

# ANNUAL REPORT

## ROYAL OAKS WASTEWATER TREATMENT PLANT

FOR THE PERIOD:  
**JANUARY 1, 2016 – DECEMBER 31, 2016**

*Prepared for the Corporation of the Township of Springwater  
by the Ontario Clean Water Agency*



Ministry of the Environment & Climate Change  
Barrie District Office  
54 Cedar Point Drive, Unit 1203  
Barrie, ON L4N 5R7

**ATTN: Water Compliance Supervisor**

RE: 2016 Annual Operating Report for the Royal Oaks Wastewater Treatment Plant (Snow Valley Landing)  
6 Budd's Mill Road, Springwater Township

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The enclosed 2016 report for the above-referenced facility and summarizes the performance and related activities in accordance with Certificate of Approval #0206-93QJEL, Condition 9 (2) as follows below.

- a) *A summary and interpretation of all monitoring data and a comparison to the effluent objectives and effluent limits outlined in Conditions 6 & 7, including an overview of the success and adequacy of the Works;*

**Table 1 - Current Monitoring Plan**

SOURCE	PARAMETER	FREQUENCY	METHOD
RAW SEWAGE (Grab)	BOD5	Monthly	External Analysis
	Total Suspended Solids		
	Total Phosphorus		
	Total Kjeldahl Nitrogen		
FINAL EFFLUENT (Grab)	CBOD5	Weekly	
	Total Suspended Solids		
	Total Phosphorus		
	Nitrate-Nitrogen		
	Ammonia-Nitrogen		
	Total Kjeldahl Nitrogen		
	Chloride		
	Sodium		

**Table 2 - Effluent Limits & Objectives**

Parameter	ANNUAL MAXIMUM	ANNUAL AVERAGE	CERTIFICATE OF APPROVAL	
			LIMIT	OBJECTIVE
CBOD5 (mg/L)	4.40	2.69	15.0	12.0
Total Suspended Solids (mg/L)	8.75	4.09	15.0	12.0
Total Phosphorus (mg/L)	0.98	0.26	1.0	0.7
Ammonia-Nitrogen + Nitrate-Nitrogen (mg/L)	14.30	4.90	7.0	-

**Refer to Appendix A for detailed performance report.**

Effluent quality from the Royal Oaks WWTP met all annual and monthly ECA effluent limits with the exception of Total Phosphorus slightly exceeding the Object limit of 0.7mg/L during the months of October and November by 0.22mg/L and 0.18mg/L respectively.

Elevated phosphorus concentrations are easily resolved by backflushing the tertiary filter and increasing waste sludge from the primary clarifier.

**b) A tabulation of the weekly volumes of effluent disposed through the subsurface disposal system during the reporting period;**

Weekly volumes of effluent are broken down in **Appendix B**. The following table summarizes the effluent flow data for the reporting period by month.

**Table 3 – Effluent Flow**

MONTH	AVERAGE DAILY FLOW (m <sup>3</sup> )	PEAK FLOW (m <sup>3</sup> )	TOTAL FLOW (m <sup>3</sup> )
<b>DESIGN</b>	<b>260.0</b>	-	-
JANUARY	70.11	112.58	2173.56
FEBRUARY	72.12	93.56	2091.42
MARCH	76.53	111.86	2372.50
APRIL	82.40	111.72	2471.85
MAY	82.45	173.26	2556.01
JUNE	75.43	110.55	2262.88
JULY	74.00	109.88	2294.04
AUGUST	77.70	126.91	2408.83
SEPTEMBER	76.47	122.39	2294.23
OCTOBER	83.52	116.60	2589.16
NOVEMBER	82.22	153.76	2384.25
DECEMBER	85.87	120.71	2661.91
<b>2016</b>	<b>AVERAGE:</b> <b>78.24</b>	<b>MAXIMUM:</b> <b>173.26</b>	<b>TOTAL:</b> <b>28560.67</b>

The plant operated at, on average, 30.1% of its rated capacity with a two SBR trains in service. The maximum flow rate for this reporting period was 173.26m<sup>3</sup>/day which is 66.6% of its rated capacity with a both SBR trains in service.

Flow meters are used to measure the raw sewage and final effluent flows. All flow meters were calibrated on October 25, 2011 by Flowmetrix Technical Services Inc.

**Refer to Appendix C for Calibration Reports**

- c) A summary of maintenance carried out on major structure, equipment, apparatus, mechanism or thing forming part of the Works;**

Plant maintenance, including scheduled and non-scheduled maintenance, is monitored using the Hansen Work Management System. Work orders are generated monthly and any actions over and above this work is documented on corrective work orders and entered into the system for future reference.

- Pump Station clean-outs
- Online gas monitor sensor repairs
- Raw equalization tank pump #1 rebuild
- Handheld gas detector repair
- Budd's Mill SPS pump rebuild
- Heron SPS flush-valve rebuild

- d) A description of impact of the effluent from the Works on the receiving groundwater.**

**Refer to Appendix D for this report, prepared by Golder Associates.**

- e) Any other information the District Manager requires from time to time.**

Odours occurring along the southern section of the Orchardview subdivision initiated an odour study within the affected area in 2016 to investigate its source and potential options to mitigate.

The Township of Springwater and Consultants are working with the Ministry of the Environment and Climate Change to develop a solution to mitigate odours.

**f) A summary of all By-pass, spill or abnormal discharge events;**

There were two spill events in 2016 that were reported to the appropriate authorities. Detailed reports are within Appendix E of this report.

Regards,



Richard Eagle  
Senior Operations Manager  
Ontario Clean Water Agency, Georgian Highlands Hub

c.c. Mark Archer, Director of Public Works, Township of Springwater

# **APPENDIX A**

## **PERFORMANCE ASSESSMENT REPORT**

Report extracted 03/30/2017 21:31

Facility: [1155] ROYAL OAKS WASTEWATER TREATMENT FACILITY

Works: [110004174]

Ontario Clean Water Agency  
Performance Assessment Report Wastewater/Lagoon

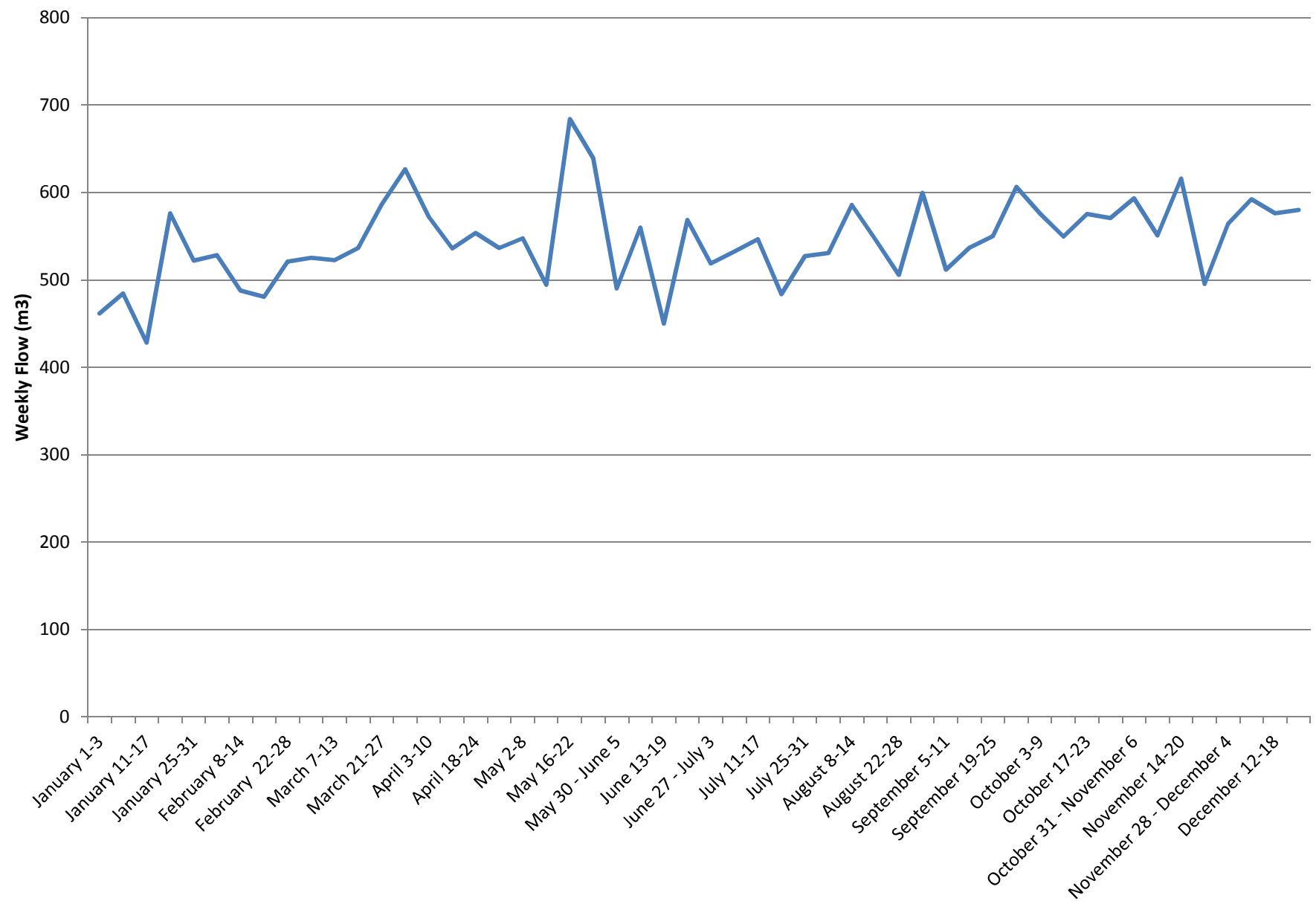
From: 01/01/2016 to 31/12/2016

	01/2016	02/2016	03/2016	04/2016	05/2016	06/2016	07/2016	08/2016	09/2016	10/2016	11/2016	12/2016	<-Total-->	<-Avg.-->	<-Max.-->	<-Criteria-->
<b>Flows:</b>																
Eff. Flow: Total - Effluent (m³)	2173.56	2091.42	2372.50	2471.85	2556.01	2262.88	2294.04	2408.83	< 2294.23	2589.16	2384.25	2661.94	< 28560.67			
Eff. Flow: Avg - Effluent (m³/d)	70.11	72.12	76.53	82.40	82.45	75.43	74.00	77.70	< 76.47	83.52	82.22	85.87		< 78.24		
Eff. Flow: Max - Effluent (m³/d)	112.58	93.56	111.86	111.72	173.26	110.55	109.88	126.91	122.39	116.60	153.76	120.71			173.26	
Raw Flow: Monthly Total - Raw (m³)	2133.90	1928.36	2142.64	2240.31	2170.31	2078.51	2108.93	2153.10	2077.79	2322.40	2143.46	2499.68	25999.39			
Raw Flow: Monthly Avg - Raw (m³/d)	68.84	66.50	69.12	74.68	70.01	69.28	68.03	69.45	69.26	74.92	71.45	80.63		71.01		
Raw Flow: Monthly Max - Raw (m³/d)	116.46	79.16	90.28	89.75	87.27	86.31	85.94	83.13	112.63	95.55	85.39	110.87			116.46	
<b>Carbonaceous Biochemical Oxygen Demand: CBOD:</b>																
Raw: Avg cBOD5 - Raw (mg/L)	276.000	452.000	320.000	322.000	232.000	348.000	278.500	237.000	272.000	306.500	222.000	148.000		284.500	452.000	
Raw: # of samples of cBOD5 - Raw (mg/L)	1	1	1	1	1	2	2	1	1	2	1	1	15			
Eff: Avg cBOD5 - Effluent (mg/L)	< 2.000	< 2.000	< 2.400	< 2.000	< 3.250	< 2.400	< 2.750	< 2.400	< 2.667	< 2.750	< 4.400	< 3.250		< 2.689	< 4.400	
Eff: # of samples of cBOD5 - Effluent (mg/L)	4	4	5	4	4	5	4	5	3	4	5	4	51			
Loading: cBOD5 - Effluent (kg/d)	< 0.140	< 0.144	< 0.184	< 0.165	< 0.268	< 0.181	< 0.204	< 0.186	< 0.204	< 0.230	< 0.362	< 0.279		< 0.212	< 0.362	
Percent Removal: cBOD5 - Raw (mg/L)	99.275	99.558	99.250	99.379	98.599	99.310	99.013	98.987	99.020	99.103	98.018	97.804			99.558	
<b>Biochemical Oxygen Demand: BOD5:</b>																
Raw: Avg BOD5 - Raw (mg/L)	269.000	519.000	337.000	387.000	325.000	337.000	406.000	305.000	307.000	359.000	306.000	262.000		343.250	519.000	
Raw: # of samples of BOD5 - Raw (mg/L)	1	1	1	1	1	2	2	1	1	2	1	1	15			
Eff: Avg BOD5 - Effluent (mg/L)				< 4.000										< 4.000	< 4.000	
Loading: BOD5 - Effluent (kg/d)				< 0.330										< 0.330	< 0.330	
Percent Removal: BOD5 - Raw (mg/L)				98.769											98.769	
<b>Total Suspended Solids: TSS:</b>																
Raw: Avg TSS - Raw (mg/L)	75.000	144.000	93.000	229.000	166.000	108.000	226.000	81.000	149.000	94.500	110.000	81.000		129.708	229.000	
Raw: # of samples of TSS - Raw (mg/L)	1	1	1	1	1	2	2	1	1	2	1	1	15			
Eff: Avg TSS - Effluent (mg/L)	< 3.000	< 2.000	< 2.400	< 2.000	< 2.000	< 2.400	8.750	4.800	2.667	5.500	< 6.600	7.000		< 4.093	8.750	
Eff: # of samples of TSS - Effluent (mg/L)	4	4	5	4	4	5	4	5	3	4	5	4	51			
Loading: TSS - Effluent (kg/d)	< 0.210	< 0.144	< 0.184	< 0.165	< 0.165	< 0.181	0.648	0.373	0.204	0.459	< 0.543	0.601		< 0.323	0.648	
Percent Removal: TSS - Raw (mg/L)	96.000	98.611	97.419	99.127	98.795	97.778	96.128	94.074	98.210	94.180	94.000	91.358			99.127	
<b>Total Phosphorus: TP:</b>																
Raw: Avg TP - Raw (mg/L)	5.780	6.940	7.090	7.120	7.000	191.227	7.010	6.450	5.890	6.720	6.170	5.810		21.934	191.227	
Raw: # of samples of TP - Raw (mg/L)	1	1	1	1	1	3	2	1	1	2	1	1	16			
Eff: Avg TP - Effluent (mg/L)	0.063	< 0.038	< 0.048	< 0.043	< 0.058	0.080	0.218	0.300	0.247	0.918	0.884	0.245		< 0.262	0.918	
Eff: # of samples of TP - Effluent (mg/L)	4	4	5	4	4	5	4	5	3	4	5	4	51			
Loading: TP - Effluent (kg/d)	0.004	< 0.003	< 0.004	< 0.004	< 0.005	0.006	0.016	0.023	0.019	0.077	0.073	0.021		< 0.021	0.077	
Percent Removal: TP - Raw (mg/L)	98.919	99.460	99.323	99.403	99.179	99.958	96.897	95.349	95.812	86.347	85.673	95.783			99.958	
<b>Nitrogen Series:</b>																
Raw: Avg TKN - Raw (mg/L)	57.900	60.400	70.100	59.700	66.900	59.000	60.300	72.300	66.500	60.800	63.800	49.300		62.250	72.300	
Raw: # of samples of TKN - Raw (mg/L)	1	1	1	1	1	2	2	1	1	2	1	1	15			
Eff: Avg TAN - Effluent (mg/L)	< 0.225	< 0.775	< 0.540	< 0.500	< 0.775	< 1.740	< 1.500	< 2.740	1.033	< 3.800	< 2.160	< 0.300		< 1.341	3.800	
Eff: # of samples of TAN - Effluent (mg/L)	4	4	5	4	4	5	4	5	3	4	5	4	51			
Loading: TAN - Effluent (kg/d)	< 0.016	< 0.056	< 0.041	< 0.041	< 0.064	< 0.131	< 0.111	< 0.213	0.079	< 0.317	< 0.178	< 0.026		< 0.106	0.317	
Eff: Avg NO3-N - Effluent (mg/L)	4.238	3.855	1.678	2.980	2.513	1.264	1.105	1.810	2.390	3.898	11.210	7.240		3.682	11.210	
Eff: # of samples of NO3-N - Effluent (mg/L)	4	4	5	4	4	5	4	5	3	4	5	4	51			
Eff: Avg NO2-N - Effluent (mg/L)	< 0.100	< 0.080	< 0.034	< 0.030	< 0.058	< 0.052	< 0.115	< 0.242	< 0.080	< 0.138	< 0.174	< 0.038		< 0.095	< 0.242	
Eff: # of samples of NO2-N - Effluent (mg/L)	4	4	5	4	4	5	4	5	3	4	5	4	51			

# **APPENDIX B**

## **EFFLUENT FLOWS**

## **ROYAL OAKS WWTP WEEKLY FINAL EFFLUENT FLOW TOTAL**



WEEK	FINAL EFFLUENT FLOWS (m <sup>3</sup> )
January 1-3	223.35
January 4-10	461.57
January 11-17	484.53
January 18-24	427.99
January 25-31	576.11
February 1-7	522.08
February 8-14	528.18
February 15-21	487.64
February 22-28	480.48
February 29 - March 6	520.88
March 7-13	525.3
March 14-20	522.47
March 21-27	536.36
March 28 – April 3	586.27
April 3-10	626.44
April 11-17	572.12
April 18-24	535.95
April 25 - May 1	553.6
May 2-8	536.53
May 9-15	547.6
May 16-22	494.27
May 23-29	683.82
May 30 - June 5	639.17
June 6-12	490.02
June 13-19	559.8
June 20-26	449.88
June 27 - July 3	568.59
July 4-10	518.81
July 11-17	532.34
July 18-24	546.57
July 25-31	483.53
August 1-7	527.27
August 8-14	530.75
August 15-21	585.81
August 22-28	546.1
August 29 - September 4	505.77
September 5-11	599.52
September 12-18	511.55
September 19-25	536.59
September 26 – October 2	549.92
October 3-9	606.4
October 10-16	575.86
October 17-23	549.56
October 24-30	575.32
October 31 - November 6	570.67
November 7-13	593.22
November 14-20	550.83
November 21-27	615.89
November 28 - December 4	495.2
December 5-11	564.03
December 12-18	592.19
December 19-25	576.02
December 26-31	579.94

# **APPENDIX C**

## **CALIBRATION REPORTS**

AS FOUND CERTIFICATION  
 FORWARD FLOW DIRECTION  
**PASS**
**CLIENT DETAIL**

 CUSTOMER OCWA - Georgian Bay Hub  
 CONTACT Richard Eagle  
 Operations Manager

**EQUIPMENT DETAIL**

 [MUT] MANUFACTURER ABB  
 MODEL MagMaster  
 CONVERTER SERIAL NUMBER P/775713/1/4  
 FUSE PLC Panel - Fuse #FU1901

VER. BY - FM Paris Machuk

 Quality Management Standards Information -  
 Reference equipment and instrumentation used to  
 conduct this verification test is found in our AC-  
 QMS document at the time this test was  
 conducted.

 PLANT ID Royal Oaks WWTP  
 METER ID Final Effluent  
 FIT ID Final Effluent  
 CLIENT TAG OCWA# 95407  
 OTHER ORG# 1155  
 GPS COORDINATES N44 25.378 W079 46.664  
 ADDRESS 6 Budd's Mill Rd. Minesing  
 VERIFICATION DATE October 25, 2016  
 CAL. FREQUENCY Annual  
 CAL. DUE DATE October, 2017

**PROGRAMMING PARAMETERS**

 DIAMETER (DN) mm 100  
 F.S. FLOW - MAG LPS 88.6  
 F.S. RANGE - O/P LPS 40.000  
 TUBE CAL. FACTOR 1 1.12849

**FORWARD TOTALIZER INFORMATION**

 AS FOUND 67485510 LITER  
 AS LEFT 67488402 LITER  
 DIFFERENCE 2892 LITER

**TEST CRITERIA**

 AS FOUND CERTIFICATION TEST Yes  
 FORWARD FLOW DIRECTION Yes  
 ALLOWABLE [%] ERROR 5

**COMPONENTS TESTED**

 CONVERTER DISPLAY yes  
 mA OUTPUT yes  
 TOTALIZER yes  
 ACCURACY BASED ON [% o.r.] yes  
 ERROR DOCUMENTED IN THIS REPORT; BASED ON % o.r.

**FLOW TUBE SIMULATION**

		0.0	0.2	0.5	1.0	2.0	m/s
		0	2	5	10	20	% F.S. Flow
		0.0	4.4	11.1	22.2	44.3	% F.S. Range
REF. FLOW RATE		0.00	1.77	4.43	8.86	17.73	LPS
MUT [Reading]		0.00	1.75	4.41	8.82	17.65	LPS
MUT [Difference]		0.00	-0.02	-0.02	-0.04	-0.08	LPS
MUT [% Error]		n/a	-1.28	-0.49	-0.49	-0.43	%
mA OUTPUT		4.000	4.709	5.773	7.545	11.091	mA
MUT [Reading]	min.	4.000 mA	3.992	4.692	5.753	7.519	mA
MUT [Difference]	max.	20.000 mA	-0.008	-0.017	-0.020	-0.026	mA
MUT [% Error]			-0.20	-0.36	-0.34	-0.35	%
TOTALIZER - REF. FLOW RATE	Enter in Totalizer Test Velocity if Different (m/s)					2.0	
TOTALIZER [MUT]						17.726	LPS
TEST TIME						1959	LITER
CALC. TOTALIZER						110.96	SECONDS
ERROR						1966.906	LITER
						-0.40	%

**COMMENTS**

QUALITY MANAGEMENT STANDARDS INFO.		
[QMS] INFORMATION	IDENT.	ID #
[REFERENCE] FTS	ABBMM	1
PROCESS METER	DMM	3
ANALOG METER	AM	N/A
STOP WATCH	SW	Yes

RESULTS		
TEST	AVG % o.r.	PASS FAIL
DISPLAY	-0.67	PASS
mA OUTPUT	-0.34	PASS
TOTALIZER	-0.40	PASS

This report reflects the test results of the overall accuracy for the above flow converter using the specified manufacturers flow tube simulator to within the specified tolerance as identified within this report.

Western Office  
 2088 Jetstream Road  
 London, Ontario  
 N5V 3P6

Eastern Office  
 1602 Old Wooler Road  
 Wooler, Ontario  
 K0K 3M0

 AS FOUND CERTIFICATION  
 FORWARD FLOW DIRECTION  
**PASS**
**CLIENT DETAIL**

CUSTOMER OCWA - Georgian Bay Hub  
 CONTACT Richard Eagle  
 Operations Manager

**EQUIPMENT DETAIL**

[MUT] MANUFACTURER ABB  
 MODEL MagMaster  
 CONVERTER SERIAL NUMBER P/775713/1/3  
 FUSE PLC Panel - Fuse #FU1901

VER. BY - FM Paris Machuk

Quality Management Standards Information -  
 Reference equipment and instrumentation used to  
 conduct this verification test is found in our AC-  
 QMS document at the time this test was  
 conducted.

PLANT ID Royal Oaks WWTP  
 METER ID Raw Sewage Pump #1  
 FIT ID RSP-1  
 CLIENT TAG OCWA# 95408  
 OTHER ORG# 1155  
 GPS COORDINATES N44 25.378 W079 46.664  
 ADDRESS 6 Budd's Mill Rd. Minesing  
 VERIFICATION DATE October 25, 2016  
 CAL. FREQUENCY Annual  
 CAL. DUE DATE October, 2017

**PROGRAMMING PARAMETERS**

DIAMETER (DN)	mm	75
F.S. FLOW - MAG	LPS	41.7
F.S. RANGE - O/P	LPS	30.000
TUBE CAL. FACTOR	1	0.94429

**FORWARD TOTALIZER INFORMATION**

AS FOUND	17912107 LITER
AS LEFT	17925271 LITER
DIFFERENCE	13164 LITER

**TEST CRITERIA**

AS FOUND CERTIFICATION TEST	Yes
FORWARD FLOW DIRECTION	Yes
ALLOWABLE [%] ERROR	5

**COMPONENTS TESTED**

CONVERTER DISPLAY	yes
mA OUTPUT	yes
TOTALIZER	yes
ACCURACY BASED ON [% o.r.]	yes
ERROR DOCUMENTED IN THIS REPORT; BASED ON % o.r.	

**FLOW TUBE SIMULATION**

		0.0	0.5	1.0	2.0	5.0	m/s
		0	5	10	20	50	% F.S. Flow
		0.0	7.0	13.9	27.8	69.5	% F.S. Range
REF. FLOW RATE		0.00	2.09	4.17	8.34	20.86	LPS
MUT [Reading]		0.00	2.10	4.18	8.34	20.82	LPS
MUT [Difference]		0.00	0.01	0.01	0.00	-0.04	LPS
MUT [% Error]		n/a	0.68	0.20	-0.04	-0.19	%
mA OUTPUT		4.000	5.112	6.225	8.450	15.125	mA
MUT [Reading]	min.	4.000 mA	3.992	5.109	6.217	8.437	mA
MUT [Difference]	max.	20.000 mA	-0.008	-0.003	-0.008	-0.013	mA
MUT [% Error]			-0.20	-0.07	-0.13	-0.15	%
TOTALIZER - REF. FLOW RATE	Enter in Totalizer Test Velocity if Different (m/s)					5.0	5.0
TOTALIZER [MUT]						20.859	LPS
TEST TIME						4205	LITER
CALC. TOTALIZER						201.81	SECONDS
ERROR						4209.496	LITER
						-0.11	%

**COMMENTS**

Note: Full Scale output has changed from previous visit based on 2010 Calibrations F/S flow was 20.0 l/s now is 30.0 l/s. Checked SCADA HMI and flows were very close therefore believe this was a planned change.

QUALITY MANAGEMENT STANDARDS INFO.		
[QMS] INFORMATION	IDENT.	ID #
[REFERENCE] FTS	ABBMM	1
PROCESS METER	DMM	3
ANALOG METER	AM	N/A
STOP WATCH	SW	Yes

**RESULTS**

TEST	AVG % o.r.	PASS FAIL
DISPLAY	0.16	PASS
mA OUTPUT	-0.18	PASS
TOTALIZER	-0.11	PASS

This report reflects the test results of the overall accuracy for the above flow converter using the specified manufacturers flow tube simulator to within the specified tolerance as identified within this report.

AS FOUND CERTIFICATION  
 FORWARD FLOW DIRECTION  
**PASS**
**CLIENT DETAIL**

 CUSTOMER OCWA - Georgian Bay Hub  
 CONTACT Richard Eagle  
 Operations Manager

VER. BY - FM Paris Machuk

 Quality Management Standards Information -  
 Reference equipment and instrumentation used to  
 conduct this verification test is found in our AC-  
 QMS document at the time this test was  
 conducted.

**EQUIPMENT DETAIL**

 [MUT] MANUFACTURER ABB  
 MODEL MagMaster  
 CONVERTER SERIAL NUMBER P/775713/1/1  
 FUSE PLC Panel - Fuse #FU1901

 PLANT ID Royal Oaks WWTP  
 METER ID Raw Sewage Pump #2  
 FIT ID RSP-2  
 CLIENT TAG OCWA# 95409  
 OTHER ORG# 1155  
 GPS COORDINATES N44 25.378 W079 46.664  
 ADDRESS 6 Budd's Mill Rd. Minesing  
 VERIFICATION DATE October 25, 2016  
 CAL. FREQUENCY Annual  
 CAL. DUE DATE October, 2017

**PROGRAMMING PARAMETERS**

 DIAMETER (DN) mm 75  
 F.S. FLOW - MAG LPS 44.7  
 F.S. RANGE - O/P LPS 20.000  
 TUBE CAL. FACTOR 1 1.01219

**FORWARD TOTALIZER INFORMATION**

 AS FOUND 48297922 LITER  
 AS LEFT 48299261 LITER  
 DIFFERENCE 1339 LITER

**TEST CRITERIA**

 AS FOUND CERTIFICATION TEST Yes  
 FORWARD FLOW DIRECTION Yes  
 ALLOWABLE [%] ERROR 5

**COMPONENTS TESTED**

 CONVERTER DISPLAY yes  
 mA OUTPUT yes  
 TOTALIZER yes  
 ACCURACY BASED ON [% o.r.] yes  
 ERROR DOCUMENTED IN THIS REPORT; BASED ON % o.r.

**FLOW TUBE SIMULATION**

		0.0	0.2	0.5	1.0	2.0	m/s
		0	2	5	10	20	% F.S. Flow
		0.0	4.5	11.2	22.4	44.7	% F.S. Range
REF. FLOW RATE		0.00	0.89	2.24	4.47	8.94	LPS
MUT [Reading]		0.00	0.89	2.23	4.46	8.91	LPS
MUT [Difference]		0.00	0.00	-0.01	-0.01	-0.03	LPS
MUT [% Error]		n/a	-0.49	-0.26	-0.26	-0.37	%
mA OUTPUT		4.000	4.715	5.789	7.577	11.155	mA
MUT [Reading]	min.	4.000 mA	3.989	4.700	5.770	7.551	mA
MUT [Difference]	max.	20.000 mA	-0.011	-0.015	-0.019	-0.026	mA
MUT [% Error]			-0.28	-0.33	-0.32	-0.35	%
TOTALIZER - REF. FLOW RATE	Enter in Totalizer Test Velocity if Different (m/s)					2.0	8.943
TOTALIZER [MUT]							838
TEST TIME							93.97
CALC. TOTALIZER							840.414
ERROR							-0.29

**COMMENTS**

QUALITY MANAGEMENT STANDARDS INFO.		
[QMS] INFORMATION	IDENT.	ID #
[REFERENCE] FTS	ABBMM	1
PROCESS METER	DMM	3
ANALOG METER	AM	N/A
STOP WATCH	SW	Yes

RESULTS		
TEST	AVG % o.r.	PASS FAIL
DISPLAY	-0.35	PASS
mA OUTPUT	-0.35	PASS
TOTALIZER	-0.29	PASS

This report reflects the test results of the overall accuracy for the above flow converter using the specified manufacturers flow tube simulator to within the specified tolerance as identified within this report.

AS FOUND CERTIFICATION  
 FORWARD FLOW DIRECTION  
**PASS**
**CLIENT DETAIL**

 CUSTOMER OCWA - Georgian Bay Hub  
 CONTACT Richard Eagle  
 Operations Manager

**EQUIPMENT DETAIL**

 [MUT] MANUFACTURER ABB  
 MODEL MagMaster  
 CONVERTER SERIAL NUMBER P/775713/1/2  
 FUSE PLC Panel - Fuse #FU1901

VER. BY - FM Paris Machuk

 Quality Management Standards Information -  
 Reference equipment and instrumentation used to  
 conduct this verification test is found in our AC-  
 QMS document at the time this test was  
 conducted.

 PLANT ID Royal Oaks WWTP  
 METER ID Raw Sewage Pump #3  
 FIT ID RSP-3  
 CLIENT TAG OCWA# 95410  
 OTHER ORG# 1155  
 GPS COORDINATES N44 25.378 W079 46.664  
 ADDRESS 6 Budd's Mill Rd. Minesing  
 VERIFICATION DATE October 25, 2016  
 CAL. FREQUENCY Annual  
 CAL. DUE DATE October, 2017

**PROGRAMMING PARAMETERS**

 DIAMETER (DN) mm 75  
 F.S. FLOW - MAG LPS 41.3  
 F.S. RANGE - O/P LPS 20.000  
 TUBE CAL. FACTOR 1 0.93490

**FORWARD TOTALIZER INFORMATION**

 AS FOUND 29873706 LITER  
 AS LEFT 29875358 LITER  
 DIFFERENCE 1652 LITER

**TEST CRITERIA**

 AS FOUND CERTIFICATION TEST Yes  
 FORWARD FLOW DIRECTION Yes  
 ALLOWABLE [%] ERROR 5

**COMPONENTS TESTED**

 CONVERTER DISPLAY yes  
 mA OUTPUT yes  
 TOTALIZER yes  
 ACCURACY BASED ON [% o.r.] yes  
 ERROR DOCUMENTED IN THIS REPORT; BASED ON % o.r.

**FLOW TUBE SIMULATION**

		0.0	0.2	0.5	1.0	2.0	m/s
		0	2	5	10	20	% F.S. Flow
		0.0	4.1	10.3	20.7	41.3	% F.S. Range
REF. FLOW RATE		0.00	0.83	2.07	4.13	8.26	LPS
MUT [Reading]		0.00	0.83	2.06	4.13	8.25	LPS
MUT [Difference]		0.00	0.00	-0.01	0.00	-0.01	LPS
MUT [% Error]		n/a	0.48	-0.25	-0.01	-0.13	%
mA OUTPUT		4.000	4.661	5.652	7.304	10.608	mA
MUT [Reading]	min.	4.000 mA	3.995	4.661	5.650	7.301	mA
MUT [Difference]	max.	20.000 mA	-0.005	0.000	-0.002	-0.003	mA
MUT [% Error]			-0.12	0.00	-0.04	-0.04	%
TOTALIZER - REF. FLOW RATE	Enter in Totalizer Test Velocity if Different (m/s)					2.0	
TOTALIZER [MUT]						8.261	LPS
TEST TIME						1097	LITER
CALC. TOTALIZER						132.51	SECONDS
ERROR						1094.601	LITER
						0.22	%

**COMMENTS**

QUALITY MANAGEMENT STANDARDS INFO.		
[QMS] INFORMATION	IDENT.	ID #
[REFERENCE] FTS	ABBMM	1
PROCESS METER	DMM	3
ANALOG METER	AM	N/A
STOP WATCH	SW	Yes

RESULTS		
TEST	AVG % o.r.	PASS FAIL
DISPLAY	0.02	PASS
mA OUTPUT	-0.05	PASS
TOTALIZER	0.22	PASS

This report reflects the test results of the overall accuracy for the above flow converter using the specified manufacturers flow tube simulator to within the specified tolerance as identified within this report.

# **APPENDIX D**

## **GROUNDWATER REPORT**

**PREPARED BY GOLDER ASSOCIATES LTD.**



March 2017

# REPORT



## ENVIRONMENTAL MONITORING REPORT

# Snow Valley Landings Waste Water Treatment Plant

**Submitted to:**

Ontario Clean Water Agency  
Attention: Mr. R. Eagle  
Georgian Highlands Regional Hub,  
30 Woodland Drive  
Wasaga Beach, ON L9V 2V4

**Report Number:** 07-1170-0005

**Distribution:**

2 copies - Ontario Clean Water Agency  
1 copy - 453211 Ontario Limited  
1 copy - Golder Associates Ltd.



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## 1.0 INTRODUCTION

Golder Associates Ltd. (Golder) has been retained by 453211 Ontario Limited (Owner) to implement the Environmental Monitoring Program (EMP) for the Snow Valley Landings subdivision and Black Creek Estates subdivision. The Miller, Patterson, Snow Valley Landings (Landings) and Black Creek Estates (Black Creek) development areas are serviced by the Royal Oaks Waste Water Treatment Plant (WWTP) located at the Landings subdivision. Domestic waste water from the Landings and Black Creek subdivisions is pumped to the Royal Oaks Waste Water Treatment Plant (WWTP) then treated. Effluent is pumped back for discharge into disposal beds (Certificate amendment 8269-84CLJ8) located on each subdivision. Golder has conducted ongoing groundwater quality and surface water quality monitoring requirements beginning May 2008 as specified in the EMP for the Landings subdivision located on Lots 12 and 13, Concession 7.

Monitoring locations were added to the EMP in 2012 in order to establish base-line water quality at Black Creek. The development is currently under construction and discharge of treated effluent at that Site commenced the last week of December 2015. During the 2016 monitoring period 80% buildout was reached at Black Creek.

The subdivisions are serviced with municipal water supplied by the Snow Valley municipal water supply wells that are located approximately 1,100 m to the south west of the WWTP. Domestic waste is treated at the WWTP and the treated effluent is pumped to beds located within the respective boundaries of the serviced subdivisions (Figure 1). The WWTP is operated by the Ontario Clean Water Agency (OCWA), Georgian Bay Hub.

### 1.1 Background

The construction of homes at the Landings began in the spring of 2009 and for about one year sewage generated on the Site was trucked to the Snow Valley Resort sewage treatment plant located approximately 1,700 m west. The WWTP began treating the sewage effluent in February 2010. Disposal of treated effluent into the Landings bed began concurrent with WWTP start-up in February 2010 (Figure 2).

Golder has been conducting groundwater quality monitoring to meet EMP Conditions 35, 36 and 40 of the subdivision agreement and Condition 9 (d) of Certificate of Approval 8269-84CLJ8 relating to monitoring of subsurface discharge of treated effluent. The water quality monitoring is to continue for two years after 80% completion and occupancy of residential dwellings in the subdivision(s). The requirements for groundwater and surface water quality monitoring have been met at the Landings locations; however, annual monitoring at the Landings locations continues for ongoing development review and incorporation with CofA reporting on the WWTP performance and Black Creek EMP for future upgradient proposed development.

Monitoring at Black Creek was semi-annual 2013 to December 2014. The sampling frequency was increased to quarterly following the commencement of disposal of treated effluent in the Black Creek beds which began in December 2014, and will continue through two years following 80% occupancy. With 80% occupancy at Black Creek reached in June 2016, quarterly monitoring is to continue through to June 2018 at the Black Creek monitoring locations.

## 2.0 ENVIRONMENTAL MONITORING PLAN

Site monitoring, as per the tables below, is based on terms of the subdivision agreement items listed above, and previous Certificate of Approval requirements. The requirements for groundwater and surface water sampling were removed from the Amended Certificate of Approval No. 8269-84CLJ8. The EMP is now governed by the subdivision agreement and review of monitoring by the municipality. In 2015 the data collected to that date was



## 2016 ENVIRONMENTAL MONITORING REPORT

forwarded to the Nottawasaga Valley Conservation Authority for their records and subsequent data are made available to them upon request.

**Table Groundwater Monitoring**

Locations	Landings Wells OW1, OW2 and OW3	Black Creek Wells BH5#2, and BH6
Frequency	Annual	Quarterly in 2016
Parameters	Total Phosphorous, Total Kjeldahl Nitrogen, Total Ammonia, nitrate, nitrite	Total Phosphorous, Total Kjeldahl Nitrogen, Total Ammonia, nitrate, nitrite

**Table Surface Water Monitoring**

Locations	Landings SW1 and SW2	Black Creek BC-SW1, and BC-SW2
Frequency	Annual	Quarterly in 2016*
Parameters	Total Phosphorous, Total Kjeldahl Nitrogen, Total Ammonia, nitrate, nitrite	Total Phosphorous, Total Kjeldahl Nitrogen, Total Ammonia, nitrate, nitrite

\*Locations listed above are illustrated on Figure 2. BC-SW1 inaccessible December 2016.

The subdivision agreement requires semi-annual monitoring be completed at Black Creek prior to discharge to the beds in order to establish background quality. This monitoring was met at the Landings in 2008 and 2009, and completed 2013 and 2014 at Black Creek.

### 2.1 2016 Water Quality Monitoring

Groundwater quality monitoring at the Landings was conducted at three standpipes constructed in the upper aquifer (water table). They are identified as OW-1, OW-2 and OW-3. The location of these wells is shown on Figure 2 and they are located on, or adjacent to, the Landings subdivision. The annual water quality monitoring was conducted on July 26, 2016. The vicinity of OW1 was avoided noting an access issue, returning to sample that location the 25<sup>th</sup> of August. The sampling at OW3 was complicated by more than usual silting / low water production during purging, and only a partial (non-filtered) sample could be obtained. A historical summary of the testing results is contained in Table 1, and plotted on Graph B-1.

Groundwater quality monitoring at Black Creek was conducted at two standpipes constructed in the upper aquifer. They are identified as BH5#2, and BH6. The location of these wells is shown on Figure 2 and they are sited on, or adjacent to, the Black Creek subdivision. The water quality monitoring was conducted March, July, October, and December, 2016. A summary of the testing results is contained in Table 2, and plotted Graph B-2.

Three water volumes were purged from each of the observation wells using dedicated Waterra tubing and foot-valves. The water samples were packed on ice and sent by overnight courier to Caduceon Environmental Testing Laboratories in Nepean for analysis. The lab reports from monitoring in 2016 are appended in this report. Water levels are measured and a historical tabulation is appended in Table 3. No major changes in trend were observed in water levels.

### 2.2 Surface Water Quality Monitoring

Surface water quality monitoring at the Landings was conducted at SW1 and SW2 which are located in the Landings subdivision. Annual water quality monitoring was conducted on July 26, 2016. Both surface water monitoring locations are located on the unnamed stream that marks the western boundary of the Landings



(Figure 2). A summary of the testing results for 2016 and previous years is contained in Table 1, and indicator parameter concentrations illustrated on Graph B-3.

Surface water quality monitoring was conducted at BC-SW1 and BC-SW2, located upstream and downstream of the Black Creek subdivision on Black Creek. The water quality monitoring was conducted March, July, October, and December, 2016. Comparison of upgradient vs downgradient concentration is plotted for both streams shown on Graph B-4.

The upgradient stream location BC-SW1 is normally accessed adjacent to the intersection of Wilson Road and Snow Valley Road. Due to road re-alignment construction and culvert replacement, the access area was used as a compound for construction equipment and closed to public access in fall 2016, and was not sampled that round. Access at other routes is unsafe due to steep slopes and parking on the roadside is snow covered in winter months. This location will be assessed for access, and frequency of sampling limited to summer / fall season following completion of road construction. Both surface water monitoring locations are located on the eponymous Black Creek that marks the eastern boundary of the subdivision (Figure 2). A summary of the testing results for 2016 and previous years is contained in Table 2.

The surface water stations at each subdivision are located with a monitor to the north of Snow Valley Road to act as an upgradient, background water quality monitoring location and a second station located at the northern, downgradient limit of the subdivision. The water samples were packed on ice and sent by overnight courier to Caduceon Environmental Testing Laboratories in Nepean for analysis. Individual lab reports from monitoring in 2016 are appended in this report.

### 2.3 Sewage Treatment Plant Monitoring

Ontario Clean Water Agency (OCWA) monitors several water quality parameters on a weekly basis at the Landings WWTP. We have prepared a graph of the monthly nitrate, nitrite, ammonia and phosphorus results (Figure 3).

## 3.0 WATER QUALITY MONITORING RESULTS

### 3.1 Groundwater

The monitor locations and distance from the respective bed(s) are listed below. The groundwater flow velocity is estimated using the Darcy equation. A measured hydraulic gradient, estimated hydraulic conductivity, estimated effective porosity, and measured width and thickness of aquifer were used to estimate a groundwater velocity of between 160 and 400 m/year across the Sites from south to north.

It is expected that groundwater flowing through the effluent disposal beds would pass all of the groundwater monitoring locations in one to four years. Nitrate concentrations at the Landings locations thus reflect background concentration or change due to both to sewage disposal as well as residential land use impacts. Start-up of the beds at Black Creek began the last week of December 2014.

It is noted the nitrate concentration at monitor BH5#2 (Graph B-2) increased to 7.6 mg/L in December 2014 from a pre-development concentration of 4 mg/L. It was rising again 6.2 mg/L December 2015 peaking to 9.3 mg/L in March 2016. It declined markedly the next three rounds of sampling to near background, and remained low as at December 2016. The increase is associated with establishing the lawn at homes upgradient. Similar seasonal increases albeit at lower concentrations was observed in 2016 at BH6, and source confirmed



## 2016 ENVIRONMENTAL MONITORING REPORT

(communication with developer) to seasonal fall fertilizer application corresponding to the increase noted. Nitrate concentrations have been observed to decline and increases damped once the lawns are well established and or the plant effluent discharge returns to normal operational concentration. The elevated phosphorous concentration in the groundwater sampled October 2016 at both locations is traced to filtered samples placed in a sample container with improper preservative.

### Summary of Groundwater Quality Monitoring Results

Location	Distance From Bed	2016 Nitrate Concentration (mg/L)	Historical High Nitrate Concentration (mg/L)
Landings OW-1	570 m	0.9	6.3 (Dec 2010)
Landings OW-2	480 m	0.8	1.3 (Jun 2009)
Landings OW-3	295 m	0.2	0.7 (Mar 2010)
Black Creek BH5#2	520 m	9.3; 5.1; 3.5; 3.9	9.3 (Mar 2016)
Black Creek BH6	355 m	1.4; 0.8; 2.2; 5.4	5.4 (Dec 2016)

Black Creek 2015 analysis March, July, October, December

### 3.2 Surface Water

Surface water is considered to reflect background conditions at both developments, particularly SW1 and BC-SW1 which are located adjacent to and upstream of the developments (Figure 2).

Phosphorus results for both upstream and downstream monitors at both Sites indicate that stream water quality at the respective locations varies in concert and no increase between upstream and downstream stations can be identified (Graph B-4). This suggests that phosphorus is from upgradient sources. Total Phosphorous samples were within Provincial Water Quality Objective (PWQO) at the Landings and Black Creek locations in 2016 for seven of eight samples collected (similar to meeting in nine of ten samples in 2015). Total Phosphorous was exceeded 0.38 mg/L at BC-SW2 in October 2016; however this concentration is deemed to be a preservative error similar to that observed in the groundwater samples collected the same date.

### Summary of Surface Water Quality Monitoring Results

Location	Spatial Relationship With Bed	Minimum Phosphorous Concentration (mg/L)	Maximum Phosphorous Concentration (mg/L)
Landings SW1	Upgradient	<0.01 (Dec 2015)	0.06 (Mar 2011)
Landings SW2	Downgradient	<0.01 (Dec 2015)	0.16 (Dec 2012)
Black Creek SW1	Upgradient	<0.01 (Dec 2015)	0.04 (Dec 2013)
Black Creek SW2	Downgradient	<0.01 (Dec 2015)	0.04 (Dec 2015)*

\*Minimum concentration shown at last achieved if historically matched; Concentration of 0.38 mg/L at BC-SW2 October 2016 deemed a sampling or preservative error.

Surface water quality monitoring at the Landings upstream station (SW1, upper plot Graph B-3) indicates nitrate concentrations ranging from 4.8 to 7.3 mg/L, with an average of 5.9 mg/L. The 2016 concentration reached a peak 7.3 mg/L, continuing a cyclical historical trend of rising peaks. Surface water monitoring at SW2 (lower plot



Graph B-3) indicates nitrate concentrations ranging from 2.7 to 3.6 mg/L, with an average of 3.2 mg/L. The 2016 concentration was 3.2 mg/L.

Trend and comparison of stream water quality between stations SW1 and SW2 is shown on Graph B-4 lower plot. The nitrate concentration at SW1 is approximately 1 to 2 mg/L higher than 2008 with increasing peaks, while the nitrate concentration at SW2 remains relatively consistent to within or just above the background range of 2.8 to 3.3 mg/L pre 2011 (3.2 mg/L in 2016). The nitrate concentration at SW1 is consistently higher than that at SW2. The stream water quality is therefore concluded to be impacted by land use activities upgradient from the Site, and it is further noted the treated effluent average nitrate concentration is lower than surface water background nitrate concentration leaving the Site.

Trend and comparison of stream water quality between stations BC-SW1 and BC-SW2 is shown on Graph B-4 upper plot. Surface water quality monitoring at the Black Creek BC-SW1 station, indicates nitrate concentrations ranging from 18.9 to 13.2 mg/L. Surface water monitoring at BC-SW2 indicates nitrate concentrations ranging 4.7 to 11.3 mg/L. The nitrate concentrations at the Black Creek stations have been high historically (Dixon 1998, Dixon 2001). Hydrogeological studies (Golder 2011) also conclude groundwater recharge in the vicinity of the bed disposal area percolates downward and remains in a lower confined portion of the upper aquifer leaving the Site. The concentration of nitrate monitored through 2014 at both BC-SW1 and BC-SW2 was noted to be slowly declining from initial highs reported at commencement of the monitoring program at these locations in 2013. The concentrations monitored 2015 reversed the trend noted through 2014, since rising and then levelling in 2016 to return similar to the initial monitoring concentrations.

Ammonia concentration was non-detect at all locations in 2016, with no potential of un-ionized ammonia exceedance. Concentrations of parameters monitored in 2016 remain at background levels with similar exceedances (one Total Phosphorous exceedance noted each year) as with previous reporting periods.

### 3.3 Landings Sewage Treatment Plant Monitoring

The monthly average nitrogen species contained in the treated effluent indicates that nitrogen removal is effective on an overall annual average basis (Figure 3). Occasional monthly exceedance of total nitrogen has been observed, notably February and March 2012, March and April 2014, January 2015, and November 2016 primarily due to high ammonia though the event in 2016 was due high Nitrate. Ammonia is expected to oxidize to nitrate at one to one ratio in the bed.

The treatment of nitrate is within the requirements of the Reasonable Use Criteria set out for the Snow Valley subdivisions serviced by the WWTP, including the subject Landings and Black Creek, calculated over an average annual basis. Provided the WWTP continues to treat effluent to average annual concentration within the limits established in the Certificate of Approval, protection of the natural environment is expected to be maintained to the Reasonable Use Criteria.



### 4.0 CONCLUSIONS

- 1) The Ministry of the Environment has removed requirements for groundwater and surface water sampling from the Amended Certificate of Approval No. 8269-84CLJ8. The environmental monitoring is being continued to meet terms of the sub-division agreement.
- 2) Surface water quality sampling conducted at the Landings Site (SW1 and SW2) between 2008 and 2016 indicates that there has not been an increase in nitrate concentrations in the adjacent stream due to land use activities on the Landings subdivision. The nitrate concentrations are lower at SW2, compared to SW1. Annual sampling at the Landings groundwater and surface water locations are being completed and reported on a voluntary basis, water quality analysed continuing similar to baseline.
- 3) Nitrate and phosphorus concentrations at stream locations upgradient of the Sites are generally at higher or equal to those monitored at the downstream Sites.
- 4) The nitrate concentrations observed in Black Creek at the upstream side Black Creek Estates subdivision (BCSW1) are elevated. The nitrate concentrations at the downstream side of the Site average less and remain approximate to background concentration. Elevated upstream nitrate concentrations are therefore related to agricultural land use within the Black Creek catchment area. The recharge bed began operation in December 2014 and to date no impacts to surface water associated with operation have been observed.
- 5) The monitoring program conducted between 2008 and 2016 indicates that the groundwater near the Landings subdivision is at or near background conditions for nitrate and phosphorus and there is no discernable impact of the disposal of treated effluent.
- 6) The treatment of inorganic nitrogen species (nitrate, nitrite and ammonia) averaged 4.6 mg/L in 2016. The WWTP met its 7.0 mg/L effluent limit for total organic nitrogen as specified in Certificate of Approval No. 8269-84CLJ8 for the 2016 operations.
- 7) The Black Creek subdivision reached 80% buildout in June 2016. Monitoring by the subdivision agreement is to continue quarterly through June 2018 (two years following 80% buildout). The location access at BC-SW1 has been reconstructed due to road realignment, and sampling at that location may be limited to seasonal access.



## 2016 ENVIRONMENTAL MONITORING REPORT

### Report Signature Page

GOLDER ASSOCIATES LTD.

Jim Regier, C.E.T.  
Senior Technologist

John Easton, M.Sc., P.Geo.  
Senior Hydrogeologist, Associate

JPR/JAE/plc

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## 2016 ENVIRONMENTAL MONITORING REPORT

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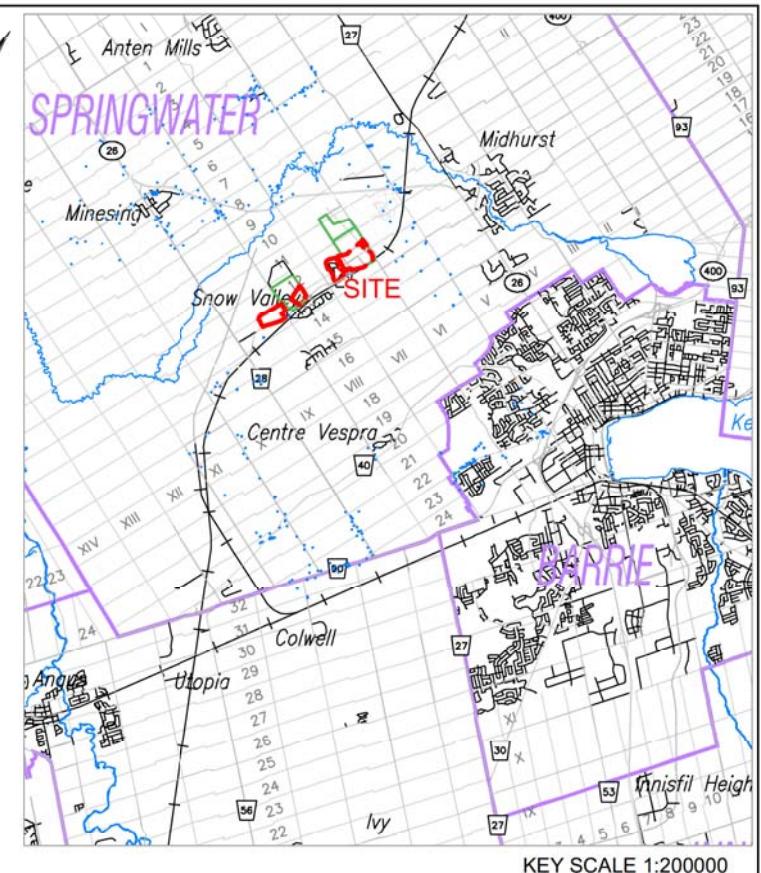
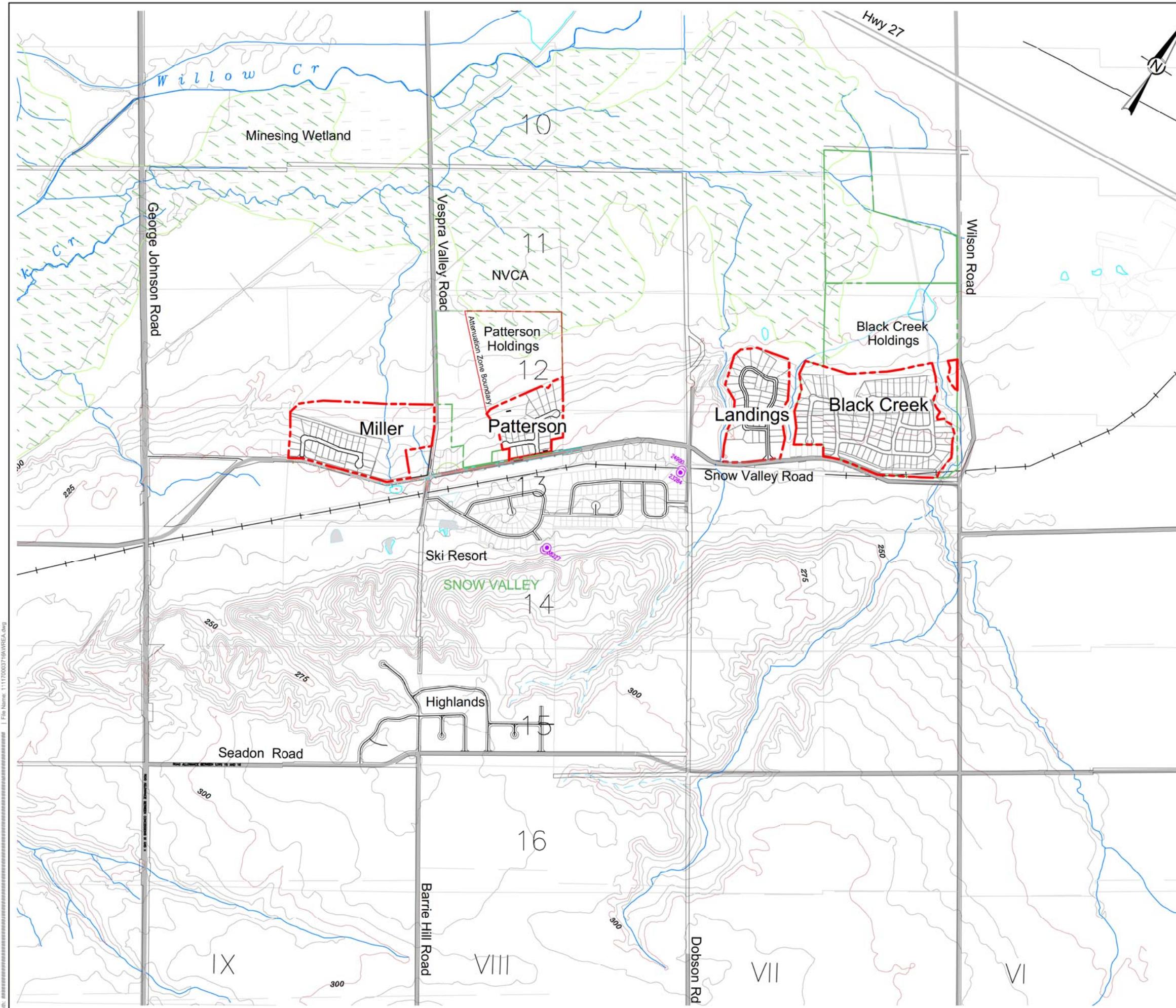
### 5.0 REFERENCES

- DHL 1998. Dixon Hydrogeology Limited. Snow Valley Secondary Plan, Township of Springwater. February 1998.
- DHL 2001. Dixon Hydrogeology Limited. Snow Valley Secondary Plan, Township of Springwater, Addendum to the Hydrogeological Study. March 2001
- Golder 2011. Environmental Monitoring Report. Snow Valley Landings Waste Water Treatment Plant. Golder 2012.
- Golder 2012. Environmental Monitoring Report. Snow Valley Landings Waste Water Treatment Plant. Golder 2013.
- Golder 2013. Environmental Monitoring Report. Snow Valley Landings Waste Water Treatment Plant. Golder 2014.
- Golder 2014. Environmental Monitoring Report. Snow Valley Landings Waste Water Treatment Plant. Golder 2015.
- Golder 2015. Environmental Monitoring Report. Snow Valley Landings Waste Water Treatment Plant. Golder 2016.



## 2016 ENVIRONMENTAL MONITORING REPORT

# FIGURES



**LEGEND:**

- Boundary of Serviced Subdivisions
- Municipal / Public Water Supply

0 100 250 500 1000  
SCALE 1:20000  
Plotted Tabloid 11x17 metres

Projection UTM NAD 83 Zone 17  
OBM Contours 5 metres interval

CLIENT  
SNOW VALLEY LANDINGS  
SNOW VALLEY BLACK CREEK ESTATES

PROJECT  
ENVIRONMENTAL MONITORING PLAN  
2016 ANNUAL MONITORING REPORT

TITLE  
**SNOW VALLEY COMMUNITY**

CONSULTANT YYYY-MM-DD 2017-03-23

PREPARED JPR

DESIGN

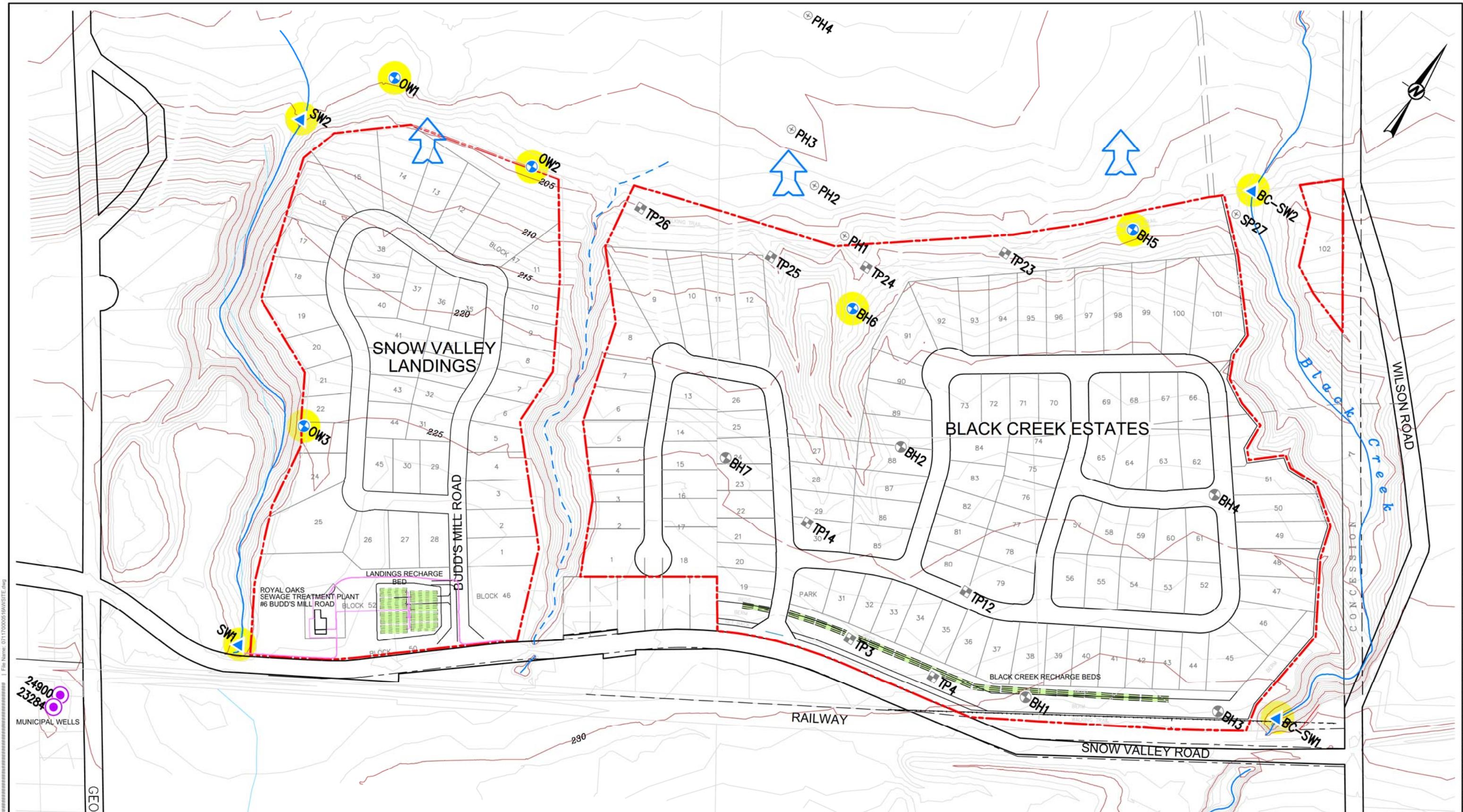
REVIEW

APPROVED

PROJECT No. 07-1170-0005 Phase 2015

Rev. 16 Figure 1





NOTES

1. BLACK CREEK DRAFT PLAN LAYOUT, P. WINTER, SEPT 2011
2. LANDINGS DRAFT PLAN & WTPP LAYOUT, TSH, SEPT 2008

0 25 50 100 250  
metres  
SCALE 1:4000  
Plotted Tabloid 11x17

CLIENT  
SNOW VALLEY LANDINGS  
SNOW VALLEY BLACK CREEK ESTATES

CONSULTANT

YYYY-MM-DD 2017-03-23

PREPARED JPR

DESIGN

REVIEW

APPROVED

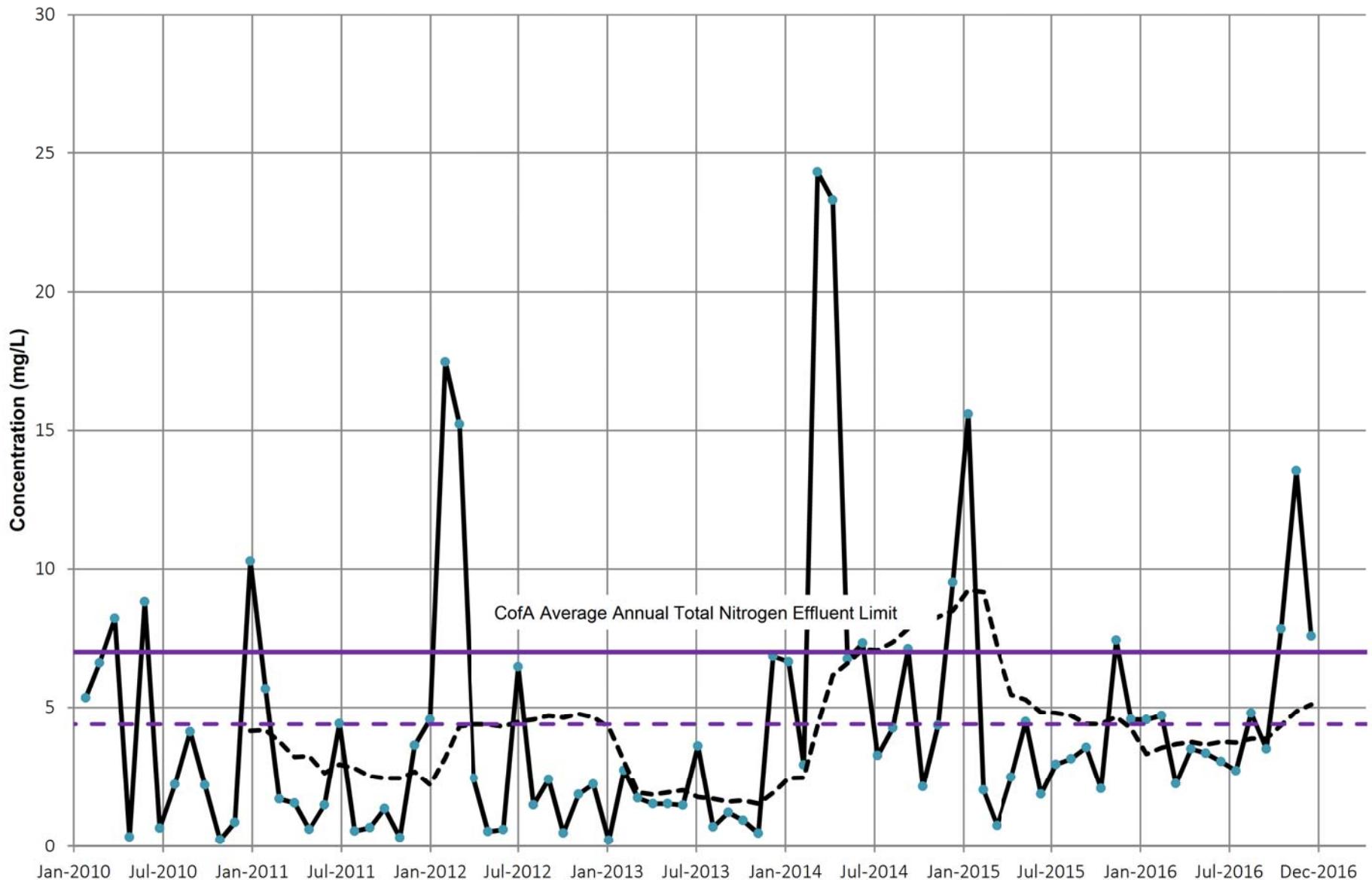
PROJECT  
ENVIRONMENTAL MONITORING PLAN  
2016 ANNUAL MONITORING REPORT

TITLE

**SAMPLE LOCATION MAP**

PROJECT No. 07-1170-0005 PHASE 2015 Rev. IA





- Total Inorganic Nitrogen
- - - 12 Month Rolling Average
- - - Historical Avg Total Nitrogen



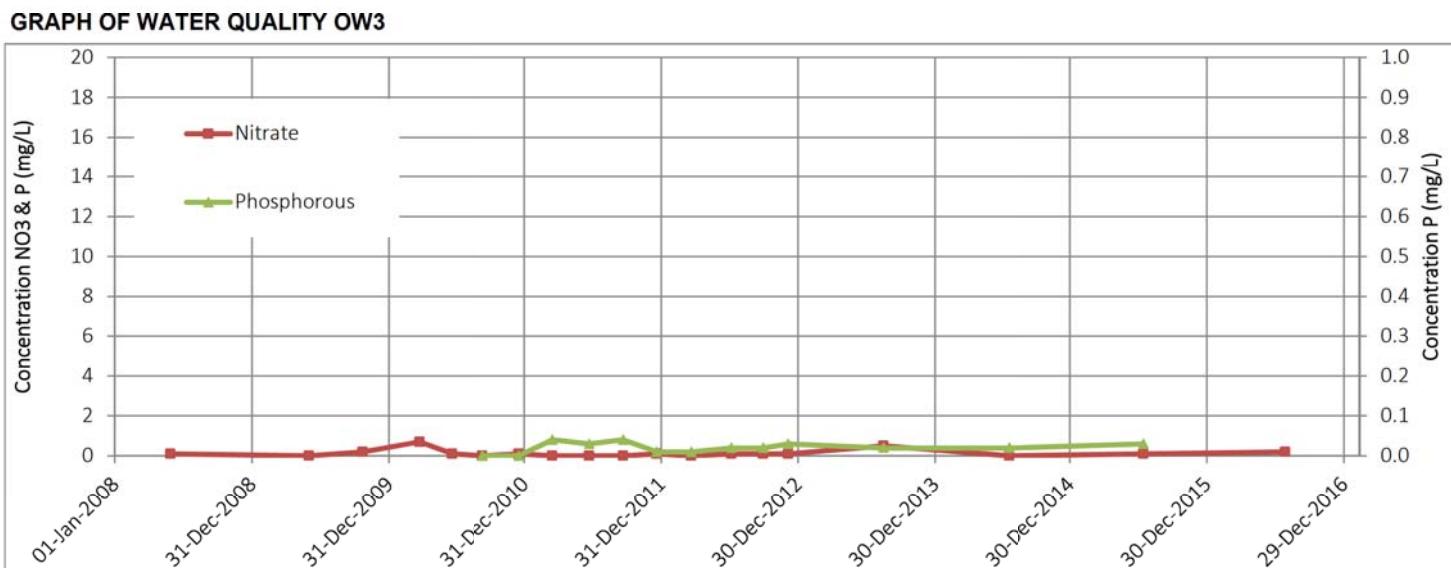
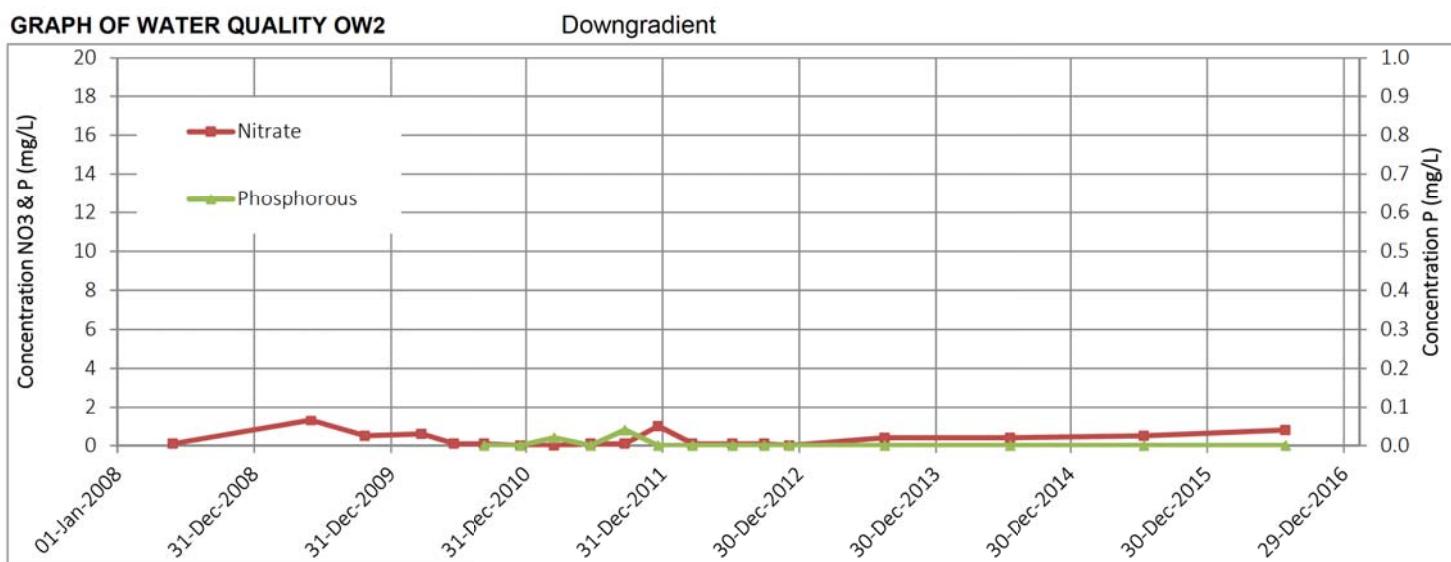
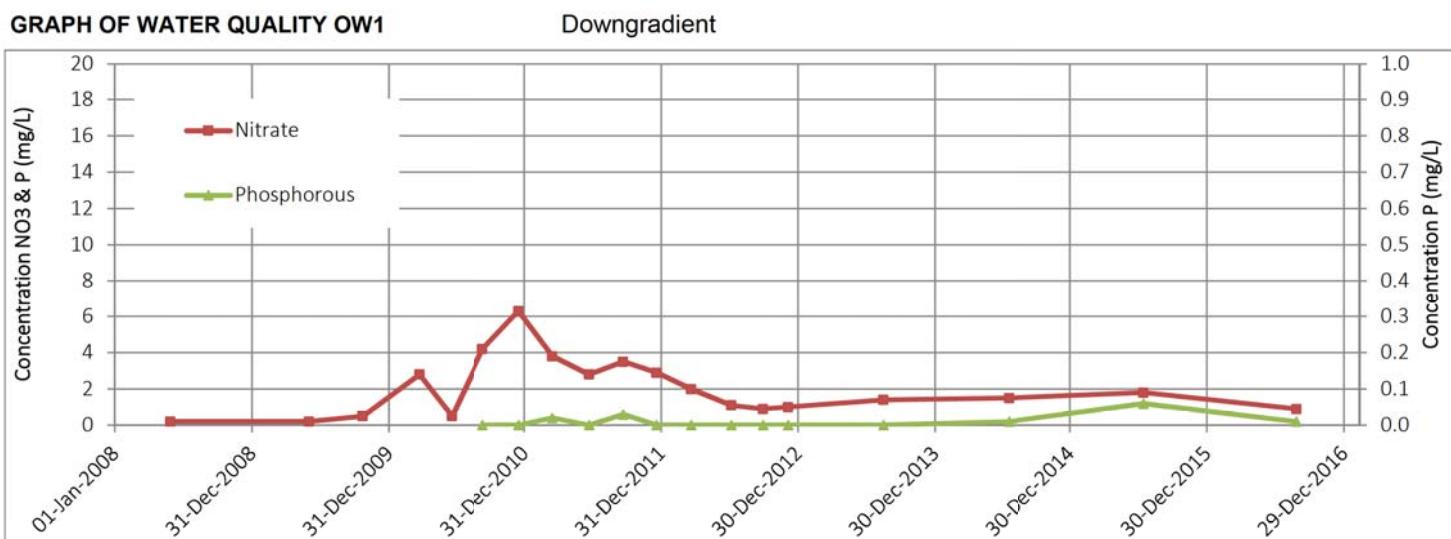
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PROJECT No. 07-1170-0005

SCALE: NTS  
DATE: 20-Mar-17  
CAD: JAE  
CHECK: JPR  
REVIEW: JAE

EFFLUENT QUALITY MONITORING  
LANDINGS SEWAGE TREATMENT PLANT  
SNOW VALLEY LANDINGS  
ANNUAL MONITORING REPORT

FIGURE No.  
3

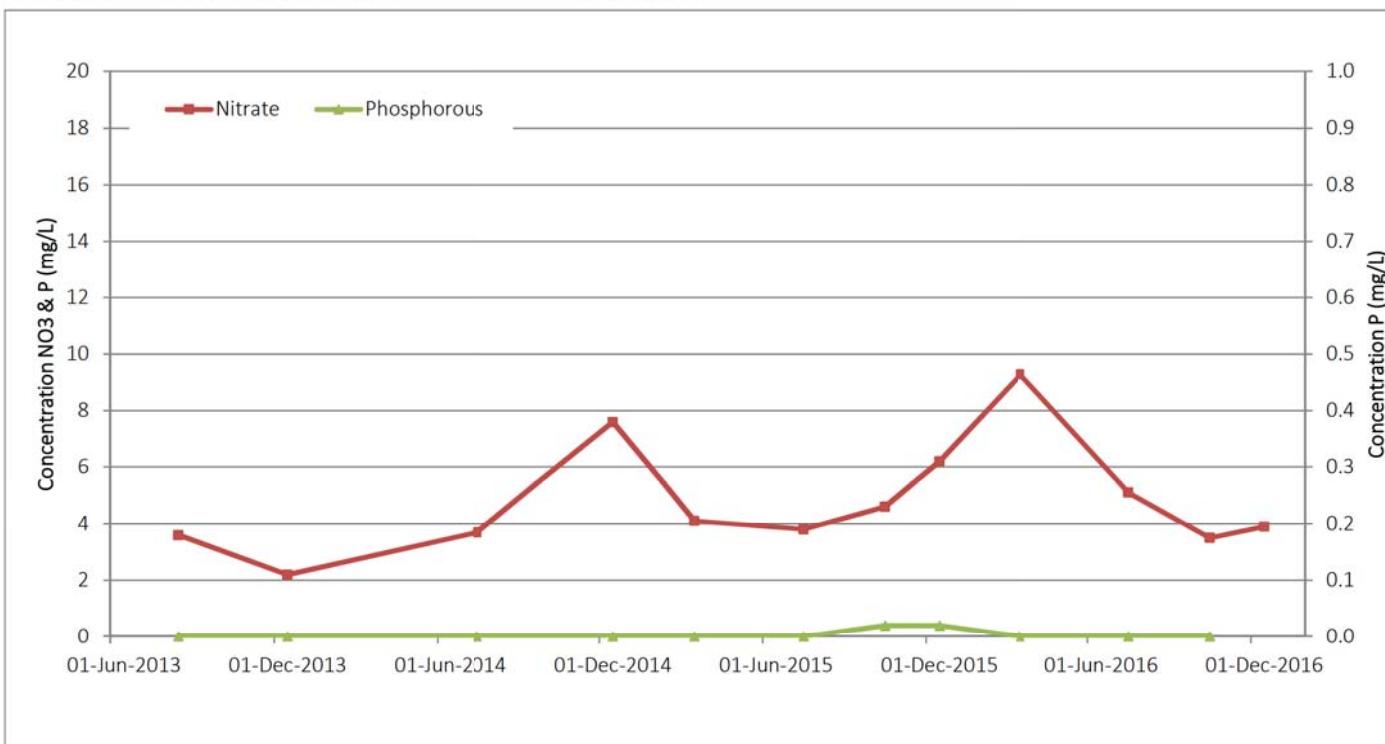
## Graph of Ground Water Quality Monitoring - Landings



## Graph of Ground Water Quality Monitoring - Black Creek Estates

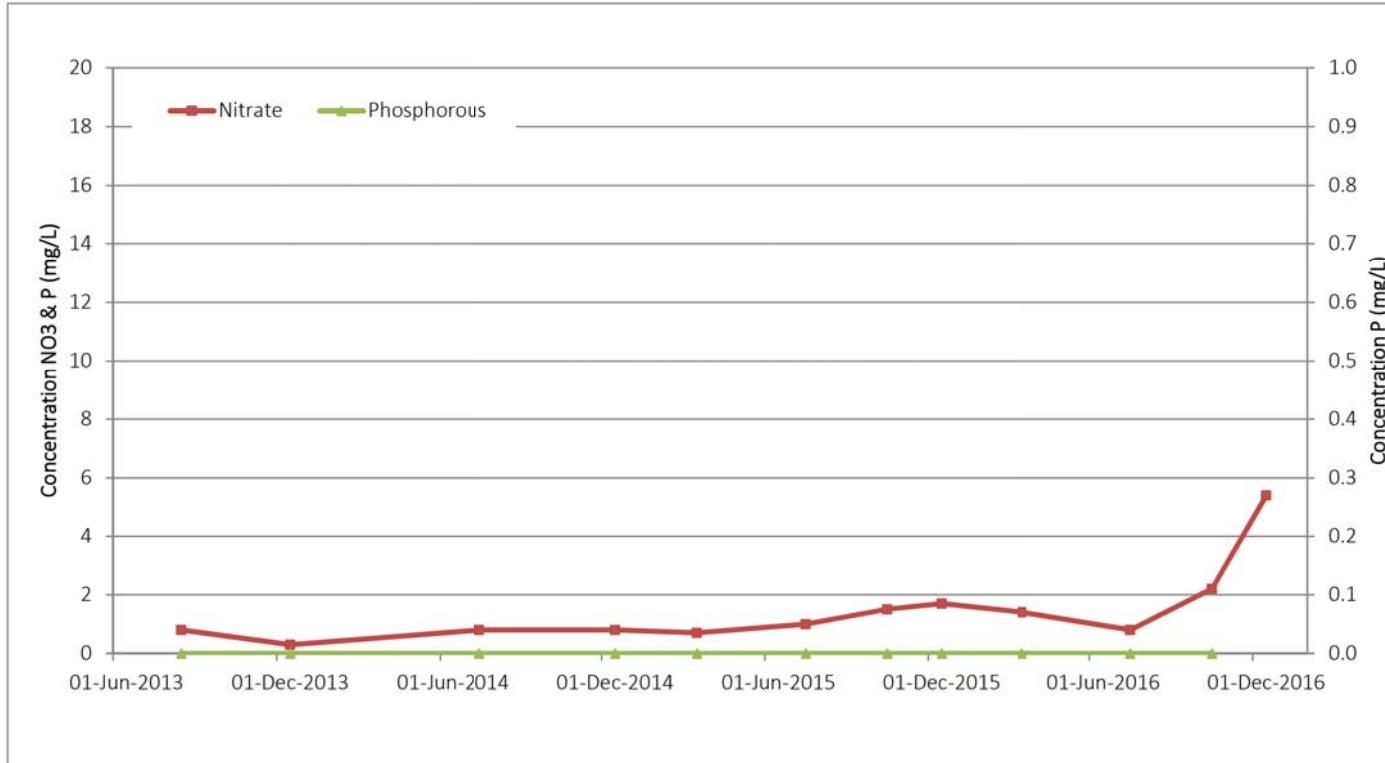
GRAPH OF WATER QUALITY BH5#2

Dowgradient



GRAPH OF WATER QUALITY BH6

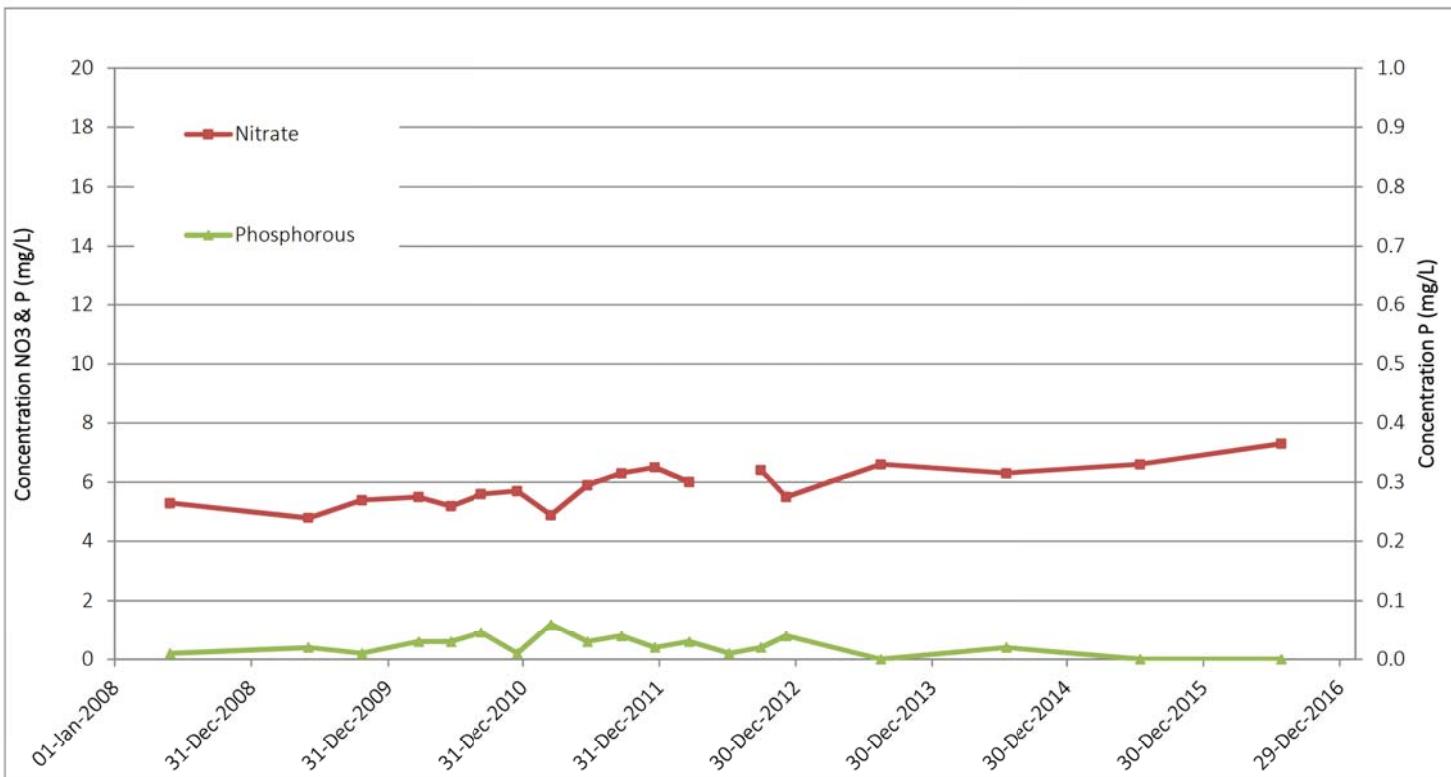
Dowgradient



## Graph of Surface Water Quality Monitoring - Landings

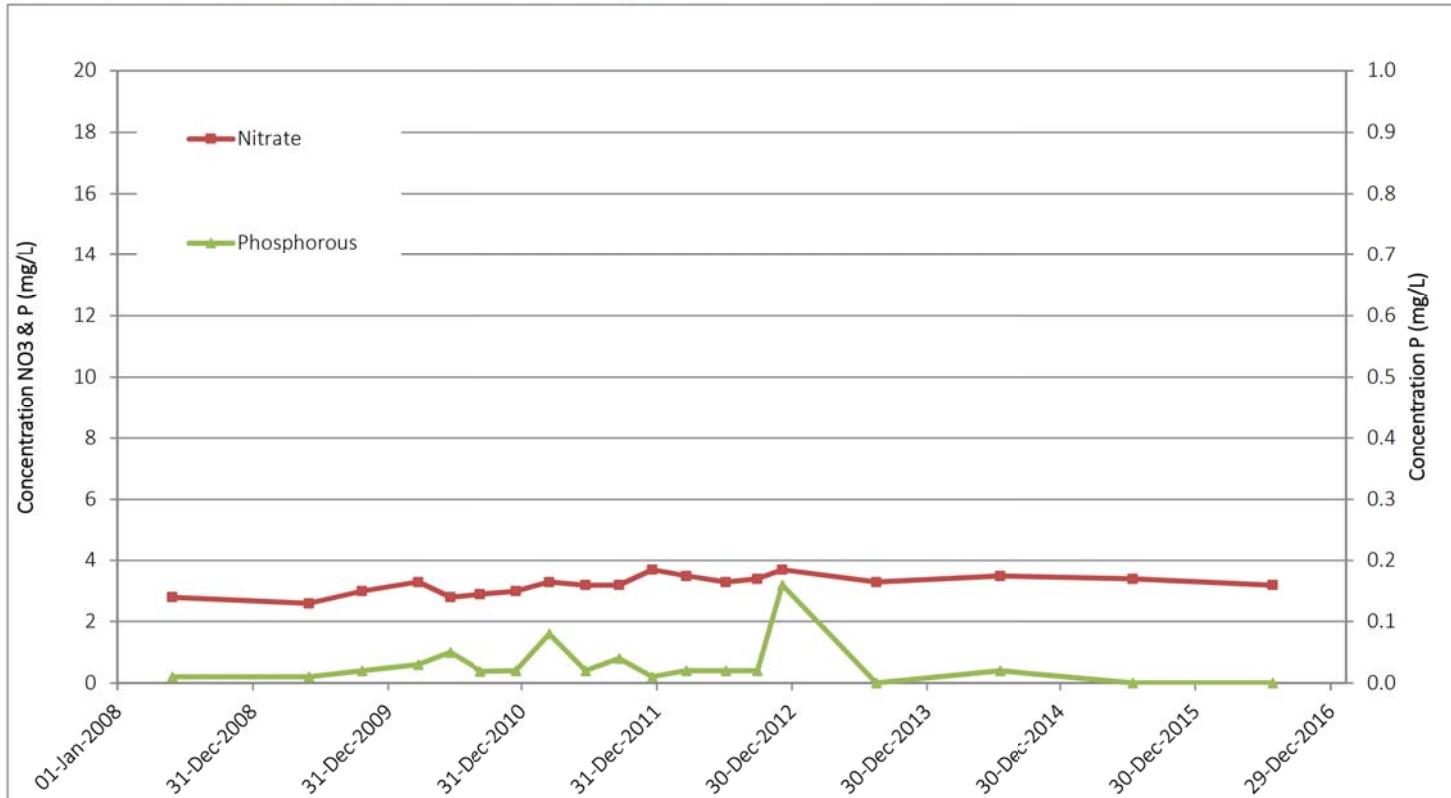
GRAPH OF WATER QUALITY SVL-SW1

Upgradient



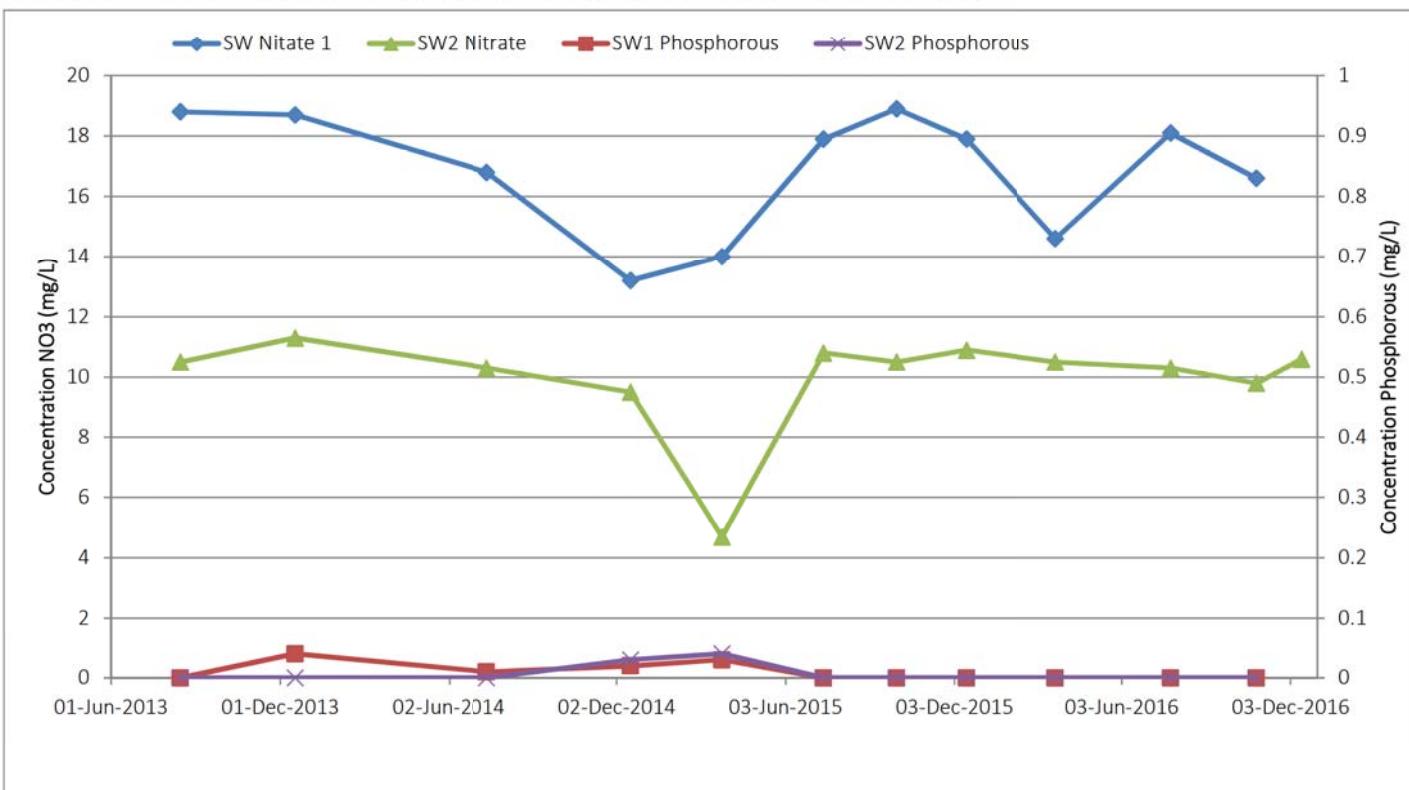
GRAPH OF WATER QUALITY SVL-SW2

Downgradient



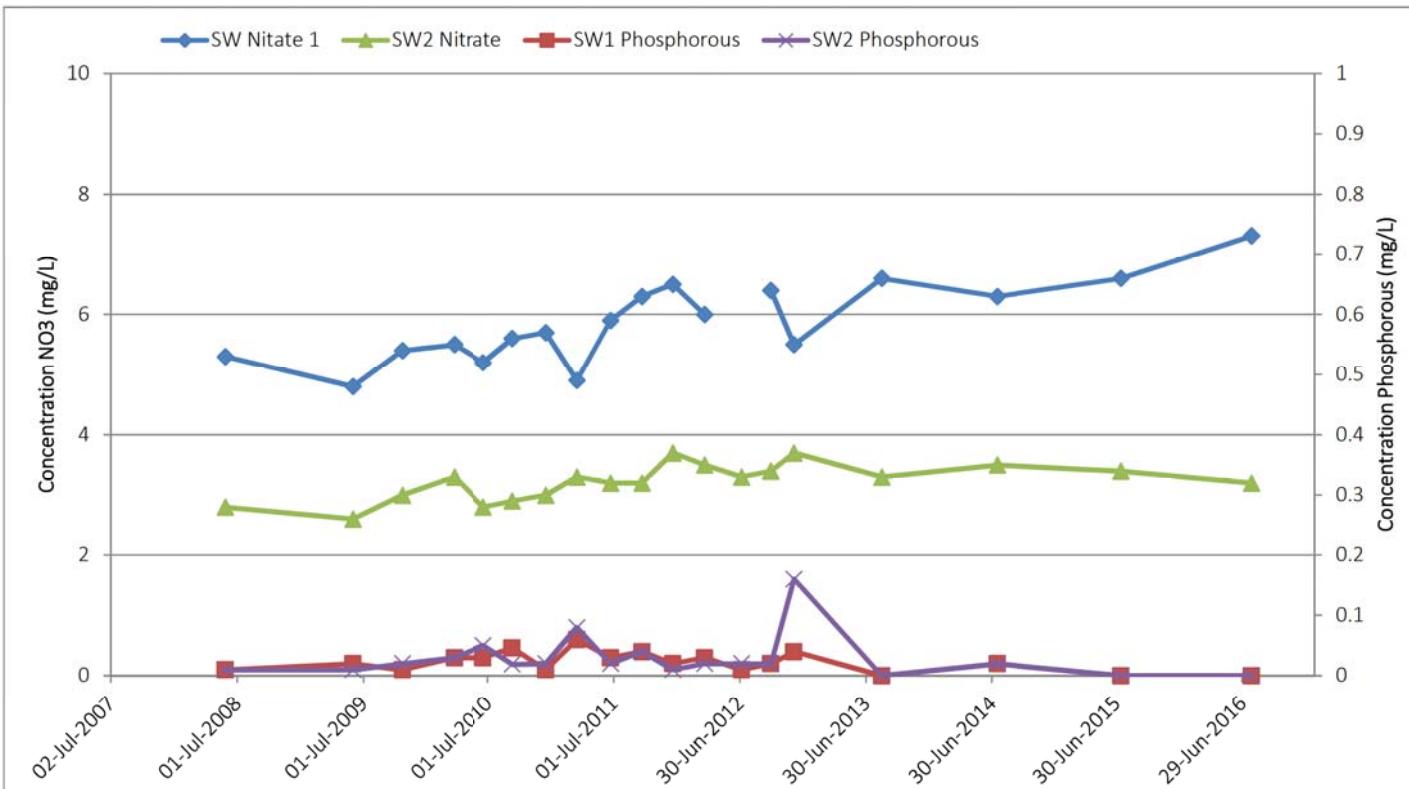
## Graph of Surface Water Quality Monitoring - Black Creek

GRAPH OF WATER QUALITY SBC-SW1 & SW2 Upgradient vs Downgradient Locations



## Graph Comparison of Ugradient vs Downgradient Surface Water Quality - Snow Valley Landings

GRAPH OF WATER QUALITY SVL-SW1 & SW2 Upgradient vs Downgradient Locations





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## 2016 ENVIRONMENTAL MONITORING REPORT

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# TABLES

**TABLE 1 SUMMARY OF SNOW VALLEY LANDINGS ENVIRONMENTAL MONITORING**

Location: OW-1 - Snow Valley Lowlands (Former TP10A/93)

Aquifer: Downgradient Upper Aquifer

Screened Interval: 2.1 - 2.9 mbgl 196.5 - 197.3 masl

UTM NAD 83 17T 597012 4920124

Date Sampled	NO2 mg/L	NO3 mg/L	Amm mg/L	TKN mg/L	P (Total) mg/L	Na mg/L	Chl mg/L	CBOD5 mg/L	TSS mg/L
28-May-2008	0.1	0.2	<0.01	2.04	15.7 *	1.6	1.5	<3	3680
01-Jun-2009	<0.1	0.2	<0.01	3.67	15.1 *	19.3	2.0	<3	28000
22-Oct-2009	<0.1	0.5	<0.01	1.93	4.2 *	6.1	3.2		
22-Mar-2010	<0.1	2.8	<0.01	2.75	14.1 *	2.1	3.8		
17-Jun-2010	<0.1	0.5	<0.01	1.93	4.2 *	6.1	3.2		
10-Sep-2010	<0.1	4.2	<0.01	0.48	<0.01 (f)	5.2	5.9		96800
16-Dec-2010	<0.1	6.3	0.02	0.06	<0.01 (f)	2.1	3.6	<3	4090
16-Mar-2011	<0.1	3.8	<0.01	0.18	0.02 (f)	1.9	2.9		
22-Jun-2011	<0.1	2.8	<0.01	0.17	<0.01 (f)	1.9	2.9	<3	32000
21-Sep-2011	<0.1	3.5	<0.01	0.64	0.03 (f)	2.3	3.1		
19-Dec-2011	0.3	2.9	<0.01	0.80	<0.01 (f)	2.0	2.5		
20-Mar-2012	<0.1	2.0	<0.01	0.10	<0.01 (f)	2.0	5.7		
05-Jul-2012	<0.1	1.1	<0.01	0.48	<0.01 (f)	2.3	4.0		
28-Sep-2012	<0.1	0.9	<0.01	0.15	<0.01 (f)	2.0	5.7		
04-Dec-2012	<0.1	1.0	<0.01	0.13	<0.01 (f)	1.8	5.4		
15-Aug-2013	<0.1	1.4	<0.01	0.46	<0.01 (f)				
16-Jul-2014	<0.1	1.5	0.04	0.38	0.01 (f)	8.3	9.1		
14-Jul-2015	<0.1	1.8	0.08	0.56	0.06 (f)				
25-Aug-2016	<0.1	0.9	<0.01	0.94	0.01 (f)				

Location: **OW-2 - Snow Valley Lowlands**

Aquifer: Downgradient Upper Aquifer

Screened Interval: 3.1 - 4.6 mbgl 199.5 - 201.0 masl

UTM NAD 83 17T 597240 4920140

Date Sampled	NO2 mg/L	NO3 mg/L	Amm mg/L	TKN mg/L	P (Total) mg/L	Na mg/L	Chl mg/L	CBOD5 mg/L	TSS
28-May-2008	<0.1	0.1	<0.01	2.47	4.9 *	4.3	6.7	<3	10600
01-Jun-2009	0.3	1.3	<0.01	1.36	9.0 *	12.5	8.0	<3	7400
22-Oct-2009	<0.1	0.5	<0.01	0.34	3.5 *	8.9	7.7		
22-Mar-2010	<0.1	0.6	<0.01	0.55	1.8 *	4.0	7.1		
17-Jun-2010	<0.1	0.1	<0.01	0.47	7.2 *	7.3	7.3		
10-Sep-2010	<0.1	0.1	0.01	0.38	<0.01 (f)	4.4	6.9		4560
16-Dec-2010	<0.1	<0.1	0.02	<0.05	<0.01 (f)	3.9	6.6	<3	1840
16-Mar-2011	<0.1	<0.1	0.01	0.07	0.02 (f)	4.1	6.7		
22-Jun-2011	<0.1	0.1	0.06	0.20	<0.01 (f)	4.1	7.2	<3	1560
21-Sep-2011	<0.1	0.1	<0.01	0.57	0.04 (f)	4.4	7.4		
19-Dec-2011	0.2	1.0	<0.01	0.20	<0.01 (f)	4.3	7.5		
20-Mar-2012	<0.1	0.1	<0.01	<0.05	<0.01 (f)	4.2	7.4		
05-Jul-2012	<0.1	0.1	<0.01	0.08	<0.01 (f)	4.3	8.5		
28-Sep-2012	<0.1	0.1	<0.01	0.12	<0.01 (f)	4.8	8.9		
04-Dec-2012	<0.1	<0.1	<0.01	0.08	<0.01 (f)	4.5	8.8		
15-Aug-2013	<0.1	0.4	<0.01	0.16	<0.01 (f)				
16-Jul-2014	<0.1	0.4	<0.01	0.22	<0.01 (f)	11.4	33.3		
14-Jul-2015	<0.1	0.5	<0.01	0.12	<0.01 (f)				
26-Jul-2016	<0.1	0.8	<0.01	0.25	<0.01 (f)	14.9	29.7		

(f) filtered Total Phosphorous sample in acidified bottle.

**TABLE 1 SUMMARY OF SNOW VALLEY LANDINGS ENVIRONMENTAL MONITORING**

Location: **OW-3 - Snow Valley Lowlands**

Aquifer: Downgradient Upper Aquifer

Screened Interval: 9.1 - 12.2mbgl 215.6 - 212.5 masl

UTM NAD 83 17T 597132 4919736

Date Sampled	NO2 mg/L	NO3 mg/L	Amm mg/L	TKN mg/L	P (Total) mg/L	Na mg/L	Chl mg/L	CBOD5	TSS
28-May-2008	<0.1	0.1	0.06	4.88	15.7 *	9.8	31.2	7	32200
01-Jun-2009	<0.1	<0.1	0.06	1.61	8.53 *	15.9	30.0	<3	13200
22-Oct-2009	<0.1	0.2	0.04	1.12	4.68 *	14.9	42.1		
22-Mar-2010	<0.1	0.7	0.06	1.87	12.3 *	7.2	17.5		
17-Jun-2010	<0.1	0.1	<0.01	0.81	7.14 *	11.8	21.6		
10-Sep-2010	<0.1	<0.1	0.02	0.20	<0.01 (f)	5.0	22.9		358000
16-Dec-2010	<0.1	0.1	0.06	0.17	0.02 (f)	5.3	20.6	<3	9160
16-Mar-2011	<0.1	<0.1	0.07	0.18	0.04 (f)	6.2	24.5		
22-Jun-2011	<0.1	<0.1	<0.01	0.06	0.03 (f)	6.1	27.2	<3	4310
21-Sep-2011	<0.1	<0.1	<0.01	0.12	0.04 (f)	8.0	40.7		
19-Dec-2011	0.1	0.1	0.30	0.30	0.01 (f)	11.4	51.8		
20-Mar-2012	<0.1	<0.1	<0.01	0.40	0.01 (f)	10.6	32.9		
05-Jul-2012	<0.1	0.1	<0.01	0.14	0.02 (f)	9.1	46.8		
28-Sep-2012	<0.1	0.1	<0.01	0.08	0.02 (f)	6.0	27.5		
04-Dec-2012	<0.1	0.1	<0.01	0.23	0.03 (f)	12.7	42.7		
15-Aug-2013	<0.1	0.5	0.07	0.34	0.02 (f)				
16-Jul-2014	<0.1	<0.1	0.05	0.49	0.02 (f)	10.2	58.5		
14-Jul-2015	<0.1	0.1	<0.01	0.54	0.03 (f)				
26-Jul-2016	<0.1	0.2				14.4	55.2		

Location: **C1**

Aquifer: Ponded Surface Water

UTM NAD 83 17T

Date Sampled	NO3 mg/L	P (Total) mg/L
16-Dec-2010	0.1	<0.1 *
16-Mar-2011	0.3	0.03 *
22-Jun-2011	0.1	0.03 *
21-Sep-2011	Dry	
19-Dec-2011	0.1	
20-Mar-2012	Dry	
05-Jul-2012	Dry	
28-Sep-2012	0.1	
04-Dec-2012	0.3	
15-Aug-2013	Dry	
16-Jul-2014	0.2	
14-Jul-2015	Dry	
26-Jul-2016	Dry	

**B2**

Ponded Surface Water

Date Sampled	NO3 mg/L	P (Total) mg/L
16-Dec-2010	0.1	<0.1 *
16-Mar-2011	<0.1	0.10 *
22-Jun-2011	0.1	0.23 *
21-Sep-2011	Dry	
19-Dec-2011	<0.1	
20-Mar-2012	Dry	
05-Jul-2012	Dry	
28-Sep-2012	<0.1	
04-Dec-2012	0.2	
15-Aug-2013	Dry	
16-Jul-2014	Dry	
14-Jul-2015	Dry	
26-Jul-2016	Dry	

(f) filtered Total Phosphorous sample in acidified bottle.

\* Total Phosphorous in un-filtered acidified sample includes Phosphorous bound to sediment particles.

(f) filtered Total Phosphorous sample in acidified bottle.

**TABLE 1 SUMMARY OF SNOW VALLEY LANDINGS ENVIRONMENTAL MONITORING**Location: **SW1 - Snow Valley Lowlands**

Aquifer: Background Surface Water

UTM NAD 83 17T 597176 4919485

Date Sampled	NO2 mg/L	NO3 mg/L	Amm mg/L	TKN mg/L	P (Total) mg/L	Na mg/L	Chl mg/L	CBOD5 mg/L	TSS mg/L
28-May-2008	<0.1	5.3	<0.01	0.37	0.01 *	7.4	10.1	<3	<3
01-Jun-2009	<0.1	4.8	<0.01	0.26	0.02 *	6.7	9.0	<3	<3
22-Oct-2009	<0.1	5.4	<0.01	0.25	0.01 *	4.2	8.2		
22-Mar-2010	<0.1	5.5	<0.01	0.36	0.03 *	5.3	9.7		
17-Jun-2010	<0.1	5.2	<0.01	0.37	0.03 *	5.1	8.5		
10-Sep-2010	<0.1	5.6	<0.01	0.23	0.05 *	3.0	6.8	<3	8
16-Dec-2010	<0.1	5.7	0.01	0.24	0.01 *	6.3	11.3	<3	18
16-Mar-2011	<0.1	4.9	0.01	0.63	0.06 *			<3	12
22-Jun-2011	<0.1	5.9	<0.01	0.37	0.03 *	5.2	8.9	<3	12
21-Sep-2011	<0.1	6.3	<0.01	0.23	0.04 *	5.1	7.8	<3	<3
19-Dec-2011	<0.1	6.5	<0.01	0.30	0.02 *	5.5	8.6	<3	3
20-Mar-2012	<0.1	6.0	<0.01	0.28	0.03 *	6.8	9.9	<3	6
05-Jul-2012	<0.1		<0.01	0.26	0.01 *	4.8	8.3	<3	7
28-Sep-2012	<0.1	6.4	<0.01	0.22	0.02 *	6.1	10.9	<3	4
04-Dec-2012	<0.1	5.5	<0.01	0.64	0.04 *	6.9	10.2	<3	19
15-Aug-2013	<0.1	6.6	<0.01	0.29	<0.01 *			<3	3
16-Jul-2014	<0.1	6.3	<0.01	0.49	0.02 *	7.1	11.4	<3	3
14-Jul-2015	<0.1	6.6	<0.01	0.21	<0.01 *	8.9	12.8	<3	4
26-Jul-2016	<0.1	7.3	<0.01	0.37	<0.01 *	4.4	7.5		

July 5, 2012 Nitrate result anomalous

Location: **SW2 - Snow Valley Lowlands**

Aquifer: Downgradient Surface Water

UTM NAD 83 17T 596933 4920008

Date Sampled	NO2 mg/L	NO3 mg/L	Amm mg/L	TKN mg/L	P (Total) mg/L	Na mg/L	Chl mg/L	CBOD5 mg/L	TSS mg/L
28-May-2008	<0.1	2.8	<0.01	0.25	0.01 *	9.6	10.8	<3	8
01-Jun-2009	<0.1	2.6	0.04	0.24	0.01 *	9.3	11.0	<3	6
22-Oct-2009	<0.1	3.0	0.07	0.16	0.02 *	6.6	9.3		
22-Mar-2010	<0.1	3.3	<0.01	0.18	0.03 *	7.8	11.1		
17-Jun-2010	<0.1	2.8	<0.01	0.35	0.05 *	7.6	9.7		
10-Sep-2010	<0.1	2.9	<0.01	0.09	0.02 *	5.1	9.5	<3	8
16-Dec-2010	<0.1	3.0	0.01	0.13	0.02 *	6.4	9.7	<3	18
16-Mar-2011	<0.1	3.3	0.03	0.43	0.08 *			<3	12
22-Jun-2011	<0.1	3.2	<0.01	0.24	0.02 *	7.6	10.5	<3	13
21-Sep-2011	<0.1	3.2	<0.01	0.18	0.04 *	7.2	9.3	<3	5
19-Dec-2011	<0.1	3.7	<0.01	0.20	0.01 *	7.8	10.4	<3	4
20-Mar-2012	<0.1	3.5	<0.01	0.21	0.02 *	8.9	11.7	<3	7
05-Jul-2012	<0.1	3.3	<0.01	0.18	0.02 *	7.2	9.5	<3	5
28-Sep-2012	<0.1	3.4	<0.01	0.14	0.02 *	8.0	10.0	<3	4
04-Dec-2012	<0.1	3.7	<0.01	0.58	0.16 *	9.1	11.6	5	44
15-Aug-2013	<0.1	3.3	<0.01	0.23	<0.01 *			<3	11
16-Jul-2014	<0.1	3.5	<0.01	0.33	0.02 *	9.7	14.4	<3	13
14-Jul-2015	<0.1	3.4	<0.01	0.41	<0.01	6.3	9.1	<3	<3
26-Jul-2016	<0.1	3.2	<0.01	< 0.05	<0.01	7.0	13.6		

(f) filtered Total Phosphorous sample in acidified bottle.

\* Total Phosphorous in un-filtered acidified sample includes Phosphorous bound to sediment particles.

**TABLE 2 SUMMARY OF SNOW VALLEY BLACK CREEK ESTATES  
ENVIRONMENTAL MONITORING**

**Location: BH5#2 - Snow Valley Black Creek Estates**

Aquifer: Downgradient Upper Aquifer (Artesian)

Screened Interval: 7.6 - 9.1 mbgl                    199.1 - 200.6 masl  
UTM NAD 83 17T        597798        4920429

Date Sampled	NO2 mg/L	NO3 mg/L	Amm mg/L	TKN mg/L	P (Total)(f) mg/L	eColi	BH5#1 NO3
15-Aug-2013	< 0.1	3.6	< 0.01	0.3	< 0.01	<2	
17-Dec-2013	< 0.1	2.2	< 0.01	< 0.05	< 0.01	<2	
14-Jul-2014	< 0.1	3.7	< 0.01	0.89	< 0.01	<2	2.4
17-Dec-2014	< 0.1	7.6	< 0.01	0.94	< 0.01	<2	
26-Mar-2015	< 0.1	4.1	< 0.01	0.15	< 0.01	<2	
14-Jul-2015	< 0.1	3.8	< 0.01	0.32	< 0.01	<2	
01-Oct-2015	< 0.1	4.6	< 0.01	0.34	0.02	<2	
16-Dec-2015	< 0.1	6.2	< 0.01	10.3	0.02	<2	
23-Mar-2016	< 0.1	9.3	0.02	0.51	< 0.01	<2	
26-Jul-2016	< 0.1	5.1	< 0.01	0.35	< 0.01	<2	
27-Oct-2016	< 0.1	3.5	< 0.01	0.19	0.45*	< 2	32
15-Dec-2016	< 0.1	3.9	0.02	0.40		< 2	36
							105
							99

**Location: BH6 - Snow Valley Black Creek Estates**

Aquifer: Downgradient Upper Aquifer (Toe of Stormwater Pond)

Screened Interval: 6.1 - 7.6 mbgl                    204.1 - 202.7 masl  
UTM NAD 83 17T        597582        4920187

Date Sampled	NO2 mg/L	NO3 mg/L	Amm mg/L	TKN mg/L	P (Total)(f) mg/L	eColi	Na	Chloride
15-Aug-2013	<0.1	0.8	0.08	0.09	<0.01	<2		
17-Dec-2013	<0.1	0.3	<0.01	0.22	<0.01	<2		
14-Jul-2014	<0.1	0.8	<0.01	0.29	<0.01	<2		
17-Dec-2014	<0.1	0.8	<0.01	0.20	<0.01	<2		
26-Mar-2015	<0.1	0.7	<0.01	0.09	<0.01	<2		
14-Jul-2015	<0.1	1.0	<0.01	0.32	<0.01	<2		
01-Oct-2015	<0.1	1.5	<0.01	0.07	<0.01	<2		
16-Dec-2015	<0.1	1.7	<0.01	0.38	<0.01	<2		
23-Mar-2016	<0.1	1.4	<0.01	0.08	<0.01	<2		
26-Jul-2016	<0.1	0.8	<0.01	0.16	<0.01	<2		
27-Oct-2016	<0.1	2.2	< 0.01	0.46	2.6*	< 2	33	67
15-Dec-2016	<0.1	5.4	< 0.01	0.42		< 2	27	60

\* Total Phosphorous result anomalous due preservative issue

Location: **BC-SW1 - Snow Valley Black Creek Estates**  
 Aquifer: Background Surface Water  
 UTM NAD 83 17T 598232 4920061

Date Sampled	NO2 mg/L	NO3 mg/L	Amm mg/L	TKN mg/L	P (Total)* mg/L	eColi	Na	Chloride
15-Aug-2013	< 0.1	18.8	< 0.01	0.17	< 0.01	18		
17-Dec-2013	< 0.1	18.7	< 0.01	0.39	0.04	<2		
14-Jul-2014	< 0.1	16.8	< 0.01	0.34	0.01	44		
17-Dec-2014	< 0.1	13.2	< 0.01	0.58	0.02	44		
26-Mar-2015	< 0.1	14.0	< 0.01	0.92	0.03	48		
14-Jul-2015	< 0.1	17.9	< 0.01	0.15	< 0.01	10	9	18
01-Oct-2015	< 0.1	18.9	< 0.01	0.16	< 0.01	18		
16-Dec-2015	< 0.1	17.9	< 0.01	0.21	< 0.01	<2	8	17
23-Mar-2016	< 0.1	14.6	< 0.01	0.28	< 0.01	6		
26-Jul-2016	< 0.1	18.1	< 0.01	0.21	< 0.01	24		
27-Oct-2016	< 0.1	16.6	< 0.01	0.23	< 0.01	26	8	39
15-Dec-2016								

BC-SW1 Location Not Accessible - Road Construction, December 2016

Location: **BC-SW2 - Snow Valley Black Creek Estates**  
 Aquifer: Downgradient Surface Water  
 UTM NAD 83 17T 597176 4919485

Date Sampled	NO2 mg/L	NO3 mg/L	Amm mg/L	TKN mg/L	P (Total)* mg/L	eColi	Na	Chloride
15-Aug-2013	< 0.1	10.5	< 0.01	0.23	< 0.01	30		
17-Dec-2013	< 0.1	11.3	< 0.01	0.15	< 0.01	2		
14-Jul-2014	< 0.1	10.3	< 0.01	0.31	< 0.01	32		
17-Dec-2014	< 0.1	9.5	< 0.01	0.47	0.03	62		
26-Mar-2015	< 0.1	4.7	< 0.01	0.56	0.04	10		
14-Jul-2015	< 0.1	10.8	< 0.01	0.19	< 0.01	6	17	38
01-Oct-2015	< 0.1	10.5	< 0.01	0.14	< 0.01	22		
16-Dec-2015	< 0.1	10.9	< 0.01	0.16	< 0.01	<2	16	39
23-Mar-2016	< 0.1	10.5	< 0.01	0.21	< 0.01	10		
26-Jul-2016	< 0.1	10.3	< 0.01	0.21	< 0.01	20		
27-Oct-2016	< 0.1	9.8	< 0.01	0.22	0.38*	6	15	74
15-Dec-2016	< 0.1	10.6	< 0.01	0.22		6	19	41

\* Total Phosphorous in un-filtered sample includes Phosphorous bound to sediment particles.

(f) filtered Total Phosphorous sample in acidified bottle.

**TABLE 3 SUMMARY OF WATER LEVELS****SNOW VALLEY LANDINGS****LANDINGS**

Date Sampled	OW1#2	OW1#1	OW2	OW3
25-Jan-1994	0.97	1.31		
28-May-2008	1.10		2.75	9.20
01-Jun-2009	0.77		2.98	9.32
22-Oct-2009	0.88		3.19	9.48
22-Mar-2010	0.88		3.04	9.42
17-Jun-2010	0.93		3.19	9.43
10-Sep-2010	0.92	1.25	3.45	9.47
16-Dec-2010	0.88		2.93	9.38
16-Mar-2011	0.80		2.95	9.24
22-Jun-2011	0.76		3.11	9.29
21-Sep-2011	0.88		3.34	9.38
19-Dec-2011				
20-Mar-2012	0.89			
05-Jul-2012	0.98		3.37	9.37
28-Sep-2012	0.97		3.24	9.34
04-Dec-2012	0.81		2.95	9.24
15-Aug-2013	0.91	1.24	3.13	9.32
16-Jul-2014	0.95	1.23	3.02	9.40
14-Jul-2015	1.00		3.08	9.35
25-Aug-2016	0.97			

**SNOW VALLEY BLACK CREEK WATER LEVELS**

	BH5#1	BH5#2	BH6	
27-Jul-2011	3.72	1.74	4.88	As-Built
10-Aug-2011	3.96	1.76	4.98	
16-Jan-2012	3.79	1.95	5.28	
15-Aug-2013	3.98	1.41	4.74	
17-Dec-2013	3.10	1.59	4.96	
16-Jul-2014	3.94	1.47	4.45	
26-Mar-2015		1.46	4.71	
14-Jul-2015		1.65	4.84	
01-Oct-2015		1.65	4.97	
16-Dec-2015	4.07	1.71	4.23	
23-Mar-2016	3.66	1.51	4.69	
26-Jul-2016	4.07	1.44	4.73	
15-Dec-2016		1.69	5.16	

C.O.C.: G64661

REPORT No. B16-07271

**Report To:**

**Golder Associates Ltd.**  
121 Commerce Park Drive, Unit L,  
Barrie ON. L4N 8X1 Canada

**Attention:** Jim Regier

DATE RECEIVED: 24-Mar-16

DATE REPORTED: 30-Mar-16

SAMPLE MATRIX: Groundwater

**Caduceon Environmental Laboratories**

2378 Holly Lane  
Ottawa Ontario K1V 7P1  
Tel: 613-526-0123  
Fax: 613-526-1244

JOB/PROJECT NO.: SBC

P.O. NUMBER: 07-1170-0005

WATERWORKS NO.

Parameter	Units	R.L.	Client I.D.	BH5 #2	BH6		
			Sample I.D.	B16-07271-1	B16-07271-2		
			Date Collected	23-Mar-16	23-Mar-16		
Nitrite (N)	mg/L	0.1	SM4110C	28-Mar-16/O	< 0.1	< 0.1	
Nitrate (N)	mg/L	0.1	SM4110C	28-Mar-16/O	9.3	1.4	
Ammonia (N)-Total	mg/L	0.01	MOEE 3364	28-Mar-16/O	0.02	< 0.01	
Total Kjeldahl Nitrogen	mg/L	0.05	MOEE 3367	29-Mar-16/O	0.51	0.08	
Phosphorus-Total	mg/L	0.01	MOEE 3367	29-Mar-16/O	< 0.01	< 0.01	
E coli	cfu/100mL	1	MOE E3371	24-Mar-16/O	< 2	< 2	

R.L. = Reporting Limit

Test methods may be modified from specified reference method unless indicated by an \*  
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

  
Greg Clarkin , BSc., C. Chem  
Lab Manager - Ottawa District

C.O.C.: G64661

REPORT No. B16-07272

**Report To:**

**Golder Associates Ltd.**  
121 Commerce Park Drive, Unit L,  
Barrie ON. L4N 8X1 Canada

**Attention:** Jim Regier

DATE RECEIVED: 24-Mar-16

DATE REPORTED: 30-Mar-16

SAMPLE MATRIX: Surface Water

**Caduceon Environmental Laboratories**

2378 Holly Lane  
Ottawa Ontario K1V 7P1  
Tel: 613-526-0123  
Fax: 613-526-1244

JOB/PROJECT NO.: SBC

P.O. NUMBER: 07-1170-0005

WATERWORKS NO.

Parameter	Units	R.L.	Client I.D.	BC-SW1	BC-SW2		
			Sample I.D.	B16-07272-1	B16-07272-2		
			Date Collected	23-Mar-16	23-Mar-16		
Nitrite (N)	mg/L	0.1	SM4110C	28-Mar-16/O	< 0.1	< 0.1	
Nitrate (N)	mg/L	0.1	SM4110C	28-Mar-16/O	14.6	10.5	
Ammonia (N)-Total	mg/L	0.01	MOEE 3364	28-Mar-16/O	< 0.01	< 0.01	
Total Kjeldahl Nitrogen	mg/L	0.05	MOEE 3367	29-Mar-16/O	0.28	0.21	
Phosphorus-Total	mg/L	0.01	MOEE 3367	29-Mar-16/O	< 0.01	< 0.01	
E coli	cfu/100mL	1	MOE E3371	24-Mar-16/O	6	10	

R.L. = Reporting Limit

Test methods may be modified from specified reference method unless indicated by an \*  
Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

  
Greg Clarkin , BSc., C. Chem  
Lab Manager - Ottawa District

C.O.C.: G61127

REPORT No. B16-22111

**Report To:**

**Golder Associates Ltd.**  
121 Commerce Park Drive, Unit L,  
Barrie ON. L4N 8X1 Canada

**Attention:** Jim Regier

DATE RECEIVED: 27-Jul-16

DATE REPORTED: 05-Aug-16

SAMPLE MATRIX: Groundwater

**Caduceon Environmental Laboratories**

2378 Holly Lane  
Ottawa Ontario K1V 7P1  
Tel: 613-526-0123  
Fax: 613-526-1244

JOB/PROJECT NO.: 07 1170 0007

P.O. NUMBER:

WATERWORKS NO.

			Client I.D.		BC-BH5#2	BC-BH6	SLV-OW2	SLV-OW3
			Sample I.D.		B16-22111-1	B16-22111-2	B16-22111-3	B16-22111-4
			Date Collected		26-Jul-16	26-Jul-16	26-Jul-16	26-Jul-16
Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
Sodium	mg/L	0.2	SM 3120	28-Jul-16/O			14.9	14.4
Chloride	mg/L	0.5	SM4110C	27-Jul-16/O			29.7	55.2
Nitrite (N)	mg/L	0.1	SM4110C	27-Jul-16/O	< 0.1	< 0.1	< 0.1	< 0.1
Nitrate (N)	mg/L	0.1	SM4110C	27-Jul-16/O	5.1	0.8	0.8	0.2
Ammonia (N)-Total	mg/L	0.01	MOEE 3364	03-Aug-16/O	< 0.01	< 0.01	< 0.01	
Total Kjeldahl Nitrogen	mg/L	0.05	MOEE 3367	04-Aug-16/O	0.35	0.16	0.25	
Phosphorus-Total	mg/L	0.01	MOEE 3367	04-Aug-16/O	< 0.01	< 0.01	< 0.01	
E coli	cfu/100mL	1	MOE E3371	27-Jul-16/O	< 2	< 2	< 2	

R.L. = Reporting Limit

Test methods may be modified from specified reference method unless indicated by an \*

Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

  
Greg Clarkin , BSc., C. Chem  
Lab Manager - Ottawa District

C.O.C.: G61127

REPORT No. B16-22113

**Report To:**

**Golder Associates Ltd.**  
 121 Commerce Park Drive, Unit L,  
 Barrie ON. L4N 8X1 Canada

**Attention:** Jim Regier

DATE RECEIVED: 27-Jul-16

DATE REPORTED: 03-Aug-16

SAMPLE MATRIX: Surface Water

**Caduceon Environmental Laboratories**

2378 Holly Lane  
 Ottawa Ontario K1V 7P1  
 Tel: 613-526-0123  
 Fax: 613-526-1244

JOB/PROJECT NO.: 07 1170 0007

P.O. NUMBER:

WATERWORKS NO.

			Client I.D.	BC-SW1	BC-SW2	SVL-SW1	SVL-SW2
			Sample I.D.	B16-22113-1	B16-22113-2	B16-22113-3	B16-22113-4
			Date Collected	26-Jul-16	26-Jul-16	26-Jul-16	26-Jul-16
Parameter	Units	R.L.	Reference Method	Date/Site Analyzed			
Sodium	mg/L	0.2	SM 3120	28-Jul-16/O		4.4	7.0
Chloride	mg/L	0.5	SM4110C	27-Jul-16/O		7.5	13.6
Nitrite (N)	mg/L	0.1	SM4110C	27-Jul-16/O	< 0.1	< 0.1	< 0.1
Nitrate (N)	mg/L	0.1	SM4110C	27-Jul-16/O	18.1	10.3	3.2
Ammonia (N)-Total	mg/L	0.01	MOEE 3364	03-Aug-16/O	< 0.01	< 0.01	< 0.01
Total Kjeldahl Nitrogen	mg/L	0.05	MOEE 3367	03-Aug-16/O	0.21	0.21	0.37
Phosphorus-Total	mg/L	0.01	MOEE 3367	03-Aug-16/O	< 0.01	< 0.01	< 0.01
E coli	cfu/100mL	1	MOE E3371	27-Jul-16/O	24	20	1660
							< 2

R.L. = Reporting Limit

Test methods may be modified from specified reference method unless indicated by an \*  
 Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill

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Greg Clarkin , BSc., C. Chem  
 Lab Manager - Ottawa District

C.O.C.: ---

**REPORT No. B16-32676**

**Report To:**

**Golder Associates Ltd.**  
 121 Commerce Park Drive, Unit L,  
 Barrie ON. L4N 8X1 Canada

**Attention:** Jim Regier

DATE RECEIVED: 28-Oct-16

DATE REPORTED: 09-Nov-16

SAMPLE MATRIX: Surface Water

**Caduceon Environmental Laboratories**

2378 Holly Lane  
 Ottawa Ontario K1V 7P1  
 Tel: 613-526-0123  
 Fax: 613-526-1244

JOB/PROJECT NO.: 07-1170-0005

P.O. NUMBER:

WATERWORKS NO.

			Client I.D.	BC-SW1	BC-SW2		
			Sample I.D.	B16-32676-1	B16-32676-2		
			Date Collected	27-Oct-16	27-Oct-16		
Parameter	Units	R.L.	Reference Method	Date/Site Analyzed			
Sodium	mg/L	0.2	SM 3120	02-Nov-16/O	7.5	15.4	
Chloride	mg/L	0.5	SM4110C	03-Nov-16/O	38.7	73.5	
Nitrite (N)	mg/L	0.1	SM4110C	03-Nov-16/O	< 0.1	< 0.1	
Nitrate (N)	mg/L	0.1	SM4110C	03-Nov-16/O	16.6	9.8	
Ammonia (N)-Total	mg/L	0.01	MOEE 3364	07-Nov-16/O	< 0.01	< 0.01	
Total Kjeldahl Nitrogen	mg/L	0.05	MOEE 3367	07-Nov-16/O	0.23	0.22	
Phosphorus-Total	mg/L	0.01	MOEE 3367	07-Nov-16/O	< 0.01	0.38	
E coli	cfu/100mL	1	MOE E3371	28-Oct-16/O	26	6	

R.L. = Reporting Limit

Test methods may be modified from specified reference method unless indicated by an \*

Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.

Greg Clarkin , BSc., C. Chem  
 Lab Manager - Ottawa District

C.O.C.: ---

**REPORT No. B16-32677**

**Report To:**

Golder Associates Ltd.  
 121 Commerce Park Drive, Unit L,  
 Barrie ON. L4N 8X1 Canada

**Attention:** Jim Regier

DATE RECEIVED: 28-Oct-16

DATE REPORTED: 09-Nov-16

SAMPLE MATRIX: Groundwater

**Caduceon Environmental Laboratories**

2378 Holly Lane  
 Ottawa Ontario K1V 7P1  
 Tel: 613-526-0123  
 Fax: 613-526-1244

JOB/PROJECT NO.: 07-1170-0005

P.O. NUMBER:

WATERWORKS NO.

			Client I.D.	BH5#2	BH6		
			Sample I.D.	B16-32677-1	B16-32677-2		
			Date Collected	27-Oct-16	27-Oct-16		
Parameter	Units	R.L.	Reference Method	Date/Site Analyzed			
Sodium	mg/L	0.2	SM 3120	03-Nov-16/O	31.5	32.8	
Chloride	mg/L	0.5	SM4110C	03-Nov-16/O	105	67.1	
Nitrite (N)	mg/L	0.1	SM4110C	03-Nov-16/O	< 0.1	< 0.1	
Nitrate (N)	mg/L	0.1	SM4110C	03-Nov-16/O	3.5	2.2	
Ammonia (N)-Total	mg/L	0.01	MOEE 3364	07-Nov-16/O	< 0.01	< 0.01	
Total Kjeldahl Nitrogen	mg/L	0.05	MOEE 3367	07-Nov-16/O	0.19	0.46	
Phosphorus-Total	mg/L	0.01	MOEE 3367	07-Nov-16/O	0.45	2.61	
E coli	cfu/100mL	1	MOE E3371	28-Oct-16/O	< 2	< 2	

R.L. = Reporting Limit

Test methods may be modified from specified reference method unless indicated by an \*

Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill

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Greg Clarkin , BSc., C. Chem  
 Lab Manager - Ottawa District

**C.O.C.: --**

**REPORT No. B16-37385**

**Report To:**

**Golder Associates Ltd.**  
 121 Commerce Park Drive, Unit L,  
 Barrie ON. L4N 8X1 Canada

**Attention:** Jim Regier

DATE RECEIVED: 16-Dec-16

DATE REPORTED: 23-Dec-16

SAMPLE MATRIX: Surface Water

**Caduceon Environmental Laboratories**

2378 Holly Lane  
 Ottawa Ontario K1V 7P1  
 Tel: 613-526-0123  
 Fax: 613-526-1244

JOB/PROJECT NO.: 07-1170-0005 - Snow Valley

P.O. NUMBER:

WATERWORKS NO.

			<b>Client I.D.</b>	BC-SW2			
			<b>Sample I.D.</b>	B16-37385-1			
			<b>Date Collected</b>	15-Dec-16			
Parameter	Units	R.L.	Reference Method	Date/Site Analyzed			
Nitrate (N)	mg/L	0.1	SM4110C	16-Dec-16/O	10.6		
Nitrite (N)	mg/L	0.1	SM4110C	16-Dec-16/O	< 0.1		
Ammonia (N)-Total	mg/L	0.01	MOEE 3364	21-Dec-16/O	< 0.01		
Total Kjeldahl Nitrogen	mg/L	0.05	MOEE 3367	20-Dec-16/O	0.22		
Chloride	mg/L	0.5	SM4110C	16-Dec-16/O	40.8		
Sodium	mg/L	0.2	SM 3120	19-Dec-16/O	18.7		
E coli	cfu/100mL	1	MOE E3371	16-Dec-16/O	6		

R.L. = Reporting Limit

Test methods may be modified from specified reference method unless indicated by an \*

Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill

The analytical results reported herein refer to the samples as received. Reproduction of this analytical report in full or in part is prohibited without prior consent from Caduceon Environmental Laboratories.



Gord Murphy  
 Lab Supervisor

**C.O.C.: --**

**REPORT No. B16-37387**

**Report To:**

**Golder Associates Ltd.**  
 121 Commerce Park Drive, Unit L,  
 Barrie ON. L4N 8X1 Canada

**Attention:** Jim Regier

DATE RECEIVED: 16-Dec-16

DATE REPORTED: 23-Dec-16

SAMPLE MATRIX: Groundwater

**Caduceon Environmental Laboratories**

2378 Holly Lane  
 Ottawa Ontario K1V 7P1  
 Tel: 613-526-0123  
 Fax: 613-526-1244

JOB/PROJECT NO.: 07-1170-005- Snow Valley

P.O. NUMBER:

WATERWORKS NO.

			<b>Client I.D.</b>	BH5#2	BH6		
			<b>Sample I.D.</b>	B16-37387-1	B16-37387-2		
			<b>Date Collected</b>	15-Dec-16	15-Dec-16		
<b>Parameter</b>	<b>Units</b>	<b>R.L.</b>	<b>Reference Method</b>	<b>Date/Site Analyzed</b>			
Ammonia (N)-Total	mg/L	0.01	MOEE 3364	21-Dec-16/O	0.02	< 0.01	
Nitrite (N)	mg/L	0.1	SM4110C	19-Dec-16/O	< 0.1	< 0.1	
Nitrate (N)	mg/L	0.1	SM4110C	19-Dec-16/O	3.9	5.4	
Total Kjeldahl Nitrogen	mg/L	0.05	MOEE 3367	20-Dec-16/O	0.40	0.42	
Chloride	mg/L	0.5	SM4110C	19-Dec-16/O	98.6	60.4	
Sodium	mg/L	0.2	SM 3120	19-Dec-16/O	36.1	26.5	
E coli	cfu/100mL	1	MOE E3371	16-Dec-16/O	< 2	< 2	

R.L. = Reporting Limit

Test methods may be modified from specified reference method unless indicated by an \*

Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill

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Gord Murphy  
 Lab Supervisor

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Africa	+ 27 11 254 4800
Asia	+ 86 21 6258 5522
Australasia	+ 61 3 8862 3500
Europe	+ 356 21 42 30 20
North America	+ 1 800 275 3281
South America	+ 55 21 3095 9500

[solutions@golder.com](mailto:solutions@golder.com)  
[www.golder.com](http://www.golder.com)

**Golder Associates Ltd.**  
**121 Commerce Park Drive, Unit L**  
**Barrie, Ontario, L4N 8X1**  
**Canada**  
**T: +1 (705) 722 4492**

# **APPENDIX E**

## **BYPASS & SPILL REPORTS**

## Ontario Clean Water Agency Environmental Incident Report

Facility ID:	1155	EIncidentReport
Facility Name:	Royal Oaks WWT (SV Landing)	
Address:	6 Budd's Mill Rd./ Heron PS 60 Heron Blvd	
City:	Minesing	
Province:	Ontario	
Postal Code:	L0L 1Y3	
Date of Occurrence:	04/11/2016	
Time of Occurrence:	01:30 PM	

### Nature of the Incident

Level 1 Contingency  Level 2 Contingency  Level 3 Contingency [Click here To Show the Definitions](#)

Incident affected:  Air  Water  Land  Nothing

What was discharged or emitted?

- |   |   |
|---|---|
| <input type="checkbox"/> Chlorine   | <input type="checkbox"/> Oil/Diesel/Gas                     |
| <input type="checkbox"/> Sodium Hypochlorite  | <input type="checkbox"/> Untreated or partly treated sewage |
| <input type="checkbox"/> Calcium Chloride   | <input type="checkbox"/> Odours                             |
| <input type="checkbox"/> Aluminum Compounds (Specify in Other) <input type="checkbox"/> Water |   |
| <input type="checkbox"/> Arsenic  | <input type="checkbox"/> Iron Coagulants                    |
| <input type="checkbox"/> Fluoride   |   |

Other: Bioxide Tetrahydrate

### If this was a discharge, spill or emission...

If a liquid, approximately what quantity was released?: <4 Litres

If a gas, approximately what quantity was released?: \_\_\_\_\_

If a solid, approximately what quantity was released?: \_\_\_\_\_ Kg

What was the source of release?:

Chemical delivery of Bioxide Tetrahydrate (an odour control agent). Cap to drum was incorrectly secured by manufacturer and failed when drum tipped. Operators John Duckett and Zac Osso were assisting in moving the drum to its final location at Heron Pump Station (60 Heron Blvd) when the drum tipped slightly, spilling no more than 4 L of the liquid solution.

Where did the release go?:

No more than 4L of the liquid spilled on the gravel driveway area at Heron Pump Station as well as on Zac Osso's uniform pants. He was able to clean up as per MSDS and change his clothes.

If it entered a watercourse:  Yes  No

If it went off site:  Yes  No

Duration of the release?: 10 seconds

Is the release now stopped?:  Yes  No

Was there any damage? (i.e. property and/or environmental):  Yes  No  N/A

If "Yes", describe below and fill out "Insurance Claim" report

#### Action(s) Taken

What actions were taken to control the incident?

Zac Osso was able to move the drum to an upright position thus stopping the spill. The spill was seconds in duration.

What actions have been taken to remediate the incident?

I instructed the operators to shovel the affected gravel into buckets. SAC was notified by phone at 2:50pm. Terrapure Environmental was called at 3:37pm regarding disposal of the gravel - awaiting confirmation regarding proper disposal. Karen Lorente is to contact manufacturer regarding the inappropriate cap used on the drum. Operators took pictures to support this. Simcoe Muskoka District Health Unit was notified via email at 4:05pm and verbal notification at 4:45pm (Rob Townes, PHI).

Was this a reportable spill or discharge?:  Yes  No

If "Yes", at what time was it first reported to the MOE?

SAC notified Mark Bailey via email at 230. Abatement team from Barrie District office was notified and Greg Atheron was on site around 315 pm. Email sent from Mary-Jo Santi to Mark Bailey, Greg Atheron at 5:09pm

Was it reported to the MOE district office?:  Yes  No

If "Yes", which office/location and who was the contact?: Greg Atheron and Mark Bailey

Was it reported to MOE SAC?:  Yes  No

If "Yes", at what time was it reported to MOE SAC?:

SAC was notified by phone at 2:50pm

Was it reported to Municipality?:  Yes  No

If "Yes", at what time was it reported to Municipality?:

Email sent from Mary-Jo Santi to Mark Archer at 5:09pm

#### External Assistance/Involvement

Was corporate or area office assistance requested?:  Yes  No

If "Yes", was it received?:  Yes  No

Was external emergency assistance requested?:  Yes  No

If "Yes", from who?:  Fire Department  Equipment Suppliers  Canutec  
 Ambulance or Hospital  MOE  Coast Guard  
 Police  Municipality

Other: \_\_\_\_\_

Was there any media involvement?:  Yes  No

If "Yes", who?: \_\_\_\_\_

Was the public affected?:  Yes  No

If "Yes", how?: \_\_\_\_\_

Updated By: Mary-Jo Santi 04/12/2016 08:58:59 AM

#### Comments:

Greg Atheron (MOECC) has suggested that the product is biodegradable and will not need to be disposed of as a hazardous substance. I am awaiting confirmation of that.

## Ontario Clean Water Agency Environmental Incident Report

Facility ID:	1155	EIncidentReport
Facility Name:	Royal Oaks WWT (SV Landing)	
Address:	6 Budd's Mill Road	
City:	Minesing	
Province:	Ontario	
Postal Code:	L0L 1Y3	
Date of Occurrence:	12/28/2016	
Time of Occurrence:	08:50:06 AM	

### Nature of the Incident

Level 1 Contingency  Level 2 Contingency  Level 3 Contingency [Click here To Show the Definitions](#)

Incident affected:  Air  Water  Land  Nothing

What was discharged or emitted?

- |   |   |
|---|---|
| <input type="checkbox"/> Chlorine   | <input type="checkbox"/> Oil/Diesel/Gas                     |
| <input type="checkbox"/> Sodium Hypochlorite  | <input type="checkbox"/> Untreated or partly treated sewage |
| <input type="checkbox"/> Calcium Chloride   | <input type="checkbox"/> Odours                             |
| <input type="checkbox"/> Aluminum Compounds (Specify in Other) <input type="checkbox"/> Water | <input type="checkbox"/> Iron Coagulants                    |
| <input type="checkbox"/> Arsenic  |   |
| <input type="checkbox"/> Fluoride   |   |

Other: sewage

### If this was a discharge, spill or emission...

If a liquid, approximately what quantity was released?: 500 Litres

If a gas, approximately what quantity was released?: \_\_\_\_\_

If a solid, approximately what quantity was released?: \_\_\_\_\_ Kg

What was the source of release?:

Partially blocked sanitary sewer restricting flow.

Where did the release go?:

In the manhole chamber and onto the pavement via manhole cover.

If it entered a watercourse:  Yes  No

If it went off site:  Yes  No

Duration of the release?: 1.5hrs

Is the release now stopped?:  Yes  No

Was there any damage? (i.e. property and/or environmental):  Yes  No  N/A

If "Yes", describe below and fill out "Insurance Claim" report

#### Action(s) Taken

What actions were taken to control the incident?

On December 28, 2016, at approximately 8:50am, Brian Smith phoned Richard Eagle to inform him that sewage was exiting the manhole cover on Mennill Road - between house 145 and 153. Richard called OCWA Operator Candace Smith to attend the scene.

Upon arrival Candace noted the sewage and called Region of Huronia Environmental Services. ROHES arrived at 10:00am and began collecting the material in the manhole chamber and material on the pavement.

This was completed by 10:30am.

A piece of broken PVC pipe was extracted and is believed to be the source of the blockage. Once this was removed, normal flow was restored.

Total volume of material collected was approximately 11 m<sup>3</sup> with LESS than 0.5m<sup>3</sup> spilled onto the pavement via manhole cover.

December 28, 2016:

Municipality notified via email from Richard Eagle at 9:56am

SAC notified at 3:25pm

SMDHU notified at 4:35pm (answering service), PHI returned call at 5:12pm

What actions have been taken to remediate the incident?

The broken piece of PVC pipe was removed from the main and normal flow was restored

Was this a reportable spill or discharge?:  Yes  No

If "Yes", at what time was it first reported to the MOE?

Reported via telephone conversation with Mark Bailey on December 28 at approximately 8:45am.

Was it reported to the MOE district office?:  Yes  No

If "Yes", which office/location and who was the contact?: Barrie District Office - Mark Bailey

Was it reported to MOE SAC?:  Yes  No

If "Yes", at what time was it reported to MOE SAC?:

December 28, 2016 - 3:25pm - SAC Ruslan Paliy; SMDHU was called at 4:35pm - answering service paged PHI. Rob Townes returned call at 5:12pm

Was it reported to Municipality?:  Yes  No

If "Yes", at what time was it reported to Municipality?:

9:56am via email from Richard Eagle to Mark Archer

#### External Assistance/Involvement

Was corporate or area office assistance requested?:  Yes  No

If "Yes", was it received?:  Yes  No

Was external emergency assistance requested?:  Yes  No

If "Yes", from who?:  Fire Department  Equipment Suppliers  Canutec  
 Ambulance or Hospital  MOE  Coast Guard  
 Police  Municipality

Other: \_\_\_\_\_

Was there any media involvement?:  Yes  No

If "Yes", who?: \_\_\_\_\_

Was the public affected?:  Yes  No

If "Yes", how?: \_\_\_\_\_

Updated By: Mary-Jo Santi 12/29/2016 11:34:35 AM

#### Comments: