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Hydrogeological Assessment and Water Balance Study – Proposed Mixed Use Development at 76 Bryne Drive, Barrie, Ontario

Palmer Project # G€€I Í €GÁ

Prepared ForT \(\hat{\mathre{H}}\hat{\mathre{H}}\hat{\mathre{O}}^c\n^{\big|} \] { \(\hat{\mathre{A}}\hat{\mathre{Q}} \hat{\mathre{A}}\hat{\mathre{A}} \hat{\mathre{A}} \hat{\mathre{A}} \)



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Á Þ[ç^{ à^!ÁFGÉÄG€G€Á Á T¦ÉÄÜæ(ÁÖáÑÖ!^*[¦ã[ÁÁ TËRÜRÜRÁÖ^ç^|[]{ ^} • ÁQ&EÁÁ ÍÏÂÜā[]•[}ÁÜåÉÁ Ó[|d[}ÉÁUÞÁ ŠĨÒÁIRÏÁÁ Á Ö^æÁT¦ÉÄÖãÁÖ!^*[¦ã[ÁÁ Á

Re: Hydrogeological Assessment and Water Balance Study – Proposed Mixed Use

Commercial and Residential Building and Parking Lot at 76 Bryne Drive, Barrie,

Ontario

Project #: 2004502

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1. Introduction

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1.1 Scope of Work

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- •Á Ü^çã^, Ás@ ÁŒŒŒÁÖæç¦[&Á^[c^&@; a&æÁş]ç^•cã ææã]}Á[¦ÁiÎÁÓ¦^}^ÁÖ¦ãç^Ás],&|`åā]*Ás@^^ÁQ+DÁ {[}ãí|ā|*Á,^||•LÁ
- $\bullet \acute{A} \ \, \ddot{O} \ \, \mathring{O} \ \, \mathring{A} \ \, \mathring$
- •Á Ö^¢\{ ā,^Ás@Á@å\æĕ|æZÁ&[}å*8sāpācÁ,-Ás@Áæĕřã^\Á,æe^\áæ¢+Ás@[**@Á&[{]|^cā,*Á;ā,*|^Á,^||Á \^•][}•^Áe^•¢-ÁzÃèÈÉA|**Áe^•¢DLÁ
- •Á Ò•cā[æe^Ás@·Á&[}•dˇ&cā[}Ás^¸æe^¦ā]*Áæe^•Áse}åÁ¸![çãā^Á^&[{ { ^}åæeā[}•Á[¦ÁseÁÚVVYÁ[¦ÁÖOEÜÜÁ • ˇà{ã•ā[}Á[ÁT ÒÔÚÁ[¦Á&]}•dˇ&cā[}Ás^¸æe^¦ā]*LÁÁ
- •Á Ú¦[çãā^ÁæÁãvË;ãã^Áj¦^Ëā^ç^|[]{^}oÁgÁj[•dËā^ç^|[]{^}oÁgÁsæÞæð;&^Ás@^Á;ææ^¦Ái`}[~Áæð;åÁ āj-ājdæāj}LÁæð;åÁ
- $\bullet \hat{A} \quad \hat{U} = \hat{A} \quad \hat{A} = \hat{A} \quad \hat{A}$





2. Hydrogeological Conditions

2.1 Regional Conditions

2.1.1 Physiography, Geology, and Hydrogeology

 $V@\dot{A}\tilde{a}c^{\dot{A}}\tilde{a}c^{\dot{A$

\text{CE\\cap\\alpha\alpha\alpha\\alpha\\alpha\\alpha\\alpha\\alpha\\alpha\\alpha\\alpha\alpha\\alpha\\alpha\\alpha\\alpha\\alpha\\alpha\\alpha\\alpha\\alpha\alpha\\alpha\\alpha\\alpha\\alpha\alpha\alpha\\alpha\\alpha\alpha\alpha\alpha\alpha\alpha\\alpha\\alpha\alpha\alpha\alpha\al

 $V@\dot{A}^* \vdash = 38\ddot{a}a + \dot{A}^* \mid a = 3a^* + \dot$

 $V@A_{a}^{a}|[8\lambda A_{a}^{b}A_{c}^{c}A_{$

2.1.2 Drainage

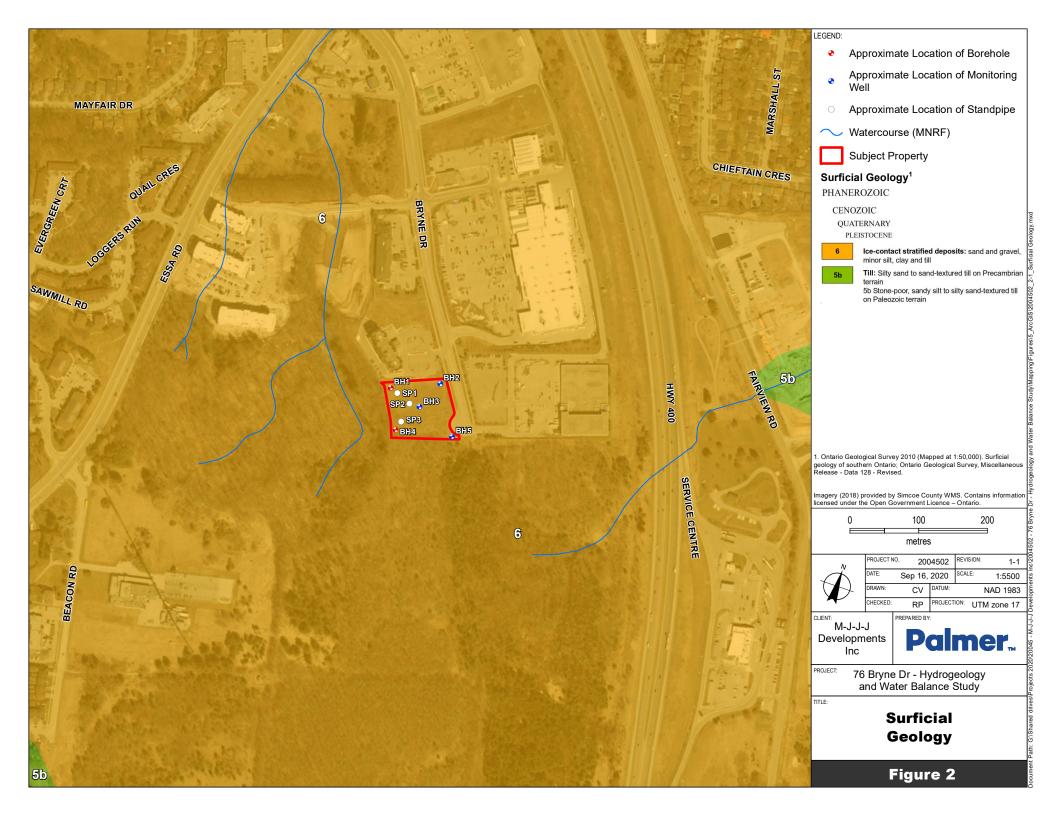
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Á Á Á Á

 $V@\dot{A}\ \tilde{a}c^{\dot{A}}\ (\&aec^{\dot{a}}\ \dot{A}\ \tilde{a}c@)\ \dot{A}c@\ \dot{A}c@\dot{A}c^{\dot{A}}\ \dot{a}e^{\dot{A}c}\ \dot{a}c^{\dot{A}c}\ \dot{a}c^{\dot{A}c}\$

 $V@\acute{A}~\tilde{a}r\acute{A}s\acute{A}l~8aer^{a}\acute{A}~\tilde{a}c@s\acute{A}r[~c&@~\tilde{a}\bullet\acute{A}Ol^{\wedge}\backslash\acute{A}r~\dot{a}E~eer^{l}\bullet @~a\acute{A}ses~\dot{a}\acute{A}s~$

V@ÁārÁarÁarÁ[&æeråá∱r••Ás@e)ÁGHĬÁ{Ár[`c@Á,^•oÁ,ÃSæb^ÁÛā[&[^Áæp}åÁæpÁ;}Á@at@\Ár]rçææā[}Ás@enÁæd]^æbéÁt[Á •|[]^Át[;æbåÁs@Áæb^ÈÁv@Ár|rçææā[}Á;^æbÁææÁs@ÁarÁæÁæ]*)åÁGU€Á;^d^•Áææà[ç^Ár^æÁr°ç^|ÁQ;æe|DÉAs@Á ^|rçææā[}Áså^&k^æ*^•Át[Áæb[`}åÁGFÏÁ;æe|ÁææÁSæb^Ár°ç^|ÈÁ Á





2.2 Water Wells

Óæ•^åÁį}ÁT ÒÔÚÁ, ææ^¦Á, ^||Á^&[¦å•Éðs@·¦^Áæ+ÁHFÁ, ^||Á^&[¦å•Á, ão@ặÁ, €€Á, Á, Ás@ Á ãc^ÁÇTable 1 æ) åÁ
Figure 3 ŪÁOE Ás@ Áæ+ æðá Áå^ç^|[]^åÁæ) åÁr^¦çã&^åÁ, ão@Á; ˇ}ã&āj æþÁ, ææ^¦ÉĎ,[Áæ&cãç^Á,[cæà|^Á, ææ^¦Á, ^||•Áæ+Á
^¢]^&c^åÁ,^æÁs@Á ãc^ÉÁ

Table 1. MECP Water Well Records

Well ID	Date Complete	Depth	Static Water Level (mbgs)	Recommended Pumping Rate (gal/min)	Use
ÍÏ∉FÍGÎÁ	FJÍÍËÐEH€Á	ÍHÈÁ	l ŒÁ	ÍÁ	Ö[{ ^•æ&Á
ÍÏ€FÍGÏÁ	FJÍÍËEÎËEJÁ	Ġ Á	GGEÌÁ	GĚÁ	Ö[{ ^•a&Á
ÍÏ € FÍ GJÁ	FJ΀ËEFËFÍÁ	G€ÈÄÁ	FŒLÁ	îÁ	Ö[{ ^•æ&Á
ÍÏ€FÍH€Á	FJ΀ËEÎËGHÁ	FŒÁ	€Á	ËÁ	ËÁ
ÍÏ€FÍHFÁ	FJÎIË≣GËGÌÁ	FÎ È Á	JÈĖÁ	F€Á	Ùq[&\£Ö[{^•ca&Á
ÍÏ€FÍHIÁ	FJÍJË€JËGHÁ	HHÈÁ	G ĐÁ	F€Á	CJ∂rænaj}Á
ÍÏ€FÍHÍÁ	FJÍJËF€ËEÍÁ	ΙΗĒΙΆ	FÌ ÈHÁ	I € Á	CJ a*aca[a]}Á
ÍÏ€FÍHÎÁ	FJ΀ËÊÎËEFÁ	ΙΙĚÁ	FÌ ÈHÁ	΀ÆÉÁÁ	Ù^¦çã&^ÁÔ^}d^ÁÁ
ÍÏ€FÍIFÁ	FJÎÍË EHËC GÁ	ΙÍĖ̈́Á	G ĐÁ	ΘÁ	Ù^¦çã&^ÁÔ^} &\
ÍÏ€ÌGÌGÁ	FJÏ FËEÍËGÍÁ	ΗÌĖÁ	GHÈÀÁ	F€Á	Ö[{^∙aã&Á
ÍÏFHÌÌIÁ	FJÏÎËF€ËGGÁ	ΪΙĖ̈́Á	IHÈÁ	ÌÁ	Ô[{{^\&ãad,ÁDÁÖ[{^•cã&Á
ÍÏFIJĠÁ	ËÁ	ΪĒΑ	۱Á	ËÁ	Ö[{^∙aã&Á
ÍÏĠFÍFÁ	FJÌJËFGË€ÍÁ	FÍ È Á	JÈÁ	GÁ	Ö[{^∙æ&Á
ÍÏĠÏÎÎÁ	FJÌJË€JËH€Á	ÍÍÈÁ	ΙÌÈCÁ	îÁ	Ö[{^•a&AÁ
ÍÏHÏJHJÁ	G€€HËEÍËEÍÁ	HHÈCÁ	ŒŤÁ	ŒÁ	Ö[{^•a&A
ÏFĠÌÎFÁ	G€€JËEÍËFGÁ	GÎ Á	GHÁ	ËÁ	V^∙oÁP[^ÁÐÁT[}ã{¦ã,*Á
Ï FGÎ Ì Î FÁ	G€€JËEÍËFGÁ	€Á	ŒÁ	ËÁ	V^∙oÁP[^ÁÐÁT[}ã{¦ã,*Á
Ï FI €€€JÁ	G€JËF€ËJÁ	GΈÁ	GHLĚÁ	ËÁ	V^∙oÁP[^ÁÐÁT[}ãa[¦āj*Á
Ï FI €€€JÁ	G€€JËF€ËGFÁ	ËÁ	G€ÈLÁ	ËÁ	V^∙oÁP[^ÁÐÁT[}ã{¦ã,*Á
Ï FI €€€JÁ	G€€JËF€ËGGÁ	ËÁ	GGĒĀ	ËÁ	V^∙oÁP[^ÁÐÁT[}ã0[¦ãj*Á
Ï FI €€€JÁ	G€€JËF€ËGHÁ	ËÁ	GH Ì CÁ	ËÁ	V^•oÁP[^ÁÐÁT[}ã{¦ã,*Á
Ï FI €€€JÁ	G€€JËF€ËGÎÁ	ËÁ	GHÉÁ	ËÁ	V^∙oÁP[^ÁÐÁT[}ãa[¦āj*Á
Ï FI €€€JÁ	G€€JËF€ËGÏÁ	ËÁ	GH Ì CÁ	ËÁ	V^∙oÁP[^ÁÐÁT[}ã0[¦ãj*Á
Ï FI €€€JÁ	G€€JËF€ËGÏÁ	ËÁ	GHÉÁ	ËÁ	V^∙oÁP[^ÁÐÁT[}ãa[¦āj*Á
ÏFIÍIJGÁ	G€F€Ë€GËGHÁ	FHÈÁ	€Á	ËÁ	V^∙oÁP[^ÁÐÁT[}ã{¦ā}*Á
ΪΓΙῚΙΉΆ	G€FFË€HËGGÁ	ËÁ	€Á	ËÁ	ËÁ
Ï FÏ ŒFGÁ	G€FFËEÎËFIÁ	ËÁ	€Á	ËÁ	ËÁ
ïG€ï€H€Á	GEFHËEÏËGGÁ	ËÁ	€Á	ËÁ	T[}ã{¦ā}*Á
ïG€ï€HHÁ	GEFHËEÏ ËGGÁ	ËÁ	€Á	ËÁ	T[}ã{[¦ã,*Á
ïGHÎÎGÁ	G€FIËFGËFÎÁ	GÈÁ	€Á	ËÁ	T[}ã{[¦ãj*Á
ÏGHIÎÎНА́	G€FIËFGËFÍÁ	GÈÁ	€Á	ËÁ	T[}ã[¦āj*Á



2.3 Source Water Protection Plan

 $V@AU[~i \& Ai & ee^i Ai | ee^i Ai & ee^i Ai | ee^i Ai & ee^i Ai | ee^i Ai & ee^i Ai &$

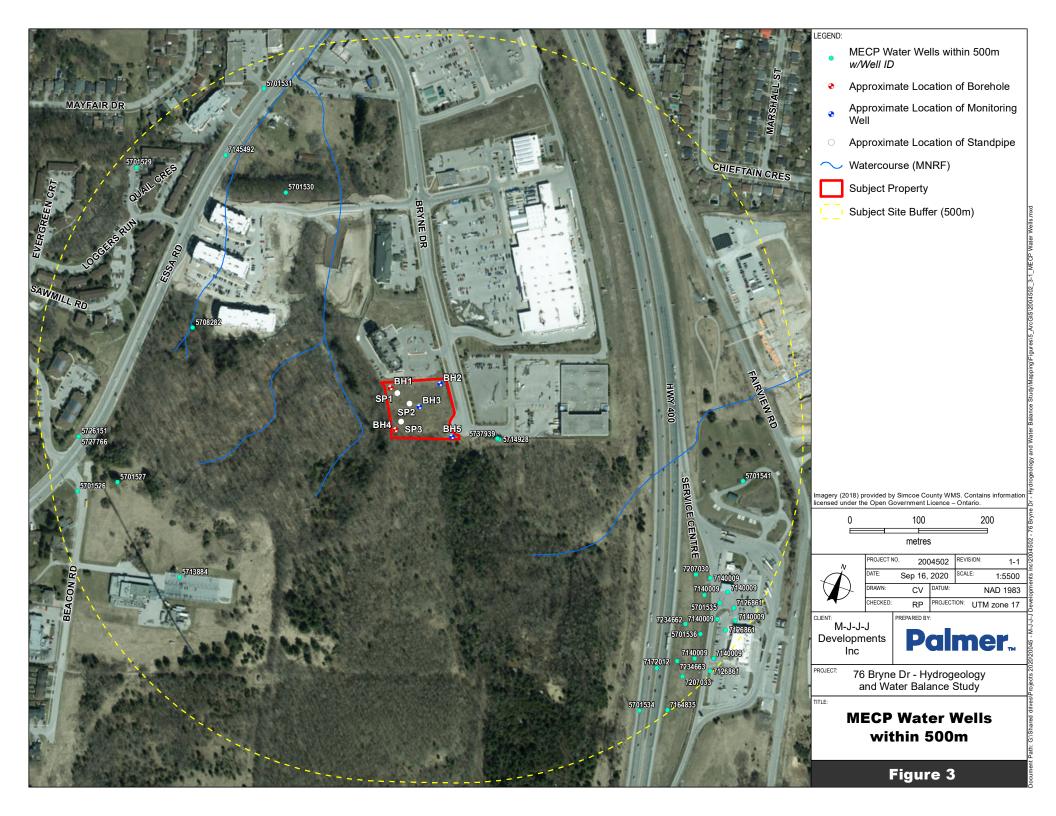
Óæ•^åÁ;}Ás@ÁÙ[ˇ|&^ÁÚ|[ơ\&cā;}ÁQ;-{|{ææā;}Á;æḍ]ā;*Ás@;}ÁsFigure 4Ēs@ÁsærÁæiÁ[&ææråá¸ás@;ÁæÁ Ü^&@ek*^ÁTæjæ²*^{} ^}ơÁŒ!^æÁÇY PÚŒÜÜŒDÈV@•^Á;[|ææð*•Á^ˇ ã^Ás@ææÁ@Á;|^ËÇÜ[[•Ó\$s^ç^|[]{^}ơÁ;æær\Á à**^ÓÆrÁ;æð;ææð;^åÁç[Ás@Ás^•Ó*¢ơ*)ơÁ;!æ&æææÞÈV@ÁsærÁæiÁæ†[Á[&ææråÁs;Áæ)ÁÙŐÜŒÁ;ás@ÁæÁçˇ|}^!ææàðæcÁ •&I!^Á;ÁÁÓ[;Áæ}ÅæÞ[Á^•dææð;}•ÁsfÁæ)åÁ••ÁsfÁæ}ÅÁ*•ÅæÅÁ;[{Ásrð;*ÆsfÆæ}ÁÙŐÜŒÐÁ

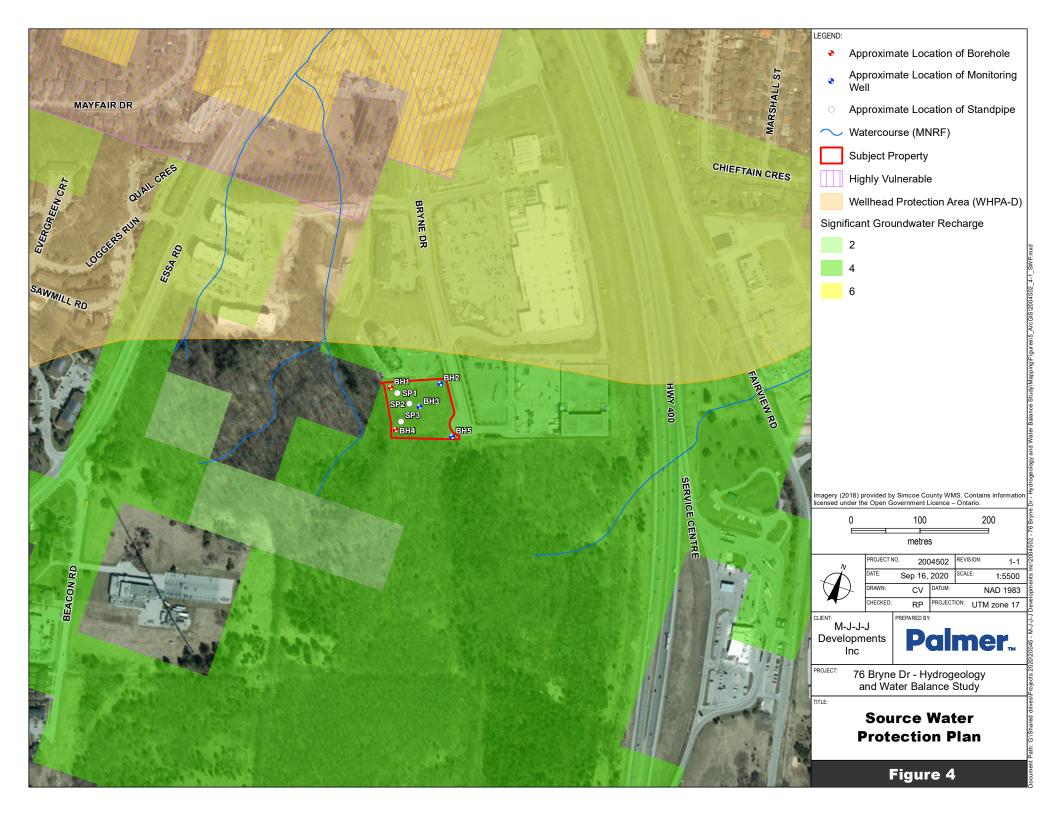
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3. Hydrogeological Investigation

3.1 Borehole Drilling and Monitoring Well Installation

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	Borehole	Stick-Up	Depth	Top of Screen	Bottom of Screen	Screened	
L		-	{ à*•Á	{ à*•Á	{ à*•Á	Geology	
	ÓP <i>Á</i> FÁ	ËÁ	F€ÌÈ€Á	ËÁ	ËÁ	ËÁ	
	ÓPÁGÁ	€ÌÌÁ	FFÈF€Á	JÈÁ	F€ÌÀ	Ùæ) åÁ	
	ÓP <i>Á</i> HÁ	€ÏÍÁ	F€ÌÈ€Á	ΪÈÁ	JÈÉÁ	Ùæ) åÁ	
	ÓPÁLÁ	ËÁ	F€ÌÈ€Á	ËÁ	ËÁ	ËÁ	
	ÓPÁ Á	€È€Á	FFÈ€Á	JÈF€Á	F€ÌÀ	Ùæ) åÁ	
	ÓPÁLÁ	ËÁ		ËÄ	ËÄ	ËÁ	

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Table 2. Borehole and Monitoring Well Installation Details

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3.2 Site Specific Hydrostratigrpahy

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 $V@\dot{A}^{\bullet\bullet}[\sigma\dot{A}_{\bullet}\dot{A}_{\bullet}] = \tilde{A}_{\bullet}\dot{A$

ÙÚFÁ

ÙÚGÁ

ÙÚHÁ



\(\text{Qx\Exi\}\) \(\text{cass}\chi\) \(\text{dass}\alpha\) \(\delta\) \(\de

3.3 Groundwater Levels and Flow

 $\begin{array}{l} Y \wedge \| \mathring{a}_{h}^{A} \| \circ \mathring{a}_{h}^$

 $V@A_{i} - A_{i} - A_$

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c@¦^Áæð;]^æð•Át;Áà^ÁæÁd[}*Áå[¸}¸æðå•Áç^¦æðæÁt;læåð?}óÁæÁx@Á*ã°ÈV@ðÁ;à•^¦çææð;}Éæd;}*Á;ãcØÁc@Á
]¦^•^}&^Á;|æðð;-¼°çæðÁ[ð;ÁæÁ*;læðð;Åæð*•Ác@æÁx@Á*ã°Áæ&æ ÁæÁ^&@æ**^Áæb^æðÁ
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July 10, **July 17**, Well Stick up Well Depth August 20, 2020 2020 2020 { à*•Á { à*•Á { à*•Á { à*•Á W}ão•Á F€ĒÏÄ F€ÈIÁ ÓPGÁ €ÈÎÁ Ö¦^ÁOÁF€ĒÏ / Ö¦^ÁOÁF€ĒÏ ÓPHÁ €ËÍÁ JÈGÌÁ Ö!^ÁO ÁJÈÈÌ Á JÈGHÁ JÈ€GÁ ÓPÍ Á €À€Á F€ĚÌÁ F€ĽÁ F€ĚIÁ F€ĚIÁ ÍÈGÁ IÈŒ€Á IÈ€IÁ ÙÚFÁ €ÈÏÁ HÈGÁ ÙÚGÁ €ÌÈ€Á ΙÈΗÁ HĚÏÁ HÊGÁ HÈÈ€Á

ΙÈÍÁ

IÈGÍÁ

IÈFÁ

€ÈÍÁ

Table 3. Groundwater Levels

ÙÚHÁ

Ö¦^ÁOÁÈÍÁ



3.4 Hydraulic Conductivity

Sample Method of K (geomean) **Borehole ID** Depth Geology D₁₀ Α K (m/s) **Analysis** (m/s) (mbgs) Ùæ}åÉA[{ ^Á ÓPÆÁ ÏÈEÉÀÈÈEÁ *¦æg^|ÉÁdæ&^Á FÈ€Á CHÌÌÁ¢ÁF€^ËÁ €ÈI GÁ • ãoÁ Pæ^}Á CHĽ GÁ¢ÁF€ŰÁ Ùæ) å Ân ãn đấ ÓPÁHÁ ÎÈF€ËË€Á T^c@ åÁ €È€JÁ €ÌÁ ÏÈHGÁ¢ÁF€^ËÁ dæ&^Á&læêÁ Ùæ)åÊkdæ&^Á ÓPÁ Á FĒ€ÜŒ€Á €ÈËÏÌÁ FÈÁ JĚÎÁ¢ÁF€[≝]Á • ãoÁ

Table 4. Estimated Empirical Hydraulic Conductivity

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3.5 Groundwater Chemistry

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V@Áæ{] | ^Ár¢&^^å^åÁæ⁄Ár@Árð[; {Ár^¸ ^!Ásã&æd** ^Áslão^!ãæÁ[!Á/[æþÁŮ*•]^}å^åÁÛ[|ãa•ÁÇVÙÙŒÁV@Á {æ¢ã[`{Ás[}&^}dæã[}Áã[ãóÁrÁrÍÁ;* EŠÁæ)åÁs@Áæá[]|^Ás[]&^}dæã[}Á¸æÁGJHÁ;* EŠÍÁQP¸^ç^!ÉÁrÁs[^•Á }[œÁr¢&^^åÁr@Áræ)ãæd*Ár^¸ ^!Á*ãá^|ã,^•ÉÁ Á



Table 5. Groundwater Sample Analyses with Criteria

	Detection Limit		aximum tration Limit		Sample				
Parameter	(DL)			Units	Sample Concentration				
	(DL)	Ù₫¦{Á Ù^,^¦Æ	· ·		Concentration				
	D.	<u> </u>							
Physical TestsÁ Ô[[ˇ├ÉÁŒE]æ^}œÁÁ ŒÁ ËÁ ÔWÁ ÎÌĒÁÁ									
Ô[[ˇ¦ÊÁCḤ]]æ\^}ơÁÁ		<u>E</u> Á	ËÁ						
Ô[}åˇ&æãçãĉÁÁ	HÈ€Á €ÌÈ€Á	ÎÈEÁÁJĚÁ		`{ @ • £3 ⟨ Á	ΙΪΗÁ				
] PÁ	€Œ€A]PÁW}ão•Á	ΪĚΙÁ				
V[cæ(AÛ~•]^}å^åAÛ[ãã•ÁÇVÙÙDÁ V~¦àãããcAÍÁ	G€A NI €€€Á	FÍÁ ËÁ	HÍ€Á ËÁ	{*£3ŠÁ ÞVWÁ	<u>293</u> €ÌÈ€Á				
V iaaaac AA				PVVA	€IF€A				
	Anions and F€Á	Nutrients	(water)	{ * E ŠÁ	GFÌ Á				
OT (I) THE AND THE PROPERTY OF	F€A €Ì€F€Á	<u>E</u> Á	ËÁ	{ "£35A { *£3ŠÁ	GFIA €ÈTIÏÁ				
OE { [} and V [contact A for DA		ËÁ	ËÁ	,	Ł€ÌF€Á				
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Ô[{] * c^ åÁÔ[} å * &cãçãc Á		-	EÁ EÁ	`ÙÐS{Á	Ι€ÌÁ				
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Ø `[¦ãã^ÁÇØDÁ	€ÈEG€Á	F€Á	ËÁ	{ *EŠÁ	€ÈÉÍ JÁ				
Pælå}^••ÁÇæ ÁÔæÔUHDÁ	ËÁ 	-	ËÁ	{ *EŠÁ	GGÌÁ				
(Q) ÁÓæþæ) &^Á	ËÁ	-	ËÁ	ÃÁ	FFÌ Á				
Šæ) * ^ ā\ ÁQ å^ ¢Á	ËÁ	-	ËÁ	ËÁ	€Á				
Þãdæ Áæð å ÁÞãd ãc Áæð ÁÞÁ	€Ì€GGÁ	-	ËÁ	{ *EŠÁ	GÈ€GÌÁ				
Þãdæ Á Çæ Á Þ DÁ	€È€G€Á	-	ËÁ	{ *EŠÁ	FËIÁ				
Þãdãc^Áqão ÁÞDÁ	€È€F€Á	-	ËÁ	{ *EŠÁ	€ÈÈÌÁ				
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U¦c@]@•]@æ^ËÖã•[ç^åÁÇæÁÚDÁ	€È€€H€Á	-	ËÁ	{ *EŠŠÁ	Ł€ŒH€Á				
VÖÙÁÇ&aq&* æe^åDÁ	ËÁ	-	ËÁ	{ *EŠŠÁ	GÍ€Á				
Ù` -æe^ÁQÙUIDÁ	€ÌH€Á	Ë	FÍ €€ Á	{ *EŠŠÁ	ÍÈÌÁ				
	ËÁ	-	ËÁ	{ ^EŠÁ	I ÈFÁ				
Ôæa¶i}ÁÙ"{Á	ËÁ	-	ËÁ	{ ^EŠŠÁ	ΙÈÎÁ				
Ôæa¶}Á,ÁŒ,ã[}ÁÓæ¢æ)&^Á	ËÁ	-	ËÁ	ÃÁ	ÌÁ				
	Organic/Inorg	anic Carb							
Öãr•[ç^åÁÔæài[}ÁØādæāi[}ÁŠ[&æaāi]}		-	ËÁ	ËÁ	ŠŒÓÁ				
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Ùāa&æÁ	€ÈFÁ	-	ËÁ	{ * £3ŠÁ	ÀĐŒÍL				
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O5;cã[[}^ÁQùàDÁÁÖã-•[ç^åÁÁ	€ÌÈE€F€Á	ËÁ	ÍÈ€Á	{ * £3ŠÁ	CIÈCCC CÁ				
OE•^} &&ÁÇCE DÁ ÁÖã•[ç^åÁÁ	€È€€F€Á	ËÁ	FÈ€Á	{ * £3 ŠÁ	€ÈE€€GJÁ				



			ximum		
Parameter	Detection Limit			Units	Sample
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Ó^¦^ ã { ÁQÓ^DÁ ÁÖã•[ç^åÁÁ	€ÌÈ€€F€Á	ËÁ	€ÈFÁ	{ * £Š Á	Ł€È€€F€Á
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Ôæ}&ã{ ÁÇÔæÐÁ ÁÖã•[ç^åÁÁ	€ÈÉÍ€Á	Á	Á	, { * £Š Á	Ì €Ì Á
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Ô[]]^¦ÁÇÔ*DÁ ÁÖã•[ç^åÁÁ	€Ì€€€€€Á	€ÈEFÁ	GÈ€Á	{ * £Š Á	€ÈE€ÌHGÁ
C[}ÁÇZ^DÁÁÖã•[ç^åÁÁÁ	€ÈEF€Á	ËÁ	Í€ÈÉÁ	{ * £Š Á	Ł€ÈEF€Á
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T [^àå^} ˇ{ÁÇT [DÁ ÁÖã•[ç^åÁÁ	€È€€€Í €Á	ËÁ	ÍÈ€Á	{ * £Š Á	€È€€€HIHÁ
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Ù^ ^}ã{ÁÇÙ^ĐÁ ÁÖã•[ç^åÁÁ	€ÌÈEEEÍ €Á	ËÁ	FÈ€Á	{ * £Š Á	€ÈE€EFÍÍÁ
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V~}*•৫^}ÁÇYDÁÁÖã•[ç^åÁÁ	€È€€F€Á	ËÁ	ËÁ	{ * EŠ Á	Ł€È€€F€Á
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Zậi&ÁÇZ}DÁ.ÁÖãi∙[ç^åÁÁ	€È€F€Á	€ÈEIÁ	GÈ€Á	{ * £Š Á	Ł€Œ€F€Á
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4. Water Balance

4.1 Pre-Development Water Balance

OZÁ, !^Ëå^ç^|[] { ^} ơÁ, ææ^!Áà` å*^oÁ, ææ Ásæ4&` |ææ^åÁ; ç^!Áo@ Áaæ^Áæ4. eð; *Áæ4. [} ơ④ Á[ðṭṭ [ã č !^Áàæ4æ) &^Á
æð;]![æ&@Áæ Áå^•&!ãà^åÁş Á/@; } ơ젤, æãæ^Áæ) åÁT ææ@!ÁQFJÍ ï DÉA/@ Á, ææ^!Áàæ4æ) &^Ásæ4&` |ææð; }Á∿•œã ææ^•Á
ææ,^!æ²^Áæ) } æþÁ°çæð; [dæ) •] ðææði; }ÁÇçæð; [!ææði; }Áæ9 åÁ; |æð; }ðá!æði; }DÁ•ð; *Áæ&ðṭ!•Á* &@Áæ•Á; [} ơ④ Á
]!^&ði ðææði; }Éæ^{}]^!ææ*!^Áæð åÁææði å^Éæ5[}*Áæ^!{ Æ&Jā; ææ^ÆåæææÁ; ^!^Á; àææði, ^åÁ+[{ Ás@ Á;^æ4^•oÁ
{ ^c^[![[* ðææþÁ ææði; }ÁṭÁæð Áæð, æðá, æðÁæð; ç^!ÁæØÁæð.
æÆði]![¢ã; ææ^Á; Æð6 Á![{ Ás@ Ác å^Áæð, æðÁ; ç^!ÁæØÁæði; |æði; }Á+[{ ÁFJÌ FÁţÁØ€F€EÁ

 $V@/Aseç^{+}ae^{+}Aseç asalacaa|^{A} = e^{+}Ae^{+}Ae^{+}ae^{+}Ae^{+}ae^{+}Aee^{+}ae$

 $V@A^{\bullet} [a] * Ab;] * ab; ae* Ai* [] * \bullet; ae* Ao@} A; ae* Ai* • a* * Ai* • a* Ai* • A$

Infiltration and Runoff Factors over Pervious Surfaces							
Øæ&q¦Á	Ô[^~&&&) ơÁ						
Ù`¦~&&&&&&#Ó^[[*^#AE#O&\EÔ[}cæ&o#\dae&&&\&AÖ^][•ão#Á</td><td>€ÌEÁ</td></tr><tr><td>X^*^cæaaaaa Aadaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa</td><td>€ÈÍÁ</td></tr><tr><td>Ù []^ÁQ€ÉĂÃDÁ</td><td>€Ì÷€Á</td></tr><tr><td>Opajkdaenaj}Á⊘ee&o[¦Á</td><td>€ÌÍÁ</td></tr><tr><td>À¦ h&rd∑k~] { ~Ü</td><td>€ÌHÍÁ</td></tr></tbody></table>							

Table 6. Summary of Infiltration and Runoff Coefficients

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V@Án• cã æcháÁ; l^Ēa^ç^|[] { ^} cÁ æchÁn*;] | *• Á æch&æd&* |æcháÁ•ā; *Ác@Á[āÁ; [ã cǐ !^Án·ch} cā] } Áçæj* ^Á[!Á æt | āc | acháa; åÁs | acháa; åÁs áæt | acháa; åÁs | acháa; acháa;



 $ad_{\hat{A}} = \frac{1}{2} \left[\frac{1}{2}$

4.2 Post-Development Water Balance

OZÁ,[•dĒa^ç^|[]{ ^}oÁ, æz^¦Áa`å*^oÁ[¦Áa@ Áāz^Á, æz Ás[{]|^c^åÁ·•ā;*ÁæÁ[ālĒ; [ãr č ¦^Áaææ) &^Áæ]];[æ&@Á
ÇV@;|}o@, ææx Áæp åÁTææ@;lĒÆJÍÏDÁs[{àāj^åÁ, āx@Áo@Á,;|[çãa^åÁářævÁ,|æ) Áa^Ázæ*•[ÁÖ[¦c^•^ÁOE&æx*&o Á
ÇC€CŒDÁÇAppendix ADÉv@Á;^¦&^}oÁ; Ás]]^¦çā[*•}^•••Ás[ç^¦Á, āx@ā, Áræ&æåå|ææ]æ*^Áæb^æá, æz Ár•oá;æz^åÁ
*•ā;*Áx@Á;|[][•^åÁæ) åÁ•^^Á;|æ) ĒÁ, @æ&æÁs[}•ã;o Á; ÁæÁ^•āâ^} cāæþÁæ) åÁs[{ { ^!&ãæþÁa`ãå;*ĒÁ;æb\ā;*Áæ}åÁ
]æç^åÁæb^æ ĒÁæ) åÁæ) å &æa]^åÁæb^æ ĒÁ

Òæ&@Á; [] [•^åÁæ; åÁ•^Á; æ Áæ• ðā; ^åÁæ; Æi] ^¦çāi ˇ•Áæ&d [/Áaæ• ^åÁ; Áa@ Á; ^|&^} æð ^Áā] ^¦çāi ˇ•Á
&[ç^!ÞÁQ;Á^{ æð;āj * Áæb^æ Éb@ Á*;] | ˇ•Á; æð Á; æð áð æð Áð ðā * Áæ Ásæð& |ææ°åÁ;ãæ Ē] ^&ãæ&æð; Æð åÁ
Lˇ} [--Áæ&d [•ÞÁQ; -ād ææā; } Æð; åÁ ˇ} [--Á*• œā ææ°•Á[!Áæ) Á; ^¦çāi ˇ•Á* '|ææ°•Á; ^|^Áæ) Áææð; |ææ°åÁa ´Á
{ ˇ|cā| ˆa * Áæ Á; ææ°\Á*;] | ˇ•Áşæ; ^Æð Áææ Áææð [•ÈÁ

4.2.1.1 Unmitigated Post-Development Water Balance

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OZÁ { { æ^ Á; Ás@ Á; ^É@ Á; 6 Œå^c^|[] { ^} oÆ@æ} * ^Á§ Ás@ Á; æc^; Ái; ææ & Ás; ÁTable 9È



Table 7. Monthly Pre-Development Water Budget

	January	February	March	April	May	June	July	August	September	October	November	December	YEAR
Precipitation (P) (m)	€ÈÈÌJÁ	€ÈEÏ€Á	€ÈÉÎIÁ	€ÈÉÎÍÁ	€ÈÈÌ€Á	€ÈÈÌJÁ	€ÈEÏHÁ	€ÈÈÌÎÁ	€ÈEJGÁ	€ÈËÏÌÁ	ÁÍLÐÉÐ	€ÈÈÌIÁ	€ÈÎÌ
Temperature (T) (*C)	ËËÁ	ËĖÁ	ËÈÁ	ÍÈÁ	FŒFÁ	FΪÈÁ	G€ÈÀ	FJÈGÁ	FÍ ÈGÁ	ÌÈÁ	ŒÎÁ	ËHĒÁ	ÎËÏÍ
Potential Evapotranspiration (PET) (m)	€Ì€€€Á	€È€€ÉÁ	€ÈEE€Á	€È€H€Á	€ÈEÏÎÁ	€ÈFGÁ	€ÈHHÁ	€ÈFÏ Á	€ÈEÏJÁ	€ÈEI€Á	€È€JÁ	€È€€€Á	l€ <u>Ť</u> JI <i>Ř</i>
Change in Soil Moisture Storage (m)	€Ì€€€Á	€È€€ÉÁ	€ÈEE€Á	€È€€€Á	€ÈE€€Á	ˀȀGGÁ	Ë∈ÈEIHÁ	ËEÈEFÍÁ	€ÈÈÈÉÁ	€Ì€€€Á	€È€€€Á	€È€€€Á	€ÈE€€/
Soil Moisture Storage (mm)	FÍ € Á	FÍ € Á	FÍ € Á	FÍ € Á	FÍ €Á	FĠ Á	ÌÍÁ	Ï € Á	FÍ € Á	FÍ €Á	FÍ €Á	FÍ €Á	ËÁ
Actual Evapotranspiration (AET) (m)	€Ì€€€Á	€ÌÈ€€Á	€ÈEE€Á	€È€H€Á	€ÈEÏÎÁ	€ÈFFÁ	€ÈFÎÁ	€ÌÈ€FÁ	€ÈEÏJÁ	€ÈEI€Á	€È€JÁ	€È€€€Á	€ĚÎF/
Soil Moisture Deficit (m)	€Ì€€€Á	€È€€ÉÁ	€ÈEE€Á	€È€€€Á	€ÈE€€Á	€È€FÁ	€È€FÎÁ	€È€FÎÁ	€ÈEE€Á	€Ì€€€Á	€È€€€Á	€È€€€Á	€ÈEH
Surplus (P-AET) (m)	€ÈÈÌJÁ	€ÈEÏ€Á	€ÈEÎIÁ	€ÈEHÍÁ	À D€E	ˀȀGGÁ	ËEÈEIHÁ	ËŒÈEFÍÁ	€È€FHÁ	€ÈEHJÁ	€ÈÈÌJÁ	€ÈÈÌIÁ	€Ì€ÏÁ
Impervious Surface Area (m²)							€Á						
Water Surplus on Impermeable Surfaces (m/yr)	€ÈÈÌ€Á	€ÈÉÎHÁ	€ÈÉÍÏÁ	€ÈEHFÁ	€È€EIÁ	ËEÈEG€Á	ËEÈEHUÁ	ËEÈEFIÁ	€ÈEFGÁ	€ÈEHÍÁ	€ÈÈÈ€Á	€ÈEÏÎÁ	€ÈHÎÎÆ
Run off from Impervious Area (m³/yr)	€Á	€Á	€Á	€Á	€Á	€Á	€Á	€Á	€Á	€Á	€Á	€Á	€Á
Pervious Surface Area (m²)							ÏÊÂÎJÁ						
Water Surplus on Vegetated Pervious Areas (m/yr)	€ÈÈÌ JÁ	€ÈEÏ€Á	€ÈEÎIÁ	€ÈEHÍÁ	€È€EIÁ	Ë≣ÈEGGÁ	ËEÈEI HÁ	ËEÈEFÍÁ	€ÈEFHÁ	€ÈEHJÁ	€ÈÈÌJÁ	€ÈÈÌIÁ	€Ì€ÏÁ
Runoff Volume From Pervious Area (m³/yr)	GÍÁ	FJGÁ	FΪÎÁ	JÎ Á	FGÁ	ÉFÁ	ËFÌÁ	ËFÁ	ΗΪÁ	F€Ï Á	GIÁ	GHGÁ	FFŒÁ
Q,-ājdæaāj}ÁX[`{^Á+ [{ÁÚ^\;çāj`•ÁŒt^æáQ; HĐ;D	ΙÍΙÁ	ΗίΪÁ	HGÎÁ	FÏ JÁ	C GÁ	ËFHÁ	Ë3G€Á	ËΪÄ	ÎJÁ	FJÌ Á	IÍIÁ	IHFÁ	G€ÌFÁ
V[cæþÁÜ`}[~-ÁX[`{^ÁQ; ^H ЦDÁ	GÍÁ	FJGÁ	FΪÎÁ	JÎ Á	FGÁ	ËFÁ	ËFÌÁ	ËFÁ	ΗΪÁ	F€Ï Á	GIÁ	GHGÁ	1,121
V[ca+ÁQ-á†dæái]}ÁX[ˇ{^ÁQ; HЦDÁ	ΙÍΙÁ	ΗίΪÁ	HGÎÁ	FÏ JÁ	C GÁ	ËFHÁ	Ë3G€Á	ËΪÄ	ÎJÁ	FJÌ Á	ΙΊΙÁ	IHFÁ	2,081

Table 8. Post-Development Water Budget (No Mitigation)

Ú¦[][•^åÆŠæ)åÁ W•^	Ù[ā́	X^*^œa[i}	OE^æÁÇ [°] D	Ù"¦] "•ÁÇ Đ¦D	O)-ájdænáj}Á Ô[^ä&a^}c	Ü`}[~-ÁÔ[^&&&&}}c	Oj⊶ajdæaaj}ÁV[cæejÁ ÇjЦD	Ü`}[~Á√[œ‡Á Ç;ЦD	Op⊸ajdaeaaj}ÁV[caejÁ X[ˇ{^AGÇ HЦD	V[cæ‡ÁÜ`}[~Á X[ĭ{^ÁÇ; ^H ЦD
Šæ)å•&æ}^Á	O3A^Ë&[}cæ&cÁ •dææãa?åÁ å^][•ãæ Ë&[}cæ&cÁ •dææãa?åÁ&^][•ãæ A	Šæ)å•&æ}^åÁ	G Îl iÏÁ	€ÈEÄÁ	€ÌÍÁ	€ÈÍÁ	€ÈGÎÁ	€ÈIGÁ	ÎĠĦÍÁ	HHÌĚÉÁ
Úæ¦∖āj*ÁnāÜ[æå•Á	O&A^ËS[}cæs&cÁ •dæcãa®åÁ å^][•ãæ ËS[}cæs&cÁ •dæcãa®åÁåA][•ãærÁ	Þ[}^Á	HÉÌFÁ	€ÌÏFÁ	€Á	FÁ	€Á	€ÌÏFÁ	€Á	HÊFJÈÏÁ
Ó ãåã *Á	O&N^Ë&[}cæ≻Á •dæcæãan³åÁ å^][•ãa•Ë&[}cæ≻Á •dæcæãan³åÁå^][•ãa•Á	Þ[}^Á	FÐFFÁ	€ÌÏ FÁ	€Á	FÁ	€Á	€ÌÏFÁ	€Á	FÊÎIÈÎÁ
Total	-	-	7,869	-	Ë	-	Ë	Ë	628.65	10,050.13



Table 9. Pre- to Post-Development Water Budget Change (No Mitigation)

	Units	Runoff	Infiltration
Ú¦^ËÖ^ç^ []{ ^}ơÁ	Àbs^Œl }	FÎFŒÎ FÁ	GÊÉÌ FÈ⊤HÁ
Ú[•dĒÖ^ç^ []{^}oÁG}[Á Tãuā*æmaā[}DÁ	{ ^H Đ^ælÁ	F€ÊÉÍ€ÈTHÁ	ÎĠĒÍÁ
	ñ ma + n n	ÉÏ JÎ È Í Ã Á	ËJËJÃÁ
Ú¦^ĒqĒÚ[•ÓÁ Ö^ç^ []{^}OÁÔ@0)*^Á	Öã⊷¦^}&^Á C° HĐ^æbDÁ	ÌÊGJĚGÁ	ËFÉLÍGÈLÌÁ

Development Considerations and Potential 5. **Effects**

5.1 Source Water Assessment

V@ÁÔã¢Á;ÁÓæ;¦ã°ÁÜ^~~ã^•ÁæÁ;!61;[1]•^åÁæ;åÁ 3ÁÚ^;{ãáÁ;}å^;Áó@ÁÔ|^æ;ÁYæ;\ÁOæ;ÁXæ;åÁ;@}ÁÁæ;åÁ å^ç^|[]{ ^}oÁ; |Ás@æ}*^Áā, Áæ8cãçãc Áā Á, ão@ã, Áæ4å^•ã} æe^åÁç*|}^!æà|^Áæ4^æÈA/@AÛ/^8cā; }Ã, JÁ,^!{ãoÁ å^• å } ææ^• Á, @ c@ ¦Ás@ Áå^ç^|[] { ^} cÁ; Á&@æ) * ^Á§ Áæ&cãçãc Áæ Á; [@ãàãc^å Áà^Ác@ ÁÙ[` ; &^Á/ ææ^; ÁÚ;[c^&cã; } Á ÚlæjállÁ @c@¦Áæååãã1}ækÁã\Á æþæ*^{^}čå^åÈXOE&8|¦åã*Ág Ág æþæ*åæ*A å æð e Êb@Áaã Ág Ág }[ofa kade*]}^|ad|^kad^ada*|Add^ada*|Add^ada*|Add^|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|Add^a*|

5.2 Dewatering

5.2.1 **Construction Dewatering**

æ}åÁ∓€ĒÏÍÁ;à*•Áæ}åÁ¹;[ˇ}叿æ^¦ÁæÁ;[œÁ¢]^&c^åÁgÍÁæ^Á}&[œÁ°;]oÁ°¢]^&c^åÁgÍÁæ^Á;}&[¸¸o′;^åÁæ°;]ā*Áæ[}•dˇ&cã;}ÈÆP[¸^ç∧;ÈÆæÆæÁ ā]] [caa) oÁg Á, [c^Ás@aoÁsaÁ, ^ l &@ åÁ, æe^ lÁsaà | ^Á, æe Ásã^ } cãaì åÁse Á @ed| [Áse ÁHĚ Ï Á, à * • Ás ÁR | ^ÁG€C€EÌÁGÁs Á ^c]^8c^åÁs@exÁs@exÁs@exÁs@exÁs@exÁs@exÁs@exÁs@An}\Ai æðÁsasÁ\AæoÁ\æexÁsæAko@An]¦ā*ÊA[ÁæAA\&@åÁæo\ÁsæAko@An] æ[`} åÁŒĚÁ; à*•Á; @ ` |åÁà^Á&[}•ãå^¦^åĚÁÁ

Ö^, æe^\a]*Á^•ca[æe^•Áæ••`{^ÁæÁ; IÁ, Áà^ÁrÌÁ; Ár¢&æçæaa]}Á;¦Ág@Á;}^ÁGFDÁ;}å^*\[`}åÁ^c^|EÖ^, æe^\a]*Á &ad&`|aæāi|}•Áæ••`{ ^ÁæÁ;^|&@°åÁ; ææ^|Áææà|^Á; -ÁnHĚ | Á; æ•|ÊÁ| | •ÁrÁ; Áf Áæ&&| `} oÁ; |Á^æ•|} æÁ;æðāæàāãĉ ÈÁ/@ Á *^[{ ^d; 88Á; ^æ; Á@ 妿; | 88Á8[} å * 86ãc ãc Ácæ; ^Á; ÁGÈ G¢F€ÉÁ; ÐÁ; æ; Á•^åÈÁ

Ö^, æe^¦ā; *Áæe^Á• cã; æe^•ÁQÛ DÁ; ¦Áó@ Á; [] [•^åÁà ðåå; *Á, æ•Á&æ4& |æe^åÁ•ā; *Áo@ Á; ||[, ā; *Á~ æã; }Á; [{ Á Ú[^¦•Á^dÀæÁQƏ€€ÏDÁ\¦Áæ}Á`}8[}~ā,^åÁæĕ ઁã^¦KÁ

$$Q = \frac{\pi K (H^2 - h^2)}{\ln \left(\frac{R_0 + r_e}{r_c}\right)} + 2 \left[\frac{x K (H^2 - h^2)}{2L}\right] \qquad m^3 / s \acute{A}$$

Y @\^Á*K*Á ΜÁ @ 妿ĕ|æðÁs∥}å škoãçãcÁÇ Ð DÁÉÖÐË G¢F€ÉÁ, Ð Á ΗÁ ΜÁ • æci ¦æc^å Ác@&k\}^•• ÁC; DÁ ÁGÈEHÁ Á • æci ˈæc^å Ác@&\}^•• Áæc^!Áå^ æc^!ā, * ÁÇ DÁ ÁEÌÈ Á, Á Á hÁ ΜÁ Á læåã•Ái√Ái√`^}&^Á•cãiæe^åÁ.•ãi*Ác@AÛa&@æ\åoÁ``ææãi}KÁ R_0 Á ΜÁ R_0 ÁMÁHECEÁRÁCH-hDE \sqrt{K} ÁC; DÁ ÁGÏ ÈDÁ Á ^~~~~ãcæt^}cÁæåã•Á∿•cã ææ^åÁà°kÁ reÁÁ ΜÁ $r_e = \sqrt{\frac{a*a}{\pi}} \left(\left\{ \right. \right. DA A F \hat{I} \stackrel{.}{\mathbf{E}} A A \hat{A}$

WhereÁa MÁC^} &@Á ãac@ÁC DÁ

^¢&æcæafi}Á^}*c@ÁÁÏÁ Х

LÁ ΜÁ |ã,^Á|[ˇ|&^Á&ãa cæ) &^ÁQ; DÁ, @B&@Ás Ác@ Á;|^æe^|Á, ÁR∂EOÁ;|ÁF€Á, Á, ÁFHÈ)Á;



 $\begin{array}{l} \text{Ce} \text{ Asi} \ \} \bullet \text{d}^* \text{ Scal} \ \} \text{ Asi}^* \text{ asc}^* \text{ Asi} \text{ And}^* \text{ Asc}^* \text{ Asc}^* \text{ Asc}^* \text{ Asc}^* \text{ And}^* \text{ Asc}^* \text{ And}^* \text{ Asc}^* \text{ And}^* \text{ Asc}^* \text{ And}^* \text$

5.2.2 Long-Term Drainage

Ö`^Áq[Ás@Á,¦^•^} &^Áp, Ás@Á,^I&@åÁ, ææ^¦Áææà|^ÊÁ[{ ^Áp]}*Ëc^¦{ Ás^^]æ*^Áspiq[Ás@Ás`āpåā,*Áq``}åææāj}Á
•@[`|åÆs^Ár¢]^&c^åEÓæ•^åÁp,Áæó,[¦^Ác] ābædÁp,^¦&@åÁ, ææ^¦Ár¢,^|ÊÁp]}*Ëc^¦{ Ás^^]æ*^Áspiá;Ás••@j ææ*åÁp,Ás^Á
`]Áq[Áæð]]¦[¢āp ææ*|^Árï ÊEEEÆŠBaæêÊÄOEÁs@sÁææ*ÁspiÁr••Ás@æ)Á €ÊEEEÆŠBaæêÊÆæÁp]}*Ëc^¦{ ÁÚVVY Á¸āþÁ,[cÁs^Á
']*å*åÊÄ
Á

5.3 LID considerations

$$\begin{split} & \hat{I} \hat{I} \hat{A} \hat{O} \hat{I} \hat{a}_{i}^{*} \hat{A} \hat{a}_{i}^{*} \hat{a}_{i}^{*} \hat{a}_{i}^{*} \hat{A} \hat{a}_{i}^{*} \hat{a}_{i}^{*} \hat{A} \hat{a}_{i}^{*} \hat{a}_{i}^{*$$

- •Á Óā¦^ơ\} cā} } Á, æþ^•ÁææÁc@ Á\} å•Á, Æó@ Á; æb\ā; *Á[o•Á; Á; c@; Á;]^}Áæb^æe LÁ
- •Á Q,&¦^æ,^åÁq[]•[ãÁå^]c@Á;}Áæ;å•&æ;^寿;^æLÁ
- \bullet Á Ú^\{ ^aæà|^Áı æç^{ ^}oÁi} Áo@^Áı æd\ā; *Ái dLÁæð; å EÁi ¦ÁÁ
- •Á W}å^!*¦[ˇ}åÁnḍ[ˈæð*^ÁÇ̞ˈˈæð̞)ˇ|ædÁd^}&@•ÁɪˈÁ&@æð[à^!•DÁu[ˈÁða]-āddææða[}Áæð]åÁu^æðAÁu[¸Á&u[þÉÁ

Óæ•^åÁr}Ás@ Á@ å¦[*^[|[*aBædÁs[}åããā]}•Ê㊌ÖÁr,^æ•`¦^•Ár@[`|åÁsa^Árā āc^åÁr[Áæ]]¦[¢ã[æe^|^ÁŒÈHÍÁr,Ása^|[,Á ^¢ã cāj*Ár¦[`}åÁr[Ása^ÁrÁr,Ása^|[,Ás@ Ár^¦&@ åÁ;æe^¦Áææà|^ĚÁÁ

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6. Summary and Conclusions

- •Á V@ÁiÎÁÓ¦^}^ÁÖ¦Ánãc^Ásh^ç^|[]{ ^}oÁsnÁscá,¦[][•^åÁaç^ÁqCDÁnq[¦^^Ási*ājå;*Á,ão@Á;}^ÁQEDÁnç^|Á;-Áààæ•^{^}dŽÁ
- •Á Øãç^ÁQÍ ĐÁB[¦^@ |^•Á¸ ^|^ÁB¦ Āļ|^ åÁ; } ÁRˇ | ÂG ªÁG€G€ÁS ÁÖæç; [8\ ÁÖ) * ¾ ^^¦ ¾ ÈÁV@^^ÁQFÐÁ¸ ÁG®Á
 à[¦^@ |^•Á¸ @ |^Áč; } ^ åÁB¸ QÍ Á; [} ãI[|¾ *Á¸ ^||•ÈÁV@^^ÁQFÐÁ ¢ã c¾ *Áˇ | ~æ&^Á¸ àħ˙ [{ ^c^!Á¸ ¾ ^-∮¸ ^!^Á
 æ‡ [ÁIˇ } åÁ¸ Á㢠ÈÁY ææ^!Á¸ 个|•Á¸ ^|•Á¸ ç^•cã ææ^åÁ¸ } ÁHÁ¸ &&敾 } •ÁææÁS[c@Ás@Á¸ [} ãI[¼¾ *Á¸ ^||•Á
 æỷ åÁs@Áˇ | ~æ&^Á¸ ¾ ^•ÈÁ
- •Á V@Á, æz^¦Áxæà|^Á[¦Áx@Á;[}āā[¦ā]*Á,^||•Áæ)*^åÁ¦[{ÁlÌEGÁ[ÁF—EĪÏÄ,à*•Áæ)åÁ;[Áæ)Á*;Hæ&^Á
]ā]^•ÊÁœ,Á, æz^¦Áxæà|^Áæ)*^åÁ;[{ÁrHÈHÁ[Á[ÁlÈÍÁ;à*•ÈÄÖ;[ˇ}å, æz^¦Á, æ•Æ;-^¦|^åÁq[Á][¸Æ]Áœ,Á
 }[¦c@@p[¦c@Ē`æ•ơÁsā^&cā[}Áq[¸æ}啯Šæà^ÁÙā[&[^ÈÁ
 Á

- •Á V@Áj^¦&[|ææāj}Áææ^Á[¦Áāj-ājdææāj}ÁārÁr¢]^&c^åÁg[Áæj*^Áaò]*^Áa^ç^^}ÁiGÁ;{ E@Ág ÁNF€€Á;{ E@ÈÁN•āj*Á
 æÁnæ^ĉÁæ&d[¦Áj-ÁGĚ ¢ÊÁs@Áå^•ã}Áj^¦&[|ææāj}Áææ^ÁárÁ•oājææ^åÁa^ç^^}ÁfiÈÁæjåÁNI€Á;{ E@ÈÁ
 Á
- •Á ŒÁ¹[ˇ]叿æ²\Á&@{ã·d^Áræṭ]|^Á¸æeÁ&[||^&c^åÁṭ}ÁRॅ|^ÁFÏĒŒŒŒÁæò¸åÁ&[{]æè^åÁţÁc@ÁÔācÁṭÁ Óæċ¦ã°qÁÙq¹{ Áæò¸åÁÙæò¸ãæò²ÁÛ^¸^¦Á&iãæèŽV[œÞÁˇ•]^}å^åÁ[|ãã•Ár¢&^^å^åÁ^¸^¦Á&iãæò¦ãæèŽŒ∏Á [c@ċ¦Ájæò{^c°¦•Áţ^óÁs[c@Ácţ¦{Áæò¸åÁræò¸ãæò²Ár^¸^¦Ásãã&œæò*^Ásäā°¦ãæèŽÁ Á



- - OZÁã°Á, ãå^Á, ¦^EÁţÁ, [•dã^ç^|[]{ ^}ơÁ, æơ ¦ÁàæÞæ) &^Á, æ Á&æÞ&` |ææ°åÈÁÚ¦^Ēā^ç^|[]{ ^}ơÁş -Ādæðāţ}Á
 æ) åÁ`}[-Áş[|`{ ^•Á¸^\^Á•oð; 朰åÁţÁà^ÁĐÊì FÈHÁ; HĐ^æÞÁæ) åÁFÊ-GŒĒ FÁ; HĐ^æÞÁ›•]^&æð;^|ÈÁ
 Ú[•dã^ç^|[]{ ^}ơÁðÁs Á°¢]^&æ°åÁs@æÞÁş -Ādæðāţ}Áş[|`{ ^•Á¸ āļÁå^&\^æ•^ÁţÁ; GÌĒÍÁ; HĐ^æÞÁæ) åÁ
 ↓`}[-Áş[|`{ ^•Á¸ āļÁş &¦^æ•^ÁţÁF-ŒÉI €ÈHÁ; HĐ^æÞÁ
 Á
- •Á CĒ Ác@ Á ãt Ás Ás Ás &æc å Á āt œs Ásæf PÚCHÊÛ GÁÇ \&æd * ^ Ásæd æd * ^ { ^ } CDÊÁc@ Á; | ^ Eā ^ ç ^ |[] { ^ } cÁ æz \ Á àæd æd Asæd & A @ ` | å Ás ^ Ás æd Asæd Asæd Asæd & A @ ` | å Ás ^ Ás æd Asæd Asæd Asæd Asæd & A @ ` | å Ás Asæd æd Asæd Asæd Asæd | å ås æd \ Å Æsæd & Asæd & Asæd & Asæd | å ås æd \ Å Æsæd & Asæd | å Ásæd \ Å Æsæd | Å Æsæd & Å Æsæd | Å Æsæ
- •Á Ü^{ [çæḥ/[-Á],^|&@å/A*|[`}叿æ^|Á\$m Án¢]^&&c^åÁq[Æa^Án^`ă^å/aÁq[Æ,ææ]ææ]Ææ&a Æææ;ææ]}ÈÄQÆm Á ^•æ]åÁs@æ#Á]ÁqĨÁlÌÊHJÆSHBæ;ÆQ[`|åÁsh^Án``ã^åÁ;[{ Ás@Á,^|&@å/;ææ^|ÆÆEÆÆAæ}AÉ]|`{ AAÆA; AÆAÆ}|



Statement of Limitations

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7. Certification

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8. References

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Úæ†^[:[&&^t^[|[*^Á;-Á*[čœ%]}ÁU}æælā;LÁU}æælā;ÁŐ^[|[*&æælÁÚč¦ç^^ÉÁTã&&^||æ}^[č•ÁÜ^|^æe^ÉÖæææÁ ŒFJEÁ

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Õ^[c^&@) aBadyÁQ)ç^•cat acea[} ÁT ERERERÁÖ^ç^|[]{ ^}o•ÁQ) &BÁÚ¦[][•^åÁIEÙ([;\^^ÁÜ^•aå^})caedeDÔ[{ { ^\&aedA Ó`ālàā;*ÁIÎÁÓ;^}^ÁÖ;ār^BÉÓæd;anBÁU}cædā;BÉÁ

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 $\dot{U}' \mid -38\tilde{a}a\phi \dot{A}\tilde{O} \wedge [\mid [*^ \dot{A}_i - \dot{A}_i @ A\tilde{S}_i] a^{\bullet} \approx \ddot{E}\dot{U} \wedge c' \mid \dot{a}[\mid [* * @\dot{A}OE \wedge acc{A}\dot{U}] \cos \dot{a}[\dot{E}X a Rac[\mid \ddot{a}acc{A}\dot{U} \wedge c' \mid \dot{a}[\mid [* * @\dot{B}\ddot{O} | \dot{a}cc{A}\dot{A})] \cos \dot{a}[\dot{A}C]) \ \dot{C}(\dot{A}_i + \dot{A}\dot{O}_i) \ \dot{C}(\dot{A}_i + \dot{A}\dot$

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Appendix A

Site Drawings (Fausto Cortese Architects, 2020)



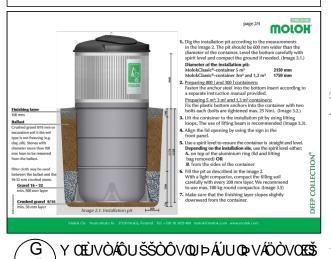
PARKING CALCULATION							
	REQUIRED	PROVIDED					
COMMERCIAL PARKING (1/24 m2)	33	34					
RESIDENTIAL PARKING (1.5 / UNIT)	72	73					
LOADING SPACE	1	1					
BARRIER-FREE PARKING	4	4					

FLOOR AREA SCHEDULE						
	T ÒVÜÔ	ar úòüqarš				
NET COMMERCIAL (7 UNITS)	785.60 m2	8450 SF				
NET RESIDENTIAL (48 UNITS)	2852 m2	30700 SF				
RESIDENTIAL CORRIDORS	285 m2	3070 SF				
G.F.A.	3922.60 m2	42220 SF				

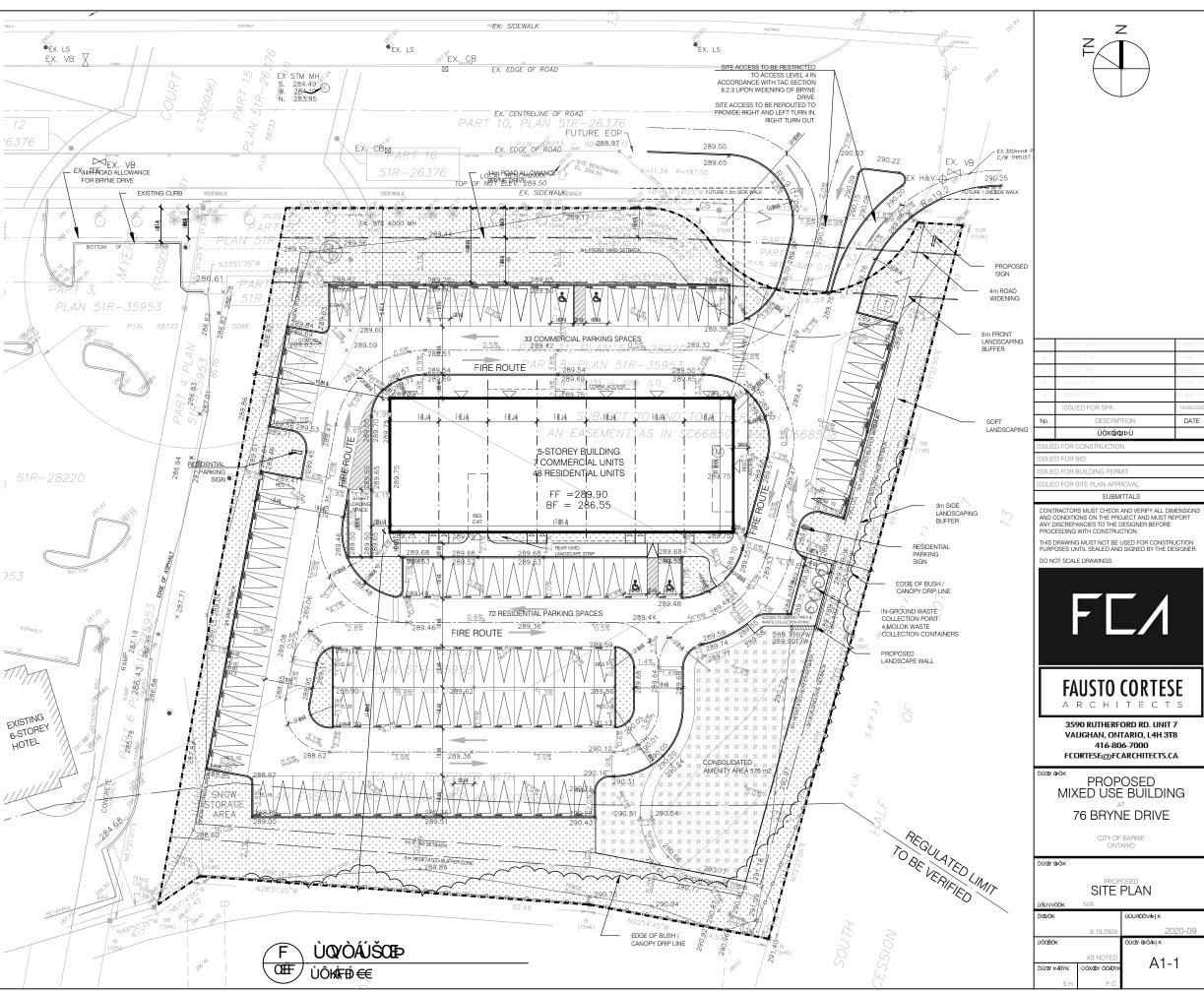
FLOOR AREA BREAKDOWN

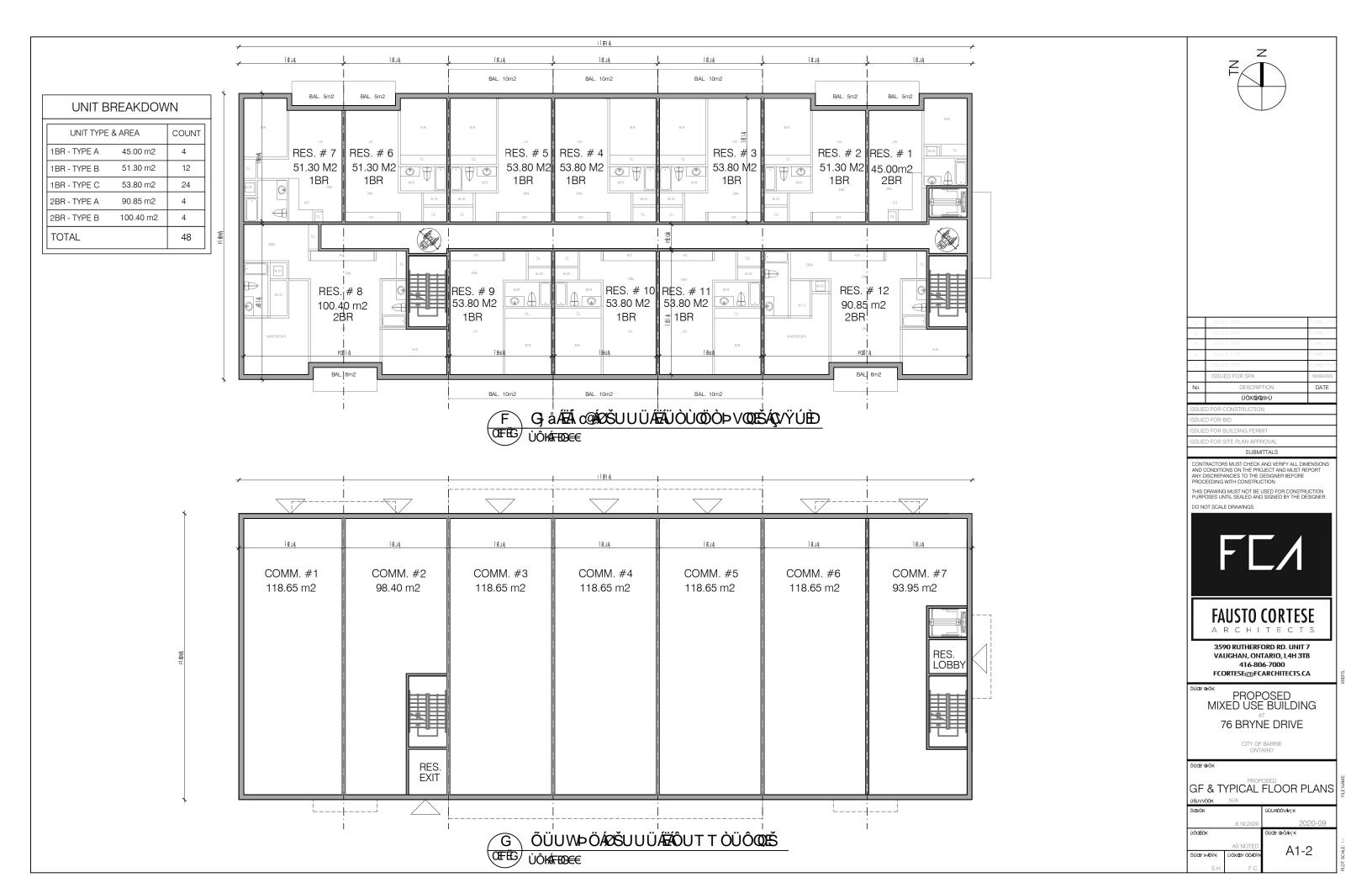
RESIDENTIAL		COMMERCIAL	
NET RESIDENTIAL: STAIRWELL & LIFT: CORRIDOR:	713.00 m2 30.25 m2 71.25 m2	NET COMMERCIAL: STAIRWELL & LIFT: TOTAL FLOOR AREA:	785.60 m2 43.50 m2 830 m2
TOTAL FLOOR AREA:	814.50 m2		
RES. GFA = 4 * (713 +	71.25) = 3137m2	COM. GFA =	785.60 m2

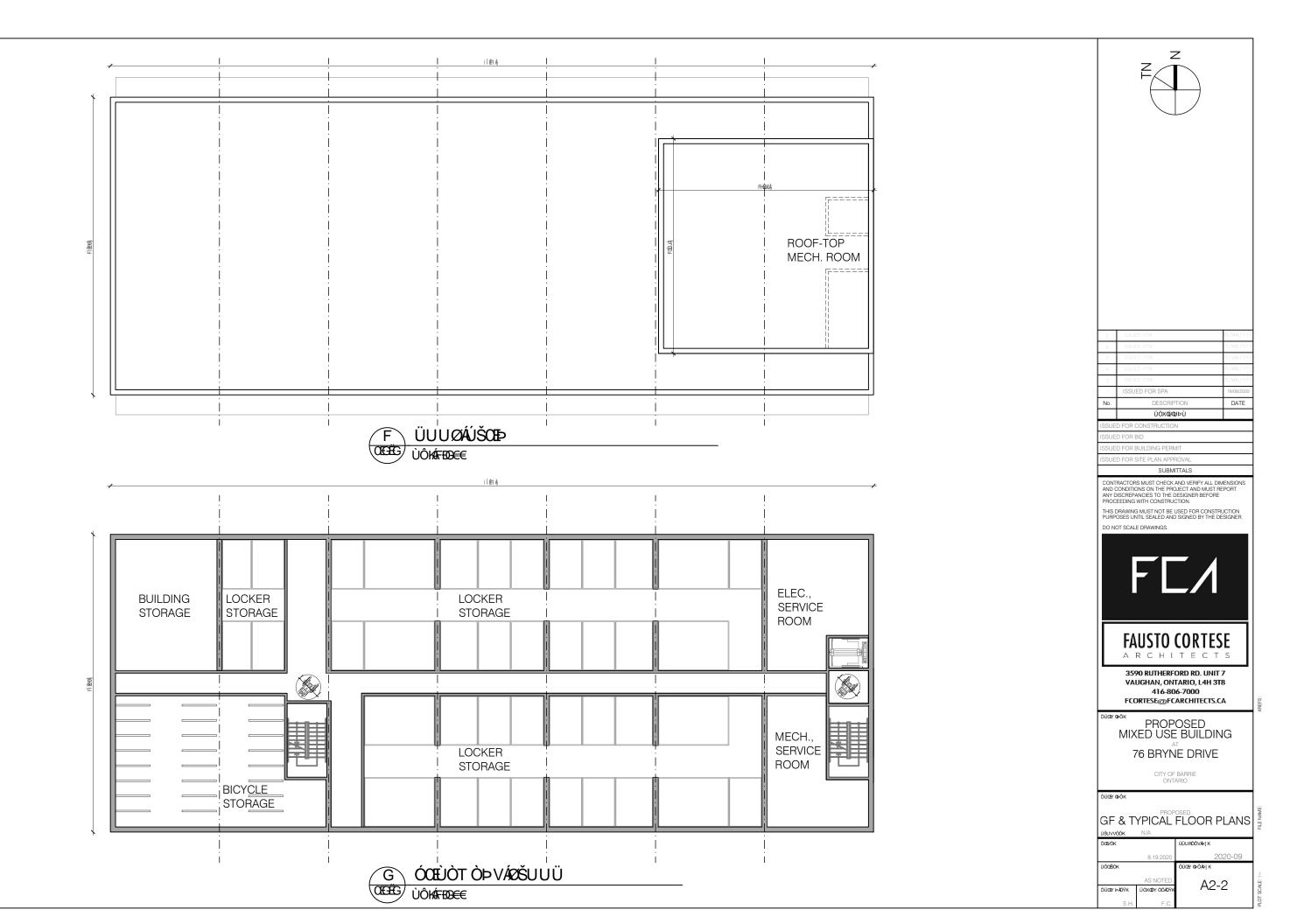
GFA: 785.60+3137=3922.6 m2

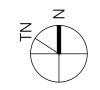


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No.	DESCRIPTION	DATE
1	ISSUED FOR SPA	19/08/2020
3	SSUED FOR	D/MM/YY
4	SSUED FOR	D/MM/YY
5	SSUED FOR	D/MM/YY
6	SSUED FOR	D/MM/YY
2	SSUED FOR	D/MM/YY

SUBMITTALS

CONTRACTORS MUST CHECK AND VERIFY ALL DIMENSIONS AND CONDITIONS ON THE PROJECT AND MUST REPORT ANY DISCREPANCIES TO THE DESIGNER BEFORE PROCEEDING WITH CONSTRUCTION.

THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION PURPOSES UNTIL SEALED AND SIGNED BY THE DESIGNER.

DO NOT SCALE DRAWINGS.



FAUSTO CORTESE

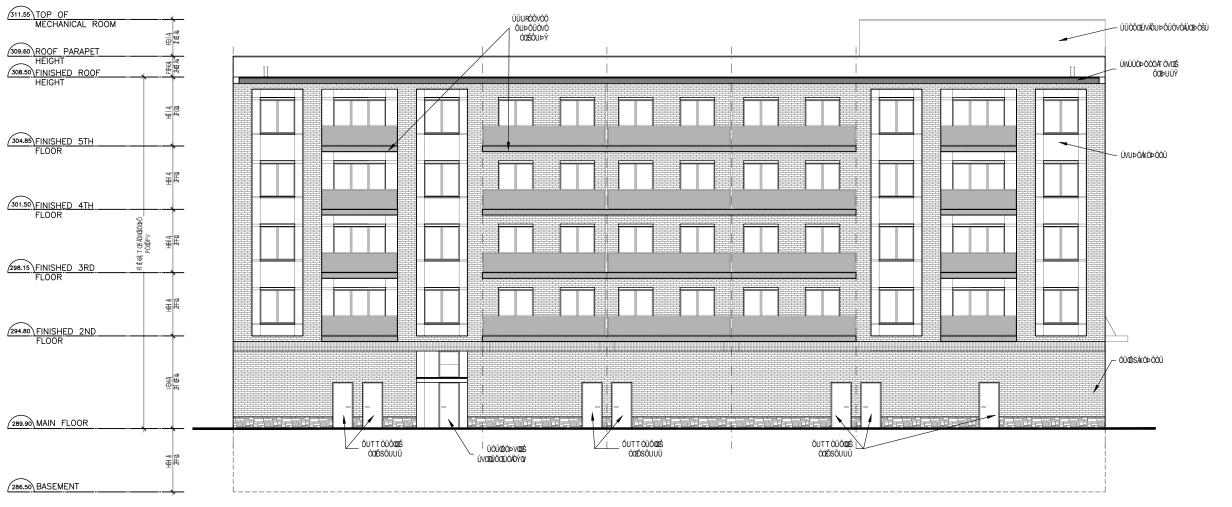
3590 RUTHERFORD RD. UNIT 7 VAUGHAN, ONTARIO, L4H 3T8 416-806-7000 FCORTESE@FCARCHITECTS.CA

PROPOSED
MIXED USE BUILDING 76 BRYNE DRIVE

ÖÜŒY ŒPÕK

NORTH ELEVATION - FRONT

ÖÜ0EYOp-ÕÁ⊳[K A3-1 ÖÜŒΥ ÞΑΌΫΚ ÜÒΧΦΟΥ ÒÖΑΌΫΚ



ÙUWPÁÒŠÒXŒVQJÞÆÄÜÒŒÜ OFFEC ÚÔKÁFEDEE

	ÜÇAMMPI	
No.	DESCRIPTION	DATE
1	ISSUED FOR SPA	19/08/2020
3	SSUED FOR	D/MM/YYY
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6	SSUED FOR	D/MM/YYY
2	SSUED FOR	D/MM/YYY

SUBMITTALS

CONTRACTORS MUST CHECK AND VERIFY ALL DIMENSIONS AND CONDITIONS ON THE PROJECT AND MUST REPORT ANY DISCREPANCIES TO THE DESIGNER BEFORE PROCEEDING WITH CONSTRUCTION.

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DO NOT SCALE DRAWINGS.



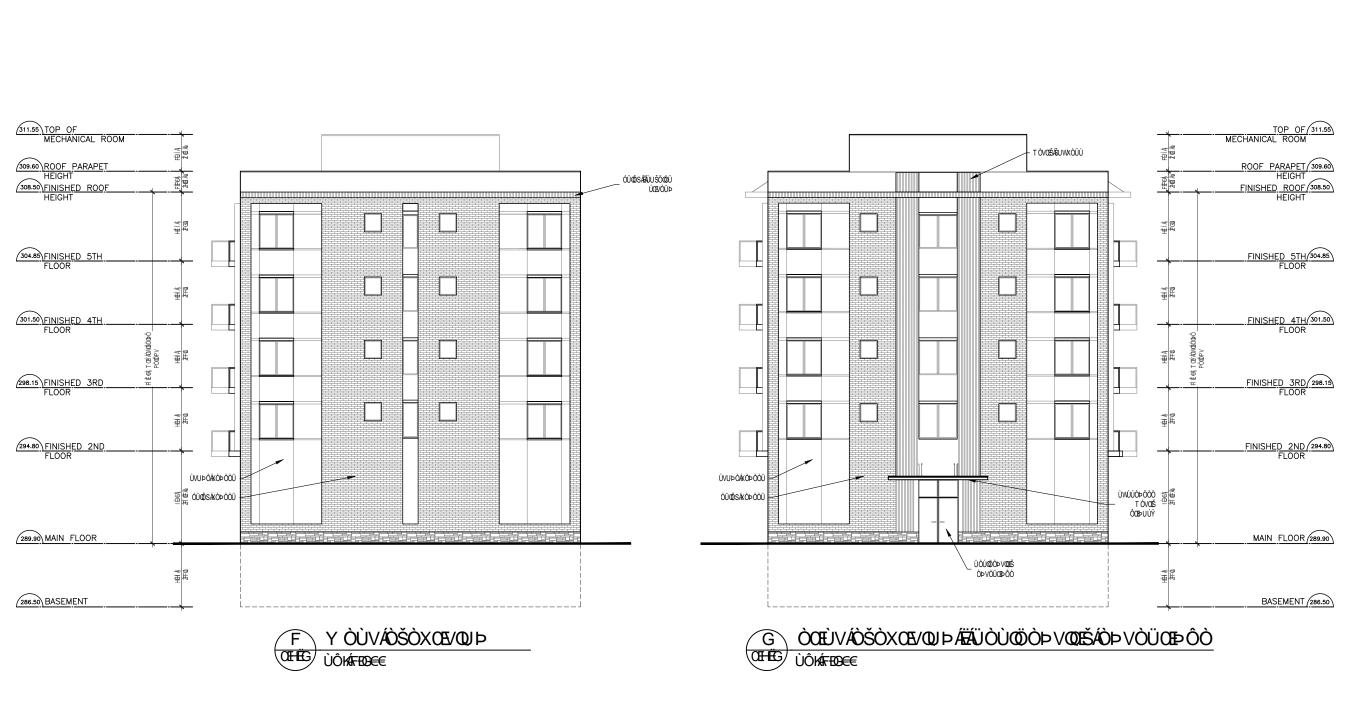
FAUSTO CORTESE

3590 RUTHERFORD RD. UNIT 7 VAUGHAN, ONTARIO, L4H 3T8 416-806-7000 FCORTESE@FCARCHITECTS.CA

PROPOSED
MIXED USE BUILDING 76 BRYNE DRIVE

SOUTH ELEVATION - REAR

ÖÜ0EYO⊅ÖÁ⊅[K A3-2 ÖÜGEY ÞÁÐÝK ÜÖXGÐY ÖÖÁÐÝK



ÜĠŒŒŎ

SUBMITTALS

CONTRACTORS MUST CHECK AND VERIFY ALL DIMENSIONS AND CONDITIONS ON THE PROJECT AND MUST REPORT ANY DISCREPANCIES TO THE DESIGNER BEFORE PROCEEDING WITH CONSTRUCTION.

THIS DRAWING MUST NOT BE USED FOR CONSTRUCTION PURPOSES UNTIL SEALED AND SIGNED BY THE DESIGNER.

DO NOT SCALE DRAWINGS.



FAUSTO CORTESE

3590 RUTHERFORD RD. UNIT 7 VAUGHAN, ONTARIO, L4H 3T8 416-806-7000

FCORTESE@FCARCHITECTS.CA

PROPOSED
MIXED USE BUILDING 76 BRYNE DRIVE

W & E ELEVATION - SIDES

ÖÜ0EY0p-ÕÁr-[K A3-3 ÖÜCEY ÞÁÓŸK ÜÖXCÓY ÖÖÁÓŸI



Appendix B

Borehole Logs (Davroc Testing Laboratories Inc., 2020, Central Earth Engineering, 2020)



DAVROC Unit 21, 2051 Williams Parkway Brampton, Ontario, L6Y-3R9

1	Y D	AVF	ROC Telephone:(905)792-7792										
CLIEN	TM-J-	J-J De	velopments Inc.		PR	OJECT N	AME	R	esiden	tial/Co	mmercial Building		
PROJI	ECT NUM	BER	L20-0249GE		PR	OJECT L	OCATIO	ON 76 Br	yne Dri	ve, Ba	rrie, Ontario		
			mm/yy) 2-7-20 COMPLETED	G	ROUN	ID ELEV	ATION	99.92 m		HOL	E SIZE 0.15		
			TOR Central Earth Engineering								-		
			Hollow stem auger	-					- Drv. J	ulv 02.	2020		
			CHECKED BY GW		AT TIME OF DRILLING _— Dry, July 02, 2020 AT END OF DRILLING _— Dry, July 02, 2020								
1	S							3		.,,			
- INOTE		r.				1 121(0)			-		▲ N - Value		
DEPTH (m)	ELEV DEPTH	GRAPHIC LOG	MATERIAL DESCRIPTION		WELL DIAGRAM	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	N VALUE	POCKET PEN. (kPa)	DRY UNIT WT. (Mg/m³)	(Blows/305mm) 20 40 60 80 PL MC LL 20 40 60 80 FINES CONTENT (%) 20 40 60 80		
	99.00	XXX	TOPSOIL			V ss	400		1				
0.4	1	\bowtie	FILL -Silt			√ SS1	100	9	-		9		
0.8	99.12	\bowtie	-Brown	Γ		VI ss	400	_	-				
1.2	0.80		-Some Clay -Some Sand	1		X SS2	100	5			^		
1.6			-Trace Rootlets -Moist	1		1 00							
2.0	1		-Stiff			SS SS3	100	4	1	4	A •		
			SAND & SILT -Brown										
2.4	1		-Moist			SS SS4	100	12			124 9		
2.8			-Loose to Compact			/ 1 334			-		\-\-\-\-\-\-\-\-\-\-\-\-\-\-\-\-\-\-		
3.2	96.82 3.10	111	SANDY SILT			V ss	100	17	1		17		
3.6			-Brown			∕\ SS5	100	17	_				
4.0	1		-Trace Clay -Moist						1				
	1		-Compact						1				
4.4	95.32												
4.8	4.60		CLAYEY SILT		1	X SS SS6	100	25			254		
5.2			-Some Sand -Grey			7 4 000			-				
5.6			-Moist -Very Stiff										
6.0			vo., vo.,										
	93.82	33333	SAND		-	1/1 88	-		-				
6.4	6.10		-Brown			X SS7	100	62			624		
6.8			-Some Gravel -Trace Silt										
7.2			-Damp -Very Dense										
7.6			-very bense										
ਲ ਕ 8.0					1	SS SS8	100	76		1 8	76		
G O.O	1					/ () 558			4				
8.4	-				1								
8.8	-				1								
图 9.2						1 00	-		-				
9.6						SS SS9	100	73			73▲		
指 10.0													
1549													
0.1ECH BH PLOTS L20-0249-76 BRANE GPJ GIVI STD CANADA GDD A STD CANADA GDD													
0 10.8	89.12		Bottom of hole at 10.80 m.		1	⊠ SS SS10	100	50+			0 50+ ▲		
표	10.80		Dottom of finie de 10.00 III.			2010	4						
공													
TO!													



DAVROC Unit 21, 2051 Williams Parkway Brampton, Ontario, L6Y-3R9 Telephone:(905)792-7792

CLIENT	Г М-J-J	ار Dev	velopments Inc.		PR	OJECT N	AME	R	esident	ial/Co	ommercial Building	
1			L20-0249GE	PROJECT LOCATION _76 Bryne Drive, Barrie, Ontario								
1			nm/yy) 2-7-20 COMPLETED	: - GE								
			TOR Central Earth Engineering							1101	0.10	
			Hollow stem auger	AT TIME OF DRILLING _— Dry, July 02, 2020								
			CHECKED BY GW									
								G Dry,				
	-			_	-						N - Value	
	ELEV DEPTH 97.80		MATERIAL DESCRIPTION		WELL DIAGRAM	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	N VALUE	POCKET PEN. (kPa)	DRY UNIT WT (Mg/m³)	(Blows/305mm) ▲ 20 40 60 80 PL MC LL 20 40 60 80 □FINES CONTENT (%) □ 20 40 60 80	
0.4	97.00 97.00 0.15		TOPSOIL FILL -Sand		١	SS SS1	100	8			8.	
1.2	97.00 0.80		-Dark Brown -Trace to Some Silt -Trace Gravel			SS SS2	100	6				
1.6			-Trace Organics -Moist -Loose			SS SS3	100	4		4	•	
2.4			SAND & SILT -Brown									
2.8			-Moist -Loose			SS SS4	100	6				
3.2	94.70	TH	SANDY SILT	_		V ss	100	20				
3.6 _ 4.0 4.4 _			-Brown -Trace Clay -Moist -Compact			SS5	100	20				
4.8 _ 5.2	93.20 4.60		SILT -Grey to Mottlen Brown			X SS SS6	100	30				
5.6			-Trace Clay -Trace Sand -Moist -Very Stiff									
6.0			-very our									
6.4	91.50	Щ	SAND		П	SS SS7	100	79				
7.2	0.00		-Brown -Some Gravel -Damp -Very Dense									
8.0						X SS SS8	100	83			833	
8.4						V 4 338			1			
0.4 - 0.4					8 K S							
8.8) î											
9.2					Ħ	X SS SS9	100	50+			59+▲	
9.6						1889						
10.0					E.							
10.4		12.10			甘							
10.8					1/2	SS SS10	100	90	-		902	
T L	86.70		Dollars of half of 44.40 m	1	XXX	/\ SS10	100	30			504	
五	11.10		Bottom of hole at 11.10 m.									
GEOIE												



DAVROC Unit 21, 2051 Williams Parkway Brampton, Ontario, L6Y-3R9 Telephone:(905)792-7792

_			TO A THE SECRETARY TO A TOP OF THE SECRETARY OF THE SECRE						_ =	wa.	1/2	ii	
T .			velopments Inc.	PROJECT NAME Residential/Commercial Building PROJECT LOCATION 76 Bryne Drive, Barrie, Ontario									
1			L20-0249GE										
			mm/yy) 2-7-20 COMPLETED							HOL	E SIZE _0.15	5	
1			TOR _Central Earth Engineering										
			Hollow stem auger	AT TIME OF DRILLING — Dry, July 02, 2020									
			CHECKED BY GW	AFTER DRILLING _6.70 m / Elev 93.44 m July 02, 2020 AFTER DRILLING Dry, July 09, 2020									
NOTE	S		V		AI	- IER DI	KILLIN	G _— Dry,	July 08	, 202		V - V-1	
DEPTH (m)	ELEV DEPTH	IS YI	MATERIAL DESCRIPTION	MAGO AIG	WELL DIAGRAIM	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	N VALUE	POCKET PEN. (KPa)	DRY UNIT WT. (Mg/m³)	(Blow 20 4	N - Value s/305mm 0 60 MC 10 60	80 (%) □
0.4	90.00	\$ 10 X	TOPSOIL FINE SAND			SS SS1	100	15			20 4	10 60	80
0.8			-Brown -Trace Silt		1	<u> </u>							
1.2			-Trace Rootlets -Moist	П		SS SS2	100	30		19	30	ļļ.	<u>.</u>
1.6			-Wet at 3m depth -Compact to Dense			√ ss	400		-			<u> </u>	
2.0					1	√ SS3	100	35	-		◎ 35▲		
2.4						/ ss	100	36			● 36▲	<u>.</u> .	
2.8					1	∖\ SS4			1			<u>.</u> <u>.</u>	
3.2						SS SS5	100	46	1		<u>. 4</u>	6	
3.6					V.	1000						/ <u></u>	
4.0											1		H
4.4	95.54	111	SAND & SILT			√l ss	_		-		<u></u>		
5.2	4.60		-Brown -Wet		4	X SS6	100	30	-		304		
5.6			-Dense								Ē \		
6.0	94.04											=	i i
6.4			SANDY SILT -Brown			SS SS7	100	48				IB.	
6.8			-Trace Clay -Wet	1	y	1001							
7.2			-Dense	3							<u></u>	\ \	
7.6	92.54		CLAYEY SILT			100					<u>Ē</u>	<u></u>	
8.0	7.60		-Mottled Brown & Grey -Some Sand			SS8	100	65			-	65.4	
8.4			-Moist -Hard									[
8.8	01.04		30000									<i>]</i> -[
9.2	91.04 9.10	mm	SAND			SS	100	50+	1	- 5	5	0+ 4	on Boson
9.6	-		-Brown -Some Gravel			SS9							<u>į</u>
10.0	-		-Trace Silt -Damp								= =		-
10.4			-Very Dense	Š									
10.8	-		Bottom of hole at 10.80 m.	K	///	≾ SS SS10	100	50+			5	D+A	i
	10.80		BOROTH OF HOIC AL TO.OU III.			2010	3						

DAVROC

DAVROC Unit 21, 2051 Williams Parkway Brampton, Ontario, L6Y-3R9

1	Y D.	AVR	Telephone:(905)792-7792											
CLIENT	Г <u>М-J-J</u>	-J Dev	elopments Inc.	P	ROJEC	T N	AME	Re	esident	ial/Co	mmercial Building			
PROJE	CT NUM	BER _	L20-0249GE	P	ROJEC	T L	OCATI	ON _76 Bry	ne Dri	ve, Ba	rrie, Ontario			
DATE S	STARTE	O (dd/m	nm/yy) <u>2-7-20</u> COMPLETED	GROI	UND EL	EV/	ATION	102.62 m		HOL	E SIZE _0.15			
1			TOR _Central Earth Engineering											
ı			Hollow stem auger						Dry, Ji	uly 02.	, 2020			
			CHECKED BY GW											
				AFTER DRILLING										
\vdash				T							▲ N - Value			
1 1		0		WELL DIAGRAM	SAMPLE TYPE	or	%		POCKET PEN. (kPa)	DRY UNIT WT. (Mg/m³)	(Blows/305mm) ▲ 20 40 60 80			
본이	ELEV	₹g	MATERIAL DESCRIPTION	§	H	BE	E (E)	Ü	a)	F.E.	PL MC LL			
DEPTH (m)	ELEV DEPTH	N N	WATERIAL DESCRIPTION		실	2 ≥	ဂ္ဂ်ၕ	N VALUE	유 등	\ B B B	20 40 60 80			
1 1		۱۳		Į	SAN	~	RECOVERY (RQD)	_	P.	R	☐ FINES CONTENT (%) ☐			
	02.62	3.16-70	TOPSOIL	-	N 4	-					20 40 60 80			
0.4	0.15	₩	FILL			SS 3S1	100	4		4	*			
0.8	101.82	\bowtie	-Fine Sand -Dark Brown											
1.2	0.80	+	-Some Silt			SS SS2	100	9						
1.6			-Trace Organic -Moist											
F		1	-Loose FINE SAND			SS SS3	100	5						
2.0			-Brown		/ //	500								
2.4			-Trace Silt -Trace Gravel at 1.9m depth		M	SS	100	31		. 1	• 31A			
2.8			-Moist -Loose to Dense		M	SS4	100	•	1					
3.2			-Loose to Delise		M	SS	400	44	1		• 41 <u>X</u>			
3.6					M:	SS5	100	41	-		414			
4.0														
					1									
4.4	98.02													
- 4.8 -	4.60		SAND & SILT -Brown	1	XI.	SS SS6	100	35						
5.2			-Wet						1					
5.6			-Dense to Compact to Dense					I						
6.0				١,	,									
6.4				1	M	SS	100	25	1		2540			
6.8					M:	SS7			-					
7.2														
7.6				1	1	22			-		<u>‡</u> <u>‡</u>			
8.0	į.			1	X	SS SS8	100	43			9 43A			
8.4														
8.8														
9.2	93.52				1- 01									
	9.10		CLAYEY SILT -Mottled Brown & Grey		M	SS SS9	100	33			@33 4			
9.6			-Some Sand		N. A.	508			1		<u> </u> <u> </u> <u> </u> <u> </u>			
10.0			-Wet -Hard											
10.4														
10.8	91.92 91.92	pagag	SAND	L	×	SS	100	50+			● 50+▲			
	10.80	1	-Brown		E	SS10	7							
		1	-Some Gravel -Trace Silt											
5		01	-Damp -Very Dense											
41														



DAVROC Unit 21, 2051 Williams Parkway Brampton, Ontario, L6Y-3R9 Telephone:(905)792-7792

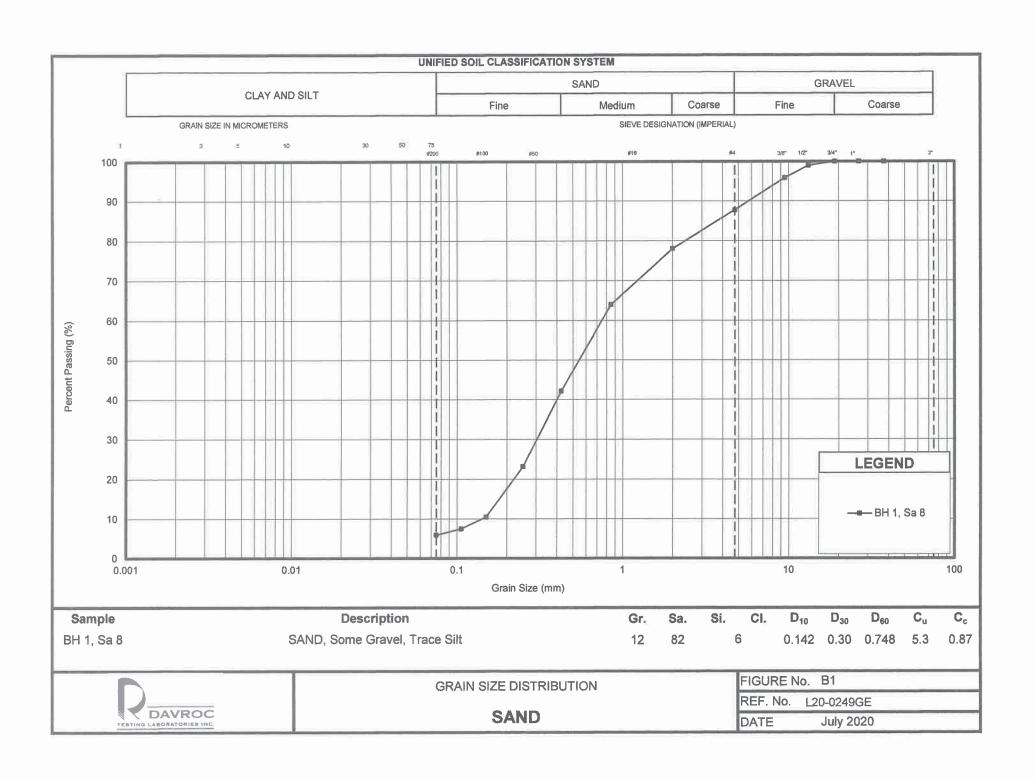
-	<u> </u>										
1			velopments Inc.	PROJECT NAME Residential/Commercial Building PROJECT LOCATION 76 Bryne Drive, Barrie, Ontario							
PROJE	ECT NUM	IBER	L20-0249GE	_	PRO	JECT L	OCATI	ON _76 Bry	ne Dri	ve, Ba	rrie, Ontario
DATE	STARTE	D (dd/	mm/yy) 2-7-20 COMPLETED	_ GRO	DUNI	D ELEV	ATION	_101.27 m		HOL	E SIZE _0.15
DRILL	ING CON	TRAC	TOR _ Central Earth Engineering	GRO	UNI	WATE	R LEV	ELS:			
DRILL	ING MET	HOD ,	Hollow stem auger	_	A	TIME (OF DRI	LLING	Dry, J	Jly 02	, 2020
LOGG	ED BY	SR	CHECKED BY GW	_ 7	ZAT	END O	F DRIL	LING 6.1	0 m / E	lev 95	5.17 m July 02, 2020
NOTE	S,			_	Al	TER D	RILLIN	G Dry,	July 09	, 202	0
DEPTH (m)	ELEV DEPTH	GRAPHIC LOG	MATERIAL DESCRIPTION	MACI I DIACEDARA	VELL DIAGRAM	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	N VALUE	POCKET PEN. (kPa)	DRY UNIT WT. (Mg/m³)	M - Value (Blows/305mm) 20 40 60 80 PL MC LL 20 40 60 80 □ FINES CONTENT (%) □
0.4	0.00		FINE SAND -Brown			SS SS1	100	7			20 40 60 80
_ 0.8 _			-Trace Silt -Trace Rootlets at 0.2m depth -Some Silt at 3.0m depth			√ ss					
1.2			-Noist to Wet -Loose to Compact/Dense		1	X SS2	100	21			021
1.6			20000 to 2011,paos201100			/ ss	100	17			
2.0					Y	∆ SS3					
2.4 _						SS SS4	100	37			37
3.2						√ ss	400		-		
3.6		03.03			4	∖\ SS5	100	30			
4.0											
4.8	96.67 4.60	71	SAND & SILT			√ ss	100	35	-		354
5.2			-Brown -Wet -Dense	1		∖\SS6	100	33			
6.0	95.17				7						
6.4			SILT -Brown			SS SS7	100	45			454
6.8			-Trace to Some Clay -Trace Sand								
7.2	02.67		-Moist -Hard								
7.6 _ 8.0	93.67 7.60		CLAYEY SILT			SS SS8	100	62	1		62
8.4			-Grey -Some Sand -Moist		1	1 228					
8.8			-Hard								
0.0	92.17										
9.2	9.10		SAND -Brown			SS SS9	100	50+			50+2
9.6			-Some Gravel	3.50		7359	1				
10.0			-Trace Silt -Damp								
10.4			-Very Dense	7.7.7							
10.8				X		SS9	100	50+	1		50+▲
2	90.27		Bottom of hole at 11.00 m.	(V)	2//	<u> </u>			1		H H H
5	11.00		Satur of Hole at 11.00 fil.								
6.4											

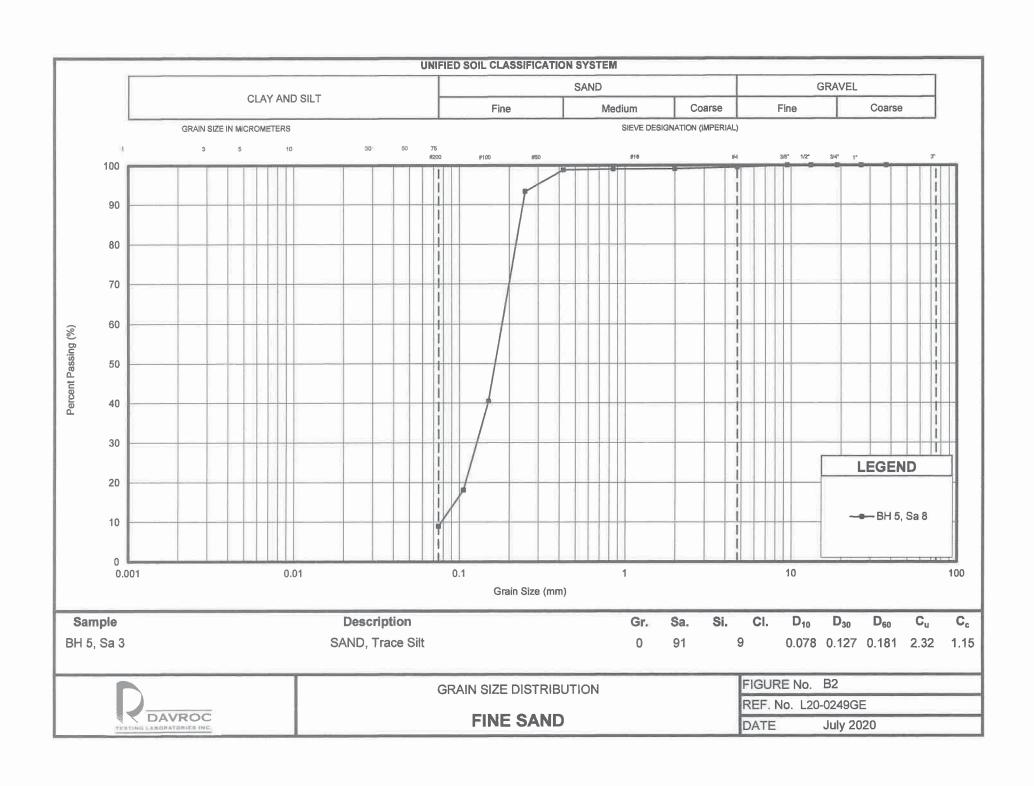


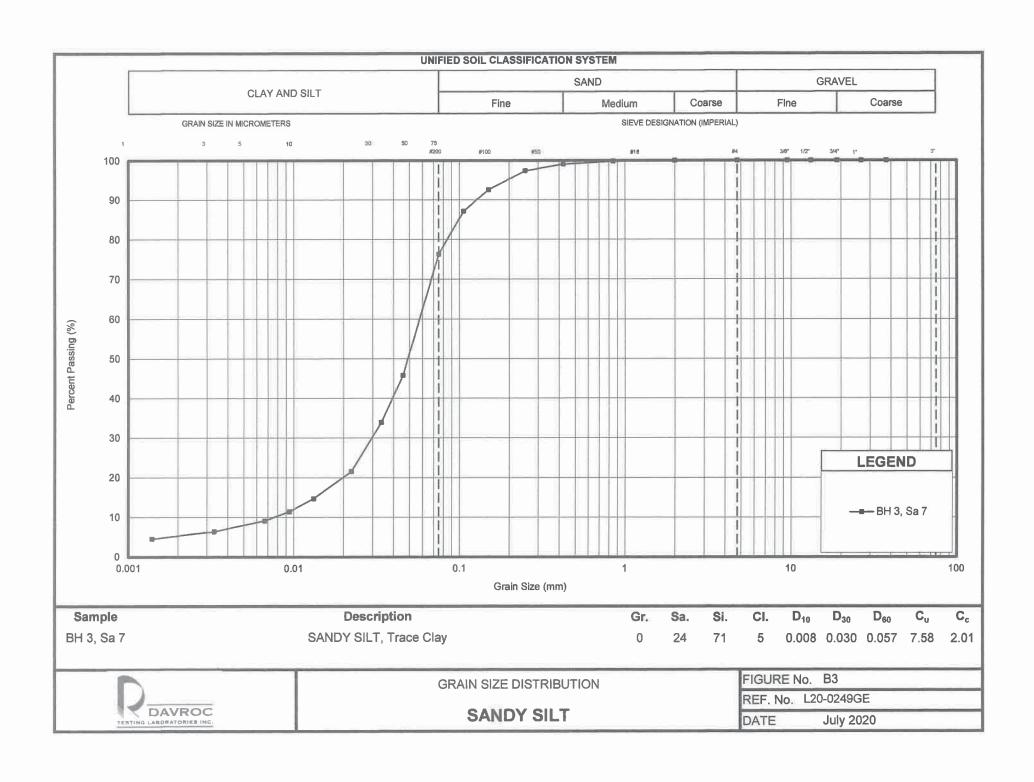
Appendix C

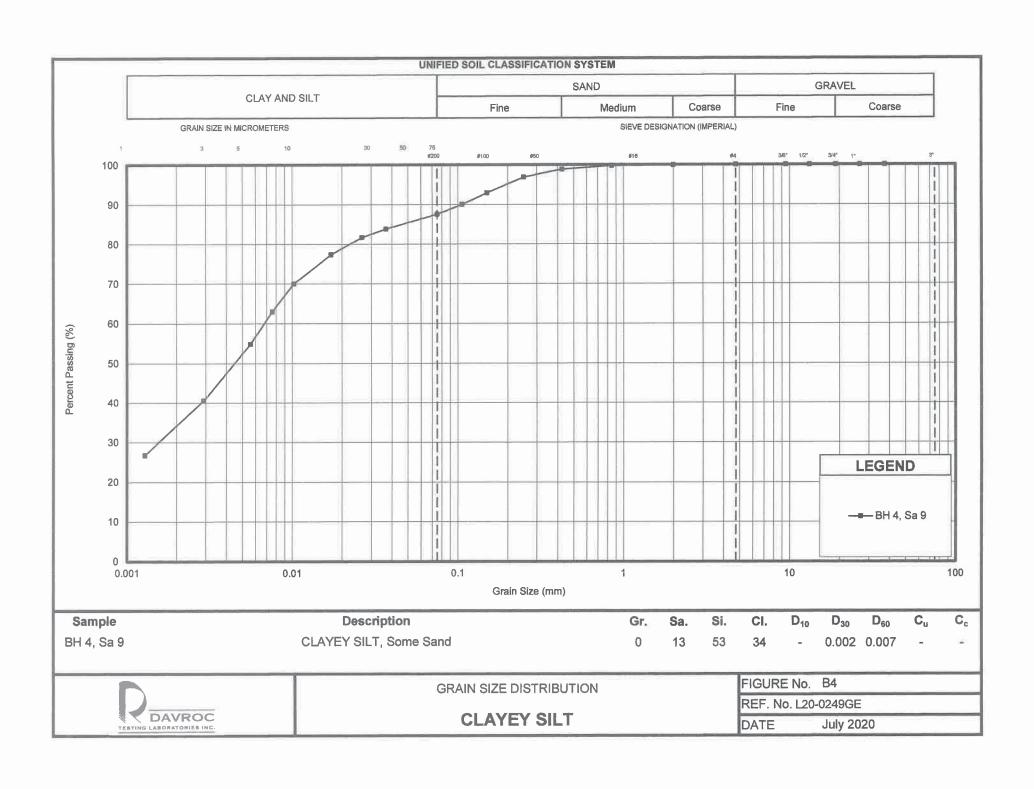
Grain Size Analysis (Davroc Testing Laboratories, 2020)

Á











Appendix D

Certificate of Analysis (ALS, 2020)



PALMER ENVIRONMENTAL CONSULTING

GROUP INC. (Richmond Hill)

ATTN: Sarah Sipak 74 Berkeley Street

Toronto ON M5V 1E3

Date Received: 20-JUL-20

Report Date: 29-JUL-20 07:09 (MT)

Version: FINAL

Client Phone: 647-795-8153

Certificate of Analysis

Lab Work Order #: L2476882

Project P.O. #: NOT SUBMITTED

Job Reference: 2004502 C of C Numbers: 17-800189

Legal Site Desc:

Jennifer Barkshire-Paterson Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 95 West Beaver Creek Road, Unit 1, Richmond Hill, ON L4B 1H2 Canada | Phone: +1 905 881 9887 | Fax: +1 905 881 8062 ALS CANADA LTD | Part of the ALS Group | An ALS Limited Company



L2476882 CONTD.... PAGE 2 of 5

Version: FINAL

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2476882-1 79 BRYNE DR COMPOSITE Sampled By: RD on 17-JUL-20 @ 10:00 Matrix: WATER							
Physical Tests							
Colour, Apparent	68.7	PEHR	2.0	CU		20-JUL-20	R5159354
Conductivity	473		3.0	umhos/cm		21-JUL-20	R5163660
pH	7.54		0.10	pH units		21-JUL-20	R5163660
Total Dissolved Solids	293	DLDS	20	mg/L		23-JUL-20	R5166371
Turbidity	>4000	PEHR	0.10	NTU		21-JUL-20	R5159516
Anions and Nutrients							
Alkalinity, Soluble (as CaCO3)	218		10	mg/L		24-JUL-20	R5167488
Ammonia, Total (as N)	0.147		0.010	mg/L		24-JUL-20	R5169382
Bromide (Br)	<0.10		0.10	mg/L		23-JUL-20	R5166673
Chloride (CI)	9.17		0.50	mg/L		23-JUL-20	R5166673
Computed Conductivity	408			uS/cm		28-JUL-20	
Conductivity % Difference	-15			%		28-JUL-20	
Fluoride (F)	0.059		0.020	mg/L		23-JUL-20	R5166673
Hardness (as CaCO3)	228			mg/L		28-JUL-20	
Ion Balance	118			%		28-JUL-20	
Langelier Index	0					28-JUL-20	
Nitrate and Nitrite as N	2.028		0.022	mg/L		24-JUL-20	
Nitrate (as N)	1.74		0.020	mg/L		23-JUL-20	R5166673
Nitrite (as N)	0.288		0.010	mg/L		23-JUL-20	R5166673
Saturation pH	7.17			рН		28-JUL-20	
Orthophosphate-Dissolved (as P)	<0.0030		0.0030	mg/L		22-JUL-20	R5161396
TDS (Calculated)	250			mg/L		28-JUL-20	
Sulfate (SO4)	5.68		0.30	mg/L		23-JUL-20	R5166673
Anion Sum	4.11			me/L		28-JUL-20	
Cation Sum	4.86			me/L		28-JUL-20	
Cation - Anion Balance	8			%		28-JUL-20	
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	LAB	PEHT				21-JUL-20	R5159924
Dissolved Organic Carbon	8.93		0.50	mg/L	21-JUL-20	27-JUL-20	R5168120
Inorganic Parameters							
Silica	9.22		0.11	mg/L		21-JUL-20	
Dissolved Metals							
Dissolved Metals Filtration Location	LAB					21-JUL-20	R5159411
Aluminum (Al)-Dissolved	0.0061		0.0050	mg/L	21-JUL-20	21-JUL-20	R5159932
Antimony (Sb)-Dissolved	0.00022		0.00010	mg/L	21-JUL-20	21-JUL-20	R5159932
Arsenic (As)-Dissolved	0.00029		0.00010	mg/L	21-JUL-20	21-JUL-20	R5159932
Barium (Ba)-Dissolved	0.0232		0.00010	mg/L	21-JUL-20	21-JUL-20	R5159932
Beryllium (Be)-Dissolved	<0.00010		0.00010	mg/L	21-JUL-20	21-JUL-20	R5159932
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L	21-JUL-20	21-JUL-20	R5159932
Boron (B)-Dissolved	<0.010		0.010	mg/L	21-JUL-20	21-JUL-20	R5159932
Cadmium (Cd)-Dissolved	<0.000010		0.000010	mg/L	21-JUL-20	21-JUL-20	R5159932
Calcium (Ca)-Dissolved	80.3		0.050	mg/L	21-JUL-20	21-JUL-20	R5159932

^{*} Refer to Referenced Information for Qualifiers (if any) and Methodology.

L2476882 CONTD.... PAGE 3 of 5

Version: FINAL

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2476882-1 79 BRYNE DR COMPOSITE							
Sampled By: RD on 17-JUL-20 @ 10:00 Matrix: WATER							
Dissolved Metals							
Chromium (Cr)-Dissolved	0.00062		0.00050	mg/L	21-JUL-20	21-JUL-20	R5159932
Cobalt (Co)-Dissolved	0.00024		0.00010	mg/L	21-JUL-20	21-JUL-20	R5159932
Copper (Cu)-Dissolved	0.00832		0.00020	mg/L	21-JUL-20	21-JUL-20	R5159932
Iron (Fe)-Dissolved	<0.010		0.010	mg/L	21-JUL-20	21-JUL-20	R5159932
Lead (Pb)-Dissolved	<0.000050		0.000050	mg/L	21-JUL-20	21-JUL-20	R5159932
Magnesium (Mg)-Dissolved	6.77		0.050	mg/L	21-JUL-20	21-JUL-20	R5159932
Manganese (Mn)-Dissolved	0.00593		0.00050	mg/L	21-JUL-20	21-JUL-20	R5159932
Molybdenum (Mo)-Dissolved	0.000343		0.000050	mg/L	21-JUL-20	21-JUL-20	R5159932
Nickel (Ni)-Dissolved	0.00378		0.00050	mg/L	21-JUL-20	21-JUL-20	R5159932
Phosphorus (P)-Dissolved	<0.050		0.050	mg/L	21-JUL-20	21-JUL-20	R5159932
Potassium (K)-Dissolved	2.88		0.050	mg/L	21-JUL-20	21-JUL-20	R5159932
Selenium (Se)-Dissolved	0.000155		0.000050	mg/L	21-JUL-20	21-JUL-20	R5159932
Silicon (Si)-Dissolved	4.31		0.050	mg/L	21-JUL-20	21-JUL-20	R5159932
Silver (Ag)-Dissolved Sodium (Na)-Dissolved	<0.00050		0.000050	mg/L	21-JUL-20	21-JUL-20	R5159932
Strontium (Sr)-Dissolved	5.21 0.171		0.50 0.0010	mg/L mg/L	21-JUL-20 21-JUL-20	21-JUL-20 21-JUL-20	R5159932 R5159932
Sulfur (S)-Dissolved	<5.0		5.0	mg/L	21-JUL-20	21-JUL-20	R5159932
Thallium (TI)-Dissolved	0.000012		0.000010	mg/L	21-JUL-20	21-JUL-20	R5159932
Tin (Sn)-Dissolved	0.00209		0.00010	mg/L	21-JUL-20	21-JUL-20	R5159932
Titanium (Ti)-Dissolved	<0.00030		0.00030	mg/L	21-JUL-20	21-JUL-20	R5159932
Tungsten (W)-Dissolved	<0.00010		0.00010	mg/L	21-JUL-20	21-JUL-20	R5159932
Uranium (U)-Dissolved	0.000163		0.000010	mg/L	21-JUL-20	21-JUL-20	R5159932
Vanadium (V)-Dissolved	<0.00050		0.00050	mg/L	21-JUL-20	21-JUL-20	R5159932
Zinc (Zn)-Dissolved	<0.0010		0.0010	mg/L	21-JUL-20	21-JUL-20	R5159932
Zirconium (Zr)-Dissolved	<0.00030		0.00030	mg/L	21-JUL-20	21-JUL-20	R5159932

^{*} Refer to Referenced Information for Qualifiers (if any) and Methodology.

L2476882 CONTD....

PAGE 4 of 5 Version: FINAL

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)	
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L2476882-1	
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L2476882-1	
Matrix Spike	Silicon (Si)-Dissolved	MS-B	L2476882-1	
Matrix Spike	Strontium (Sr)-Dissolved	MS-B	L2476882-1	
Matrix Spike	Nitrate (as N)	MS-B	L2476882-1	

Sample Parameter Qualifier key listed:

Qualifier	Description
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
PEHR	Parameter Exceeded Recommended Holding Time On Receipt: Proceed With Analysis As Requested.
PEHT	Parameter Exceeded Recommended Holding Time Prior to Analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-SOLUBLE-WT	Water	Alkalinity, total (as CaCO3)	EPA 310.2
BR-IC-N-WT	Water	Bromide in Water by IC	EPA 300.1 (mod)
Inorganic anions are ana	alyzed by Ion	Chromatography with conductivity and	or UV detection.
CL-IC-N-WT	Water	Chloride by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

COLOUR-APPARENT-WT Water Colour APHA 2120

Apparent Colour is measured spectrophotometrically by comparison to platinum-cobalt standards using the single wavelength method after sample decanting. Colour measurements can be highly pH dependent, and apply to the pH of the sample as received (at time of testing), without pH adjustment. Concurrent measurement of sample pH is recommended.

DOC-WT Water Dissolved Organic Carbon APHA 5310B

Sample is filtered through a 0.45um filter, then injected into a heated reaction chamber which is packed with an oxidative catalyst. The water is vaporized and the organic carbon is oxidized to carbon dioxide. The carbon dioxide is transported in a carrier gas and is measured by a non-dispersive infrared detector.

ililialed detector.

EC-SCREEN-WT Water Conductivity Screen (Internal Use APHA 2510 Only)

Qualitative analysis of conductivity where required during preparation of other tests - e.g. TDS, metals, etc.

EC-WT Water Conductivity APHA 2510 B
Water samples can be measured directly by immersing the conductivity cell into the sample.

ETL-N2N3-WT Water Calculate from NO2 + NO3 APHA 4110 B

ETL-SILICA-CALC-WT Water Calculate from SI-TOT-WT EPA 200.8

F-IC-N-WT Water Fluoride in Water by IC EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

IONBALANCE-OP03-WT Water Detailed Ion Balance Calculation APHA 1030E, 2330B, 2510A

MET-D-CCMS-WT Water Dissolved Metals in Water by CRC APHA 3030B/6020A (mod)

ICPMS

Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

L2476882 CONTD....

PAGE 5 of 5 Version: FINAL

Reference Information

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

NH3-F-WT

Water

Ammonia in Water by Fluorescence J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et

NO2-IC-WT

Water

Nitrite in Water by IC

EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-IC-WT

Water

Nitrate in Water by IC

EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

PH-WT

Water

APHA 4500 H-Flectrode

Water samples are analyzed directly by a calibrated pH meter.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental

Protection Act (July 1, 2011). Holdtime for samples under this regulation is 28 days

PO4-DO-COL-WT

Water

Diss. Orthophosphate in Water by

APHA 4500-P PHOSPHORUS

Colour

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.

Water

Sulfate in Water by IC

EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

SOLIDS-TDS-WT

SO4-IC-N-WT

Total Dissolved Solids

APHA 2540C

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

Turbidity

APHA 2130 B

Sample result is based on a comparison of the intensity of the light scattered by the sample under defined conditions with the intensity of light scattered by a standard reference suspension under the same conditions. Sample readings are obtained from a Nephelometer.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code

Laboratory Location

ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

Chain of Custody Numbers:

17-800189

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Workorder: L2476882 Report Date: 29-JUL-20 Page 1 of 10

Client: PALMER ENVIRONMENTAL CONSULTING GROUP INC. (Richmond Hill)

74 Berkeley Street Toronto ON M5V 1E3

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ALK-SOLUBLE-WT Batch R5167488 WG3370988-3 DUP	Water	L2476882-1						
Alkalinity, Soluble (as Ca	aCO3)	218	215		mg/L	1.4	25	24-JUL-20
WG3370988-2 LCS Alkalinity, Soluble (as Ca	aCO3)		103.6		%		70-130	24-JUL-20
WG3370988-1 MB Alkalinity, Soluble (as Ca	aCO3)		<10		mg/L		10	24-JUL-20
BR-IC-N-WT	Water							
Batch R5166673								
WG3369306-4 DUP Bromide (Br)		WG3369306-3 <0.10	<0.10	RPD-NA	mg/L	N/A	20	23-JUL-20
WG3369306-2 LCS Bromide (Br)			101.0		%		85-115	23-JUL-20
WG3369306-1 MB Bromide (Br)			<0.10		mg/L		0.1	23-JUL-20
WG3369306-5 MS Bromide (Br)		WG3369306-3	98.5		%		75-125	23-JUL-20
CL-IC-N-WT	Water							
Batch R5166673								
WG3369306-4 DUP Chloride (CI)		WG3369306-3 57.6	57.5		mg/L	0.1	20	23-JUL-20
WG3369306-2 LCS Chloride (Cl)			102.5		%		90-110	23-JUL-20
WG3369306-1 MB Chloride (CI)			<0.50		mg/L		0.5	23-JUL-20
WG3369306-5 MS Chloride (CI)		WG3369306-3	102.8		%		75-125	23-JUL-20
COLOUR-APPARENT-WT	Water							
Batch R5159354 WG3366522-3 DUP		L2476611-1						
Colour, Apparent		32.3	32.3		CU	0.2	20	20-JUL-20
WG3366522-2 LCS Colour, Apparent			100.3		%		85-115	20-JUL-20
WG3366522-1 MB Colour, Apparent			<2.0		CU		2	20-JUL-20
DOC-WT	Water							



Workorder: L2476882 Report Date: 29-JUL-20 Page 2 of 10

Client: PALMER ENVIRONMENTAL CONSULTING GROUP INC. (Richmond Hill)

74 Berkeley Street Toronto ON M5V 1E3

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
DOC-WT	Water							
Batch R5168 WG3367234-3 D Dissolved Organic	UP	L2472463-4 3.43	3.53		mg/L	2.6	20	27-JUL-20
WG3367234-2 Lo Dissolved Organic	CS Carbon		107.2		%		80-120	27-JUL-20
WG3367234-1 M Dissolved Organic	I B Carbon		<0.50		mg/L		0.5	27-JUL-20
WG3367234-4 M Dissolved Organic	-	L2472463-4	105.0		%		70-130	27-JUL-20
EC-WT	Water							
Batch R5163 WG3366794-4 D	3660 UP	WG3366794-3						
Conductivity	cs	1280	1300		umhos/cm	1.2	10	21-JUL-20
Conductivity			101.1		%		90-110	21-JUL-20
WG3366794-1 M Conductivity	IB		<3.0		umhos/cm		3	21-JUL-20
F-IC-N-WT	Water							
Batch R5166								
WG3369306-4 D Fluoride (F)	UP	WG3369306-3 0.071	0.071		mg/L	0.4	20	23-JUL-20
WG3369306-2 Lo Fluoride (F)	cs		105.4		%		90-110	23-JUL-20
WG3369306-1 M Fluoride (F)	IB		<0.020		mg/L		0.02	23-JUL-20
WG3369306-5 M Fluoride (F)	IS	WG3369306-3	100.6		%		75-125	23-JUL-20
MET-D-CCMS-WT	Water							
	UP	WG3366604-3						
Aluminum (Al)-Diss		0.0132	0.0203	J	mg/L	0.0071	0.01	21-JUL-20
Antimony (Sb)-Diss		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	21-JUL-20
Arsenic (As)-Dissol		0.00019	0.00020		mg/L	3.5	20	21-JUL-20
Barium (Ba)-Dissol		0.00415	0.00419		mg/L	1.1	20	21-JUL-20
Beryllium (Be)-Diss		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	21-JUL-20
Bismuth (Bi)-Dissol		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	21-JUL-20
Boron (B)-Dissolve	d	<0.010	<0.010	RPD-NA	mg/L	N/A	20	21-JUL-20



Workorder: L2476882 Report Date: 29-JUL-20 Page 3 of 10

Client: PALMER ENVIRONMENTAL CONSULTING GROUP INC. (Richmond Hill)

74 Berkeley Street Toronto ON M5V 1E3

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-WT	Water							
Batch R5159	9932							
	UP	WG3366604-3	0.000005	·	a./I			
Cadmium (Cd)-Dis		<0.0000050	<0.000005	C RPD-NA	mg/L	N/A	20	21-JUL-20
Calcium (Ca)-Disso		30.0	30.4		mg/L	1.3	20	21-JUL-20
Chromium (Cr)-Dis		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	21-JUL-20
Cobalt (Co)-Dissolv		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	21-JUL-20
Copper (Cu)-Disso		0.00041	0.00046		mg/L	11	20	21-JUL-20
Iron (Fe)-Dissolved		<0.010	<0.010	RPD-NA	mg/L	N/A	20	21-JUL-20
Lead (Pb)-Dissolve		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	21-JUL-20
Magnesium (Mg)-D		4.71	4.60		mg/L	2.4	20	21-JUL-20
Manganese (Mn)-D		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	21-JUL-20
Molybdenum (Mo)-	Dissolved	<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	21-JUL-20
Nickel (Ni)-Dissolve	ed	<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	21-JUL-20
Phosphorus (P)-Dis	ssolved	<0.050	<0.050	RPD-NA	mg/L	N/A	20	21-JUL-20
Potassium (K)-Diss	solved	0.406	0.409		mg/L	0.8	20	21-JUL-20
Selenium (Se)-Diss	solved	<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	21-JUL-20
Silicon (Si)-Dissolv	ed	3.67	3.76		mg/L	2.4	20	21-JUL-20
Silver (Ag)-Dissolve	ed	<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	21-JUL-20
Sodium (Na)-Disso	lved	1.43	1.41		mg/L	1.2	20	21-JUL-20
Strontium (Sr)-Diss	solved	0.0319	0.0321		mg/L	0.6	20	21-JUL-20
Sulfur (S)-Dissolve	d	<0.50	<0.50	RPD-NA	mg/L	N/A	20	21-JUL-20
Thallium (TI)-Disso	lved	<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	21-JUL-20
Tin (Sn)-Dissolved		0.00019	0.00020		mg/L	1.7	20	21-JUL-20
Titanium (Ti)-Disso	lved	< 0.00030	0.00045	RPD-NA	mg/L	N/A	20	21-JUL-20
Tungsten (W)-Diss	olved	<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	21-JUL-20
Uranium (U)-Disso	lved	0.000055	0.000056		mg/L	2.9	20	21-JUL-20
Vanadium (V)-Diss	olved	0.00070	0.00069		mg/L	2.1	20	21-JUL-20
Zinc (Zn)-Dissolved	d	<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	21-JUL-20
Zirconium (Zr)-Diss	solved	<0.00020	<0.00020	RPD-NA	mg/L	N/A	20	21-JUL-20
WG3366604-2 L Aluminum (Al)-Diss	CS solved		102.6		%		80-120	21-JUL-20
Antimony (Sb)-Diss			99.6		%		80-120	21-JUL-20
Arsenic (As)-Disso			99.2		%		80-120	21-JUL-20
Barium (Ba)-Dissol			100.0		%		80-120	21-JUL-20
Beryllium (Be)-Diss	solved		89.3		%		80-120	21-JUL-20
1							_	



Workorder: L2476882 Report Date: 29-JUL-20 Page 4 of 10

Client: PALMER ENVIRONMENTAL CONSULTING GROUP INC. (Richmond Hill)

74 Berkeley Street Toronto ON M5V 1E3

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-WT	Water							
Batch R51599	32							
WG3366604-2 LCS Bismuth (Bi)-Dissolve			98.4		%		00.400	04 00
Boron (B)-Dissolved	tu		89.9		%		80-120	21-JUL-20
Cadmium (Cd)-Disso	lvod		98.1		%		80-120	21-JUL-20
Calcium (Ca)-Dissolv			96.1		%		80-120	21-JUL-20
Chromium (Cr)-Dissolv			97.2		%		80-120	21-JUL-20
Cobalt (Co)-Dissolve			97.2 95.1		%		80-120	21-JUL-20
Copper (Cu)-Dissolve			94.3		%		80-120	21-JUL-20
Iron (Fe)-Dissolved	su		94.3 95.8		%		80-120	21-JUL-20
Lead (Pb)-Dissolved			100.6		%		80-120	21-JUL-20
Magnesium (Mg)-Dis	colvod		99.9		%		80-120	21-JUL-20
Manganese (Mn)-Dis			98.9		%		80-120	21-JUL-20
Molybdenum (Mo)-Di			97.6		%		80-120	21-JUL-20
Nickel (Ni)-Dissolved			94.4		%		80-120 80-120	21-JUL-20 21-JUL-20
Phosphorus (P)-Diss			100.1		%			
Potassium (K)-Dissol			97.1		%		80-120	21-JUL-20
Selenium (Se)-Dissol			100.3		%		80-120 80-120	21-JUL-20 21-JUL-20
Silicon (Si)-Dissolved			97.3		%		60-140	21-JUL-20
Silver (Ag)-Dissolved			99.3		%		80-120	21-JUL-20
Sodium (Na)-Dissolve			98.1		%		80-120	21-JUL-20
Strontium (Sr)-Dissol			102.5		%		80-120	21-JUL-20
Sulfur (S)-Dissolved	vou		96.5		%		80-120	21-JUL-20
Thallium (TI)-Dissolve	ed.		103.2		%		80-120	21-JUL-20
Tin (Sn)-Dissolved	-		98.2		%		80-120	21-JUL-20
Titanium (Ti)-Dissolve	ed		96.7		%		80-120	21-JUL-20
Tungsten (W)-Dissol			103.6		%		80-120	21-JUL-20
Uranium (U)-Dissolve			107.3		%		80-120	21-JUL-20
Vanadium (V)-Dissol			98.0		%		80-120	21-JUL-20
Zinc (Zn)-Dissolved			97.1		%		80-120	21-JUL-20
Zirconium (Zr)-Dissol	ved		93.9		%		80-120	21-JUL-20
WG3366604-1 MB								
Aluminum (Al)-Dissol	ved		<0.0050		mg/L		0.005	21-JUL-20
Antimony (Sb)-Dissol	ved		<0.00010		mg/L		0.0001	21-JUL-20
Arsenic (As)-Dissolve	ed		<0.00010		mg/L		0.0001	21-JUL-20
Barium (Ba)-Dissolve	ed		<0.00010		mg/L		0.0001	21-JUL-20



Workorder: L2476882 Report Date: 29-JUL-20 Page 5 of 10

Client: PALMER ENVIRONMENTAL CONSULTING GROUP INC. (Richmond Hill)

74 Berkeley Street Toronto ON M5V 1E3

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-WT	Water							
Batch R515	9932							
	/IB		0.00040		/I		0.0004	
Beryllium (Be)-Diss			<0.00010		mg/L		0.0001	21-JUL-20
Bismuth (Bi)-Disso			<0.00005	U	mg/L		0.00005	21-JUL-20
Boron (B)-Dissolve			<0.010		mg/L		0.01	21-JUL-20
Cadmium (Cd)-Dis			<0.00000	5C	mg/L		0.000005	21-JUL-20
Calcium (Ca)-Diss			<0.050		mg/L		0.05	21-JUL-20
Chromium (Cr)-Dis			<0.00050		mg/L		0.0005	21-JUL-20
Cobalt (Co)-Dissol			<0.00010		mg/L		0.0001	21-JUL-20
Copper (Cu)-Disso			<0.00020		mg/L		0.0002	21-JUL-20
Iron (Fe)-Dissolved			<0.010		mg/L		0.01	21-JUL-20
Lead (Pb)-Dissolve	ed		<0.00005	0	mg/L		0.00005	21-JUL-20
Magnesium (Mg)-	Dissolved		<0.0050		mg/L		0.005	21-JUL-20
Manganese (Mn)-[Dissolved		<0.00050		mg/L		0.0005	21-JUL-20
Molybdenum (Mo)-	-Dissolved		<0.00005	0	mg/L		0.00005	21-JUL-20
Nickel (Ni)-Dissolv	ed		<0.00050		mg/L		0.0005	21-JUL-20
Phosphorus (P)-Di	ssolved		< 0.050		mg/L		0.05	21-JUL-20
Potassium (K)-Dis	solved		<0.050		mg/L		0.05	21-JUL-20
Selenium (Se)-Dis	solved		<0.00005	0	mg/L		0.00005	21-JUL-20
Silicon (Si)-Dissolv	red		<0.050		mg/L		0.05	21-JUL-20
Silver (Ag)-Dissolv	red		<0.00005	0	mg/L		0.00005	21-JUL-20
Sodium (Na)-Disso	olved		< 0.050		mg/L		0.05	21-JUL-20
Strontium (Sr)-Diss	solved		<0.0010		mg/L		0.001	21-JUL-20
Sulfur (S)-Dissolve	ed		<0.50		mg/L		0.5	21-JUL-20
Thallium (TI)-Disso	olved		<0.00001	0	mg/L		0.00001	21-JUL-20
Tin (Sn)-Dissolved	I		<0.00010		mg/L		0.0001	21-JUL-20
Titanium (Ti)-Disso	olved		<0.00030		mg/L		0.0003	21-JUL-20
Tungsten (W)-Diss	solved		<0.00010		mg/L		0.0001	21-JUL-20
Uranium (U)-Disso	lved		<0.00001	0	mg/L		0.00001	21-JUL-20
Vanadium (V)-Diss	solved		<0.00050		mg/L		0.0005	21-JUL-20
Zinc (Zn)-Dissolve	d		<0.0010		mg/L		0.001	21-JUL-20
Zirconium (Zr)-Dis	solved		<0.00020		mg/L		0.0002	21-JUL-20
WG3366604-5 N	ıs	WG3366604-6						
Aluminum (Al)-Dis	solved		105.3		%		70-130	21-JUL-20
Antimony (Sb)-Disa	solved		95.2		%		70-130	21-JUL-20
Arsenic (As)-Disso	lved		101.2		%		70-130	21-JUL-20



Workorder: L2476882 Report Date: 29-JUL-20 Page 6 of 10

Client: PALMER ENVIRONMENTAL CONSULTING GROUP INC. (Richmond Hill)

74 Berkeley Street

Toronto ON M5V 1E3

Contact: Sarah Sipak

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-WT	Water							
Batch R5159	932							
WG3366604-5 M		WG3366604-6			0.4			
Barium (Ba)-Dissol			101.5		%		70-130	21-JUL-20
Beryllium (Be)-Diss			92.2		%		70-130	21-JUL-20
Bismuth (Bi)-Dissol			94.2		%		70-130	21-JUL-20
Boron (B)-Dissolved			91.6		%		70-130	21-JUL-20
Cadmium (Cd)-Diss			98.7		%		70-130	21-JUL-20
Calcium (Ca)-Disso			N/A	MS-B	%		-	21-JUL-20
Chromium (Cr)-Dis	solved		94.5		%		70-130	21-JUL-20
Cobalt (Co)-Dissolv	red		91.5		%		70-130	21-JUL-20
Copper (Cu)-Dissol	ved		91.4		%		70-130	21-JUL-20
Iron (Fe)-Dissolved			100.4		%		70-130	21-JUL-20
Lead (Pb)-Dissolve	d		99.7		%		70-130	21-JUL-20
Magnesium (Mg)-D	issolved		N/A	MS-B	%		-	21-JUL-20
Manganese (Mn)-D	issolved		97.5		%		70-130	21-JUL-20
Molybdenum (Mo)-l	Dissolved		95.8		%		70-130	21-JUL-20
Nickel (Ni)-Dissolve	ed		90.5		%		70-130	21-JUL-20
Phosphorus (P)-Dis	ssolved		104.9		%		70-130	21-JUL-20
Potassium (K)-Diss	olved		95.7		%		70-130	21-JUL-20
Selenium (Se)-Diss	olved		107.4		%		70-130	21-JUL-20
Silicon (Si)-Dissolve	ed		N/A	MS-B	%		-	21-JUL-20
Silver (Ag)-Dissolve	ed		94.6		%		70-130	21-JUL-20
Sodium (Na)-Disso	lved		91.4		%		70-130	21-JUL-20
Strontium (Sr)-Diss	olved		N/A	MS-B	%		-	21-JUL-20
Sulfur (S)-Dissolved	d		96.7		%		70-130	21-JUL-20
Thallium (TI)-Disso	lved		101.1		%		70-130	21-JUL-20
Tin (Sn)-Dissolved			94.3		%		70-130	21-JUL-20
Titanium (Ti)-Disso	lved		98.4		%		70-130	21-JUL-20
Tungsten (W)-Diss	olved		100.1		%		70-130	21-JUL-20
Uranium (U)-Dissol	ved		101.3		%		70-130	21-JUL-20
Vanadium (V)-Diss	olved		96.2		%		70-130	21-JUL-20
Zinc (Zn)-Dissolved	I		98.2		%		70-130	21-JUL-20
Zirconium (Zr)-Diss			92.4		%		70-130	21-JUL-20

NH3-F-WT Water



Workorder: L2476882 Report Date: 29-JUL-20 Page 7 of 10

Client: PALMER ENVIRONMENTAL CONSULTING GROUP INC. (Richmond Hill)

74 Berkeley Street Toronto ON M5V 1E3

Sarah Sipak

Contact:

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NH3-F-WT	Water							
Batch R5169382 WG3366545-3 DUP Ammonia, Total (as N)		L2476611-2 <0.010	<0.010	RPD-NA	mg/L	N/A	20	24-JUL-20
WG3366545-2 LCS Ammonia, Total (as N)			91.7		%		85-115	24-JUL-20
WG3366545-1 MB Ammonia, Total (as N)			<0.010		mg/L		0.01	24-JUL-20
WG3366545-4 MS Ammonia, Total (as N)		L2476611-2	95.5		%		75-125	24-JUL-20
NO2-IC-WT	Water							
Batch R5166673								
WG3369306-4 DUP Nitrite (as N)		WG3369306-3 <0.010	<0.010	RPD-NA	mg/L	N/A	20	23-JUL-20
WG3369306-2 LCS Nitrite (as N)			102.8		%		90-110	23-JUL-20
WG3369306-1 MB Nitrite (as N)			<0.010		mg/L		0.01	23-JUL-20
WG3369306-5 MS Nitrite (as N)		WG3369306-3	103.7		%		75-125	23-JUL-20
NO3-IC-WT	Water							
Batch R5166673 WG3369306-4 DUP Nitrate (as N)		WG3369306-3 2.73	2.74		mg/L	0.0	20	23-JUL-20
WG3369306-2 LCS Nitrate (as N)			101.8		%		90-110	23-JUL-20
WG3369306-1 MB Nitrate (as N)			<0.020		mg/L		0.02	23-JUL-20
WG3369306-5 MS Nitrate (as N)		WG3369306-3	N/A	MS-B	%		-	23-JUL-20
PH-WT	Water							
Batch R5163660 WG3366794-4 DUP pH		WG3366794-3 7.80	7.84	J	pH units	0.04	0.2	21-JUL-20
WG3366794-2 LCS pH			7.01		pH units		6.9-7.1	21-JUL-20
PO4-DO-COL-WT	Water							



Workorder: L2476882 Report Date: 29-JUL-20 Page 8 of 10

Client: PALMER ENVIRONMENTAL CONSULTING GROUP INC. (Richmond Hill)

74 Berkeley Street Toronto ON M5V 1E3

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PO4-DO-COL-WT	Water							
	61396 DUP Dissolved (as P)	L2477564-1 <0.0030	<0.0030	RPD-NA	mg/L	N/A	20	22-JUL-20
WG3367529-6 Orthophosphate-I	LCS Dissolved (as P)		103.9		%		80-120	22-JUL-20
WG3367529-5 Orthophosphate-I	MB Dissolved (as P)		<0.0030		mg/L		0.003	22-JUL-20
WG3367529-8 Orthophosphate-I	MS Dissolved (as P)	L2477564-1	96.5		%		70-130	22-JUL-20
SO4-IC-N-WT	Water							
	66673							
WG3369306-4 Sulfate (SO4)	DUP	WG3369306-3 61.0	61.0		mg/L	0.0	20	23-JUL-20
WG3369306-2 Sulfate (SO4)	LCS		103.8		%		90-110	23-JUL-20
WG3369306-1 Sulfate (SO4)	МВ		<0.30		mg/L		0.3	23-JUL-20
WG3369306-5 Sulfate (SO4)	MS	WG3369306-3	105.5		%		75-125	23-JUL-20
SOLIDS-TDS-WT	Water							
Batch R516	66371							
WG3368608-3 Total Dissolved S	DUP olids	L2476230-1 167	168		mg/L	0.6	20	23-JUL-20
WG3368608-2 Total Dissolved S	LCS olids		101.9		%		85-115	23-JUL-20
WG3368608-1 Total Dissolved S	MB olids		<10		mg/L		10	23-JUL-20
TURBIDITY-WT	Water							
Batch R515	59516							
WG3366705-3 Turbidity	DUP	L2476597-1 0.72	0.76		NTU	6.1	15	21-JUL-20
WG3366705-2 Turbidity	LCS		103.5		%		85-115	21-JUL-20
WG3366705-1 I Turbidity	МВ		<0.10		NTU		0.1	21-JUL-20

Workorder: L2476882 Report Date: 29-JUL-20

Client: PALMER ENVIRONMENTAL CONSULTING GROUP INC. (Richmond Hill)

74 Berkeley Street

Toronto ON M5V 1E3

Contact: Sarah Sipak

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
ADE MB IRM CRM CCV	Average Desorption Efficiency Method Blank Internal Reference Material Certified Reference Material Continuing Calibration Verification

Sample Parameter Qualifier Definitions:

LCSD Laboratory Control Sample Duplicate

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
PEHR	Parameter Exceeded Recommended Holding Time On Receipt: Proceed With Analysis As Requested.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

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Workorder: L2476882 Report Date: 29-JUL-20

Client: PALMER ENVIRONMENTAL CONSULTING GROUP INC. (Richmond Hill)

74 Berkeley Street

Toronto ON M5V 1E3

Contact: Sarah Sipak

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Hold Time Exceedances:

	Sample						
ALS Product Description	ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Physical Tests							
Colour							
	1	17-JUL-20 10:00	20-JUL-20 21:00	48	83	hours	EHTR
Turbidity							
	1	17-JUL-20 10:00	21-JUL-20 00:00	48	86	hours	EHTR
Organic / Inorganic Carbon							
Dissolved Organic Carbon							
	1	17-JUL-20 10:00	21-JUL-20 16:00	3	4	days	EHTL

Legend & Qualifier Definitions:

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.

EHTR: Exceeded ALS recommended hold time prior to sample receipt.

EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.

EHT: Exceeded ALS recommended hold time prior to analysis.

Rec. HT: ALS recommended hold time (see units).

Notes*:

Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes. Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2476882 were received on 20-JUL-20 09:20.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.



Chain of Custody (COC) / Analytical Request Form

L2476882-COFC

1 111

COC Number: 17 - 800189

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Canada Toll Free: 1 800 668 9878

Report To	Contact and company name below will appe			Report Format	/ Distribution		Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)											
Company:	PalmerEnvironmental	Consulting Group	Select Report Fo	ormat: 🖊 PDF [EXCEL E	DD (DIGITAL)		Regu	lar [R]	Standard	d TAT if red	eived by 3 p	om - business	days - no s	urcharges	apply		
Contact:	Rebetich Price	J · ·	1	QC) Report with Rep	• • •		Engl	4 day [I	P4-20%]		ENCY	Busines	s day [E -	100%]				
Phone:	416 432 9937	=.	1	ults to Criteria on Report -			RIOR		P3-25%]				Weekend				-200%	
	Company address below will appear on the fina	al report	Select Distribution		MAIL		ı e	2 day [P2-50%] [(Laboratory opening fees may apply)]								_ L		
Street:	74 Berkeley St		Email 1 or Fax	rebekuh.P	ice@pe	cd.ca	_	Date and	te and Time Required for all E&P TATs: dd-mmm-yy hh:mm									
City/Province:	Toronto J		Email 2 70%	1911 2 JOSON COLE @ PECCY CX For test				ts that can n	at can not be performed according to the service level selected, you will be contacted.									
Postal Code:	M5V 1E3	·	Email 3				-						Request					
nvoice To	Same as Report To YES			Invoice Dis	···		ا _د ی ا	<u> </u>	Indicat	te Filtered (F),	Preserved	(P) or Filtere	ed and Preser	ved (F/P) be	elow			<u> </u>
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