

Prepared By:



## Servicing Feasibility Study

Chapman's Ice Cream Production Addition  
Northerly Addition to Main Plant  
West Grey / Grey Highlands, ON

Chapman's Ice Cream Limited

**GMBP File: 215158**

**August, 2021**

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APPENDIX A: FIRE FLOW EVALUATION REPORT - Leber-Rubes Code Consultants

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**CHAPMAN'S ICE CREAM PRODUCTION ADDITION  
NORTHERLY ADDITION TO MAIN PLANT**

**SERVICING FEASIBILITY STUDY**

**AUGUST, 2021**

**GMBP FILE: 215158**

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## **1. INTRODUCTION**

David Chapman's Ice Cream Limited (Chapman's) proposes to construct an 8400 m<sup>2</sup> (90,000 sq.ft.) freezer and production addition to the existing main ice cream production facility in the Municipality of Grey Highlands, Markdale, ON. The proposed addition would extend the main production facility northerly beyond the current municipal border into the Township of West Grey, onto other lands also owned by Chapman's. The planning process requires an Official Plan Amendment (OPA) and a Zoning By-Law Amendment (ZBA).

The existing development utilizes dual systems for water supply and wastewater management. Water supply is separated into domestic / production flows and fire flows. Domestic / production water flows are metered. Fire flows are delivered by the municipal system to an on-site storage reservoir and fire pumping station. Wastewater flows are separated into production flows and domestic flows. Production wastewater is directed to an on-site wastewater treatment plant, prior to discharging either to the municipal sewer system, or evaporating via a Reverse Osmosis (RO) system through rooftop condensers. Flows from the wastewater treatment plant to the municipal sewer are metered. Domestic flows to the municipal sewer are not metered. The volume and strength (Biochemical Oxygen Demand; BOD) of discharge flows from the wastewater treatment plant are subject to an Agreement between Chapman's and the Municipality.

In support of the Official Plan and Zoning By-Law Amendment applications for this proposed addition, the Municipality of Grey Highlands requested a Servicing Feasibility Study to confirm that the sanitary and water servicing is adequate.

## **2. BACKGROUND**

The Chapman's property includes the main peanut-free production facility (Phoenix), a second non-peanut free production facility (Nut House) and a wastewater treatment facility (Waste Treatment). Records received from Chapman's indicate that influent water is metered at five locations, as follows:

- i) 3 Production Flow Meters at Phoenix,
- ii) 1 Domestic Flow Meter at Phoenix, and
- iii) 1 Combined Production & Domestic Flow Meter at Nut House.

Additionally, production wastewater is metered as it is discharged from the on-site wastewater treatment facility to the municipal sewer system.

In 2017, Chapman's constructed a 90,000 sq.ft. addition, which is expected to be similar to the currently planned addition. Flow records from 2016 through 2020 are available, which may be used to approximate increased servicing demands for the proposed addition.

### 3. WATER SYSTEMS

#### 3.1 Domestic and Production Flows

Water inflows from the municipal water distribution system are metered at three locations:

- 1) Main Production
- 2) Phoenix Domestic
- 3) Nut House Production

The following Table 1 summarizes metered inflows to Chapman's facilities from 2016 to 2020.

**TABLE 1 – Metered Water Flows (m<sup>3</sup>/year)**

Year	Phoenix Main	Phoenix Domestic	Nut House Main	Nut House Domestic (Est)	Total
2016	144,180	9,960	20,832	2,478	177,450
2017	138,864	10,896	19,788	2,478	172,026
2018	162,480	12,672	21,672	2,478	199,302
2019	170,004	18,145	23,364	2,478	213,991
2020	154,812	12,732	19,548	2,478	189,570

The average total water consumption, pre-addition, for 2016 and 2017, prior to the previous addition, is 174,738 m<sup>3</sup>/year. The average total water consumption, post-addition, for 2018 through 2020 is 200,954 m<sup>3</sup>/year. Therefore, the planned addition is expected to increase water demand by about 26,200 m<sup>3</sup>/year (72 m<sup>3</sup>/day).

#### 3.2 Fire Flows

Chapman's retained Leber-Rubes (LRI) Code Consultants to review the fire flow requirements for the entire production facility, including the planned addition. Their report, included as **Appendix A**, indicated that "...it is reasonable to assume only one sprinkler system in one building will activate at a given time." The highest demand sprinkler system is identified as the system that was installed with the 2018 freezer addition and, therefore, the required fire flow rate would be 2631 USgpm at a pressure of 89.3 psig.

At the time of the original Phoenix building construction, an on-site fire storage reservoir and dedicated fire pumping station were constructed to provide fire flows to the internal sprinkler systems and to the fire protection yard piping and hydrants.

The existing fire storage reservoir has a capacity of 15m x 15m x 5m = 1,125 m<sup>3</sup>, which may be augmented by a 200 mm Ø municipal watermain, which feeds the reservoir from "A" Street.

The existing fire pumping station can provide a flow rate of 2000 USgpm (0.126 m<sup>3</sup>/s) at a hydraulic head of 120 psi (84 m head). LRI has verified the existing fire pump and on-site storage volume are adequate.

The fire pumping station delivers flow via a 300 mm Ø dedicated fire protection watermain to a cross, which then feeds 3 x 250 fire mains. One branch feeds directly to the original Phoenix building sprinkler system. The other two branches feed fire protection loops which surround each of the Phoenix and Nut House buildings, and additional sprinkler systems in the 2018 Phoenix freezer addition and the Nut House. Forest City Fire Protection has verified that the on-site supply is adequate for the sprinkler systems.

#### 4. WASTEWATER SYSTEMS

The Chapman's facilities are serviced by two wastewater conveyance systems; one for production wastewater and one for domestic wastewater. Production wastewater is directed from each of the Phoenix and Nut House facilities to various pumping stations, which deliver flows by forcemains to the on-site wastewater treatment building, where a sequential batch reactor (SBR) provides pre-treatment. Effluent from the SBR is divided into two streams; one to a Reverse Osmosis (RO) system for disposal through evaporation via rooftop condensers and one to the municipal sanitary sewer system. The volume of wastewater permitted to be discharged to the municipal sewer system is governed by an Agreement at an average of 360 m<sup>3</sup>/day, or 131,400 m<sup>3</sup>/year.

Chapman's has provided metered inflow water rates and metered effluent rates from the waste treatment plant to the municipal sewer. In addition, to the water inflows, certain chemical uses are added to the total inflow. In addition to the metered effluent, estimates of mix consumption, RO recycled water and evaporation/cooling tower usage are factored into the effluent discharge total. Based on the information provided by Chapman's, the following **Table 2** summarizes the estimated total wastewater flows from the site for 2016 through 2020.

**TABLE 2 – Estimated Total Sewage Flows (m<sup>3</sup>/year)**

Year	Estimated Total Flow	Percentage of Agreement
2016	102,056	78%
2017	101,644	77%
2018	121,998	93%
2019	136,439	104%
2020	111,356	85%

Based on the data provided in **Table 2**, the pre-addition 2-year (2016 & 2017) average total volume of effluent to the municipal sewer system is 101,850 m<sup>3</sup>/year, or 77.5% of the 131,400 m<sup>3</sup>/year volume noted in the Agreement. The post-addition 3-year (2018 to 2020) average total volume of effluent to the municipal sewer system is 123,264 m<sup>3</sup>/year, which is 93.8% of the volume noted in the Agreement. Based on the increase of post-2017 addition over pre-2017 addition, the proposed new addition would add 21,400 m<sup>3</sup>/year to the current total average effluent flow, for a predicted total annual flow rate of 144,678 m<sup>3</sup>/year, or 110% of the volume noted in the Agreement. Chapman's estimates the new addition would add 75 m<sup>3</sup>/day, or 27,375 m<sup>3</sup>/year to the current loading, for an estimated total of 155,784 m<sup>3</sup>/year. Although either of these estimates would exceed the volume in the Agreement, Chapman's intends to expand the existing RO system and evaporate the additional wastewater to maintain flows within the allotment provided in the Agreement.

#### 4.1 Domestic Wastewater Flows

Domestic wastewater flows from the previous addition will need to be relocated, as the new addition will occupy the current servicing corridor. The new addition will require additional domestic wastewater servicing.

Interior Plumbing design is expected to be completed by a licensed plumber and/or Mechanical Engineer at the time of a Building Permit application.

### 5. SUMMARY

The proposed 90,000 sq.ft. addition is expected to increase water usage by about 26,200 m<sup>3</sup>/year (72 m<sup>3</sup>/day). The existing on-site fire protection system is adequate to support the proposed addition.

The proposed new addition would add 21,400 m<sup>3</sup>/year to the current total average effluent flow, for a predicted total annual flow rate of 144,678 m<sup>3</sup>/year, or 110% of the volume noted in the Agreement. Although this volume would exceed the volume in the Agreement, Chapman's intends to expand the existing RO system to evaporate the additional wastewater to maintain flows within the allotment provided in the Agreement.

All of which is respectfully submitted,

GM BLUEPLAN ENGINEERING LIMITED

Prepared by:

A handwritten signature in blue ink, appearing to read 'John Slocombe'.

John Slocombe, P. Eng.

**APPENDIX A:**  
**FIRE FLOW EVALUATION REPORT - LEBER-RUBES CODE**  
**CONSULTANTS**



**FIRE PROTECTION  
& BUILDING CODE**  
ENGINEERS • SINCE 1986

July 28, 2021

Joe Jacobs  
Chapman's Ice Cream  
P.O. Box 379, 100 Chapman's Cres.,  
Markdale, ON N0C 1H0

**EMAIL:** jjacobs@chapmans.ca

Dear Joe:

**RE: CHAPMAN'S ICE CREAM – WATER SUPPLIES FOR FIRE FIGHTING  
LRI FILE 27635**

LRI evaluated water supplies for firefighting for the original Phoenix Building and Nut House in 2010. The results of this evaluation were presented in a letter report dated February 24, 2010.

As advised by Chapman's Ice Cream (CIC), both buildings have been expanded. LRI has been requested to review the water supplies that are required for fire fighting for the expanded buildings. A site plan of the expanded buildings is appended for reference purposes.

Our review of water supplies for firefighting has been limited to those buildings that are on CIC's fire water supply. As advised by CIC, the village of Markdale supplies water for the Dry Storage Building. On the basis, we have excluded it from our review.

The sprinkler water demand for each sprinkler design area has been reviewed on Forest City Fire Protection's (FCFP) drawings for the following buildings or portions thereof:

1. Phoenix Building,
2. First addition to Phoenix Building,
3. Proposed second addition to Phoenix Building,
4. Nut House,
5. First addition to Nut House,
6. Second addition to Nut House.

CIC have not started designing the proposed second 90,000 square foot addition to the Phoenix Building. Nevertheless, they recommended our water supply calculations be based on the first 90,000 square foot addition that they commissioned in 2018.

Our mandate as it was in February of 2010 is to compare the water supplies available from Markdale's municipal water supply system to the water supplies required by the Ontario Building Code (OBC).

Water supplies for firefighting that are available from Markdale's municipal water supply system are derived from the November 2009 water flow and residual pressure test on the nearest municipal hydrant. As advised by CIC, this is the most recent test.


The Phoenix Building and the Nut House are sprinklered. Hence water supplies required by the Ontario Building Code (OBC) are derived from the water demand for the buildings' sprinkler systems. It is reasonable to assume only one sprinkler system in one building will activate at a given time. Hence the water supplies that are required by the OBC are based solely on the sprinkler system that has the highest water demand. The south freezer in the 2018 addition to the Phoenix Building has the highest water demand.

A comparison of the water supplies is tabulated below.

<b>Water Supply Parameter</b>	<b>Municipal Water Supply Available</b>	<b>Municipal Water Supply Mandated by OBC</b>
Flow Rate (US Gallons per Minute)	1,216	2,631
Residual Pressure (psig)	37	89.3
Capacity of CIC's On-Site Water Reservoir (US gallons)	290,000	0

On these bases, the municipal water supply would be required to provide a minimum flow rate of 2,631 US gallons per minute at a residual pressure of 89.3 psig in order to waive the OBC requirement for a water reservoir on Chapman's site.

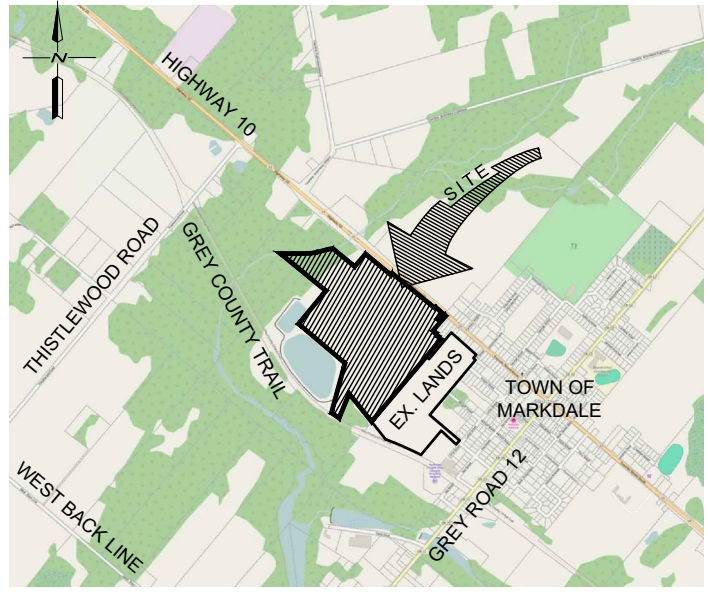
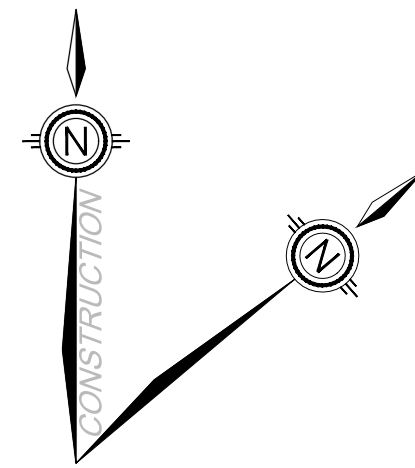
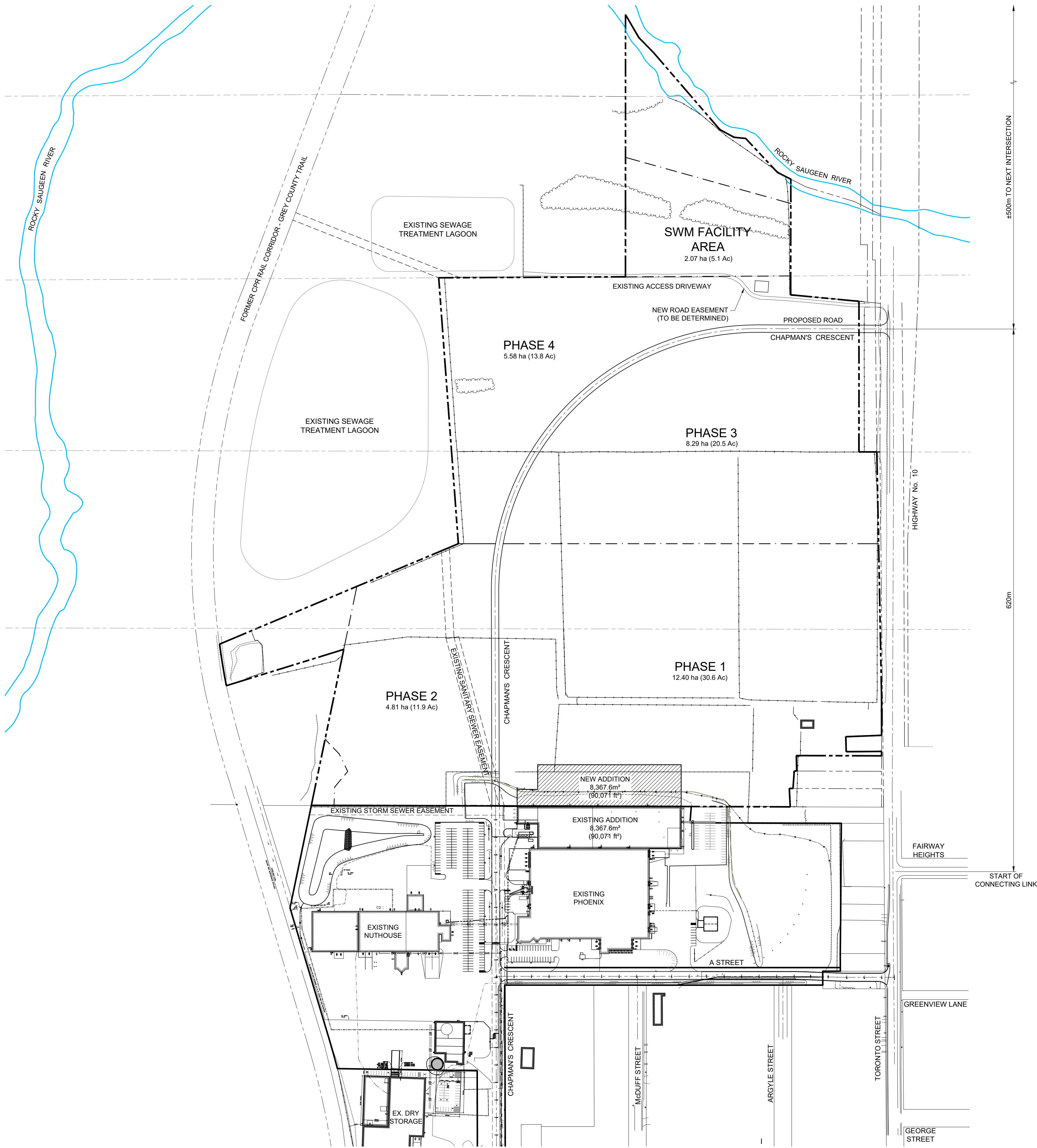
Yours truly,  
**LRI ENGINEERING INC.**

  
Paul Wagner, P. Eng.  
Senior Associate

Reviewed by,  
**LRI ENGINEERING INC.**

  
Mohammad Dadgardoust, P. Eng.  
Senior Associate

FILE C:\GIS\3D Projects\11158 Conceptual Site Plan\11158 Conceptual Site Plan.dwg  
11/20/2021 2:28:32 PM  
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MUNICIPALITY OF WEST GREY/  
MUNICIPALITY OF GREY HIGHLANDS  
**KEY PLAN**  
NOT TO SCALE

NOTES :  
1. LEGAL SURVEY INFORMATION BASED ON PLAN OF SURVEY  
OF PARTS OF LOTS 94, 95, 96 AND 97, CONCESSION I,  
SOUTHWEST OF THE TORONTO AND SYDENHAM ROAD,  
TOWNSHIP OF GLENELG, COUNTY OF GREY, PLAN No. 59357,  
DATED OCTOBER 3, 1968.

LEGEND :  
--- SUBJECT PROPERTY BOUNDARY  
--- ORIGINAL PROPERTY BOUNDARY  
--- PROPOSED DEVELOPMENT  
--- PHASE BOUNDARY

BENCHMARKS :

THE POSITION OF POLE LINES, CONDUITS, WATERMANS, SEWERS AND OTHER  
UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY  
SHOWN ON THE CONTRACT DRAWINGS, AND, WHERE SHOWN, THE ACCURACY OF  
THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED.  
BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM HIMSELF OF THE  
EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL  
ASSUME ALL LIABILITY FOR ANY DAMAGE TO THEM.

**PRELIMINARY  
NOT FOR CONSTRUCTION**

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TEL. 519-378-1805 www.blueplan.ca

ADDITIONAL LANDS			
CHAPMAN'S ICE CREAM			
MUNICIPALITY OF WEST GREY AND MUNICIPALITY OF GREY HIGHLANDS			
CONCEPTUAL OVERALL SITE PLAN AND ZONING PROVISIONS			
DRAWN BY: K.B.	APPROVED BY: J.B.S.	PROJECT NO.: 215158	DRAWING NO.: 4
DESIGNED BY: J.B.S.	DATE: JANUARY 2021	SCALE: 1:2,500	

**From:** [Paul Wagner](#)  
**To:** [Joe Jacobs](#); [John Slocombe - GM BluePlan](#)  
**Subject:** RE: 215158 27635 CIC - Comparative Analysis of Water Supplies for Fire Fighting for Expanded Buildings  
**Date:** Tuesday, August 03, 2021 10:17:07 AM  
**Attachments:** [image001.jpg](#)  
[image002.jpg](#)  
[image003.jpg](#)  
[image004.jpg](#)  
[image005.jpg](#)  
[image006.jpg](#)  
[image007.jpg](#)  
[image008.jpg](#)  
[image009.png](#)

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Good morning Joe,

The fire pump information is adequate for the 2018 addition to the Phoenix Building.

It is understood the proposed 2022 addition will be further away from the fire pump and reservoir than the 2018 addition. Hence, the pressure drop across the sprinkler piping serving the 2022 addition will likely be higher than for the 2018 addition. Hence we cannot comment on the adequacy of the existing fire pump for the 2022 addition until FCFP performs their hydraulic calculations for it.

Let me know if you have any questions.

**Paul Wagner, P.Eng.**

Senior Associate

**LRI Engineering Inc.**

416.515.9331 ext. 344 | F: 416.515.1640

170 University Avenue 3<sup>rd</sup> Floor Box 1 Toronto M5H 3B3

[pwagner@lrifire.com](mailto:pwagner@lrifire.com) | [www.LRiFire.com](http://www.LRiFire.com)

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*Due to the COVID-19 pandemic, LRI staff are working from remote locations and will continue to operate to provide the quality service you expect.*

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**From:** Joe Jacobs <jjacobs@chapmans.ca>

**Sent:** Thursday, July 29, 2021 4:57 PM

**To:** John Slocombe - GM BluePlan <John.Slocombe@gmblueplan.ca>; Paul Wagner <pwagner@lrifire.com>

**From:** [Andy Coghlin](#)  
**To:** [Al Vanderlaan](#); [Joe Jacobs](#)  
**Cc:** [John Slocombe - GM BluePlan](#); [Dan Bird](#)  
**Subject:** RE: Chapman's Ice Cream Fire Suppression  
**Date:** Tuesday, May 18, 2021 9:26:30 PM  
**Attachments:** [image002.jpg](#)  
[image003.jpg](#)  
[image004.jpg](#)  
[image005.jpg](#)  
[image006.jpg](#)  
[image007.jpg](#)  
[image008.jpg](#)

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Hi Joe,

I can confirm Al's comments, the existing water supply will be adequate for the sprinkler demand for your new addition.

The OBC fire flow calculations for fire-fighting water is a different calculation that we don't do, but I'm assuming this was done back with the original build.

I'm guessing you're just asking us about the sprinkler demand and we can confirm you are good there.

Feel free to call me with any questions or concerns.

Thanks,  
Andy

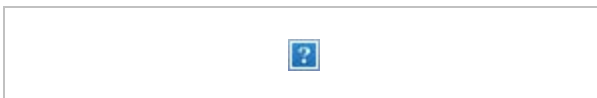
Andy Coghlin

Vice President

NSD

P: 866.798.1154 M: 519.476.0761

[www.northernsprinklerdesign.com](http://www.northernsprinklerdesign.com)



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**From:** Al Vanderlaan <al@fcfp.ca>  
**Sent:** May 17, 2021 5:40 PM  
**To:** Joe Jacobs <jjacobs@chapmans.ca>  
**Cc:** John Slocombe - GM BluePlan <John.Slocombe@gmblueplan.ca>; Dan Bird <danb@fcfp.ca>; Andy Coghlin <acoghlin@northernsprinklerdesign.com>  
**Subject:** RE: Chapman's Ice Cream Fire Suppression

Good day Joe,

Yes I am keeping safe although itching to be done with this lockdown!. Hope you and yours are as

well. Congrats on the next addition as well!

As far as fire protection is concerned, I can only comment on the sprinkler water requirements and I can safely say that the water supply will be adequate to protect a 2<sup>nd</sup> 90,000 sq. ft. addition, assuming that the new addition will be built in much the same manner (building height being the key factor) and for the same / similar usage. The reservoir and fire pump would be adequate for this.

However, if you are asking me to comment on fire fighting water, I cannot comment on that. That is typically done by an architect or code consultant. (Hence LRI originally). We can provide you with some contacts if this is needed but as it is unfortunately beyond our expertise. I have copied in Andy from our design team as he may be able to enlighten us more.

Regards,

**Al Vanderlaan**

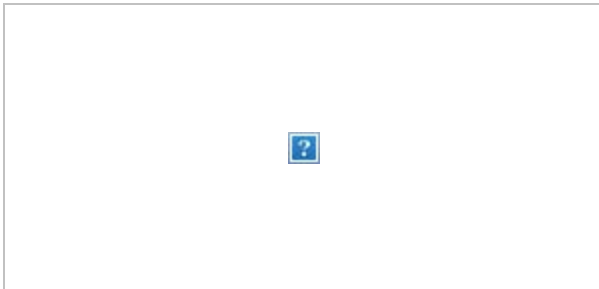
Director of Estimating

FCFP

London, Windsor, Cambridge, GTA, Ottawa, Winnipeg

P: 800.755.0962 M:519.476.0625

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**From:** Joe Jacobs <jjacobs@chapmans.ca>

**Sent:** Friday, May 14, 2021 3:34 PM

**To:** Al Vanderlaan <al@fcfp.ca>

**Cc:** John Slocombe - GM BluePlan <John.Slocombe@gmblueplan.ca>; Dan Bird <danb@fcfp.ca>

**Subject:** Chapman's Ice Cream Fire Suppression

Good day Al,

Hope you are keeping safe.

Chapman's is considering embarking on yet another 90,000 sq.ft. addition to the existing Phoenix 1 and 2 building. We are currently in the process of rezoning the land north of our current location.