summary for Subcatchment A.1: Subcat A.1**

Runoff = 0.1617 m<sup>3</sup>/s @ 12.23 hrs, Volume= 652.0 m<sup>3</sup>, Depth> 44 mm

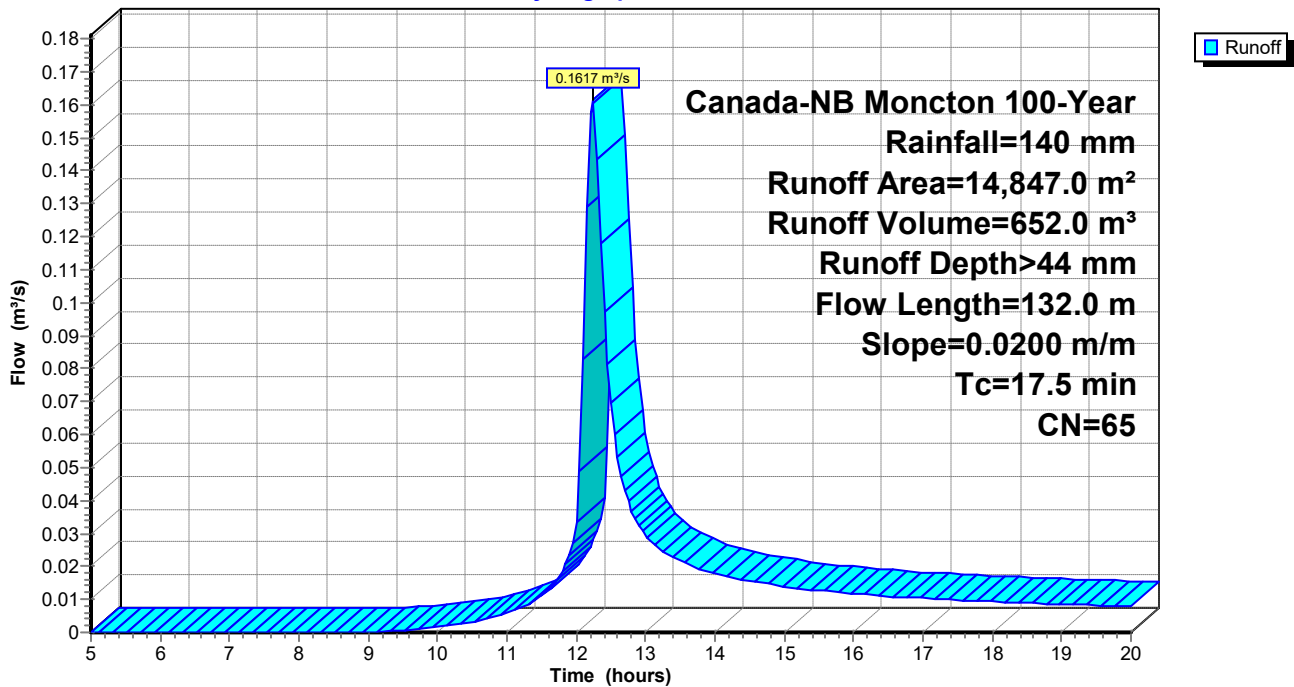
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Canada-NB Moncton 100-Year Rainfall=140 mm

Area (m <sup>2</sup> )	CN	Description
14,847.0	65	Woods/grass comb., Fair, HSG B
14,847.0		100.00% Pervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m <sup>3</sup> /s)	Description
17.5	132.0	0.0200	0.13		Lag/CN Method,

**Subcatchment A.1: Subcat A.1**

Hydrograph



**Summary for Subcatchment B.1: Subcat B.1**

Runoff = 0.0754 m<sup>3</sup>/s @ 12.11 hrs, Volume= 181.9 m<sup>3</sup>, Depth> 69 mm  
 Routed to Pond 1P : Swale 1

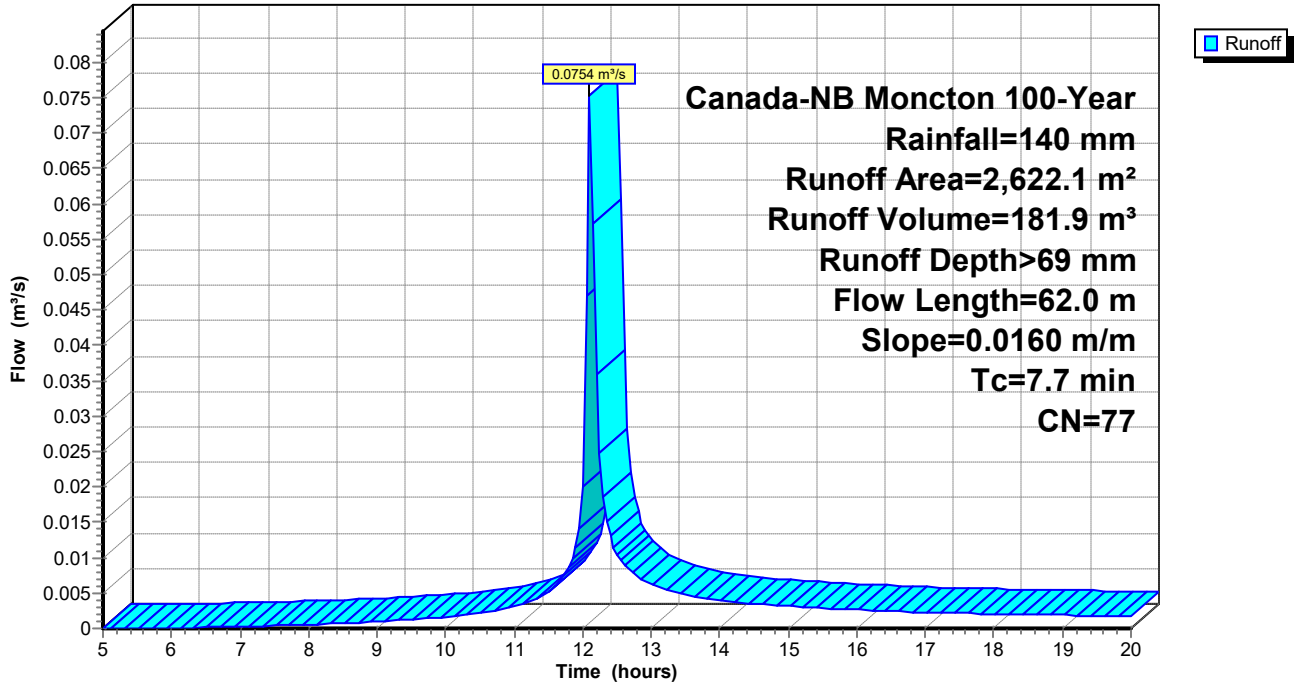
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Canada-NB Moncton 100-Year Rainfall=140 mm

Area (m <sup>2</sup> )	CN	Description
744.0	65	Woods/grass comb., Fair, HSG B
121.0	61	>75% Grass cover, Good, HSG B
45.0	61	>75% Grass cover, Good, HSG B
10.0	96	Gravel surface, HSG B
16.0	96	Gravel surface, HSG B
6.0	98	Unconnected pavement, HSG B
6.0	98	Unconnected pavement, HSG B
6.0	98	Unconnected pavement, HSG B
6.0	98	Unconnected pavement, HSG B
211.1	98	Paved parking, HSG B
202.0	98	Paved parking, HSG B
515.0	98	Roofs, HSG B
123.0	89	Paved roads w/open ditches, 50% imp, HSG B
0.0	61	>75% Grass cover, Good, HSG B
611.0	61	>75% Grass cover, Good, HSG B
2,622.1	77	Weighted Average
1,608.5		61.34% Pervious Area
1,013.6		38.66% Impervious Area
24.0		2.37% Unconnected

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m <sup>3</sup> /s)	Description
7.7	62.0	0.0160	0.13		<b>Lag/CN Method,</b>

### Subcatchment B.1: Subcat B.1

Hydrograph



**Summary for Subcatchment B.2: Subcat B.2**

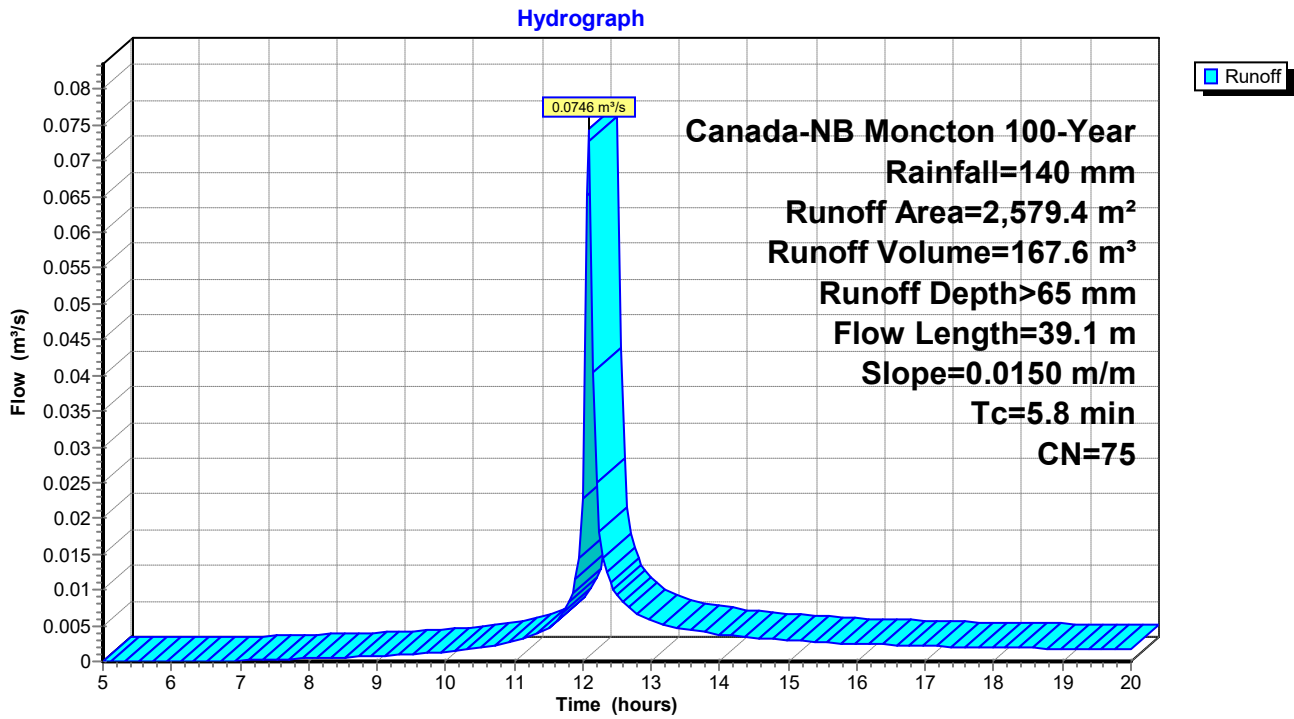
Runoff = 0.0746 m<sup>3</sup>/s @ 12.08 hrs, Volume= 167.6 m<sup>3</sup>, Depth> 65 mm  
 Routed to Pond 2P : Swale 2

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Canada-NB Moncton 100-Year Rainfall=140 mm

Area (m <sup>2</sup> )	CN	Description
20.2	65	Woods/grass comb., Fair, HSG B
242.6	65	Woods/grass comb., Fair, HSG B
0.2	65	Woods/grass comb., Fair, HSG B
39.1	61	>75% Grass cover, Good, HSG B
152.2	61	>75% Grass cover, Good, HSG B
1,098.9	61	>75% Grass cover, Good, HSG B
51.7	96	Gravel surface, HSG B
15.9	96	Gravel surface, HSG B
8.8	96	Gravel surface, HSG B
5.9	98	Unconnected pavement, HSG B
5.9	98	Unconnected pavement, HSG B
5.9	98	Unconnected pavement, HSG B
77.1	98	Paved parking, HSG B
221.3	98	Paved parking, HSG B
390.7	98	Roofs, HSG B
243.0	89	Paved roads w/open ditches, 50% imp, HSG B
2,579.4	75	Weighted Average
1,751.1		67.89% Pervious Area
828.3		32.11% Impervious Area
17.7		2.14% Unconnected

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m <sup>3</sup> /s)	Description
5.8	39.1	0.0150	0.11		<b>Lag/CN Method,</b>

### Subcatchment B.2: Subcat B.2



**Summary for Subcatchment B.3: Subcat B.3**

Runoff = 0.0928 m<sup>3</sup>/s @ 12.12 hrs, Volume= 247.3 m<sup>3</sup>, Depth> 63 mm  
 Routed to Pond 3P : Swale 3

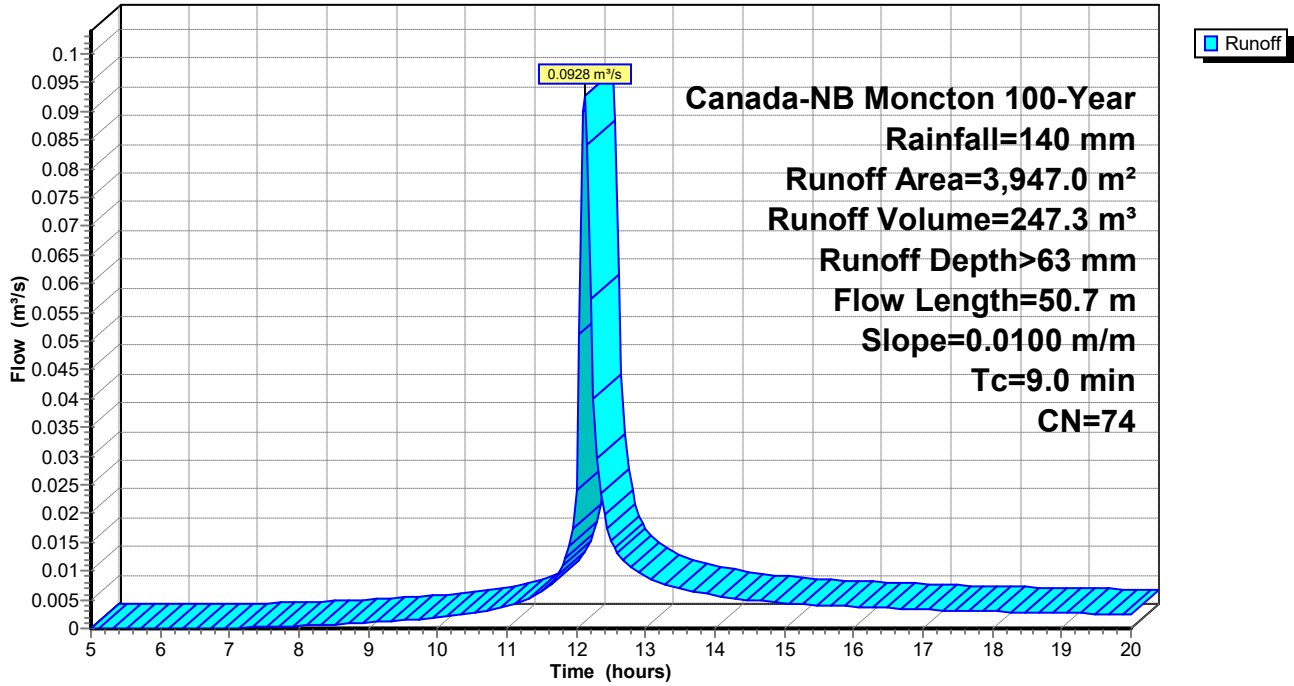
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Canada-NB Moncton 100-Year Rainfall=140 mm

Area (m <sup>2</sup> )	CN	Description
* 0.1	65	Woods/grass comb., Fair, HSG B
* 205.3	65	Woods/grass comb., Fair, HSG B
* 263.3	65	Woods/grass comb., Fair, HSG B
* 166.2	61	>75% Grass cover, Good, HSG B
* 117.5	61	>75% Grass cover, Good, HSG B
* 782.6	61	>75% Grass cover, Good, HSG B
* 936.4	61	>75% Grass cover, Good, HSG B
* 93.7	96	Gravel surface, HSG B
* 16.0	96	Gravel surface, HSG B
* 13.4	96	Gravel surface, HSG B
* 401.6	89	Paved roads w/open ditches, 50% imp, HSG B
* 5.9	98	Unconnected pavement, HSG B
* 5.9	98	Unconnected pavement, HSG B
* 5.9	98	Unconnected pavement, HSG B
* 5.9	98	Unconnected pavement, HSG B
* 183.9	98	Paved parking, HSG B
* 228.3	98	Paved parking, HSG B
* 515.1	98	Roofs, HSG B
3,947.0	74	Weighted Average
2,795.3		70.82% Pervious Area
1,151.7		29.18% Impervious Area
23.6		2.05% Unconnected

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m <sup>3</sup> /s)	Description
9.0	50.7	0.0100	0.09		<b>Lag/CN Method,</b>

### Subcatchment B.3: Subcat B.3

Hydrograph



**Summary for Subcatchment B.4: Subcat B.4**

Runoff = 0.0797 m<sup>3</sup>/s @ 12.06 hrs, Volume= 163.9 m<sup>3</sup>, Depth> 76 mm  
 Routed to Pond 4P : Swale 4

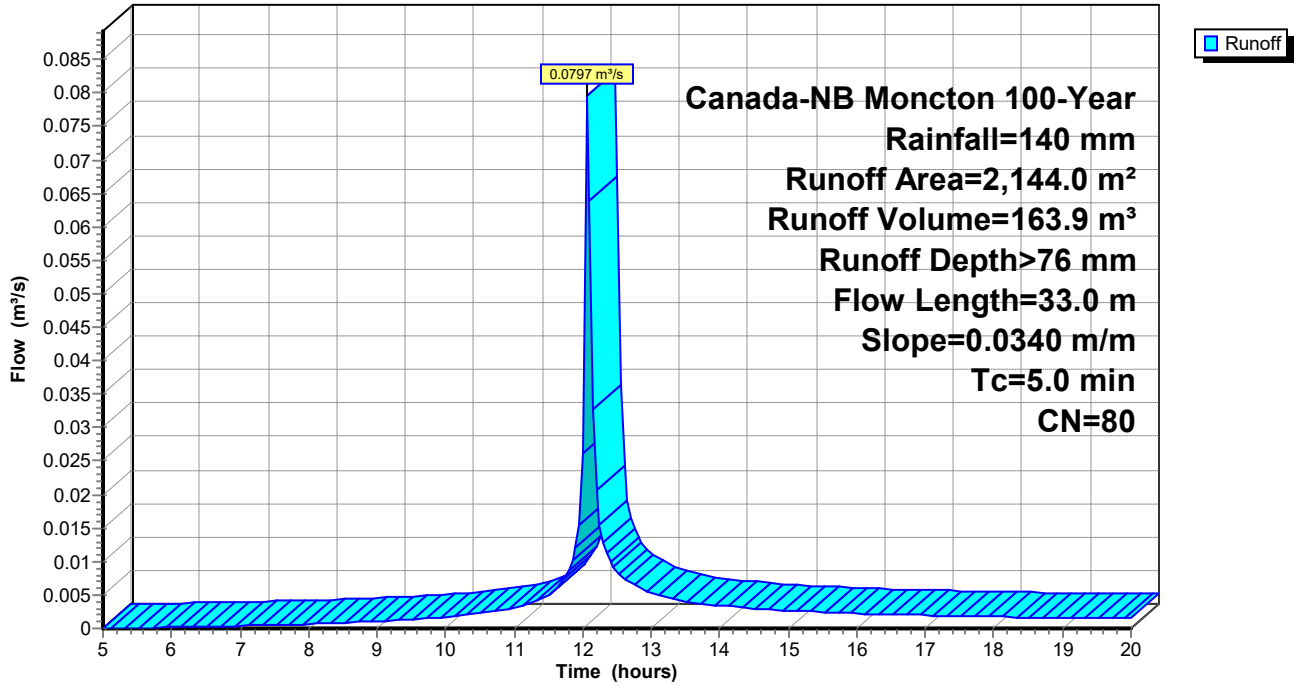
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Canada-NB Moncton 100-Year Rainfall=140 mm

Area (m <sup>2</sup> )	CN	Description
0.1	65	Woods/grass comb., Fair, HSG B
0.1	65	Woods/grass comb., Fair, HSG B
142.7	65	Woods/grass comb., Fair, HSG B
177.1	61	>75% Grass cover, Good, HSG B
15.7	96	Gravel surface, HSG B
83.9	96	Gravel surface, HSG B
6.0	98	Unconnected pavement, HSG B
5.9	98	Unconnected pavement, HSG B
5.9	98	Unconnected pavement, HSG B
250.9	98	Paved parking, HSG B
64.5	98	Paved parking, HSG B
390.7	98	Roofs, HSG B
7.2	96	Gravel surface, HSG B
619.8	61	>75% Grass cover, Good, HSG B
9.3	61	>75% Grass cover, Good, HSG B
32.0	61	>75% Grass cover, Good, HSG B
332.2	89	Paved roads w/open ditches, 50% imp, HSG B
2,144.0	80	Weighted Average
1,254.0		58.49% Pervious Area
890.0		41.51% Impervious Area
17.8		2.00% Unconnected

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m <sup>3</sup> /s)	Description
2.9	33.0	0.0340	0.19		<b>Lag/CN Method,</b>
2.9	33.0	Total, Increased to minimum Tc = 5.0 min			

### Subcatchment B.4: Subcat B.4

Hydrograph



**Summary for Subcatchment B.5: Subcat B.5**

Runoff = 0.0687 m<sup>3</sup>/s @ 12.10 hrs, Volume= 162.2 m<sup>3</sup>, Depth> 76 mm  
 Routed to Pond 5P : Swale 5

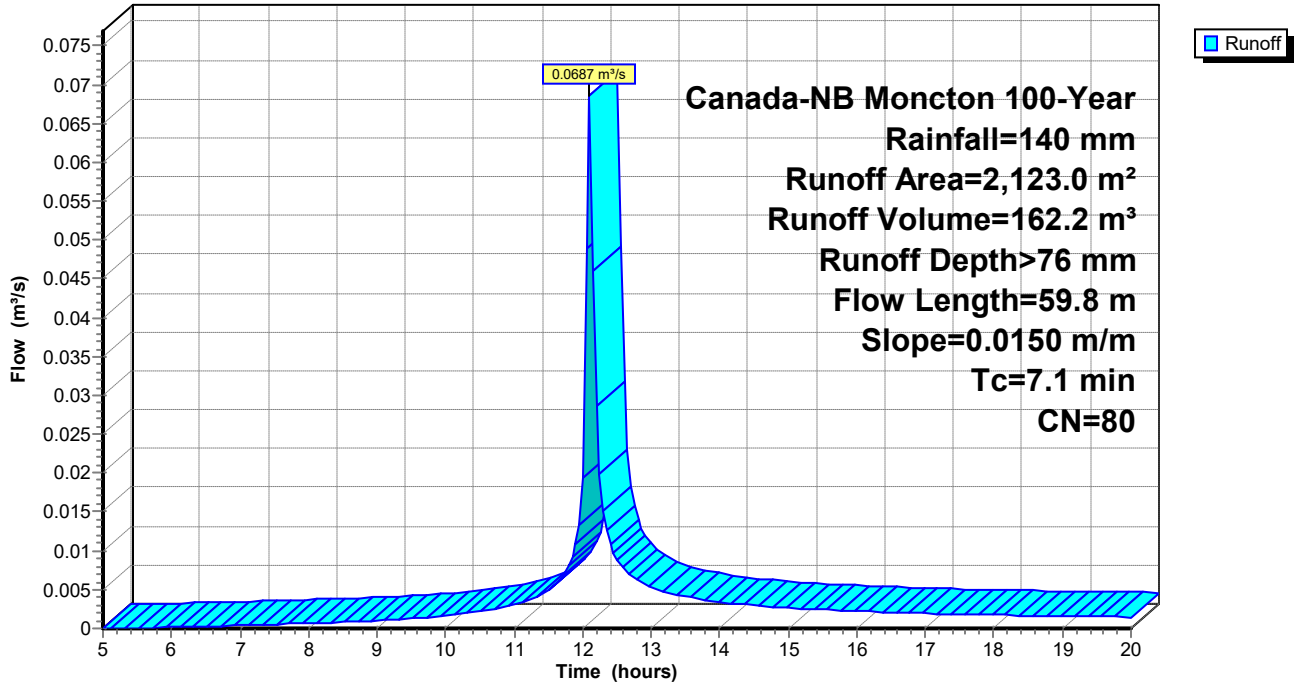
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Canada-NB Moncton 100-Year Rainfall=140 mm

Area (m <sup>2</sup> )	CN	Description
146.8	65	Woods/grass comb., Fair, HSG B
178.3	61	>75% Grass cover, Good, HSG B
15.9	96	Gravel surface, HSG B
7.2	96	Gravel surface, HSG B
87.1	96	Gravel surface, HSG B
5.7	98	Unconnected pavement, HSG B
5.7	98	Unconnected pavement, HSG B
5.7	98	Unconnected pavement, HSG B
64.6	98	Paved parking, HSG B
250.8	98	Paved parking, HSG B
390.7	98	Roofs, HSG B
340.1	89	Paved roads w/open ditches, 50% imp, HSG B
9.6	61	>75% Grass cover, Good, HSG B
582.9	61	>75% Grass cover, Good, HSG B
31.9	61	>75% Grass cover, Good, HSG B
2,123.0	80	Weighted Average
1,229.8		57.93% Pervious Area
893.3		42.07% Impervious Area
17.1		1.91% Unconnected

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m <sup>3</sup> /s)	Description
7.1	59.8	0.0150	0.14		<b>Lag/CN Method,</b>

### Subcatchment B.5: Subcat B.5

Hydrograph



### Summary for Subcatchment B.6: Subcat B.6

Runoff = 0.0202 m<sup>3</sup>/s @ 12.13 hrs, Volume= 57.8 m<sup>3</sup>, Depth> 40 mm  
 Routed to Pond 6P : Swale 6

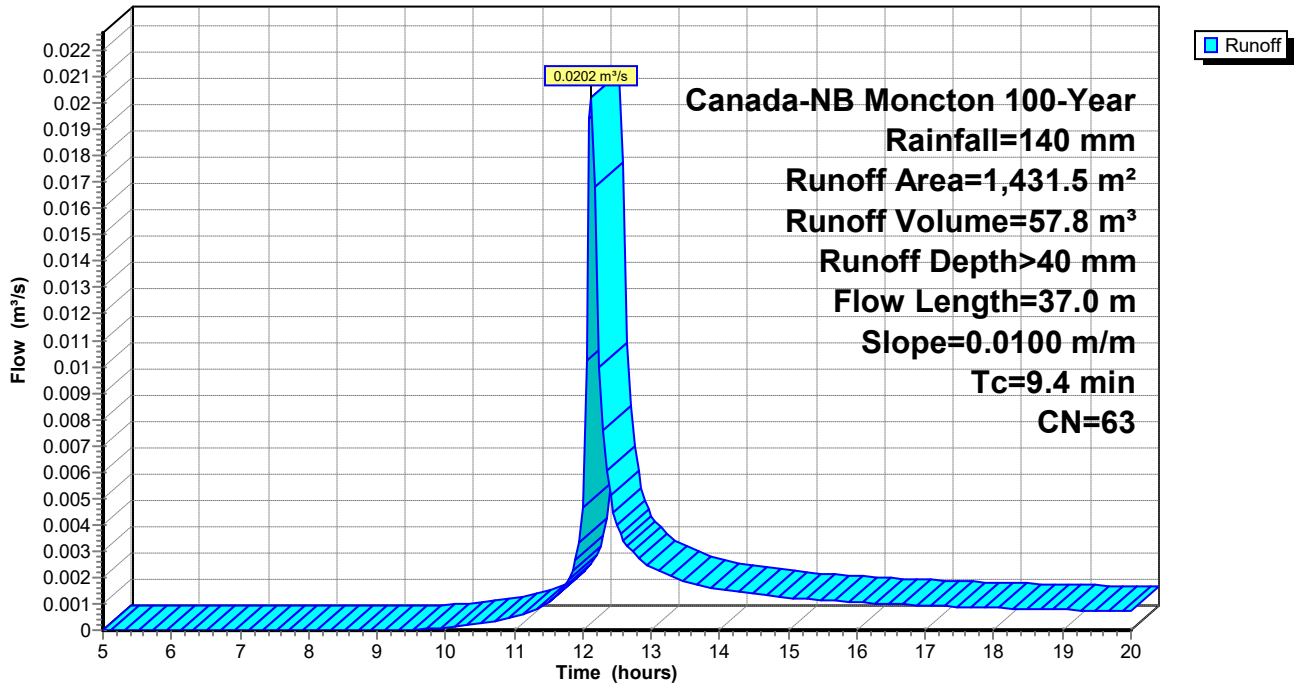
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Canada-NB Moncton 100-Year Rainfall=140 mm

Area (m <sup>2</sup> )	CN	Description
403.3	65	Woods/grass comb., Fair, HSG B
444.5	61	>75% Grass cover, Good, HSG B
519.1	61	>75% Grass cover, Good, HSG B
18.4	96	Gravel surface, HSG B
46.0	89	Paved roads w/open ditches, 50% imp, HSG B
0.2	98	Paved parking, HSG B
1,431.5	63	Weighted Average
1,408.3		98.38% Pervious Area
23.2		1.62% Impervious Area

Tc (min)	Length (meters)	Slope (m/m)	Velocity (m/sec)	Capacity (m <sup>3</sup> /s)	Description
9.4	37.0	0.0100	0.07		Lag/CN Method,

### Subcatchment B.6: Subcat B.6

Hydrograph



### Summary for Pond 1P: Swale 1

Inflow Area = 2,622.1 m<sup>2</sup>, 38.66% Impervious, Inflow Depth > 69 mm for 100-Year event  
 Inflow = 0.0754 m<sup>3</sup>/s @ 12.11 hrs, Volume= 181.9 m<sup>3</sup>  
 Outflow = 0.0165 m<sup>3</sup>/s @ 12.33 hrs, Volume= 180.8 m<sup>3</sup>, Atten= 78%, Lag= 13.6 min  
 Primary = 0.0165 m<sup>3</sup>/s @ 12.33 hrs, Volume= 180.8 m<sup>3</sup>  
 Routed to Link 1L : OVA

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs / 2  
 Peak Elev= 17.424 m @ 12.33 hrs Surf.Area= 98.6 m<sup>2</sup> Storage= 39.0 m<sup>3</sup>

Plug-Flow detention time= 19.3 min calculated for 180.2 m<sup>3</sup> (99% of inflow)  
 Center-of-Mass det. time= 16.8 min ( 816.6 - 799.8 )

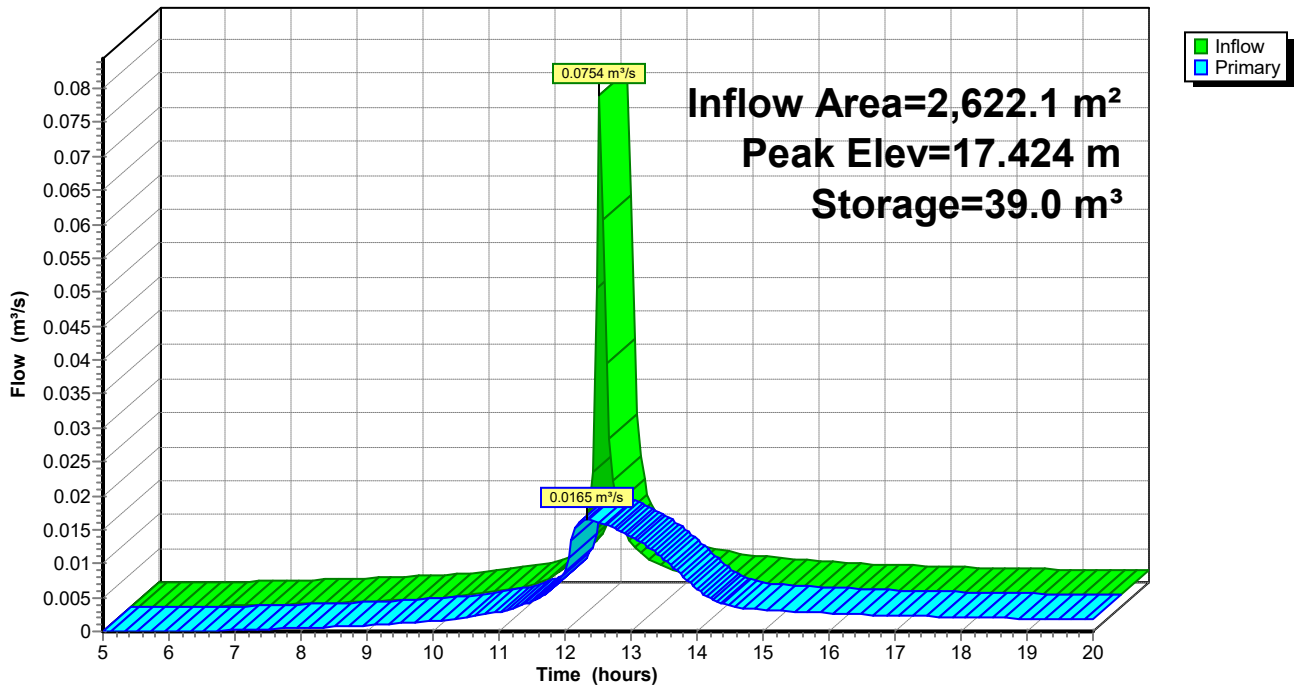
Volume	Invert	Avail.Storage	Storage Description
#1	16.750 m	46.8 m <sup>3</sup>	<b>0.75 mW x 25.89 mL x 0.75 mH Prismatic Z=2.0</b>

Device	Routing	Invert	Outlet Devices
#1	Primary	16.750 m	<b>100 mm Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads

**Primary OutFlow** Max=0.0165 m<sup>3</sup>/s @ 12.33 hrs HW=17.424 m (Free Discharge)  
 ←1=Orifice/Grate (Orifice Controls 0.0165 m<sup>3</sup>/s @ 2.10 m/s)

### Pond 1P: Swale 1

Hydrograph



### Summary for Pond 2P: Swale 2

Inflow Area = 2,579.4 m<sup>2</sup>, 32.11% Impervious, Inflow Depth > 65 mm for 100-Year event  
 Inflow = 0.0746 m<sup>3</sup>/s @ 12.08 hrs, Volume= 167.6 m<sup>3</sup>  
 Outflow = 0.0039 m<sup>3</sup>/s @ 13.89 hrs, Volume= 120.8 m<sup>3</sup>, Atten= 95%, Lag= 108.5 min  
 Primary = 0.0039 m<sup>3</sup>/s @ 13.89 hrs, Volume= 120.8 m<sup>3</sup>  
 Routed to Link 1L : OVA

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 16.770 m @ 13.89 hrs Surf.Area= 212.9 m<sup>2</sup> Storage= 75.8 m<sup>3</sup>

Plug-Flow detention time= 192.7 min calculated for 120.4 m<sup>3</sup> (72% of inflow)  
 Center-of-Mass det. time= 114.3 min ( 918.5 - 804.1 )

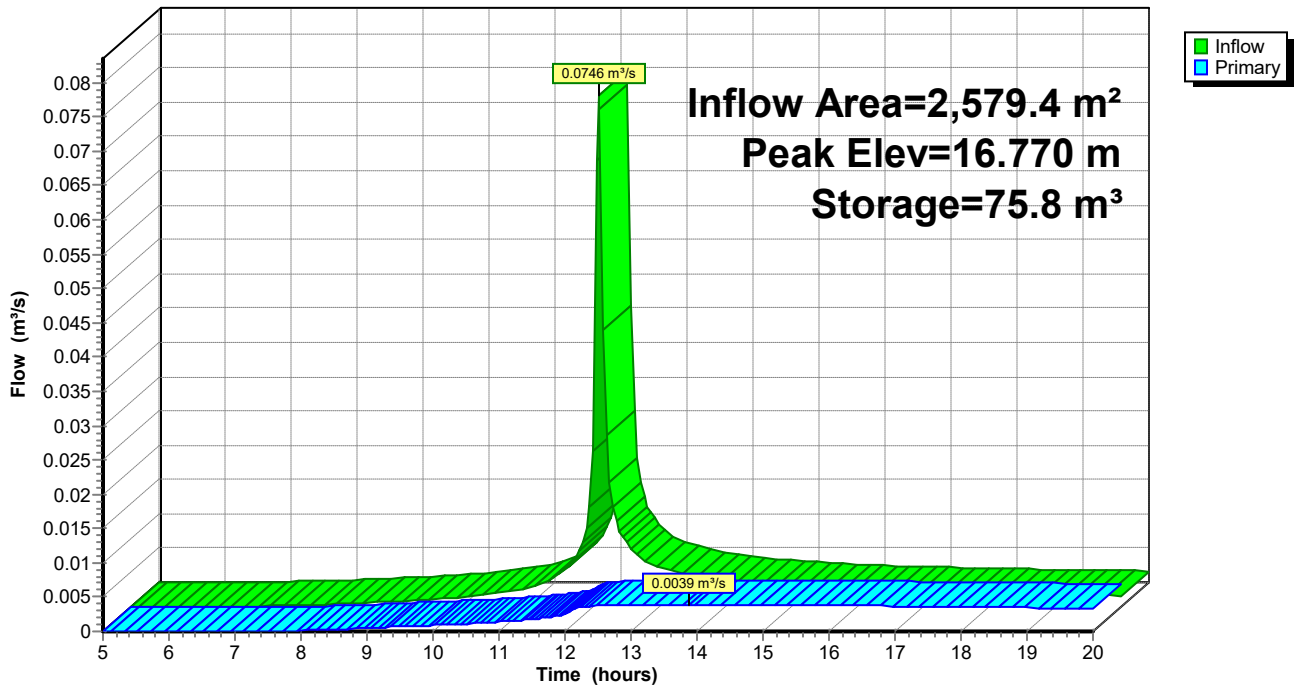
Volume	Invert	Avail.Storage	Storage Description
#1	16.190 m	116.2 m <sup>3</sup>	<b>0.75 mW x 67.03 mL x 0.75 mH Prismatoid Z=2.0</b>

Device	Routing	Invert	Outlet Devices
#1	Primary	16.190 m	<b>50 mm Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads

**Primary OutFlow** Max=0.0039 m<sup>3</sup>/s @ 13.89 hrs HW=16.770 m (Free Discharge)  
 ←1=Orifice/Grate (Orifice Controls 0.0039 m<sup>3</sup>/s @ 1.98 m/s)

### Pond 2P: Swale 2

Hydrograph



### Summary for Pond 3P: Swale 3

Inflow Area = 3,947.0 m<sup>2</sup>, 29.18% Impervious, Inflow Depth > 63 mm for 100-Year event  
 Inflow = 0.0928 m<sup>3</sup>/s @ 12.12 hrs, Volume= 247.3 m<sup>3</sup>  
 Outflow = 0.0137 m<sup>3</sup>/s @ 12.57 hrs, Volume= 242.2 m<sup>3</sup>, Atten= 85%, Lag= 27.2 min  
 Primary = 0.0137 m<sup>3</sup>/s @ 12.57 hrs, Volume= 242.2 m<sup>3</sup>  
 Routed to Link 1L : OVA

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs  
 Peak Elev= 16.379 m @ 12.57 hrs Surf.Area= 243.6 m<sup>2</sup> Storage= 74.1 m<sup>3</sup>

Plug-Flow detention time= 57.0 min calculated for 241.4 m<sup>3</sup> (98% of inflow)  
 Center-of-Mass det. time= 49.1 min ( 858.3 - 809.1 )

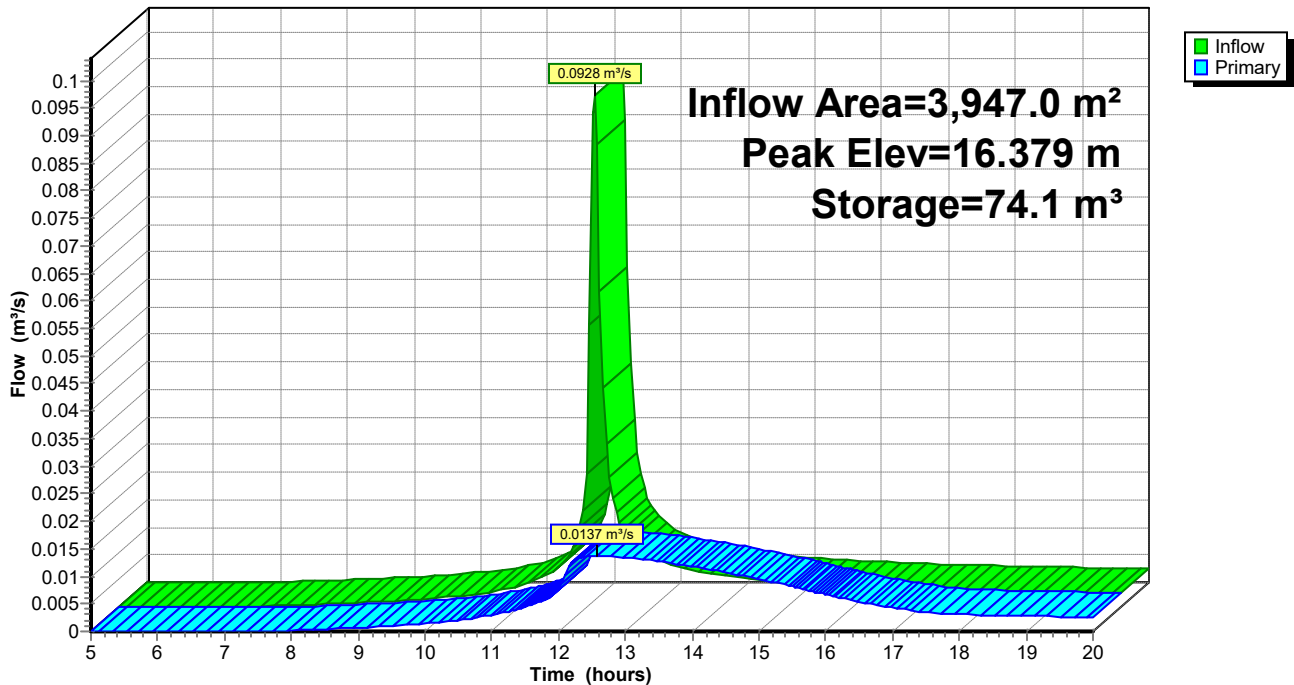
Volume	Invert	Avail.Storage	Storage Description
#1	15.900 m	154.1 m <sup>3</sup>	<b>0.75 mW x 89.46 mL x 0.75 mH Prismatic Z=2.0</b>

Device	Routing	Invert	Outlet Devices
#1	Primary	15.900 m	<b>100 mm Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads

**Primary OutFlow** Max=0.0137 m<sup>3</sup>/s @ 12.57 hrs HW=16.379 m (Free Discharge)  
 ←1=Orifice/Grate (Orifice Controls 0.0137 m<sup>3</sup>/s @ 1.74 m/s)

### Pond 3P: Swale 3

Hydrograph



### Summary for Pond 4P: Swale 4

Inflow Area = 2,144.0 m<sup>2</sup>, 41.51% Impervious, Inflow Depth > 76 mm for 100-Year event  
 Inflow = 0.0797 m<sup>3</sup>/s @ 12.06 hrs, Volume= 163.9 m<sup>3</sup>  
 Outflow = 0.0144 m<sup>3</sup>/s @ 12.27 hrs, Volume= 162.4 m<sup>3</sup>, Atten= 82%, Lag= 12.4 min  
 Primary = 0.0144 m<sup>3</sup>/s @ 12.27 hrs, Volume= 162.4 m<sup>3</sup>  
 Routed to Link 1L : OVA

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs / 2  
 Peak Elev= 16.815 m @ 12.27 hrs Surf.Area= 114.4 m<sup>2</sup> Storage= 37.2 m<sup>3</sup>

Plug-Flow detention time= 23.5 min calculated for 162.4 m<sup>3</sup> (99% of inflow)  
 Center-of-Mass det. time= 19.7 min ( 808.7 - 789.0 )

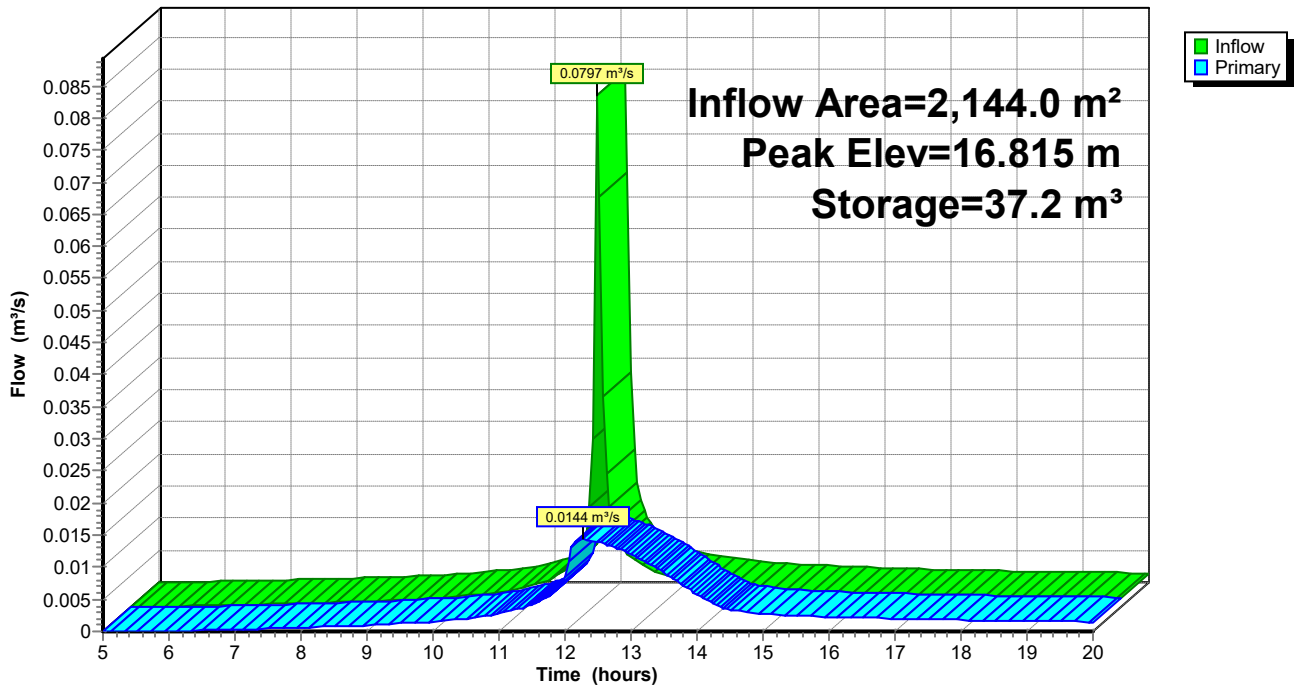
Volume	Invert	Avail.Storage	Storage Description
#1	16.290 m	67.2 m <sup>3</sup>	<b>0.75 mW x 38.01 mL x 0.75 mH Prismatic Z=2.0</b>

Device	Routing	Invert	Outlet Devices
#1	Primary	16.290 m	<b>100 mm Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads

**Primary OutFlow** Max=0.0144 m<sup>3</sup>/s @ 12.27 hrs HW=16.815 m (Free Discharge)  
 ←1=Orifice/Grate (Orifice Controls 0.0144 m<sup>3</sup>/s @ 1.83 m/s)

### Pond 4P: Swale 4

Hydrograph



### Summary for Pond 5P: Swale 5

Inflow Area = 2,123.0 m<sup>2</sup>, 42.07% Impervious, Inflow Depth > 76 mm for 100-Year event  
 Inflow = 0.0687 m<sup>3</sup>/s @ 12.10 hrs, Volume= 162.2 m<sup>3</sup>  
 Outflow = 0.0038 m<sup>3</sup>/s @ 13.70 hrs, Volume= 120.7 m<sup>3</sup>, Atten= 94%, Lag= 96.1 min  
 Primary = 0.0038 m<sup>3</sup>/s @ 13.70 hrs, Volume= 120.7 m<sup>3</sup>  
 Routed to Link 1L : OVA

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs / 2  
 Peak Elev= 17.182 m @ 13.70 hrs Surf.Area= 213.5 m<sup>2</sup> Storage= 73.0 m<sup>3</sup>

Plug-Flow detention time= 188.6 min calculated for 120.3 m<sup>3</sup> (74% of inflow)  
 Center-of-Mass det. time= 114.2 min ( 904.7 - 790.5 )

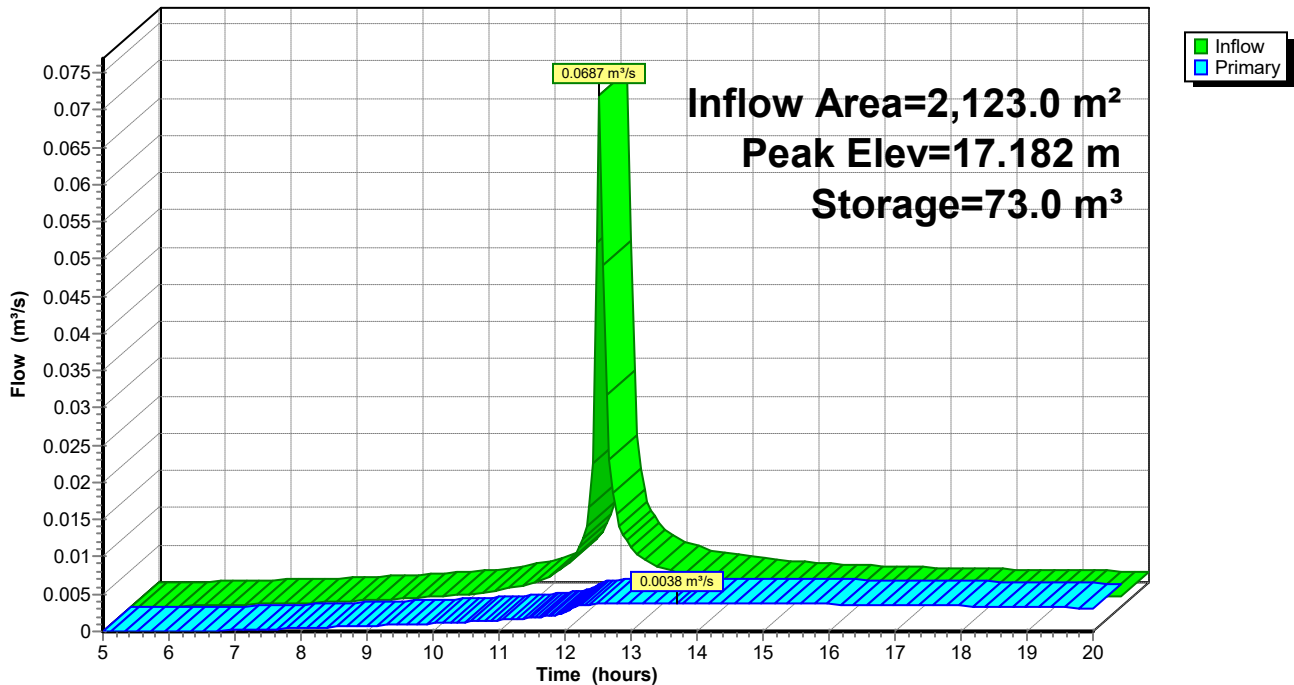
Volume	Invert	Avail.Storage	Storage Description
#1	16.630 m	121.1 m <sup>3</sup>	<b>0.75 mW x 69.94 mL x 0.75 mH Prismatoid Z=2.0</b>

Device	Routing	Invert	Outlet Devices
#1	Primary	16.630 m	<b>50 mm Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads

**Primary OutFlow** Max=0.0038 m<sup>3</sup>/s @ 13.70 hrs HW=17.182 m (Free Discharge)  
 ←1=Orifice/Grate (Orifice Controls 0.0038 m<sup>3</sup>/s @ 1.93 m/s)

### Pond 5P: Swale 5

Hydrograph



### Summary for Pond 6P: Swale 6

Inflow Area = 1,431.5 m<sup>2</sup>, 1.62% Impervious, Inflow Depth > 40 mm for 100-Year event  
 Inflow = 0.0202 m<sup>3</sup>/s @ 12.13 hrs, Volume= 57.8 m<sup>3</sup>  
 Outflow = 0.0099 m<sup>3</sup>/s @ 12.26 hrs, Volume= 57.3 m<sup>3</sup>, Atten= 51%, Lag= 7.9 min  
 Primary = 0.0099 m<sup>3</sup>/s @ 12.26 hrs, Volume= 57.3 m<sup>3</sup>  
 Routed to Link 1L : OVA

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs / 2  
 Peak Elev= 17.395 m @ 12.26 hrs Surf.Area= 39.4 m<sup>2</sup> Storage= 7.4 m<sup>3</sup>

Plug-Flow detention time= 9.9 min calculated for 57.1 m<sup>3</sup> (99% of inflow)  
 Center-of-Mass det. time= 6.7 min ( 845.1 - 838.4 )

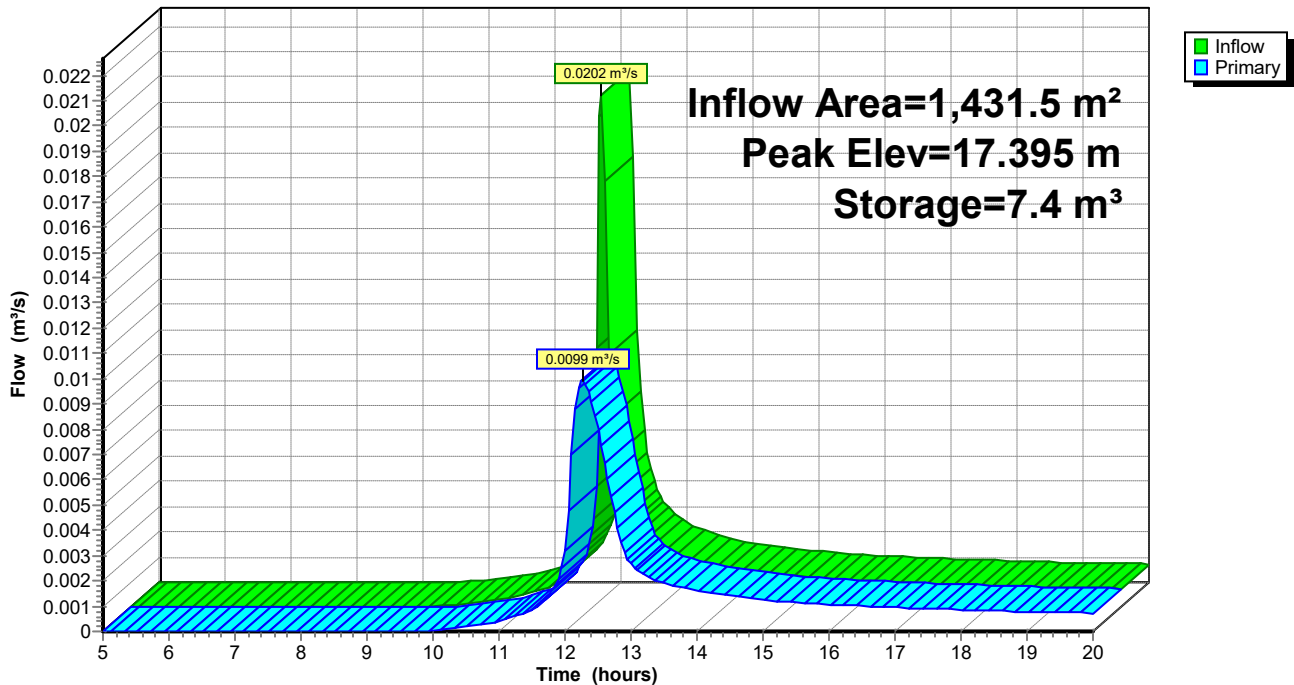
Volume	Invert	Avail.Storage	Storage Description
#1	17.120 m	37.2 m <sup>3</sup>	<b>0.75 mW x 20.22 mL x 0.75 mH Prismatic Z=2.0</b>

Device	Routing	Invert	Outlet Devices
#1	Primary	17.120 m	<b>100 mm Vert. Orifice/Grate</b> C= 0.600 Limited to weir flow at low heads

**Primary OutFlow** Max=0.0099 m<sup>3</sup>/s @ 12.26 hrs HW=17.394 m (Free Discharge)  
 ←1=Orifice/Grate (Orifice Controls 0.0099 m<sup>3</sup>/s @ 1.26 m/s)

### Pond 6P: Swale 6

Hydrograph



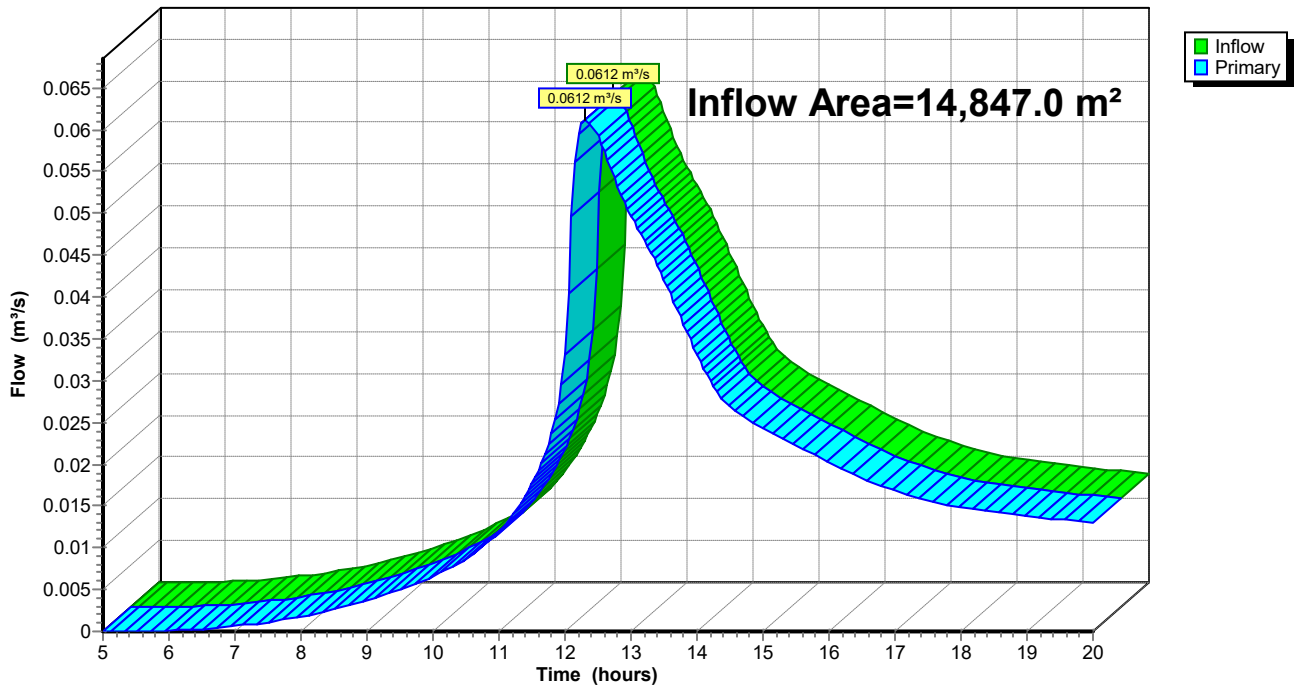
### Summary for Link 1L: OVA

Inflow Area = 14,847.0 m<sup>2</sup>, 32.33% Impervious, Inflow Depth > 60 mm for 100-Year event  
Inflow = 0.0612 m<sup>3</sup>/s @ 12.31 hrs, Volume= 884.2 m<sup>3</sup>  
Primary = 0.0612 m<sup>3</sup>/s @ 12.31 hrs, Volume= 884.2 m<sup>3</sup>, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

### Link 1L: OVA

Hydrograph



# CRAIG HYDROGEOLOGIC INC.



## MICHAUD CAPITAL CORPORATION BRAEMAR LOT APARTMENT BUILDING

### WSSA REPORT 24 HOUR PUMP TEST

SALISBURY, NB

May 2024

Prepared for: **Michaud Capital Corp.**  
Atten: Dr. Wes Michaud  
221 Main Street, Unit 1  
Sussex, NB  
E4E 0M3

Prepared by: **Craig HydroGeoLogic Inc.**  
479 Maces Bay Road  
Maces Bay, N.B.  
E5J 1T39  
Phone: 506-659-3064

Date: May 29, 2024

**Craig HydroGeoLogic Inc.**  
479 Maces Bay Road. Maces Bay, NB E5J 1T3  
Telephone 506-659-3064 Email [dcraig@craighydrogeologic.ca](mailto:dcraig@craighydrogeologic.ca)  
<http://www.craighydrogeologic.ca/>

**MICHAUD CAPITAL CORPORATION**  
**BRAEMAR LOT APARTMENT BUILDING**

**WSSA REPORT**  
**24 HOUR PUMP TEST**

**SALISBURY, NB**

**May 2024**

**INTRODUCTION**

Craig HydroGeoLogic Inc. was retained by Dr. Wes Michaud of Michaud Capital Corp. to conduct pump testing on a potential groundwater supply well (PW1 in this report) as specified in the EIA Water Supply Source Assessment Guidelines (April 2017) prescribed by the New Brunswick Department of Environment and Local Government (NBDELG). The pump testing is part of the approval process which is required for Michaud Capital Corp. to obtain an approval to construct and operate the groundwater supply well to provide water for a proposed residential apartment building (Braemar Lot) in Salisbury, NB.

This report presents the results of the pump test and conclusions and recommendations based on the results of the pump test. This report was prepared by Craig HydroGeoLogic Inc. for the clients, Dr. Wes Michaud and Michaud Capital Corp., and the report presents the results of pump testing a groundwater supply sourced from a production wells (PW1). The groundwater produced from the production well is intended to be the water supply for an eight-unit apartment building proposed to be built on PID 00816140 (Braemar Lot) located on McDonald Road, Salsbury, NB.

The report is based on the application of scientific principles and professional judgment to certain facts with resultant subjective interpretations. For example, but not limited to, interpolation between boreholes is an accepted industry practice, however, actual

subsurface conditions may vary from that interpolated and such variation could impact observations, discussions, conclusions and recommendations in the report. Professional judgments expressed herein are based on the facts currently available within the existing data, scope of work, budget and schedule. The material and information in the report reflect Craig HydroGeoLogic Inc.'s best judgment in light of the information available at the time of report preparation. Any use which a third party makes of this report, or any reliance on or decision(s) to be made based on this report are the responsibility of the third party(ies). Craig HydroGeoLogic Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken based on this report.

## **SCOPE**

The scope of the assessment is as follows:

1. To conduct a 24-hour pump test on the proposed water supply well (PW1) as specified in the EIA Water Supply Source Assessment guidelines prescribed by the New Brunswick Department of Environment and Local Government, and;
2. To produce a report with the findings of the pump testing and recommendations with regard to the development/operation of the proposed groundwater supply.

## **SITE DESCRIPTION**

### **LOCATION**

Michaud Capital Corp. is proposing the residential apartment development on PID 00816140. The property is in Salisbury, NB, east of McDonald Road and north of the end of Dundee Drive. The property is referred to as the Braemar Lot.

## **EXISTING DEVELOPMENT/OPERATION**

PID 00816140 is currently undeveloped and is covered with trees. There is no existing development on the property. The site is surrounded on the north, west and south sides by existing residential development and, on the east side is a large school. All the surrounding properties are serviced by private wells but have a municipal sewage system.

## **REQUIRED WATER QUANTITY**

As mentioned above, an eight-unit apartment building is proposed. The building will have one 1-bedroom unit and seven 2-bedroom units. The design water demand for private recreational or residential homes is prescribed in the NBDELG Water Supply Assessment Guideline as follows:

“The per-person requirement shall be 450 liters per day. Peak demand occurs for a period of 120 minutes each day. This is equivalent to a peak demand rate of 3.75 liters/minute (0.82 igpm) for each person. The basic minimum pumping test rate is this rate multiplied by the “likely number of persons per well” which, for a single-family residence shall be the number of bedrooms plus one.”

For the one single bedroom unit, the design population is 2, based on the NBDELG design criteria. For the seven 2-bedroom units the design population is  $7 \times 3 = 21$  for a total design population of 23 individuals. Based on these design population numbers the average daily requirement is 10,350 liters per day, or 7.19 L/min or 1.58 igpm (10.3 m<sup>3</sup>/day). The predicted peak demand rate for a design population of 23 is 86.25 L/min or 18.86 igpm. Based on the average daily water requirement of 7.19 L/min or 1.58 igpm (10.3 m<sup>3</sup>/day), an EIA would not be required as the trigger is 50 m<sup>3</sup>/day and the site is within an incorporated area (Salisbury).

## **SITE DESCRIPTION**

### **General**

The location of the proposed production well (PW1) and the two observation wells (OBS1 and OBS2) are shown in Figure 1. The existing land use in the general area is residential and institutional. The existing development in the area relies on private wells but has a municipal sewage system.

Based on site visits (May 14 through 16, 2024) and the existing land use in the area, the potential contamination of ground water resources by previous land uses does not appear to be an issue for the new well development. The land on which the exploration wells are located is undeveloped.

### **Geology and Hydrogeology**

A 100-meter radius well log search of the NB Environment Well Log Database was conducted around PID 00816140. The well log search provided a total of 12 well logs. Copies of the 12 well logs are provided in Appendix 1, at the back of this report. The search radius was not increased beyond 100 meters so as to try and focus on the area of the proposed apartment building as much as possible.

**Geology:** The overburden in the general area of the site is a brown clay till. According to the well logs in the area the till ranges from 4.9 to 19.8 meters (16 to 65 feet) in thickness. The overburden is not used as a water source in the local area, and it is the bedrock that forms the local aquifer. The bedrock in the area is mapped as Late Carboniferous age sedimentary rocks which form the Salisbury Formation. The rock is composed of reddish mudstone, siltstone, and sandstone. There is some conglomerate and minor thin coal seams may also be present.

**Hydrogeology:** A 100-meter search of the NBDELG well log database was conducted around PID 00816140. A total of 12 well logs were returned.

Table 1: 100 Meters Search Radius

<b>Well Depth (feet)</b>	<b>Estimated Yield (igpm)</b>	<b>Depth to Bedrock (feet)</b>	<b>Casing Length (feet)</b>
Average: 161.7	Average: 7.8	Average: 29.0	Average: 55.4
Median: 180	Median: 5	Median: 25	Median: 67
Minimum: 25	Minimum: 4	Minimum: 16	Minimum: 30
Maximum: 240	Maximum: 30	Maximum: 65	Maximum: 71

As can be seen from the above information contained in Table 1, the 12 well logs found in the database for wells in this area have an average depth of 161.7 feet with an estimated average yield of approximately 7.8 igpm. The average estimated yield of 7.8 igpm and the observed median yield of 5 igpm are greater than the typical domestic well instantaneous needs of approximately 3 igpm. The minimum yield observed was 4 igpm, observed in two wells with depths of 25 and 188 feet. The maximum yield observed in the well logs was 30 igpm observed in a well with a depth of 140 feet. Most of the well records from the database are probably for single homes and, as such, would only be drilled deep enough to provide sufficient water for a single home. A summary of the individual well log data is attached.

**NB Environment Well Water Chemistry Database:** A search of the NB Environment well chemistry database was conducted for a radius of 175 meters around PID00816140. The precise locations of the wells from which the ground water chemistry was obtained are not available due to right to privacy considerations for the property owners. The results from the data available in the NB Environment database are provided in Table 2 which follows. A total of eight sample records were provided for inorganic chemistry as a result of the database search. The average value of the measured result and the New Brunswick Drinking Water Quality Guideline (NBDWQG) are included in the table for the purpose

of comparison. Any parameter which exceeds the New Brunswick Drinking Water Quality Guideline concentration is bolded and shaded for ease of recognition in the data table.

Out of the eight well chemistry records available, one well exceeded the NBDWQG for chloride of 250 mg/L with measured concentrations of 269 mg/L. Two other well chemistry records exceeded the NBDWQG for sodium of 200 mg/L with measured concentrations of 214 and 215 mg/L. Waters containing elevated concentrations of chloride and sodium should not be consumed or used for cooking; however, they can be used for bathing. Higher than normal levels of sodium chloride would likely cause corrosion and shorten the life of plumbing, hot water heaters and any appliances that come in contact with the water. Treatment options for removing sodium and chloride include reverse osmosis and distillation. Such units are available from local suppliers and installers. Alternatively, water with elevated concentrations of sodium chloride can be replaced with bottled water for drinking and cooking.

Out of the eight chemistry records available, five samples had elevated concentrations of fluoride (1.93, 1.96, 1.97, 2.52, and 4.19 mg/L) compared to the New Brunswick Drinking Water Guideline of 1.5 mg/L. Fluoride occurs naturally in minerals and soils. According to the Guidelines for Canadian Drinking Water Quality, sixth edition, 1996, the optimum concentration of fluoride in drinking water for the reduction of dental caries is 1.0 mg per liter. The appearance of dental fluorosis (mottling of teeth) may be objectionable at fluoride concentrations above 1.5 mg per liter. The US EPA has a health-based criteria for fluoride of 4.0 mg/L and a secondary criterion of 2.0 mg/L for cosmetic effects as referenced above for the Canadian Drinking Water Guideline. One exceedance of 4.19 mg/L exceeds the 4.0 mg/L health-based criteria. The other four do not. The US EPA criteria is based on 70 years of exposure. Elevated fluoride concentrations can be treated with reverse osmosis systems in order to provide water for drinking or cooking. The water is suitable for bathing. Bottled water can be used to replace this water for drinking or cooking if desired.

**Table 2**

NBDWQG = New Brunswick Drinking Water Quality Guideline

**NBDOE Groundwater Chemistry Database**

Parameter	ALK_T (mg/L)	Al (mg/L)	As (µg/L)	B (mg/L)	Ba (mg/L)	Br (mg/L)	COND (µSIE/cm)	Ca (mg/L)	Cd (µg/L)
	227	0.025	1.5	0.042	0.025	0.1	509	2.75	0.5
	230	0.025	1.5	0.04	0.142	0.1	966	31.4	0.5
	238	0.039	1.5	0.029	0.058	0.124	853	5.64	0.5
	231	0.43	1.5	0.045	0.021	0.1	631	1.75	0.5
	178	0.025	1.5	0.021	0.771	0.108	1240	144	0.5
	239	0.36	1.5	0.043	0.013	0.1	531	1.1	0.5
	185	0.14	1.5	0.041	0.046	0.755	1030	3.11	0.5
	186	0.03	1.5	0.023	0.046	0.1	923	4.33	0.5
<b>Mean</b>	<b>214.3</b>	<b>0.134</b>	<b>1.5</b>	<b>0.036</b>	<b>0.140</b>	<b>0.2</b>	<b>835</b>	<b>24.3</b>	<b>0.5</b>
<b>NBDWQG</b>			<b>&lt;10</b>	<b>&lt;5.0</b>	<b>&lt;1.0</b>				<b>&lt;5.0</b>

Parameter	Cl (mg/L)	Cr (µg/L)	Cu (µg/L)	E_coli P/A (P/A)	F (mg/L)	Fe (mg/L)	HARD (mg/L)	K (mg/L)	Mg (mg/L)
	12	11	10	Ab	2.52	0.254	7.51	0.62	0.15
	159	14	10	Ab	0.416	0.048	97.5	2.2	4.62
	106	35	11	Ab	1.93	0.338	16	1.1	0.46
	31.3	14	34	Ab	4.19	0.245	5.11	0.5	0.18
	269	13	10	Ab	0.197	0.194	442	2.6	20
	5.57	10	10	Ab	1.96	0.323	3.16	0.5	0.1
	196	10	10	Ab	1.97	0.262	8.38	0.7	0.15
	167	10	10	Ab	1.14	0.142	12	0.972	0.288
				Ab					
				Ab					
<b>Mean</b>	<b>118.2</b>	<b>15</b>	<b>13</b>		<b>1.79</b>	<b>0.226</b>	<b>74.0</b>	<b>1.15</b>	<b>3.24</b>
<b>NBDWQG</b>	<b>&lt;250</b>	<b>&lt;50</b>	<b>&lt;1000</b>		<b>&lt;1.5</b>	<b>&lt;0.3</b>			

**Table 2**

NBDWQG = New Brunswick Drinking Water Quality Guideline

**NBDOE Groundwater Chemistry Database**

Parameter	Mn (mg/L)	NO2 (mg/L)	NO3 (mg/L)	NOX (mg/L)	Na (mg/L)	PH (pH)	Pb (µg/L)	SO4 (mg/L)	Sb (µg/L)
	0.024	0.05	0.05	0.05	119	8.64	1	19.9	1
	0.27	0.05	0.2	0.25	180	8.11	1	8.74	1
	0.072	0.05	0.05	0.05	186	8.42	1	17.4	1
	0.033	0.05	0.05	0.05	146	8.97	3.3	39.3	1
	0.52	0.05	0.74	0.79	59	7.96	1	10	1
	0.014	0.05	0.05	0.05	129	9.13	1.2	25.2	1
	0.021	0.05	0.05	0.05	216	8.84	1	19.9	1
	0.034	0.05	0.05	0.062	214	8.55	1	10.4	1
<b>Mean</b>	<b>0.124</b>	<b>0.05</b>	<b>0.16</b>	<b>0.17</b>	<b>156.13</b>	<b>8.58</b>	<b>1.3</b>	<b>18.86</b>	<b>1.0</b>
<b>NBDWQG</b>	<b>&lt;0.05</b>	<b>&lt;10</b>	<b>&lt;10</b>	<b>&lt;10</b>	<b>&lt;200</b>	<b>7.0-10.5</b>	<b>&lt;10</b>	<b>&lt;500</b>	<b>6</b>

Parameter	Se (µg/L)	TC-P/A (P/A)	TURB (NTU)	TI (µg/L)	U (µg/L)	Zn (µg/L)	TDS (mg/L)
	1.5	Ab	4.41	1	11	5	294
	1.5	Ab	0.79	1	13	5	526
	1.5	Ab	8.2	1	5.6	10	462
	1.6	Pr	116	1	2.3	30	363
	1.5	Ab	1.5	1	7.7	6	616
	1.5	Ab	14	1	3.8	5	308
	1.5	Ab	5.5	1	1.2	5	550
	1.5	Ab	3.1	1	6.3	5	510
		Ab					
<b>Mean</b>	<b>1.5</b>		<b>19.2</b>	<b>1</b>	<b>6.4</b>	<b>9</b>	<b>454</b>
<b>NBDWQG</b>			<b>&lt;1.0</b>		<b>&lt;20</b>	<b>&lt;5000</b>	<b>&lt;500</b>

Elevated concentrations of iron and manganese are common in many groundwater aquifers in New Brunswick and some elevated concentrations are found in the data for this bedrock aquifer in this general location. Out of the eight chemistry sample results available, two exceeded the guideline for iron, and three samples exceeded the guideline for manganese. Such elevated concentrations are normally due to natural conditions within the aquifer. The applicable NB Drinking Water Guidelines for iron and manganese are aesthetic objectives. Iron and manganese can cause staining of plumbing fixtures and laundry and may be associated with smells imparted to the water. Iron and manganese can usually be readily removed by commercial water treatment systems at the hardness observed in this water. Water treatment equipment suppliers in NB have extensive experience with removing iron and/or manganese from domestic water supplies.

A total of seven out of the eight chemistry records available had elevated turbidity present in the samples. The elevated levels of turbidity may be related to the relative newness of the wells, and they may not have had sufficient time, or use, to clear naturally. The water samples in the database are provided from the water well testing certificates which are provided by the well drilled immediately after the well has been drilled. As a result, the majority of the analytical results come from new wells. Most new wells clear naturally with time and use. At levels in excess of 5 NTUs turbidity may become noticeable to consumers and therefore, objectionable. The turbidity may be the result of elevated concentrations of iron and or manganese or the presence of particulate in the water.

**Microbiological Results:** A total of 10 sample results were available in the data set for E. coli analysis. Out of these results, no well had a detection of E. coli. A total of nine sample results were available for total coliform analysis and out of these nine results, one well had a detection of total coliform. Total coliforms are natural soil bacteria and are commonly present in private well water systems, particularly associated with elevated turbidity. Such detections are usually easily treated and corrected by shock chlorination of the wells and associated plumbing systems.

In general terms the groundwater chemistries found in the NBDELG database are not unusual for this area and reflect natural aquifer conditions. All other parameters measured, other than those specifically discussed above, had concentrations below the New Brunswick Drinking Water Quality Guidelines.

## **SURFACE WATER**

**Surface Streams:** The site is located within the developed area of Salisbury, NB, and local drainage is controlled by ditches and storm sewers. There are no surface waters located within 60 m of the test property. The Petitcodiac River is located approximately 420 meters southwest of the site at its closest point.

### **GWUDI Assessment:**

#### **Step 1: GWUDI Screening (NB Protocol)**

1. **In a sensitive setting:** The location of the well PW1 is shown in Figure 1. The production well (PW1) is cased to 36.0 meters (118 feet) below the ground surface and the well log does not indicate any significant accumulations of sand and/or gravel which extend below the water table in the area. The wells are not in a sensitive setting.
2. **In proximity to surface water:** Ground water wells are considered to be in proximity to surface water if they are within 60 meters. The closest surface water is at least approximately 400 meters from PW1.
3. **Improper well construction:** The wells is new and constructed by licensed well drillers. PW1 is cased to the 36.0 meters (118 feet) depth.
4. **Water quality indicative of surface water:** The water quality samples collected during the pump test did not indicate surface water. The microbiology samples were all non-detect.

Based on the above GWUDI screening well PW1 screens out under the New Brunswick protocol.

## **FIELD TESTING PROGRAM**

### **Antecedent and Pump Test Period Weather**

The temperatures and precipitation amount for the weather immediately before and during the pump test are provided below in Table 3. The data source is Environment Canada, the closest operating station is Moncton/Greater Moncton Romeo Leblanc Intl A (Temp Data and Precipitation Data) NB. In Table 3 the time period of the pump test and recovery is shaded.

**Table 3: Antecedent and Test Period Weather**

Date	Max. Temp. C	Min. Temp. C	Avg. Temp. C	Total Precip. mm
May 5 2024	Missing	Missing	Missing	1.4
May 6, 2024	16.8	5.8	11.2	2.1
May 7, 2024	18.2	4.7	11.5	T
May 8, 2024	12.8	2.1	7.5	11.6
May 9, 2024	5.6	-0.4	2.6	15.5
May 10, 2024	9.8	-1.4	2.6	0.0
May 11, 2024	13.4	-0.2	6.6	0.0
May 12, 2024	13.8	0.2	7.0	0.0
May 13, 2024	20.2	-0.3	10.0	0.0
May 14, 2024	22.1	3.5	12.8	0.0
May 15, 2024	25.0	5.9	15.5	0.0
May 16, 2024	19.4	6.1	12.8	0.0

As can be seen in the above Table 3 there was some precipitation about six days before the start of the pump test. During the actual pump test no precipitation was recorded, there was no recorded precipitation during the period of recovery. Based on the above information it seems unlikely that groundwater recharge from precipitation significantly impacted ground water levels during the pump test and recovery periods.

## **Field Testing Program**

Two new test wells (PW1 and OBS1) were drilled at the locations shown in Figure 1, and the well logs are provided in Appendix 1, at the back of this report. Out of two new test wells, PW1 was identified as having the best potential for water supply development based on estimated safe yield and location. Well OBS1 was designated as an observation well due to its location between the test pumped well and the adjacent school as well as being located at a similar distance of the nearest home with a private well relative to PW1.

PW1 (tag 00677821) is a six-inch diameter well drilled on April 24, 2024. The well is 91.4 meters (300 feet) in depth, cased to 36.0 meters (118 feet) and the well driller estimated a safe yield of 9 igpm. OBS1 (tag 0068692) is a six-inch diameter well drilled on November 30, 2023. The well is 87.5 meters (287 feet) in depth, cased to 32.0 meters (105 feet) and the well driller estimated a safe yield of 4 igpm. OBS2 is an existing drilled well located at 3166 Main Street, Salisbury. The well is a 6-inch drilled well, located in the house basement, with a jet pump. The well was measured to be 19 meters (62 feet) in depth and based on site observations, predates the start of the NB Well Log Database.

OBS1 is 53 meters (173.9 feet) from well PW1, OBS2 is located approximately 256 meters (840 feet) from PW1.

## **Field Testing**

Well PW1 was the production well that was pumped for the 24-hour pump test. The wells, OBS1 and OBS2 were used as an observation wells. PW1 and OBS1 were drilled specifically for the pump test. OBS2 was an existing private well located at 3166 Main Street, Salisbury. OBS2 was not in use during the pump test with the single exception of one event early on the morning of May 16.

A direct read pressure transducer was installed in PW1 on the morning of May 15, 2024, prior to the start of the pump test. Recording pressure transducers was installed in OBS1 and OBS2 on the morning of May 15, 2024, prior to the start of the pump test. Water levels were recorded by the pressure transducers every five minutes during the pump test and recovery period. The pressure transducers remained in the wells until they were retrieved on the morning of May 16, 2024, following the completion of the pump test and recovery. The initial static level in each well was measured prior to installing the pressure transducers. The initial static level in PW1 was -7.36 m below the top of casing (BTOC), in OBS1 the initial static was -8.06 m BTOC, and in OBS2 the initial static was -7.39 m BTOC.

Well PW1 was pump tested for 24 hours starting on May 15, 2024 and extending into May 16 2024. The pump intake was set at approximately 42.7 meters (140 feet). In well PW1, pumping was started at 9:21 am , May 15 at a flow rate of 36.4L/min (8 igpm). This rate was sustained until 9:21 am , May 16, 2024. A water quality sample was collected from PW1 on May 16 , just before the end of the 24-hour pump test.

It is the Top of Casing that is used as the reference point for all groundwater level measurements during the pump test and recovery period.

The well coordinates are as follows:

			PID
PW1	46.023856	-65.04239	00816140
OBS1	46.024144	-65.041862	00816140
OBS2	46.025912	-65.043924	00816306

## Water Quality Testing

Well PW1 was pump tested for 24 hours starting on May 15, 2024 and extending into May 16 2024. Microbiological and inorganic potable water chemistry samples were collected from PW1 near the end of the 24-hour pump test. The water samples collected during this pump test were analyzed at RPC laboratories in Moncton and Fredericton, NB. It is the analytical results of these samples that are provided below. The laboratory certificates are provided in Appendix 2 at the back of this report.

**Inorganic Results:** The general inorganic chemistry, trace metal, and microbiological analytical results for the groundwater samples collected during the pump test are provided in Tables 4 and 5 which follows. In Table 4 (inorganic parameters) any parameter that exceeds the New Brunswick Drinking Water Quality Guidelines (NBDWQG) is bolded and shaded for ease of recognition.

As can be seen in Table 4 all the inorganic chemistry and trace metal parameters measured met the New Brunswick Drinking Water Quality Guidelines except for fluoride and turbidity. The water sample had an elevated concentration of fluoride (2.1 mg/L) compared to the New Brunswick Drinking Water Guideline of 1.5 mg/L. Fluoride occurs naturally in minerals and soils. According to the Guidelines for Canadian Drinking Water Quality, sixth edition, 1996, the optimum concentration of fluoride in drinking water for the reduction of dental caries is 1.0 mg per liter. The appearance of dental fluorosis (mottling of teeth) may be objectionable at fluoride concentrations above 1.5 mg per liter. The US EPA has a health-based criteria for fluoride of 4.0 mg/L and a secondary criterion of 2.0 mg/L for cosmetic effects as referenced above for the Canadian Drinking Water Guideline. The exceedance of 2.1 mg/L does not exceed the 4.0 mg/L health-based criteria. The US EPA criteria is based on 70 years of exposure. Elevated fluoride concentrations can be treated with reverse osmosis systems in order to provide water for drinking or cooking. The water is suitable for bathing. Bottled water can be used to replace this water for drinking or cooking if desired. The elevated turbidity observed is expected to reduce to acceptable levels with time and further pumping.

**Microbiological Results:** No E. coli or total coliforms were detected as is shown in Table 5.

Table 4: Major inorganic ion chemistry for the groundwater sample from Well during 24-hour pump test, Salisbury WSSA.

					Guidelines
Sample ID	PW1 At 23.75 hr.				New Brunswick Drinking Water Quality Guidelines
Sample Date	May 16, 2024				
Sodium (mg/L)	140				≤200
Potassium (mg/L)	0.38				
Calcium (mg/L)	1.16				
Magnesium (mg/L)	0.05				
Alkalinity (as CaCO <sub>3</sub> ) (mg/L)	270				
Chloride (mg/L)	19.6				≤250
Sulphate (mg/L)	27				≤500
Nitrate + Nitrite (as N) (mg/L)	<0.05				10.0
Iron (mg/L)	<0.02				≤0.3
Manganese (mg/L)	0.009				≤0.05
Aluminum (mg/L)	0.026				
Antimony (mg/L)	<0.0001				0.006
Arsenic (mg/L)	<0.001				0.01
Barium (mg/L)	0.019				1.0
Boron (mg/L)	0.041				5.0
Cadmium (mg/L)	<0.00001				0.005
Chromium (mg/L)	<0.001				0.05
Copper (mg/L)	<0.001				≤1.0
Fluoride (mg/L)	<b>2.1</b>				1.5
Lead mg/L)	<0.0001				0.01
Selenium (mg/L)	<0.001				0.01
Uranium (mg/L)	0.0034				0.02
Zinc (mg/L)	<0.001				
pH	8.9				
Turbidity (NTU)	<b>2.7</b>				1
Conductivity (µS/cm)	582				
Colour TCU	<5				
Hardness (calc) mg/l as CaCO <sub>3</sub>	3.1				

### Microbiology Results

A microbiological sample was collected from the production well at the end of the pump test for analysis. The results of these are provided below. The laboratory certificate is provided in the Appendix.

**Table 5: Microbiology Results**

Well	Date and Time (d-m-y) (12 hr.)	E. coli	Total Coliform
Current Pump Test Results			
PW1	16-05-24 9:00 am	0	0

As can be seen in Table 5 above, there were no detections of either E. coli or Total Coliforms in the microbiological sample.

## Field Pump Testing

A 24-hour pump test was started at 9:21 am on May 15, 2023, and conducted until 9:21 am, May 16, 2024, when the pump was turned off and the water level allowed to recover. PW1 was pumped at 36.4 L/min (8 igpm, 52.4 m<sup>3</sup>/day) for 24 hours, followed by recovery.

## Aquifer Parameters PW1

The arithmetic plot of the drawdown and recovery curve for Well PW1 is shown in Figure 2. The log plot of the drawdown and recovery curve for Well PW1 is provided in Figure 3 which also shows the trend line for the analysis carried out below. The analytical method reference is C.W. Fetter, 1994: Applied Hydrogeology, Macmillan College Publishing Company Inc. Pages 214 – 241. It is the Jacob straight line method that was used.

During the 24-hour pump test with a constant pumping rate of 36.4 L/min (8 igpm or 52.4 m<sup>3</sup>/day) the total drawdown was 19.3 meters.

## PW1 Transmissivity

$$T = 2.3Q / 4\pi\Delta s = 0.183Q / \Delta s$$

where  $Q = 8 \text{ igpm} = 36.4 \text{ L/min} = 52.4 \text{ m}^3/\text{day}$

and  $\Delta s = 4.34$  from the slope of the trend line shown in Figure 3

Then 
$$T = (0.183 * 52.4) / 4.34 = 2.21 \text{ m}^2/\text{day}$$

Based on the Jacob straight line method the aquifer transmissivity is estimated at 2.21 m<sup>2</sup>/day, indicating a hydraulic conductivity of approximately 0.04 m/day (b = 55.4 meters). The results can be considered within the normal range for the bedrock aquifer as is found in the local area. The specific capacity is estimated at approximately 0.41 igal (1.86 liters) per meter of drawdown. Upon shutdown of the pump test, the wells recovery was

monitored. Well PW1 recovered to 80% of the total drawdown after 80 minutes of recovery.

PW1 was pump tested at 36.4 L/minute in order to see any associated drawdown in OBS1 and OBS2. In fact, the average water demand is predicted to be 7.19 L/minute for the Apartment building proposed (see Required Water Quantity). We can derive a trend line for a constant pumping rate (Q) of 7.19 L/minute using the following.

For PW1

$$T=2.3Q / 4\pi\Delta s = 0.183Q / \Delta s$$

rearranging we get

$$\Delta s = 0.183Q / T$$

where  $Q = 7.19 \text{ L/minute} = 10.4 \text{ m}^3/\text{day} = 1.58 \text{ igpm}$

and using  $T = 2.21 \text{ m}^2/\text{day}$

Therefore  $\Delta s = 0.86 \text{ meters}$

We can construct a trend line of this slope as is shown in Figure 3. Based on this trend line, at the 100-day (144,000 min) mark with negligible recharge, well PW1 would have approximately 4.3 meters of drawdown.

Figure 4 shows the residual drawdown plotted against the ratio of  $t/t'$ . The plot indicates an approach to zero drawdown at a positive intercept. The  $\Delta s$  from the trend line showing is 5.8, which yields a  $T = 1.65 \text{ m}^2/\text{day}$

The observed water level fluctuations in OBS1 are shown in Figure 5. The initial static in OBS1 was -8.06 meters BTOC. In OBS1 the maximum drawdown observed during the pump test is 2.59 meters. It is clear from the irregularities in the plotted drawdown line in Figure 5 that OBS1 is also being influenced to a lesser extent by other pumping wells in

the neighborhood. This is especially true for the small increase in drawdown in OBS1 towards the end of the pump test (+1400 min), a time when drawdown in PW1 was relatively stable with a smooth curve.

The observed water level fluctuations in OBS2 are shown in Figure 6. The initial static in OBS1 was -7.39 meters BTOC. The water level in OBS2 was not influenced by the pumping in PW1 and no drawdown in OBS2 can be attributed to the drawdown in PW1. The sudden sharp drawdown followed by recovery observed in OBS2 is probably a result of a single pumping event in OBS2 itself.

The distance drawdown relationship for PW 1 and PW2 combined, pumping a total of 36.4 L/min (75 igpm) for 24 hours is shown in Figure 7. Under the pump test conditions, the zero-impact radius is predicted to be approximately 140 meters.

## **DISCUSSION**

**Water Chemistry:** The analytical results of the groundwater sample collected from PW1 at the end of the pump test are provided in Tables 4 and 5. All parameters measured meet drinking water guidelines with the exception of fluoride and turbidity. The water supply will require treatment to reduce the concentrations of fluoride to an acceptable concentration. It is expected that the elevated level of turbidity will decrease to acceptable levels with further time and pumping as the vast majority of most wells will clear naturally.

**Water Quantity:** Well PW1 was pumped at a rate of 36.04 L/min (8 igpm) for 24 hours during the pump test. Wells PW1 and OBS1 had measured drawdowns of approximately -19.3 and -2.59 meters after the pumping portion of the test ended.

As outlined in the section on Required Water Quantity, the proposed apartment building will require a total water flow of 10,350 liters per day (10.35 m<sup>3</sup>/day, 7.19 L/min, or 1.58 igpm). The total daily flow of 7.19 L/min or 1.58 igpm is well within the capacity of PW1. The peak design flow for the apartment building is 86.25 L/min (0.86 m<sup>3</sup>/min, or 18.86 igpm). If this flow is to come from PW1 (assuming approval for a maximum pumping rate of 36.4 L/min (8 igpm)) then the peak design number would be provided by 8 igpm from the well and a storage tank of minimum of 1,303 igal capacity providing the additional 10.86 igpm over the 120 min of peak flow. These numbers are suggested for planning purposes at this stage of the project. Any such water system design should be conducted by a qualified engineer with experience in designing such systems.

These design numbers used for the design flow estimation are recognized as being high and also plan for the maximum number of users, a condition that is relatively unusual. In any event, it appears, based on the pump test, that PW1 has sufficient capacity to provide adequate water for the proposed project.

**PW1 Average Daily Water Demand:** Well PW1 was pumped at a minimum of 36.4 L/min (8 igpm) for 24 hours in order to assess the impacts on water levels in the aquifer at

that rate. In fact, as outlined above, the average water demand for PW1 over a 24-hour period is estimated to be 1.58 igpm (10.35 m<sup>3</sup>/day, 7.19 L/min) providing water to the apartment building. We can derive a trend line for a pumping rate (Q) of 7.19 L/minute (1.58 igpm) as shown in Figure 4. Based on this trend line, at the 100-day (144,000 min) mark with negligible recharge, well PW1 would have approximately 4.3 meters of drawdown.

**Potential Drawdown Impacts on Adjacent Wells:** OBS1 is located closest to the existing production well (PW1). During the pump test the impact of pumping PW1 at 36.4 L/min (max. drawdown 19.3 meters) was a maximum drawdown in OBS1 of 2.59 meters after 24 hours. Based on the projections for pumping PW1 at the average daily demand rate shown in Figure 3, the projected drawdown at 1440 minutes (one day) would be approximately 2 meters in PW1. For PW1 the ratio of drawdown pumping at 36.4 L/min compared to the drawdown predicted pumping at a rate of 7.19 L/min is  $2 / 19.3 = 0.10$ . Based on this we can predict that pumping PW1 at the average daily demand rate outlined above would induce approximately  $0.10 * 2.59 = 0.26$  meters of drawdown in OBS1 after 1440 minutes or one day. Pumping in PW1 at 8 igpm, combined with storage would not be constant. There would be periods of recovery throughout the day and recharge to the aquifer will occur periodically. Therefore the actual drawdown in OBS2 would be less than the 0.25 meters predicted.

**Potential for Saltwater Intrusion:** Given the distance of the proposed development from the seacoast, saltwater intrusion is not considered to be a factor at this site. Groundwater recharge between the site and the seacoast would rule out any intrusion occurring over such distances.

## **CONCLUSIONS AND RECOMMENDATIONS**

Based on the above information relating to water quantity it is concluded that Well PW1:

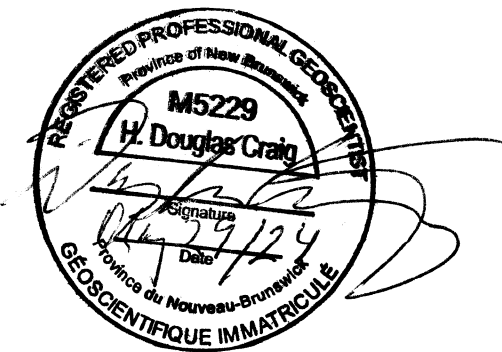
1. Has sufficient potential ground water resources for the intended use, and;
2. Will not aggravate any existing or create new water supply problems.

The inorganic water quality sample collected at the end of the pump test did not indicate any water quality problems with the exception of fluoride. Groundwater from the well will require treatment to reduce measured concentrations of fluoride to acceptable levels compared to the NB Drinking Water Quality Guidelines.

Based on the above, it is recommended that well PW1 be approved for an average 24-hour pumping rate of 1.58 igpm (10.35 m<sup>3</sup>/day, 7.19 L/min ) with a peak pumping rate of 8 igpm (36.4 L/min ) for no more than 120 minutes a day. The water supply will require water treatment to reduce the observed concentration of fluoride to acceptable levels.

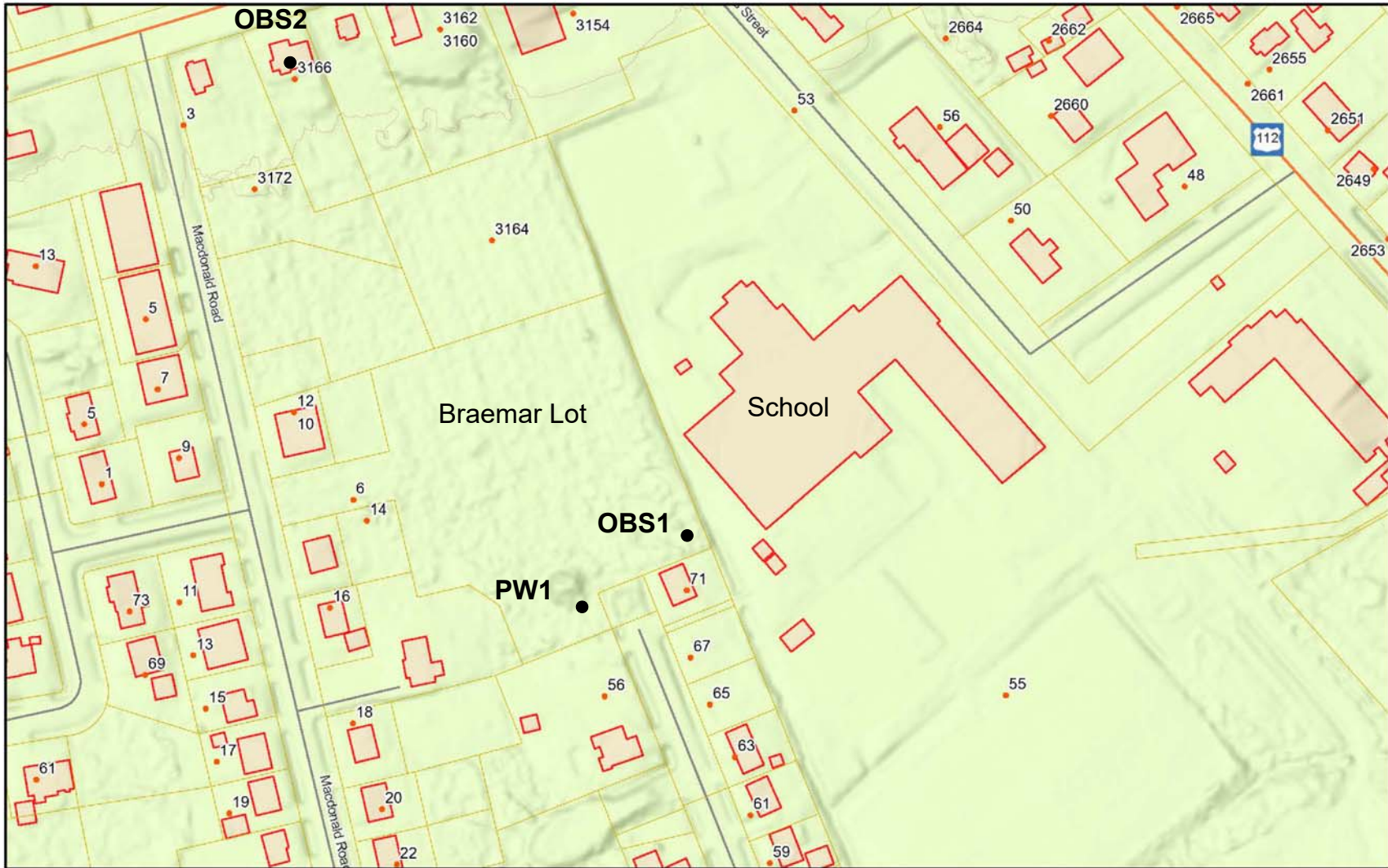
Report Prepared by:

**Craig HydroGeoLogic Inc.**



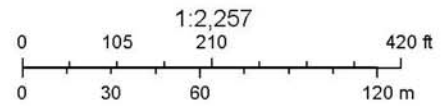
Douglas Craig, M.Sc., P. Geo.  
Hydrogeologist

Figure 1: Site Location and Test Wells  
GeoNB Map Viewer



2024-05-22, 8:45:27 a.m.

- Civic Addresses
- Buildings
- Large Scale
- parcels
- Year of Photography



Service New Brunswick, Service New Brunswick / Service Nouveau-Brunswick, Department of Environment and Local Government / Ministère de

GeoNB

This map is a graphical representation which approximates the size, configuration and location of features. This map is not intended to be used for legal descriptions or to calculate exact dimensions or area.

Figure 2: Arithmetic Plot of Drawdown in PW1

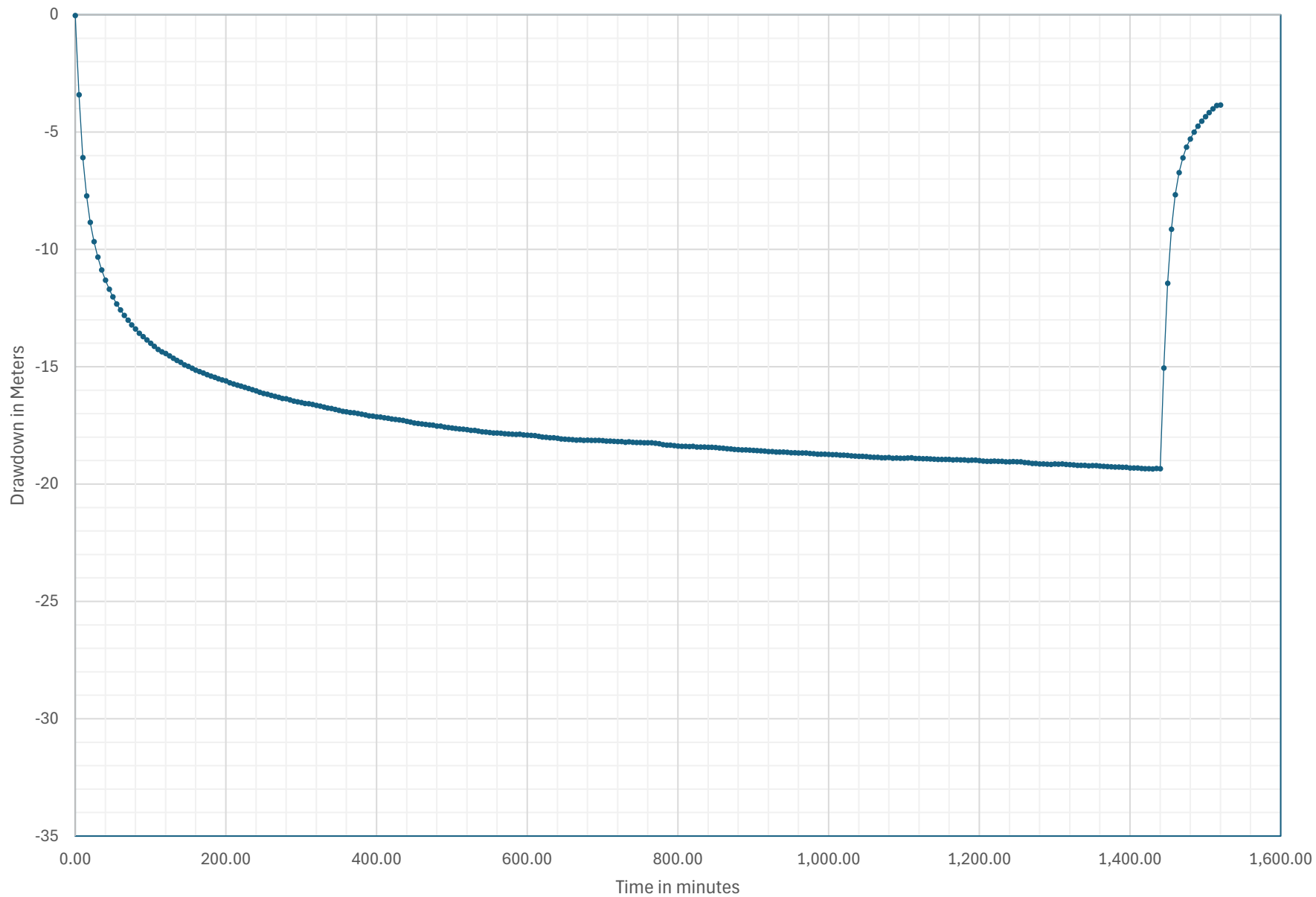


Figure 3: Log Plot of Drawdown in PW1

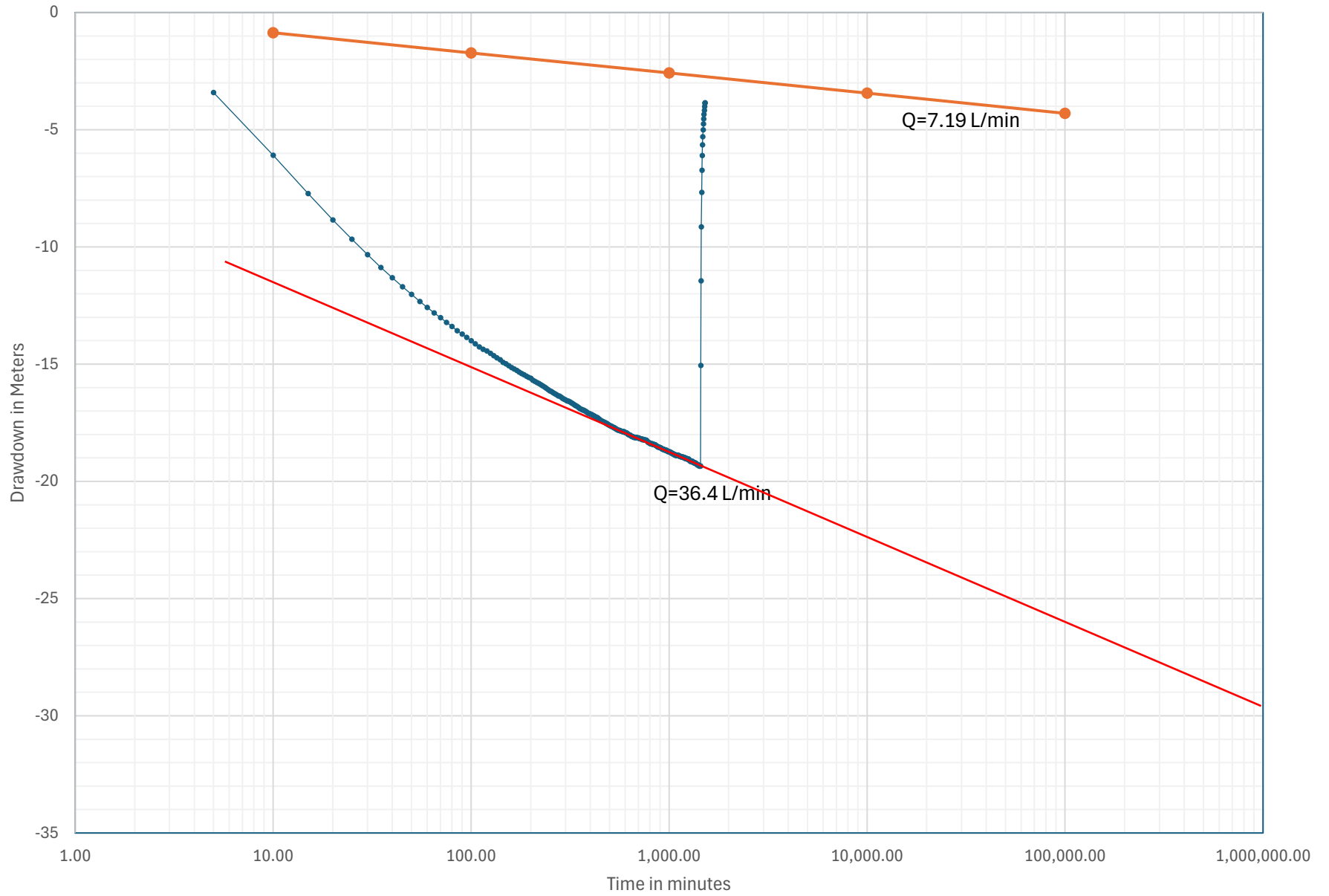


Figure 4: PW1 Residual Drawdown vs t/t'

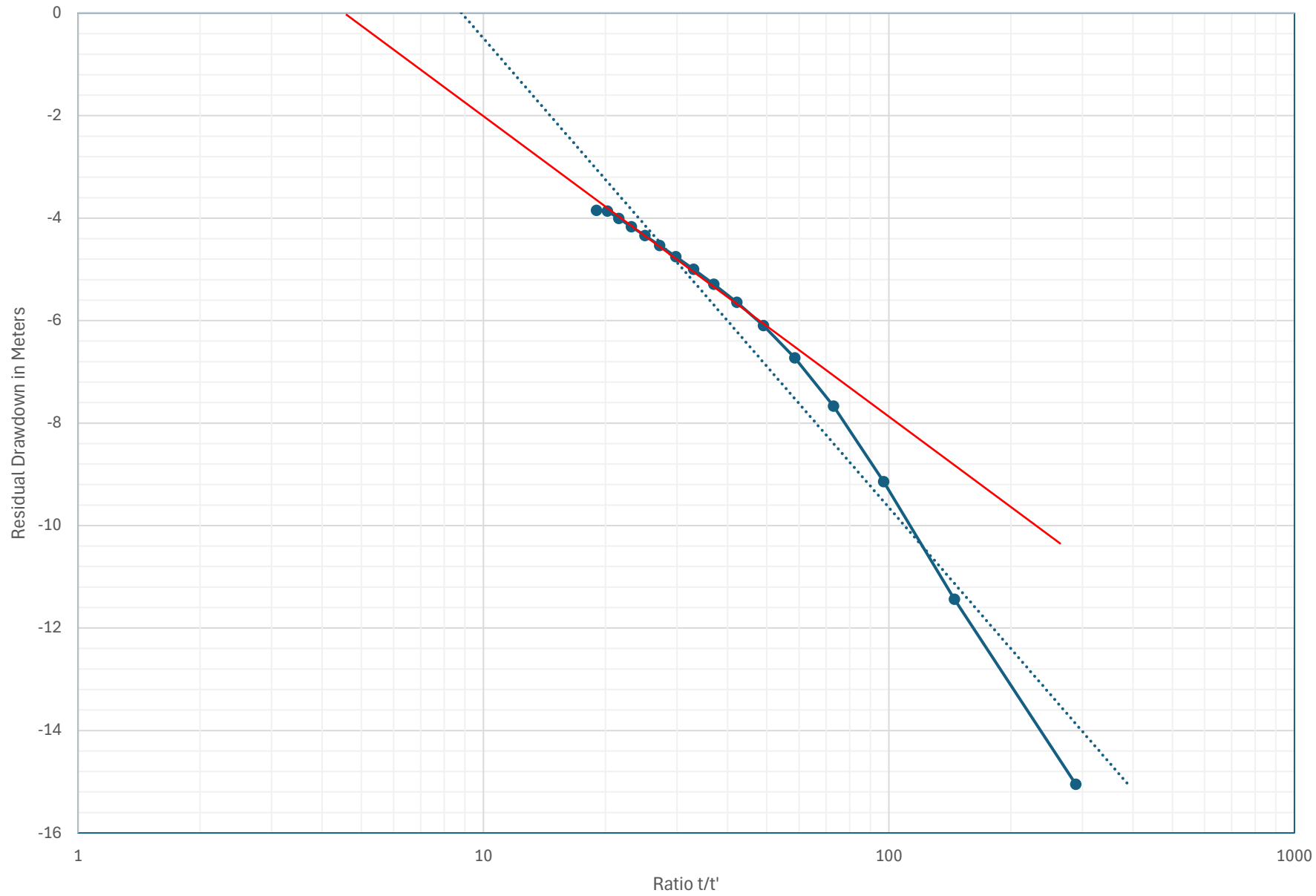


Figure 5: Drawdown in OBS1

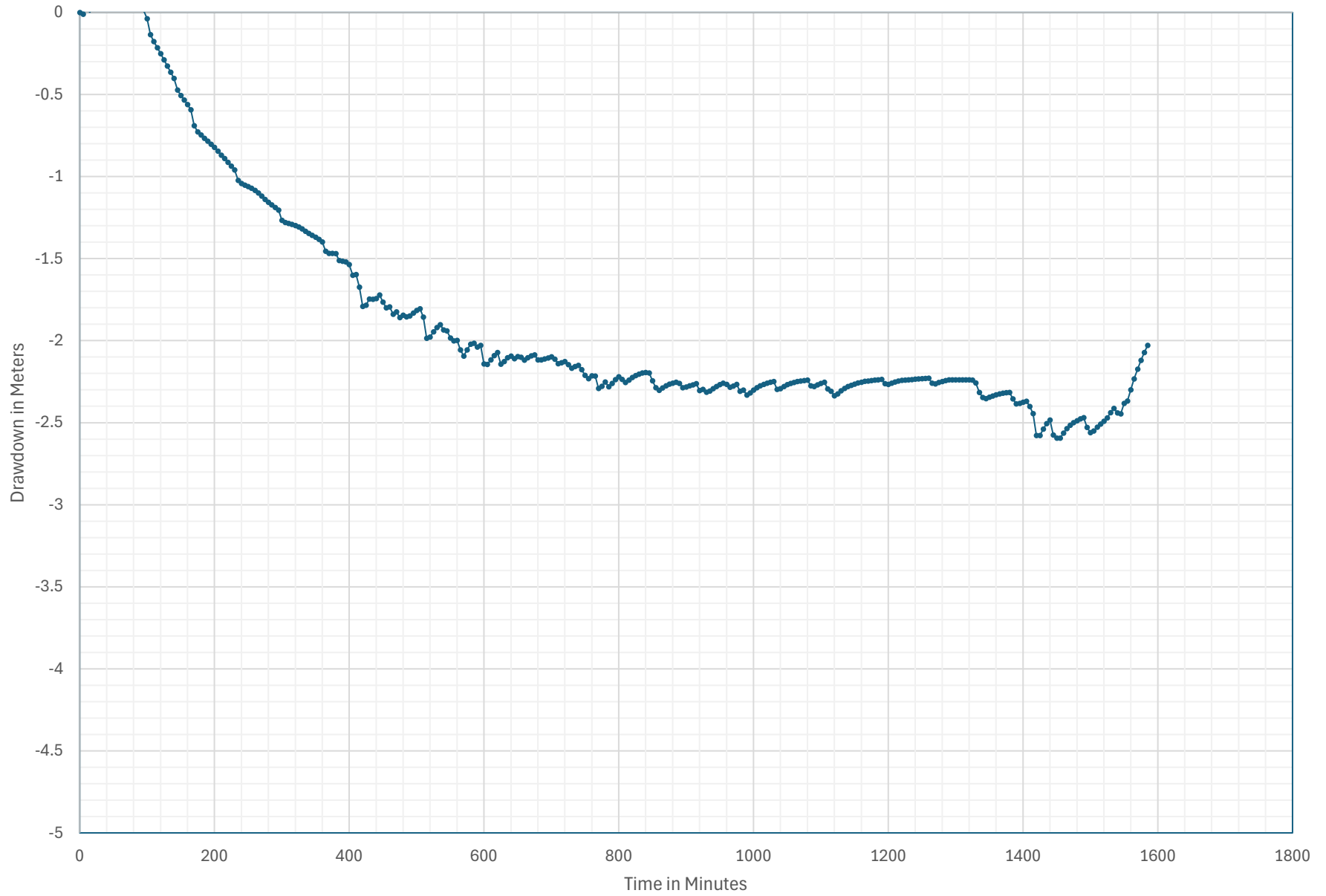


Figure 6: Drawdown in OBS2

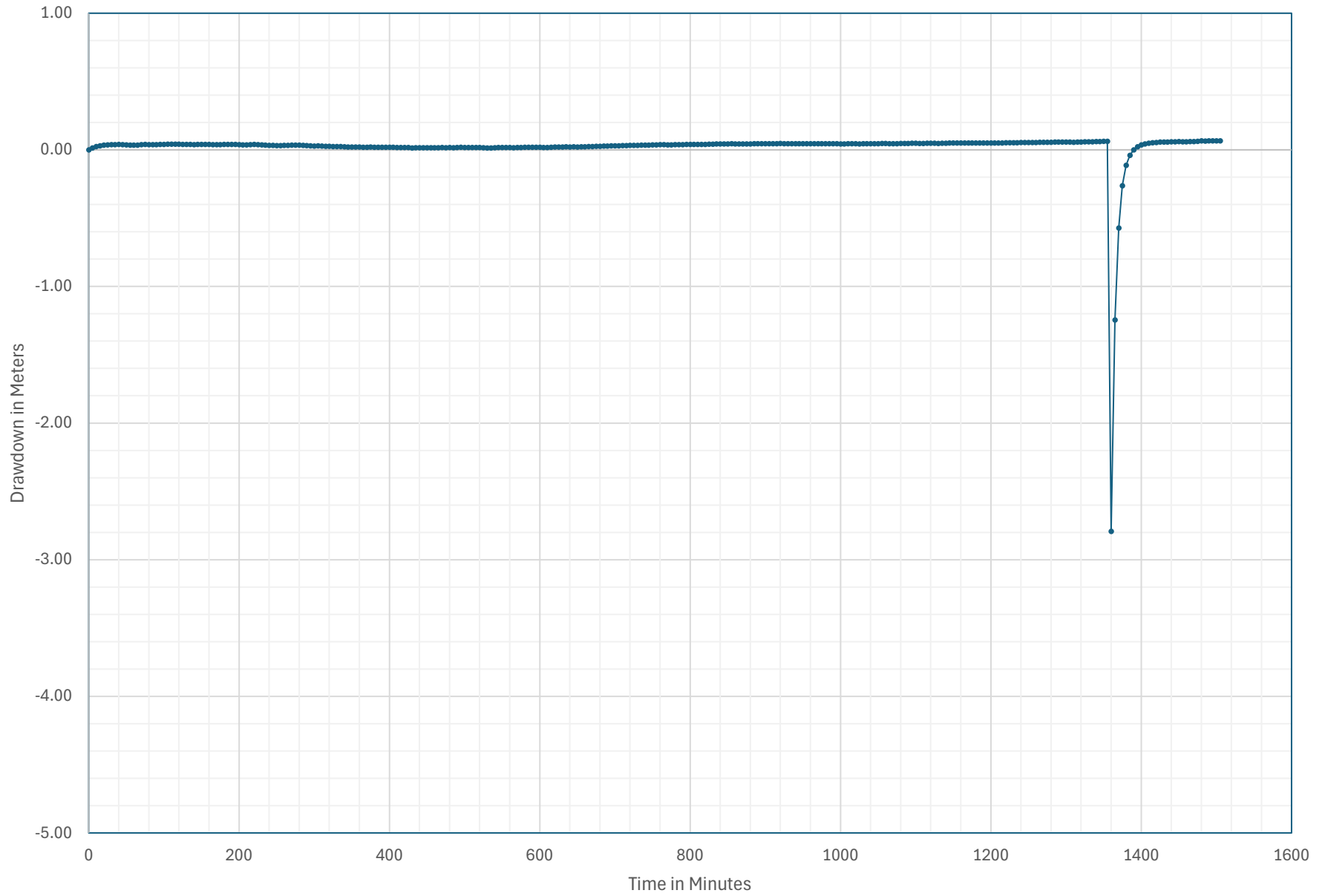
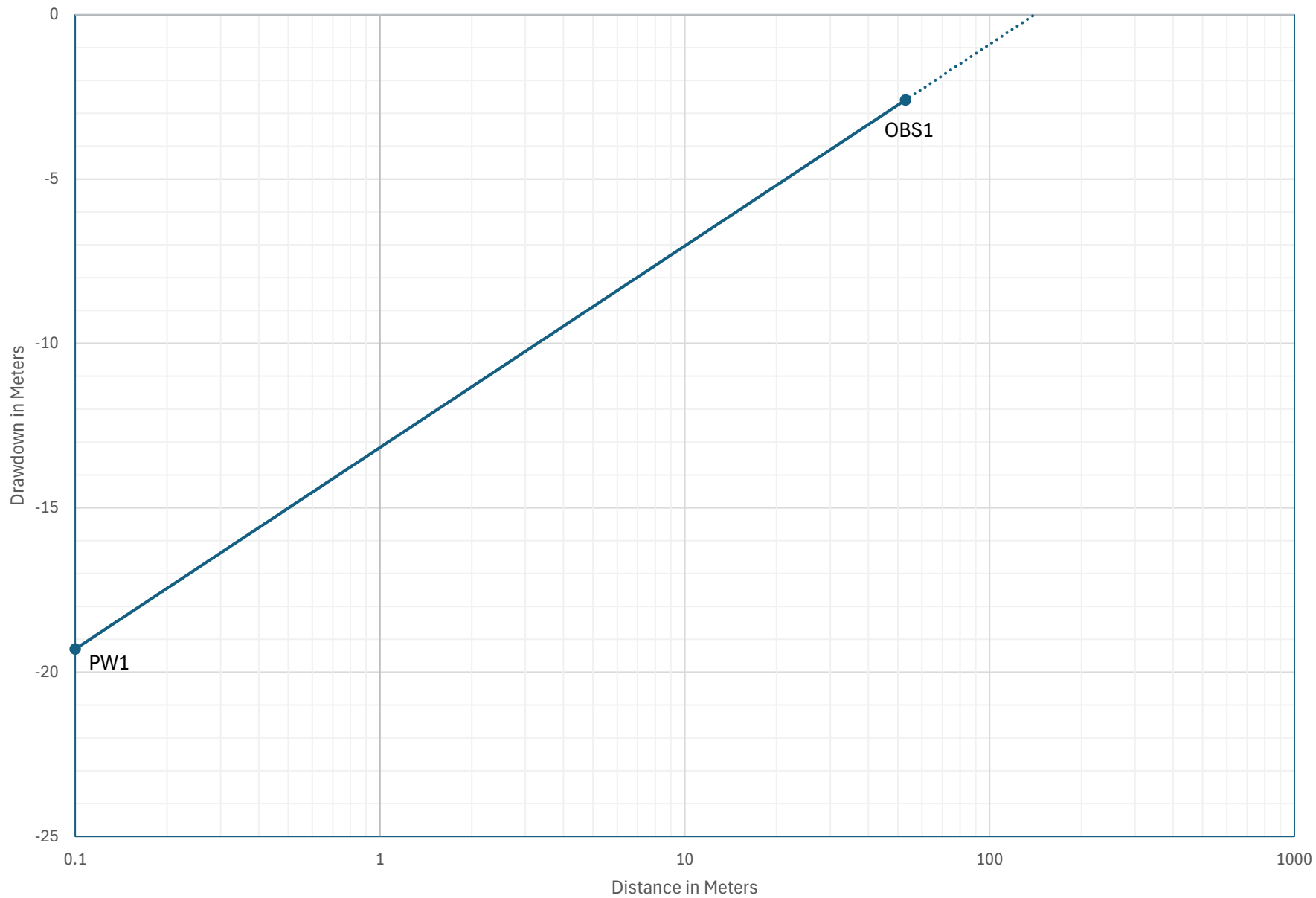


Figure 7: Distnce Drawdown



## Appendix 1

### Well Logs



OFFICE USE ONLY FIELD NO	HEALTH CODE	LAB NO	SAMPLE RECEIVED DATE	SAMPLE RECEIVED BY
	HEALTH OFFICE	EVENT NO	YR MO DAY	

TESTING VOUCHER INFORMATION MANDATORY FOR WATER TEST

SEE BACK FOR DETAILS PLEASE PRINT  
INFORMATION INCLUDED HEREIN SHOULD BE THE WELL OWNER AT TIME OF SAMPLING

FIRST NAME \_\_\_\_\_ LAST NAME \_\_\_\_\_  
ADDRESS (MAIL RESULTS TO) \_\_\_\_\_  
CITY/TOWN/VILLAGE \_\_\_\_\_ PROV \_\_\_\_\_ POSTAL CODE \_\_\_\_\_  
DAYTIME PHONE \_\_\_\_\_ FAX NO \_\_\_\_\_  
TEL NO \_\_\_\_\_ SAMPLE COLLECTED YR MO DAY HR MIN AM PM \_\_\_\_\_

P.I.D. NO. 00816140 WELL I.D. NO. 67782

WELL OWNER INFORMATION

INFORMATION INCLUDED HEREIN SHOULD BE THE WELL OWNER AT TIME OF DRILLING

FIRST NAME \_\_\_\_\_ LAST NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY/TOWN/VILLAGE \_\_\_\_\_ PROVINCE \_\_\_\_\_ POSTAL CODE \_\_\_\_\_  
WELL LOCATION SAME AS ABOVE OR Well # 2  
CIVIC NUMBER \_\_\_\_\_ STREET NAME 6 BRAEMAR DRIVE

DO YOU NEED A SAMPLE FOR YOUR MORTGAGE? YES  NO   
IF YOU WISH THE RESULTS TO BE RELEASED TO A MORTGAGE INSTITUTION PLEASE INCLUDE THE FOLLOWING CONTACT INFORMATION: SEE BACK FOR DETAILS

CITY/TOWN/VILLAGE SALISBURY  
WELL ON RESERVE? YES  NO  WELL ALREADY TAGGED? YES  NO  OLD WELL ID \_\_\_\_\_

ATTENTION OF \_\_\_\_\_  
TEL NO \_\_\_\_\_ FAX NO \_\_\_\_\_  
SIGNATURE OF WELL OWNER \_\_\_\_\_

DRILLER'S LOG\*

FROM (FT)	TO (FT)	COLOUR	ROCK TYPE
GROUND LEVEL	103	Red	CLAY
103	111	Red	CLAYSTONE
111	160	Red	SHALE
160	165	grey	SHALE
165	300	Red	SHALE

WAS THE COST OF THIS WELL FINANCED BY NB HOUSING? YES  NO

WELL / WATER USE:

INDUSTRIAL  ABANDONED  DOMESTIC   
EXPLORATORY  MUNICIPAL  MONITORING   
HEAT PUMP  OBSERVATION  OTHER

TYPE OF WORK COMPLETED: NEW WELL  DEEPENED

METHOD: CABLE TOOL  ROTARY  OTHER \_\_\_\_\_

CASING INSTALLED:

LENGTH OF CASING ABOVE GROUND 2 FT 0 IN  
STEEL 6" DIAM FROM 0 FT TO 118 FT  
PVC \_\_\_\_\_ IN DIAM FROM \_\_\_\_\_ FT TO \_\_\_\_\_ FT  
SLOTTED \_\_\_\_\_ IN DIAM FROM \_\_\_\_\_ FT TO \_\_\_\_\_ FT  
SCREENS: TYPE \_\_\_\_\_ SLOT SIZE \_\_\_\_\_ DRIVE SHOE YES  NO

SETBACKS: SEE BACK FOR DETAILS

SEPTIC TANK (1) N/A FT SEPTIC TANK (2) N/A FT FIELD (1) N/A FT FIELD (2) N/A FT  
\*RIGHT OF WAY OF ANY PUBLIC ROAD (1) \_\_\_\_\_ ROAD (2) \_\_\_\_\_  
CENTER OF ROAD (1) 195 (2) \_\_\_\_\_  
SETBACKS MEASURED \_\_\_\_\_ (NEW CONSTRUCTION)  
APPROXIMATE SETBACKS AS INDICATED BY HOMEOWNER \_\_\_\_\_ (EXISTING CONST.)

FLOWING WELL? YES  NO  IF YES-RATE \_\_\_\_\_ igpm (approx)

AQUIFER TEST: METHOD AIR  BAILER  PUMP   
INITIAL WATER LEVEL 8 26 FT BELOW TOP OF CASING  
PUMPING RATE 8 igpm DURATION \_\_\_\_\_ hrs \_\_\_\_\_ min  
FINAL WATER LEVEL 70 9 FT BELOW TOP OF CASING  
ESTIMATED SAFE YIELD: \_\_\_\_\_ igpm

WELL GROUTED? YES  NO   
FROM \_\_\_\_\_ FT TO \_\_\_\_\_ FT GROUT TYPE: \_\_\_\_\_  
DRILLING FLUIDS USED: YES  NO   
TYPE \_\_\_\_\_

IF INSUFFICIENT SPACE PLEASE USE ADDITIONAL SHEETS

TOTAL WELL DEPTH: 300 FT DEPTH TO BEDROCK: 103 FT  
WATER BEARING 1 2 igpm AT 160 FT 2 2 igpm AT 175 FT  
FRACTURE ZONES 3 2 igpm AT 255 FT 4 3 igpm AT 270 FT

PUMP INSTALLATION: INSTALLED  NOT INSTALLED   
PUMP INTAKE SETTING: 280 FT BELOW TOP OF CASING  
PUMP TYPE: SUBMERSIBLE  JET  TURBINE   
OTHER \_\_\_\_\_  
WELL DISINFECTED? YES  NO   
TYPE Ch pellets

DRILLER'S COMMENTS \_\_\_\_\_

DRILLING COMPANY: Bill KYTE Well DRILLING  
COMPLETION DATE: 24 04 24 YR MO DAY LICENSE NO. 309

G.P.S. (OPTIONAL)

I CERTIFY THAT THE WELL HEREIN DESCRIBED HAS BEEN CONSTRUCTED IN ACCORDANCE WITH THE WATER WELL REGULATION UNDER THE NEW BRUNSWICK CLEAN WATER ACT.

Signature of Driller  
Tom MacEachern

Signature of Helper  
Mike Arnold

- WHITE - NB DENV
- BLUE - Homeowner / Voucher
- YELLOW - Homeowner
- PINK - Drilling Company

KEEP THIS REPORT WITH YOUR IMPORTANT DOCUMENTS

OFFICE USE ONLY FIELD NO		HEALTH CODE	LAB NO	SAMPLE RECEIVED DATE YR MO DAY	SAMPLE RECEIVED BY
		HEALTH OFFICE	EVENT NO		
TESTING VOUCHER INFORMATION SEE BACK FOR DETAILS PLEASE PRINT INFORMATION INCLUDED HEREIN SHOULD BE THE WELL OWNER AT TIME OF SAMPLING			MANDATORY FOR WATER TEST		P.I.D. NO. 00816140
FIRST NAME			LAST NAME		WELL I.D. NO. 68692
ADDRESS (MAIL RESULTS TO)			WELL OWNER INFORMATION INFORMATION INCLUDED HEREIN SHOULD BE THE WELL OWNER AT TIME OF DRILLING		
CITY/TOWN/VILLAGE PROV POSTAL CODE			FIRST NAME LAST NAME MICHAUD CAPITAL CORP		
DAYTIME PHONE FAX NO			ADDRESS 25 CHAD CRES		
TEL NO			CITY/TOWN/VILLAGE PROVINCE POSTAL CODE SALISBURY NB E4T3N1		
DO YOU NEED A SAMPLE FOR YOUR MORTGAGE? IF YOU WISH THE RESULTS TO BE RELEASED TO A MORTGAGE INSTITUTION PLEASE INCLUDE THE FOLLOWING CONTACT INFORMATION:			SEE BACK FOR DETAILS		WELL LOCATION, SAME AS ABOVE OR CIVIC NUMBER STREET NAME 6 BRARMAR DR
ATTENTION OF			CITY/TOWN/VILLAGE SALISBURY		
TEL NO FAX NO			WELL ON RESERVE? YES <input type="checkbox"/> NO <input type="checkbox"/>		
SIGNATURE OF WELL OWNER			WELL ALREADY TAGGED? YES <input type="checkbox"/> NO <input type="checkbox"/>		
WAS THE COST OF THIS WELL FINANCED BY NB HOUSING? YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>			WELL PAID FOR BY PROVINCIAL DEPT OF		
WELL / WATER USE: INDUSTRIAL <input type="checkbox"/> ABANDONED <input type="checkbox"/> DOMESTIC <input checked="" type="checkbox"/> EXPLORATORY <input type="checkbox"/> MUNICIPAL <input type="checkbox"/> MONITORING <input type="checkbox"/> HEAT PUMP <input type="checkbox"/> OBSERVATION <input type="checkbox"/> OTHER <input type="checkbox"/>			DRILLER'S LOG*		
TYPE OF WORK COMPLETED: NEW WELL <input checked="" type="checkbox"/> DEEPENED <input type="checkbox"/>			FROM (FT) TO (FT) COLOUR ROCK TYPE		
METHOD: CABLE TOOL <input type="checkbox"/> ROTARY <input checked="" type="checkbox"/> OTHER			GROUND LEVEL 82 TO 110 BROWN TILL		
CASING INSTALLED: LENGTH OF CASING ABOVE GROUND 2 FT IN			82 110 Red CLAYSTONE		
STEEL 6" DIAM FROM 0 FT TO 105 FT			110 157 Red SANDSTONE		
PVC IN DIAM FROM FT TO FT			157 170 BROWN CONGLOMERATE		
SLOTTED IN DIAM FROM FT TO FT			170 287 Red SHALE		
SCREENS: TYPE SLOT SIZE					
DRIVE SHOE YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>					
SETBACKS: SEE BACK FOR DETAILS					
SEPTIC TANK (1) N/A FT					
SEPTIC TANK (2) N/A FT					
FIELD (2) N/A FT					
FIELD (1) N/A FT					
*RIGHT OF WAY OF ANY PUBLIC ROAD (1) 100 FT					
ROAD (2)					
CENTER OF ROAD (1) (2)					
SETBACKS MEASURED (NEW CONSTRUCTION)					
APPROXIMATE SETBACKS AS INDICATED BY HOMEOWNER (EXISTING CONST.)					
FLOWING WELL? YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> IF YES-RATE _____ l/gpm (approx)			IF INSUFFICIENT SPACE PLEASE USE ADDITIONAL SHEETS		
AQUIFER TEST: METHOD AIR <input checked="" type="checkbox"/> BAILER <input type="checkbox"/> PUMP <input type="checkbox"/>			TOTAL WELL DEPTH: 287 FT DEPTH TO BEDROCK: 82 FT		
INITIAL WATER LEVEL: 25 FT BELOW TOP OF CASING			WATER BEARING 1 3/4 l/gpm AT 127 FT 2 3/4 l/gpm AT 135 FT		
PUMPING RATE 5 l/gpm DURATION 1 hrs 0 min			FRACTURE ZONES 3 1/2 l/gpm AT 157 FT 4 2 l/gpm AT 178 FT		
FINAL WATER LEVEL 70 FT BELOW TOP OF CASING			PUMP INSTALLATION: INSTALLED <input type="checkbox"/> NOT INSTALLED <input checked="" type="checkbox"/>		
ESTIMATED SAFE YIELD: 4 l/gpm			PUMP INTAKE SETTING: 260 FT BELOW TOP OF CASING		
WELL GROUTED? YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>			PUMP TYPE: SUBMERSIBLE <input checked="" type="checkbox"/> JET <input type="checkbox"/> TURBINE <input type="checkbox"/>		
FROM FT TO FT GROUT TYPE:			OTHER		
DRILLING FLUIDS USED: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>			WELL DISINFECTED? YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>		
TYPE			TYPE ch Pellets		
DRILLER'S COMMENTS			DRILLING COMPANY: Bill KYTE Well DRILLING		
29 DEC			COMPLETION DATE: 23 11 30		
			LICENSE NO. 309		
G.P.S. (OPTIONAL)					
I CERTIFY THAT THE WELL HEREIN DESCRIBED HAS BEEN CONSTRUCTED IN ACCORDANCE WITH THE WATER WELL REGULATION UNDER THE NEW BRUNSWICK CLEAN WATER ACT.					
Signature of Driller Tom MacEachern			Signature of Helper Mike Arnold		
KEEP THIS REPORT WITH YOUR IMPORTANT DOCUMENTS					

WHITE - NB DENV  
BLUE - Homeowner / Voucher  
YELLOW - Homeowner  
PINK - Drilling Company

**Well Driller's Report**

Date printed 1/28/2024

Drilled by	Work Type	Drill Method	Work Completed
Well Use Drinking Water, Domestic	New Well	Cable Tool	01/18/2003

Casing Information		Casing above ground			Drive Shoe Used?
Well Log	Casing Type	Diameter	From	End	Slotted?
84	Steel	6 inch	0ft	53ft	

Aquifer Test/Yield							
Method	Initial Water Level (BTC)	Pumping Rate	Duration	Final Water Level (BTC)	Estimated Safe Yield	Flowing Well?	Rate
Bailer	0ft <i>(BTC - Below top of casing)</i>	0 igpm	0hr	0ft	4 igpm	No	0 igpm

Well Grouting
There is no Grout information.

Drilling Fluids Used	Disinfectant	Pump Installed
None	Bleach (Javex)	N/A
	Qty 0 ig	Intake Setting (BTC) 0ft

Driller's Log				
Well Log	From	End	Colour	Rock Type
84	0ft	30ft	Brown	Overburden
84	30ft	40ft	Red	Shale
84	40ft	100ft	Brown	Shale
84	100ft	150ft	Brown and red	Shale
84	150ft	188ft	Mix	Conglomerate and Shale

Overall Well Depth  
188ft  
Bedrock Level  
30ft

Water Bearing Fracture Zone		
Well Log	Depth	Rate
84	90ft	1 igpm
84	160ft	1.5 igpm
84	170ft	1.5 igpm

Setbacks		
Well Log	Distance	Setback From
84	100ft	Right of any Public Way Road

**Well Driller's Report**

Date printed 1/28/2024

Drilled by	Well Use	Work Type	Drill Method	Work Completed
	Drinking Water, Domestic	New Well	Cable Tool	11/23/2004

Casing Information		Casing above ground			Drive Shoe Used?
Well Log	Casing Type	Diameter	From	End	Slotted?
9178	Steel	6 inch	0ft	67ft	

Aquifer Test/Yield							
Method	Initial Water Level (BTC)	Pumping Rate	Duration	Final Water Level (BTC)	Estimated Safe Yield	Flowing Well?	Rate
Bailer	32ft	0 igpm	1hr	98ft	8 igpm	No	0 igpm
<i>(BTC - Below top of casing)</i>							

<b>Well Grouting</b>
There is no Grout information.

Drilling Fluids Used	Disinfectant	Pump Installed
None	Chlorine Pucks	Submersible Intake Setting (BTC)
	Qty 0 ig	140ft

Driller's Log				
Well Log	From	End	Colour	Rock Type
9178	0ft	25ft	Brown	Overburden
9178	25ft	120ft	Brown	Shale
9178	120ft	155ft	Brown and red	Shale
9178	155ft	180ft	Mix	Conglomerate and Shale

Overall Well Depth  
180ft  
Bedrock Level  
25ft

<b>Water Bearing Fracture Zone</b>
There is no water bearing fracture zone information.

<b>Setbacks</b>		
Well Log	Distance	Setback From
9178	50ft	Right of any Public Way Road

**Well Driller's Report**

Date printed 1/28/2024

Drilled by	Well Use	Work Type	Drill Method	Work Completed
	Drinking Water, Domestic	New Well	Cable Tool	01/03/2005

Casing Information		Casing above ground			Drive Shoe Used?
Well Log	Casing Type	Diameter	From	End	Slotted?
9181	Steel	6 inch	0ft	69ft	

Aquifer Test/Yield							
Method	Initial Water Level (BTC)	Pumping Rate	Duration	Final Water Level (BTC)	Estimated Safe Yield	Flowing Well?	Rate
Bailer	0ft	0 igpm	1hr	30ft	5 igpm	No	0 igpm
<i>(BTC - Below top of casing)</i>							

Well Grouting
There is no Grout information.

Drilling Fluids Used	Disinfectant	Pump Installed
Foam	Chlorine Pucks	N/A
	Qty 0 ig	Intake Setting (BTC)
		0ft

Driller's Log				
Well Log	From	End	Colour	Rock Type
9181	50ft	80ft	Mix	Conglomerate and Shale
9181	0ft	20ft	Brown	Overburden
9181	20ft	40ft	Brown	Shale
9181	40ft	50ft	Red	Shale
9181	80ft	95ft	Brown	Shale
9181	95ft	152ft	Mix	Conglomerate and Shale

Overall Well Depth  
152ft  
Bedrock Level  
20ft

Water Bearing Fracture Zone		
Well Log	Depth	Rate
9181	90ft	2 igpm
9181	120ft	2 igpm
9181	140ft	1 igpm

Setbacks		
Well Log	Distance	Setback From
9181	20ft	Right of any Public Way Road

**Well Driller's Report**

Date printed 1/28/2024

Drilled by	Well Use	Work Type	Drill Method	Work Completed
	Drinking Water, Domestic	New Well	Rotary	12/19/2007

Casing Information		Casing above ground			Drive Shoe Used?
Well Log	Casing Type	Diameter	From	End	Slotted?
12536	Steel	6 inch	0ft	30ft	

Aquifer Test/Yield							
Method	Initial Water Level (BTC)	Pumping Rate	Duration	Final Water Level (BTC)	Estimated Safe Yield	Flowing Well?	Rate
Bailer	28ft	125 igpm	1hr	5ft	5 igpm	No	0 igpm
<i>(BTC - Below top of casing)</i>							

Well Grouting
There is no Grout information.

Drilling Fluids Used	Disinfectant	Pump Installed
None	Chlorine Pucks	Submersible
	Qty 0 ig	Intake Setting (BTC)
		170ft

Driller's Log				
Well Log	From	End	Colour	Rock Type
12536	90ft	150ft	Mix	Shale
12536	0ft	18ft	Brown	Overburden
12536	18ft	70ft	Brown	Shale
12536	70ft	90ft	Red	Shale
12536	150ft	190ft	Brown	Shale
12536	190ft	220ft	Red	Shale
12536	220ft	240ft	Mix	Shale

Overall Well Depth  
240ft  
Bedrock Level  
18ft

Water Bearing Fracture Zone		
Well Log	Depth	Rate
12536	120ft	1 igpm
12536	185ft	1 igpm
12536	215ft	3 igpm

Setbacks		
Well Log	Distance	Setback From
12536	100ft	Right of any Public Way Road

**Well Driller's Report**

Date printed 1/28/2024

Drilled by	Well Use	Work Type	Drill Method	Work Completed
	Drinking Water, Domestic	New Well	Cable Tool	07/15/2008

Casing Information		Casing above ground			Drive Shoe Used?
Well Log	Casing Type	Diameter	From	End	Slotted?
12547	Steel	6 inch	0ft	71ft	

Aquifer Test/Yield							
Method	Initial Water Level (BTC)	Pumping Rate	Duration	Final Water Level (BTC)	Estimated Safe Yield	Flowing Well?	Rate
Bailer	20ft	8 igpm	1hr	80ft	8 igpm	No	0 igpm
<i>(BTC - Below top of casina)</i>							

Well Grouting
There is no Grout information.

Drilling Fluids Used	Disinfectant	Pump Installed
None	Chlorine Pucks	Submersible Intake Setting (BTC)
	Qty 0 ig	100ft

Driller's Log				
Well Log	From	End	Colour	Rock Type
12547	100ft	160ft	Mix	Shale
12547	0ft	45ft	Brown	Overburden
12547	45ft	90ft	Brown	Shale
12547	90ft	100ft	Red	Shale

Overall Well Depth  
160ft  
Bedrock Level  
45ft

Water Bearing Fracture Zone		
Well Log	Depth	Rate
12547	90ft	2 igpm
12547	140ft	6 igpm

Setbacks		
Well Log	Distance	Setback From
12547	150ft	Right of any Public Way Road

**Well Driller's Report**

Date printed 1/28/2024

Drilled by	Well Use	Work Type	Drill Method	Work Completed
	Drinking Water, Domestic	New Well	Cable Tool	06/26/2007

Casing Information		Casing above ground			Drive Shoe Used?
Well Log	Casing Type	Diameter	From	End	Slotted?
17044	Steel	6 inch	0ft	67ft	

Aquifer Test/Yield							
Method	Initial Water Level (BTC)	Pumping Rate	Duration	Final Water Level (BTC)	Estimated Safe Yield	Flowing Well?	Rate
Bailer	36ft	5 igpm	1hr	120ft	5 igpm	No	0 igpm
<i>(BTC - Below top of casing)</i>							

Well Grouting
There is no Grout information.

Drilling Fluids Used	Disinfectant	Pump Installed
None	Chlorine Pucks	N/A
	Qty 0 ig	Intake Setting (BTC) 140ft

Driller's Log				
Well Log	From	End	Colour	Rock Type
17044	120ft	180ft	Mix	Conglomerate and Shale
17044	0ft	30ft	Brown	Overburden
17044	30ft	50ft	Red	Shale
17044	50ft	110ft	Brown	Shale
17044	110ft	120ft	Red	Shale

Overall Well Depth  
180ft  
Bedrock Level  
30ft

Water Bearing Fracture Zone		
Well Log	Depth	Rate
17044	120ft	1 igpm
17044	90ft	1 igpm
17044	160ft	3 igpm

Setbacks		
Well Log	Distance	Setback From
17044	90ft	Right of any Public Way Road
17044	100ft	Right of any Public Way Road

**Well Driller's Report**

Date printed 1/28/2024

Drilled by	Well Use	Work Type	Drill Method	Work Completed
	Drinking Water, Domestic	New Well	Cable Tool	12/01/2009

Casing Information		Casing above ground			Drive Shoe Used?
Well Log	Casing Type	Diameter	From	End	Slotted?
24579	Steel	6 inch	0ft	68ft	

Aquifer Test/Yield							
Method	Initial Water Level (BTC)	Pumping Rate	Duration	Final Water Level (BTC)	Estimated Safe Yield	Flowing Well?	Rate
Bailer	35ft	4 igpm	1hr	100ft	4 igpm	No	0 igpm
<i>(BTC - Below top of casing)</i>							

Well Grouting
There is no Grout information.

Drilling Fluids Used	Disinfectant	Pump Installed
None	Chlorine Pucks	Submersible
	Qty 0 ig	Intake Setting (BTC)
		170ft

Driller's Log				
Well Log	From	End	Colour	Rock Type
24579	110ft	160ft	Mix	Shale
24579	0ft	25ft	Brown	Overburden
24579	25ft	40ft	Red	Shale
24579	40ft	110ft	Brown	Shale
24579	160ft	205ft	Brown	Shale
24579	205ft	220ft	Mix	Shale

Overall Well Depth  
220ft  
Bedrock Level  
25ft

Water Bearing Fracture Zone		
Well Log	Depth	Rate
24579	90ft	1 igpm
24579	150ft	1 igpm
24579	200ft	2 igpm

Setbacks		
Well Log	Distance	Setback From
24579	80ft	Right of any Public Way Road
24579	150ft	Right of any Public Way Road

**Well Driller's Report**

Date printed 1/28/2024

Drilled by	Well Use	Work Type	Drill Method	Work Completed
	Drinking Water, Domestic	New Well	Rotary	11/08/2018

Casing Information		Casing above ground			Drive Shoe Used?
Well Log	Casing Type	Diameter	From	End	Slotted?
37197	Steel	6 inch	0ft	70ft	

Aquifer Test/Yield							
Method	Initial Water Level (BTC)	Pumping Rate	Duration	Final Water Level (BTC)	Estimated Safe Yield	Flowing Well?	Rate
Air	40ft	30 igpm	1hr	40ft	30 igpm	No	0 igpm
<i>(BTC - Below top of casing)</i>							

Well Grouting
There is no Grout information.

Drilling Fluids Used	Disinfectant	Pump Installed
None	Chlorine pellets	Submersible
	Qty 0 ig	Intake Setting (BTC)
		80ft

Driller's Log				
Well Log	From	End	Colour	Rock Type
37197	120ft	140ft	Brown	Clay
37197	0ft	18ft	Grey	Sandstone
37197	18ft	65ft	Brown	Clay
37197	65ft	120ft	Grey	Sandstone

Overall Well Depth  
140ft  
Bedrock Level  
0ft

Water Bearing Fracture Zone		
Well Log	Depth	Rate
37197	120ft	30 igpm

Setbacks		
Well Log	Distance	Setback From
37197	80ft	Center of road
37197	60ft	Septic Tank
37197	80ft	Leach Field
37197	75ft	Right of any Public Way Road

**Well Driller's Report**

Date printed 1/28/2024

Drilled by	Work Type	Drill Method	Work Completed
Well Use	New Well	Rotary	11/09/2021
Drinking Water, Domestic			

Casing Information	Casing above ground	Drive Shoe Used?
There is no casing information.		

Aquifer Test/Yield							
Method	Initial Water Level (BTC)	Pumping Rate	Duration	Final Water Level (BTC)	Estimated Safe Yield	Flowing Well?	Rate
Air	0ft <i>(BTC - Below top of casina)</i>	0 igpm	0hr	0ft	8 igpm	No	0 igpm

Well Grouting	Drilling Fluids Used	Disinfectant	Pump Installed
There is no Grout information.	None	Bleach (Javex)	Submersible
		Qty 0 ig	Intake Setting (BTC) 85ft

Driller's Log	Overall Well Depth
There is no rock layer information.	0ft
	Bedrock Level
	0ft

Water Bearing Fracture Zone	Setbacks
There is no water bearing fracture zone information.	There is no Setback information.

**Well Driller's Report**

Date printed 1/28/2024

Drilled by	Well Use	Work Type	Drill Method	Work Completed
	Drinking Water, Domestic	New Well (NEW WELL)	Rotary (ROTARY)	07/07/1995

Casing Information		Casing above ground			Drive Shoe Used?
Well Log	Casing Type	Diameter	From	End	Slotted?
90327500	Unknown	6 inch	0ft	40ft	

Aquifer Test/Yield							
Method	Initial Water Level (BTC)	Pumping Rate	Duration	Final Water Level (BTC)	Estimated Safe Yield	Flowing Well?	Rate
Air	0ft	6 igpm	1hr	20ft	6 igpm	No	0 igpm
<i>(BTC - Below top of casing)</i>							

Well Grouting
There is no Grout information.

Drilling Fluids Used	Disinfectant	Pump Installed
Foam	Chlorine Pucks	N/A
	Qty 6.0 ig	Intake Setting (BTC) 150ft

Driller's Log				
Well Log	From	End	Colour	Rock Type
90327500	160ft	175ft	Brown	Sandstone
90327500	0ft	25ft	Brown	Overburden
90327500	25ft	100ft	Brown	Shale
90327500	100ft	160ft	Red	Shale
90327500	175ft	185ft	Brown	Shale

Overall Well Depth  
185ft  
Bedrock Level  
25ft

Water Bearing Fracture Zone		
Well Log	Depth	Rate
90327500	100ft	1 igpm
90327500	165ft	5 igpm

Setbacks
There is no Setback information.

**Well Driller's Report**

Date printed 1/28/2024

Drilled by	Well Use	Work Type	Drill Method	Work Completed
	Drinking Water, Domestic	New Well (NEW WELL)	Cable Tool (CABLE TOOL)	12/15/1997

Casing Information		Casing above ground			Drive Shoe Used?
Well Log	Casing Type	Diameter	From	End	Slotted?
90957800	Steel	6 inch	0ft	30ft	

Aquifer Test/Yield							
Method	Initial Water Level (BTC)	Pumping Rate	Duration	Final Water Level (BTC)	Estimated Safe Yield	Flowing Well?	Rate
Bailer	0ft	5 igpm	1hr	40ft	5 igpm	No	0 igpm
<i>(BTC - Below top of casing)</i>							

Well Grouting
There is no Grout information.

Drilling Fluids Used	Disinfectant	Pump Installed
None	Chlorine Pucks	N/A
	Qty 10.0 ig	Intake Setting (BTC)
		0ft

Driller's Log				
Well Log	From	End	Colour	Rock Type
90957800	70ft	180ft	Brown	Shale
90957800	0ft	20ft	Grey and purple	Overburden
90957800	20ft	50ft	Brown	Shale
90957800	50ft	70ft	Red	Shale

Overall Well Depth  
180ft  
Bedrock Level  
20ft

Water Bearing Fracture Zone		
Well Log	Depth	Rate
90957800	160ft	3 igpm
90957800	120ft	2 igpm

Setbacks
There is no Setback information.

**Well Driller's Report**

Date printed 1/28/2024

Drilled by	Work Type	Drill Method	Work Completed
Well Use	New Well		08/27/2001
Drinking Water, Domestic			

Casing Information		Casing above ground			Drive Shoe Used?
Well Log	Casing Type	Diameter	From	End	Slotted?
92088400	Steel	6 inch	0ft	44ft	

Aquifer Test/Yield							
Method	Initial Water Level (BTC)	Pumping Rate	Duration	Final Water Level (BTC)	Estimated Safe Yield	Flowing Well?	Rate
Bailer	30ft	0 igpm	1hr	120ft	5 igpm	No	0 igpm
<i>(BTC - Below top of casing)</i>							

Well Grouting	Drilling Fluids Used	Disinfectant	Pump Installed
There is no Grout information.	None	N/A	N/A
		Qty 0 ig	Intake Setting (BTC) 140ft

Driller's Log					Overall Well Depth
Well Log	From	End	Colour	Rock Type	220ft
92088400	100ft	220ft	Brown and grey	Shale	Bedrock Level 16ft
92088400	0ft	16ft	EMPTY VALUE	Overburden	
92088400	16ft	35ft	Red	Shale	
92088400	35ft	100ft	Brown	Shale	

Water Bearing Fracture Zone		
Well Log	Depth	Rate
92088400	90ft	1 igpm
92088400	205ft	3 igpm

Setbacks
There is no Setback information.

## Appendix 2

### Ground Water Chemistries

Report ID: 521992-IAS  
 Report Date: 24-May-24  
 Date Received: 16-May-24

### CERTIFICATE OF ANALYSIS

for  
 Craig HydroGeoLogic Inc  
 479 Maces Bay Road  
 Maces Bay, NB E5J 1T3



921 College Hill Rd  
 Fredericton NB  
 Canada E3B 6Z9  
 Tel: 506.452.1212  
 Fax: 506.452.0594  
 www.rpc.ca

Attention: Doug Craig

**Project #: Not Available**

Location: Salisbury NB WM

#### Analysis of Potable Water

RPC Sample ID:					521992-1
Client Sample ID:					PW1
Date Sampled:					16-May-24
Analytes	Units	RL	MAC	AO	
Alkalinity (as CaCO <sub>3</sub> )	mg/L	2	-	-	270
Chloride	mg/L	0.5	-	250	19.6
Colour	TCU	5	-	15	< 5
Conductivity	µS/cm	1	-	-	582
Fluoride	mg/L	0.05	1.5	-	2.1
Nitrate + Nitrite (as N)	mg/L	0.05	10	-	< 0.05
pH	units	-	-	-	8.9
Phosphorus	mg/L	0.02	-	-	< 0.02
r-Silica (as SiO <sub>2</sub> )	mg/L	0.1	-	-	7.9
Sulfate	mg/L	1	-	500	27
Total Organic Carbon	mg/L	0.5	-	-	1.1
Turbidity	NTU	0.1	-	-	2.7
<b>Calculated Parameters</b>					
Hardness (as CaCO <sub>3</sub> )	mg/L	0.2	-	-	3.1
TDS (calc)	mg/L	-	-	500	364
Saturation pH (5°C)	units	-	-	-	9.2
Langelier Index (5°C)	-	-	-	-	-0.28

This report relates only to the sample(s) and information provided to the laboratory.

**RL = Reporting Limit; MAC = Maximum Acceptable Concentration; AO = Aesthetic Objective**

Guidelines are from Guidelines for Canadian Drinking Water Quality.

Matthew Norman  
 Senior Chemist  
 Inorganic Analytical Chemistry

Brannen Burhoe  
 Supervisor  
 Inorganic Analytical Services

Report ID: 521992-IAS  
 Report Date: 24-May-24  
 Date Received: 16-May-24

**CERTIFICATE OF ANALYSIS**

for  
 Craig HydroGeoLogic Inc  
 479 Maces Bay Road  
 Maces Bay, NB E5J 1T3



921 College Hill Rd  
 Fredericton NB  
 Canada E3B 6Z9  
 Tel: 506.452.1212  
 Fax: 506.452.0594  
 www.rpc.ca

Attention: Doug Craig  
**Project #: Not Available**  
 Location: Salisbury NB WM

**Analysis of Metals in Potable Water**

RPC Sample ID:					521992-1
Client Sample ID:					PW1
Date Sampled:					16-May-24
Analytes	Units	RL	MAC	AO	
Aluminum	mg/L	0.001	2.9	-	0.026
Antimony	mg/L	0.0001	0.006	-	< 0.0001
Arsenic	mg/L	0.001	0.01	-	< 0.001
Barium	mg/L	0.001	2	-	0.019
Boron	mg/L	0.001	5	-	0.041
Cadmium	mg/L	0.00001	0.007	-	< 0.00001
Calcium	mg/L	0.05	-	-	1.16
Chromium	mg/L	0.001	0.05	-	< 0.001
Copper	mg/L	0.001	2	1	< 0.001
Iron	mg/L	0.02	-	0.3	< 0.02
Lead	mg/L	0.0001	0.005	-	< 0.0001
Lithium	mg/L	0.0001	-	-	0.0097
Magnesium	mg/L	0.01	-	-	0.05
Manganese	mg/L	0.001	0.12	0.02	0.009
Molybdenum	mg/L	0.0001	-	-	0.0109
Nickel	mg/L	0.001	-	-	< 0.001
Potassium	mg/L	0.02	-	-	0.38
Selenium	mg/L	0.001	0.05	-	< 0.001
Sodium	mg/L	0.05	-	200	140.
Strontium	mg/L	0.001	7	-	0.025
Thallium	mg/L	0.0001	-	-	< 0.0001
Uranium	mg/L	0.0001	0.02	-	0.0034
Vanadium	mg/L	0.001	-	-	< 0.001
Zinc	mg/L	0.001	-	5	< 0.001

Report ID: 521992-IAS  
Report Date: 24-May-24  
Date Received: 16-May-24

## CERTIFICATE OF ANALYSIS

for  
Craig HydroGeoLogic Inc  
479 Maces Bay Road  
Macces Bay, NB E5J 1T3

**rpc**

921 College Hill Rd  
Fredericton NB  
Canada E3B 6Z9  
Tel: 506.452.1212  
Fax: 506.452.0594  
www.rpc.ca

### Methods

<u>Analyte</u>	<u>RPC SOP #</u>	<u>Method Reference</u>	<u>Method Principle</u>
pH	IAS-M03	APHA 4500-H <sup>+</sup> B	pH Electrode - Electrometric
Alkalinity (as CaCO <sub>3</sub> )	IAS-M43	EPA 310.2	Methyl Orange Colourimetry
Chloride	IAS-M44	APHA 4500-CL E	Ferricyanide Colourimetry
Fluoride	IAS-M30	APHA 4500-F- D	SPADNS Colourimetry
Sulfate	IAS-M45	APHA 4500-SO <sub>4</sub> E	Turbidimetry
Nitrate + Nitrite (as N)	IAS-M48	APHA 4500-NO <sub>3</sub> H	Hydrazine Red., Derivitization, Colourimetry
r-Silica (as SiO <sub>2</sub> )	IAS-M46	APHA 4500-SI F	Heteropoly Blue Colourimetry
Carbon - Total Organic	IAS-M57	APHA 5310 B	Combustion/NDIR
Turbidity	IAS-M06	APHA 2130 B	Nephelometry
Colour	IAS-M55	APHA 2120 Color (A,C)	Single Wavelength Spectrophotometry
Conductivity	IAS-M04	APHA 2510 B	Conductivity Meter - Electrode
Trace Metals	IAS-M01/IAS-M29	EPA 200.8/EPA 200.7	ICP-MS/ICP-ES

## CERTIFICATE OF ANALYSIS / CERTIFICAT D'ANALYSE

for/pour  
Craig HydroGeoLogic Inc  
140 Meadow Cove Road  
Dipper Harbour, NB E5J 2S9



115A Harrisville Blvd  
Moncton NB  
Canada E1H 3T3  
Tel: 506.855.6472  
Fax: 506.855.8294  
www.rpc.ca

Location: Salisbury NB WM

### Examination of Water/Examen de l'eau

RPC Sample ID/No. d'échantillon de RPC:				521992-1
Client Sample ID/ID d'échantillon du client:				PW1
Date collected/Date du prélèvement:				16-May-24
Analytes/Paramètre(s)	Method Méthode	Date Analyzed Date Analysé	Units Unités	
Total Coliforms/Coliformes totaux	MICRO10	16-May-24	MPN/100mL	0
E. coli	MICRO10	16-May-24	MPN/100mL	0

This report relates only to the sample(s) and information provided to the laboratory.

Le présent rapport ne s'applique qu'aux échantillons et à l'information transmis au laboratoire.

#### LEGEND:

RL/SD = Reporting Limit/Seuil de déclaration cfu/ufc = Colony Forming Units/Unités formant des colonies

MPN/NPP = Most Probable Number/Nombre Plus Probable A = Absence P = Presence/Présence

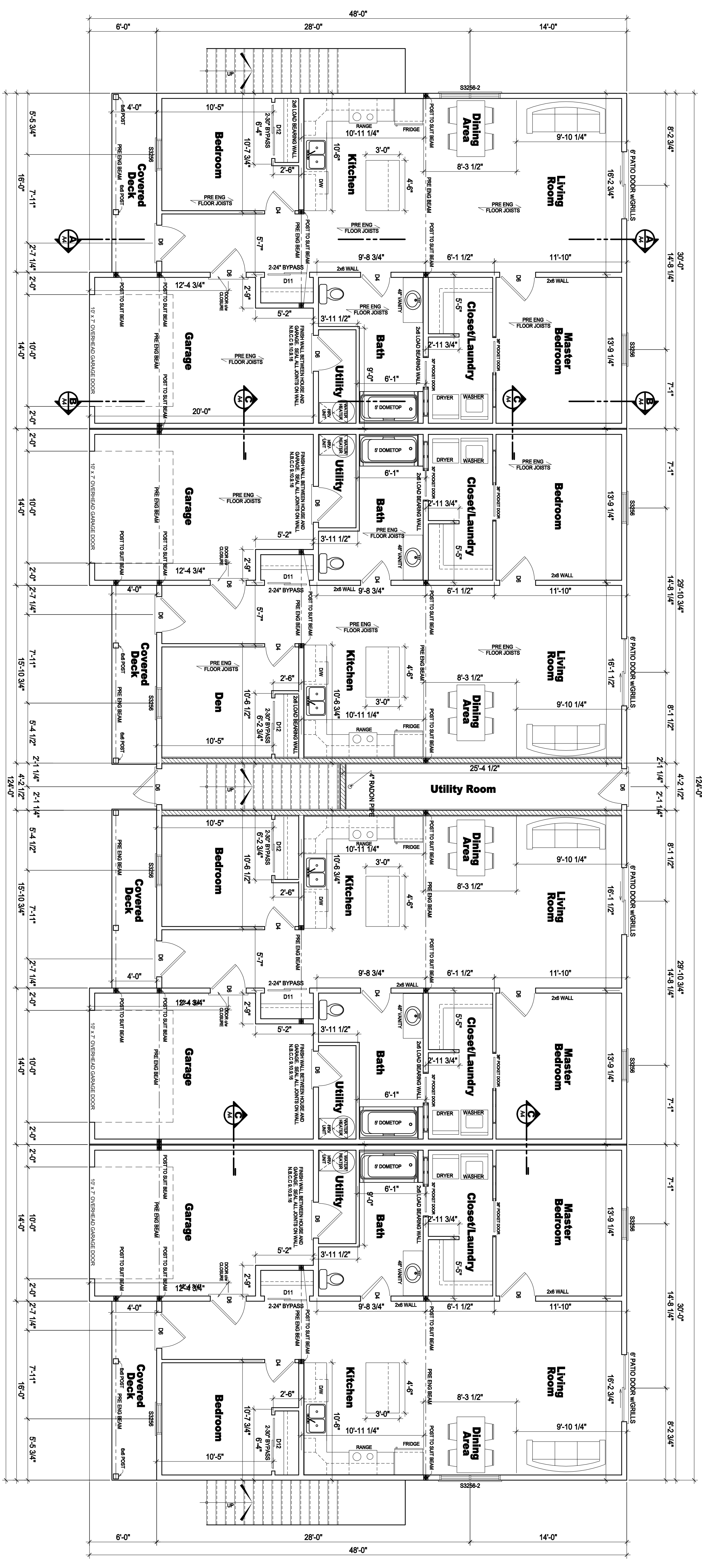
Nadine Godin  
Microbiology Supervisor  
Moncton Laboratory/Laboratoire de Moncton

Matthew Poole  
Lab Technician  
Moncton Laboratory/Laboratoire de Moncton

Appendix 3  
Field Results

All water level data for the observation wells was recorded using data logging pressure transducers. As a result, that field data is in electronic format. If you desire the electronic files, please contact the report issuer.

ALL MATCHED WALLS TO BE 2x6 STUDS @ 16" OC WITH R20 BATS AND LAYERS OF 5/8" TYPE 'X' DRYWALL EACH SIDE



NOTE: STAIR RISE MIN. 7" AND MAX. 7.75"  
STAIR RUN MIN. 10" AND MAX. 14"  
MINIMUM HEADROOM OF 8'-0"

**First Floor Plan**  
FIRST FLOOR AREA - EACH UNIT - 1085 sq.ft.  
GARAGE AREA - EACH UNIT - 272 sq.ft.

OWNER/BUILDING CONTRACTOR TO REVIEW APPROVAL FROM LOCAL BUILDING AUTHORITY AND FIRE MARSHALL PRIOR TO CONSTRUCTION.  
ALL EAVES TROUGH AND DOWN SPOUTS ARE TO DIRECT WATER AWAY FROM DWELLING.  
ANY RESIDENCE CONTAINING A FUEL BURNING APPLIANCE OR HAS AN ATTACHED GARAGE IS REQUIRED TO HAVE A CARBON MONOXIDE DETECTOR INSTALLED OUTSIDE EACH BEDROOM WITHIN 9M OF THE BEDROOM DOOR, AS PER NBC 9.22.3.8.

**WINDOW LEGEND**

S3064-2	
TWO GANG	
WITH "PUSH" HANDLE	
WITH "PULL" HANDLE	
STYLE	
WIDTH (INCHES)	
HEIGHT (INCHES)	
GLASS	
STYLE	
C CASHEMINT	
D DOUBLE HUNG	
E SINGLE HUNG	
F ROOF MOUNTED SLIDER	
G OCTAGON	
H OVAL	
I HALF ROUND	
J SINGLE HUNG	
K TRANSOM	
L	
M	
N	
O	
P	
Q	
R	
S	
T	
U	
V	
W	
X	
Y	
Z	

**DOOR SCHEDULE**

NO.	DOOR SIZE
D1	1'-6" x 6'-6"
D2	2'-0" x 6'-6"
D3	2'-4" x 6'-6"
D4	2'-6" x 6'-6"
D5	2'-8" x 6'-6"
D6	3'-0" x 6'-6"
D7	3'-4" x 6'-6"
D8	2'-6" x 6'-6" BIFOLD
D9	2'-6" x 6'-6" BIFOLD
D10	4'-0" x 6'-6" BIFOLD
D11	5'-0" x 6'-6" BIFOLD
D12	5'-0" x 6'-6" BIFOLD

**PRELIMINARY**  
Not for Construction  
February 19, 2024

**NOTES**

ALL WORK TO BE IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL BUILDING REGULATIONS.  
ALL DIMENSIONS ON DRAWINGS AND DIMENSIONS ON SITE. BUILDING DIMENSIONS PRIOR TO ORDERING MATERIALS FOR WORKS. DESIGNER NOT RESPONSIBLE FOR WORKS ORDERED OR CHANGES ORDERED.  
ANY DRAWINGS, CONCERN OR DESIGN REQUESTED BY WILLIOW ROCK HOME DESIGNS ARE TO BE SUBMITTED TO THE DESIGNER AND NOT TO THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE LOCAL BUILDING AUTHORITY AND FIRE MARSHALL PRIOR TO CONSTRUCTION.  
IT IS THE SOLE RESPONSIBILITY OF THE BUILDING CONTRACTOR OWNERS AND FLOOR JOIST AND DISTRIBUTED LOADS AND POINT LOADS ARE TO BE OBTAINED FROM THE LOCAL BUILDING AUTHORITY AND FIRE MARSHALL PRIOR TO CONSTRUCTION.  
ALL DIMENSIONS IN THE EXISTING STRUCTURE SHALL BE FIELD CHECKED BY THE CONTRACTOR AND THE MARSHALL PRIOR TO CONSTRUCTION. DIMENSIONS TO THE OWNER.  
CERTAIN PERMISSIONS OF THE OWNER ARE TO OBTAIN REMOVING OR MODIFYING ANY EXISTING STRUCTURAL MEMBER COMMENT.  
NO DIMENSIONS, PERMITS, SERVICES OR MATERIALS SHALL BE MADE UNLESS SPECIFICALLY INDICATED ON THE STRUCTURAL DRAWINGS.  
ALL LIMITS AND HEADERS TO BE DESIGNED AS PER THE LATEST EDITION OF NBC.  
ALSO SEE ATTACHED FOUNDATION NOTES.

Prepared by  
**Willow Rock Home Designs**  
506-432-5587  
willowrockhd@gmail.com

**Michaud Multi Unit**  
Salisbury, NB

**First Floor Plan**

NO. Number: -  
Date: Feb. 19, 2024  
Drawn by: MB Holland  
Scale: 3/8" = 1'-0"

**A1**







