

## 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:  
[http://www1.toronto.ca/static\\_files/CityPlanning/PDF/geotechnical.pdf](http://www1.toronto.ca/static_files/CityPlanning/PDF/geotechnical.pdf)

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

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	40-44 Broadway Ave., Toronto, ON	Title page, Pg. ii	
Postal Code	M4Y 1T4		
Property Owner (on request for comments memo)	Collecdev	Title page, Pg ii	
Proposed description of the project (if applicable) (point towers, number of podiums)	Redevelopment of existing church and new thirty-five (35) storey residential tower.	Pg ii & Pg. 1., Sc. 1.0	
Land Use (ex. commercial, residential, mixed, institutional, industrial)	Mixed- use (Residential, Commercial, community)	Pg. 1 Sc. 1.0	
Number of below grade levels for the proposed structure	Five (5) levels of basement (P5)	P. ii P.1.,Sc. 1.0 p.5., Sc.4.0	
HYDROLOGICAL REVIEW INFORMATION			

## HYDROLOGICAL REVIEW SUMMARY

Date Hydrological Review was prepared:	June 28, 2019	Title page	
Who Performed the Hydrological Review (Consulting Firm)	DS Consultants Ltd.	Title page	
Name of Author of Hydrological Review	Pradeep Patel, M.Sc., P.Geo & Martin Gedeon, M.Sc., P.Geo	P. iv & P.9., Sc.7	
<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="http://peo.on.ca/index.php?ci_id=1798&amp;la_id=1">http://peo.on.ca/index.php?ci_id=1798&amp;la_id=1</a></p> <p>APGO: <a href="https://www.apgo.net/search/registered-members">https://www.apgo.net/search/registered-members</a></p>	<p>#2710 #0682</p>	<p>P. iv &amp; P.9. Sc.7</p>	
<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>Yes</p>	<p>P.8., Sc. 5.4</p>	

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		Page # & Section # of every occurrence in the 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>196,000 L/day (196 m<sup>3</sup>/day) to 238,000 L/day (298 m<sup>3</sup>/day) taking into account the removal of stormwater (unsealed excavation)</p> <p>28,000 L/day (28 m<sup>3</sup>/day) (sealed excavation)</p> <p>What safety factor was used? x2</p>	<p>P.5-7.,Sc.4.1 &amp; 4.5</p> <p>P.6. Sc.4.2 &amp; 4.5</p>	
<p>Total Volume (L/day) Short Term Discharge of groundwater (construction dewatering) <b>without safety factor included</b></p>	<p>98,000 L/day (98 m<sup>3</sup>/day) (unsealed excavation)</p> <p>14,000 L/day (14 m<sup>3</sup>/day) (sealed excavation)</p>	<p>P.5.,Sc.4.1</p> <p>P.6.,Sc.4.2</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>28,000 L/day (28 m<sup>3</sup>/day)</p> <p>What safety factor was used? X2</p>	<p>P.7.,Sc.4.6</p>	

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List the nearest surface water (river, creek, lake)	There are no surface water features at the development site	P.2., Sc. 3.1	
Lowest basement elevation	Finished floor slab is anticipated to be approximately 15 mbgs (Elev. 149 masl)	P.ii; P.1., Sc.1.0; P.5., Sc. 4.0	
Foundation elevation	Not discussed- Foundation is Discussed in the geotechnical report under a separate cover by DS Consultants.		
Ground elevation	Current ground elevation at the site is 111 masl	P.5., Sc.4.0	
<b>STUDY AREA MAP</b>		<b>Page # &amp; Section # of every occurrence in the Review</b>	<b>Review Includes this Information City Staff (Check)</b>
Study area map(s) have been included in the report.	Yes	Figure 1 to Figure 4	
Study area map(s) been prepared according to the Hydrological Review Terms of Reference.	<input checked="" type="radio"/> Yes		N/A
	<input type="radio"/> Yes		N/A
<b>WATER LEVEL AND WELLS</b>		<b>Page # &amp; Section # of every occurrence</b>	<b>Review Includes this Information</b>

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		in the Review	(City Staff Initial)
The groundwater level has been monitored using all wells located on site (within property boundary).	Yes	P.3-4., Sc.3.3.2	
The static water level measurements have been monitored at all monitoring wells for a minimum of 3 months with  The intent is for the qualified professional to use professional judgement to estimate the seasonally high groundwater level.	Yes- Six (6) monitoring events	P.3-4., Sc.3.3.2	
All water levels in the wells have been measured with respect to masl.	Yes	P.4., Sc.3.3.2	
A table of geology/soil stratigraphy for the property has been included.	Yes	Borehole logs shown in Appendix A	
<b>GEOLOGY AND PHYSICAL HYDROLOGY</b>		<b>Page # &amp; Section # of every occurrence in the Review</b>	<b>Review Includes this Information (City Staff Initial)</b>
The review has made reference to the soil materials including thickness, composition and texture, and bedrock environments.	Yes	P.2-3.,Sc.3.2.3  And Borehole logs in Appendix A	
Key aquifers and the site's proximity to nearby surface water has been identified.	<input checked="" type="radio"/> Yes	P.2.,Sc.3.1	N/A

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PUMP TEST/SLUG TEST/DRAWDOWN ANALYSIS		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.	Pumping tests were not conducted as part of the hydrogeological investigation. Rising head tests (slug tests) were completed.		
The pump test been carried out for at least 24 hours if possible. If not, has a slug test been conducted?	Yes- a slug test was conducted.	P.4., Sc. 3.3.3	
Have the monitoring well(s) have been monitored using digital devices? If yes how frequently?	Yes; data loggers were placed at the bottom of the aquifer set to every 30s for 24 hrs.	P.4., Sc. 3.3.3	
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="radio"/> Yes  Slug tests were completed at one (1) monitoring well	P.4., Sc. 3.3.3 Appendix B	N/A
The above noted slug or pump tests have been included in the report.	<input checked="" type="radio"/> Yes	P.4., Sc. 3.3.3 Appendix B	
WATER QUALITY		Page # & Section # of every occurrence in the Review	Review Includes this Information City Staff (Check)
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	Yes	P5.,Sc.3.3.4	

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<p>Toronto Municipal Code (found in Appendix A) and the samples must have to be taken unfiltered within 9 months of the date of submission.</p>			
<p>The water quality data templates in Appendix A have been completed for each sample taken for both sanitary/combined and storm sewer limits.</p>	<p>For sanitary discharge- See the sanitary/combined sewer parameter limit template</p> <p>For storm discharge- See the storm sewer parameter limit template</p>	<p>yes</p>	
<p>Qualified professional to list all sample parameters that have violated the Bylaw limits for each sample taken for the sanitary/combined Bylaw limits</p> <p><b>If there are any sample parameter Exceedances the groundwater can't be discharged as is.</b></p>	<p>No exceedances</p>	<p>P.5.,Sc.3.3.4</p>	
<p>Qualified professional to list all sample parameters that have violated the Bylaw limits for each sample taken for the storm Bylaw limits.</p> <p><b>If there are any sample parameter exceedances the groundwater can't be discharged as is.</b></p>	<p>Total Suspended Solids</p> <p>Manganese- Total</p>	<p>P.5.,Sc.3.3.4</p>	

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<p>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.</p> <p>List of Canadian accredited laboratories:  <a href="https://www.scc.ca/en/search/palcan">https://www.scc.ca/en/search/palcan</a></p>	<input checked="" type="radio"/> <b>Yes</b>  ALS Laboratory- accredited	P.5.,Sc.3.3.4	N/A
A chain of custody record for the samples is included with the report.	Yes	Appendix C	
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.	Unfiltered sample submitted	Appendix C	
List any of the sample parameters that exceed the Bylaw limits with the reporting detection limit (RDL) included.	Total Suspended Solids (2.0 mg/L) Manganese- Total (0.0050 mg/L)	P.5.,Sc.3.3.4 Appendix C	
A true copy of the Certificate of Analysis report, is included with the report.	Yes	Appendix C	
<b>EVALUATION OF IMPACT</b>		<b>Page # &amp; Section # of every occurrence in the Review</b>	<b>Review Includes this Information City Staff (Check)</b>
Does the report recommend a back-up system or relief safety valve(s)?	<input type="radio"/> <b>Yes</b> <input checked="" type="radio"/> <b>No</b>	Not referenced in report	
Does the associated Geotechnical report	<input type="radio"/> <b>Yes</b> <input checked="" type="radio"/> <b>No</b>		



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recommend a back-up system or relief safety valve(s)?			
The taking and discharging of groundwater on site has been analyzed to ensure that no negative impacts will occur to: the City sewage works in terms of quality and quantity (including existing infrastructure), the natural environment, and settlement issues.	<input checked="" type="radio"/> Yes	P.8.,Sc.5.0	N/A
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 checked="" type="radio"/> Yes  <b>If yes, identify impact:</b>  Groundwater not suitable for discharge into the City's storm sewers without treatment   <input type="radio"/> No	P.8.,Sc.5.2	N/A

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

### Appendix A:

**SANITARY/COMBINED**

**Sample Location:  
BH18-1**

Inorganics		Sample Result	Sample Result with upper RDL included	
<u>Parameter</u>	<u>mg/L</u>	<u>mg/L</u>	<u>mg/L</u>	<u>ug/L</u>
BOD	300	<2.0	<2.0	300,000
Fluoride	10	0.074	<0.020	10,000
TKN	100	0.47	<0.15	100,000
pH	6.0 - 11.5	7.39	<0.10	6.0 - 11.5
Phenolics 4AAP	1	0.0049	<0.0010	1,000
TSS	350	123	<2.0	350,000
Total Cyanide	2	<0.0020	<0.0020	2,000

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<b>Metals</b>				
Chromium Hexavalent	2	<0.00050	<0.00050	2,000
Mercury	0.01	<0.000010	<0.000010	10
Total Aluminum	50	2.40	<0.050	50,000
Total Antimony	5	<0.0010	<0.0010	5,000
Total Arsenic	1	0.0012	<0.0010	1,000
Total Cadmium	0.7	<0.000050	<0.000050	700
Total Chromium	4	0.0068	<0.0050	4,000
Total Cobalt	5	0.0025	<0.0010	5,000
Total Copper	2	<0.010	<0.010	2,000
Total Lead	1	0.00339	<0.00050	1,000
Total Manganese	5	0.204	<0.0050	5,000
Total Molybdenum	5	0.0119	<0.00050	5,000
Total Nickel	2	<0.0050	<0.0050	2,000
Total Phosphorus	10	0.107	<0.0030	10,000
Total Selenium	1	<0.00050	<0.00050	1,000
Total Silver	5	<0.00050	<0.00050	5,000
Total Tin	5	<0.0010	<0.0010	5,000
Total Titanium	5	0.0882	<0.0030	5,000
Total Zinc	2	<0.030	<0.030	2,000
<b>Petroleum Hydrocarbons</b>				
Animal/Vegetable Oil & Grease	150	<2.0	<2.0	150,000
Mineral/Synthetic Oil & Grease	15	<1.0	<1.0	15,000

<b>Volatile Organics</b>		<b>Sample Result</b>	<b>Sample Result with upper RDL included</b>	
<u>Parameter</u>	<u>mg/L</u>	<u>ug/L</u>	<u>ug/L</u>	<u>ug/L</u>
Benzene	0.01	<0.50	<0.50	10
Chloroform	0.04	<1.0	<1.0	40
1,2-Dichlorobenzene	0.05	<0.50	<0.50	50
1,4-Dichlorobenzene	0.08	<0.50	<0.50	80
Cis-1,2-Dichloroethylene	4	<0.50	<0.50	4,000
Trans-1,3-Dichloropropylene	0.14	<0.50	<0.50	140
Ethyl Benzene	0.16	<0.50	<0.50	160
Methylene Chloride	2	<2.0	<2.0	2,000
1,1,2,2-Tetrachloroethane	1.4	<0.50	<0.50	1,400
Tetrachloroethylene	1	<0.50	<0.50	1,000
Toluene	0.016	<0.050	<0.50	16
Trichloroethylene	0.4	<0.50	<0.50	400
Total Xylenes	1.4	<1.1	<1.1	1,400
<b>Semi-Volatile Organics</b>				

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Di-n-butyl Phthalate	0.08	<1.0	<1.0	80
Bis (2-ethylhexyl) Phthalate	0.012	4.1	<2.0	12
3,3'-Dichlorobenzidine	0.002	<0.40	<0.40	2
Pentachlorophenol	0.005	<0.50	<0.50	5
Total PAHs	0.005	<1.7	<1.7	5
<b>Misc Parameters</b>				
Nonylphenols	0.02	<1.0	<1.0	20
Nonylphenol Ethoxylates	0.2	<2.0	<2.0	200

Sample Collected: 05/10/18

Temperature: 13.4

**STORM**

**Sample Location:  
BH18-1**

Inorganics		Sample Result	Sample Result with upper RDL included	
<u>Parameter</u>	<u>mg/L</u>	<u>mg/L</u>	<u>mg/L</u>	<u>ug/L</u>
pH	6.0 - 9.5	7.39	<0.10	
BOD	15	<2.0	<2.0	15,000
Phenolics 4AAP	0.008	0.0049	<0.0010	8
TSS	15	123	<2.0	15,000
Total Cyanide	0.02	<0.0020	<0.0020	20
<b>Metals</b>				
Total Arsenic	0.02	<0.000050	<0.000050	20
Total Cadmium	0.008	<0.000050	<0.000050	8
Total Chromium	0.08	0.0068	<0.0050	80
Chromium Hexavalent	0.04	<0.00050	<0.00050	40
Total Copper	0.04	<0.010	<0.010	40
Total Lead	0.12	0.00339	<0.00050	120
Total Manganese	0.05	0.204	<0.0050	50
Total Mercury	0.0004	<0.000010	<0.000010	0.4
Total Nickel	0.08	<0.0050	<0.0050	80
Total Phosphorus	0.4	0.107	<0.0030	400
Total Selenium	0.02	<0.00050	<0.00050	20
Total Silver	0.12	<0.00050	<0.00050	120
Total Zinc	0.04	<0.030	<0.030	40
<b>Microbiology</b>				
E. coli	200	62	CFU/100 ml	200,000
<b>Volatile Organics</b>				
<u>Parameter</u>	<u>mg/L</u>	<u>ug/L</u>	<u>ug/L</u>	<u>ug/L</u>
Benzene	0.002	<0.50	<0.50	2
Chloroform	0.002	<1.0	<1.0	2
1,2-Dichlorobenzene	0.0056	<0.50	<0.50	6
1,4-Dichlorobenzene	0.0068	<0.50	<0.50	7

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Cis-1,2-Dichloroethylene	0.0056	<0.50	<0.50	6
Trans-1,3-Dichloropropylene	0.0056	<0.50	<0.50	6
Ethyl Benzene	0.002	<0.50	<0.50	2
Methylene Chloride	0.0052	<2.0	<2.0	5
1,1,2,2-Tetrachloroethane	0.017	<0.50	<0.50	17
Tetrachloroethylene	0.0044	<0.50	<0.50	4
Toluene	0.002	<0.050	<0.50	2
Trichloroethylene	0.0076	<0.50	<0.50	8
Total Xylenes	0.0044	<1.1	<1.1	4

Semi-Volatile Organics		Sample Result	Sample Result with upper RDL included	
Di-n-butyl Phthalate	0.015	<1.0	<1.0	15
Bis (2-ethylhexyl) Phthalate	0.0088	4.1	<2.0	8.8
3,3'-Dichlorobenzidine	0.0008	<0.40	<0.40	0.8
Pentachlorophenol	0.002	<0.50	<0.50	2
Total PAHs	0.005	<1.7	<1.7	5
Hexachlorocyclohexane	0.1	N/A (See note 1)	N/A	100
<b>Misc Parameters</b>				
Nonylphenols	0.001	<1.0	<1.0	1
Nonylphenol Ethoxylates	0.01	<2.0	<2.0	10

Sample Collected: 05/10/18

Temperature: 13.4

Note 1- Hexachlorocyclohexane is no longer analyzed in the Toronto Sanitary and Storm Package.

Consulting Firm that prepared Hydrological Report: DS Consultants Ltd.

Qualified Professional who completed the report summary: Martin Gedeon, M.Sc., P.Geo.

Print Name

Qualified Professional who completed the report summary: *Martin Gedeon*

Signature



Date & Stamp