

File 121088

March 15, 2022

John Rodgers
Rhem Properties
119 Fieldcrest Court
Clarksburg, ON
john@rhemproperties.com

Re: 372 Grey Road 21, Town of The Blue Mountains
Functional Servicing Brief – East Parcel

Dear John:

Tatham Engineering Limited (Tatham) has been retained to complete a functional servicing brief for the lands municipally known as 372 Grey Road 21, Town of The Blue Mountains. The lands are split into two distinct parcels by the Georgian Trail. This report will specifically address the servicing requirements for the east parcel, fronting on Grey Road 21.

The zoning for the east parcel is primarily Wetland (WL), Wetland Adjacent (H1) and Hazard (H) lands with the northeast corner currently zoned for Development (D). We understand that a Zoning Amendment will be required to change the Development (D) zoned areas to Residential (R1-3) to allow single detached dwellings. It has an area of approximately 13.6 hectares with a lot frontage of 145 metres on Grey Road 21. The lands are bounded by the Georgian Trail to the west, residential properties to the north, Grey Road 21 to the east and un-developed vacant land to the south. Most of the east parcel consists of wetland, however it is proposed to sever the existing residential property into 4 lots fronting Grey Road 21 and construct single detached dwellings on each lot (refer to Appendix A – Consent Plans)

This servicing brief will focus on the following: servicing for sanitary sewage, water supply, stormwater management, flood protection, grading and drainage, and traffic/transportation. The following sections describe our findings.

SERVICING

Sanitary Sewage

An existing 525 mm diameter sanitary sewer runs along the west side of Grey Road 21 from Mountain Road to Highway 26. The sanitary sewer discharges to a smaller 300 mm diameter sanitary sewer which conveys sewage west along Highway 26 to the Craigleith Pump Station. The sewage is then pumped east via forcemain to the Craigleith Wastewater Treatment Plant (WWTP).

A flow monitoring program and assessment was completed in 2020 to confirm the available capacity of the 300 mm diameter sewer on Highway 26 to accommodate additional flows from new development (refer to Appendix B – Data Review and Assessment). The study confirmed that based on actual flows in the system, the 300 mm sewer could accommodate up to 668 additional occupied residential units before reaching 80% capacity. In this regard, there are currently no restrictions in the conveyance system downstream of the subject property to the Craigleith pump station.

Per the Town of the Blue Mountains 2020 Year End Water & Wastewater Capacity Assessment, the Craigleith Wastewater Treatment Plant has a built capacity of 8,133 m³/day or 11,141 units based on the historical 5-year average daily flow of 0.730 m³/day. Of the total built capacity, 5,678 units are allocated, and 3,455 units are reserved. This leaves 2,009 units available to be reserved. It is understood that sanitary units will be reserved for the development once Consent Approval is achieved; however, the units will not be allocated until a development agreement (Site Plan Agreement, Subdivision Agreement, etc.) is in place.

Individual 125 mm diameter sanitary services will be provided to each lot from the 525 mm diameter sanitary sewer on Grey Road 21 (refer to Appendix C – Site Development Plan showing existing and proposed sewage works).

Watermain

The preferred water servicing option is to connect to the existing TOBM 200 mm diameter watermain on Highway 26. The watermain will be extended east on Highway 26 and south on Grey Road 21 for approximately 200m. Individual 25 mm diameter water services will be provided to each lot from the extended watermain. A hydrant will be installed in accordance with Town standards and will provide requisite fire protection. The watermain will be terminated with an automatic flushing device to maintain water quality in the system (refer to Appendix C – Site Development Plan showing the existing and proposed watermain works).

The proposed watermain extension will be designed and constructed in accordance with Town standards including completion of a design checklist and Ministry of Environment, Conservation and Parks Form 1 – Record of Watermains.

Utilities

Electrical and communication services to each lot will be provided via connections to Hydro One, Bell Canada and Rogers Cable distribution systems. Natural gas services will be provided via connections to the Enbridge Gas distribution system. All utility providers have services fronting the proposed lots.

Permits and Approvals

Detailed design drawings will be required to support construction of the watermain extension and sanitary service laterals to service the proposed lots. A Town of The Blue Mountains watermain design checklist



and Ministry of Environment, Conservation and Parks (MECP) Form 1 – Record of Watermain will be required. The proposed servicing works are to be designed in accordance with Ministry of Transportation (MTO), MECP, Town, County and Provincial standards.

STORMWATER MANAGEMENT, FLOOD PROTECTION, GRADING AND DRAINAGE

Stormwater Management

Based on our review of the parcel and the expected soil conditions, the use of Low Impact Development techniques for stormwater control will be impractical due to the anticipated high groundwater levels and soil conditions that will not promote infiltration. Due to the size of the proposed lots compared to the rest of the east parcel, it is proposed to implement a split drainage system with lot level controls (i.e., sump pump and downspouts discharging to side-yard swales) to provide stormwater control. The runoff from these lots is considered “clean” and will not require additional quality treatment prior to discharging to the roadside ditch in the front and the existing wetland in the rear yards. Due to the proximity to the wetlands and the flat nature of the parcel, more detailed stormwater management controls are impractical and unnecessary.

Flood Protection

A flood model was prepared based on available background information and a detailed topographic survey completed in the fall of 2021. Preliminary modeling results indicate the 100-year and Timmons storm water surface elevations for the adjacent is approximately 182.00 m and 182.17 m respectively. Generally, the existing ground elevations of the proposed lots is 182.00 m or higher. The addition of fill to raise the site will ensure the properties and buildings are flood protected with negligible impact to the wetland storage volumes.

Grading and Drainage

A preliminary grading design has been completed to demonstrate access to Grey Road 21, split lot drainage, the addition of fill to raise the lots for flood protection, and matching to existing grades along the north, west and south sides of the property. Along the frontage of the property grades will be raised to better define the roadside ditch and ensure flows remain within it. Driveway culverts will be sized and installed within the roadside ditch to convey flows as necessary to match existing conditions.

A groundwater monitoring program is underway, results will be collected through the spring and continue until summer. It is anticipated groundwater will be near to the existing surface; as such, basements are expected to be just below existing grade. If necessary, lot grading and building elevations can be adjusted to ensure a minimum separation from basement floors to groundwater is provided in accordance with Town standards (refer to Appendix C – Site Development Plan for conceptual grading information).



Permits and Approvals

The properties are within the areas regulated by the Grey Sauble Conservation Authority (GSCA) and will require a permit to be issued to allow for construction. A detailed individual lot grading plan will be required in support of a building permit application.

TRAFFIC/TRANSPORTATION**Grey Road 21**

Grey County is planning to improve Grey Road 21 to include four lanes with paved shoulders and a 5.2 m wide road widening dedication is required along the entire frontage of the property. The required land dedication has been shown on the consent plans.

Driveway access to and from each lot on the east parcel will be from Grey Road 21. It is proposed to utilize shared driveways to limit the number of connections to Grey Road 21 to two. There is currently one existing driveway to the property that will need to be slightly modified to suit the proposed lot layout and one new driveway to be constructed. Entrance permits would be required from the County to allow for the existing driveway to be modified and for a new driveway to be constructed. Driveways would be required to be constructed in accordance with Grey County's Entrance Permit procedures and requirements. Exemptions may be required from the County's Director of Transportation Services where minimum requirements cannot be achieved.

Town Owned Public Use Trail System

The Town of The Blue Mountains is planning for a public use trail to be constructed along the west side of Grey Road 21 from Highway 26 south to Grey Road 19. The Town requires a 6.0 m land dedication for the trail in addition to the 5.2 m dedication required by the County for the road widening. The developer would be required to dedicate the lands and the Town would be responsible for future trail construction. The required land dedication has been shown on the consent plans.

Highway 26

The property is within 180 m of the centre point of the Grey Road 21 and Highway 26 intersection. Highway 26 is a Provincial Highway; therefore a Ministry of Transportation (MTO) permit will be required. Consultation with the MTO has been initiated to determine their requirements for approval. No comments have been received to date.



Permits and Approvals

A permit from the County will be required for the modification and construction of new and proposed driveways and a permit from the MTO will be required due to the proximity of the site to the Highway.

SUMMARY

This functional servicing brief confirms that sanitary and water servicing can be provided to the proposed four lots. Electrical, communication and gas services are available along the frontage of the property. Lot level controls will be provided via side-yard swales, however due to the high groundwater conditions, more detailed LIDs and stormwater management facilities are not recommended. The runoff from the lots is considered clean flow so lot level controls are sufficient for this development. Fill will be added to raise grades and protect the property and buildings from flooding with negligible impact to wetland storage volumes. Groundwater monitoring is on-going, and results will be available by the summer. Basements floors are to be elevated a minimum of 300 mm above the recorded seasonal high groundwater elevation in accordance with Town standards. Access to and from public roads is available via driveway connections at Grey Road 21.

We trust that this letter sufficiently provides the information necessary to describe the servicing opportunities and constraints for this property.

Yours truly,

Tatham Engineering Limited



Andrew Schoof, B.A.Sc., M.A.Sc.
Intern Engineer
AS:rlh

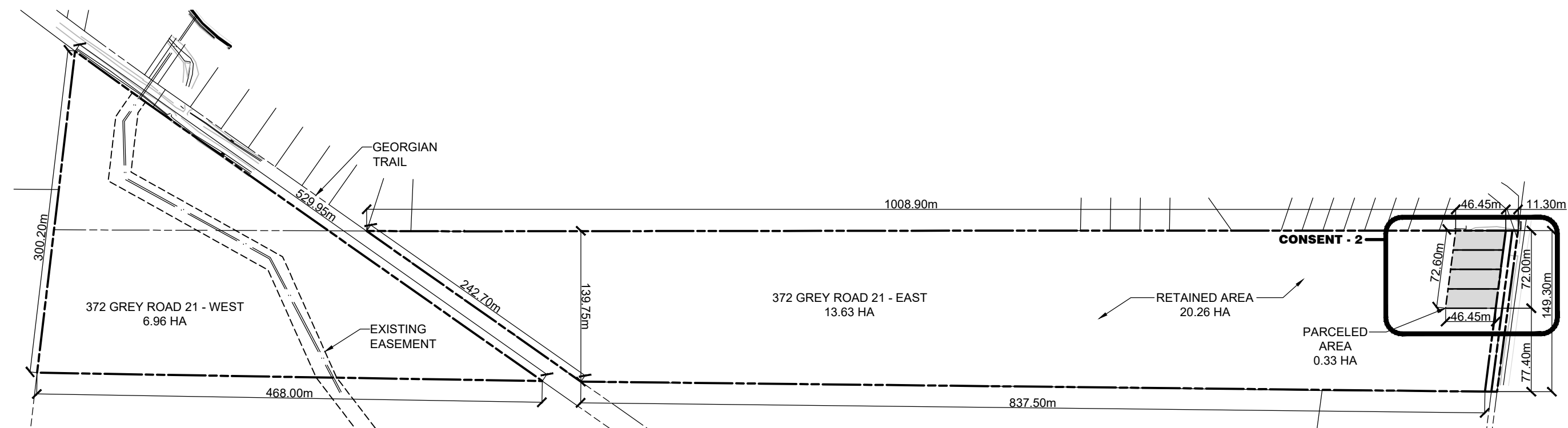


Randy Simpson, B.A.Sc., P.Eng.
Director, Manager – Land Development Engineering



LEGEND

- PROPERTY BOUNDARY
- LOT BOUNDARY
- PARCELED LAND (0.33 HA)



NOTE:
1. ALL DIMENSIONS IN METRES
UNLESS OTHERWISE NOTED



115 Sandford Fleming Drive, Suite 200, Collingwood, ON L9Y 5A6
Tel. 705.445.0422 inquiry@envision-tatham.com

				SCALE: 1:4000
				DRAWN: GEC
1.	ISSUED FOR TOWN CONSENT	MAR. 11/22	AB	REVIEWED: AB
NO.	REVISIONS	DATE	INITIAL	DATE: MAR. 11, 2022

PROJECT:
372 GREY ROAD 21

JOB NO.
ET121015-1

DWG.
CONSENT - 1

LEGEND

<div></div>	PROPERTY BOUNDARY
<div></div>	LOT BOUNDARY
<div></div>	BUILDING ENVELOPE
<div></div>	PROPOSED DRIVEWAY

RESIDENTIAL ZONE STANDARDS

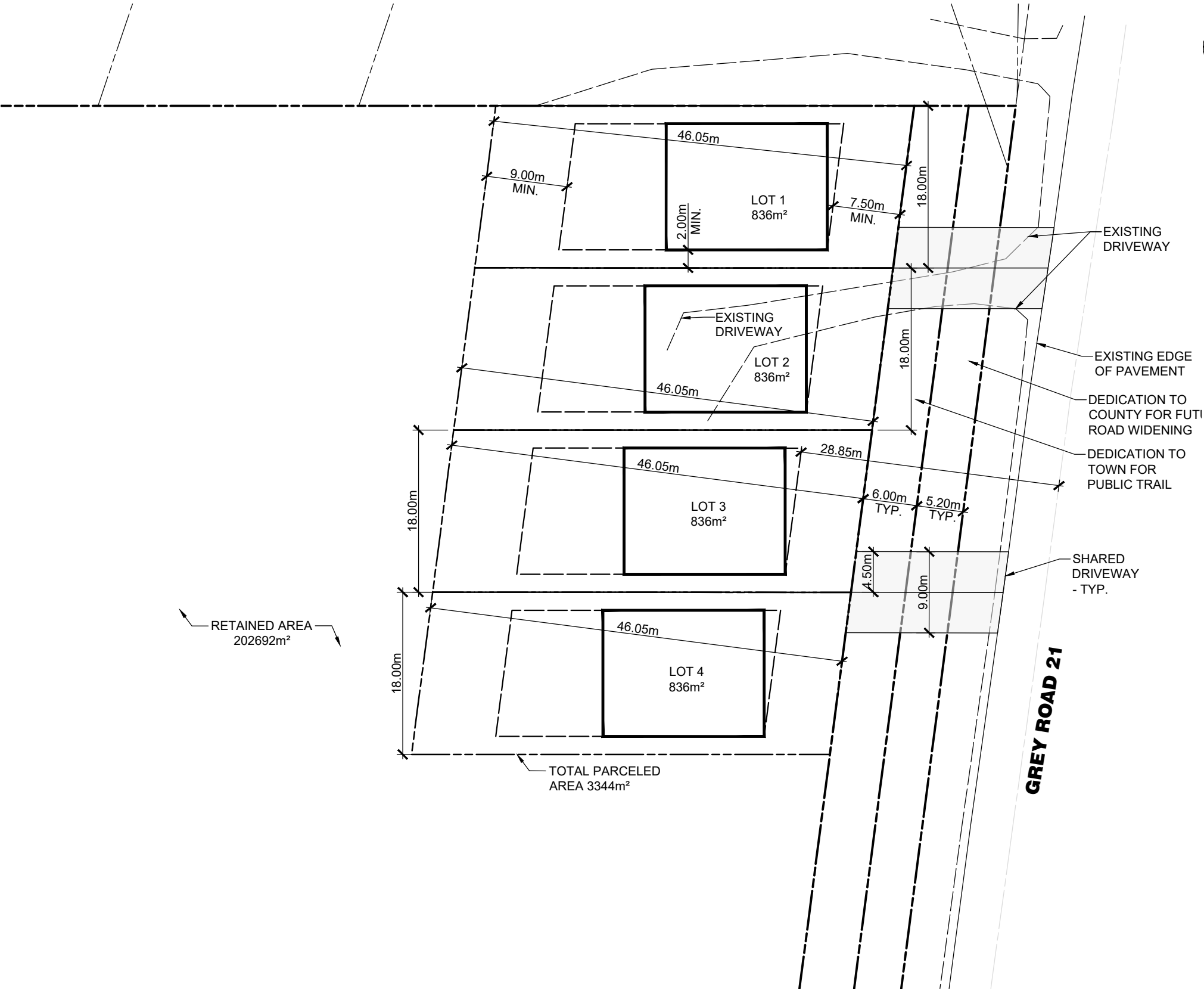
(TOWN OF THE BLUE MOUNTAINS ZONING BY-LAW 2018-65)

SINGLE DETACHED

ZONING STANDARD	R1-1
MINIMUM LOT AREA (m2)	550
MAXIMUM LOT COVERAGE	30%
MINIMUM LOT FRONTAGE (m)	18
MINIMUM FRONT YARD (m)	7.5
MINIMUM EXTERIOR SIDE YARD (m)	5
MINIMUM INTERIOR SIDE YARD (m)	2
MINIMUM REAR YARD (m)	9
MAXIMUM HEIGHT (m)	9.5
MAXIMUM HEIGHT (STOREYS)	2.5

ADDITIONAL PARAMETERS:

WHERE A BUILDING OR STRUCTURE IS TO BE BUILT ADJACENT TO A COUNTY ARTERIAL OR COUNTY COLLECTOR ROAD, MINIMUM SETBACKS ARE DETERMINED THROUGH A COUNTY BY-LAW BUT ARE GENERALLY 75 FEET (22.86 METRES) FROM THE CENTRELINE OF THE ROAD. WITHIN SETTLEMENT AREAS AND ON COUNTY LOCAL ROADS, THE SETBACKS AS IDENTIFIED IN THE LOCAL MUNICIPAL ZONING BY-LAWS WILL BE USED (Pg. 145, GREY COUNTY OFFICIAL PLAN).



NOTE:
1. ALL DIMENSIONS IN METRES
UNLESS OTHERWISE NOTED



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Tel. 705.445.0422 inquiry@envision-tatham.com

				SCALE: 1:500	PROJECT: 372 GREY ROAD 21	
				DRAWN: GEC	JOB NO. ET121015-1	DWG. CONSENT - 2
1.	ISSUED FOR TOWN CONSENT	MAR. 11/22	AB	REVIEWED: AB		
NO.	REVISIONS	DATE	INITIAL	DATE: MAR. 11, 2022		

File 120121

January 27, 2020

Allison Kershaw
Manager of Water and Wastewater Services
Town of The Blue Mountains
32 Mill Street
Thornbury, Ontario N0H 2P0
akershaw@thebluemountains.ca

Re: Highway 26 Flow Monitoring (Grey Road 21 to Timmons Street), Town of The Blue Mountains
Data Review & Assessment

Dear Allison:

We are pleased to present the findings of the flow monitoring study and an assessment of the remaining capacity for the above noted sanitary sewer on Highway 26 in the Town of The Blue Mountains.

BACKGROUND

The Town circulated RFP 2020-15-Q-OPS on June 23, 2020 requesting a consultant complete flow monitoring and provide an assessment of the associated data to confirm the existing volume of flow and remaining capacity within the 300 mm diameter sanitary sewer on the south side of Highway 26 between Grey Road 21 and the west leg of Timmons Street (the limits of which are indicated in Figure 1). It is understood that once flows within this sewer reach 80% capacity, the existing sanitary sewer on Grey Road 21 (which ranges in size from 450 mm at its south limit at Grey Road 19 to 525 mm at its north limit at Highway 26) is to be extended across Highway 26 to provide an ultimate connection to the Craigleith Wastewater Treatment Plant.

DATA COLLECTION

Monitoring Locations

Tatham Engineering engaged AMG Environmental Inc. to complete the requisite flow monitoring at the following 2 locations:

- Location 1: Maintenance Hole 41 (MH 41) on the Highway 26 300 mm sanitary sewer at the west leg of Timmons Street. This location is the downstream limit of the 300 mm sewer and thus reflects the most critical location from a flow and capacity perspective (west of MH 41, the pipe size increases to 750 mm which extends to the pump station).
- Location 2: Maintenance Hole E29 (MH E29) on Grey Road 21 on a 300 mm sewer at the north limit of the Mountain House development. The upstream sewers contributing to MH E29 are isolated and

limited to the Mountain House and Windfall developments, and therefore this location serves as a means to establish actual sanitary flow demands per residential unit.

In addition, a rain gauge was installed at the Craigleith WWTP to record rainfall duration and intensity.

The locations of the monitoring devices and rain gauge are illustrated on Figure 1.

Monitoring Period

The flow monitors and rain gauge recorded information over the period August 13, 2020 to October 10, 2020 (a 2-month period as required under the RFP). Both flow and rainfall data were collected in 5-minute increments for the entire duration. AMG monitored the data and performed maintenance on the flow monitors and rain gauge as required to maintain the quality of data. No issues were noted with the data collection. AMG subsequently undertook a quality review of the 2-month period data.

It is noted that the measuring devices remained in place under November 5, 2020 and data for the period October 11, 2020 to November 4, 2020 was also provided. However, as this data was not quality reviewed, it has only been provided for information purposes only and has not been included in the assessment.

Summary of Data

The following is a selection of peak data at MH 41, which is the focus of this study:

- peak daily volume
 - 197.5 m³ on October 10
 - 175.1 m³ on August 29
- peak flow rate
 - 7.9 L/s on August 13
 - 6.9 L/s on August 29
- peak velocity
 - 0.58 m/s on September 24

As per the Town's RFP, wet weather events are defined as having a rainfall intensity greater than 10 mm over 24 hours. Such occurred on the following dates (6 in total):

- August 2, 27 and 28;
- September 30; and
- October 4 and 7.

Graphical representations of the collected data for both monitoring stations are provided in Figure 2 through Figure 4, addressing both daily flow rates and rainfall accumulation (the data for the period



October 11, 2020 to November 4, 2020 is included for illustration purposes only). In most cases, there are pronounced peaks with the Saturday and Sunday data, suggesting that weekend data reflects the greatest demands.

Little correlation exists between the peak volumes, flows and velocities and measured rainfall. The only day with any identifiable correlation is August 29 which followed an extended period of rainfall and exhibited a high daily flow volume and peak flow rate. However, neither of these were the maximum for the monitoring period nor do they appear to be solely related to the preceding rainfall. Based on the monitoring data, the Saturday conditions are likely to have contributed to the peak as well.

CAPACITY ANALYSIS METHODOLOGY

Multiple approaches for analysis are available to determine the remaining capacity of a sanitary sewer.

Theoretical Flow Rates

The most common approach used in the design and analysis of capacity is a theoretical comparison to the Ministry of the Environment *Design Guidelines for Sewage Works* flow rate (ranging from 225 to 450 L/cap/day) and an assumed population per unit (2.3 persons) to determine the total flow distributed over the day with peaking factors to determine peak expected flow. This approach is quite conservative and typically results in sewers designed with significant additional capacity, suitable for future intensification.

Actual Flow Rates

An alternative approach to sanitary sewer design and analysis is to complete flow monitoring to establish actual flow rates and determine the amount of infiltration and inflow within the subject section of sanitary sewer. The results of flow monitoring can aid the development of more accurate parameters to determine the remaining actual capacity and average flow rate per unit.

DATA ANALYSIS

Consideration for Dry Weather Conditions

A number of dry weather flow (DWF) periods were observed during the monitoring period. The extended period of September 14 to 21 had no recorded precipitation, so the flow rates during the following week are considered suitable for DWF (considering the following week allows a one-week period for rainfall to accumulate, migrate and infiltrate into the sanitary sewer system). Based on the data collected, the DWF rate recorded at MH 41 varies between 95.5 and 148.2 m³/day. Similarly, at MH E29 the data during the same period varies between 98.9 and 128.8 m³/day. This high variance in flow rate suggests the base flow rate is directly dependant on other contributing factors, primarily occupancy rates within the upstream contributing residences.



It is also evident that the weekend flow rates are typically higher than those rates realized through the week, regardless of the contributing rainfall events. Again, this is likely attributed to increased residential occupancies and hence utilization on the weekends.

Consideration for Occupancy

As this area is heavily influenced by seasonal residents, the development of a dry weather flow (DWF) rate is less critical for this project. Rather, flow rates based on actual occupancy levels have been explored and further considered.

At MH 41, the contributing areas include a number of residential and non-residential uses such as Squire Johns and Le Scandinave. Occupancy information and/or flow data specific to these uses was not collected or determined as part of this assignment. In this regard, data from MH 41 was not considered in establishing a baseline residential flow demand.

At MH E29, the contributing area is limited to that of the Mountain House and Windfall residential developments. Furthermore, it is noted that the corresponding sewers were installed within the last 10 years and accordingly reflect modern construction materials and practices, and thus these sewers are expected to have minimal infiltration (as per the data in Figure 3, there is no obvious correlation between rainfall and sewer flows). To establish the occupancy rates within the Windfall and Mountain House developments, a Tatham Engineering staff member visited the developments on each Sunday morning (around 09:00) during the 2 month monitoring period and established the number of occupied units. For Mountain House, the number of occupied units was estimated based on the number of cars in parking lots assuming 1 car per unit (in that units are only assigned 1 spaces). For Windfall, the number of occupied units was estimated based on either vehicles present in the driveway or obvious signs of resident activity. It is assumed that the occupancy data as collected on Sunday mornings is reflective of occupancy over the course of the weekend (ie. applicable to both Saturday and Sunday). It is noted that at the time of the surveys, 288 units were completed and delivered to purchasers in Windfall and 70 units in Mountain House (total 358 units).

Table 1 provides a summary of the occupied units, the daily flows as measured at MH E29 for each Saturday and Sunday during the collection period and the resulting daily flows per occupied unit (as per Figures 4 and 5, the weekend flows were typically greater than flows during the preceding weekdays and thus reflect the maximum conditions); Figure 5 illustrates the unit flows graphically.

As noted, the average flows are in the order of 518 to 531 L/unit/day, whereas the maximum flows (recorded over the period August 29-30) are in the order of 597 to 660 L/unit/day. While the Thanksgiving weekend, October 10-11, had the highest unit occupancy, the resulting flows/unit were slightly less than average. The maximum flow of 660 L/unit/day equates to 287 L/cap/day based on 2.3 persons per unit. As previously noted, MOE design guidelines suggest 225 to 450 L/cap/day.



Table 1: Weekend Flow Rate Per Unit Calculations

WEEKEND PERIOD	OCCUPIED UNITS (of 358)	SATURDAY		SUNDAY	
		Total Flow (m ³ /day)	Flow Per Unit (L/day)	Total Flow (m ³ /day)	Flow Per Unit (L/day)
August 22-23, 2020	233	137.3	589	128.2	550
August 29-30, 2020	245	161.6	660	146.3	597
September 5-6, 2020	259	137.2	530	132.2	511
September 12-13, 2020	255	131.2	514	136.4	535
September 19-20, 2020	255	118.4	464	116.6	457
September 26-27, 2020	254	120.5	474	128.8	507
October 3-4, 2020	254	134.5	530	129.7	511
October 10-11, 2020	283	137.4	486	134.1	474
Average	255	134.8	531	131.5	518
Minimum	233	118.4	464	116.6	457
Maximum	283	161.6	660	146.3	597

CAPACITY ANALYSIS & ASSESSMENT

Peak Measures

At MH 41, the following measures are noted:

- the peak measured velocity is 0.58 m/s at a flow depth of only 50 mm (indicating the theoretical roughness is likely conservative);
- the peak depth of flow is 88.3 mm with a flow rate of 6.9 L/s (approximately 30% of the cross sectional area and 15% of total capacity); and
- the peak flow rate is 7.9 L/s (18% of the total capacity).

AT MH E29, the following area are noted:

- the peak flow rate is 9.44 L/s (13.5% of the total capacity); and
- compared to MH 41, this flow rate is higher despite being upstream, but is indicative of measurements closer to the source (addressed by peaking factors in large catchments).



Peak Factors

The peaking factor of the sewer is established by dividing the peak flow rate by the average flow rate. For both sewers, the peaking factors are as follows:

- MH 41 $7.92 \text{ L/s (maximum)} \div 1.47 \text{ L/s (average)} = 5.39 \text{ Peaking Factor}$
- MH E29 $9.44 \text{ L/s (maximum)} \div 1.43 \text{ L/s (average)} = 6.60 \text{ Peaking Factor}$

It is noted that the peaking factors reflect data for the overall monitoring period, inclusive of weekend and weekday day. As evident in the charts of Figures 2 and Figure 4, the weekday demands are typically less than the weekend demands, which is reflective of the recreational and seasonal nature of some of the area residents. The lower weekday demands result in lower average values and hence higher peak factors (which is premised on the peak values that occur during the weekend). When considering only the weekend data (which effectively assumes that usage during the remainder of the week will be comparable and consistent, reflective of full-time residency and utilization), the following peak factors are realized:

- MH 41 4.41 Peaking Factor (which is more reflective of typical conditions)
- MH E29 5.56 Peaking Factor

Pipe Capacity

The full flow capacity of a sewer is directly dependant on the slope and roughness coefficient. As per the as-built drawings for Highway 26, the slope of the 300 mm diameter PVC sanitary sewer discharging to MH 41 is 0.21%. For PVC sewers, typical roughness coefficients vary between 0.009 and 0.011. However, to ensure a conservative approach, and to be consistent with standard design practice, including that of the Town, a coefficient of 0.013 has been employed (representative of a concrete pipe).

Available Capacity (L/s) = 44.3 L/s with a peak velocity of 0.63 m/s

It is noted that the peak velocity as observed at MH 41 is 0.58 m/s and thus the actual roughness coefficient will be somewhat less than 0.013 (which has a corresponding peak velocity of 0.63 m/s).

Remaining Capacity (L/s)

The remaining capacity within the Highway 26 sanitary sewer has been determined based on its available capacity and the peak flows observed (which include consideration for inflow and infiltration). Consideration for an 80% capacity threshold is also noted.

Remaining Capacity (L/s) = Available Capacity - Peak Flow
 = $44.3 \text{ L/s} - 7.9 \text{ L/s}$
 = 36.4 L/s

Remaining Capacity (80%) = $80\% \times 44.3 \text{ L/s} - 7.9 \text{ L/s}$
 = 27.5 L/s



Remaining Capacity (units)

The remaining capacity as it relates to residential units is determined below, considering the actual unit demand of 287 L/cap/day or 660 L/unit/day (based on 2.3 persons per unit) as determined at MH E29 and the actual peak factor of 5.4, as determined at MH 41. Again, an 80% capacity threshold is also noted

$$\begin{aligned}\text{Remaining Capacity (units)} &= \text{Remaining Capacity (L/s)} \div \text{Unit Rate} \div \text{Peak Factor} \\ &= 36.4 \text{ L/s} \div 660 \text{ L/unit/day} \div 5.39 \\ &= 884 \text{ units}\end{aligned}$$

$$\begin{aligned}\text{Remaining Capacity (80\%)} &= 27.5 \text{ L/s} \div 660 \text{ L/unit/day} \div 5.39 \\ &= 668 \text{ units}\end{aligned}$$

Based on the above, the existing system has capacity for an additional 668 units prior to it reaching 80% capacity, at which time the crossing of Highway 26 is desired. An additional 884 units can be accommodated prior to the system reaching full capacity.

Should the “weekend peak factor” of 4.41 be used, the remaining capacity unit count increases to 816 units under 80% capacity and 1080 units under 100% capacity.

CONCLUSION

Based on the actual flow data (including existing inflow and infiltration) and unit demands realized from the Mountain House and Windfall developments (as determined from the peak weekend data), the 300 mm diameter sanitary sewer on Highway 26 can accommodate:

- 668 additional occupied residential units prior to reaching 80% capacity; and
- 884 additional occupied residential units prior to reaching 100% capacity.

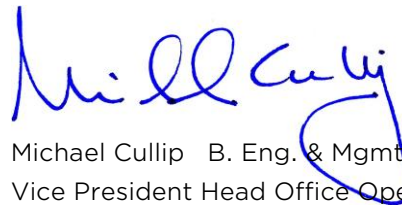
Due to the seasonal and recreational nature of the area, the weekday demands are lower than the weekend demands, resulting in an exaggerated peaking factor (maximum demand ÷ average demand). If data for only the weekends is considered (and assumed to be reflective of demands throughout the week), the peaking factor is reduced to 4.41 and the remaining unit counts increase to 816 for 80% capacity and 1080 for 100% capacity.

Yours truly,

Tatham Engineering Limited

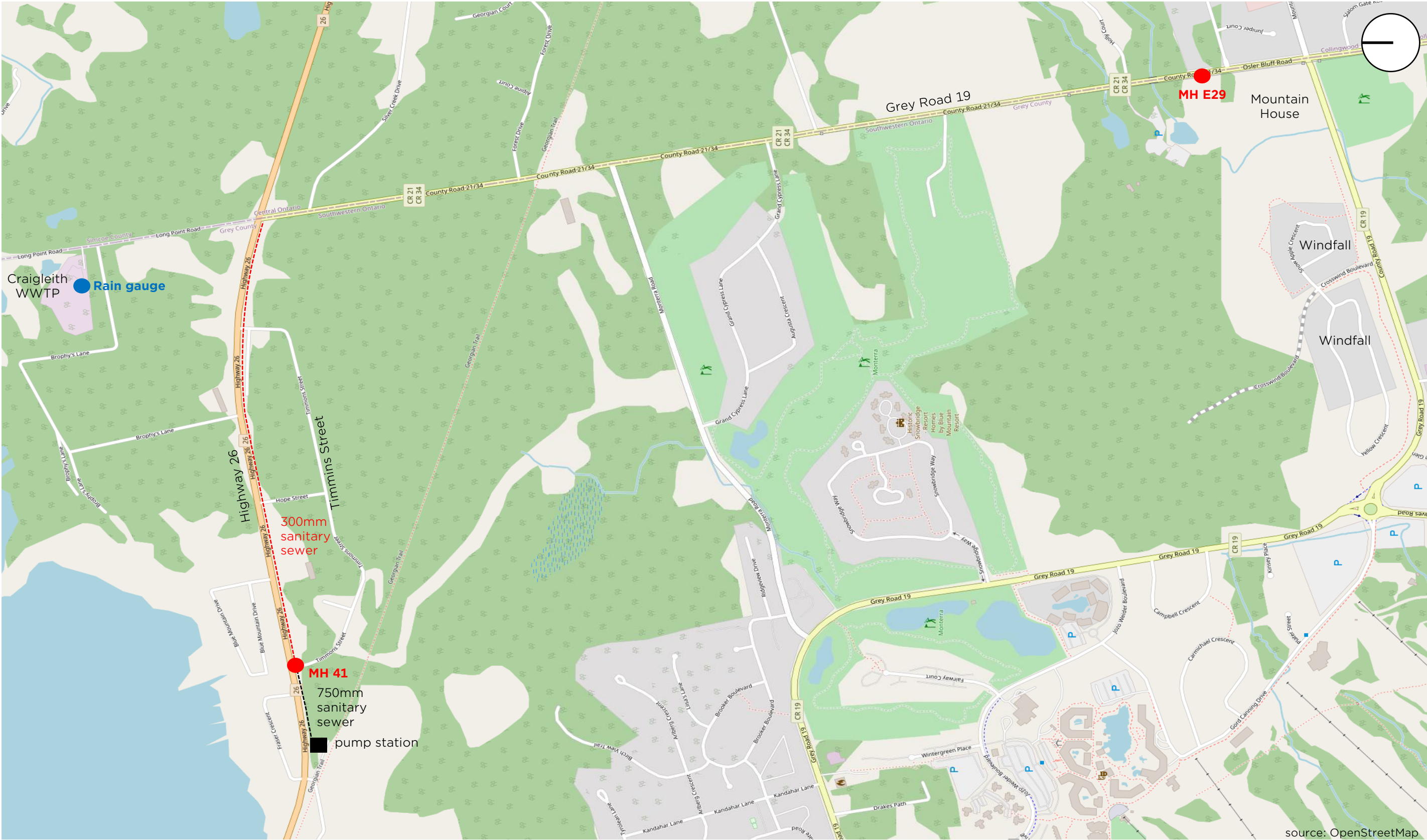


Aaron Roeper B.A.Sc., P.Eng.
Intermediate Engineer
APR/MJC:



Michael Cullip B. Eng. & Mgmt., M. Eng., P. Eng.
Vice President Head Office Operations

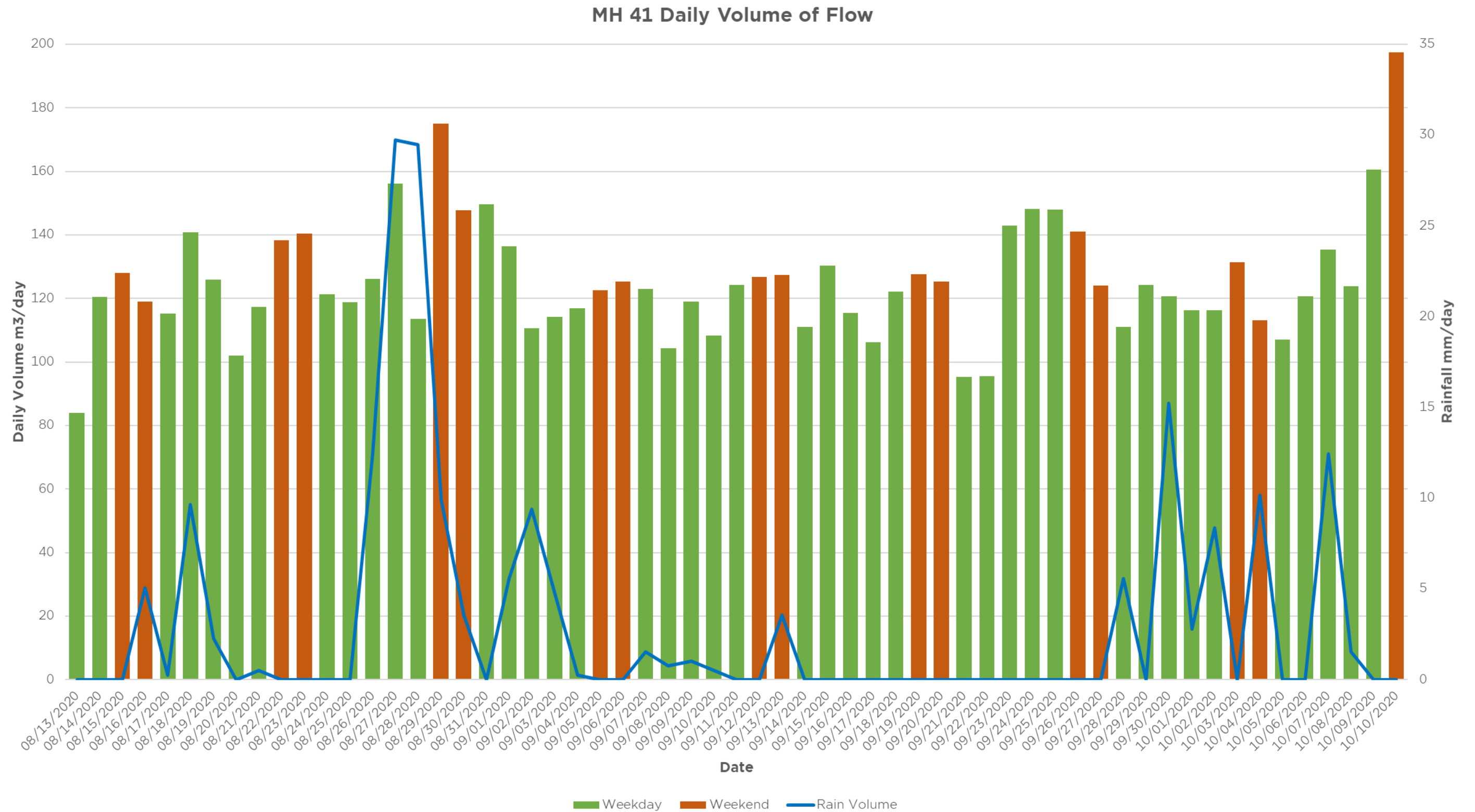




TOBM FLOW MONITORING

Figure 1: Study Limits & Monitoring Locations

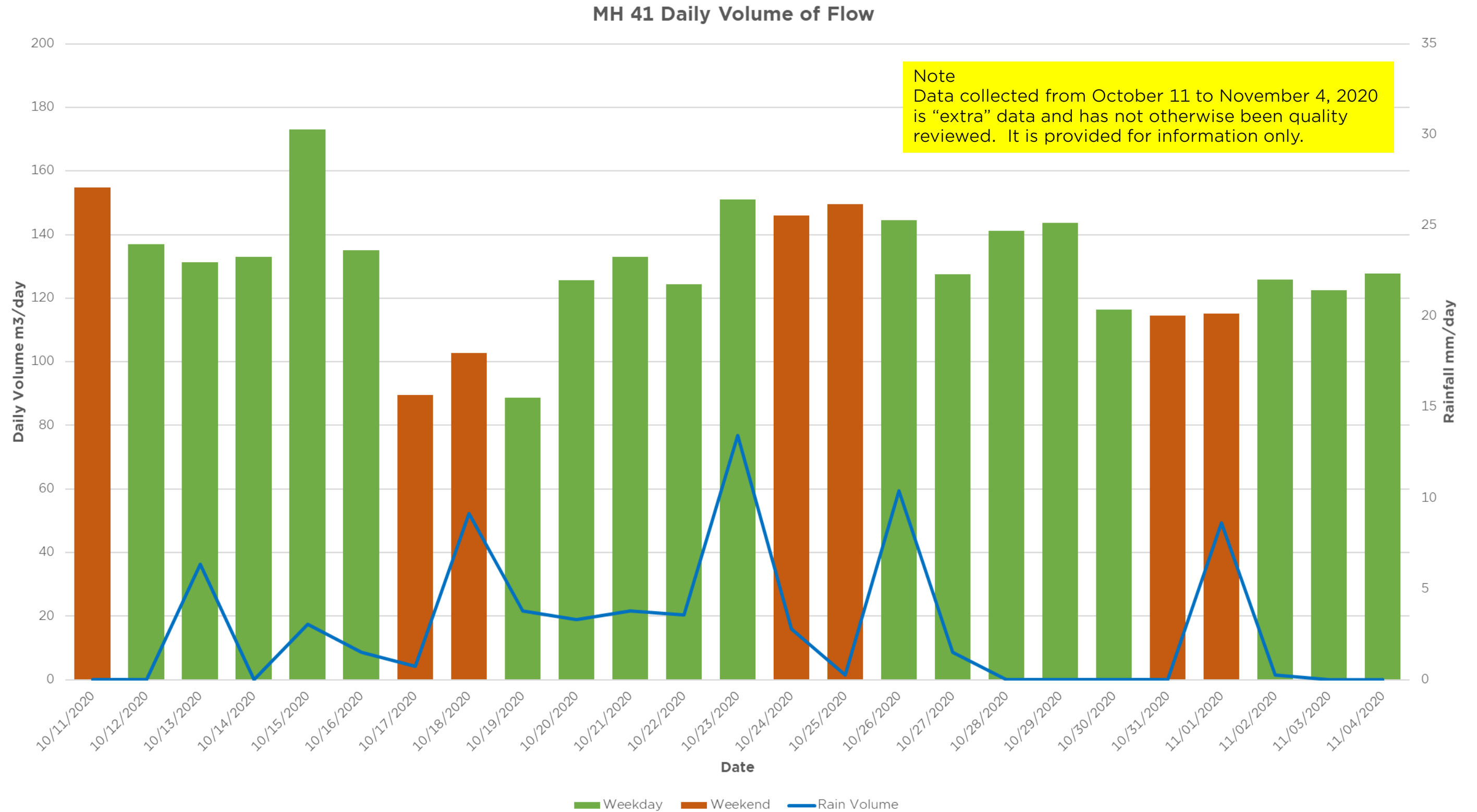




TOBM FLOW MONITORING

Figure 2: Daily Measures MH 41 + Rainfall (Aug 13, 2020 to Oct 10, 2020)

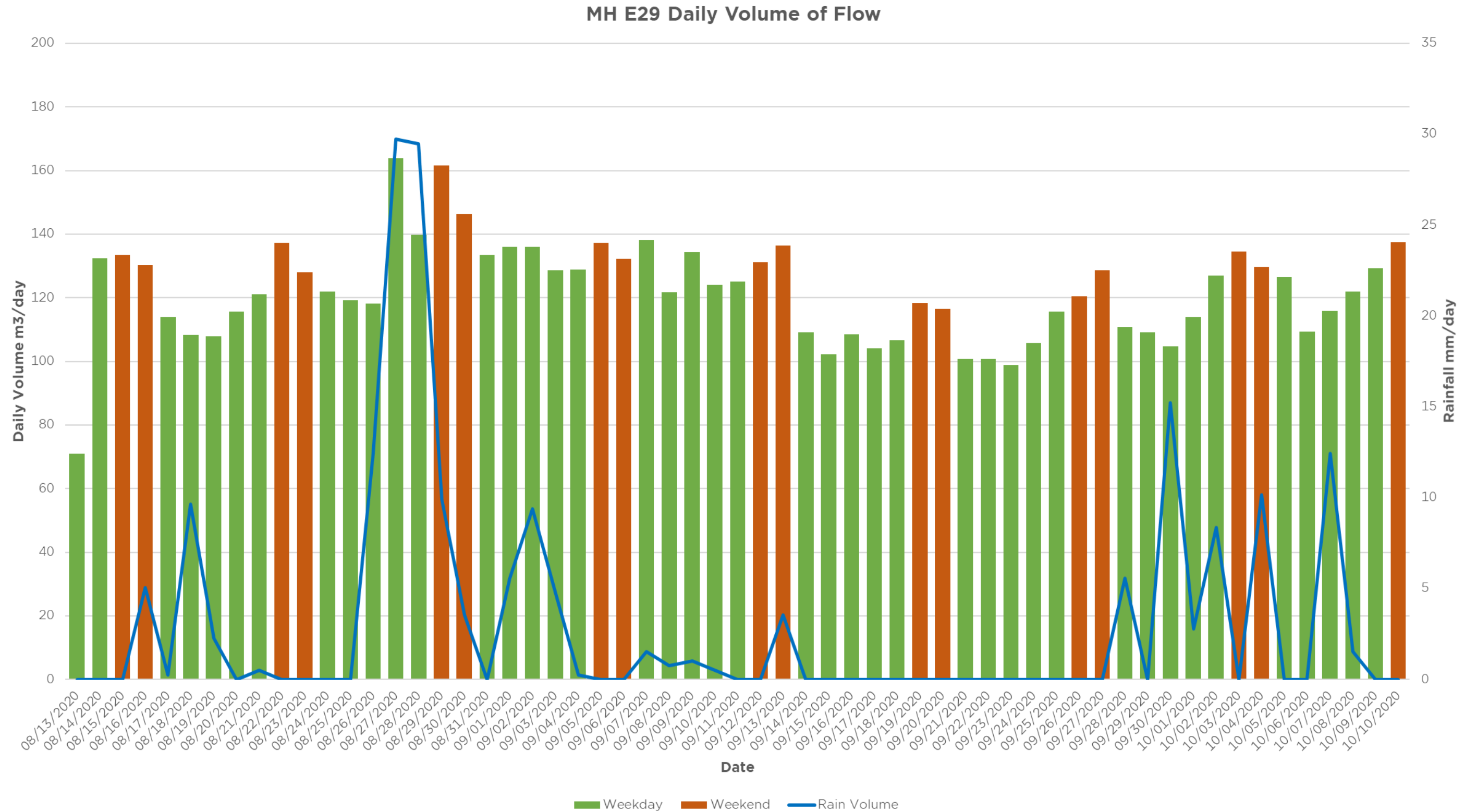




TOBM FLOW MONITORING

Figure 3: Daily Measures MH 41 + Rainfall (Oct 11, 2020 to Nov 4, 2020)

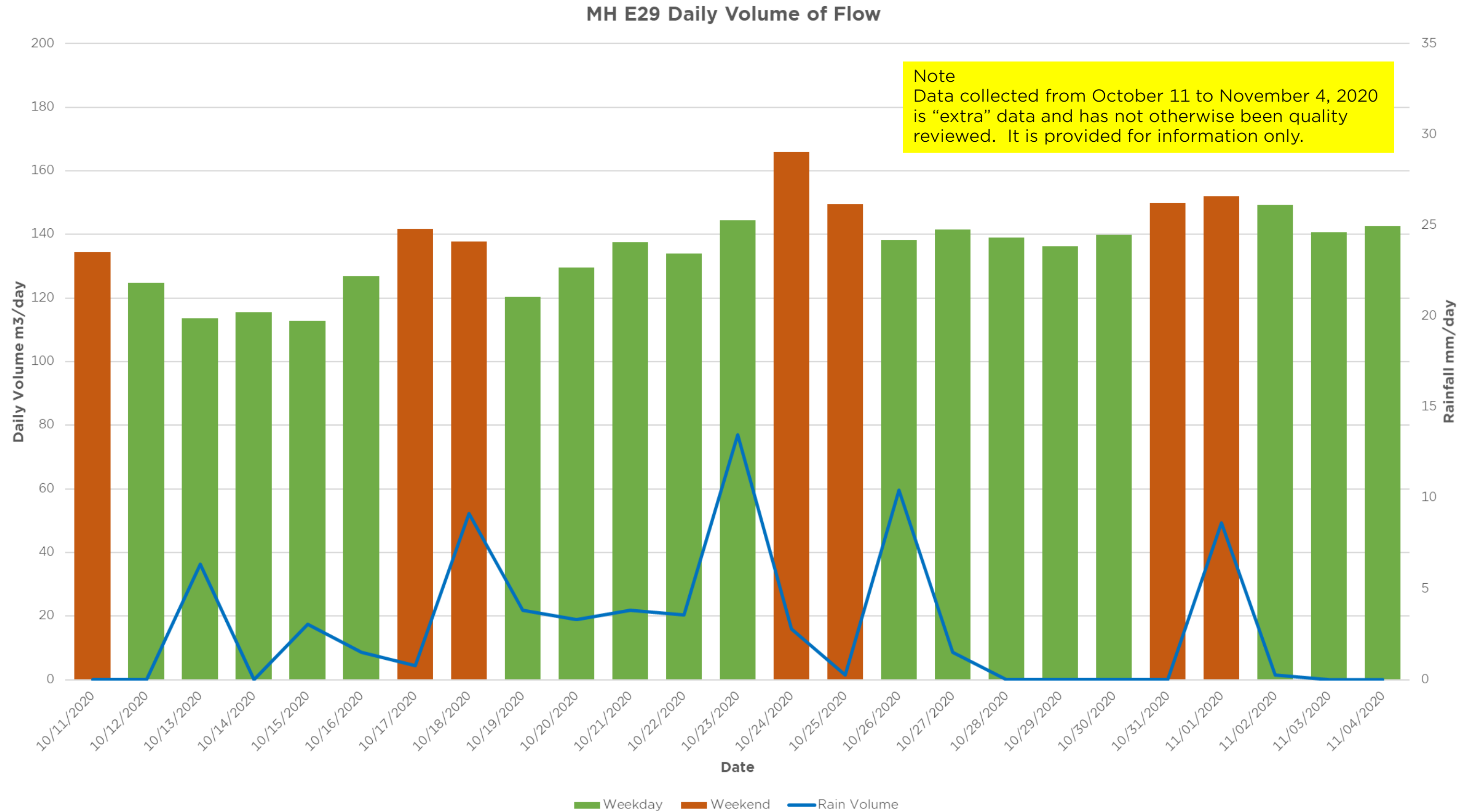


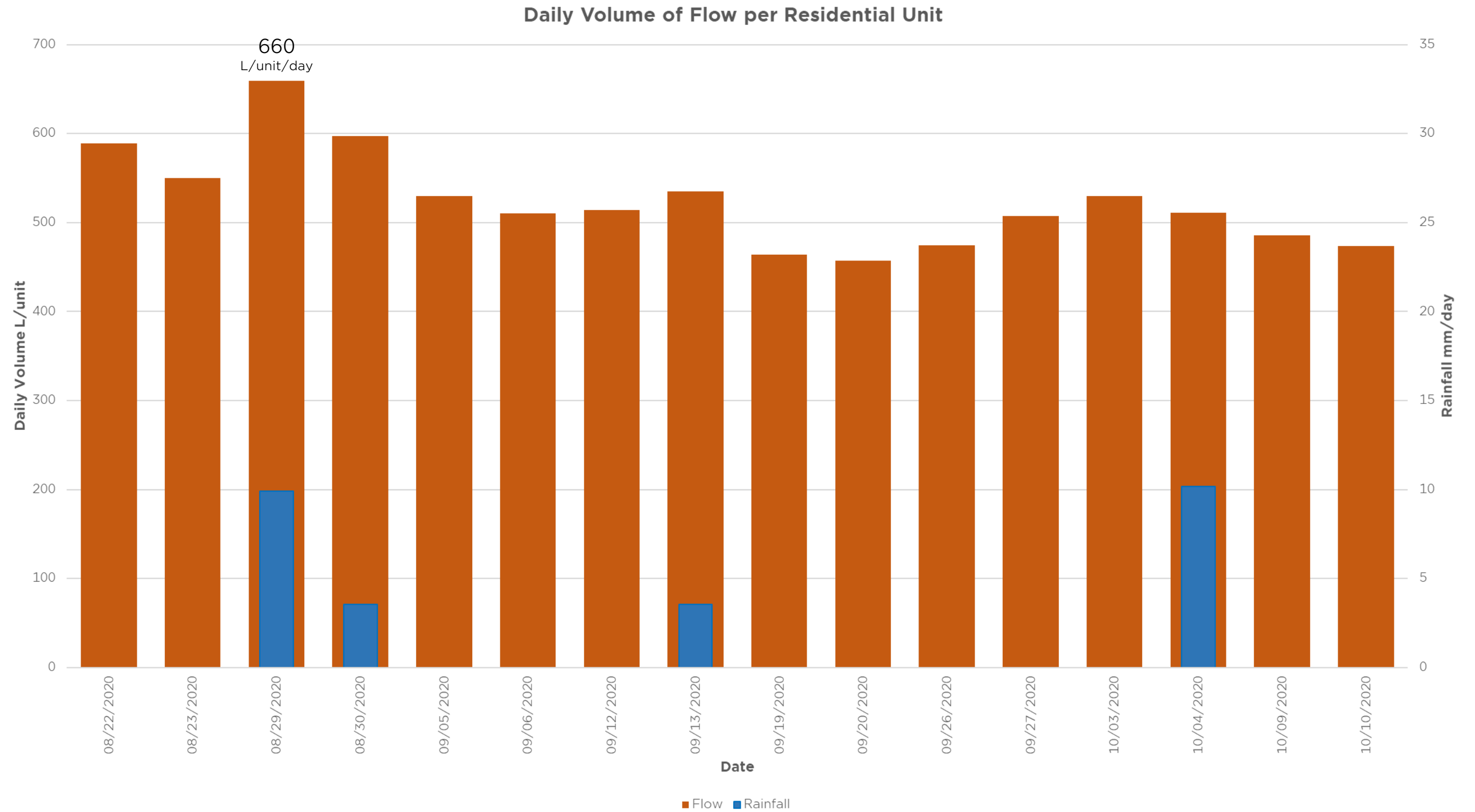


TOBM FLOW MONITORING

Figure 4: Daily Measures MH E29 + Rainfall (Aug 13, 2020 to Oct 10, 2020)

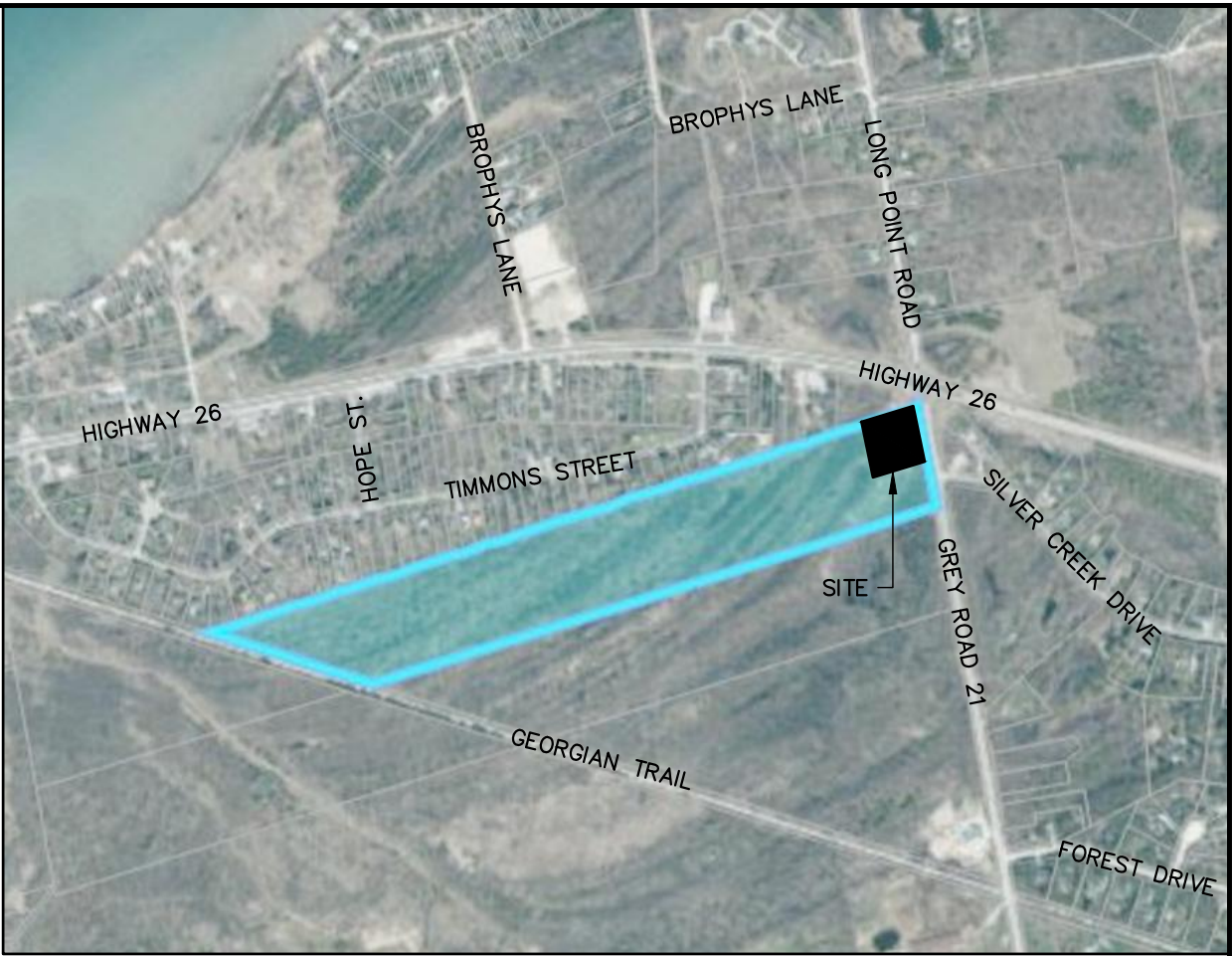




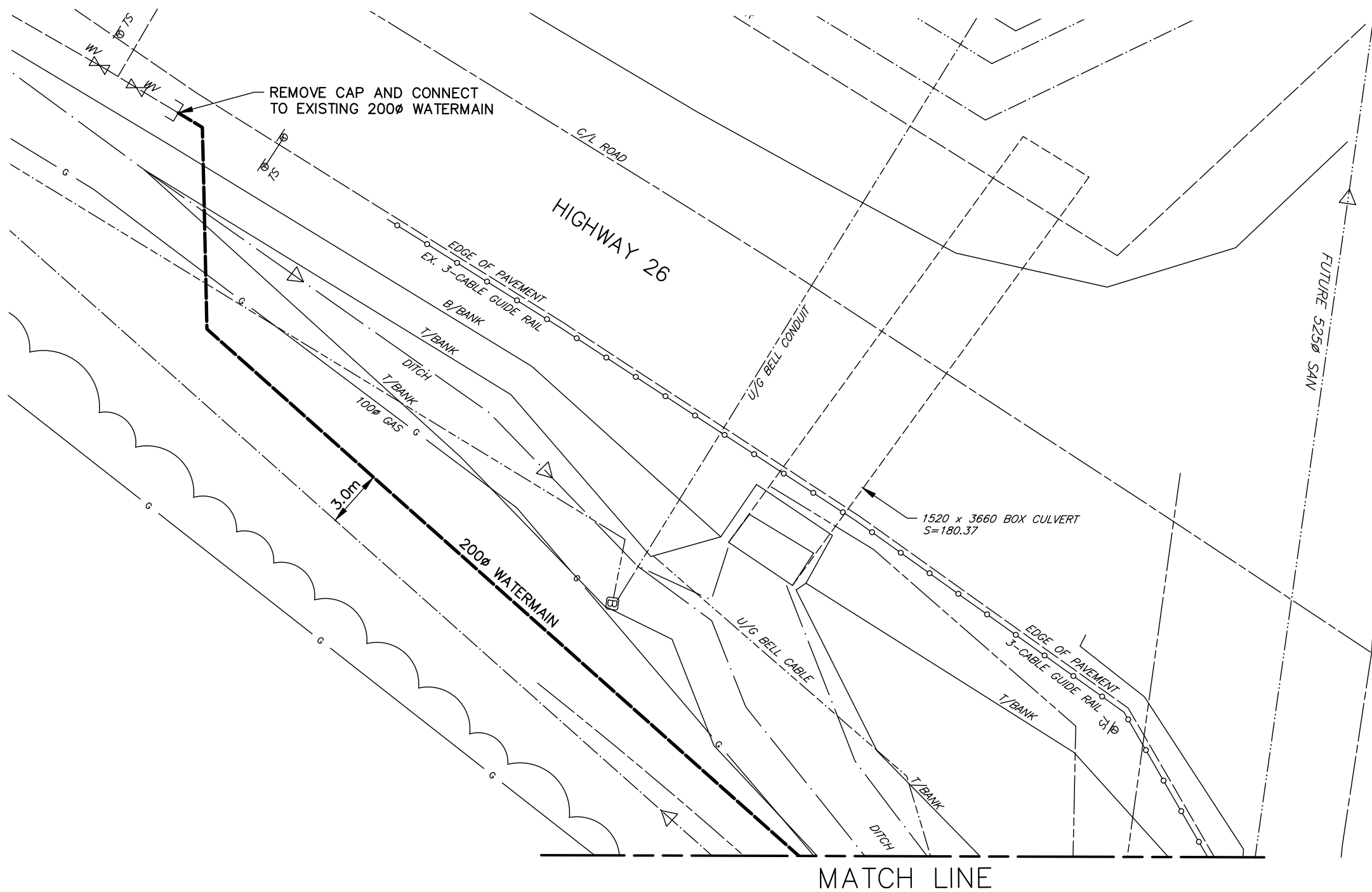
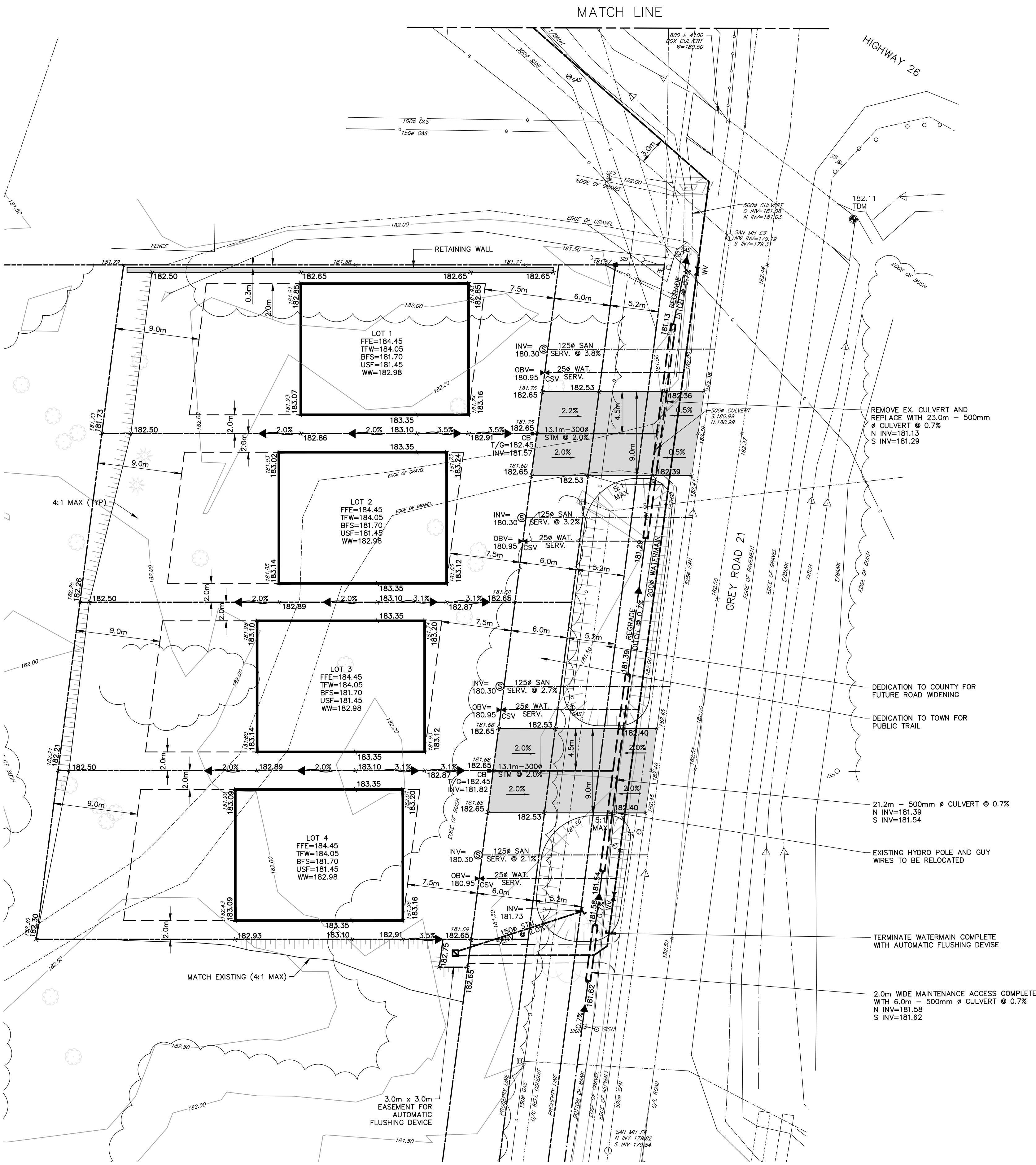
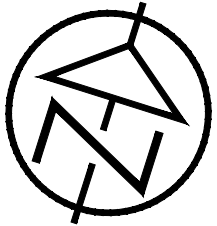


TOBM FLOW MONITORING
Figure 5: Flow per Residential Unit





KEY PLAN (NOT TO SCALE)



DISCLAIMER AND COPYRIGHT

CONTRACTOR MUST VERIFY ALL DIMENSIONS AND BE RESPONSIBLE FOR SAME. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER BEFORE COMMENCING WORK. DRAWINGS ARE NOT TO BE SCALED.

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BENCHMARKS

TBM#1 - ELEVATION 182.11m
ELEVATIONS HEREON ARE GEODETIC AND REFER TO THE CUT CROSS ON NORTH CORNER OF CULVERT ON EAST SIDE OF GREY COUNTY RD 21, SOUTH OF HWY 26 INTERSECTION.

NOTES

LEGAL SURVEY INFORMATION AND LOT DIMENSIONS SHOWN ON THIS PLAN ARE TAKEN FROM A SURVEY PLAN PREPARED BY J.D. BARNES LTD., DATED 12/02/2021, WHICH MAY NOT BE FINAL AND ARE NOT GUARANTEED. THE FINAL REGISTERED PLAN SHALL BE REFERRED TO FOR CONFIRMATION OF THE DATA.

TOPOGRAPHIC INFORMATION ON THE PLAN TAKE FROM A SURVEY PREPARED BY TATHAM ENGINEERING DATED FEBRUARY 9, 2022.

No.	REVISION DESCRIPTION	DATE	ENGINEER STAMP

DRAFT

372 GREY ROAD 21
TOWN OF THE BLUE MOUNTAINS



SITE DEVELOPMENT PLAN

DESIGN: MG	FILE: 121088	DWG:
DRAWN: MG	DATE: MAR 2022	SD-1
CHECK: JPA/RS	SCALE: 1:250	