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

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 INLCUDED 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 on City Staff (Check)**
Site Address	1 Heron's Hill Way, City of Toronto	Title page Pg. I, section 1.0 Pg. 3, section 2.1	
Postal Code	M2J 0G2		
Property Owner (on request for comments memo)	Paradise Developments Heron's Hill Inc.	Title Page Pg ii-First Paragraph Pg 3, section 2.1	
Proposed description of the project (if applicable) (point towers, number of podiums)	Proposed 39-storey building with a 1 level underground structure	Pg. 1, section 1.0 Pg. 3, section 2.1 Pg. 17- section 7.1	
Land Use (ex. commercial, residential, mixed, institutional, industrial)	Mixed use- Residential and Office	Title page Pg. 1, section 1.0 Pg. 3, section 2.1 Pg. 4, section 2.3 Pg. 17 section 7.1	
Number of below grade levels for the proposed structure	1-Level Undergroud Parking structure	Pg. 1, section 1.0 Pg. 3, section 2.1 Pg. 16,section 7.0 Pg. 17,section 7.1 Pg. 22,section 7.6	
HYDROLOGICAL REVIEW INFORMATION			
Date Hydrological Review was prepared:	April 2020	Title page	
Who Performed the Hydrological Review (Consulting Firm)	Soil Engineers Limited (SEL)	Title page Pg. ii Pg. 1-section 1.0	

August 2018

HYDROLOGICAL REVIEW SUMMARY

Name of Author of Hydrological Review	Gavin O'Brien Angella Graham	Pg. ii Pg. 24	

SITE INFORMATION		Page # & Section # of Review	Review Includes this Information City Staff (Check)
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? PEO: Professional Engineers of Ontario APGO: Association of Professional Geoscientists of Ontario		N/A	
Has the Hydrological Review been prepared in accordance with all the following: • Ontario Water Resources Act • Ontario Regulation 387/04 • Toronto Municipal Code Chapter 681-Sewers	Although not explicitly stated in the report itself, the hydrogeological study has been prepared in accordance with the Ontario Water Resources Act, Ontario Regulation 387/04 and the Toronto Municipal Code Chapter 681-Sewers.		
		Page # & Section # of every occurrence in the Review	**Review Includes this Information City Staff (Check)**

TORONTO

August 2018

HYDROLOGICAL REVIEW SUMMARY

SITE INFORMATION		Page # & Section # of Review	Review Includes this Information City Staff (Check)
Total Volume (L/day) Short Term Discharge of groundwater (construction dewatering) **with safety factor included**	What safety factor was used? None. The 100-yr return period rainfall records for the site was utilized for the calculation. The accumulated stormwater runoff following storm events precipitation is 412,760 L/day, for the underground parking structure	Pg. 2, section 1.0 Pgs. 18 section 7.2 Pg. 23, section 8.0-No. 10.	
Total Volume (L/day) Short Term Discharge of groundwater (construction dewatering) **without safety factor included**	No dewatering flow anticipated. The accumulated stormwater runoff following storm events precipitation is 412,760 L/day, for the underground parking structure	Pg. 2, section 1.0 Pgs. 18 section 7.2 Pg. 23, section 8.0-No. 10.	
Total Volume (L/day) Long Term drainage of groundwater (from foundation drainage, weeping tiles, sub slab drainage) **with safety factor included** If the development is part of a multiple tower complex, include total volume for each separate tower	What safety factor was used? Three (3) There is no anticipated long-term permanent foundation drainage. The potential drainage associated with shallow runoff from storm event precipitation is 2,036 L/day, by applying 3 x safety factor it could reach to maximum range of 6,108 L/day.	Pg. 2, section 1.0 Pg. 19 section 7.4 Pg.24, section 8.0-No. 11	
List the nearest surface water (river, creek, lake)	There are no surface water sources located within a 800 m radius of the site	Pg. 9, section 4.4	

SITE INFORMATION		Page # & Section # of Review	Review Includes this Information City Staff (Check)
Lowest basement elevation	N/A	N/A	
Foundation elevation	170.6 masl	Pg.17, section 7.1-paragraph 3	
Ground elevation	175.2 to 175.8		

August 2018

HYDROLOGICAL REVIEW SUMMARY

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.	☑ **Yes**	Under Enclosures Drawings 1-9	N/A
Study area map(s) been prepared according to the Hydrological Review Terms of Reference.	☑ **Yes**		N/A
WATER LEVEL AND WELLS		**Page # & Section # of every occurrence**	**Review Includes this Information (City Staff Initial)**

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, six (6) wells were installed to measure groundwater levels for the hydrogeological study.	Pg. 5, section 3.1 Pg. 13, section 6.3	
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.	The static groundwater level measurements were monitored for 3 months, with the measurements taken every 2 weeks, for a total of 6 monitoring events.	Pg. 6, section 3.2 Pg. 13, section 6.3	
All water levels in the wells have been measured with respect to masl.	Yes	Pg. 13, section 6.3	
A table of geology/soil stratigraphy for the property has been included.	Yes	Drawing No. 8-2	

August 2018

HYDROLOGICAL REVIEW SUMMARY

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	Pg. 8, section 4.1 Pgs 9-12,, section 5.0	
Key aquifers and the site's proximity to nearby surface water has been identified.	☑ **Yes**		N/A

SITE INFORMATION		Page # & Section # of Review	Review Includes this Information City Staff (Check)
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.	No pumping test was completed.		
The pump test been carried out for at least 24 hours if possible. If not, has a slug test been conducted?	No pumping test was completed. Slug testing was conducted at the monitoring wells	Pg. 1, section 1.0 Pg. 4, section 2.3 Pg. 6, section 3.4 Pg. 14, section 6.5 Pg. 23, section 7.0 Appendix B	
Have the monitoring well(s) have been monitored using digital devices? If yes how frequently?	Yes, data loggers set at 5 second intervals were installed for the slug testing.	Pg. 6, section 3.4	
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)?	☑ **Yes**	Pg. 6, section 3.4 Appendix B	N/A
The above noted slug or pump tests have been included in the report.	☑ **Yes**	Pgs 14-16, section 6.5 Appendix B	

August 2018

HYDROLOGICAL REVIEW SUMMARY

WATER QUALITY		Page # & Section # of every occurrence in the Review	Review Includes this Information City Staff (Check)
SITE INFORMATION		**Page # & Section # of 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 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 The groundwater was sampled and analyzed (unfiltered) for all of the City of Toronto Storm and Sanitary Sewer Use Bylaw Parameters. Additional separate samples were also submitted for total metals and total phosphorus analysis that had undergone field filtration.	Pg. 2, section 1.0 Pg. 4, section 2.3 Pg. 7, section 3.5 Pg. 20 section 7.5 Appendix C	
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 sewer discharge- See the sanitary/combined sewer parameter limit template For storm sewer discharge- See the storm sewer parameter limit template		
Qualified professional to list all sample parameters that have violated the Bylaw limits for each sample taken for the sanitary/combined Bylaw limits **If there are any sample parameter Exceedances the groundwater can't be discharged as is.**	None	Pgs. 21, Section 7.5 Appendix C	
Qualified professional to list all sample parameters that have violated the Bylaw limits for each sample taken for the storm Bylaw limits. **If there are any sample parameter exceedances the groundwater can't be discharged as is.**	Total Suspended Solids Chloroform	Pgs. 20-22, Section 7.5 Pg. 21, Table 7-2 Appendix C	
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.	☑ **Yes**		N/A
SITE INFORMATION		**Page # & Section # of Review**	**Review Includes this Information City Staff (Check)**

HYDROLOGICAL REVIEW SUMMARY

List of Canadian accredited laboratories: Standards Council of Canada	Samples were submitted SGS Environmental Services Accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA).	Pgs. 7, section 3.5 Pg. 20, section 7.5 Appendix C	
A chain of custody record for the samples is included with the report.	Yes	Pg. 20 section 7.5 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.	Yes, it does, but these samples were taken in addition to a complete set of unfiltered samples that were analyzed and evaluated against the City of Toronto's Storm and Sanitary Sewer Use Bylaw limits for metals and phosphorus parameters.	Pg. 7, section 3.5 Pg. 21 section 7.5 Appendix C	
List any of the sample parameters that exceed the Bylaw limits with the reporting detection limit (RDL) included.	Storm By Law Parameters Total suspended solids – 2 mg/L Chloroform – 0.0005 mg/L	Pg. 21 section 7.5, Table 7-2 Appendix C	
A true copy of the Certificate of Analysis report, is included with the report.	Yes	Appendix C	
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)? Does the associated Geotechnical report recommend a back-up system or relief safety valve(s)?	◯ **Yes** ☑ **No** ◯ **Yes** ☑ **No**		
The taking and discharging of groundwater on site has been analyzed to ensure that no negative	☑ **Yes**	Pg. 22, section 7.6	N/A
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.			

August 2018

HYDROLOGICAL REVIEW SUMMARY

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?	◯ **Yes** **If yes, identify impact:** ☑ **No**	Pg. 22, section 7.6	N/A

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

August 2018

HYDROLOGICAL REVIEW SUMMARY

Appendix A:

SANITARY/COMBINED **Sample Location: BH/MW 4**

Inorganics		Sample Result	Sample Result with upper RDL included	
Parameter	mg/L			ug/L
BOD	300	5	2	300,000
Fluoride	10	0.17	0.06	10,000
TKN	100	<0.5	0.5	100,000
pH	6.0 - 1.5	7.91	0.05	6.0 - 11.5
Phenolics 4AAP	1	<0.002	0.002	1,000
TSS	350	57	2	350,000
Total Cyanide	2	<0.01	0.01	2,000
Metals				
Chromium Hexavalent	2	<0.0002	0.0002	2,000
Mercury	0.01	<0.00001	0.00001	10
Total Aluminum	50	1.22	0.001	50,000
Total Antimony	5	0.0012	0.0002	5,000
Total Arsenic	1	0.0010	0.0002	1,000
Total Cadmium	0.7	0.000012	0.000003	700
Total Chromium	4	0.00206	0.00003	4,000
Total Cobalt	5	0.000627	0.000004	5,000
Total Copper	2	0.0036	0.00002	2,000
Total Lead	1	0.00085	0.00001	1,000
Total Manganese	5	0.0392	0.00001	5,000
Total Molybdenum	5	0.0122	0.00001	5,000
Total Nickel	2	0.0028	0.0001	2,000
Total Phosphorus	10	0.082	0.003	10,000
Total Selenium	1	0.00022	0.00004	1,000
Total Silver	5	< 0.00005	0.00005	5,000
Total Tin	5	0.00644	0.00001	5,000
Total Titanium	5	0.0430	0.00005	5,000
Total Zinc	2	0.010	0.002	2,000

August 2018

HYDROLOGICAL REVIEW SUMMARY

Petroleum Hydrocarbons				
Animal/Vegetable Oil & Grease	15 0	<4	4	150,000
Mineral/Synthetic Oil & Grease	15	<4	4	15,000
Volatile Organics		**Sample Result**	**Sample Result with upper RDL included**	
Parameter	**mg/L**			**ug/L**
Benzene	0.01	<0.0005	0.0005	10
Chloroform	0.04	0.0041	0.0005	40
1,2-Dichlorobenzene	0.05	< 0.0005	0.0005	50
1,4-Dichlorobenzene	0.08	< 0.0005	0.0005	80
Cis-1,2-Dichloroethylene	4	<0.0005	0.0005	4,000
Trans-1,3-Dichloropropylene	0.14	<0.0005	0.0005	140
Ethyl Benzene	0.16	<0.0005	0.0005	160
Methylene Chloride	2	<0.0005	0.0005	2,000
1,1,2,2-Tetrachloroethane	1.4	<0.0005	0.0005	1,400
Tetrachloroethylene	1	<0.0005	0.0005	1,000
Toluene	0.016	<0.0005	0.0005	16
Trichloroethylene	0.4	<0.0005	0.0005	400
Total Xylenes	1.4	<0.0005	0.0005	1,400
Semi-Volatile **Organics**				
Di-n-butyl Phthalate	0.08	<0.002	0.002	80
Bis (2-ethylhexyl) Phthalate	0.012	<0.002	0.002	12
3,3'-Dichlorobenzidine	0.002	< 0.0005	0.0005	2
Pentachlorophenol	0.005	<0.0005	0.0005	5
Total PAHs	0.005	<0.001	-	5
Misc **Parameters**				
Nonylphenols	0.02	<0.001	0.001	20
Nonylphenol Ethoxylates	0.2	<0.01	0.01	200

Sample Collected:

Temperature:

August 2018

HYDROLOGICAL REVIEW SUMMARY

STORM **Sample Location: BH/MW 4**

Inorganics		Sample Result	Sample Result with upper RDL included	
Parameter	mg/L			ug/L
pH	6.0 - 9.5	7.91	0.05	
BOD	15	5	2	15,000
Phenolics 4AAP	0.008	< 0.002	0.002	8
TSS	15	57	-	15,000
Total Cyanide	0.02	<0.01	0.01	20
Metals				
Total Arsenic	0.02	0.0010	0.0002	20
Total Cadmium	0.008	0.000012	0.000003	8
Total Chromium	0.08	0.00206	0.00003	80
Chromium Hexavalent	0.04	0.0002	0.0002	40
Total Copper	0.04	0.0036	0.00002	40
Total Lead	0.12	0.00085	0.00001	120
Total Manganese	0.05	0.0392	0.00001	50
Total Mercury	0.0004	<0.00001	0.00001	0.4
Total Nickel	0.08	0.0028	0.0001	80
Total Phosphorus	0.4	0.082	0.003	400
Total Selenium	0.02	0.00022	0.00004	20
Total Silver	0.12	< 0.00005	0.00005	120
Total Zinc	0.04	0.010	0.002	40
Microbiology				
E.coli	200	<2	-	200,000
Volatile Organics				
Parameter	mg/L			ug/L
Benzene	0.002	< 0.0005	0.0005	2
Chloroform	0.002	0.0041	0.0005	2
1,2-Dichlorobenzene	0.0056	<0.0005	0.0005	6
1,4-Dichlorobenzene	0.0068	<0.0005	0.0005	7
Cis-1,2-Dichloroethylene	0.0056	<0.0005	0.0005	6

HYDROLOGICAL REVIEW SUMMARY

Trans-1,3-Dichloropropylene	0.0056	<0.0005	0.0005	6
Ethyl Benzene	0.002	<0.0005	0.0005	2
Methylene Chloride	0.0052	<0.0005	0.0005	5
1,1,2,2-Tetrachloroethane	0.017	<0.0005	0.0005	17
Tetrachloroethylene	0.0044	<0.0005	0.0005	4
Toluene	0.002	<0.0005	0.0005	2
Trichloroethylene	0.0076	<0.0005	0.0005	8
Total Xylenes	0.0044	<0.0005	0.0005	4
Semi-Volatile Organics		**Sample Result**	**Sample Result with upper RDL included**	
Di-n-butyl Phthalate	0.015	<0.002	0.002	5
Bis (2-ethylhexyl) Phthalate	0.0088	<0.002	0.002	8.8
3,3'-Dichlorobenzidine	0.0008	<0.0005	0.0005	0.8
Pentachlorophenol	0.002	<0.0005	0.0005	2
Total PAHs	0.002	<0.001	-	2
PCBs	0.0004	<0.0001	0.0001	0.4
Misc Parameters				
Nonylphenols	0.001	<0.001	0.001	1
Nonylphenol Ethoxylates	0.01	<0.01	0.01	10

Sample Collected: November 4, 2019
Temperature:8 ^{0} C

Consulting Firm that prepared Hydrological Report: Soil Engineers Limited

Qualified Professional who completed the report summary: Gavin O'Brien
Print Name

PROFESSIONAL GEOSCIENTIST
GAVIN R. O'BRIEN
PRACTISING MEMBER
1267
ONTARIO

Qualified Professional who completed the report summary: GR O'Brien April 1, 2020
Signature Date & Stamp