FAM Construction Ltd.
468 Parkwood Drive, Hubbards, NS, B0J 1To
902-719-5010 / marcoferro13@gmail.com

April 23rd, 2025

Stormwater Management Report
51 Sonny's Road – PID 41454125
FAM Reference: 250423-1

This document is to discuss the stormwater management plan as per the conference meeting as of March 12th, 2025

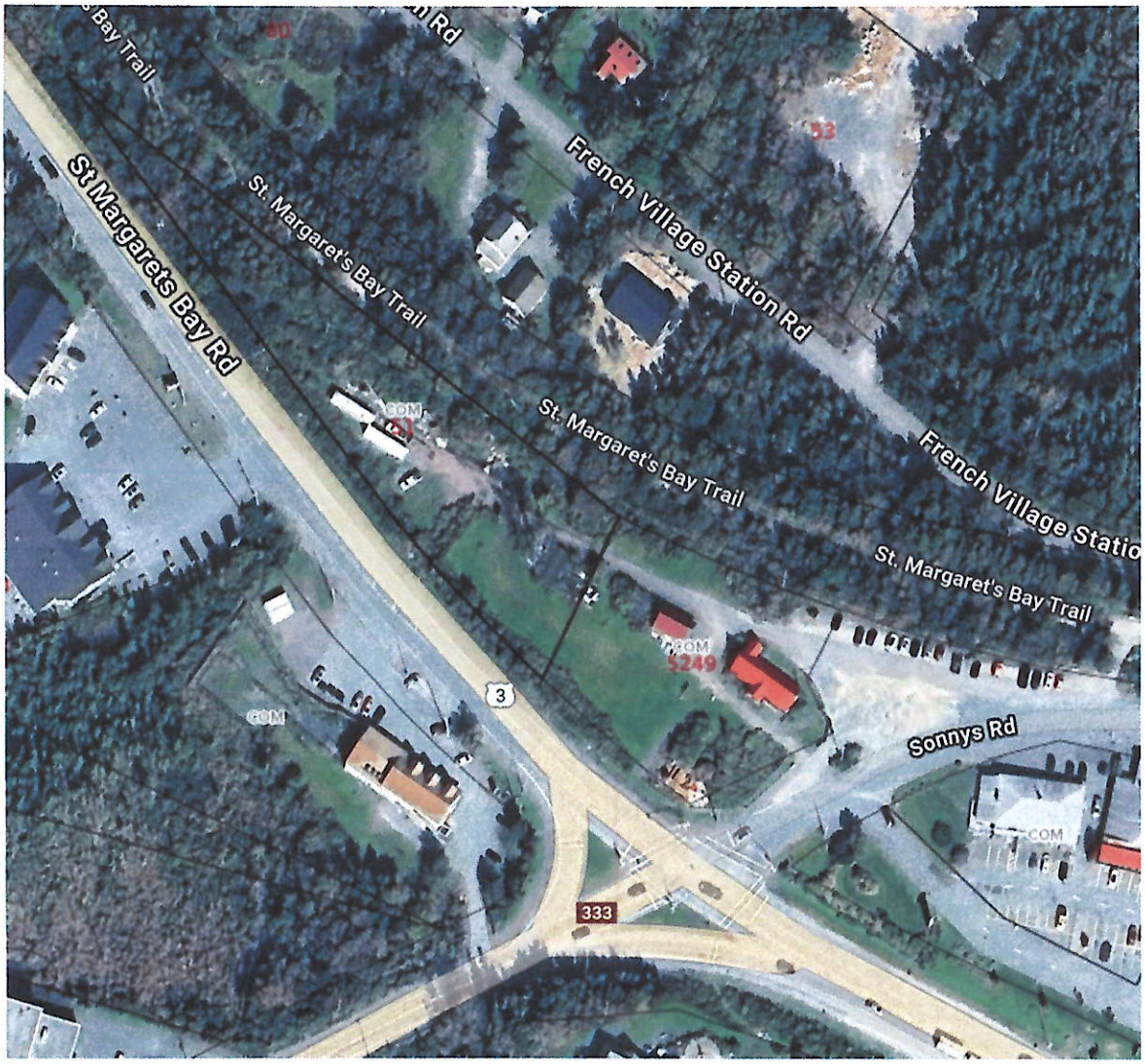
As discussed previously we are going to be taking the rain capture from the roof to help subsidize the water flow for the property.

- Why
  - Allows Stormwater management to be in the position of post development being favorable to predevelopment.
  - The PHASE 1 water study provides a deficit of 1000 liters a day to demand, this will alleviate this as well
- Conclusions
  - Need for a robust RO (Reverse Osmosis system with holding tanks)
  - Eliminates need for a PHASE 2 Ground Water Assessment
  - Solves the site stormwater management vulnerability (lot size vs building size)

Site Description:

Existing Conditions:

The Site is +/- 7450m^2 and is made up of cleared lands with 3 existing outbuildings, 2 trailers and a hard packed driveway. The site is bordered to north by Rails to Trails (St. Margaret's Bay Trail), to the south is the number 3 highway and the existing intersection between the highway 333 and highway 3 also known as The Crossroads, the east is bordered by Sonny's Road which divides the St. Margaret's Bay Business Development Center and the proposed building, finally the west is again facing the curve in Highway 3.



Development:

The Development is 19200 ft^2 building footprint that encompasses a 16000 ft^2 commercial space with residential units above the facility. It will be partly asphalt, permeable pavers (Rock filled Geogrid such as True Grid Permeable Pavers), Roof with rainwater capture and cisterns, landscaped area and stabilizing rock material.

Stormwater Management:

The water from the system will be caught in the designed drains as drawn on the submitted plan. These drains lead to the HRM ditch system. As the post development will have a positive impact on the stormwater pre-development.

Post Development- Surface Classification	Area (m^2)	Runoff Coefficients
Undisturbed Natural	1500	0.35
Building Footprint	1783	0.15
Landscaped	1462	0.15
Graveled	2000	0.3
Concrete Paved		0.8
Asphalt Paved	720	0.95
Total Area	7465	0.307535164

Pre Development- Surface Classification	Area (m^2)	Runoff Coefficients
Undisturbed Natural	4530	0.35
Building Footprint	350	0.95
Landscaped	2305	0.15
Graveled	280	0.3
Concrete Paved		0.8
Asphalt Paved	0	0.9
Total Area	7465	0.314501005

$R = A*T^b$

$Q = CiA$

$Q = CiA$

$C = Q/iA$

		IDF DATA		PRE DEVELOPMENT				POST DEVELOPMENT						
Storm Period	Drainage area (ha)	A	B	Runoff Coefficient C	Time Concentration (t - hour)	Intensity (mm/hr)	Peak Runoff (Q in m^3/s)	Runoff Coefficient C	Time Concentration (t - hour)	Intensity (mm/hr)	Peak Runoff (Q in m^3/s)	Controlled Peak Runoff (Q in m^3/s)		
2 year	0.7465	19.2	-0.574	0.314501005	0.1667	52.2	0.0340	0.307535	0.1667	52.2	0.0333	0.030638	10%	0.954086
5 year	0.7465	25.3	-0.591	0.314501005	0.1667	64.6	0.0421	0.307535	0.1667	64.6	0.0412	0.040023	5%	0.422403
10 year	0.7465	29.3	-0.598	0.314501005	0.1667	72.9	0.0475	0.307535	0.1667	72.9	0.0465	0.046591	2%	-0.03678
25 year	0.7465	34.4	-0.495	0.314501005	0.1667	83.4	0.0544	0.307535	0.1667	83.4	0.0532	0.053302	2%	-0.04208
50 year	0.7465	38.1	-0.488	0.314501005	0.1667	91.3	0.0595	0.307535	0.1667	91.3	0.0582	0.058946	1%	-0.26041
100 year	0.7465	41.8	-0.482	0.534651708	0.1667	99.1	0.1099	0.52281	0.1667	99.1	0.1074	0.109868	0%	-0.87604

IDF Curve Data for Halifax

Design:

- Assumptions
  - Rainwater captures 85% of roof. (We anticipate higher but have designed around this constraint)
  - Cistern tanks to be double containment tank with storage capacity of no less than 189000 L
  - Well pumps to be set to fill cistern's when water level drops below 50% and shut off at 60%
  - Available room for water capture of 75,600L per event
  - Average rainfall capture for environment data will be roughly 6000 liters per day of rainwater capture based on historical data and building sizing.
  - 6000 liters per day will offset the additional need for water from the groundwater phase 1 study.
  - Cisterns to be NSF/ANSI 61 compliant
  - Projected runoff as if no rain capture must not be higher than 75,600 liters per event
    - The numbers below show this is achieved using 95% impervious roof
    - 23 m^3 is much lower than the 75.6 m^3 of storage. Condition is met
  - Besides parking for storefront additional parking to be with permeable pavers such as True Grid Permeable Pavers.

Post Development-Surface Classification	Area (m^2)	Runoff Coefficients
Undisturbed Natural	1500	0.35
Building Footprint	1783	0.95
Landscaped	1462	0.15
Graveled	2000	0.3
Concrete Paved		0.8
Asphalt Paved	720	0.95
Total Area	7465	0.49861353

Pre Development-Surface Classification	Area (m^2)	Runoff Coefficients
Undisturbed Natural	4530	0.35
Building Footprint	350	0.95
Landscaped	2305	0.15
Graveled	280	0.3
Concrete Paved		0.8
Asphalt Paved	0	0.9
Total Area	7465	0.314501005

$R = A*T^b$

$Q = CiA$

$Q = CiA$

$C = Q/iA$

		IDF DATA		PRE DEVELOPMENT				POST DEVELOPMENT						
Storm Period	Drainage area (ha)	A	B	Runoff Coefficient C	Time Concentration (t - hour)	Intensity (mm/hr)	Peak Runoff (Q in m^3/s)	Runoff Coefficient C	Time Concentration (t - hour)	Intensity (mm/hr)	Peak Runoff (Q in m^3/s)	Controlled Peak Runoff (Q in m^3/s)		
2 year	0.7465	19.2	-0.574	0.314501005	0.1667	52.2	0.0340	0.498614	0.1667	52.2	0.0540	0.030638	10%	8.399894
5 year	0.7465	25.3	-0.591	0.314501005	0.1667	64.6	0.0421	0.498614	0.1667	64.6	0.0668	0.040023	5%	9.636947
10 year	0.7465	29.3	-0.598	0.314501005	0.1667	72.9	0.0475	0.498614	0.1667	72.9	0.0754	0.046591	2%	10.36168
25 year	0.7465	34.4	-0.495	0.314501005	0.1667	83.4	0.0544	0.498614	0.1667	83.4	0.0862	0.053302	2%	11.8541
50 year	0.7465	38.1	-0.488	0.314501005	0.1667	91.3	0.0595	0.498614	0.1667	91.3	0.0944	0.058946	1%	12.76262
100 year	0.7465	41.8	-0.482	0.534651708	0.1667	99.1	0.1099	0.847643	0.1667	99.1	0.1742	0.109868	0%	23.15452

IDF Curve Data for Halifax

Retain the first 10mm or more in the first 10 minutes of rainfall, this will be achieved. The required volume calculation is above.

We will be aiming to stay at the removal of 85% of the TSS (Total Suspended Solids), This is achieved through capturing the runoff and transferring it through very permeable surfaces to drains. Such as french drains and stabilizing gravel. Best management practices call for the removal of 70-90% of TSS.

Retention Volume Required = 23 m^3 If looking at a traditional Stormwater System

Retention Volume Required = 0 m^3 if using our engineered method

Peak Runoff Balancing:

Peak runoff balancing is not necessary as we will be using stormwater as potable water after treatment.

Maintenance:

Double containment cisterns should be checked yearly and monitored for possible collection of TSS from eavestrough and downspout collection system. This system should have relatively low maintenance, but we recommend monitoring the system in 3-month intervals.

We do recommend monitoring the system to check for unforeseen circumstances or debris that may infiltrate the system.

Sincerely,

[redacted]

Marco Ferro P.Eng

[redacted]