R.J. Burnside & Associates Limited 449 Josephine Street P.O. Box 10 Wingham ON N0G 2W0 CANADA
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BURNSIDE
[THE DIFFERENCE IS OUR PEOPLE]

May 25, 2016

Via: Email

Ms. Lori Riviere-Doersam, Principal Planner (Acting)
Planning & Economic Development
Regional Municipality of Durham
605 Rossland Road East
Whitby ON L1N 6A3

Dear Ms. Riviere-Doersam:

Re: QSRP Developments Inc.
Proposed Residential Subdivision
309 Zephyr Road, Township of Uxbridge
Response to Peer Review
Project No.: 300034602.0000

A plan of subdivision consisting of seven lots on 2.96 hectares has been proposed for Part Lot 25, Concession 3, Uxbridge Township. The proposed lots are to be serviced by individual drilled wells and individual onsite sewage disposal systems. Grace & Associates Inc. (Grace) prepared an initial report entitled "Hydrogeological Assessment and Private Servicing Report" dated August 7, 2012.

Since that time there has been additional work carried out. The work has been submitted to the Region in a report entitled "Hydrogeological Assessment Response to Peer Review Comments" dated August 19, 2013 (Grace), and a letter dated April 27, 2015 by R.J. Burnside & Associates Limited (Burnside). The most recent peer review letter was provided by WSP Canada Inc. (WSP) dated July 28, 2015. This letter summarized the remaining issues to be addressed. The issue numbering used below corresponds to the WSP first peer review letter April 15, 2013.

Issue 2: Nitrate Attenuation

Issue: This issue pertained to the use of land belonging to the golf course east of the subdivision to dilute the nitrate from the on-site sewage systems. The reviewer accepted the use of these lands but required revisions to the dilution calculations to reduce infiltration from 200 mm per year to 150 mm per year. This would eliminate the reliance on the enhanced infiltration systems.

Response: The revised dilution calculation using an infiltration rate of 150 mm is included below. However, the enhanced infiltration systems (e.g., roof drain infiltrators) were not recommended for the purpose of enhancing infiltration for nitrate dilution. They were proposed in the 2013 Stormwater Management Report to control stormwater on site and may still be needed to meet stormwater management requirements. If that is the case, the infiltration will still be enhanced.

Nitrate Dilution Calulation: C = QeCe / (Qe + Qp)

Where:

C = concentration of nitrate after dilution
Qe = volume of effluent from the leaching beds = 7,000 L/day
Ce = nitrate concentration in the sewage effluent = 40 mg/L
Qp = volume of precipitation infiltration = 150 mm/year over 9.87 ha
(2.96 ha of development property plus 6.91 ha on golf course property)
C = 5.89 mg/L

The predicted nitrate concentration is below the objective limit of 10 mg/L.

Issue 3: Background Nitrate

Issue: Background nitrate levels need to be determined and the sources assessed. In areas where the background already exceeds 10 mg/L, development may not be possible if the levels are likely to remain elevated.

Response: Shallow groundwater samples were collected by Grace from two dug wells and five shallow standpipes in 2011 and 2013. The results are included in the table below. The locations of the test pits are shown on the attached Figure 2, from the Grace 2013 report.

Location	Well Type	Nitrate (mg/L)			
		Oct. 27, 2011	Apr. 30, 2013	July 2, 2013	Apr. 14, 2016
DW-1	dug	1.21	1.82	1.24	-
DW-2	dug	2.66	4.4	2.95	-
TP-4	standpipe	6.94	10.6	3.52	5.27
TP-5	standpipe	12.1	7.72	7.27	6.63
TP-6	standpipe	16.9	11.5	14.3	0.96
TP-7	standpipe	-	0.18	<0.05	-
TP-8	standpipe	-	0.08	0.17	-

The report stated that the levels were the result of agricultural practices that were only stopped in 2012. The report also stated that the levels would decline with no agricultural land use. Additional samples were collected in April of 2016 from the three standpipes remaining on the site. An attempt to sample the standpipes in August 2015 was not successful as the standpipes were dry.

The results show a significant decline in TP-6 and a declining trend in TP-5. TP-6 is up-gradient of TP-5. The trend at TP-4 is less clear. These were the three sampling points where nitrate previously exceeded 10 mg/L. Declining nitrate supports a historic agricultural source that has been recently removed.

Issue 4: Impermeable Surfaces

Issue: The reviewer noted that the area previously used for on-site dilution calculations did not consider impermeable surfaces under the post-development scenario.

Response: The Stormwater Management Report proposed infiltration systems to control runoff and to match pre and post-development infiltration.

Issue 8: Other Water Requirements

Outstanding Issue: The reviewer noted that if residents were expected to use irrigation systems then there should be an evaluation of the effects from this additional water demand. If groundwater will not be used for irrigation or geothermal for example, then this should be started and appropriate limitation put on title for the development.

Response: It was noted in an earlier letter that open loop groundwater heat pumps will not be used. Closed loop geothermal heat pumps will be allowed. In addition, the developer is not providing irrigation systems. If the Municipality requires, this can be placed on title.

Issue 11: Total Coliform

Outstanding Issue: Water supply well testing in 2012 reported 9 CFU total coliform in TW1. No bacteria were detected in TW2 or TW3. The reviewer required that the well be retested to evaluate whether the coliform bacteria was due to incomplete chlorination of a newly drilled well or if there were issues with the microbiological content of the groundwater at this well.

Response: TW1 was chlorinated on August 21, 2015 and then purged and tested on August 26 using an electric submersible pump. The pumping rate was 60 L/min for 22 min and 70 L/min for 38 min resulting in approx. 4,000 L being pumped to waste prior to testing. This represented approximately three casing volumes. Samples were tested for total coliform and Escherichia coli. None was detected suggesting the original detection was due to incomplete chlorination of the new well or pumping equipment. A copy of the lab report is attached.

Issue 12: Iron, Manganese and Hardness

Outstanding Issue: The water supply well testing in 2012 reported concentrations of iron, manganese and hardness above the ODWQS aesthetic objectives. The reviewer required additional information into treatment of these plus other water quality issues that would have to be treated (colour and total coliform were also present in 2012).

Response: All three test wells were purged and retested in 2015. The purging was necessary, as the wells had not been pumped for two years. Each well was pumped for over an hour using an electric submersible pump. A minimum of three casing volumes was pumped to waste from each well. As noted above, TW1 was chlorinated prior to purging. Water samples were collected on August 26, 2015. The lab report is attached. Colour and total coliform were below water quality criteria in all of the wells and treatment is not required.

The concentrations of hardness, iron and manganese were consistent with the concentrations in 2012 and remained above the Ontario Drinking Water Quality Standards (ODWQS). As discussed in previous correspondence, it is not unusual for these parameters to exceed the ODWQS in groundwater and are commonly treated using a water softener. The table below compares the 2015 concentrations to the ODWQS and to the MOECC suggested level of treatability using a water softener.

	units	ODWQS[1]	Treatability[2]	TW1	TW2	TW3
Hardness	mg/L	180	NA	194	230	221
Iron	mg/L	0.3	5	0.776	0.358	0.809
Manganese	mg/L	0.05	1	0.051	0.061	0.05

[1] Ontario Drinking Water Quality Standard
[2] Maximum concentration considered reasonably treatable – MOE Procedure D-5-5

The parameters are well within treatability ranges. Information obtained from a water treatment provider was that the effectiveness and cost of domestic treatment depends on the iron content. If the iron is high, two treatment units are required, the first unit to remove the iron and manganese (filter) and the second to reduce the hardness (softener). The cost of these combined units for a four-bedroom home is in the range of $3,000 to $4,000. However, the iron concentration in the test wells is not that high (<1 mg/L) and it may be possible to treat with only the one unit. This reduces that cost to a range of $2,000.

Issue 13: Maximum Treatability Criteria

Outstanding Issue: The aesthetic objective for colour is 5 TCU but tests from 2012 reported colour in TW2 and TW3 at 9 to 13 TCU. The reviewer required the proponent to demonstrate that the water can be treated and document the cost.

As reported in Issue 12 above, the wells were purged and retested in August 2015. Lab results reported colour concentrations at less than 5 TCU in all three wells. This is below the aesthetic objective (5 TCU). The lab report is attached. There is no need for treatment beyond that for hardness, iron and manganese.

We trust that the information provided above is satisfactory.

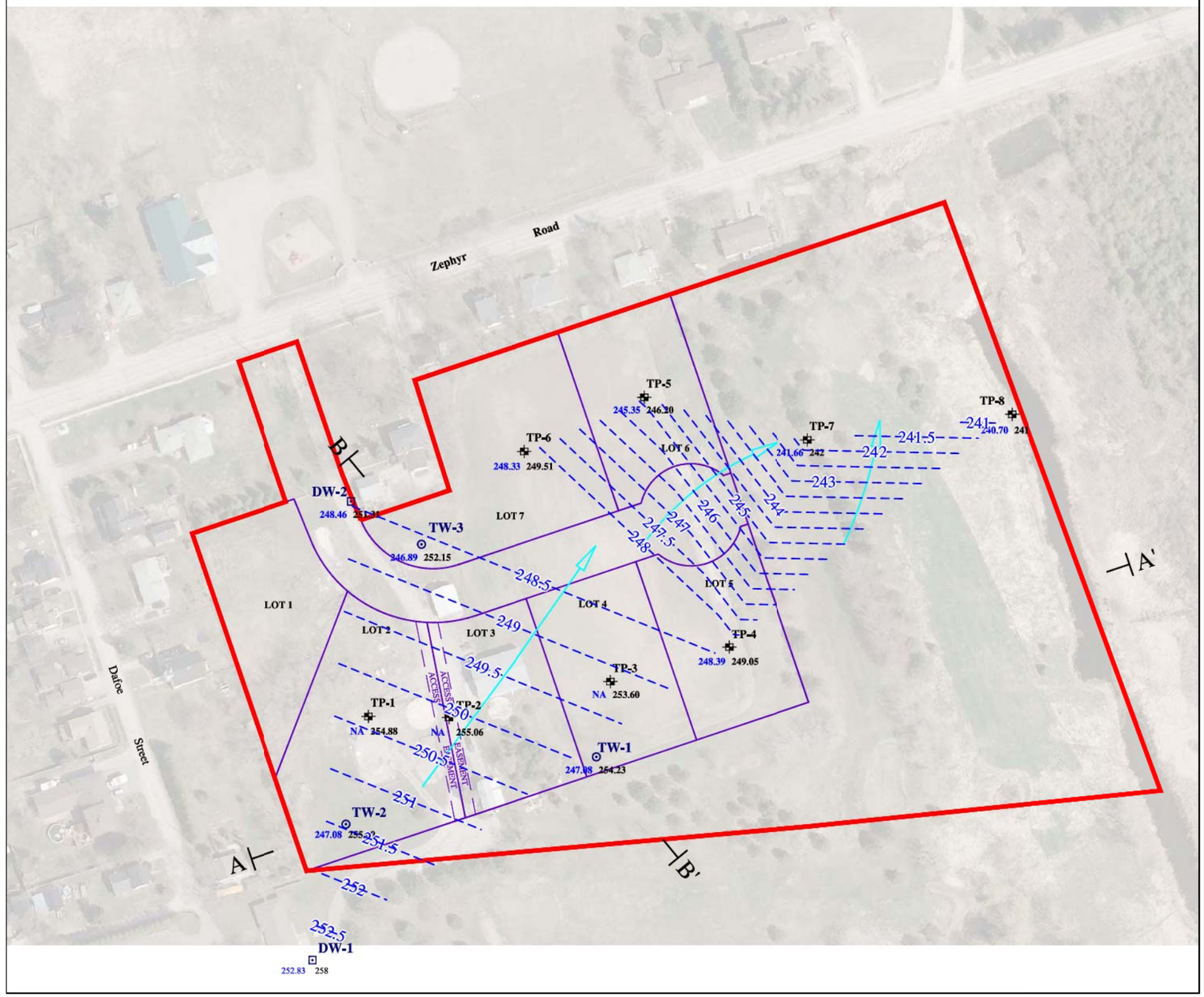
Yours truly,

R.J. Burnside & Associates Limited

Joy Rutherford, P.Geo.
Senior Hydrogeologist
JR:js

Enclosure(s) Figure 2 – Shallow Groundwater Flow, QSRP Developments (August 2013)
AGAT Laboratory Reports

cc: Mark Strangways, QSRP Developments Inc. (enc.) (Via: Email)
Heather Sadler, EcoVue Consulting Services Inc. (enc.) (Via: Email)
James Orr, R.J. Burnside & Associates Limited (enc.) (Via: Email)



Peer Review Response
Hydrogeological Assessment
and Private Servicing Report

309 Zephyr Road
Part Lot 25, Concession 3
Former Scott Township, Hamlet of Zephyr
Township of Uxbridge, Ontario

LEGEND

- Property Boundary
- Proposed Lots
- Proposed Road
- TW-1 (Aquifer ELEV / Grade ELEV) — Drilled Well Location
- DW-2 (Aquifer ELEV / Grade ELEV) — Dug Well Location
- Test Pit ID (Aquifer ELEV / Grade ELEV) — Test Pit Location
- A — A' — Geological Cross-Section (Refer to Drawing No. 5 - Geological Cross Sections)
- –241– — Shallow Groundwater Elevation Contour (mASL)
- Inferred Shallow Groundwater Flow Direction

Scale: 1:1,750
0 15 30 45 m

Property lot lines obtained from E.R. Garden Limited. Draft Plan of Subdivision Part of Lot 25, Concession 3 (Geographic Township of Scott), Township of Uxbridge, Regional Municipality of Durham. File number 12-5923.
Base Aerial photograph obtained from First Base Solutions, 2011. Orthophotograph date 2008.

TITLE
SHALLOW GROUNDWATER FLOW

CLIENT
QSRP DEVELOPMENTS INC.

GRACE & ASSOCIATES INC.
Geological & Environmental Consultants

DRAWN	DRAWING NO.
R11-510.3	2
DATE	
August, 2013	

AGAT Laboratories

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CLIENT NAME: **R.J. BURNSIDE & ASSOCIATES LTD.**
449 Josephine Street, PO Box 10
Wingham, ON N0G2W0
(519) 357-1521

ATTENTION TO: **Joy Rutherford**

PROJECT:

AGAT WORK ORDER: **15T012384**

MICROBIOLOGY ANALYSIS REVIEWED BY: **Inesa Alizarchyk, Inorganic Lab Supervisor**

WATER ANALYSIS REVIEWED BY: **Parvathi Malemath, Data Reviewer**

DATE REPORTED: **Sep 08, 2015**

PAGES (INCLUDING COVER): **11**

VERSION*: **1**

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

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Certificate of Analysis

AGAT WORK ORDER: 15T012384

PROJECT:

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD.

ATTENTION TO: Joy Rutherford

SAMPLING SITE:

SAMPLED BY:Sean Quinlan

Microbiological Analysis (water)

DATE RECEIVED: 2015-08-27

DATE REPORTED: 2015-09-08

		SAMPLE DESCRIPTION:		TW1
		SAMPLE TYPE:		Water
		DATE SAMPLED:		8/26/2015
Parameter	**Unit**	**G / S**	**RDL**	**6906601**
Escherichia coli	CFU/100mL		2	ND
Total Coliforms	CFU/100mL		2	ND
Heterotrophic Plate Count	CFU/1mL		10	ND

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

6906601 RDL >1 indicates dilutions of the sample.
ND - Not Detected.

Certified By:

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AGAT WORK ORDER: 15T012384

PROJECT:

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD.

ATTENTION TO: Joy Rutherford

SAMPLING SITE:

SAMPLED BY:Sean Quinlan

Dissolved Metals (Water)

DATE RECEIVED: 2015-08-27

DATE REPORTED: 2015-09-08

		SAMPLE DESCRIPTION:		TW1 (filtered)	TW2 (filtered)	TW3 (filtered)
		SAMPLE TYPE:		Water	Water	Water
		DATE SAMPLED:		8/26/2015	8/26/2015	8/26/2015
Parameter	Unit	G / S	RDL	6906660	6906669	6906680
Aluminum	mg/L		0.004	<0.004	<0.004	<0.004
Antimony	mg/L		0.003	<0.003	<0.003	<0.003
Arsenic	mg/L		0.003	<0.003	<0.003	<0.003
Barium	mg/L		0.002	0.089	0.116	0.099
Beryllium	mg/L		0.001	<0.001	<0.001	<0.001
Boron	mg/L		0.010	0.014	0.027	<0.010
Cadmium	mg/L		0.001	<0.001	<0.001	<0.001
Chromium	mg/L		0.003	0.006	0.007	0.007
Cobalt	mg/L		0.001	<0.001	<0.001	<0.001
Copper	mg/L		0.003	<0.003	<0.003	<0.003
Iron	mg/L		0.010	0.518	0.302	0.620
Lead	mg/L		0.002	<0.002	<0.002	<0.002
Manganese	mg/L		0.002	0.047	0.057	0.045
Molybdenum	mg/L		0.002	<0.002	<0.002	<0.002
Nickel	mg/L		0.003	<0.003	<0.003	<0.003
Selenium	mg/L		0.004	<0.004	<0.004	<0.004
Silver	mg/L		0.002	<0.002	<0.002	<0.002
Strontium	mg/L		0.005	0.298	0.430	0.244
Thallium	mg/L		0.006	<0.006	<0.006	<0.006
Tin	mg/L		0.002	<0.002	<0.002	<0.002
Titanium	mg/L		0.002	<0.002	<0.002	<0.002
Tungsten	mg/L		0.010	<0.010	<0.010	<0.010
Uranium	mg/L		0.002	<0.002	<0.002	<0.002
Vanadium	mg/L		0.002	<0.002	<0.002	<0.002
Zinc	mg/L		0.005	<0.005	<0.005	<0.005
Zirconium	mg/L		0.004	<0.004	<0.004	<0.004

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Certified By:

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Certificate of Analysis

AGAT WORK ORDER: 15T012384

PROJECT:

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD.

ATTENTION TO: Joy Rutherford

SAMPLING SITE:

SAMPLED BY:Sean Quinlan

Water Quality Assessment (mg/L) excl. Hg

DATE RECEIVED: 2015-08-27

DATE REPORTED: 2015-09-08

		SAMPLE DESCRIPTION:		TW1	TW2	TW3
		SAMPLE TYPE:		Water	Water	Water
		DATE SAMPLED:		8/26/2015	8/26/2015	8/26/2015
Parameter	Unit	G / S	RDL	6906601	6906662	6906674
Electrical Conductivity	uS/cm		2	417	484	467
pH	pH Units		NA	8.30	8.34	8.33
Saturation pH				7.19	7.11	7.16
Langelier Index				1.11	1.23	1.17
Total Hardness (as CaCO3)	mg/L		0.5	194	230	221
Total Dissolved Solids	mg/L		20	214	250	238
Alkalinity (as CaCO3)	mg/L		5	223	227	211
Bicarbonate (as CaCO3)	mg/L		5	223	223	209
Carbonate (as CaCO3)	mg/L		5	<5	<5	<5
Hydroxide (as CaCO3)	mg/L		5	<5	<5	<5
Fluoride	mg/L		0.05	<0.05	<0.05	<0.05
Chloride	mg/L		0.10	2.03	5.97	9.53
Nitrate as N	mg/L		0.05	<0.05	<0.05	<0.05
Nitrite as N	mg/L		0.05	<0.05	<0.05	<0.05
Bromide	mg/L		0.05	<0.05	<0.05	<0.05
Sulphate	mg/L		0.10	4.21	18.6	18.3
Ortho Phosphate as P	mg/L		0.10	<0.10	<0.10	<0.10
Reactive Silica	mg/L		0.1	19.8	20.1	15.5
Ammonia as N	mg/L		0.02	0.32	0.70	0.28
Total Phosphorus	mg/L		0.05	<0.05	0.08	<0.05
Total Organic Carbon	mg/L		0.5	1.3	1.5	1.1
Colour	TCU		5	<5	<5	<5
Turbidity	NTU		0.5	4.4	2.6	10.1
Calcium	mg/L		0.05	51.2	57.3	60.1
Magnesium	mg/L		0.05	16.0	21.0	17.2
Sodium	mg/L		0.05	11.4	14.9	9.14
Potassium	mg/L		0.05	1.43	1.41	1.36
Iron	mg/L		0.010	0.776	0.358	0.809
Manganese	mg/L		0.002	0.051	0.061	0.050
% Difference/ Ion Balance	%		NA	1.97	2.16	0.0274

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Certificate of Analysis

AGAT WORK ORDER: 15T012384

PROJECT:

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD.

ATTENTION TO: Joy Rutherford

SAMPLING SITE:

SAMPLED BY:Sean Quinlan

Water Quality Assessment (mg/L) excl. Hg

DATE RECEIVED: 2015-08-27

DATE REPORTED: 2015-09-08

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Certified By:

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Quality Assurance

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD.

AGAT WORK ORDER: 15T012384

PROJECT:

ATTENTION TO: Joy Rutherford

SAMPLING SITE:

SAMPLED BY:Sean Quinlan

Microbiology Analysis

RPT Date: Sep 08, 2015			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Microbiological Analysis (water)															
Escherichia coli	1		ND	ND	NA	< 1									
Total Coliforms	1		ND	ND	NA	< 1									
Heterotrophic Plate Count	1	6906601	ND	ND	NA	< 10									

Comments: ND - Not Detected, NA - % RPD Not Applicable

Certified By:

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Quality Assurance

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD.

AGAT WORK ORDER: 15T012384

PROJECT:

ATTENTION TO: Joy Rutherford

SAMPLING SITE:

SAMPLED BY:Sean Quinlan

Water Analysis

RPT Date: Sep 08, 2015			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Water Quality Assessment (mg/L) excl. Hg															
Electrical Conductivity	6905338		811	812	0.1%	< 2	107%	80%	120%	NA			NA		
pH	6905338		8.06	8.16	1.2%	NA	102%	90%	110%	NA			NA		
Total Dissolved Solids	6904309		446	448	0.4%	< 20	110%	80%	120%	NA			NA		
Alkalinity (as CaCO3)	6905338		236	238	0.8%	< 5	98%	80%	120%	NA			NA		
Bicarbonate (as CaCO3)	6905338		236	238	0.8%	< 5	NA			NA			NA		
Carbonate (as CaCO3)	6905338		<5	<5	0.0%	< 5	NA			NA			NA		
Hydroxide (as CaCO3)	6905338		<5	<5	0.0%	< 5	NA			NA			NA		
Fluoride	6905416		<0.25	<0.25	0.0%	< 0.05	105%	90%	110%	92%	90%	110%	100%	80%	120%
Chloride	6905416		55.2	55.8	1.1%	< 0.10	106%	90%	110%	98%	90%	110%	96%	80%	120%
Nitrate as N	6905416		<0.25	<0.25	0.0%	< 0.05	94%	90%	110%	105%	90%	110%	104%	80%	120%
Nitrite as N	6905416		<0.25	<0.25	0.0%	< 0.05	NA	90%	110%	102%	90%	110%	97%	80%	120%
Bromide	6905416		<0.25	<0.25	0.0%	< 0.05	110%	90%	110%	102%	90%	110%	96%	80%	120%
Sulphate	6905416		6.08	6.21	2.1%	< 0.10	98%	90%	110%	104%	90%	110%	103%	80%	120%
Ortho Phosphate as P	6905416		<0.50	<0.50	0.0%	< 0.10	96%	90%	110%	98%	90%	110%	99%	80%	120%
Reactive Silica	6907839		17.6	17.5	0.6%	< 0.05	98%	90%	110%	99%	90%	110%	88%	80%	120%
Ammonia as N	6911045		145	144	0.7%	< 0.02	103%	90%	110%	105%	90%	110%	98%	80%	120%
Total Phosphorus	6905448		0.10	0.09	10.5%	< 0.05	103%	80%	120%	93%	90%	110%	121%	70%	130%
Total Organic Carbon	6906601	6906601	1.3	1.3	0.0%	< 0.5	93%	90%	110%	NA	90%	110%	84%	80%	120%
Colour	6898862		33	33	0.0%	< 5	103%	90%	110%	NA			NA		
Turbidity	6905326		4.3	4.2	2.4%	< 0.5	110%	90%	110%	NA			NA		
Calcium	6908220		16.9	17.0	0.6%	< 0.05	100%	90%	110%	98%	90%	110%	107%	70%	130%
Magnesium	6908220		6.32	6.36	0.6%	< 0.05	103%	90%	110%	103%	90%	110%	105%	70%	130%
Sodium	6908220		63.3	63.0	0.5%	< 0.05	100%	90%	110%	100%	90%	110%	108%	70%	130%
Potassium	6908220		0.93	0.93	0.0%	< 0.05	104%	90%	110%	105%	90%	110%	111%	70%	130%
Iron	6906601	6906601	0.776	0.676	13.8%	< 0.010	110%	90%	110%	106%	90%	110%	104%	70%	130%
Manganese	6906601	6906601	0.051	0.048	6.1%	< 0.002	106%	90%	110%	109%	90%	110%	97%	70%	130%

Comments: NA signifies Not Applicable.

Certified By:

AGAT Laboratories

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CANADA L4Z 1Y2
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FAX (905)712-5122
http://www.agatlabs.com

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES
17345 LESLIE STREET
Newmarket, ON L3Y0A4
(905) 953-8967

ATTENTION TO: Bonnie Ward

PROJECT: 300034602 (Zephyr)

AGAT WORK ORDER: 16T086110

WATER ANALYSIS REVIEWED BY: Amanjot Bhela, Inorganic Coordinator

DATE REPORTED: Apr 26, 2016

PAGES (INCLUDING COVER): 5

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

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Certificate of Analysis

AGAT WORK ORDER: 16T086110

PROJECT: 300034602 (Zephyr)

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES

ATTENTION TO: Bonnie Ward

SAMPLING SITE:

SAMPLED BY:Bonnie Ward

Nitrate (Water)

DATE RECEIVED: 2016-04-15

DATE REPORTED: 2016-04-26

		SAMPLE DESCRIPTION:		TP-4	TP-5	TP-6
		SAMPLE TYPE:		Water	Water	Water
		DATE SAMPLED:		4/14/2016	4/14/2016	4/14/2016
Parameter	Unit	G / S	RDL	7494818	7494821	7494823
Nitrate as N	mg/L		0.05	5.27	6.63	0.96

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Certified By: Amanjot Bhela

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES

AGAT WORK ORDER: 16T086110

PROJECT: 300034602 (Zephyr)

ATTENTION TO: Bonnie Ward

SAMPLING SITE:

SAMPLED BY:Bonnie Ward

Water Analysis

RPT Date: Apr 26, 2016			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Nitrate (Water)															
Nitrate as N	7495361		<0.25	<0.25	NA	< 0.05	96%	90%	110%	103%	90%	110%	107%	80%	120%

Comments: NA signifies Not Applicable.
Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Certified By: Amanjot Bhela

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Method Summary

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES

AGAT WORK ORDER: 16T086110

PROJECT: 300034602 (Zephyr)

ATTENTION TO: Bonnie Ward

SAMPLING SITE:

SAMPLED BY:Bonnie Ward

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Nitrate as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH

AGAT Laboratories

1 med blue

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
Ph: 905.712.5100 Fax: 905.712.5122
webearth.agatlabs.com

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water intended for human consumption)

Laboratory Use Only

Work Order #: 16T086110

Cooler Quantity:

Arrival Temperatures: 9.4 | 9.8 | 8.7

Custody Seal Intact: ☐ Yes ☐ No ☑ N/A

Notes:

Report Information:

Company: RJ Burnside
Contact: Bonnie Ward
Address: 17345 Leslie St, Suite 200
Newmarket, ON L3Y 0A4
Phone: 289-383-6256 Fax:

Reports to be sent to:

1. Email: bonnie.jean.ward@rjburnside.com
2. Email: joy.rutherford@rjburnside.com

Regulatory Requirements:

☑ No Regulatory Requirement

(Please check all applicable boxes)

☐ Regulation 153/04
Table (Indicate One) ☐ Ind/Com ☐ Res/Park ☐ Agriculture
Soil Texture (Check One) ☐ Coarse ☐ Fine

☐ Sewer Use
☐ Sanitary ☐ Storm
Region (Indicate One)

☐ Regulation 558
☐ CCME
☐ Prov. Water Quality Objectives (PWQO)
☐ Other
(Indicate One)

Is this submission for a **Record of Site Condition?** ☐ Yes ☐ No

Report Guideline on *Certificate of Analysis* ☐ Yes ☐ No

Turnaround Time (TAT) Required:

Regular TAT ☑ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

☐ 3 Business Days ☐ 2 Business Days ☐ 1 Business Day

OR Date Required (Rush Surcharges May Apply):

Please provide prior notification for rush TAT
**TAT is exclusive of weekends and statutory holidays*

Project Information:

Project: 300034602 (Zephyr)
Site Location: Zephyr
Sampled By: Bonnie Ward
AGAT Quote #: PO:
Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:

Bill To Same: Yes ☑ No ☐

Company:
Contact:
Address:
Email:

Sample Matrix Legend

B	Biota
GW	Ground Water
O	Oil
P	Paint
S	Soil
SD	Sediment
SW	Surface Water

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI (Please Circle) Y / N	Metals and Inorganics	Metal Scan	Hydride Forming Metals	Client Custom Metals	(Check Applicable) ORPs: ☐ B-HWS ☐ Cr^{6+} ☐ EC ☐ Total N ☐ Cl^- ☐ FOC ☐ Hg ☐ CN^- ☐ NO_3/NO_2 ☐ pH ☐ SAR	Nutrients: ☐ TP ☐ NH_3 ☐ NO_3 ☐ NO_2 ☐ TKN ☐ NO_3/NO_2	Volatiles: ☐ VOC ☐ BTEX ☐ THM	CCME Fractions 1 to 4	ABNs	PAHs	Chlorophenols	PCBs	Organochlorine Pesticides	TCLP Metals/Inorganics	Sewer Use
TP-4	04/14/16	12:00pm	1	GW		N						✓							
TP-5	04/14/16	12:20pm	1	GW		N						✓							
TP-6	04/14/16	12:30pm	1	GW		N						✓							

Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
Bonnie Ward Bonnie Ward	04/15/16		Shannon F Apr 15/16	4:00	
Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time

Page ____ of ____

N°: T 024454

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CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Method Summary

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD.

AGAT WORK ORDER: 15T012384

PROJECT:

ATTENTION TO: Joy Rutherford

SAMPLING SITE:

SAMPLED BY:Sean Quinlan

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Microbiology Analysis			
Escherichia coli	MIC-93-7010	EPA 1604	Membrane Filtration
Total Coliforms	MIC-93-7010	EPA 1604	Membrane Filtration
Heterotrophic Plate Count	MIC-93-7020	SM 9215C	Spread Plate

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Method Summary

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD.

AGAT WORK ORDER: 15T012384

PROJECT:

ATTENTION TO: Joy Rutherford

SAMPLING SITE:

SAMPLED BY:Sean Quinlan

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Aluminum	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Antimony	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Arsenic	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Barium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Beryllium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Boron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cadmium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Chromium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cobalt	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Copper	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Iron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Lead	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Manganese	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Molybdenum	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Nickel	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Selenium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Silver	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Strontium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Thallium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Tin	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Titanium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Tungsten	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Uranium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Vanadium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Zinc	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Zirconium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Electrical Conductivity	INOR-93-6000	SM 2510 B	PC TITRATE
pH	INOR-93-6000	SM 4500-H+ B	PC TITRATE
Saturation pH		SM 2320 B	CALCULATION
Langelier Index		SM 2330B	CALCULATION
Total Hardness (as CaCO3)	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Total Dissolved Solids	INOR-93-6028	SM 2540 C	BALANCE
Alkalinity (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE
Bicarbonate (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE
Carbonate (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE
Hydroxide (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE
Fluoride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Chloride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Nitrate as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Bromide	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Sulphate	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Ortho Phosphate as P	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Reactive Silica	INOR-93-6047	AQ2 EPA-122A & SM 4500 SiO2 D	AQ2 DISCRETE ANALYSER
Ammonia as N	INOR-93-6059	QuikChem 10-107-06-1-J & SM 4500 NH3-F	LACHAT FIA
Total Phosphorus	INOR-93-6057	QuikChem 10-115-01-3-A & SM 4500-P I	LACHAT FIA
Total Organic Carbon	INOR-93-6049	EPA 415.1 & SM 5310	SHIMADZU CARBON ANALYZER

AGAT Laboratories

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Method Summary

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD.

AGAT WORK ORDER: 15T012384

PROJECT:

ATTENTION TO: Joy Rutherford

SAMPLING SITE:

SAMPLED BY:Sean Quinlan

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Colour	INOR-93-6046	SM 2120 B	SPECTROPHOTOMETER
Turbidity	INOR-93-6044	SM 2130 B	NEPHELOMETER
Calcium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Magnesium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Sodium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Potassium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
% Difference/ Ion Balance		SM 1030 E	CALCULATION

AGAT Laboratories

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
Ph: 905.712.5100 Fax: 905.712.5122
www.agatlabs.com webearth.agatlabs.com

Mibi

Laboratory Use Only 15T012384
Work Order #: [illegible]
Cooler Quantity: 3 Med
Arrival Temperatures: 3.9 | 3.6 | 4
2.2 | 1.4 | 2.5
Custody Seal Intact: ☐Yes ☐No ☐N/A
Notes:

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water intended for human consumption)

Report Information:
Company: BURNSIDE
Contact: Joy Rutherford
Address: 292 SPEEDVALE AVE
GUELPH, ON
Phone: 519 823 4995 Fax:
Reports to be sent to:
1. Email: joy.rutherford@rjburnside.com
2. Email: Seanquinlan@rjburnside.com

Regulatory Requirements: ☐ No Regulatory Requirement
(Please check all applicable boxes)

☐ Regulation 153/04
Table ___ *Indicate One*
☐ Ind/Com
☐ Res/Park
☐ Agriculture
Soil Texture *(Check One)*
☐ Coarse
☐ Fine

☐ Sewer Use
☐ Sanitary
☐ Storm
Region ___ *Indicate One*

☐ Regulation 558
☐ CCME
☐ Prov. Water Quality Objectives (PWQO)
☐ Other
___ *Indicate One*

Is this submission for a **Record of Site Condition?** ☐ Yes ☒ No

Report Guideline on *Certificate of Analysis* ☐ Yes ☐ No

Turnaround Time (TAT) Required:
Regular TAT ☒ 5 to 7 Business Days
Rush TAT (Rush Surcharges Apply)
☐ 3 Business Days ☐ 2 Business Days ☐ 1 Business Day
OR Date Required (Rush Surcharges May Apply): ___
Please provide prior notification for rush TAT
**TAT is exclusive of weekends and statutory holidays*

Project Information:
Project:
Site Location: Zephyr
Sampled By: Sean Quinlan
AGAT Quote #: ___ PO: ___
Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:
Bill To Same: Yes ☒ No ☐
Company:
Contact:
Address:
Email:

Sample Matrix Legend
B	Biota
GW	Ground Water
O	Oil
P	Paint
S	Soil
SD	Sediment
SW	Surface Water

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Metals and Inorganics	Metal Scan	Hydride Forming Metals	Client Custom Metals	(Check Applicable) ORPs: ☐B-HWS ☐Cl⁻ ☐CN⁻ ☐Cr⁶⁺ ☐EC ☐FOC ☐NO_3/NO_2 ☐Total N ☐Hg ☐pH ☐SAR	Nutrients: ☐TP ☐NH_3 ☐TKN ☐NO_3 ☐NO_2 ☐NO_3/NO_2	Volatiles: ☐VOC ☐BTEX ☐THM	CCME Fractions 1 to 4	ABNs	PAHs	Chlorophenols	PCBs	Organochlorine Pesticides	TCLP Metals/Inorganics	Sewer Use	WQA	Total Metals	Dissolved Metals	Microbiology
TW1	26 AUG 15	9:25	7	GW																	✓	✓	✓	✓
TW2	↓	10:50	6	GW																	✓	✓	✓	
TW3	↓	12:45	6	GW																	✓	✓	✓	

Mercury not submitted
Dissolved Metals field filtered

Samples Relinquished By (Print Name and Sign)	Date	Time	Samples Received By (Print Name and Sign)	Date	Time
SEAN QUINLAN	26 AUG 15	13:00		2015-8-27	12:27
	2015-8-27	3:56			

Page 1 of 1
N°: T 007041