

August 2018

## HYDROLOGICAL REVIEW SUMMARY

The form is to be completed by the Professional that prepared the Hydrological Review.  
 Use of the form by the City of Toronto is not to be construed as verification of engineering/hydrological content.

Refer to the Terms of Reference, Hydrological Review:

[Link to Terms of Reference Hydrological Review](#)

<b>For City Staff Use Only:</b>	
<b>Name of ECS Case Manager (Please print)</b>	
<b>Date Review Summary provided to to TW, EM&amp;P</b>	

**IF ANY OF THE REQUIREMENTS LISTED BELOW HAVE NOT BEEN INCLUDED IN THE HYDROLOGICAL REVIEW, THE REVIEW WILL BE CONSIDERED INCOMPLETE.  
 THE GREY SHADED BOXES WILL REQUIRE A CONSISTANCY CHECK BY THE ECS CASE MANAGER.**

**Summary of Key Information:**

SITE INFORMATION		Page # & Section # of Review	Review Includes this Information City Staff (Check)
Site Address	145 Wellington Street West, Toronto, Ontario	Page 1 Section 1.0	
Postal Code	M5J 1H8	Page 1 Section 1.0	
Property Owner (on request for comments memo)	H & R Reit – 145 Wellington	Page 2-3 Section 1.4	
Proposed description of the project (if applicable) (point towers, number of podiums)	Sixty-five [65] storey building with a mechanical penthouse floor	Page 2 Section 1.3	
Land Use (ex. commercial, residential, mixed, institutional, industrial)	Mixed residential/commercial	Page 2 Section 1.3	
Number of below grade levels for the proposed structure	Four [4]	Page 2 Section 1.3	
HYDROLOGICAL REVIEW INFORMATION			
Date Hydrological Review was prepared:	September 25, 2020	Page 21 Section 9.0	
Who Performed the Hydrological Review (Consulting Firm)	McClymont and Rak Engineers Inc.	Page 21 Section 9.0	
Name of Author of Hydrological Review	Lad Rak, P.Eng., M.Eng., QP <sub>ESA</sub>	Page 21 Section 9.0	

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<p>Check the directories on the website for Professional Geoscientists and/or Professional Engineers of Ontario been checked to ensure that the Hydrological Report has been prepared by a qualified person who is a licensed Professional Geoscientist as set out in the Professional Geoscientist Act of Ontario or a Professional Engineer?</p> <p>PEO: <a href="#">Professional Engineers of Ontario</a>            APGO: <a href="#">Association of Professional Geoscientists of Ontario</a></p>	Yes	N/A	
<p>Has the Hydrological Review been prepared in accordance with all the following:</p> <ul style="list-style-type: none"> <li>• Ontario Water Resources Act</li> <li>• Ontario Regulation 387/04</li> <li>• Toronto Municipal Code Chapter 681-Sewers</li> </ul>	<p>Ontario Water Resources Act            Toronto Municipal Code Chapter 681 – Sewers            Ontario Regulation 387/04</p>	<p>Page 6            Section 3.2            Page 7            Section 3.5            Page 13-14            Section 5.3</p>	
		<b>Page # &amp; Section # of every occurrence in the Review</b>	<b>Review Includes this Information City Staff (Check)</b>

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SITE INFORMATION		Page # & Section # of Review	Review Includes this Information City Staff (Check)
<p>Total Volume (L/day) Short Term Discharge of groundwater (construction dewatering) <b>with safety factor included</b></p>	<p>What safety factor was used?</p> <p>Steady State discharge = 82,000 L/day with a safety factor of 1.50</p> <p>Maximum discharge = 160,000 L/day</p>	<p>Page 11-12 Section 5.1.1 Table 4</p>	
<p>Total Volume (L/day) Short Term Discharge of groundwater (construction dewatering) <b>without safety factor included</b></p>	<p>Steady State discharge = 55,000 L/day without the safety factor</p>	<p>-</p>	
<p>Total Volume (L/day) Long Term drainage of groundwater (from foundation drainage, weeping tiles, sub slab drainage) <b>with safety factor included</b></p> <p>If the development is part of a multiple tower complex, include total volume for each separate tower</p>	<p>What safety factor was used?</p> <p>Steady State discharge = 41,000 L/day with a safety factor of 1.50</p>	<p>Page 13 Section 5.2.1 Table 5</p>	
<p>List the nearest surface water (river, creek, lake)</p>	<p>Lake Ontario</p>	<p>Page 4 Section 2.1</p>	

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SITE INFORMATION		Page # & Section # of Review	Review Includes this Information City Staff (Check)
Lowest basement elevation	70.10 masl	Page 2 Section 1.3	
Foundation elevation	68.60 masl	Page 10 Section 5.1	
Ground elevation	83.30 masl	Page 2 Section 1.3	
STUDY AREA MAP		Page # & Section # of every occurrence in the Review	Review Includes this Information City Staff (Check)
Study area map(s) have been included in the report.	Borehole Location Plan	Drawing No. 1	
Study area map(s) been prepared according to the Hydrological Review Terms of Reference.	<input checked="" type="checkbox"/> Yes	Drawing No. 1	N/A
WATER LEVEL AND WELLS		Page # & Section # of every occurrence	Review Includes this Information (City Staff Initial)

## HYDROLOGICAL REVIEW SUMMARY

SITE INFORMATION		Page # & Section # of Review	Review Includes this Information City Staff (Check)
		in the Review	
The groundwater level has been monitored using all wells located on site (within property boundary).	Yes	Page 9 Section 4.2	
The static water level measurements have been monitored at all monitoring wells for a minimum of 3 months with samples taken every 2 weeks for a minimum of 6 samples.  The intent is for the qualified professional to use professional judgement to estimate the seasonally high groundwater level.	No	Page 9 Section 4.2 Table 1	
All water levels in the wells have been measured with respect to masl.	Yes	Page 9 Section 4.2 Table 1	
A table of geology/soil stratigraphy for the property has been included.	Yes	Page 8-9 Section 4.1	
GEOLOGY AND PHYSICAL HYDROLOGY		Page # & Section # of every occurrence in the Review	Review Includes this Information (City Staff Initial)
The review has made reference to the soil materials including thickness, composition and texture, and bedrock environments.	Yes	Page 8-9 Section 4.1	
Key aquifers and the site's proximity to nearby surface water has been identified.	<input checked="" type="checkbox"/> Yes	Page 15 Section 5.5	N/A

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SITE INFORMATION		Page # & Section # of Review	Review Includes this Information City Staff (Check)
<b>PUMP TEST/SLUG TEST/DRAWDOWN ANALYSIS</b>		Page # & Section # of every occurrence in the Review	Review Includes this Information City Staff (Check)
A summary of the pumping test data and analysis is included in the review.	No pumping test completed	-	
The pump test been carried out for at least 24 hours if possible. If not, has a slug test been conducted?	No slug test completed	-	
Have the monitoring well(s) have been monitored using digital devices? If yes how frequently?	Water levels were measured manually	Page 9 Section 4.2	
If a slug or pump test has been conducted has the static groundwater level been monitored at all monitoring well(s) multiple times to measure recovery? -prior to the slug or pumping test(s)? -post slug or pumping test(s)?	<input checked="" type="checkbox"/> No	-	N/A
The above noted slug or pump tests have been included in the report.	<input checked="" type="checkbox"/> No	-	
<b>WATER QUALITY</b>		Page # & Section # of every occurrence in the Review	Review Includes this Information City Staff (Check)

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The report includes baseline water quality samples from a laboratory. The water quality must be analyzed for all parameters listed in Tables 1 and 2 of Chapter 681 Sewers of the Toronto Municipal Code (found in Appendix A) and the samples must have to be taken unfiltered within 9 months of the date of submission.	Yes	Page 9 Section 4.3 Table 2	
The water quality data templates in Appendix A have been completed for each sample taken for both sanitary/combined and storm sewer limits.	For sanitary discharge- See the sanitary/combined sewer parameter limit template  Yes  For storm discharge- See the storm sewer parameter limit template  Yes	Table 2 Appendix D	
Qualified professional to list all sample parameters that have violated the Bylaw limits for each sample taken for the sanitary/combined Bylaw limits <b>If there are any sample parameter Exceedances the groundwater can't be discharged as is.</b>	Sample collected from BH 1: No exceedances recorded	Page 9 Section 4.3 Table 2	
Qualified professional to list all sample parameters that have violated the Bylaw limits for each sample taken for the storm Bylaw limits.  <b>If there are any sample parameter exceedances the groundwater can't be discharged as is.</b>	Sample collected from BH 2: Total Suspended Solids (174 mg/L vs. 15 mg/L) Total Manganese (0.193 mg/L vs. 0.05 mg/L)	Page 9 Section 4.3 Table 2	
The water quality samples have been analyzed by a Canadian laboratory accredited and licensed by Standards Council of Canada and/or Canadian Association for Laboratory Accreditation.	<input checked="" type="checkbox"/> Yes	Page 7 Section 3.5 Appendix D	N/A

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List of Canadian accredited laboratories: <a href="#">Standards Council of Canada</a>	ALS Laboratory is certified by the Canadian Association for Laboratory Accreditation (CALA) for chemical analysis	Page 7 Section 3.5 Appendix D	
A chain of custody record for the samples is included with the report.	Yes	Appendix D	
Has the chain of custody reference any filtered sample? If yes, the report has to be amended and re-submitted to include only non-filtered samples.	No samples were field filtered prior to laboratory analysis, in accordance with the standard	Page 6-7 Section 3.4	
List any of the sample parameters that exceed the Bylaw limits with the reporting detection limit (RDL) included.	Suspended Solids RDL: 2.0 mg/L Manganese RDL: 0.00050 mg/L	Appendix D	
A true copy of the Certificate of Analysis report, is included with the report.	Yes	Appendix D	
EVALUATION OF IMPACT		Page # & Section # of every occurrence in the Review	Review Includes this Information City Staff (Check)
Does the report recommend a back-up system or relief safety valve(s)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	-	
Does the associated Geotechnical report recommend a back-up system or relief safety valve(s)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	-	
The taking and discharging of groundwater on site has been analyzed to ensure that no negative	<input checked="" type="checkbox"/> No	-	N/A



## HYDROLOGICAL REVIEW SUMMARY

SITE INFORMATION		Page # & Section # of Review	Review Includes this Information City Staff (Check)
impacts will occur to the City sewage works in terms of quality and quantity (including existing infrastructure), the natural environment, and settlement issues.	The report has not conducted induced settlement calculations	-	
Has it been determined that there will be a negative impact to the natural environment, City sewage works, or surrounding properties has the study identified the following: the extent of the negative impact, the detail of the precondition state of all the infrastructure, City sewage works, and natural environment within the effected zone and the proposed remediation and monitoring plan?	<input type="checkbox"/> Yes  <b>If yes, identify impact:</b>  <input checked="" type="checkbox"/> No	-	N/A

Summary of Additional Information and Key Items (if applicable):

## HYDROLOGICAL REVIEW SUMMARY

### Appendix A:

**SANITARY/COMBINED**

**Sample Location: BH 1**

Inorganics		Sample Result	Sample Result with upper RDL included	
<u>Parameter</u>	<u>mg/L</u>			<u>ug/L</u>
BOD	300	<2.0	<2.0	300,000
Fluoride	10	0.240	0.240	10,000
TKN	100	1.21	1.21	100,000
pH	6.0 - 11.5	7.85	7.85	6.0 - 11.5
Phenolics 4AAP	1	0.0047	0.0047	1,000
TSS	350	174.0	174.0	350,000
Total Cyanide	2	<0.0020	<0.0020	2,000
<b>Metals</b>				
Chromium Hexavalent	2	<0.00050	<0.00050	2,000
Mercury	0.01	<0.000010	<0.000010	10
Total Aluminum	50	4.580	4.580	50,000
Total Antimony	5	<0.0010	<0.0010	5,000
Total Arsenic	1	0.00170	0.00170	1,000
Total Cadmium	0.7	<0.000050	<0.000050	700
Total Chromium	4	0.01100	0.01100	4,000
Total Cobalt	5	0.00490	0.00490	5,000
Total Copper	2	0.0110	0.0110	2,000
Total Lead	1	0.00129	0.00129	1,000
Total Manganese	5	0.4310	0.4310	5,000
Total Molybdenum	5	0.02280	0.02280	5,000
Total Nickel	2	0.01250	0.01250	2,000
Total Phosphorus	10	<0.0030	<0.0030	10,000
Total Selenium	1	<0.00050	<0.00050	1,000
Total Silver	5	0.00	0.00	5,000
Total Tin	5	<0.0010	<0.0010	5,000
Total Titanium	5	0.03950	0.03950	5,000
Total Zinc	2	<0.030	<0.030	2,000
Animal/Vegetable Oil & Grease	150	<2.0	<2.0	150,000
Mineral/Synthetic Oil & Grease	15	<1.0	<1.0	15,000

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Volatile Organics		Sample Result	Sample Result with upper RDL included	
<u>Parameter</u>	<u>ug/L</u>			<u>mg/L</u>
Benzene	10	<0.50	<0.50	0.01
Chloroform	40	<1.0	<1.0	0.04
1,2-Dichlorobenzene	50	<0.50	<0.50	0.05
1,4-Dichlorobenzene	80	<0.50	<0.50	0.08
Cis-1,2-Dichloroethylene	4,000	<0.50	<0.50	4
Trans-1,3-Dichloropropylene	140	<0.50	<0.50	0.14
Ethyl Benzene	160	<0.50	<0.50	0.16
Methylene Chloride	2,000	<2.0	<2.0	2
1,1,2,2-Tetrachloroethane	1,400	<0.50	<0.50	1.4
Tetrachloroethylene	1,000	<0.50	<0.50	1
Toluene	16	<0.50	<0.50	0.016
Trichloroethylene	400	<0.50	<0.50	0.4
Total Xylenes	1,400	<1.1	<1.1	1.4
<b>Semi-Volatile Organics</b>				
Di-n-butyl Phthalate	80	<1.0	<1.0	0.08
Bis (2-ethylhexyl) Phthalate	12	<2.0	<2.0	0.012
3,3'-Dichlorobenzidine	2	<0.40	<0.40	0.002
Pentachlorophenol	5	<0.50	<0.50	0.005
Total PAHs	5	<1.7	<1.7	0.005
<b>Misc Parameters</b>				
Nonylphenols	20	<1.0	<1.0	0.02
Nonylphenol Ethoxylates	200	<2.0	<2.0	0.2

Sample Collected: April 8, 2019

Temperature: 1.9°

## HYDROLOGICAL REVIEW SUMMARY

**STORM**

**Sample Location: BH 1**

Inorganics		Sample Result	Sample Result with upper RDL included	
<b>Parameter</b>	<b>mg/L</b>			<b>ug/L</b>
pH	6.0 - 9.5	7.85	7.85	
BOD	15	<2.0	<2.0	15,000
Phenolics 4AAP	0.008	0.0047	0.0047	8
TSS	15	174.0	174.0	15,000
Total Cyanide	0.02	<0.0020	<0.0020	20
<b>Metals</b>				
Total Arsenic	0.02	0.00170	0.00170	20
Total Cadmium	0.008	<0.000050	<0.000050	8
Total Chromium	0.08	0.0110	0.0110	80
Chromium Hexavalent	0.04	<0.00050	<0.00050	40
Total Copper	0.04	0.0110	0.0110	40
Total Lead	0.12	0.00129	0.00129	120
Total Manganese	0.05	0.4310	0.4310	50
Total Mercury	0.0004	<0.000010	<0.000010	0.4
Total Nickel	0.08	0.01250	0.01250	80
Total Phosphorus	0.4	<0.0030	<0.0030	400
Total Selenium	0.02	<0.00050	<0.00050	20
Total Silver	0.12	0.0017	0.0017	120
Total Zinc	0.04	<0.030	<0.030	40
<b>Microbiology</b>				
E.coli	200	<2	<2	200,000
<b>Volatile Organics</b>				
<b>Parameter</b>	<b>ug/L</b>			<b>mg/L</b>
Benzene	2	<0.50	<0.50	0.002
Chloroform	2	<1.0	<1.0	0.002
1,2-Dichlorobenzene	6	<0.50	<0.50	0.0056
1,4-Dichlorobenzene	7	<0.50	<0.50	0.0068
Cis-1,2-Dichloroethylene	6	<0.50	<0.50	0.0056
Trans-1,3-Dichloropropylene	6	<0.50	<0.50	0.0056
Ethyl Benzene	2	<0.50	<0.50	0.002
Methylene Chloride	5	<2.0	<2.0	0.0052
1,1,2,2-Tetrachloroethane	17	<0.50	<0.50	0.017
Tetrachloroethylene	4	<0.50	<0.50	0.0044
Toluene	2	<0.50	<0.50	0.002
Trichloroethylene	8	<0.50	<0.50	0.0076
Total Xylenes	4	<1.1	<1.1	0.0044

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Semi-Volatile Organics		Sample Result	Sample Result with upper RDL included	
Di-n-butyl Phthalate	5	<1.0	<1.0	0.015
Bis (2-ethylhexyl) Phthalate	8.8	<2.0	<2.0	0.0088
3,3'-Dichlorobenzidine	0.8	<0.40	<0.40	0.0008
Pentachlorophenol	2	<0.50	<0.50	0.002
Total PAHs	2	<1.7	<1.7	0.002
PCBs	0.4	<0.040	<0.040	0.0004
Misc Parameters				
Nonylphenols	1	<1.0	<1.0	0.001
Nonylphenol Ethoxylates	10	<2.0	<2.0	0.01

Sample Collected: April 8, 2019  
 Temperature: 1.9°

Consulting Firm that prepared Hydrological Report: McClymont & Rak Engineers Inc

Qualified Professional who completed the report summary: Lad Rak, P.Eng., M.Eng., QP<sub>ESA</sub>  
 Print Name



Qualified Professional who completed the report summary: \_\_\_\_\_  
 Signature September 25, 2020  
 Date & Stamp