MONTHLY UPDATE REPORT - PRIMROSE SOUTH
09-21-067-04 W4M

OCTOBER 30, 2013

Introduction

The Canadian Natural Resources Limited Primrose South in situ oil sands project is located in the Cold Lake Air Weapons Range approximately 65 km north-northeast of Bonnyville, Alberta. Canadian Natural operations staff discovered a bitumen emulsion flow to surface (FTS) at 09-21-067-04 W4M on June 24, 2013. The FTS area is beneath an unnamed water body within the Canadian Natural Primrose South production area.

On September 24, 2013, Alberta Environment and Sustainable Resource Development (ESRD) issued an Environmental Protection Order (EPO-2013-33/NR), requesting the preparation of a Comprehensive Remedial Plan (CRP). This report summarizes the progress towards the realization of this plan and includes data collected and reported up to October 26, 2013.

Summary of Activities to Date

Individual Plan Submission

As required by the EPO, the CRP includes the development, submission and implementation of several specific plans. The status of these plans is indicated below:

Table 1: Components of the Comprehensive Remedial Plan

Plan Name	Due Date	Submission Date	Approval Date	Implementation Start Date	Completion Date
Water Management Plan for Dewatering	September 26, 2013	September 26, 2013	September 27, 2013	September 27, 2013	October 22, 2013
Water Body Monitoring Plan	September 26, 2013	September 26, 2013	September 27, 2013	September 27, 2013	Ongoing
Erosion and Sedimentation Prevention Plan	September 26, 2013	September 26, 2013	September 27, 2013	September 27, 2013	October 22, 2013
Phase 2 Environmental Assessment Plan	October 15, 2013	October 3, 2013	October 17, 2013	Pending	Pending
Bitumen Emulsion Delineation and Containment Plan	October 6, 2013	October 3, 2013	October 17, 2013	October 18, 2013	Pending
Amphibian Salvage Plan	September 26, 2013	September 25, 2013	September 27, 2013	September 27, 2013	October 22, 2013

Plan Name	Due Date	Submission Date	Approval Date	Implementation Start Date	Completion Date
Fish and Fish Habitat Assessment Plan	September 26, 2013	September 25, 2013	September 27, 2013	September 27, 2013	October 30, 2013
Wetlands Impact Assessment Plan	September 30, 2013	September 25, 2013	September 27, 2013	September 27, 2013	October 30, 2013
Water Body Restoration Plan	November 30, 2013	Pending	Pending	No later than April 1, 2014	Pending
Wildlife Management Plan	N/A	Revised Plan October 23, 2013	Pending	Pending	Pending
Waste Management Plan	N/A	Revised Plan October 24, 2013	Pending	Pending	Pending
Communications Plan	October 1, 2013	October 1, 2013	October 2, 2013	October 2, 2013	Pending

Dewatering Activities

The water body was divided in four basins as indicated on Figure 1. Basins 1, 2 and 3 were dewatered while Basin 4 is being used for water storage. Three independent pumping systems were used to pump water out of Basins 1, 2 and 3. This configuration allowed Canadian Natural to adjust pumping rates in the various basins as laid out in the approved Water Management Plan for Dewatering (Figures 1 to 3).

Pumping started on September 27, 2013. The volume of water pumped from each basin is presented in Appendix A. On October 22, 2013, pumping was stopped. Pumping will be carried out intermittently and as needed, as water seeps into Basins 1, 2 and 3 from the surrounding area. The dewatering activities took place in accordance to the conditions specified in the Water Management Plan for Dewatering and in the Erosion and Sedimentation Prevention Plan.

Summary of Monitoring Data

In accordance with the Water Body Monitoring Plan, an extensive water quality and water quantity monitoring program was implemented on September 27, 2013. This program was specific to the dewatering phase of the CRP and complemented the ongoing water quality monitoring implemented in June 2013.

Dewatering Water Quality

Water quality samples were collected every two hours from the pumping lines and/or discharge locations to ensure that water quality met the guidelines for discharge into the environment. Sampling locations are shown on Figures 1, 2 and 3, and water quality results are presented in Appendix B.

Water from Basin 2 (the most affected by the bitumen emulsion FTS) was directed through an activated carbon filtration system. Once pumping from Basin 2 was complete, water from Basin 1 was pumped through the activated carbon filtration unit. Water quality was within applicable guidelines at all discharge points throughout the dewatering program.

Dewatering Water Quantity

Water quantity parameters were recorded, at a minimum, twice daily to document the progress of the dewatering operations and ensure the hydrology in the receiving environment was not affected by the dewatering operations. Monitoring locations are illustrated on Figure 4 and water quantity results are presented in Appendix A.

Since the start of the dewatering activities on September 27, 2013, water levels in the water body and its surrounding areas have been fluctuating as anticipated. As of October 26, 2013, water levels in Basins 1, 2 and 3 decreased by 1.29 m and increased by 0.61 m in Basin 4.

Surface Water Quality

Water quality samples were collected daily from surface locations indicated on Figure 5A and Figure 5B to ensure water quality in the receiving environment was not affected by the dewatering operations. Water quality results are presented in Appendix C.

Water quality from the water body and the downstream fen has been within freshwater aquatic life guidelines with the exception of seven measurements above guidelines for toluene at site 09-21. The toluene levels have been decreasing and the source is still under investigation.

During the dewatering phase, monitoring was also carried out for 18 polycyclic aromatic hydrocarbons (PAHs). These compounds consist of fused carbon rings, and are found in natural deposits of crude oil and coal. They may also be produced as byproducts of burning hydrocarbons or organic materials such as wood. PAHs can be released to the environment when crude oil or bitumen is exposed at surface.

There were no PAH compounds measured in the discharge water after activated carbon treatment. Concentrations above freshwater aquatic life guideline were measured in 4% of all samples collected, before treatment and discharge.

Measurements taken in the Basin 2 discharge line before activated carbon treatment did show low concentrations of PAH compounds fluorene, fluoranthene, naphthalene and phenanthrene. There were no PAH compounds measured in the discharge water after activated carbon treatment.

Shallow Groundwater

Water quality samples were collected from shallow groundwater locations, as denoted on Figure 6. Water quality results are presented in Appendix C.

All samples met acceptable freshwater guidelines with the exception of 13 samples that indicated elevated levels of toluene. Two fluoranthene concentrations slightly above the freshwater aquatic life guideline were also reported on October 5 2013 in two shallow groundwater well samples collected on September 28, 2013. The fluoranthene concentration in subsequent measurements throughout October 2013 was measured below detection or at a low concentration below the freshwater aquatic life guideline.

Conclusions

The implementation of the CRP started on September 27, 2013 upon approval by ESRD of specific components of the plan as indicated in Table 1.

The data collected as of October 26, 2013 indicate that the dewatering of the water body took place as planned with no adverse effects on the hydrology and water quality in the surrounding environment. The toluene levels found in the shallow groundwater and fen, downstream of the water body, were not associated with dewatering activities, while the fluoranthene concentrations in the shallow groundwater wells did not persist into October 2013.

I:\CanadianNatural\8881\FiguresAndTables\SPL\2013\Report_MonthlySummary\October\Site_9_21\Public\FIGURE-1-Discharge_Sampling_Locations_Oct1.mxd

Easting (m)

528500 529000 529500 530000 530500

Northing (m)

6076000 6075500 6075000 6074500 6074000 6073500 6073000

Basin 4
Basin 3
Basin 2
Basin 1
13-DW31
13-DW32
13-DW10
13-DW20
13-DW21
13-DW22
13-DW23
Basin 1 & 2 Pumps
Basin 3 Pump
13-DW30
13-DW30a
13-DW25
Borrow Pump
13-DW11
13-DW12

- Basin Boundary
- Watercourse
- Aqua Dam
- Discharge Line
- Dewatering Program Facility
- Dewatering Program Pump Facility
- Compliance Monitoring Location
- Discharge Outlet Monitoring Location
- Filtration Monitoring Location

1:11,000 m
110 0 110 220
NAD 1983 UTM Zone 12N

Reference: Data obtained from AltaLIS © Government of Alberta used under license. Imagery obtained from client (August 2010) used under license.

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Canadian Natural Ltd.
Primrose 09-21-067-04 W4M

Discharge Sampling Locations as of October 1, 2013

Date:	Project:	Technical:	Reviewer:	Drawn:
02 Nov 2013	8881-523	S. Toner	H. de Pennart	R. Keller

Figure 1

I:\CanadianNatural\8881\FiguresAndTables\SPL\2013\Report_MonthlySummary\October\Site_9_21\Public\FIGURE-2-Discharge_Sampling_Locations_Oct10.mxd

Easting (m)

528500 529000 529500 530000 530500

Northing (m)

6076000 6075500 6075000 6074500 6074000 6073500 6073000

N

Basin 4
Basin 3
Basin 2
Basin 1

13-DW31a
13-DW31
13-DW32
13-DW10
13-DW20
13-DW21
13-DW23
13-DW25
13-DW12
13-DW11
13-DW30c

Basin 3 Pump
Basin 1 & 2 Pumps
Borrow Pump

- Basin Boundary
- Watercourse
- Aqua Dam
- Discharge Line
- Dewatering Program Facility
- Dewatering Program Pump Facility
- Compliance Monitoring Location
- Discharge Outlet Monitoring Location
- Filtration Monitoring Location

1:11,000 m
110 0 110 220
NAD 1983 UTM Zone 12N

Reference: Data obtained from AltaLIS © Government of Alberta used under license. Imagery obtained from client (August 2010) used under license.

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Discharge Sampling Locations as of October 10, 2013

Date:	Project:	Technical:	Reviewer:	Drawn:
02 Nov 2013	8881-523	S. Toner	H. de Pennart	R. Keller

Figure 2

I:\CanadianNatural\8881\FiguresAndTables\SPL\2013\Report_MonthlySummary\October\Site_9_21\Public\FIGURE-3-Discharge_Sampling_Locations_Oct18.mxd

Easting (m)

528500 529000 529500 530000 530500

Northing (m)

6076000 6075500 6075000 6074500 6074000 6073500 6073000

N

13-DW49

13-DW33a

13-DW33

Basin 4

Basin 3

13-DW31a

13-DW32

13-DW45

Basin 3 Pump

13-DW30c

13-DW21a

13-DW23

Basin 1 & 2 Pumps

Basin 2

Basin 1

13-DW25

- Basin Boundary
- Watercourse
- Aqua Dam
- Aqua Dam (Completed on October 30)
- Discharge Line
- Dewatering Program Facility
- Dewatering Program Pump Facility
- Compliance Monitoring Location
- Discharge Outlet Monitoring Location
- Filtration Monitoring Location

1:11,000

110 0 110 220 m

NAD 1983 UTM Zone 12N

Reference: Data obtained from AltaLIS © Government of Alberta used under license. Imagery obtained from client (August 2010) used under license.

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Discharge Sampling Locations as of October 18, 2013

Date:	Project:	Technical:	Reviewer:	Drawn:
03 Nov 2013	8881-523	S. Toner	H. de Pennart	R. Keller

Figure 3

Easting (m)

519500 520000 520500 521000 521500 522000 522500 523000 523500 524000 524500 525000 525500 526000 526500 527000 527500 528000 528500 529000 529500 530000 530500 531000

Northing (m)

6077500 6077000 6076500 6076000 6075500 6075000 6074500 6074000 6073500 6073000 6072500 6072000

N

13-SG5
13-SG1
13-SG8
13-SG12
13-SG11
13-SG14
13-SG7
13-SG6
13-SG13
13-SG4
13-SG3
13-SG2
13-SG10
13-SG9

Basin 3
Basin 4
Unnamed Water Body
Basin 2
Basin 1

Wolf River

Kea Baker Road

- Basin Boundary
- Water Body
- Watercourse
- Direction of Flow
- Staff Gauge Location
- Discharge Monitoring Location and Staff Gauge Location

1:30,000

300 0 300 600 m

NAD 1983 UTM Zone 12N

Reference: Data obtained from AltaLIS © Government of Alberta and GeoBase® used under license. Imagery obtained from a combination of client (August 2010) and Valtus (June 29, 1999 - September 13, 2009) used under license.

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Staff Gauge and Discharge Monitoring Locations

Date:	Project:	Technical:	Reviewer:	Drawn:
02 Nov 2013	8881-523	S. Toner	H. de Pennart	R. Keller

Figure 4

I:\Canada\Natural\8881\FiguresAndTables\SPL\2013\Report_Monthly Summary\October\Site_0_21\Public\FIGURE-4-Staff_Gauge_and_Discharge_Monitoring_Locations.mxd

I:\CanadianNatural\8881\FiguresAndTables\SPL\2013\Report_MonthlySummary\October\Site_9_21\Public\FIGURE-5A-Daily_Surface_Water_Monitoring_Locations.mxd

Easting (m)

528500 529000 529500 530000 530500

Northing (m)

6076000 6075500 6075000 6074500 6074000 6073500 6073000

N

Basin 4
13-SW12
Basin 3
13-SW31
13-SW7
13-SW22
Basin 2
Basin 1
13-SW26
13-DP1
13-SW27
13-SW16
13-SW39

- Basin Boundary
- Watercourse
- Aqua Dam
- Aqua Dam (Completed on October 30)
- Discharge Line
- Dewatering Program Facility
- Daily Surface Water Monitoring Location
- Discontinued on October 9
- Drivepoint Piezometer Sample Location (Sampled Daily)

1:11,000 m
110 0 110 220
NAD 1983 UTM Zone 12N

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Daily Surface Water Monitoring Locations

Date:	Project:	Technical:	Reviewer:	Drawn:
03 Nov 2013	8881-523	S. Toner	H. de Pennart	R. Keller

Figure 5A

Easting (m)

519500 520000 520500 521000 521500 522000 522500 523000 523500 524000 524500 525000 525500 526000 526500 527000 527500 528000 528500 529000 529500 530000 530500

Northing (m)

6077500 6077000 6076500 6076000 6075500 6075000 6074500 6074000 6073500 6073000 6072500 6072000

N

13-SW44

13-SW43

Wolf River

13-SW42

Ken Baker Road

Basin 3

Basin 4

Unnamed Water Body

13-SW12

13-SW31

13-SW7

13-SW22

Basin 2

Basin 1

13-SW26

13-SW27

13-SW39

13-SW16

Basin Boundary
Water Body
Watercourse
Direction of Flow
Daily Surface Water Monitoring Location

1:30,000

300 0 300 600 m

NAD 1983 UTM Zone 12N

Reference: Data obtained from AltaLIS © Government of Alberta and GeoBase® used under license. Imagery obtained from a combination of client (August 2010) and Valtus (June 29, 1999 - September 13, 2009) used under license.

I:\Canadian Natural\8881b\Figures And Tables\SPL\2013 Report_Monthly Summary\October\Site_9_21 Public\FIGURE-5B-Daily_Surface_Water_Monitoring_Locations.mxd

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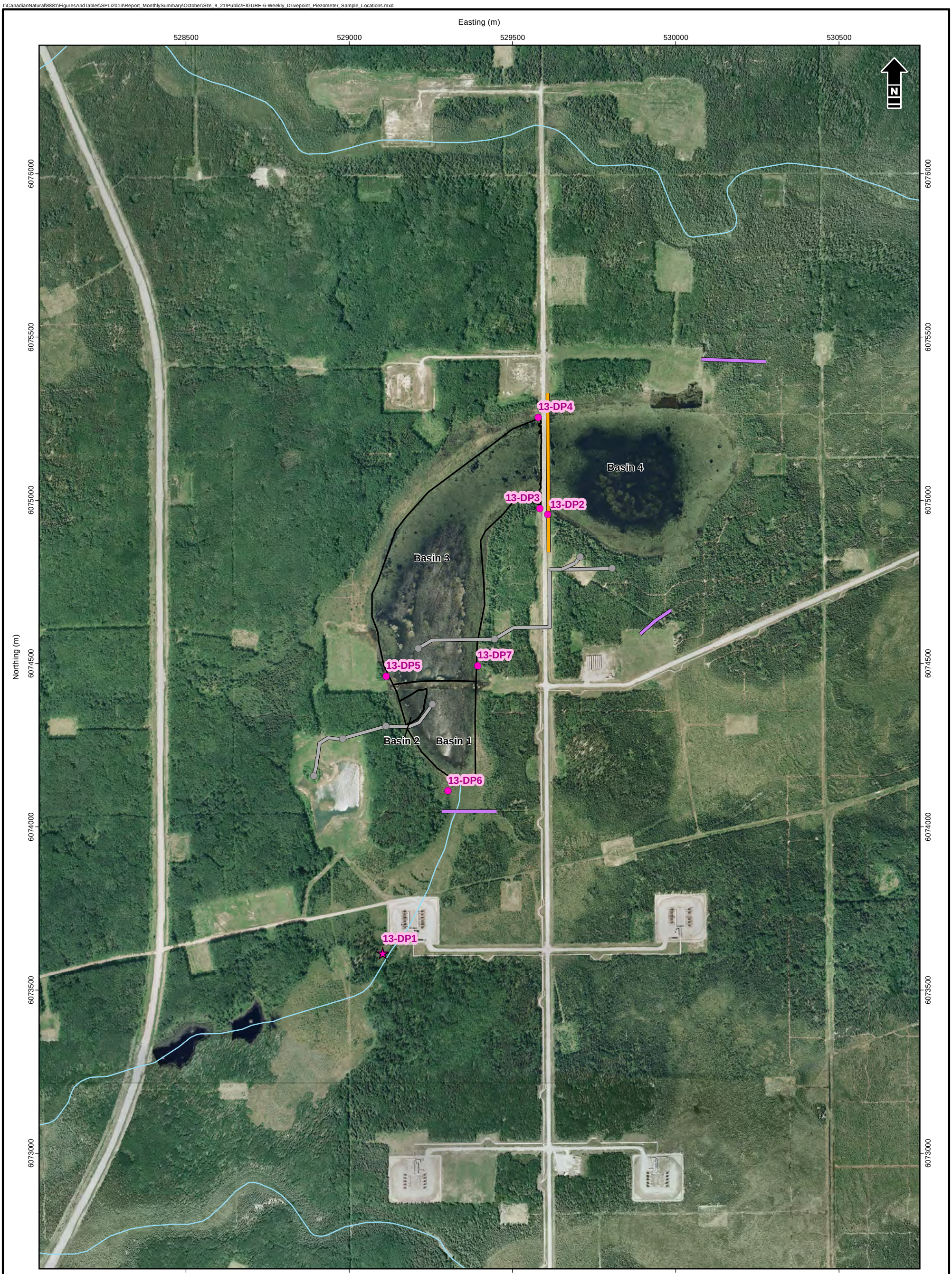
Daily Surface Water Monitoring Locations Downstream of the 09-21 Water body and in the Wolf Lake River

Date:	Project:	Technical:	Reviewer:	Drawn:
02 Nov 2013	8881-523	S. Toner	H. de Pennart	R. Keller

Figure 5B

I:\CanadianNatural\8881\FiguresAndTables\SPL\2013\Report_MonthlySummary\October\Site_9_21\Public\FIGURE-6-Weekly_Drivepoint_Piezometer_Sample_Locations.mxd



Basin Boundary
Watercourse
Aqua Dam
Aqua Dam (Completed on October 30)
Discharge Line
Dewatering Program Facility
Drivepoint Piezometer Sample Location (Sampled Daily)
Drivepoint Piezometer Sample Location (Sampled Weekly)

1:11,000 m
110 0 110 220
NAD 1983 UTM Zone 12N

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Weekly Drivepoint Piezometer Sample Locations

Date:	Project:	Technical:	Reviewer:	Drawn:
03 Nov 2013	8881-523	S. Toner	H. de Pennart	R. Keller

Figure 6

APPENDIX A

DEWATERING AND WATER LEVEL DATA

Figure A-1: 9-21 Water Body Dewatering

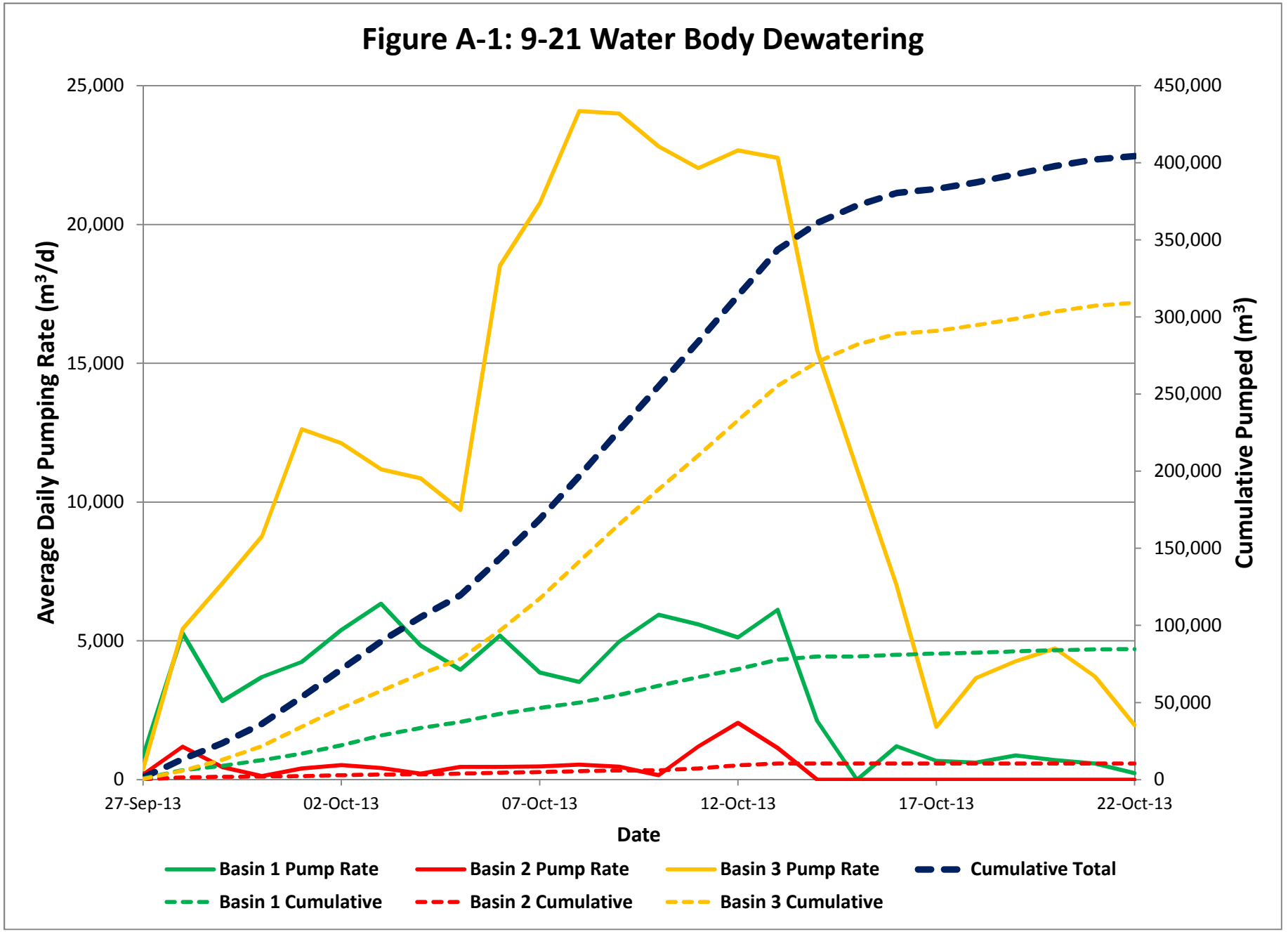

Figure A-2: Water Levels at 9-21 Water Body

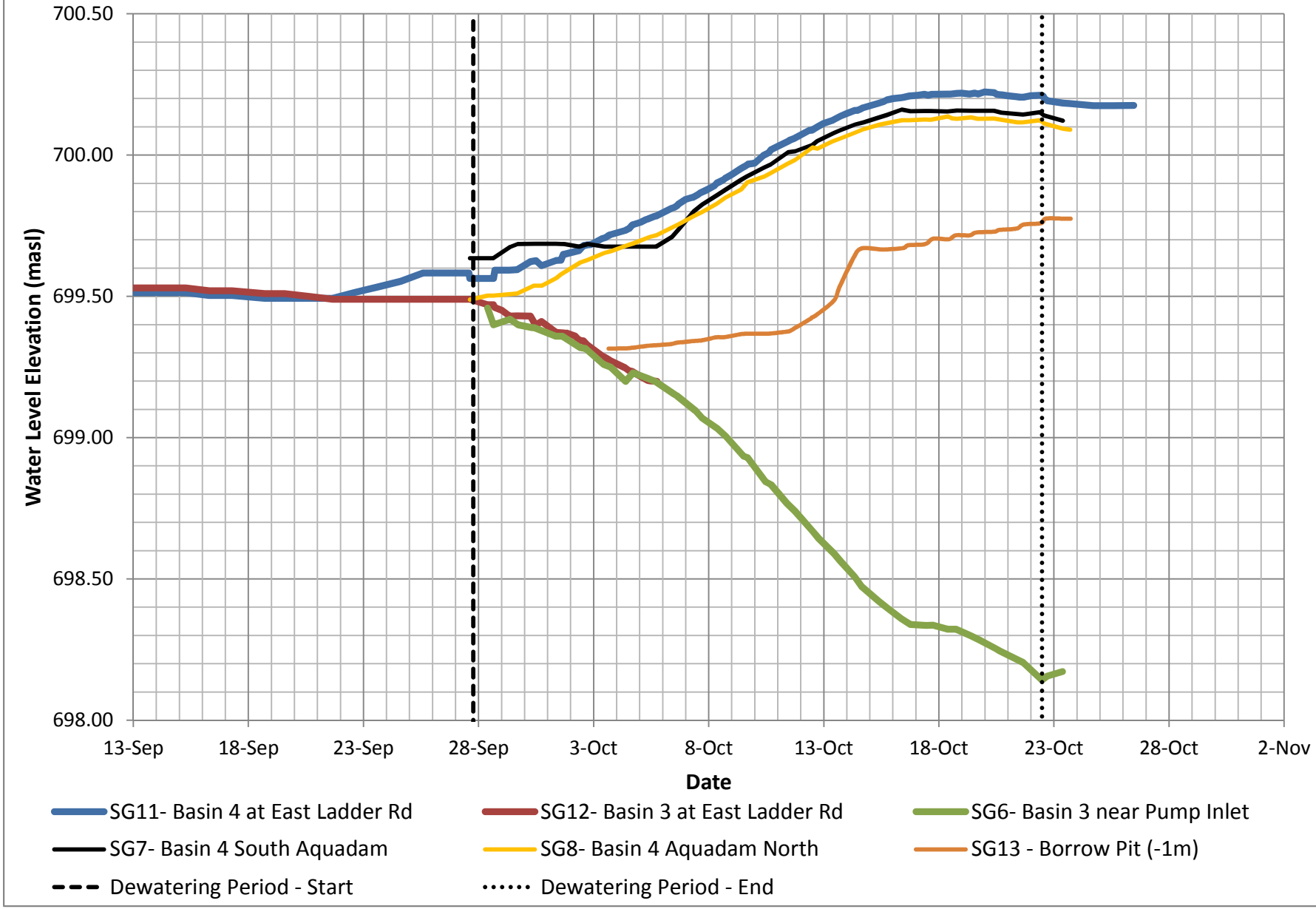

Figure A-3: Water Levels in the Downstream Fen

Figure A-4: Water Levels at Wolf River and Burnt Lake Drainage

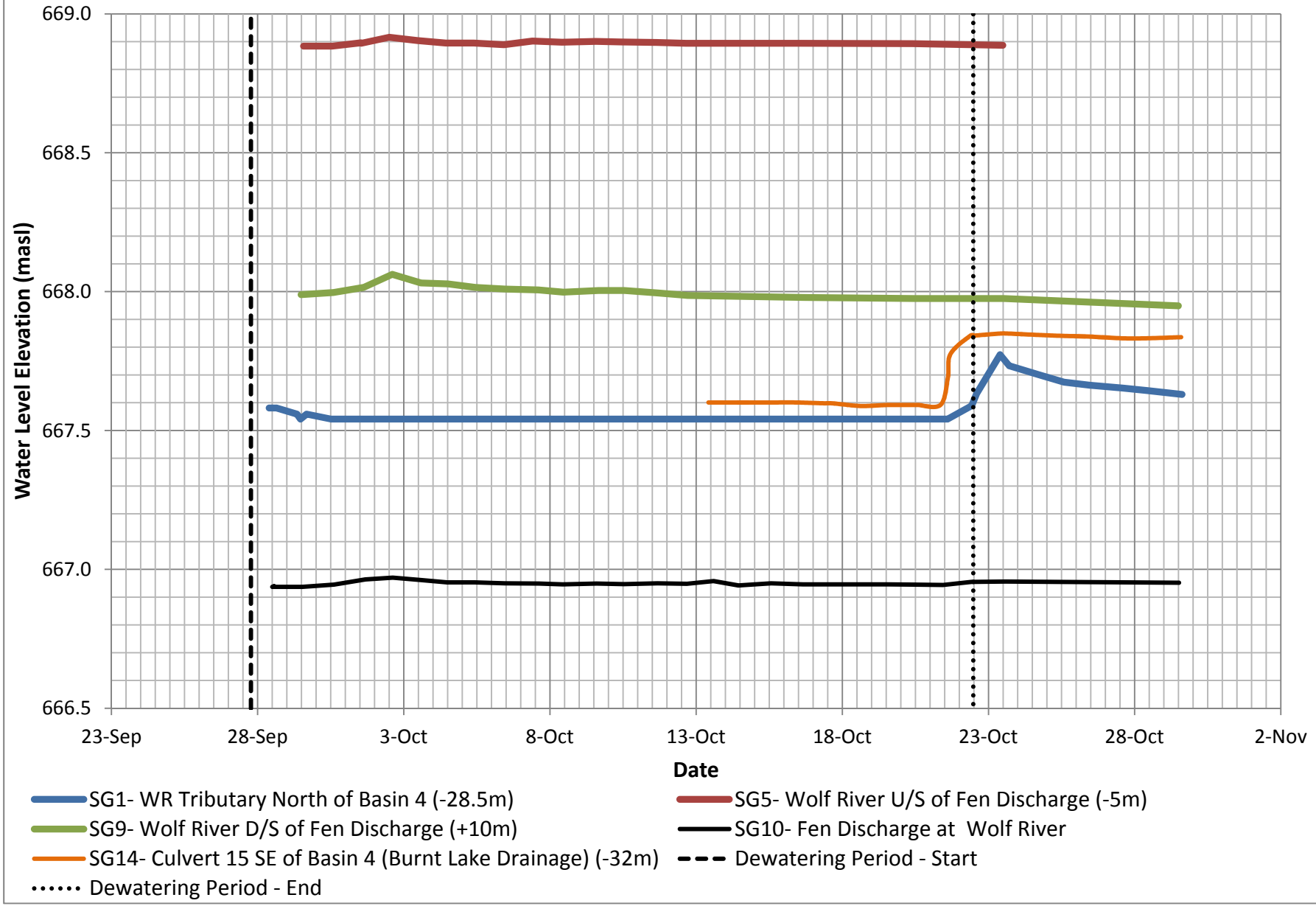

Table A-1: Daily Flow Volumes

CNRL Primrose 09-21 Water Body: Dewatering Phase

Date	Daily Total Discharge (m^3/day)	Cumulative Pumped (m^3)	Daily Total Discharge m^3/day	Cumulative Pumped (m^3)	Daily Total Discharge m^3/day	Cumulative Pumped (m^3)	Daily Volume from Water Body (m^3/day)	Cumulative Total from Water Body (m^3)
	Basin 1		Basin 2		Basin 3			
Design Rate:	**5,800**	-	**430**	-	**15,000**	-	**21,230**	
27-Sep-13	838	838	180	180	375	375	1,393	1,393
28-Sep-13	5,277	6,115	1,184	1,364	5,431	5,806	11,892	13,285
29-Sep-13	2,830	8,945	450	1,814	7,072	12,878	10,352	23,637
30-Sep-13	3,696	12,641	124	1,938	8,767	21,645	12,587	36,224
01-Oct-13	4,242	16,883	399	2,337	12,618	34,263	17,259	53,483
02-Oct-13	5,388	22,271	524	2,861	12,120	46,383	18,032	71,515
03-Oct-13	6,336	28,607	414	3,275	11,180	57,563	17,930	89,445
04-Oct-13	4,832	33,439	213	3,488	10,858	68,421	15,903	105,348
05-Oct-13	3,954	37,393	455	3,943	9,713	78,134	14,122	119,470
06-Oct-13	5,190	42,583	462	4,405	18,515	96,649	24,167	143,637
07-Oct-13	3,856	46,439	475	4,880	20,754	117,403	25,085	168,722
08-Oct-13	3,516	49,955	538	5,418	24,084	141,487	28,138	196,860
09-Oct-13	4,970	54,925	468	5,886	23,992	165,479	29,430	226,290
10-Oct-13	5,940	60,865	160	6,046	22,813	188,292	28,913	255,203
11-Oct-13	5,588	66,453	1,194	7,240	22,026	210,318	28,808	284,011
12-Oct-13	5,122	71,575	2,041	9,281	22,665	232,983	29,828	313,839
13-Oct-13	6,117	77,692	1,142	10,423	22,400	255,383	29,659	343,498
14-Oct-13	2,110	79,802	0	10,423	15,453	270,836	17,563	361,061
15-Oct-13	0	79,802	0	10,423	11,198	282,034	11,198	372,259
16-Oct-13	1,201	81,003	0	10,423	7,010	289,044	8,211	380,470
17-Oct-13	676	81,679	0	10,423	1,900	290,944	2,576	383,046
18-Oct-13	615	82,294	0	10,423	3,660	294,604	4,275	387,321
19-Oct-13	873	83,167	0	10,423	4,261	298,865	5,134	392,455
20-Oct-13	704	83,871	0	10,423	4,729	303,594	5,433	397,888
21-Oct-13	577	84,448	0	10,423	3,716	307,310	4,293	402,181
22-Oct-13	233	84,681	0	10,423	1,964	309,274	2,197	404,378

APPENDIX B

WATER QUALITY DATA – DISCHARGE POINTS

APPENDIX B1.

WATER QUALITY RESULTS - PUMPED WATER

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Date	Sample time	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylenes mg/L	F1[††] C_6-C_{10} mg/L	F2 $C_{>10}$-C_{16} mg/L	F3 $C_{>16}$-C_{34} mg/L	F4 $C_{>34}$-C_{50} mg/L	Chloride mg/L	TSS mg/L	Turbidity NTU
13-DW10	Pump from Basin 1	27-Sep-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<2.0	---	---
13-DW10	Pump from Basin 1	28-Sep-13	5:00	<0.0004	<0.002	<0.0004	<0.004	0.11	<0.1	<0.2	<0.2	<2.0	---	0.66
13-DW10	Pump from Basin 1	28-Sep-13	7:00	<0.0004	<0.002	<0.0004	<0.004	0.32	<0.1	<0.2	<0.2	1.2	---	0.75
13-DW10	Pump from Basin 1	28-Sep-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	1.3	0.74
13-DW10	Pump from Basin 1	28-Sep-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	---	0.82
13-DW10	Pump from Basin 1	28-Sep-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.0	---	0.74
13-DW10 dup	Pump from Basin 1	28-Sep-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	---	0.97
13-DW10	Pump from Basin 1	28-Sep-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	---	0.95
13-DW10	Pump from Basin 1	28-Sep-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	4.7	1.3
13-DW10	Pump from Basin 1	28-Sep-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	2	1.1
13-DW10	Pump from Basin 1	28-Sep-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	3.3	1.3
13-DW10	Pump from Basin 1	28-Sep-13	23:00	---	---	---	---	---	---	---	---	---	---	---
13-DW10	Pump from Basin 1	29-Sep-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.11	<0.2	<0.2	<1	---	1
13-DW10	Pump from Basin 1	29-Sep-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.82
13-DW10	Pump from Basin 1	29-Sep-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	1
13-DW10	Pump from Basin 1	29-Sep-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	0.29	<0.2	<1	---	1.3
13-DW10	Pump from Basin 1	29-Sep-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	2	0.94
13-DW10	Pump from Basin 1	29-Sep-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	1.1
13-DW10	Pump from Basin 1	30-Sep-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.95
13-DW10	Pump from Basin 1	30-Sep-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.77
13-DW10	Pump from Basin 1	30-Sep-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.76
13-DW10	Pump from Basin 1	30-Sep-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	2	0.68
13-DW10 dup	Pump from Basin 1	30-Sep-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.65
13-DW10	Pump from Basin 1	30-Sep-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.66
13-DW10	Pump from Basin 1	30-Sep-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.64
13-DW10	Pump from Basin 1	30-Sep-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.68
13-DW10	Pump from Basin 1	01-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.2	---	0.65
13-DW10	Pump from Basin 1	01-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.69
13-DW10	Pump from Basin 1	01-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.56
13-DW10	Pump from Basin 1	01-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.59
13-DW10	Pump from Basin 1	01-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.57
13-DW10	Pump from Basin 1	01-Oct-13	15:00	0.00058	0.0022	0.00055	<0.004	0.11	<0.1	<0.2	<0.2	<1	2.7	0.55
13-DW10	Pump from Basin 1	01-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	0.12	<0.1	<0.2	<0.2	<1	---	0.58
13-DW10	Pump from Basin 1	01-Oct-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.59
13-DW10	Pump from Basin 1	01-Oct-13	21:00	<0.0004	<0.002	<0.0004	<0.004	0.16	<0.1	<0.2	<0.2	<1	---	0.65
13-DW10	Pump from Basin 1	01-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	---	0.64
13-DW10	Pump from Basin 1	02-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.81
13-DW10	Pump from Basin 1	02-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.66
13-DW10	Pump from Basin 1	02-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	1.3
13-DW10	Pump from Basin 1	02-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.56
13-DW10	Pump from Basin 1	02-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	1.3	0.71
13-DW10	Pump from Basin 1	02-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	0.12	<0.1	<0.2	<0.2	<1	---	0.59
13-DW10	Pump from Basin 1	02-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.56
13-DW10	Pump from Basin 1	02-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.55
13-DW10	Pump from Basin 1	02-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.55
13-DW10 dup	Pump from Basin 1	02-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	<0.1
13-DW10	Pump from Basin 1	02-Oct-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.62
AENV Tier 1 Wildlife Water*				**0.076**	**4.25**	**2.77**	**0.18**	**46.4**	**42.6**	**69**	**36.4**	**NS**	**NS**	**NS**

APPENDIX B1.

WATER QUALITY RESULTS - PUMPED WATER

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Date	Sample time	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylenes mg/L	F1[††] C_6-C_{10} mg/L	F2 $C_{>10}$-C_{16} mg/L	F3 $C_{>16}$-C_{34} mg/L	F4 $C_{>34}$-C_{50} mg/L	Chloride mg/L	TSS mg/L	Turbidity NTU
13-DW10	Pump from Basin 1	02-Oct-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.55
13-DW10	Pump from Basin 1	02-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.65
13-DW10	Pump from Basin 1	03-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.55
13-DW10	Pump from Basin 1	03-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.5
13-DW10 dup	Pump from Basin 1	03-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	---	---	---
13-DW10	Pump from Basin 1	03-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.5
13-DW10	Pump from Basin 1	03-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.65
13-DW10	Pump from Basin 1	03-Oct-13	7:00	<0.001	<0.001	<0.001	<0.001	<0.2	<0.2	<0.1	<0.1	0.6	<1	---
13-DW10	Pump from Basin 1	03-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.51
13-DW10	Pump from Basin 1	03-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.54
13-DW10	Pump from Basin 1	03-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.51
13-DW10	Pump from Basin 1	03-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.52
13-DW10	Pump from Basin 1	03-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.57
13-DW10	Pump from Basin 1	03-Oct-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.54
13-DW10	Pump from Basin 1	03-Oct-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.52
13-DW10	Pump from Basin 1	04-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.52
13-DW10	Pump from Basin 1	04-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.62
13-DW10	Pump from Basin 1	04-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.59
13-DW10	Pump from Basin 1	04-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.66
13-DW10	Pump from Basin 1	04-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	0.1	<0.1	<0.2	<0.2	<1	---	0.80
13-DW10	Pump from Basin 1	04-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.78
13-DW10	Pump from Basin 1	04-Oct-13	11:00	<0.001	<0.001	<0.001	<0.001	<0.2	<0.2	<0.1	<0.1	0.6	2	2
13-DW10	Pump from Basin 1	04-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.58
13-DW10	Pump from Basin 1	04-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.94
13-DW10	Pump from Basin 1	04-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.84
13-DW10	Pump from Basin 1	04-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.74
13-DW10	Pump from Basin 1	04-Oct-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.78
13-DW10	Pump from Basin 1	04-Oct-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.71
13-DW10	Pump from Basin 1	04-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.53
13-DW10	Pump from Basin 1	05-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.79
13-DW10	Pump from Basin 1	05-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.85
13-DW10	Pump from Basin 1	05-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.67
13-DW10	Pump from Basin 1	05-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.73
13-DW10	Pump from Basin 1	05-Oct-13	7:00	<0.001	<0.001	<0.001	<0.001	<0.2	<0.2	<0.1	<0.1	0.6	2	1.9
13-DW10	Pump from Basin 1	05-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.8
13-DW10 dup	Pump from Basin 1	05-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.73
13-DW10	Pump from Basin 1	05-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	0.14	<0.1	0.28	<0.2	<1	---	0.58
13-DW10	Pump from Basin 1	05-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	0.11	<0.1	<0.2	0.56	<1	---	0.52
13-DW10	Pump from Basin 1	05-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	---	0.58
13-DW10	Pump from Basin 1	05-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1	1.3	0.63
13-DW10	Pump from Basin 1	05-Oct-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.7
13-DW10	Pump from Basin 1	05-Oct-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.57
13-DW10	Pump from Basin 1	05-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.62
13-DW10	Pump from Basin 1	06-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.57
13-DW10	Pump from Basin 1	06-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.51
13-DW10	Pump from Basin 1	06-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.49
13-DW10	Pump from Basin 1	06-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	0.32	<0.2	<1	1.3	0.47
13-DW10	Pump from Basin 1	06-Oct-13	7:00	<0.001	<0.001	<0.001	<0.001	<0.2	<0.2	<0.1	<0.1	0.8	<2	0.9
13-DW10	Pump from Basin 1	06-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	0.32	<0.2	<1	---	0.51
13-DW10	Pump from Basin 1	06-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.5
13-DW10	Pump from Basin 1	06-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.67
13-DW10	Pump from Basin 1	06-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	<0.1
13-DW10	Pump from Basin 1	06-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.75
13-DW10	Pump from Basin 1	06-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	4	0.64
13-DW10	Pump from Basin 1	06-Oct-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.68
13-DW10	Pump from Basin 1	06-Oct-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	---	0.83
13-DW10	Pump from Basin 1	06-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.56
AENV Tier 1 Wildlife Water*				**0.076**	**4.25**	**2.77**	**0.18**	**46.4**	**42.6**	**69**	**36.4**	**NS**	**NS**	**NS**

APPENDIX B1.

WATER QUALITY RESULTS - PUMPED WATER

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Date	Sample time	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylenes mg/L	F1[TT] C_6-C_{10} mg/L	F2 $C_{>10}$-C_{16} mg/L	F3 $C_{>16}$-C_{34} mg/L	F4 $C_{>34}$-C_{50} mg/L	Chloride mg/L	TSS mg/L	Turbidity NTU
13-DW10	Pump from Basin 1	07-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.1	<0.2	<0.2	1.1	---	0.69
13-DW10 dup	Pump from Basin 1	07-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.12	0.22	<0.2	1.2	---	0.64
13-DW10	Pump from Basin 1	07-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.1	<0.2	<0.2	1.1	---	0.76
13-DW10	Pump from Basin 1	07-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.66
13-DW10	Pump from Basin 1	07-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.14	0.23	<0.2	<1	2	0.69
13-DW10	Pump from Basin 1	07-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.86
13-DW10	Pump from Basin 1	07-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.3	---	0.68
13-DW10	Pump from Basin 1	07-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.11	<0.2	<0.2	1.4	---	0.9
13-DW10	Pump from Basin 1	07-Oct-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.2	---	0.74
13-DW10	Pump from Basin 1	07-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.63
13-DW10	Pump from Basin 1	07-Oct-13	7:00	<0.001	<0.001	<0.001	<0.001	<0.2	<0.2	<0.1	<0.1	0.8	<2	0.8
13-DW10	Pump from Basin 1	08-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.3	1.3	0.83
13-DW10	Pump from Basin 1	08-Oct-13	7:00	<0.001	<0.001	<0.001	<0.001	<0.2	<0.2	<0.1	<0.1	0.8	<1	2.4
13-DW10	Pump from Basin 1	08-Oct-13	19:00	<0.0004	<0.002	<0.0004	<0.004	0.16	<0.1	<0.2	<0.2	1.1	---	0.81
13-DW10	Pump from Basin 1	08-Oct-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.12	<0.2	<0.2	1.2	---	0.81
13-DW10	Pump from Basin 1	09-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.3	---	0.81
13-DW10 dup	Pump from Basin 1	09-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	---	0.84
13-DW10	Pump from Basin 1	09-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.2	---	0.88
13-DW10	Pump from Basin 1	09-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.3	---	1.3
13-DW10	Pump from Basin 1	09-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.3	<1	0.55
13-DW10	Pump from Basin 1	09-Oct-13	7:00	<0.001	<0.001	<0.001	<0.001	<0.2	<0.2	<0.1	<0.1	0.8	<1	1.4
13-DW10	Pump from Basin 1	09-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.3	---	0.78
13-DW10	Pump from Basin 1	09-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.2	---	0.81
13-DW10	Pump from Basin 1	09-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.3	---	0.95
13-DW10	Pump from Basin 1	09-Oct-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	1.1
13-DW10	Pump from Basin 1	09-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.3	---	0.87
13-DW10	Pump from Basin 1	10-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.18	0.34	0.23	1.1	---	0.9
13-DW10	Pump from Basin 1	10-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1	---	0.88
13-DW10	Pump from Basin 1	10-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	---	---	---
13-DW10	Pump from Basin 1	10-Oct-13	5:00	---	---	---	---	---	---	---	---	1.1	---	0.82
13-DW10	Pump from Basin 1	10-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.1	0.2	0.23	1	<1	0.85
13-DW10	Pump from Basin 1	10-Oct-13	7:00	<0.001	<0.001	<0.001	<0.001	<0.2	<0.2	<0.1	<0.1	0.8	<2	0.9
13-DW10	Pump from Basin 1	10-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1	---	0.76
13-DW10	Pump from Basin 1	10-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.13	0.22	<0.2	<1	---	0.86
13-DW10	Pump from Basin 1	10-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.13	0.24	<0.2	1	---	0.78
13-DW10	Pump from Basin 1	10-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	<1	0.8
13-DW10	Pump from Basin 1	10-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.16	0.27	<0.2	1.2	---	0.72
13-DW10	Pump from Basin 1	10-Oct-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	---	1
13-DW10	Pump from Basin 1	10-Oct-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.2	---	0.77
13-DW10	Pump from Basin 1	11-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	---	0.68
13-DW10	Pump from Basin 1	11-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	---	0.77
13-DW10	Pump from Basin 1	11-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.13	0.2	<0.2	1.3	---	0.65
13-DW10	Pump from Basin 1	11-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.12	<0.2	<0.2	1.3	---	0.66
13-DW10	Pump from Basin 1	11-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.16	0.32	0.23	1.1	2	0.67
13-DW10	Pump from Basin 1	11-Oct-13	7:00	<0.001	<0.001	<0.001	<0.001	<0.2	<0.2	<0.1	<0.1	0.7	<1	1.3
13-DW10	Pump from Basin 1	11-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.2	0.38	0.26	1.3	---	0.67
13-DW10	Pump from Basin 1	11-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	0.21	<0.2	1.3	---	0.67
13-DW10 dup	Pump from Basin 1	11-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	0.2	<0.2	1.3	---	0.61
13-DW10	Pump from Basin 1	11-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	0.65	<0.1	<0.2	<0.2	<1	1.3	0.59
13-DW10	Pump from Basin 1	11-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	0.63	<0.1	<0.2	<0.2	1.2	---	0.63
13-DW10	Pump from Basin 1	11-Oct-13	19:00	<0.0004	<0.002	<0.0004	<0.004	0.47	<0.1	<0.2	<0.2	<1	---	0.82
13-DW10	Pump from Basin 1	11-Oct-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1	---	0.61
13-DW10	Pump from Basin 1	11-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	---	0.7
13-DW10	Pump from Basin 1	12-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.2	---	0.62
AENV Tier 1 Wildlife Water*				**0.076**	**4.25**	**2.77**	**0.18**	**46.4**	**42.6**	**69**	**36.4**	**NS**	**NS**	**NS**

APPENDIX B1.

WATER QUALITY RESULTS - PUMPED WATER

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Date	Sample time	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylenes mg/L	F1[TT] C_6-C_{10} mg/L	F2 $C_{>10}$-C_{16} mg/L	F3 $C_{>16}$-C_{34} mg/L	F4 $C_{>34}$-C_{50} mg/L	Chloride mg/L	TSS mg/L	Turbidity NTU
13-DW10	Pump from Basin 1	12-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.14	0.23	<0.2	1	---	0.86
13-DW10 dup	Pump from Basin 1	12-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.19	0.35	0.21	<1	---	0.85
13-DW10	Pump from Basin 1	12-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	0.11	<0.1	<0.2	<0.2	1.1	---	0.69
13-DW10	Pump from Basin 1	12-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	0.45	0.19	0.37	0.25	1.1	<1	1
13-DW10	Pump from Basin 1	12-Oct-13	7:00	<0.001	<0.001	<0.001	<0.001	<0.2	<0.2	<0.1	<0.1	0.9	<2	1.2
13-DW10	Pump from Basin 1	12-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.2	0.45	0.32	1.1	---	1
13-DW10	Pump from Basin 1	12-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.16	0.48	<0.2	<1	<1	0.7
13-DW10	Pump from Basin 1	12-Oct-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.92
13-DW10	Pump from Basin 1	12-Oct-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	1
13-DW10	Pump from Basin 1	12-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.72
13-DW10	Pump from Basin 1	13-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.58
13-DW10 dup	Pump from Basin 1	13-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.83
13-DW10	Pump from Basin 1	13-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	1
13-DW10	Pump from Basin 1	13-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	1.1
13-DW10	Pump from Basin 1	13-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	1.3	0.81
13-DW10	Pump from Basin 1	13-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.72
13-DW10	Pump from Basin 1	13-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	1
13-DW10	Pump from Basin 1	13-Oct-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	2	0.99
13-DW10	Pump from Basin 1	14-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.67
13-DW10A	Basin 1 Discharge into Storage Tank	25-Oct-13	14:51	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.1	0.39	<0.2	1.6	4	5.5
13-DW11	E Overland discharge from Basin 1	28-Sep-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	3.3	0.78
13-DW11	E Overland discharge from Basin 1	29-Sep-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	0.27	<0.2	<1	<1	0.65
13-DW11	E Overland discharge from Basin 1	30-Sep-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	1.3	0.69
13-DW11	E Overland discharge from Basin 1	30-Sep-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	2	0.65
13-DW11	E Overland discharge from Basin 1	01-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	1.3	0.49
13-DW11	E Overland discharge from Basin 1	01-Oct-13	15:00	0.00043	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.52
13-DW11	E Overland discharge from Basin 1	01-Oct-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	---	---	---
13-DW11	E Overland discharge from Basin 1	02-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.57
13-DW12	W Overland discharge from Basin 1	28-Sep-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.2	<1	0.87
13-DW12	W Overland discharge from Basin 1	29-Sep-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.63
13-DW12	W Overland discharge from Basin 1	30-Sep-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	1.3	0.7
13-DW12	W Overland discharge from Basin 1	30-Sep-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.62
13-DW12	W Overland discharge from Basin 1	01-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	2.7	0.51
13-DW12	W Overland discharge from Basin 1	01-Oct-13	15:00	0.00055	<0.002	0.00047	<0.004	<0.1	<0.1	<0.2	<0.2	<1	3.3	0.5
13-DW12	W Overland discharge from Basin 1	02-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	1.3	0.55
13-DW20	Pump from Basin 2	28-Sep-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.13	<0.2	<0.2	<2.0	---	0.68
13-DW20	Pump from Basin 2	28-Sep-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<2.0	---	0.68
13-DW20	Pump from Basin 2	28-Sep-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.1	<0.2	<0.2	<2.0	---	0.63
13-DW20	Pump from Basin 2	28-Sep-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.4	---	0.61
13-DW20	Pump from Basin 2	28-Sep-13	9:00	<0.0004	<0.002	<0.0004	<0.004	0.1	<0.1	<0.2	<0.2	<1	2	0.63
13-DW20	Pump from Basin 2	28-Sep-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.2	---	0.67
13-DW20	Pump from Basin 2	28-Sep-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.11	<0.2	<0.2	1.1	---	0.63
13-DW20	Pump from Basin 2	28-Sep-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.2	---	0.64
13-DW20	Pump from Basin 2	28-Sep-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1	2	0.66
13-DW20	Pump from Basin 2	28-Sep-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	3.3	0.71
13-DW20	Pump from Basin 2	28-Sep-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	1.3	0.57
13-DW20	Pump from Basin 2	28-Sep-13	23:00	---	---	---	---	---	---	---	---	---	---	---
13-DW20	Pump from Basin 2	29-Sep-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.62
13-DW20	Pump from Basin 2	29-Sep-13	3:00	<0.0004	<0.002	<0.0004	<0.004	0.35	<0.1	<0.2	<0.2	<1	---	0.74
13-DW20	Pump from Basin 2	29-Sep-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	---	0.73
13-DW20	Pump from Basin 2	29-Sep-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.12	0.22	<0.2	<1	---	0.67
13-DW20	Pump from Basin 2	29-Sep-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.76
13-DW20	Pump from Basin 2	30-Sep-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	2	0.88
13-DW20	Pump from Basin 2	30-Sep-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	---	0.61
AENV Tier 1 Wildlife Water*				**0.076**	**4.25**	**2.77**	**0.18**	**46.4**	**42.6**	**69**	**36.4**	**NS**	**NS**	**NS**

APPENDIX B1.

WATER QUALITY RESULTS - PUMPED WATER

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Date	Sample time	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylenes mg/L	F1[TT] C_6-C_{10} mg/L	F2 $C_{>10}$-C_{16} mg/L	F3 $C_{>16}$-C_{34} mg/L	F4 $C_{>34}$-C_{50} mg/L	Chloride mg/L	TSS mg/L	Turbidity NTU
13-DW20	Pump from Basin 2	30-Sep-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	---	0.58
13-DW20	Pump from Basin 2	01-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.3	---	0.53
13-DW20	Pump from Basin 2	01-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	---	1.1
13-DW20	Pump from Basin 2	01-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.61
13-DW20 dup	Pump from Basin 2	01-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1	3.3	0.65
13-DW20	Pump from Basin 2	01-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	0.48	<0.1	<0.2	<0.2	1.1	---	0.58
13-DW20	Pump from Basin 2	01-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	---	0.70
13-DW20	Pump from Basin 2	01-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	4	0.64
13-DW20	Pump from Basin 2	01-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.92
13-DW20	Pump from Basin 2	01-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.65
13-DW20	Pump from Basin 2	01-Oct-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.62
13-DW20	Pump from Basin 2	01-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.2	---	0.61
13-DW20	Pump from Basin 2	02-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.76
13-DW20	Pump from Basin 2	02-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	1.1
13-DW20	Pump from Basin 2	02-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.65
13-DW20	Pump from Basin 2	02-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.76
13-DW20	Pump from Basin 2	02-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.68
13-DW20	Pump from Basin 2	02-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.64
13-DW20	Pump from Basin 2	02-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	0.12	<0.1	<0.2	<0.2	<1	---	0.71
13-DW20	Pump from Basin 2	02-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.63
13-DW20	Pump from Basin 2	03-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.14	<0.2	0.4	<1	<1	0.58
13-DW20	Pump from Basin 2	03-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.6
13-DW20	Pump from Basin 2	04-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.4	47	12
13-DW20	Pump from Basin 2	05-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	0.27	<0.2	---	---	---
13-DW20	Pump from Basin 2	05-Oct-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	0.27	<0.2	1.2	2.7	1.9
13-DW20	Pump from Basin 2	06-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	0.21	<0.2	<1	2.7	0.85
13-DW20	Pump from Basin 2	07-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.2	1.3	0.83
13-DW20	Pump from Basin 2	08-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1	<1	0.53
13-DW20	Pump from Basin 2	08-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	0.32	<0.2	1.1	<1	0.6
13-DW20	Pump from Basin 2	09-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.3	<1	0.64
13-DW20	Pump from Basin 2	09-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.3	<1	0.62
13-DW20	Pump from Basin 2	11-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.3	---	0.77
13-DW20	Pump from Basin 2	11-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	0.98	0.1	0.22	<0.2	1.3	---	2.9
13-DW20	Pump from Basin 2	11-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.3	2	0.77
13-DW20	Pump from Basin 2	11-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	0.98	0.1	0.22	<0.2	1.3	12	2.9
13-DW20	Pump from Basin 2	12-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	0.11	<0.1	<0.2	<0.2	1	1.3	1.1
13-DW20	Pump from Basin 2	12-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.23	0.7	<0.2	1.2	6.7	6.8
13-DW20	Pump from Basin 2	13-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	1.6	5.2	2.1	<1	7.3	0.97
13-DW21	Basin 2 Discharge Line before Filtration	28-Sep-13	11:00	<0.0004	<0.002	<0.0004	<0.004	0.12	0.11	<0.2	<0.2	<1	<1	0.65
13-DW21	Basin 2 Discharge Line before Filtration	28-Sep-13	23:00	---	---	---	---	---	---	---	---	---	---	---
13-DW21	Basin 2 Discharge Line before Filtration	29-Sep-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.1	<0.2	<0.2	2.7	72	22
13-DW21	Basin 2 Discharge Line before Filtration	01-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	---	---	---
13-DW21	Basin 2 Discharge Line before Filtration	01-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.9	---	13
13-DW21	Basin 2 Discharge Line before Filtration	01-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	1.3
13-DW21	Basin 2 Discharge Line before Filtration	02-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.73
13-DW21	Basin 2 Discharge Line before Filtration	02-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	1.1
13-DW21	Basin 2 Discharge Line before Filtration	05-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.59
13-DW21	Basin 2 Discharge Line before Filtration	06-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	0.22	<0.2	<1	1.3	1.1
13-DW21	Basin 2 Discharge Line before Filtration	07-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	1.3	0.59
13-DW21	Basin 1 Discharge Line before Filtration	14-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.16	0.35	0.34	---	---	---
13-DW21	Basin 1 Discharge Line before Filtration	17-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	4	0.93
13-DW21	Basin 1 Discharge Line before Filtration	17-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.2	<1	0.97
13-DW21	Basin 1 Discharge Line before Filtration	18-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.5	<1	0.78
13-DW21	Basin 1 Discharge Line before Filtration	19-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	0.89	0.23	1.4	2	1.4
13-DW21	Basin 1 Discharge Line before Filtration	19-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	0.24	<0.2	1.5	11	5.4
13-DW21	Basin 1 Discharge Line before Filtration	20-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	---	---	---	---	---	---
AENV Tier 1 Wildlife Water*				**0.076**	**4.25**	**2.77**	**0.18**	**46.4**	**42.6**	**69**	**36.4**	**NS**	**NS**	**NS**

APPENDIX B1.

WATER QUALITY RESULTS - PUMPED WATER

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Date	Sample time	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylenes mg/L	F1[TT] C_6-C_{10} mg/L	F2 $C_{>10}$-C_{16} mg/L	F3 $C_{>16}$-C_{34} mg/L	F4 $C_{>34}$-C_{50} mg/L	Chloride mg/L	TSS mg/L	Turbidity NTU
13-DW21a	Basin 1 Discharge Line before Filtration	21-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	---	---	---	---	---	---
13-DW21a	Basin 1 Discharge Line before Filtration	21-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	19	5.3
13-DW22	Basin 2 Discharge Line after Filtration	28-Sep-13	11:00	<0.0004	<0.002	<0.0004	<0.004	0.19	0.13	<0.2	<0.2	<1	2	0.58
13-DW22	Basin 2 Discharge Line after Filtration	28-Sep-13	23:00	---	---	---	---	---	---	---	---	---	---	---
13-DW22	Basin 2 Discharge Line after Filtration	29-Sep-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1	<1	0.66
13-DW22	Basin 2 Discharge Line after Filtration	01-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	---	---	---
13-DW22	Basin 2 Discharge Line after Filtration	01-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1	---	3.8
13-DW22	Basin 2 Discharge Line after Filtration	01-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	2.3
13-DW22	Basin 2 Discharge Line after Filtration	02-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.65
13-DW22	Basin 2 Discharge Line after Filtration	02-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.76
13-DW22	Basin 2 Discharge Line after Filtration	14-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	0.25	<0.2	---	---	---
13-DW23	Basin 2 Discharge Line after Carbon Treatment	28-Sep-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	0.29	<0.2	9.4	---	2.7
13-DW23	Basin 2 Discharge Line after Carbon Treatment	28-Sep-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	2.7	---	1.10
13-DW23	Basin 2 Discharge Line after Carbon Treatment	28-Sep-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<2.0	---	0.65
13-DW23	Basin 2 Discharge Line after Carbon Treatment	28-Sep-13	7:00	<0.0004	<0.002	<0.0004	<0.004	0.17	<0.1	<0.2	<0.2	1.3	---	1
13-DW23	Basin 2 Discharge Line after Carbon Treatment	28-Sep-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.58
13-DW23	Basin 2 Discharge Line after Carbon Treatment	28-Sep-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	3.3	0.55
13-DW23	Basin 2 Discharge Line after Carbon Treatment	28-Sep-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.65
13-DW23	Basin 2 Discharge Line after Carbon Treatment	28-Sep-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.67
13-DW23	Basin 2 Discharge Line after Carbon Treatment	28-Sep-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	1.3	0.67
13-DW23	Basin 2 Discharge Line after Carbon Treatment	28-Sep-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.52
13-DW23	Basin 2 Discharge Line after Carbon Treatment	28-Sep-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.69
13-DW23	Basin 2 Discharge Line after Carbon Treatment	29-Sep-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.47
13-DW23 dup	Basin 2 Discharge Line after Carbon Treatment	29-Sep-13	1:00	<0.0004	<0.002	<0.0004	<0.004	0.14	<0.1	<0.2	<0.2	<1	---	0.47
13-DW23	Basin 2 Discharge Line after Carbon Treatment	29-Sep-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.48
13-DW23	Basin 2 Discharge Line after Carbon Treatment	29-Sep-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.53
13-DW23	Basin 2 Discharge Line after Carbon Treatment	29-Sep-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.52
13-DW23	Basin 2 Discharge Line after Carbon Treatment	29-Sep-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	1.3	0.49
13-DW23	Basin 2 Discharge Line after Carbon Treatment	30-Sep-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1	---	0.84
13-DW23	Basin 2 Discharge Line after Carbon Treatment	30-Sep-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.63
13-DW23	Basin 2 Discharge Line after Carbon Treatment	01-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	---	0.84
13-DW23	Basin 2 Discharge Line after Carbon Treatment	01-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.84
13-DW23	Basin 2 Discharge Line after Carbon Treatment	01-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.83
13-DW23	Basin 2 Discharge Line after Carbon Treatment	01-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	0.1	<0.1	<0.2	<0.2	<1	---	0.93
13-DW23	Basin 2 Discharge Line after Carbon Treatment	01-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	1.1
13-DW23	Basin 2 Discharge Line after Carbon Treatment	01-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	1.3	0.95
13-DW23	Basin 2 Discharge Line after Carbon Treatment	01-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.97
13-DW23	Basin 2 Discharge Line after Carbon Treatment	01-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	1.3	0.98
13-DW23	Basin 2 Discharge Line after Carbon Treatment	01-Oct-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.77
13-DW23	Basin 2 Discharge Line after Carbon Treatment	01-Oct-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.93
13-DW23	Basin 2 Discharge Line after Carbon Treatment	01-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	---	0.7
13-DW23	Basin 2 Discharge Line after Carbon Treatment	02-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.98
13-DW23	Basin 2 Discharge Line after Carbon Treatment	02-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.82
13-DW23	Basin 2 Discharge Line after Carbon Treatment	02-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.84
13-DW23	Basin 2 Discharge Line after Carbon Treatment	02-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	1
13-DW23	Basin 2 Discharge Line after Carbon Treatment	02-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.82
13-DW23 dup	Basin 2 Discharge Line after Carbon Treatment	02-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.82
13-DW23	Basin 2 Discharge Line after Carbon Treatment	02-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	1.3	0.82
13-DW23	Basin 2 Discharge Line after Carbon Treatment	02-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.77
13-DW23	Basin 2 Discharge Line after Carbon Treatment	02-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	1.1
13-DW23	Basin 2 Discharge Line after Carbon Treatment	03-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.86
13-DW23	Basin 2 Discharge Line after Carbon Treatment	03-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	1
13-DW23	Basin 2 Discharge Line after Carbon Treatment	03-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.93
13-DW23	Basin 2 Discharge Line after Carbon Treatment	04-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.84
13-DW23	Basin 2 Discharge Line after Carbon Treatment	04-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.83
13-DW23	Basin 2 Discharge Line after Carbon Treatment	05-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.72
AENV Tier 1 Wildlife Water*				**0.076**	**4.25**	**2.77**	**0.18**	**46.4**	**42.6**	**69**	**36.4**	**NS**	**NS**	**NS**

APPENDIX B1.

WATER QUALITY RESULTS - PUMPED WATER

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Date	Sample time	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylenes mg/L	F1[TT] C_6-C_{10} mg/L	F2 $C_{>10}$-C_{16} mg/L	F3 $C_{>16}$-C_{34} mg/L	F4 $C_{>34}$-C_{50} mg/L	Chloride mg/L	TSS mg/L	Turbidity NTU
13-DW23	Basin 2 Discharge Line after Carbon Treatment	05-Oct-13	11:00	---	---	---	---	---	---	---	---	<1	1.3	2.2
13-DW23	Basin 2 Discharge Line after Carbon Treatment	05-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	1.3
13-DW23	Basin 2 Discharge Line after Carbon Treatment	05-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.75
13-DW23	Basin 2 Discharge Line after Carbon Treatment	06-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	0.22	<0.2	<1	<1	0.88
13-DW23	Basin 2 Discharge Line after Carbon Treatment	06-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	1.3	0.9
13-DW23	Basin 2 Discharge Line after Carbon Treatment	06-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	1.3	2
13-DW23	Basin 2 Discharge Line after Carbon Treatment	06-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.91
13-DW23	Basin 2 Discharge Line after Carbon Treatment	07-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.77
13-DW23	Basin 2 Discharge Line after Carbon Treatment	07-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1	<1	0.98
13-DW23	Basin 2 Discharge Line after Carbon Treatment	07-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1	<1	0.89
13-DW23	Basin 2 Discharge Line after Carbon Treatment	07-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	1.3	1.6
13-DW23	Basin 2 Discharge Line after Carbon Treatment	08-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.77
13-DW23	Basin 2 Discharge Line after Carbon Treatment	08-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	1.3	1.1
13-DW23	Basin 2 Discharge Line after Carbon Treatment	08-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.18	0.21	0.24	<1	<1	0.9
13-DW23	Basin 2 Discharge Line after Carbon Treatment	08-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.15	<0.2	<0.2	1.1	<1	0.81
13-DW23	Basin 2 Discharge Line after Carbon Treatment	09-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.2	<1	0.86
13-DW23	Basin 2 Discharge Line after Carbon Treatment	09-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.95
13-DW23	Basin 2 Discharge Line after Carbon Treatment	09-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.2	<1	0.82
13-DW23	Basin 2 Discharge Line after Carbon Treatment	09-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	<1	0.81
13-DW23	Basin 2 Discharge Line after Carbon Treatment	10-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	1.7
13-DW23	Basin 2 Discharge Line after Carbon Treatment	11-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.13	0.22	<0.2	<1	<1	1
13-DW23	Basin 2 Discharge Line after Carbon Treatment	11-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	---	0.99
13-DW23	Basin 2 Discharge Line after Carbon Treatment	11-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	0.22	<0.2	1.1	---	0.72
13-DW23	Basin 2 Discharge Line after Carbon Treatment	11-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	1.3	<0.1	<0.2	<0.2	<1	---	1
13-DW23	Basin 2 Discharge Line after Carbon Treatment	11-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.13	0.22	<0.2	<1	---	1
13-DW23	Basin 2 Discharge Line after Carbon Treatment	11-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	2	0.99
13-DW23	Basin 2 Discharge Line after Carbon Treatment	11-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	0.22	<0.2	1.1	1.3	0.72
13-DW23	Basin 2 Discharge Line after Carbon Treatment	11-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	1.3	<0.1	<0.2	<0.2	<1	1.3	1
13-DW23	Basin 2 Discharge Line after Carbon Treatment	11-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.16	0.25	<0.2	1	<1	1
13-DW23	Basin 2 Discharge Line after Carbon Treatment	12-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	<1	0.93
13-DW23	Basin 2 Discharge Line after Carbon Treatment	12-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.16	0.33	0.25	1.3	1.3	6.9
13-DW23	Basin 2 Discharge Line after Carbon Treatment	12-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.14	0.27	<0.2	<1	<1	1.7
13-DW23	Basin 2 Discharge Line after Carbon Treatment	12-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	---	---	---
13-DW23	Basin 2 Discharge Line after Carbon Treatment	12-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	1.3	0.74
13-DW23	Basin 2 Discharge Line after Carbon Treatment	13-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	1.3
13-DW23	Basin 2 Discharge Line after Carbon Treatment	13-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	3.3	0.77
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	13-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.98
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	13-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.74
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	13-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	---	---	---
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	13-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.86
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	13-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.17	<0.27	<0.36	<1	---	0.47
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	13-Oct-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.13	<0.2	<0.26	<1	---	0.82
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	13-Oct-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.81
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	13-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.78
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	14-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.69
13-DW23a dup	Basin 1 Discharge Line after Carbon Treatment	14-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.79
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	14-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.75
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	14-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.65
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	14-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	1.3	1.4
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	14-Oct-13	7:00	<0.001	<0.001	<0.001	<0.001	<0.2	<0.2	<0.1	<0.1	0.8	<1	2.5
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	14-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	1
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	16-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	2.9
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	16-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	1.1
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	16-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	2
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	16-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	1.2
AENV Tier 1 Wildlife Water*				**0.076**	**4.25**	**2.77**	**0.18**	**46.4**	**42.6**	**69**	**36.4**	**NS**	**NS**	**NS**

APPENDIX B1.

WATER QUALITY RESULTS - PUMPED WATER

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Date	Sample time	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylenes mg/L	F1[TT] C_6-C_{10} mg/L	F2 $C_{>10}$-C_{16} mg/L	F3 $C_{>16}$-C_{34} mg/L	F4 $C_{>34}$-C_{50} mg/L	Chloride mg/L	TSS mg/L	Turbidity NTU
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	17-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	---	2
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	17-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.2	---	1.6
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	17-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.3	<1	1.1
13-DW23a dup	Basin 1 Discharge Line after Carbon Treatment	17-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.2	<1	1
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	17-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.3	---	1.1
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	17-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.4	<1	0.84
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	17-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.2	---	1
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	18-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.4	---	1.5
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	18-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.5	<1	1.4
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	18-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.4	---	0.98
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	18-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.2	---	1.8
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	18-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	0.22	<0.2	1.3	<1	1.3
13-DW23a dup	Basin 1 Discharge Line after Carbon Treatment	18-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.2	---	0.8
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	19-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.2	---	0.81
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	19-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.5	<1	3.1
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	19-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.5	---	1.2
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	19-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	1.4
13-DW23a dup	Basin 1 Discharge Line after Carbon Treatment	19-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.3	---	1.5
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	19-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.3	2.0	1.5
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	19-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.3	---	1.3
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	20-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	0.22	1.0	2.0	8.0
13-DW23a dup	Basin 1 Discharge Line after Carbon Treatment	20-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	<1	7.2
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	20-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	0.56	<0.2	1.3	---	2.6
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	21-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	2.8
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	21-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	2.7	1.6
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	21-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	4.4
13-DW23a dup	Basin 1 Discharge Line after Carbon Treatment	21-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	4.0	2.4
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	21-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	---	1.9
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	21-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	4.7	1.1
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	21-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	0.18	<0.1	<0.2	<0.2	<1	---	1.6
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	22-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	---	2.4
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	22-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	0.25	<0.2	1.3	<1	2.1
13-DW25	E Overland Discharge from Basin 2	28-Sep-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<2.0	1.3	0.71
13-DW25	E Overland Discharge from Basin 2	28-Sep-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.49
13-DW25	E Overland Discharge from Basin 2	01-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	2.7	0.95
13-DW25 dup	E Overland Discharge from Basin 2	01-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	2.7	0.96
13-DW25	E Overland Discharge from Basin 2	01-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	1.3	1
13-DW25	E Overland Discharge from Basin 2	02-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	1.3	0.82
13-DW30	Pump from Basin 3 (North)	27-Sep-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<2.0	---	---
13-DW30	Pump from Basin 3 (North)	28-Sep-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<2.0	---	0.66
13-DW30 dup	Pump from Basin 3 (North)	28-Sep-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<2.0	---	0.66
13-DW30	Pump from Basin 3 (North)	28-Sep-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<2.0	---	0.67
13-DW30	Pump from Basin 3 (North)	28-Sep-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<2.0	---	0.66
13-DW30	Pump from Basin 3 (North)	28-Sep-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.65
13-DW30	Pump from Basin 3 (North)	28-Sep-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	1.3	0.7
13-DW30	Pump from Basin 3 (North)	28-Sep-13	11:00	<0.0004	<0.002	<0.0004	<0.004	0.13	<0.1	<0.2	<0.2	<1	---	0.67
13-DW30	Pump from Basin 3 (North)	28-Sep-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.83
13-DW30	Pump from Basin 3 (North)	28-Sep-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.61
13-DW30	Pump from Basin 3 (North)	28-Sep-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	1.3	0.68
13-DW30	Pump from Basin 3 (North)	28-Sep-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	2.7	0.9
13-DW30	Pump from Basin 3 (North)	28-Sep-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.72
13-DW30	Pump from Basin 3 (North)	28-Sep-13	23:00	---	---	---	---	---	---	---	---	<1	---	1.00
13-DW30	Pump from Basin 3 (North)	29-Sep-13	1:00	<0.0004	<0.002	<0.0004	<0.004	0.13	<0.1	<0.2	<0.2	<1	---	0.99
13-DW30	Pump from Basin 3 (North)	29-Sep-13	3:00	<0.0004	<0.002	<0.0004	<0.004	0.11	<0.1	<0.2	<0.2	<1	---	0.66
13-DW30	Pump from Basin 3 (North)	29-Sep-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.83
13-DW30	Pump from Basin 3 (North)	29-Sep-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	2	0.69
AENV Tier 1 Wildlife Water*				**0.076**	**4.25**	**2.77**	**0.18**	**46.4**	**42.6**	**69**	**36.4**	**NS**	**NS**	**NS**

APPENDIX B1.

WATER QUALITY RESULTS - PUMPED WATER

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Date	Sample time	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylenes mg/L	F1[††] C_6-C_{10} mg/L	F2 $C_{>10}$-C_{16} mg/L	F3 $C_{>16}$-C_{34} mg/L	F4 $C_{>34}$-C_{50} mg/L	Chloride mg/L	TSS mg/L	Turbidity NTU
13-DW30	Pump from Basin 3 (North)	29-Sep-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.71
13-DW30 dup	Pump from Basin 3 (North)	29-Sep-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1	---	0.78
13-DW30	Pump from Basin 3 (North)	29-Sep-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	2	0.78
13-DW30	Pump from Basin 3 (North)	29-Sep-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.66
13-DW30	Pump from Basin 3 (North)	29-Sep-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	1.1
13-DW30	Pump from Basin 3 (North)	29-Sep-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	---	---	---
13-DW30	Pump from Basin 3 (North)	29-Sep-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	2	0.66
13-DW30	Pump from Basin 3 (North)	29-Sep-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	1.3	0.74
13-DW30	Pump from Basin 3 (North)	29-Sep-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	1.3	0.77
13-DW30	Pump from Basin 3 (North)	30-Sep-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	1.3	0.61
13-DW30	Pump from Basin 3 (North)	30-Sep-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	2.7	0.67
13-DW30	Pump from Basin 3 (North)	30-Sep-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	1.50
13-DW30	Pump from Basin 3 (North)	30-Sep-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	1.3	0.69
13-DW30	Pump from Basin 3 (North)	30-Sep-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	1.40
13-DW30	Pump from Basin 3 (North)	30-Sep-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.65
13-DW30	Pump from Basin 3 (North)	30-Sep-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.71
13-DW30	Pump from Basin 3 (North)	30-Sep-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	---	---	---
13-DW30	Pump from Basin 3 (North)	30-Sep-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1	---	0.71
13-DW30	Pump from Basin 3 (North)	01-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1	---	0.61
13-DW30	Pump from Basin 3 (North)	01-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.67
13-DW30	Pump from Basin 3 (North)	01-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.61
13-DW30	Pump from Basin 3 (North)	01-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	1.3	0.64
13-DW30	Pump from Basin 3 (North)	01-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.6
13-DW30	Pump from Basin 3 (North)	01-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.55
13-DW30	Pump from Basin 3 (North)	01-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	4	1.4
13-DW30	Pump from Basin 3 (North)	01-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.57
13-DW30	Pump from Basin 3 (North)	01-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.6
13-DW30	Pump from Basin 3 (North)	01-Oct-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.61
13-DW30	Pump from Basin 3 (North)	01-Oct-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.59
13-DW30	Pump from Basin 3 (North)	01-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.58
13-DW30	Pump from Basin 3 (North)	02-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	0.37	<0.1	<0.2	<0.2	<1	---	0.64
13-DW30	Pump from Basin 3 (North)	02-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.51
13-DW30	Pump from Basin 3 (North)	02-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	0.13	<0.1	<0.2	<0.2	<1	---	0.55
13-DW30	Pump from Basin 3 (North)	02-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	0.26	<0.1	<0.2	<0.2	<1	---	0.54
13-DW30	Pump from Basin 3 (North)	02-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	1.3	0.55
13-DW30	Pump from Basin 3 (North)	02-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.53
13-DW30	Pump from Basin 3 (North)	02-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.56
13-DW30	Pump from Basin 3 (North)	02-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.53
13-DW30	Pump from Basin 3 (North)	02-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.53
13-DW30	Pump from Basin 3 (North)	02-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.52
13-DW30	Pump from Basin 3 (North)	02-Oct-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.51
13-DW30	Pump from Basin 3 (North)	02-Oct-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.57
13-DW30	Pump from Basin 3 (North)	02-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	---	---	---
13-DW30	Pump from Basin 3 (North)	03-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.56
13-DW30	Pump from Basin 3 (North)	03-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	---	---	---
13-DW30	Pump from Basin 3 (North)	03-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.51
13-DW30	Pump from Basin 3 (North)	03-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.49
13-DW30	Pump from Basin 3 (North)	03-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.56
13-DW30	Pump from Basin 3 (North)	03-Oct-13	9:00	---	---	---	---	---	---	---	---	<1	---	0.51
13-DW30	Pump from Basin 3 (North)	03-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.5
13-DW30 dup	Pump from Basin 3 (North)	03-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	---	---	---
13-DW30	Pump from Basin 3 (North)	03-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	0.1	<0.1	<0.2	<0.2	<1	---	0.51
13-DW30	Pump from Basin 3 (North)	03-Oct-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.82
13-DW30	Pump from Basin 3 (North)	03-Oct-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.53
13-DW30	Pump from Basin 3 (North)	04-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.54
13-DW30 dup	Pump from Basin 3 (North)	04-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.63
13-DW30	Pump from Basin 3 (North)	04-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.75
AENV Tier 1 Wildlife Water*				**0.076**	**4.25**	**2.77**	**0.18**	**46.4**	**42.6**	**69**	**36.4**	**NS**	**NS**	**NS**

APPENDIX B1.

WATER QUALITY RESULTS - PUMPED WATER

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Date	Sample time	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylenes mg/L	F1[††] C_6-C_{10} mg/L	F2 $C_{>10}$-C_{16} mg/L	F3 $C_{>16}$-C_{34} mg/L	F4 $C_{>34}$-C_{50} mg/L	Chloride mg/L	TSS mg/L	Turbidity NTU
13-DW30	Pump from Basin 3 (North)	04-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.52
13-DW30	Pump from Basin 3 (North)	05-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	---	---	---
13-DW30	Pump from Basin 3 (North)	06-Oct-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.53
13-DW30a	Pump from Basin 3 (North)	29-Sep-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	2.7	0.89
13-DW30a	Pump from Basin 3 (North)	29-Sep-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	2	1.6
13-DW30a	Pump from Basin 3 (North)	30-Sep-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	1.3	0.72
13-DW30a	Pump from Basin 3 (North)	30-Sep-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	1.3	0.89
13-DW30a	Pump from Basin 3 (North)	30-Sep-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	1.3	2.7
13-DW30a	Pump from Basin 3 (North)	30-Sep-13	7:00	<0.0004	<0.002	<0.0004	<0.004	0.18	<0.1	<0.2	<0.2	<1	1.3	1.6
13-DW30a	Pump from Basin 3 (North)	30-Sep-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.57
13-DW30a	Pump from Basin 3 (North)	30-Sep-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.75
13-DW30a dup	Pump from Basin 3 (North)	30-Sep-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	1.1
13-DW30a	Pump from Basin 3 (North)	30-Sep-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.6
13-DW30a	Pump from Basin 3 (North)	30-Sep-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1	---	0.82
13-DW30a	Pump from Basin 3 (North)	01-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	1.6
13-DW30a	Pump from Basin 3 (North)	01-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.77
13-DW30a	Pump from Basin 3 (North)	01-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.72
13-DW30a	Pump from Basin 3 (North)	01-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	0.17	<0.1	<0.2	<0.2	<1	<1	1.2
13-DW30a	Pump from Basin 3 (North)	01-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.53
13-DW30a	Pump from Basin 3 (North)	01-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.76
13-DW30a	Pump from Basin 3 (North)	01-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.52
13-DW30a	Pump from Basin 3 (North)	01-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.53
13-DW30a	Pump from Basin 3 (North)	01-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.56
13-DW30a	Pump from Basin 3 (North)	01-Oct-13	19:00	<0.0004	<0.002	<0.0004	<0.004	0.12	<0.1	<0.2	<0.2	<1	---	0.54
13-DW30a	Pump from Basin 3 (North)	01-Oct-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	1
13-DW30a	Pump from Basin 3 (North)	01-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.71
13-DW30a	Pump from Basin 3 (North)	02-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.56
13-DW30a	Pump from Basin 3 (North)	02-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.56
13-DW30a	Pump from Basin 3 (North)	02-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	0.11	<0.1	<0.2	<0.2	<1	---	0.53
13-DW30a	Pump from Basin 3 (North)	02-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.7	1.3	0.58
13-DW30a	Pump from Basin 3 (North)	02-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.52
13-DW30a	Pump from Basin 3 (North)	02-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.51
13-DW30a	Pump from Basin 3 (North)	02-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.63
13-DW30a	Pump from Basin 3 (North)	02-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	0.11	<0.1	<0.2	<0.2	<1	---	0.6
13-DW30a	Pump from Basin 3 (North)	02-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.52
13-DW30a	Pump from Basin 3 (North)	02-Oct-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	1.3
13-DW30a	Pump from Basin 3 (North)	02-Oct-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.54
13-DW30a	Pump from Basin 3 (North)	02-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	---	---	---
13-DW30a	Pump from Basin 3 (North)	03-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.56
13-DW30a	Pump from Basin 3 (North)	03-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.54
13-DW30a	Pump from Basin 3 (North)	03-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.53
13-DW30a	Pump from Basin 3 (North)	03-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.52
13-DW30a	Pump from Basin 3 (North)	03-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.5
13-DW30a	Pump from Basin 3 (North)	03-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.5
13-DW30a	Pump from Basin 3 (North)	03-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.14	0.26	<0.2	<1	---	0.48
13-DW30a	Pump from Basin 3 (North)	05-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.54
13-DW30a dup	Pump from Basin 3 (North)	05-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.77
13-DW30a	Pump from Basin 3 (North)	06-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.61
13-DW30a	Pump from Basin 3 (North)	07-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.61
13-DW30a	Pump from Basin 3 (North)	13-Oct-13	15:00	---	---	---	---	---	---	---	---	<1	---	0.76
13-DW30a	Pump from Basin 3 (North)	14-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	---	---	---
13-DW30c	Pump from Basin 3 (North)	04-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.60
13-DW30c	Pump from Basin 3 (North)	04-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	2	0.51
13-DW30c	Pump from Basin 3 (North)	04-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.51
13-DW30c	Pump from Basin 3 (North)	04-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.64
AENV Tier 1 Wildlife Water*				**0.076**	**4.25**	**2.77**	**0.18**	**46.4**	**42.6**	**69**	**36.4**	**NS**	**NS**	**NS**

APPENDIX B1.

WATER QUALITY RESULTS - PUMPED WATER

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Date	Sample time	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylenes mg/L	F1[TT] C_6-C_{10} mg/L	F2 $C_{>10}$-C_{16} mg/L	F3 $C_{>16}$-C_{34} mg/L	F4 $C_{>34}$-C_{50} mg/L	Chloride mg/L	TSS mg/L	Turbidity NTU
13-DW30c	Pump from Basin 3 (North)	04-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.67
13-DW30c	Pump from Basin 3 (North)	04-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.49
13-DW30c	Pump from Basin 3 (North)	04-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	0.12	<0.1	<0.2	<0.2	<1	---	0.47
13-DW30c	Pump from Basin 3 (North)	04-Oct-13	17:00	<0.001	<0.001	<0.001	<0.001	<0.2	<0.2	<0.1	<0.1	0.5	<1	1.5
13-DW30c	Pump from Basin 3 (North)	04-Oct-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.72
13-DW30c	Pump from Basin 3 (North)	04-Oct-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.65
13-DW30c	Pump from Basin 3 (North)	05-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.59
13-DW30c	Pump from Basin 3 (North)	05-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.56
13-DW30c	Pump from Basin 3 (North)	05-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.52
13-DW30c	Pump from Basin 3 (North)	05-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.54
13-DW30c	Pump from Basin 3 (North)	05-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	0.11	<0.1	<0.2	<0.2	---	---	---
13-DW30c	Pump from Basin 3 (North)	05-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	0.11	<0.1	<0.2	<0.2	<1	---	1.00
13-DW30c	Pump from Basin 3 (North)	05-Oct-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	0.23	<0.2	<1	---	0.72
13-DW30c	Pump from Basin 3 (North)	05-Oct-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.59
13-DW30c	Pump from Basin 3 (North)	05-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.5
13-DW30c	Pump from Basin 3 (North)	06-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.51
13-DW30c	Pump from Basin 3 (North)	06-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.5
13-DW30c	Pump from Basin 3 (North)	06-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	0.26	<0.2	<1	---	0.52
13-DW30c	Pump from Basin 3 (North)	06-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.48
13-DW30c	Pump from Basin 3 (North)	06-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.64
13-DW30c	Pump from Basin 3 (North)	06-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.46
13-DW30c dup	Pump from Basin 3 (North)	06-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.46
13-DW30c	Pump from Basin 3 (North)	06-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.58
13-DW30c	Pump from Basin 3 (North)	06-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.58
13-DW30c	Pump from Basin 3 (North)	06-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.51
13-DW30c	Pump from Basin 3 (North)	06-Oct-13	17:00	<0.001	<0.001	<0.001	<0.001	<0.2	<0.2	<0.1	<0.1	0.6	<2	1.00
13-DW30c	Pump from Basin 3 (North)	06-Oct-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.52
13-DW30c	Pump from Basin 3 (North)	06-Oct-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	---	---	---
13-DW30c	Pump from Basin 3 (North)	06-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.5
13-DW30c	Pump from Basin 3 (North)	07-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.54
13-DW30c	Pump from Basin 3 (North)	07-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.49
13-DW30c	Pump from Basin 3 (North)	07-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.48
13-DW30c	Pump from Basin 3 (North)	07-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.49
13-DW30c	Pump from Basin 3 (North)	07-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.11	<0.2	<0.2	<1	---	0.5
13-DW30c	Pump from Basin 3 (North)	07-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1	---	0.63
13-DW30c	Pump from Basin 3 (North)	07-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.64
13-DW30c	Pump from Basin 3 (North)	07-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.64
13-DW30c	Pump from Basin 3 (North)	07-Oct-13	17:00	<0.001	<0.001	<0.001	<0.001	<0.2	<0.2	<0.1	<0.1	0.6	<2	0.7
13-DW30c	Pump from Basin 3 (North)	07-Oct-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	---	---	---
13-DW30c	Pump from Basin 3 (North)	07-Oct-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.51
13-DW30c	Pump from Basin 3 (North)	07-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.78
13-DW30c	Pump from Basin 3 (North)	07-Oct-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.49
13-DW30c	Pump from Basin 3 (North)	08-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.47
13-DW30c dup	Pump from Basin 3 (North)	08-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	---	0.51
13-DW30c	Pump from Basin 3 (North)	08-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	---	0.52
13-DW30c	Pump from Basin 3 (North)	08-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1	---	0.53
13-DW30c	Pump from Basin 3 (North)	08-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	<1	0.59
13-DW30c	Pump from Basin 3 (North)	08-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	0.15	<0.1	0.25	<0.2	1.1	---	0.5
13-DW30c	Pump from Basin 3 (North)	08-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.46
13-DW30c	Pump from Basin 3 (North)	08-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	---	0.45
13-DW30c	Pump from Basin 3 (North)	08-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.22	0.33	0.25	<1	---	0.44
13-DW30c	Pump from Basin 3 (North)	08-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.51
13-DW30c	Pump from Basin 3 (North)	08-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1	<1	0.59
13-DW30c	Pump from Basin 3 (North)	08-Oct-13	17:00	<0.001	<0.001	<0.001	<0.001	<0.2	<0.2	<0.1	<0.1	0.6	<1	0.6
13-DW30c	Pump from Basin 3 (North)	08-Oct-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.16	<0.2	0.2	---	---	---
13-DW30c	Pump from Basin 3 (North)	08-Oct-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.16	<0.2	0.2	<1	---	0.58
13-DW30c	Pump from Basin 3 (North)	08-Oct-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.62
AENV Tier 1 Wildlife Water*				**0.076**	**4.25**	**2.77**	**0.18**	**46.4**	**42.6**	**69**	**36.4**	**NS**	**NS**	**NS**

APPENDIX B1.

WATER QUALITY RESULTS - PUMPED WATER

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Date	Sample time	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylenes mg/L	F1[††] C_6-C_{10} mg/L	F2 $C_{>10}$-C_{16} mg/L	F3 $C_{>16}$-C_{34} mg/L	F4 $C_{>34}$-C_{50} mg/L	Chloride mg/L	TSS mg/L	Turbidity NTU
13-DW30c	Pump from Basin 3 (North)	08-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.15	0.21	<0.2	<1	---	0.65
13-DW30c	Pump from Basin 3 (North)	08-Oct-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.16	<0.2	0.2	<1	---	0.58
13-DW30c	Pump from Basin 3 (North)	09-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.6
13-DW30c	Pump from Basin 3 (North)	09-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.53
13-DW30c	Pump from Basin 3 (North)	09-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	---	0.63
13-DW30c	Pump from Basin 3 (North)	09-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	---	---	---
13-DW30c	Pump from Basin 3 (North)	09-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.54
13-DW30c	Pump from Basin 3 (North)	09-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	---	0.57
13-DW30c	Pump from Basin 3 (North)	09-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.53
13-DW30c	Pump from Basin 3 (North)	09-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.57
13-DW30c dup	Pump from Basin 3 (North)	09-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	<0.1
13-DW30c	Pump from Basin 3 (North)	09-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	---	0.58
13-DW30c	Pump from Basin 3 (North)	09-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	1.3	0.52
13-DW30c	Pump from Basin 3 (North)	09-Oct-13	17:00	<0.001	<0.001	<0.001	<0.001	<0.2	<0.2	<0.1	<0.1	0.7	<1	0.8
13-DW30c	Pump from Basin 3 (North)	09-Oct-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.50
13-DW30c	Pump from Basin 3 (North)	09-Oct-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.54
13-DW30c	Pump from Basin 3 (North)	09-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1	---	0.64
13-DW30c	Pump from Basin 3 (North)	10-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.18	0.32	0.21	<1	---	0.51
13-DW30c dup	Pump from Basin 3 (North)	10-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.15	0.28	<0.2	<1	---	0.51
13-DW30c	Pump from Basin 3 (North)	10-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.67
13-DW30c	Pump from Basin 3 (North)	10-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.94
13-DW30c	Pump from Basin 3 (North)	10-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.47
13-DW30c	Pump from Basin 3 (North)	10-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.46
13-DW30c dup	Pump from Basin 3 (North)	10-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.48
13-DW30c	Pump from Basin 3 (North)	10-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.48
13-DW30c	Pump from Basin 3 (North)	10-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.11	<0.2	<0.2	<1	---	0.54
13-DW30c	Pump from Basin 3 (North)	10-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	1.3	0.45
13-DW30c	Pump from Basin 3 (North)	10-Oct-13	15:00	<0.001	<0.001	<0.001	<0.001	<0.2	<0.2	<0.1	<0.1	0.5	<2	0.5
13-DW30c	Pump from Basin 3 (North)	10-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.15	0.24	<0.2	<1	---	0.62
13-DW30c	Pump from Basin 3 (North)	10-Oct-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.5
13-DW30c	Pump from Basin 3 (North)	10-Oct-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.43
13-DW30c	Pump from Basin 3 (North)	10-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.67
13-DW30c	Pump from Basin 3 (North)	11-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.4
13-DW30c dup	Pump from Basin 3 (North)	11-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.45
13-DW30c	Pump from Basin 3 (North)	11-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.64
13-DW30c	Pump from Basin 3 (North)	11-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.62
13-DW30c	Pump from Basin 3 (North)	11-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.14	0.24	<0.2	<1	1.3	0.44
13-DW30c	Pump from Basin 3 (North)	11-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.4
13-DW30c	Pump from Basin 3 (North)	11-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.4
13-DW30c	Pump from Basin 3 (North)	11-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	0.68	<0.1	<0.2	<0.2	<1	1.3	0.39
13-DW30c	Pump from Basin 3 (North)	11-Oct-13	15:00	<0.001	<0.001	<0.001	<0.001	<0.2	<0.2	0.3	<0.1	0.5	<1	0.8
13-DW30c	Pump from Basin 3 (North)	11-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	0.13	<0.1	<0.2	<0.2	<1	---	0.43
13-DW30c	Pump from Basin 3 (North)	11-Oct-13	19:00	<0.0004	<0.002	<0.0004	<0.004	0.12	<0.1	<0.2	<0.2	<1	---	0.84
13-DW30c	Pump from Basin 3 (North)	11-Oct-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.75
13-DW30c	Pump from Basin 3 (North)	11-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.15	0.26	<0.2	<1	---	0.61
13-DW30c	Pump from Basin 3 (North)	11-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.16	0.25	<0.2	<1	---	0.62
13-DW30c	Pump from Basin 3 (North)	12-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.62
13-DW30c	Pump from Basin 3 (North)	12-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	0.28	<1	---	0.71
13-DW30c	Pump from Basin 3 (North)	12-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.15	0.25	<0.2	<1	---	0.6
13-DW30c	Pump from Basin 3 (North)	12-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	0.46	<0.1	<0.2	<0.2	<1	<1	0.69
13-DW30c	Pump from Basin 3 (North)	12-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.2	0.42	0.26	<1	---	0.55
13-DW30c	Pump from Basin 3 (North)	12-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.61
13-DW30c	Pump from Basin 3 (North)	12-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.6
13-DW30c dup	Pump from Basin 3 (North)	12-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.54
13-DW30c	Pump from Basin 3 (North)	12-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.42
13-DW30c	Pump from Basin 3 (North)	12-Oct-13	15:00	<0.001	<0.001	<0.001	<0.001	<0.2	<0.2	<0.1	<0.1	0.7	<1	0.9
13-DW30c	Pump from Basin 3 (North)	12-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.61
13-DW30c	Pump from Basin 3 (North)	12-Oct-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	0.74	0.33	<1	---	0.46
13-DW30c	Pump from Basin 3 (North)	12-Oct-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.61
AENV Tier 1 Wildlife Water*				**0.076**	**4.25**	**2.77**	**0.18**	**46.4**	**42.6**	**69**	**36.4**	**NS**	**NS**	**NS**

APPENDIX B1.

WATER QUALITY RESULTS - PUMPED WATER

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Date	Sample time	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylenes mg/L	F1[††] C_6-C_{10} mg/L	F2 $C_{>10}$-C_{16} mg/L	F3 $C_{>16}$-C_{34} mg/L	F4 $C_{>34}$-C_{50} mg/L	Chloride mg/L	TSS mg/L	Turbidity NTU
13-DW30c	Pump from Basin 3 (North)	12-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.35
13-DW30c	Pump from Basin 3 (North)	13-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.36
13-DW30c	Pump from Basin 3 (North)	13-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.58
13-DW30c	Pump from Basin 3 (North)	13-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.13	<0.2	<0.2	<1	---	0.66
13-DW30c	Pump from Basin 3 (North)	13-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.36
13-DW30c	Pump from Basin 3 (North)	13-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.53
13-DW30c	Pump from Basin 3 (North)	13-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.48
13-DW30c	Pump from Basin 3 (North)	13-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.32
13-DW30c	Pump from Basin 3 (North)	13-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<3.0	0.76
13-DW30c	Pump from Basin 3 (North)	13-Oct-13	5:00	<0.001	<0.001	<0.001	<0.001	<0.2	<0.2	<0.1	<0.1	0.7	<1	1
13-DW30c	Pump from Basin 3 (North)	13-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.17	<0.27	<0.36	<1	---	0.56
13-DW30c	Pump from Basin 3 (North)	13-Oct-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.12	<0.2	<0.26	<1	---	0.46
13-DW30c	Pump from Basin 3 (North)	13-Oct-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.48
13-DW30c	Pump from Basin 3 (North)	13-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.38
13-DW30c	Pump from Basin 3 (North)	14-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.42
13-DW30c	Pump from Basin 3 (North)	14-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.41
13-DW30c	Pump from Basin 3 (North)	14-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.62
13-DW30c	Pump from Basin 3 (North)	14-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	6.7	2.5
13-DW30c	Pump from Basin 3 (North)	14-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	0.55	<1	---	0.59
13-DW30c	Pump from Basin 3 (North)	14-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.42
13-DW30c	Pump from Basin 3 (North)	14-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.44
13-DW30c	Pump from Basin 3 (North)	14-Oct-13	15:00	<0.001	<0.001	<0.001	<0.001	<0.2	<0.2	<0.1	<0.1	0.6	<1	1.1
13-DW30c	Pump from Basin 3 (North)	14-Oct-13	17:00	---	---	---	---	---	---	---	---	<1	---	0.43
13-DW30c	Pump from Basin 3 (North)	14-Oct-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.74
13-DW30c	Pump from Basin 3 (North)	14-Oct-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.62
13-DW30c	Pump from Basin 3 (North)	14-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.73
13-DW30c	Pump from Basin 3 (North)	15-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.67
13-DW30c dup	Pump from Basin 3 (North)	15-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.45
13-DW30c	Pump from Basin 3 (North)	15-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.19	0.37	0.22	<1	---	0.71
13-DW30c	Pump from Basin 3 (North)	15-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.15	0.3	<0.2	<1	---	1.2
13-DW30c	Pump from Basin 3 (North)	15-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	2	0.51
13-DW30c	Pump from Basin 3 (North)	15-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.71
13-DW30c	Pump from Basin 3 (North)	15-Oct-13	11:00	<0.001	<0.001	<0.001	<0.001	<0.2	<0.2	<0.1	<0.1	0.6	15	0.8
13-DW30c	Pump from Basin 3 (North)	15-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.55
13-DW30c	Pump from Basin 3 (North)	15-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	2.7	1.1
13-DW30c	Pump from Basin 3 (North)	15-Oct-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.71
13-DW30c	Pump from Basin 3 (North)	15-Oct-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.75
13-DW30c	Pump from Basin 3 (North)	15-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	1.1
13-DW30c	Pump from Basin 3 (North)	16-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	1.2
13-DW30c dup	Pump from Basin 3 (North)	16-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	1
13-DW30c	Pump from Basin 3 (North)	16-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.88
13-DW30c	Pump from Basin 3 (North)	16-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	1.3
13-DW30c	Pump from Basin 3 (North)	16-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	1.3	0.67
13-DW30c	Pump from Basin 3 (North)	16-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.97
13-DW30c	Pump from Basin 3 (North)	16-Oct-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.2	---	0.94
13-DW30c	Pump from Basin 3 (North)	16-Oct-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	---	0.55
13-DW30c	Pump from Basin 3 (North)	16-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.2	---	0.57
13-DW30c	Pump from Basin 3 (North)	17-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.2	---	0.84
13-DW30c dup	Pump from Basin 3 (North)	17-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.2	---	0.94
13-DW30c	Pump from Basin 3 (North)	17-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1	---	0.68
13-DW30c	Pump from Basin 3 (North)	17-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.61
13-DW30c	Pump from Basin 3 (North)	17-Oct-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	---	---	---
13-DW30c	Pump from Basin 3 (North)	17-Oct-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	---	---	---
13-DW30c	Pump from Basin 3 (North)	17-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	---	---	---
13-DW30c	Pump from Basin 3 (North)	18-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	1.2
13-DW30c dup	Pump from Basin 3 (North)	18-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	1
13-DW30c	Pump from Basin 3 (North)	18-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.66
13-DW30c	Pump from Basin 3 (North)	18-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.79
AENV Tier 1 Wildlife Water*				**0.076**	**4.25**	**2.77**	**0.18**	**46.4**	**42.6**	**69**	**36.4**	**NS**	**NS**	**NS**

APPENDIX B1.

WATER QUALITY RESULTS - PUMPED WATER

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Date	Sample time	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylenes mg/L	F1[††] C_6-C_{10} mg/L	F2 $C_{>10}$-C_{16} mg/L	F3 $C_{>16}$-C_{34} mg/L	F4 $C_{>34}$-C_{50} mg/L	Chloride mg/L	TSS mg/L	Turbidity NTU
13-DW30c	Pump from Basin 3 (North)	18-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	2	0.54
13-DW30c	Pump from Basin 3 (North)	18-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	---	0.76
13-DW30c	Pump from Basin 3 (North)	18-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.78
13-DW30c	Pump from Basin 3 (North)	18-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	0.27	<0.2	<1	4	1.2
13-DW30c	Pump from Basin 3 (North)	18-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.6	---	1.1
13-DW30c	Pump from Basin 3 (North)	18-Oct-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.7
13-DW30c	Pump from Basin 3 (North)	18-Oct-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.66
13-DW30c	Pump from Basin 3 (North)	18-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.57
13-DW30c	Pump from Basin 3 (North)	19-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.57
13-DW30c	Pump from Basin 3 (North)	19-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.53
13-DW30c dup	Pump from Basin 3 (North)	19-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.66
13-DW30c	Pump from Basin 3 (North)	19-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.67
13-DW30c	Pump from Basin 3 (North)	19-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.0	1.3	0.64
13-DW30c	Pump from Basin 3 (North)	19-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	---	0.83
13-DW30c	Pump from Basin 3 (North)	19-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.70
13-DW30c	Pump from Basin 3 (North)	19-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.62
13-DW30c	Pump from Basin 3 (North)	19-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1	2.7	0.50
13-DW30c	Pump from Basin 3 (North)	19-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.93
13-DW30c	Pump from Basin 3 (North)	19-Oct-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.59
13-DW30c	Pump from Basin 3 (North)	19-Oct-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.50
13-DW30c	Pump from Basin 3 (North)	19-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.51
13-DW30c	Pump from Basin 3 (North)	20-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.59
13-DW30c dup	Pump from Basin 3 (North)	20-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.53
13-DW30c	Pump from Basin 3 (North)	20-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.55
13-DW30c	Pump from Basin 3 (North)	20-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.53
13-DW30c	Pump from Basin 3 (North)	20-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	1.2
13-DW30c	Pump from Basin 3 (North)	20-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.74
13-DW30c	Pump from Basin 3 (North)	20-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.66
13-DW30c	Pump from Basin 3 (North)	20-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	1.2
13-DW30c	Pump from Basin 3 (North)	20-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.55
13-DW30c	Pump from Basin 3 (North)	20-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	---	0.73
13-DW30c	Pump from Basin 3 (North)	20-Oct-13	19:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.61
13-DW30c	Pump from Basin 3 (North)	20-Oct-13	21:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	1.1
13-DW30c	Pump from Basin 3 (North)	20-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	1
13-DW30c	Pump from Basin 3 (North)	21-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	0.11	<0.1	<0.2	<0.2	<1	---	0.66
13-DW30c dup	Pump from Basin 3 (North)	21-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	1.5
13-DW30c	Pump from Basin 3 (North)	21-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	0.13	<0.1	<0.2	<0.2	<1	---	0.62
13-DW30c	Pump from Basin 3 (North)	21-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.82
13-DW30c	Pump from Basin 3 (North)	21-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.63
13-DW30c	Pump from Basin 3 (North)	21-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	1.6
13-DW30c	Pump from Basin 3 (North)	21-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	1.7
13-DW30c	Pump from Basin 3 (North)	21-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	2
13-DW30c	Pump from Basin 3 (North)	21-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	2	1
13-DW30c	Pump from Basin 3 (North)	21-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	0.2	<0.1	<0.2	<0.2	<1	2	0.92
13-DW30c	Pump from Basin 3 (North)	21-Oct-13	19:00	<0.0004	<0.002	<0.0004	<0.004	0.21	<0.1	<0.2	<0.2	<1	---	0.85
13-DW30c	Pump from Basin 3 (North)	21-Oct-13	21:00	<0.0004	<0.002	<0.0004	<0.004	0.23	<0.1	<0.2	<0.2	<1	---	0.82
13-DW30c	Pump from Basin 3 (North)	21-Oct-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	3.9
13-DW30c	Pump from Basin 3 (North)	22-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	0.12	<0.1	<0.2	<0.2	<1	---	0.74
13-DW30c dup	Pump from Basin 3 (North)	22-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.62
13-DW30c	Pump from Basin 3 (North)	22-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	0.11	<0.1	<0.2	<0.2	<1	---	0.6
13-DW30c	Pump from Basin 3 (North)	22-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.69
13-DW30c	Pump from Basin 3 (North)	22-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	47	15
13-DW30c	Pump from Basin 3 (North)	22-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.67
AENV Tier 1 Wildlife Water*				**0.076**	**4.25**	**2.77**	**0.18**	**46.4**	**42.6**	**69**	**36.4**	**NS**	**NS**	**NS**

APPENDIX B1.

WATER QUALITY RESULTS - PUMPED WATER

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Date	Sample time	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylenes mg/L	F1[TT] C_6-C_{10} mg/L	F2 $C_{>10}$-C_{16} mg/L	F3 $C_{>16}$-C_{34} mg/L	F4 $C_{>34}$-C_{50} mg/L	Chloride mg/L	TSS mg/L	Turbidity NTU
13-DW31	NW Overland Discharge from Basin 2	28-Sep-13	5:00	<0.0004	<0.002	<0.0004	<0.004	0.16	<0.1	<0.2	<0.2	<2.0	2	0.71
13-DW31	NW Overland Discharge from Basin 2	28-Sep-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	1.3	0.66
13-DW31	NW Overland Discharge from Basin 2	29-Sep-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	1.3	0.64
13-DW31	NW Overland Discharge from Basin 2	29-Sep-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	1.3	0.62
13-DW31	NW Overland Discharge from Basin 2	30-Sep-13	7:00	<0.0004	<0.002	<0.0004	<0.004	0.18	<0.1	<0.2	<0.2	<1	<1	0.57
13-DW31	NW Overland Discharge from Basin 2	01-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	0.25	<0.1	<0.2	<0.2	<1	6	0.51
13-DW31	NW Overland Discharge from Basin 2	01-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	2	0.51
13-DW31	NW Overland Discharge from Basin 2	02-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.6
13-DW31	NW Overland Discharge from Basin 2	02-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.53
13-DW31	NW Overland Discharge from Basin 2	03-Oct-13		<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.54
13-DW31	NW Overland Discharge from Basin 2	07-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	---	0.56
13-DW32	NE Overland Discharge from Basin 2	28-Sep-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<2.0	2	0.74
13-DW32	NE Overland Discharge from Basin 2	28-Sep-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	2.7	0.63
13-DW32	NE Overland Discharge from Basin 2	29-Sep-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.64
13-DW32	NE Overland Discharge from Basin 2	29-Sep-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	1.3	0.58
13-DW32	NE Overland Discharge from Basin 2	29-Sep-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	1.3	0.89
13-DW32	NE Overland Discharge from Basin 2	30-Sep-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.58
13-DW32	NE Overland Discharge from Basin 2	30-Sep-13	23:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	---	---	---
13-DW32	NE Overland Discharge from Basin 2	01-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	0.15	<0.1	<0.2	<0.2	<1	<1	0.53
13-DW32	NE Overland Discharge from Basin 2	01-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	<1	0.52
13-DW32	NE Overland Discharge from Basin 2	02-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	2	0.54
13-DW32	NE Overland Discharge from Basin 2	02-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	0.17	<0.1	<0.2	<0.2	<1	<1	0.52
13-DW33	Outflow of North Aquadam	14-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	18	4.5
13-DW33	Outflow of North Aquadam	15-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	1.3	1.1
13-DW33	Outflow of North Aquadam	16-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	15	4.5
13-DW33a	Outflow of North Aquadam	17-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	400	45
13-DW33a	Outflow of North Aquadam	17-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1	4.7	1.7
13-DW33a	Outflow of North Aquadam	18-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.2	37	8.9
13-DW33a	Outflow of North Aquadam	18-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.4	44	13
13-DW33a	Outflow of North Aquadam	19-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.2	19	4.2
13-DW33a	Outflow of North Aquadam	19-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.2	93	48
13-DW33a	Outflow of North Aquadam	20-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	6.7	5
13-DW33a	Outflow of North Aquadam	20-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1	13	4.6
13-DW33a	Outflow of North Aquadam	21-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1	23	18
13-DW33a	Outflow of North Aquadam	21-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1	35	16
13-DW33a	Outflow of North Aquadam	22-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.1	17	1.9
13-DW33a	Outflow of North Aquadam	22-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	1.4	19	4
13-DW33a	Outflow of North Aquadam	23-Oct-13	1:00	<0.0004	0.00043	<0.0004	<0.00080	<0.1	<0.1	<0.2	<0.2	1.8	5.3	2.6
13-DW33a	Outflow of North Aquadam	23-Oct-13	3:00	<0.0004	<0.0004	<0.0004	<0.00080	<0.1	<0.1	<0.2	<0.2	<1	36	15
13-DW45	Culvert 15 along E-W Road (@ SG-14)	22-Oct-13	---	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	2.6	3.3	6
13-DW45	Culvert 15 along E-W Road (@ SG-14)	23-Oct-13	---	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	---	---	---	2.2	2	4.3
13-DW45	Culvert 15 along E-W Road (@ SG-14)	29-Oct-13	---	<0.00040	<0.00040	<0.00040	<0.00080	<0.1	<0.10	<0.20	<0.20	1.5	3.3	2.5
13-DW49	E Ladder Road Culvert N of Basin 4 (@ SG-1)	22-Oct-13	---	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	3.1	10	7.5
13-DW49	E Ladder Road Culvert N of Basin 4 (@ SG-1)	23-Oct-13	---	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	---	---	---	3	2	4.4
13-DW49	E Ladder Road Culvert N of Basin 4 (@ SG-1)	29-Oct-13	---	<0.00040	<0.00040	<0.00040	<0.00080	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	1.6
Minimal Detection Limit				**0.0004**	**0.002**	**0.0004**	**0.004**	**0.1**	**0.1**	**0.2**	**0.2**	**2**	**1**	**1**
AENV Tier 1 Wildlife Water*				**0.076**	**4.25**	**2.77**	**0.18**	**46.4**	**42.6**	**69**	**36.4**	**NS**	**NS**	**NS**

Notes:

--- - not analyzed

NS - guideline not specified

* - Alberta Tier 1 Soils and Groundwater Remediation Guidelines - Surface Water Guidelines (AENV, 2010)

Italics - indicates values do not meet applicable guidelines

APPENDIX B2.

WATER QUALITY RESULTS - PUMPED WATER

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Date	Sample Time	Acenaphthene µg/L	Acenaphthylene µg/L	Acridine µg/L	Anthracene µg/L	Benz[a]anthracene µg/L	Benzo[b+j]fluoranthene µg/L	Benzo[k]fluoranthene µg/L	Benzo[g,h,i]perylene µg/L	Benzo[a]pyrene µg/L	Chrysene µg/L	Dibenz[a,h]anthracene µg/L	Fluoranthene µg/L	Fluorene µg/L	Indeno[1,2,3-cd]pyrene µg/L	Naphthalene µg/L	Phenanthrene µg/L	Pyrene µg/L	Quinoline µg/L
13-DW10	Pump from Basin 1	28-Sep-13	9:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW10	Pump from Basin 1	30-Sep-13	9:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW10	Pump from Basin 1	30-Sep-13	15:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW10 dup	Pump from Basin 1	30-Sep-13	15:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW10	Pump from Basin 1	01-Oct-13	9:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW10	Pump from Basin 1	01-Oct-13	15:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	0.011	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW10	Pump from Basin 1	02-Oct-13	9:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW10	Pump from Basin 1	03-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW10	Pump from Basin 1	03-Oct-13	7:00	<0.2	<0.2	<0.2	<0.009	<0.02	<0.2	<0.2	<0.09	<0.01	<0.2	<0.09	0.03	<0.2	<0.09	<0.2	<0.2	0.02	<0.5
13-DW10	Pump from Basin 1	03-Oct-13	17:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW10	Pump from Basin 1	04-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW10	Pump from Basin 1	04-Oct-13	11:00	<0.2	<0.2	<0.2	0.01	<0.02	<0.2	<0.2	<0.09	<0.01	<0.2	<0.09	0.02	<0.2	<0.09	<0.2	<0.2	0.02	<0.5
13-DW10	Pump from Basin 1	04-Oct-13	17:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW10	Pump from Basin 1	05-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW10	Pump from Basin 1	05-Oct-13	7:00	<0.2	<0.2	<0.2	<0.009	<0.02	<0.2	<0.2	<0.09	<0.01	<0.2	<0.09	0.03	<0.2	<0.09	<0.2	<0.2	0.02	<0.5
13-DW10	Pump from Basin 1	05-Oct-13	17:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW10	Pump from Basin 1	06-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW10	Pump from Basin 1	06-Oct-13	7:00	<0.1	<0.1	<0.1	<0.005	<0.01	<0.1	<0.1	<0.05	<0.008	<0.1	<0.05	<0.01	<0.1	<0.05	<0.1	<0.1	<0.01	<0.3
13-DW10	Pump from Basin 1	06-Oct-13	17:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW10	Pump from Basin 1	07-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW10	Pump from Basin 1	08-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW10	Pump from Basin 1	08-Oct-13	7:00	<0.1	<0.1	<0.1	<0.005	<0.01	<0.1	<0.1	<0.05	<0.008	<0.1	<0.05	<0.01	<0.1	<0.05	<0.1	<0.1	<0.01	<0.3
13-DW10	Pump from Basin 1	09-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW10	Pump from Basin 1	10-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW10	Pump from Basin 1	10-Oct-13	7:00	<0.1	<0.1	<0.1	<0.005	<0.01	<0.1	<0.1	<0.05	<0.008	<0.1	<0.05	0.01	<0.1	<0.05	<0.1	<0.1	<0.01	<0.3
13-DW10	Pump from Basin 1	10-Oct-13	15:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW10	Pump from Basin 1	11-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW10	Pump from Basin 1	11-Oct-13	7:00	<0.1	<0.1	<0.1	<0.005	<0.01	<0.1	<0.1	<0.05	<0.008	<0.1	<0.05	0.01	<0.1	<0.05	<0.1	<0.1	<0.01	<0.3
13-DW10	Pump from Basin 1	11-Oct-13	15:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW10	Pump from Basin 1	12-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW10	Pump from Basin 1	12-Oct-13	7:00	<0.1	<0.1	<0.1	<0.005	<0.01	<0.1	<0.1	<0.05	<0.008	<0.1	<0.05	<0.01	<0.1	<0.05	<0.1	<0.1	<0.01	<0.3
13-DW10	Pump from Basin 1	12-Oct-13	17:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW10	Pump from Basin 1	13-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW10	Pump from Basin 1	13-Oct-13	21:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW10	Pump from Basin 1	14-Oct-13	5:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW10A	Basin 1 Discharge into Storage Tank	25-Oct-13	14:51	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	0.034	<0.0075	0.011	<0.050	<0.0085	<0.10	<0.050	***0.037***	<0.20
13-DW11	E Overland discharge from Basin 1	28-Sep-13	13:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW11	E Overland discharge from Basin 1	30-Sep-13	9:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW11	E Overland discharge from Basin 1	30-Sep-13	15:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW11	E Overland discharge from Basin 1	01-Oct-13	9:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW11	E Overland discharge from Basin 1	01-Oct-13	15:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	0.017	<0.050	<0.0085	0.24	<0.050	<0.020	<0.20
13-DW11	E Overland discharge from Basin 1	02-Oct-13	9:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW12	W Overland discharge from Basin 1	28-Sep-13	13:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW12	W Overland discharge from Basin 1	30-Sep-13	9:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW12	W Overland discharge from Basin 1	30-Sep-13	15:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW12	W Overland discharge from Basin 1	01-Oct-13	9:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	0.013	<0.050	<0.0085	0.33	<0.050	<0.020	<0.20
13-DW12	W Overland discharge from Basin 1	01-Oct-13	15:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	0.013	<0.050	<0.0085	0.23	<0.050	<0.020	<0.20
13-DW12	W Overland discharge from Basin 1	02-Oct-13	9:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
AENV Freshwater Aquatic Life*				**5.8^**	**NS**	**4.4^**	**0.012^**	**0.018^**	**NS**	**NS**	**NS**	**0.015^**	**NS**	**NS**	**0.015^**	**3^**	**NS**	**1.1^**	**0.4^**	**0.025^**	**3.4^**

APPENDIX B2.

WATER QUALITY RESULTS - PUMPED WATER

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Date	Sample Time	Acenaphthene µg/L	Acenaphthylene µg/L	Acridine µg/L	Anthracene µg/L	Benz[a]anthracene µg/L	Benzo[b+j]fluoranthene µg/L	Benzo[k]fluoranthene µg/L	Benzo[g,h,i]perylene µg/L	Benzo[a]pyrene µg/L	Chrysene µg/L	Dibenz[a,h]anthracene µg/L	Fluoranthene µg/L	Fluorene µg/L	Indeno[1,2,3-cd]pyrene µg/L	Naphthalene µg/L	Phenanthrene µg/L	Pyrene µg/L	Quinoline µg/L
13-DW20	Pump from Basin 2	28-Sep-13	9:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	0.011	0.13	<0.0085	0.26	0.094	<0.020	<0.20
13-DW20	Pump from Basin 2	30-Sep-13	17:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	0.11	<0.0085	0.22	0.1	<0.020	<0.20
13-DW20	Pump from Basin 2	01-Oct-13	11:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	0.12	<0.0085	0.23	0.12	<0.020	<0.20
13-DW20	Pump from Basin 2	01-Oct-13	17:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	0.11	<0.0085	0.2	0.11	<0.020	<0.20
13-DW20	Pump from Basin 2	02-Oct-13	11:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	0.12	<0.0085	0.22	0.12	<0.020	<0.20
13-DW20	Pump from Basin 2	03-Oct-13	5:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	0.1	<0.0085	0.17	0.097	<0.020	<0.20
13-DW20	Pump from Basin 2	03-Oct-13	17:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	0.012	0.11	<0.0085	0.19	0.11	<0.020	<0.20
13-DW20	Pump from Basin 2	04-Oct-13	19:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	0.078	<0.0085	0.24	0.069	<0.020	<0.20
13-DW20	Pump from Basin 2	05-Oct-13	21:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	0.23	<0.050	***0.059***	<0.20
13-DW20	Pump from Basin 2	06-Oct-13	17:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	0.078	<0.0085	0.15	0.075	<0.020	<0.20
13-DW20	Pump from Basin 2	07-Oct-13	17:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	0.095	<0.0085	0.18	0.11	<0.020	<0.20
13-DW20	Pump from Basin 2	08-Oct-13	5:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	0.072	<0.0085	0.11	0.087	<0.020	<0.20
13-DW20	Pump from Basin 2	08-Oct-13	17:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	0.07	<0.0085	<0.10	0.068	<0.020	<0.20
13-DW20	Pump from Basin 2	09-Oct-13	5:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	0.076	<0.0085	0.14	0.081	<0.020	<0.20
13-DW20	Pump from Basin 2	09-Oct-13	17:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	0.069	<0.0085	0.13	0.074	<0.020	<0.20
13-DW20	Pump from Basin 2	11-Oct-13	5:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	0.088	<0.0085	0.15	0.083	<0.020	<0.20
13-DW20	Pump from Basin 2	11-Oct-13	15:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	0.066	<0.0085	0.13	0.067	<0.020	<0.20
13-DW20	Pump from Basin 2	12-Oct-13	5:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW20	Pump from Basin 2	12-Oct-13	15:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	0.063	<0.0085	0.11	0.095	<0.020	<0.20
13-DW20	Pump from Basin 2	13-Oct-13	5:00	0.15	<0.10	<0.20	***0.026***	0.0098	<0.0085	<0.0085	<0.0085	0.0095	0.033	<0.0075	0.026	0.2	<0.0085	0.25	***0.42***	***0.051***	<0.20
13-DW21	Basin 2 Discharge Line before Filtration	28-Sep-13	11:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	0.12	<0.0085	0.26	0.089	<0.020	<0.20
13-DW21	Basin 2 Discharge Line before Filtration	05-Oct-13	5:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	0.083	<0.0085	0.16	0.072	<0.020	<0.20
13-DW21	Basin 2 Discharge Line before Filtration	06-Oct-13	5:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	0.086	<0.0085	0.16	0.083	<0.020	<0.20
13-DW21	Basin 2 Discharge Line before Filtration	07-Oct-13	5:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	0.092	<0.0085	0.18	0.08	<0.020	<0.20
13-DW21	Basin 1 Discharge Line before Filtration	17-Oct-13	11:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW21	Basin 1 Discharge Line before Filtration	17-Oct-13	17:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW21	Basin 1 Discharge Line before Filtration	18-Oct-13	11:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW21	Basin 1 Discharge Line before Filtration	19-Oct-13	9:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	0.029	<0.0075	<0.010	0.088	<0.0085	0.11	0.22	***0.035***	<0.20
13-DW21	Basin 1 Discharge Line before Filtration	19-Oct-13	15:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	0.094	<0.020	<0.20
13-DW21a	Basin 1 Discharge Line before Filtration	21-Oct-13	15:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	0.013	<0.050	<0.0085	<0.10	0.11	<0.020	<0.20
13-DW22	Basin 2 Discharge Line after Filtration	28-Sep-13	11:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	0.11	<0.0085	0.23	0.079	<0.020	<0.20
13-DW23	Basin 2 Discharge Line after Carbon Treatment	28-Sep-13	11:00	<0.10	<0.10	<0.21	<0.010	<0.0089	<0.0089	<0.0089	<0.0089	<0.0078	<0.0089	<0.0078	<0.010	<0.052	<0.0089	<0.10	<0.052	<0.021	<0.21
13-DW23	Basin 2 Discharge Line after Carbon Treatment	01-Oct-13	11:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23	Basin 2 Discharge Line after Carbon Treatment	01-Oct-13	17:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23	Basin 2 Discharge Line after Carbon Treatment	02-Oct-13	11:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23	Basin 2 Discharge Line after Carbon Treatment	03-Oct-13	5:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23	Basin 2 Discharge Line after Carbon Treatment	03-Oct-13	11:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23	Basin 2 Discharge Line after Carbon Treatment	03-Oct-13	17:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23	Basin 2 Discharge Line after Carbon Treatment	04-Oct-13	11:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23	Basin 2 Discharge Line after Carbon Treatment	04-Oct-13	17:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23	Basin 2 Discharge Line after Carbon Treatment	04-Oct-13	23:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23	Basin 2 Discharge Line after Carbon Treatment	05-Oct-13	5:00	<0.10	<0.10	<0.028	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23	Basin 2 Discharge Line after Carbon Treatment	05-Oct-13	11:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23	Basin 2 Discharge Line after Carbon Treatment	05-Oct-13	17:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23	Basin 2 Discharge Line after Carbon Treatment	05-Oct-13	23:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23	Basin 2 Discharge Line after Carbon Treatment	06-Oct-13	5:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23	Basin 2 Discharge Line after Carbon Treatment	06-Oct-13	11:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23	Basin 2 Discharge Line after Carbon Treatment	06-Oct-13	17:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
AENV Freshwater Aquatic Life*				**5.8^**	**NS**	**4.4^**	**0.012^**	**0.018^**	**NS**	**NS**	**NS**	**0.015^**	**NS**	**NS**	**0.015^**	**3^**	**NS**	**1.1^**	**0.4^**	**0.025^**	**3.4^**

APPENDIX B2.

WATER QUALITY RESULTS - PUMPED WATER

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Date	Sample Time	Acenaphthene µg/L	Acenaphthylene µg/L	Acridine µg/L	Anthracene µg/L	Benz[a]anthracene µg/L	Benzo[b+j]fluoranthene µg/L	Benzo[k]fluoranthene µg/L	Benzo[g,h,i]perylene µg/L	Benzo[a]pyrene µg/L	Chrysene µg/L	Dibenz[a,h]anthracene µg/L	Fluoranthene µg/L	Fluorene µg/L	Indeno[1,2,3-cd]pyrene µg/L	Naphthalene µg/L	Phenanthrene µg/L	Pyrene µg/L	Quinoline µg/L
13-DW23	Basin 2 Discharge Line after Carbon Treatment	06-Oct-13	23:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23	Basin 2 Discharge Line after Carbon Treatment	07-Oct-13	5:00	<0.10	<0.10	<0.21	<0.010	<0.0089	<0.0089	<0.0089	<0.0089	<0.0078	<0.0089	<0.0078	<0.010	<0.052	<0.0089	<0.10	<0.052	<0.021	<0.21
13-DW23	Basin 2 Discharge Line after Carbon Treatment	07-Oct-13	11:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23	Basin 2 Discharge Line after Carbon Treatment	07-Oct-13	17:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23	Basin 2 Discharge Line after Carbon Treatment	07-Oct-13	23:00	<0.11	<0.11	<0.21	<0.011	<0.0091	<0.0091	<0.0091	<0.0091	<0.0080	<0.0091	<0.0080	<0.011	<0.053	<0.0091	<0.11	<0.053	<0.021	<0.21
13-DW23	Basin 2 Discharge Line after Carbon Treatment	08-Oct-13	5:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23	Basin 2 Discharge Line after Carbon Treatment	08-Oct-13	11:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23	Basin 2 Discharge Line after Carbon Treatment	08-Oct-13	17:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23	Basin 2 Discharge Line after Carbon Treatment	08-Oct-13	23:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23	Basin 2 Discharge Line after Carbon Treatment	09-Oct-13	5:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23	Basin 2 Discharge Line after Carbon Treatment	09-Oct-13	11:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23	Basin 2 Discharge Line after Carbon Treatment	09-Oct-13	17:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23	Basin 2 Discharge Line after Carbon Treatment	09-Oct-13	23:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23	Basin 2 Discharge Line after Carbon Treatment	10-Oct-13	23:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23	Basin 2 Discharge Line after Carbon Treatment	11-Oct-13	5:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23	Basin 2 Discharge Line after Carbon Treatment	11-Oct-13	11:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23	Basin 2 Discharge Line after Carbon Treatment	11-Oct-13	15:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23	Basin 2 Discharge Line after Carbon Treatment	11-Oct-13	23:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23	Basin 2 Discharge Line after Carbon Treatment	11-Oct-13	23:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23	Basin 2 Discharge Line after Carbon Treatment	12-Oct-13	5:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23	Basin 2 Discharge Line after Carbon Treatment	12-Oct-13	11:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23	Basin 2 Discharge Line after Carbon Treatment	12-Oct-13	15:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23	Basin 2 Discharge Line after Carbon Treatment	12-Oct-13	23:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23	Basin 2 Discharge Line after Carbon Treatment	13-Oct-13	1:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23	Basin 2 Discharge Line after Carbon Treatment	13-Oct-13	5:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	13-Oct-13	11:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23a dup	Basin 1 Discharge Line after Carbon Treatment	13-Oct-13	11:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	13-Oct-13	15:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	14-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	14-Oct-13	7:00	<0.1	<0.1	<0.1	<0.005	<0.01	0.2	0.1	<0.05	<0.008	<0.1	<0.05	<0.01	<0.1	<0.05	<0.1	<0.1	<0.01	<0.3
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	16-Oct-13	11:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	17-Oct-13	11:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23a dup	Basin 1 Discharge Line after Carbon Treatment	17-Oct-13	11:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	17-Oct-13	15:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	18-Oct-13	9:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	18-Oct-13	15:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	19-Oct-13	9:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	19-Oct-13	15:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	20-Oct-13	9:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23a dup	Basin 1 Discharge Line after Carbon Treatment	20-Oct-13	9:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	21-Oct-13	9:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	21-Oct-13	11:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	21-Oct-13	15:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	22-Oct-13	9:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW25	E Overland Discharge from Basin 2	28-Sep-13	3:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW25	E Overland Discharge from Basin 2	28-Sep-13	15:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW25	E Overland Discharge from Basin 2	01-Oct-13	11:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW25 dup	E Overland Discharge from Basin 2	01-Oct-13	11:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW25	E Overland Discharge from Basin 2	02-Oct-13	11:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW25	E Overland Discharge from Basin 2	02-Oct-13	17:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
AENV Freshwater Aquatic Life*				**5.8^**	**NS**	**4.4^**	**0.012^**	**0.018^**	**NS**	**NS**	**NS**	**0.015^**	**NS**	**NS**	**0.015^**	**3^**	**NS**	**1.1^**	**0.4^**	**0.025^**	**3.4^**

APPENDIX B2.

WATER QUALITY RESULTS - PUMPED WATER

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Date	Sample Time	Acenaphthene µg/L	Acenaphthylene µg/L	Acridine µg/L	Anthracene µg/L	Benz[a]anthracene µg/L	Benzo[b+j]fluoranthene µg/L	Benzo[k]fluoranthene µg/L	Benzo[g,h,i]perylene µg/L	Benzo[a]pyrene µg/L	Chrysene µg/L	Dibenz[a,h]anthracene µg/L	Fluoranthene µg/L	Fluorene µg/L	Indeno[1,2,3-cd]pyrene µg/L	Naphthalene µg/L	Phenanthrene µg/L	Pyrene µg/L	Quinoline µg/L
13-DW30	Pump from Basin 3 (North)	28-Sep-13	9:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30	Pump from Basin 3 (North)	30-Sep-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30	Pump from Basin 3 (North)	01-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30	Pump from Basin 3 (North)	01-Oct-13	13:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30	Pump from Basin 3 (North)	02-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30	Pump from Basin 3 (North)	02-Oct-13	13:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30	Pump from Basin 3 (North)	03-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30a	Pump from Basin 3 (North)	30-Sep-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30a	Pump from Basin 3 (North)	01-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30a	Pump from Basin 3 (North)	01-Oct-13	13:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30a	Pump from Basin 3 (North)	02-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30a	Pump from Basin 3 (North)	02-Oct-13	13:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30a	Pump from Basin 3 (North)	03-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30C	Pump from Basin 3 (North)	04-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30C	Pump from Basin 3 (North)	04-Oct-13	17:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30C	Pump from Basin 3 (North)	04-Oct-13	17:00	<0.2	<0.2	<0.2	<0.009	<0.02	<0.2	<0.2	<0.09	<0.01	<0.2	<0.09	<0.02	<0.2	<0.09	<0.2	<0.2	<0.02	<0.5
13-DW30C	Pump from Basin 3 (North)	05-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30C	Pump from Basin 3 (North)	06-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30C	Pump from Basin 3 (North)	06-Oct-13	17:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30C	Pump from Basin 3 (North)	06-Oct-13	17:00	<0.1	<0.1	<0.1	<0.005	<0.01	<0.1	<0.1	<0.05	<0.008	<0.1	<0.05	<0.01	<0.1	<0.05	<0.1	<0.1	<0.01	<0.3
13-DW30c	Pump from Basin 3 (North)	07-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30c	Pump from Basin 3 (North)	07-Oct-13	17:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30c	Pump from Basin 3 (North)	08-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30c	Pump from Basin 3 (North)	08-Oct-13	17:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30c	Pump from Basin 3 (North)	08-Oct-13	17:00	<0.1	<0.1	<0.1	<0.005	<0.01	<0.1	<0.1	<0.05	<0.008	<0.1	<0.05	<0.01	<0.1	<0.05	<0.1	<0.1	<0.01	<0.3
13-DW30c	Pump from Basin 3 (North)	09-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30c	Pump from Basin 3 (North)	09-Oct-13	13:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30c	Pump from Basin 3 (North)	09-Oct-13	17:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30c	Pump from Basin 3 (North)	10-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30c	Pump from Basin 3 (North)	10-Oct-13	15:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30c	Pump from Basin 3 (North)	10-Oct-13	15:00	<0.1	<0.1	<0.1	<0.005	<0.01	<0.1	<0.1	<0.05	<0.008	<0.1	<0.05	0.01	<0.1	<0.05	<0.1	<0.1	<0.01	<0.3
13-DW30c	Pump from Basin 3 (North)	11-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30c	Pump from Basin 3 (North)	11-Oct-13	15:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30c	Pump from Basin 3 (North)	11-Oct-13	15:00	<0.1	<0.1	<0.1	<0.005	<0.01	<0.1	<0.1	<0.05	<0.008	<0.1	<0.05	0.01	<0.1	<0.05	<0.1	<0.1	<0.01	<0.3
13-DW30c	Pump from Basin 3 (North)	12-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30c	Pump from Basin 3 (North)	12-Oct-13	15:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30c	Pump from Basin 3 (North)	12-Oct-13	15:00	<0.1	<0.1	<0.1	<0.005	<0.01	<0.1	<0.1	<0.05	<0.008	<0.1	<0.05	<0.01	<0.1	<0.05	<0.1	<0.1	<0.01	<0.3
13-DW30c	Pump from Basin 3 (North)	13-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30c	Pump from Basin 3 (North)	13-Oct-13	15:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30c	Pump from Basin 3 (North)	14-Oct-13	9:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30c	Pump from Basin 3 (North)	14-Oct-13	15:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30c	Pump from Basin 3 (North)	15-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30c	Pump from Basin 3 (North)	15-Oct-13	11:00	<0.1	<0.1	<0.1	<0.005	<0.01	<0.1	<0.1	<0.05	<0.008	<0.1	<0.05	<0.01	<0.1	<0.05	<0.1	<0.1	<0.01	<0.3
13-DW30c	Pump from Basin 3 (North)	15-Oct-13	15:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30c	Pump from Basin 3 (North)	16-Oct-13	9:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30c	Pump from Basin 3 (North)	18-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	0.0086	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30c	Pump from Basin 3 (North)	18-Oct-13	15:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30c	Pump from Basin 3 (North)	19-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30c	Pump from Basin 3 (North)	19-Oct-13	15:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30c	Pump from Basin 3 (North)	20-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
AENV Freshwater Aquatic Life*				**5.8^**	**NS**	**4.4^**	**0.012^**	**0.018^**	**NS**	**NS**	**NS**	**0.015^**	**NS**	**NS**	**0.015^**	**3^**	**NS**	**1.1^**	**0.4^**	**0.025^**	**3.4^**

APPENDIX B2.

WATER QUALITY RESULTS - PUMPED WATER

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Date	Sample Time	Acenaphthene µg/L	Acenaphthylene µg/L	Acridine µg/L	Anthracene µg/L	Benz[a]anthracene µg/L	Benzo[b+j]fluoranthene µg/L	Benzo[k]fluoranthene µg/L	Benzo[g,h,i]perylene µg/L	Benzo[a]pyrene µg/L	Chrysene µg/L	Dibenz[a,h]anthracene µg/L	Fluoranthene µg/L	Fluorene µg/L	Indeno[1,2,3-cd]pyrene µg/L	Naphthalene µg/L	Phenanthrene µg/L	Pyrene µg/L	Quinoline µg/L
13-DW30c	Pump from Basin 3 (North)	20-Oct-13	15:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30c	Pump from Basin 3 (North)	21-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30c	Pump from Basin 3 (North)	21-Oct-13	15:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30c	Pump from Basin 3 (North)	22-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW31	NW Overland Discharge from Basin 2	28-Sep-13	5:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW31	NW Overland Discharge from Basin 2	30-Sep-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW31	NW Overland Discharge from Basin 2	01-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW31	NW Overland Discharge from Basin 2	01-Oct-13	13:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW31	NW Overland Discharge from Basin 2	02-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW31	NW Overland Discharge from Basin 2	02-Oct-13	13:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW32	NE Overland Discharge from Basin 2	28-Sep-13	5:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW32	NE Overland Discharge from Basin 2	30-Sep-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW32	NE Overland Discharge from Basin 2	01-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW32	NE Overland Discharge from Basin 2	01-Oct-13	13:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW32	NE Overland Discharge from Basin 2	02-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW32	NE Overland Discharge from Basin 2	02-Oct-13	13:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW33	Outflow of North Aquadam	14-Oct-13	13:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW33	Outflow of North Aquadam	15-Oct-13	9:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW33	Outflow of North Aquadam	16-Oct-13	9:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW33a	Outflow of North Aquadam	17-Oct-13	9:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW33a	Outflow of North Aquadam	17-Oct-13	15:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW33	Outflow of North Aquadam	18-Oct-13	9:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW33	Outflow of North Aquadam	18-Oct-13	15:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW33a	Outflow of North Aquadam	19-Oct-13	9:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW33a	Outflow of North Aquadam	19-Oct-13	15:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW33a	Outflow of North Aquadam	20-Oct-13	9:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW33a	Outflow of North Aquadam	20-Oct-13	15:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW33a	Outflow of North Aquadam	21-Oct-13	9:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW33a	Outflow of North Aquadam	21-Oct-13	15:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW33a	Outflow of North Aquadam	22-Oct-13	9:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW33a	Outflow of North Aquadam	22-Oct-13	15:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW33a	Outflow of North Aquadam	23-Oct-13	1:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW33a	Outflow of North Aquadam	23-Oct-13	3:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW45	Culvert 15 along E-W Road (@ SG-14)	22-Oct-13	---	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW45	Culvert 15 along E-W Road (@ SG-14)	23-Oct-13	---	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW45	Culvert 15 along E-W Road (@ SG-14)	29-Oct-13	---	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW49	E Ladder Road Culvert N of Basin 4 (@ SG-1)	22-Oct-13	---	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW49	E Ladder Road Culvert N of Basin 4 (@ SG-1)	23-Oct-13	---	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW49	E Ladder Road Culvert N of Basin 4 (@ SG-1)	29-Oct-13	---	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Minimal Detection Limit				**0.1**	**0.1**	**0.2**	**0.01**	**0.0085**	**0.0085**	**0.0085**	**0.0085**	**0.0075**	**0.0085**	**0.0075**	**0.01**	**0.05**	**0.0085**	**0.1**	**0.05**	**0.02**	**0.2**
AENV Freshwater Aquatic Life*				**5.8^**	**NS**	**4.4^**	**0.012^**	**0.018^**	**NS**	**NS**	**NS**	**0.015^**	**NS**	**NS**	**0.015^**	**3^**	**NS**	**1.1^**	**0.4^**	**0.025^**	**3.4^**

Notes:

--- - not analyzed

NS - not specified

* - Alberta Environment Surface Water Quality Guidelines for use in Alberta (AENV, 1999)

Italics - indicates values do not meet applicable guidelines

APPENDIX B3.

WATER QUALITY CONTROL SAMPLE RESULTS - DISSOLVED HYDROCARBONS

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Date	Sample Time	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylenes mg/L	F1 C_6-C_{10} mg/L	F2 $C_{>10}$-C_{16} mg/L	F3 $C_{>16}$-C_{34} mg/L	F4 $C_{>34}$-C_{50} mg/L	Cl mg/L	TSS mg/L	Turbidity NTU
13-DW10	Pump from Basin 1	28-Sep-13	13:00	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	1	---	0.74
13-DW10 dup	Pump from Basin 1	28-Sep-13	13:00	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	1.1	---	0.97
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	---	0.5
				---	---	---	---	---	---	---	---	0.1	---	0.23
				---	---	---	---	---	---	---	---	---	---	27
				Good	Good	Good	Good	Good	Good	Good	Good	Good	---	Good
13-DW30	Pump from Basin 3 (North)	28-Sep-13	1:00	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<2.0	---	0.66
13-DW30 dup	Pump from Basin 3 (North)	28-Sep-13	1:00	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<2.0	---	0.66
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	2	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	10	---	0.5
				---	---	---	---	---	---	---	---	---	---	0
				---	---	---	---	---	---	---	---	---	---	0
				Good	Good	Good	Good	Good	Good	Good	Good	Good	---	Good
13-DW23	Basin 2 Discharge Line after Carbon Treatment	29-Sep-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	---	0.47
13-DW23 dup	Basin 2 Discharge Line after Carbon Treatment	29-Sep-13	1:00	<0.00040	<0.0020	<0.00040	<0.0040	0.14	<0.10	<0.20	<0.20	<1.0	---	0.47
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	---	0.5
				---	---	---	---	---	---	---	---	---	---	0
				---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	---	Good
13-DW30	Pump from Basin 3 (North)	29-Sep-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	---	0.71
13-DW30 dup	Pump from Basin 3 (North)	29-Sep-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	1	---	0.78
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	---	0.5
				---	---	---	---	---	---	---	---	---	---	0.07
				---	---	---	---	---	---	---	---	---	---	9
				Good	Good	Good	Good	Good	Good	Good	Good	Good	---	Good
13-DW10	Pump from Basin 1	30-Sep-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	2	0.68
13-DW10 dup	Pump from Basin 1	30-Sep-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	0.65
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	5	0.5
				---	---	---	---	---	---	---	---	---	---	0.03
				---	---	---	---	---	---	---	---	---	---	5
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-DW30a	Pump from Basin 3 (North)	30-Sep-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	---	0.75
13-DW30a dup	Pump from Basin 3 (North)	30-Sep-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<100	<0.10	<0.20	<0.20	---	---	---
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	---	---	---
				---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	---	---	---
13-DW20	Pump from Basin 2	01-Oct-13	5:00	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	---	0.61
13-DW20 dup	Pump from Basin 2	01-Oct-13	5:00	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	1	3.3	0.65
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	---	0.5
				---	---	---	---	---	---	---	---	---	---	0.04
				---	---	---	---	---	---	---	---	---	---	6
				Good	Good	Good	Good	Good	Good	Good	Good	Good	---	Good
13-DW25	E Overland Discharge from Basin 2	01-Oct-13	11:00	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	2.7	0.95
13-DW25 dup	E Overland Discharge from Basin 2	01-Oct-13	11:00	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	2.7	0.96
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	5	0.5
				---	---	---	---	---	---	---	---	---	0	0.01
				---	---	---	---	---	---	---	---	---	---	1
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good

APPENDIX B3.

WATER QUALITY CONTROL SAMPLE RESULTS - DISSOLVED HYDROCARBONS

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Date	Sample Time	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylenes mg/L	F1 C_6-C_{10} mg/L	F2 $C_{>10}$-C_{16} mg/L	F3 $C_{>16}$-C_{34} mg/L	F4 $C_{>34}$-C_{50} mg/L	Cl mg/L	TSS mg/L	Turbidity NTU
13-DW10	Pump from Basin 1	02-Oct-13	17:00	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	---	---	---
13-DW10 dup	Pump from Basin 1	02-Oct-13	17:00	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	---	---	---
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	---	---	---
				---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	---	---	---
13-DW23	Basin 2 Discharge Line after Carbon Treatment	02-Oct-13	9:00	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	---	0.82
13-DW23 dup	Basin 2 Discharge Line after Carbon Treatment	02-Oct-13	9:00	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	---	0.82
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	---	0.5
				---	---	---	---	---	---	---	---	---	---	0
				---	---	---	---	---	---	---	---	---	---	0
				Good	Good	Good	Good	Good	Good	Good	Good	Good	---	Good
13-DW10	Pump from Basin 1	03-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	---	0.5
13-DW10 dup	Pump from Basin 1	03-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	---	---	---
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	---	---	---
				---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	---	---	---
13-DW30	Pump from Basin 3 (North)	03-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	---	0.5
13-DW30 dup	Pump from Basin 3 (North)	03-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	---	---	---
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	---	---	---
				---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	---	---	---
13-DW30	Pump from Basin 3 (North)	04-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	---	0.54
13-DW30 dup	Pump from Basin 3 (North)	04-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	---	0.63
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	---	0.5
				---	---	---	---	---	---	---	---	---	---	0.09
				---	---	---	---	---	---	---	---	---	---	15
				Good	Good	Good	Good	Good	Good	Good	Good	Good	---	Good
13-DW30A	Pump from Basin 3 (North)	05-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	---	0.54
13-DW30A dup	Pump from Basin 3 (North)	05-Oct-13	5:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	---	0.77
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	---	0.5
				---	---	---	---	---	---	---	---	---	---	0.23
				---	---	---	---	---	---	---	---	---	---	35
				Good	Good	Good	Good	Good	Good	Good	Good	Good	---	Good
13-DW10	Pump from Basin 1	05-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	---	0.8
13-DW10 dup	Pump from Basin 1	05-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	---	0.73
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	---	0.5
				---	---	---	---	---	---	---	---	---	---	0.07
				---	---	---	---	---	---	---	---	---	---	9
				Good	Good	Good	Good	Good	Good	Good	Good	Good	---	Good
13-DW30c	Pump from Basin 3 (North)	06-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	---	0.46
13-DW30c dup	Pump from Basin 3 (North)	06-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	---	0.46
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	---	0.5
				---	---	---	---	---	---	---	---	---	---	0
				---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	---	Good

APPENDIX B3.

WATER QUALITY CONTROL SAMPLE RESULTS - DISSOLVED HYDROCARBONS

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Date	Sample Time	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylenes mg/L	F1 C_6-C_{10} mg/L	F2 $C_{>10}$-C_{16} mg/L	F3 $C_{>16}$-C_{34} mg/L	F4 $C_{>34}$-C_{50} mg/L	Cl mg/L	TSS mg/L	Turbidity NTU
13-DW10	Pump from Basin 1	07-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.1	<0.20	<0.20	1.1	---	0.69
13-DW10 dup	Pump from Basin 1	07-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.12	0.22	<0.20	1.2	---	0.64
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	---	0.5
				---	---	---	---	---	0.02	---	---	0.1	---	0.05
				---	---	---	---	---	---	---	---	---	---	8
				Good	Good	Good	Good	Good	Good	Good	Good	Good	---	Good
13-DW30c	Pump from Basin 3 (North)	08-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	---	0.47
13-DW30c dup	Pump from Basin 3 (North)	08-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	1.1	---	0.51
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	---	0.5
				---	---	---	---	---	---	---	---	---	---	0.04
				---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	---	Good
13-DW10	Pump from Basin 1	09-Oct-13	1:00	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	1.3	---	0.81
13-DW10 dup	Pump from Basin 1	09-Oct-13	1:00	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	1.1	---	0.84
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	---	0.5
				---	---	---	---	---	---	---	---	0.2	---	0.03
				---	---	---	---	---	---	---	---	---	---	4
				Good	Good	Good	Good	Good	Good	Good	Good	Good	---	Good
13-DW30c	Pump from Basin 3 (North)	09-Oct-13	13:00	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	---	0.57
13-DW30c dup	Pump from Basin 3 (North)	09-Oct-13	13:00	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	---	0.5
				---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	---	Good
13-DW30c	Pump from Basin 3 (North)	10-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.18	0.32	0.21	<1.0	---	0.51
13-DW30c dup	Pump from Basin 3 (North)	10-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.15	0.28	<0.20	<1.0	---	0.51
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	---	0.5
				---	---	---	---	---	0.03	0.04	---	---	---	0
				---	---	---	---	---	---	---	---	---	---	0
				Good	Good	Good	Good	Good	Good	Good	Good	Good	---	Good
13-DW30c	Pump from Basin 3 (North)	10-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	---	0.46
13-DW30c dup	Pump from Basin 3 (North)	10-Oct-13	9:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	---	0.48
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	---	0.5
				---	---	---	---	---	---	---	---	---	---	0.02
				---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	---	Good
13-DW10	Pump from Basin 1	11-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	0.21	<0.20	1.3	---	0.67
13-DW10 dup	Pump from Basin 1	11-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	0.2	<0.20	1.3	---	0.61
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	---	0.5
				---	---	---	---	---	---	0.01	---	0	---	0.06
				---	---	---	---	---	---	---	---	---	---	9
				Good	Good	Good	Good	Good	Good	Good	Good	Good	---	Good

APPENDIX B3.

WATER QUALITY CONTROL SAMPLE RESULTS - DISSOLVED HYDROCARBONS

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Date	Sample Time	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylenes mg/L	F1 C_6-C_{10} mg/L	F2 $C_{>10}$-C_{16} mg/L	F3 $C_{>16}$-C_{34} mg/L	F4 $C_{>34}$-C_{50} mg/L	Cl mg/L	TSS mg/L	Turbidity NTU
13-DW30c	Pump from Basin 3 (North)	11-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	---	0.4
13-DW30c dup	Pump from Basin 3 (North)	11-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	---	0.45
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	---	0.5
				---	---	---	---	---	---	---	---	---	---	0.05
				---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	---	Good
13-DW10	Pump from Basin 1	12-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.14	0.23	<0.20	1	---	0.86
13-DW10 dup	Pump from Basin 1	12-Oct-13	3:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.19	0.35	0.21	<1.0	---	0.85
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	---	0.5
				---	---	---	---	---	0.05	0.12	---	---	---	0.01
				---	---	---	---	---	---	---	---	---	---	1
				Good	Good	Good	Good	Good	Good	Good	Good	Good	---	Good
13-DW30c	Pump from Basin 3 (North)	12-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	---	0.6
13-DW30c dup	Pump from Basin 3 (North)	12-Oct-13	13:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	---	0.54
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	---	0.5
				---	---	---	---	---	---	---	---	---	---	0.06
				---	---	---	---	---	---	---	---	---	---	11
				Good	Good	Good	Good	Good	Good	Good	Good	Good	---	Good
13-DW10	Pump from Basin 1	13-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	---	0.58
13-DW10 dup	Pump from Basin 1	13-Oct-13	1:00	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	---	0.83
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	---	0.5
				---	---	---	---	---	---	---	---	---	---	0.25
				---	---	---	---	---	---	---	---	---	---	35
				Good	Good	Good	Good	Good	Good	Good	Good	Good	---	Good
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	14-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	---	0.69
13-DW23a dup	Basin 1 Discharge Line after Carbon Treatment	14-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	---	0.79
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	---	0.5
				---	---	---	---	---	---	---	---	---	---	0.1
				---	---	---	---	---	---	---	---	---	---	14
				Good	Good	Good	Good	Good	Good	Good	Good	Good	---	Good
13-DW30c	Pump from Basin 3 (North)	15-Oct-13	1:00	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	---	0.67
13-DW30c dup	Pump from Basin 3 (North)	15-Oct-13	1:00	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	---	0.45
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	---	0.5
				---	---	---	---	---	---	---	---	---	---	0.22
				---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	---	Good
13-DW30c	Pump from Basin 3 (North)	16-Oct-13	1:00	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	---	1.2
13-DW30c dup	Pump from Basin 3 (North)	16-Oct-13	1:00	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	---	1
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	---	0.5
				---	---	---	---	---	---	---	---	---	---	0.2
				---	---	---	---	---	---	---	---	---	---	18
				Good	Good	Good	Good	Good	Good	Good	Good	Good	---	Good

APPENDIX B3.

WATER QUALITY CONTROL SAMPLE RESULTS - DISSOLVED HYDROCARBONS

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Date	Sample Time	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylenes mg/L	F1 C_6-C_{10} mg/L	F2 $C_{>10}$-C_{16} mg/L	F3 $C_{>16}$-C_{34} mg/L	F4 $C_{>34}$-C_{50} mg/L	Cl mg/L	TSS mg/L	Turbidity NTU
13-DW30c	Pump from Basin 3 (North)	17-Oct-13	1:00	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	1.2	---	0.84
13-DW30c dup	Pump from Basin 3 (North)	17-Oct-13	1:00	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	1.2	---	0.94
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	---	0.5
				---	---	---	---	---	---	---	---	0	---	0.1
				---	---	---	---	---	---	---	---	---	---	11
				Good	Good	Good	Good	Good	Good	Good	Good	Good	---	Good
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	17-Oct-13	11:00	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	1.3	<1.0	1.1
13-DW23a dup	Basin 1 Discharge Line after Carbon Treatment	17-Oct-13	11:00	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	1.2	<1.0	1
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	5	0.5
				---	---	---	---	---	---	---	---	0.1	---	0.1
				---	---	---	---	---	---	---	---	---	---	10
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-DW30c	Pump from Basin 3 (North)	18-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	---	1.2
13-DW30c dup	Pump from Basin 3 (North)	18-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	---	1
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	---	0.5
				---	---	---	---	---	---	---	---	---	---	0.2
				---	---	---	---	---	---	---	---	---	---	18
				Good	Good	Good	Good	Good	Good	Good	Good	Good	---	Good
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	18-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	0.22	<0.20	1.3	<1.0	1.3
13-DW23a dup	Basin 1 Discharge Line after Carbon Treatment	18-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	1.2	---	0.8
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	---	0.5
				---	---	---	---	---	---	---	---	0.1	---	0.5
				---	---	---	---	---	---	---	---	---	---	48
				Good	Good	Good	Good	Good	Good	Good	Good	Good	---	***Poor***
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	19-Oct-13	13:00	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	---	1.4
13-DW23a dup	Basin 1 Discharge Line after Carbon Treatment	19-Oct-13	13:00	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	1.3	---	1.5
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	---	0.5
				---	---	---	---	---	---	---	---	---	---	0.1
				---	---	---	---	---	---	---	---	---	---	7
				Good	Good	Good	Good	Good	Good	Good	Good	Good	---	Good
13-DW30c	Pump from Basin 3 (North)	19-Oct-13	3:00	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	---	0.53
13-DW30c dup	Pump from Basin 3 (North)	19-Oct-13	3:00	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	---	0.66
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	---	0.5
				---	---	---	---	---	---	---	---	---	---	0.13
				---	---	---	---	---	---	---	---	---	---	22
				Good	Good	Good	Good	Good	Good	Good	Good	Good	---	Good
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	20-Oct-13	9:00	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	0.22	1.0	2.0	8.0
13-DW23a dup	Basin 1 Discharge Line after Carbon Treatment	20-Oct-13	9:00	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	1.1	<1.0	7.2
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	5	0.5
				---	---	---	---	---	---	---	---	0.1	---	0.8
				---	---	---	---	---	---	---	---	---	---	11
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good

APPENDIX B3.

WATER QUALITY CONTROL SAMPLE RESULTS - DISSOLVED HYDROCARBONS

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Date	Sample Time	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylenes mg/L	F1 C_6-C_{10} mg/L	F2 $C_{>10}$-C_{16} mg/L	F3 $C_{>16}$-C_{34} mg/L	F4 $C_{>34}$-C_{50} mg/L	Cl mg/L	TSS mg/L	Turbidity NTU
13-DW30c	Pump from Basin 3 (North)	20-Oct-13	1:00	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	---	0.59
13-DW30c dup	Pump from Basin 3 (North)	20-Oct-13	1:00	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	---	0.53
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	---	0.5
				---	---	---	---	---	---	---	---	---	---	0.06
				---	---	---	---	---	---	---	---	---	---	11
				Good	Good	Good	Good	Good	Good	Good	Good	Good	---	Good
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	21-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	---	4.4
13-DW23a dup	Basin 1 Discharge Line after Carbon Treatment	21-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	4	2.4
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	---	0.5
				---	---	---	---	---	---	---	---	---	---	2
				---	---	---	---	---	---	---	---	---	---	59
				Good	Good	Good	Good	Good	Good	Good	Good	Good	---	***Poor***
13-DW30c	Pump from Basin 3 (North)	21-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	0.11	<0.10	<0.20	<0.20	<1.0	---	0.66
13-DW30c dup	Pump from Basin 3 (North)	21-Oct-13	1:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	---	1.5
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	---	0.5
				---	---	---	---	---	---	---	---	---	---	0.84
				---	---	---	---	---	---	---	---	---	---	78
				Good	Good	Good	Good	Good	Good	Good	Good	Good	---	***Poor***
13-DW30c	Pump from Basin 3 (North)	22-Oct-13	1:00	<0.00040	<0.0020	<0.00040	<0.0040	0.12	<0.10	<0.20	<0.20	<1.0	---	0.74
13-DW30c dup	Pump from Basin 3 (North)	22-Oct-13	1:00	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	---	0.62
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	---	0.5
				---	---	---	---	---	---	---	---	---	---	0.12
				---	---	---	---	---	---	---	---	---	---	18
				Good	Good	Good	Good	Good	Good	Good	Good	Good	---	Good

Notes:

--- - not applicable

* - non-detectable concentrations are assessed at 95% of the detection limit

** - the reliable (reporting) detection limit (RDL) or practical detection limit (PDL) is defined as 5 times the DL

Good - evaluation indicates acceptable reproducibility

Poor - evaluation indicates poor reproducibility

APPENDIX B4.

WATER QUALITY CONTROL SAMPLE RESULTS - POLYCYCLIC AROMATIC HYDROCARBONS

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Date	Sample Time	Acenaphthene µg/L	Acenaphthylene µg/L	Acridine µg/L	Anthracene µg/L	Benz[a]anthracene µg/L	Benzo[b+j]fluoranthene µg/L	Benzo[k]fluoranthene µg/L	Benzo[g,h,i]perylene µg/L	Benzo[a]pyrene µg/L	Chrysene µg/L	Dibenz[a,h]anthracene µg/L	Fluoranthene µg/L	Fluorene µg/L	Indeno[1,2,3-cd]pyrene µg/L	Naphthalene µg/L	Phenanthrene µg/L	Pyrene µg/L	Quinoline µg/L
13-DW10	Pump from Basin 1	30-Sep-13	15:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW10 dup	Pump from Basin 1	30-Sep-13	15:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-DW25	E Overland Discharge from Basin 2	01-Oct-13	11:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW25 dup	E Overland Discharge from Basin 2	01-Oct-13	11:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	13-Oct-13	11:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	13-Oct-13	11:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	17-Oct-13	11:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23a dup	Basin 1 Discharge Line after Carbon Treatment	17-Oct-13	11:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-DW23a	Basin 1 Discharge Line after Carbon Treatment	20-Oct-13	9:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23a dup	Basin 1 Discharge Line after Carbon Treatment	20-Oct-13	9:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good

Notes:

--- - not applicable

* - non-detectable concentrations are assessed at 95% of the detection limit

** - the reliable (reporting) detection limit (RDL) or practical detection limit (PDL) is defined as 5 times the DL

Good - evaluation indicates acceptable reproducibility

Poor - evaluation indicates poor reproducibility

APPENDIX B5.

WATER QUALITY CONTROL SAMPLE RESULTS - DISSOLVED HYDROCARBONS Maxxam vs Exova

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Lab	Sample Location	Sample Date	Sample Time	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylenes mg/L	F1 C_6-C_{10} mg/L	F2 $C_{>10}$-C_{16} mg/L	F3 $C_{>16}$-C_{34} mg/L	F4 $C_{>34}$-C_{50} mg/L	Cl mg/L	TSS mg/L	Turbidity NTU
13-DW10	Maxxam	Pump from Basin 1	03-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	0.65
13-DW10	Exova	Pump from Basin 1	03-Oct-13	7:00	<0.001	<0.001	<0.001	<0.001	<0.2	<0.2	<0.1	<0.1	0.6	<1	---
					0.0004	0.001	0.0004	0.001	0.1	0.1	0.1	0.1	0.4	1	0.1
					0.002	0.005	0.002	0.005	0.5	0.5	0.5	0.5	2	5	---
					---	---	---	---	---	---	---	---	---	---	---
					---	---	---	---	---	---	---	---	---	---	---
					Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	---
13-DW10	Maxxam	Pump from Basin 1	04-Oct-13	11:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	---	0.78
13-DW10	Exova	Pump from Basin 1	04-Oct-13	11:00	<0.001	<0.001	<0.001	<0.001	<0.2	<0.2	<0.1	<0.1	0.6	2	2
					0.0004	0.001	0.0004	0.001	0.1	0.1	0.1	0.1	0.4	1	0.1
					0.002	0.005	0.002	0.005	0.5	0.5	0.5	0.5	2	---	0.5
					---	---	---	---	---	---	---	---	---	---	1.22
					---	---	---	---	---	---	---	---	---	---	88
					Good	Good	Good	Good	Good	Good	Good	Good	Good	---	***Poor***
13-DW10	Maxxam	Pump from Basin 1	05-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	0.73
13-DW10	Exova	Pump from Basin 1	05-Oct-13	7:00	<0.001	<0.001	<0.001	<0.001	<0.2	<0.2	<0.1	<0.1	0.6	2	1.9
					0.0004	0.001	0.0004	0.001	0.1	0.1	0.1	0.1	0.4	1	0.1
					0.002	0.005	0.002	0.005	0.5	0.5	0.5	0.5	2	5	0.5
					---	---	---	---	---	---	---	---	---	---	1.17
					---	---	---	---	---	---	---	---	---	---	89
					Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	***Poor***
13-DW10	Maxxam	Pump from Basin 1	06-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	0.32	<0.20	<1.0	1.3	0.47
13-DW10	Exova	Pump from Basin 1	06-Oct-13	7:00	<0.001	<0.001	<0.001	<0.001	<0.20	<0.20	<0.1	<0.1	0.8	<2	0.9
					0.0004	0.001	0.0004	0.001	0.1	0.1	0.1	0.1	0.4	1	0.1
					0.002	0.005	0.002	0.005	0.5	0.5	0.5	0.5	2	5	0.5
					---	---	---	---	---	---	---	---	---	---	0.43
					---	---	---	---	---	---	---	---	---	---	---
					Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-DW10	Maxxam	Pump from Basin 1	08-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	1.3	1.3	0.83
13-DW10	Exova	Pump from Basin 1	08-Oct-13	7:00	<0.001	<0.001	<0.001	<0.001	<0.20	<0.20	<0.1	<0.1	0.8	<1	2.4
					0.0004	0.001	0.0004	0.001	0.1	0.1	0.1	0.1	0.4	1	0.1
					0.002	0.005	0.002	0.005	0.5	0.5	0.5	0.5	2	5	0.5
					---	---	---	---	---	---	---	---	0.5	---	1.57
					---	---	---	---	---	---	---	---	---	---	97
					Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	***Poor***
13-DW10	Maxxam	Pump from Basin 1	09-Oct-13	7:00	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	1.3	<1.0	0.55
13-DW10	Exova	Pump from Basin 1	09-Oct-13	7:00	<0.001	<0.001	<0.001	<0.001	<0.20	<0.20	<0.1	<0.1	0.8	<1	1.4
					0.0004	0.001	0.0004	0.001	0.1	0.1	0.1	0.1	0.4	1	0.1
					0.002	0.005	0.002	0.005	0.5	0.5	0.5	0.5	2	5	0.5
					---	---	---	---	---	---	---	---	0.5	---	0.85
					---	---	---	---	---	---	---	---	---	---	87
					Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	***Poor***
13-DW30c	Maxxam	Pump from Basin 3 (North)	04-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	0.12	<0.10	<0.20	<0.20	<1.0	---	0.47
13-DW30c	Exova	Pump from Basin 3 (North)	04-Oct-13	17:00	<0.001	<0.001	<0.001	<0.001	<0.2	<0.2	<0.1	<0.1	0.5	<1	1.5
					0.0004	0.001	0.0004	0.001	0.1	0.1	0.1	0.1	0.4	1	0.1
					0.002	0.005	0.002	0.005	0.5	0.5	0.5	0.5	2	---	0.5
					---	---	---	---	---	---	---	---	---	---	1.03
					---	---	---	---	---	---	---	---	---	---	---
					Good	Good	Good	Good	Good	Good	Good	Good	Good	---	***Poor***
13-DW30c	Maxxam	Pump from Basin 3 (North)	06-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	0.51
13-DW30c	Exova	Pump from Basin 3 (North)	06-Oct-13	17:00	<0.001	<0.001	<0.001	<0.001	<0.20	<0.20	<0.1	<0.1	0.6	<2	1
					0.0004	0.001	0.0004	0.001	0.1	0.1	0.1	0.1	0.4	1	0.1
					0.002	0.005	0.002	0.005	0.5	0.5	0.5	0.5	2	5	0.5
					---	---	---	---	---	---	---	---	---	---	0.49
					---	---	---	---	---	---	---	---	---	---	65
					Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	***Poor***

APPENDIX B5.

WATER QUALITY CONTROL SAMPLE RESULTS - DISSOLVED HYDROCARBONS Maxxam vs Exova

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Lab	Sample Location	Sample Date	Sample Time	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylenes mg/L	F1 C_6-C_{10} mg/L	F2 $C_{>10}$-C_{16} mg/L	F3 $C_{>16}$-C_{34} mg/L	F4 $C_{>34}$-C_{50} mg/L	Cl mg/L	TSS mg/L	Turbidity NTU
13-DW30c	Maxxam	Pump from Basin 3 (North)	07-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	0.64
13-DW30c	Exova	Pump from Basin 3 (North)	07-Oct-13	17:00	<0.001	<0.001	<0.001	<0.001	<0.20	<0.20	<0.1	<0.1	0.6	<2	0.70
					0.0004	0.001	0.0004	0.001	0.1	0.1	0.1	0.1	0.4	1	0.1
					0.002	0.005	0.002	0.005	0.5	0.5	0.5	0.5	2	5	0.5
					---	---	---	---	---	---	---	---	---	---	0.06
					---	---	---	---	---	---	---	---	---	---	9
					Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-DW30c	Maxxam	Pump from Basin 3 (North)	08-Oct-13	17:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	1.0	<1.0	0.59
13-DW30c	Exova	Pump from Basin 3 (North)	08-Oct-13	17:00	<0.001	<0.001	<0.001	<0.001	<0.20	<0.20	<0.1	<0.1	0.6	<1	0.6
					0.0004	0.001	0.0004	0.001	0.1	0.1	0.1	0.1	0.4	1	0.1
					0.002	0.005	0.002	0.005	0.5	0.5	0.5	0.5	2	5	0.5
					---	---	---	---	---	---	---	---	0.4	---	0.01
					---	---	---	---	---	---	---	---	---	---	2
					Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-DW30c	Maxxam	Pump from Basin 3 (North)	09-Oct-13	17:00	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	1.1	1.3	0.52
13-DW30c	Exova	Pump from Basin 3 (North)	09-Oct-13	17:00	<0.001	<0.001	<0.001	<0.001	<0.20	<0.20	<0.1	<0.1	0.7	<1	0.8
					0.0004	0.001	0.0004	0.001	0.1	0.1	0.1	0.1	0.4	1	0.1
					0.002	0.005	0.002	0.005	0.5	0.5	0.5	0.5	2	5	0.5
					---	---	---	---	---	---	---	---	0.4	---	0.28
					---	---	---	---	---	---	---	---	---	---	42
					Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	***Poor***
13-DW10	Maxxam	Pump from Basin 1	10-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.1	0.2	0.23	1.0	<1.0	0.85
13-DW10	Exova	Pump from Basin 1	10-Oct-13	7:00	<0.001	<0.001	<0.001	<0.001	<0.20	<0.20	<0.1	<0.1	0.8	<2	0.9
					0.0004	0.001	0.0004	0.001	0.1	0.1	0.1	0.1	0.4	1	0.1
					0.002	0.005	0.002	0.005	0.5	0.5	0.5	0.5	2	5	0.5
					---	---	---	---	---	---	---	---	0.2	---	0.05
					---	---	---	---	---	---	---	---	---	---	6
					Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-DW30c	Maxxam	Pump from Basin 3 (North)	10-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	1.3	0.45
13-DW30c	Exova	Pump from Basin 3 (North)	10-Oct-13	15:00	<0.001	<0.001	<0.001	<0.001	<0.20	<0.20	<0.1	<0.1	0.5	<2	0.5
					0.0004	0.001	0.0004	0.001	0.1	0.1	0.1	0.1	0.4	1	0.1
					0.002	0.005	0.002	0.005	0.5	0.5	0.5	0.5	2	5	0.5
					---	---	---	---	---	---	---	---	---	---	0.05
					---	---	---	---	---	---	---	---	---	---	---
					Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-DW10	Maxxam	Pump from Basin 1	11-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.16	0.32	0.23	1.1	2	0.67
13-DW10	Exova	Pump from Basin 1	11-Oct-13	7:00	<0.001	<0.001	<0.001	<0.001	<0.20	<0.20	<0.1	<0.1	0.7	<1	1.3
					0.0004	0.001	0.0004	0.001	0.1	0.1	0.1	0.1	0.4	1	0.1
					0.002	0.005	0.002	0.005	0.5	0.5	0.5	0.5	2	5	0.5
					---	---	---	---	---	---	---	---	0.4	---	0.63
					---	---	---	---	---	---	---	---	---	---	64
					Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	***Poor***
13-DW30c	Maxxam	Pump from Basin 3 (North)	11-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	0.68	<0.10	<0.20	<0.20	<1.0	1.3	0.39
13-DW30c	Exova	Pump from Basin 3 (North)	11-Oct-13	15:00	<0.001	<0.001	<0.001	<0.001	<0.20	<0.20	0.3	<0.1	0.5	<1	0.8
					0.0004	0.001	0.0004	0.001	0.1	0.1	0.1	0.1	0.4	1	0.1
					0.002	0.005	0.002	0.005	0.5	0.5	0.5	0.5	2	5	0.5
					---	---	---	---	---	---	---	---	---	---	0.41
					---	---	---	---	---	---	---	---	---	---	---
					Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good

APPENDIX B5.

WATER QUALITY CONTROL SAMPLE RESULTS - DISSOLVED HYDROCARBONS Maxxam vs Exova

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Lab	Sample Location	Sample Date	Sample Time	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylenes mg/L	F1 C_6-C_{10} mg/L	F2 $C_{>10}$-C_{16} mg/L	F3 $C_{>16}$-C_{34} mg/L	F4 $C_{>34}$-C_{50} mg/L	Cl mg/L	TSS mg/L	Turbidity NTU
13-DW10	Maxxam	Pump from Basin 1	12-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	0.45	0.19	0.37	0.25	1.1	<1.0	1
13-DW10	Exova	Pump from Basin 1	12-Oct-13	7:00	<0.001	<0.001	<0.001	<0.001	<0.20	<0.20	<0.1	<0.1	0.9	<2	1.2
					0.0004	0.001	0.0004	0.001	0.1	0.1	0.1	0.1	0.4	1	0.1
					0.002	0.005	0.002	0.005	0.5	0.5	0.5	0.5	2	5	0.5
					---	---	---	---	---	---	---	---	0.2	---	0.2
					---	---	---	---	---	---	---	---	---	---	18
					Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-DW30c	Maxxam	Pump from Basin 3 (North)	12-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	0.42
13-DW30c	Exova	Pump from Basin 3 (North)	12-Oct-13	15:00	<0.001	<0.001	<0.001	<0.001	<0.20	<0.20	<0.1	<0.1	0.7	<1	0.9
					0.0004	0.001	0.0004	0.001	0.1	0.1	0.1	0.1	0.4	1	0.1
					0.002	0.005	0.002	0.005	0.5	0.5	0.5	0.5	2	5	0.5
					---	---	---	---	---	---	---	---	---	---	0.48
					---	---	---	---	---	---	---	---	---	---	---
					Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-DW30c	Maxxam	Pump from Basin 3 (North)	13-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<3.0	0.76
13-DW30c	Exova	Pump from Basin 3 (North)	13-Oct-13	5:00	<0.001	<0.001	<0.001	<0.001	<0.20	<0.20	<0.1	<0.1	0.7	<1	1
					0.0004	0.001	0.0004	0.001	0.1	0.1	0.1	0.1	0.4	1	0.1
					0.002	0.005	0.002	0.005	0.5	0.5	0.5	0.5	2	5	0.5
					---	---	---	---	---	---	---	---	---	---	0.24
					---	---	---	---	---	---	---	---	---	---	27
					Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-DW23a	Maxxam	---	14-Oct-13	7:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	1.3	1.4
13-DW23a	Exova	---	14-Oct-13	7:00	<0.001	<0.001	<0.001	<0.001	<0.2	<0.20	<0.10	<0.10	0.8	<1	2.5
					0.0004	0.001	0.0004	0.001	0.1	0.1	0.1	0.1	0.4	1	0.1
					0.002	0.005	0.002	0.005	0.5	0.5	0.5	0.5	2	5	0.5
					---	---	---	---	---	---	---	---	---	---	1.1
					---	---	---	---	---	---	---	---	---	---	56
					Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	***Poor***
13-DW30c	Maxxam	Pump from Basin 3 (North)	14-Oct-13	15:00	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	0.44
13-DW30c	Exova	Pump from Basin 3 (North)	14-Oct-13	15:00	<0.001	<0.001	<0.001	<0.001	<0.20	<0.20	<0.1	<0.1	0.6	<1	1.1
					0.0004	0.001	0.0004	0.001	0.1	0.1	0.1	0.1	0.4	1	0.1
					0.002	0.005	0.002	0.005	0.5	0.5	0.5	0.5	2	5	0.5
					---	---	---	---	---	---	---	---	---	---	0.66
					---	---	---	---	---	---	---	---	---	---	---
					Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-DW30c	Maxxam	Pump from Basin 3 (North)	15-Oct-13	11:00	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	---	0.71
13-DW30c	Exova	Pump from Basin 3 (North)	15-Oct-13	11:00	<0.001	<0.001	<0.001	<0.001	<0.20	<0.20	<0.1	<0.1	0.6	15	0.8
					0.0004	0.001	0.0004	0.001	0.1	0.1	0.1	0.1	0.4	1	0.1
					0.002	0.005	0.002	0.005	0.5	0.5	0.5	0.5	2	---	0.5
					---	---	---	---	---	---	---	---	---	---	0.09
					---	---	---	---	---	---	---	---	---	---	12
					Good	Good	Good	Good	Good	Good	Good	Good	Good	---	Good

APPENDIX B6.

WATER QUALITY CONTROL SAMPLE RESULTS - POLYCYCLIC AROMATIC HYDROCARBONS Maxxam vs Exova

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Lab	Sample Location	Sample Date	Sample Time	Acenaphthene µg/L	Acenaphthylene µg/L	Acridine µg/L	Anthracene µg/L	Benz[a]anthracene µg/L	Benzo[b+j]fluoranthene µg/L	Benzo[k]fluoranthene µg/L	Benzo[g,h,i]perylene µg/L	Benzo[a]pyrene µg/L	Chrysene µg/L	Dibenz[a,h]anthracene µg/L	Fluoranthene µg/L	Fluorene µg/L	Indeno[1,2,3-cd]pyrene µg/L	Naphthalene µg/L	Phenanthrene µg/L	Pyrene µg/L	Quinoline µg/L
13-DW10	Maxxam	Pump from Basin 1	03-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW10	Exova	Pump from Basin 1	03-Oct-13	7:00	<0.2	<0.2	<0.2	<0.009	<0.02	<0.2	<0.2	<0.09	<0.01	<0.2	<0.09	0.03	<0.2	<0.09	<0.2	<0.2	0.02	<0.5
					0.1	0.1	0.2	0.009	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
					0.5	0.5	1	0.045	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
					---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
					---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
					Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-DW10	Maxxam	Pump from Basin 1	05-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW10	Exova	Pump from Basin 1	05-Oct-13	7:00	<0.2	<0.2	<0.2	<0.009	<0.02	<0.2	<0.2	<0.09	<0.01	<0.2	<0.09	0.03	<0.2	<0.09	<0.2	<0.2	0.02	<0.5
					0.1	0.1	0.2	0.009	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
					0.5	0.5	1	0.045	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
					---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
					---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
					Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-DW10	Maxxam	Pump from Basin 1	06-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW10	Exova	Pump from Basin 1	06-Oct-13	7:00	<0.1	<0.1	<0.1	<0.005	<0.01	<0.1	<0.1	<0.05	<0.008	<0.1	<0.05	<0.01	<0.1	<0.05	<0.1	<0.1	<0.01	<0.3
					0.1	0.1	0.2	0.005	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
					0.5	0.5	1	0.025	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
					---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
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					Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-DW10	Maxxam	Pump from Basin 1	08-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.01	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW10	Exova	Pump from Basin 1	08-Oct-13	7:00	<0.1	<0.1	<0.1	<0.005	<0.01	<0.1	<0.1	<0.05	<0.008	<0.1	<0.05	<0.01	<0.1	<0.05	<0.1	<0.1	<0.01	<0.3
					0.1	0.1	0.2	0.005	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
					0.5	0.5	1	0.025	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
					---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
					---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
					Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-DW30C	Maxxam	Pump from Basin 3 (North)	04-Oct-13	17:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30C	Exova	Pump from Basin 3 (North)	04-Oct-13	17:00	<0.2	<0.2	<0.2	<0.009	<0.02	<0.2	<0.2	<0.09	<0.01	<0.2	<0.09	<0.02	<0.2	<0.09	<0.2	<0.2	<0.02	<0.5
					0.1	0.1	0.2	0.009	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
					0.5	0.5	1	0.045	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
					---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
					---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
					Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good

APPENDIX B6.

WATER QUALITY CONTROL SAMPLE RESULTS - POLYCYCLIC AROMATIC HYDROCARBONS Maxxam vs Exova

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Lab	Sample Location	Sample Date	Sample Time	Acenaphthene µg/L	Acenaphthylene µg/L	Acridine µg/L	Anthracene µg/L	Benz[a]anthracene µg/L	Benzo[b+j]fluoranthene µg/L	Benzo[k]fluoranthene µg/L	Benzo[g,h,i]perylene µg/L	Benzo[a]pyrene µg/L	Chrysene µg/L	Dibenz[a,h]anthracene µg/L	Fluoranthene µg/L	Fluorene µg/L	Indeno[1,2,3-cd]pyrene µg/L	Naphthalene µg/L	Phenanthrene µg/L	Pyrene µg/L	Quinoline µg/L
13-DW30C	Maxxam	Pump from Basin 3 (North)	06-Oct-13	17:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30C	Exova	Pump from Basin 3 (North)	06-Oct-13	17:00	<0.1	<0.1	<0.1	<0.005	<0.01	<0.1	<0.1	<0.05	<0.008	<0.1	<0.05	<0.01	<0.1	<0.05	<0.1	<0.1	<0.01	<0.3
					0.1	0.1	0.2	0.005	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
					0.5	0.5	1	0.025	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
					---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
					---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
					Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-DW30c	Maxxam	Pump from Basin 3 (North)	08-Oct-13	17:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30c	Exova	Pump from Basin 3 (North)	08-Oct-13	17:00	<0.1	<0.1	<0.1	<0.005	<0.01	<0.1	<0.1	<0.05	<0.008	<0.1	<0.05	<0.01	<0.1	<0.05	<0.1	<0.1	<0.01	<0.3
					0.1	0.1	0.2	0.005	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
					0.5	0.5	1	0.025	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
					---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
					---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
					Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-DW10	Maxxam	Pump from Basin 1	10-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW10	Exova	Pump from Basin 1	10-Oct-13	7:00	<0.1	<0.1	<0.1	<0.005	<0.01	<0.1	<0.1	<0.05	<0.008	<0.1	<0.05	0.01	<0.1	<0.05	<0.1	<0.1	<0.01	<0.3
					0.1	0.1	0.2	0.005	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
					0.5	0.5	1	0.025	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
					---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
					---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
					Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-DW30c	Maxxam	Pump from Basin 3 (North)	10-Oct-13	15:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30c	Exova	Pump from Basin 3 (North)	10-Oct-13	15:00	<0.1	<0.1	<0.1	<0.005	<0.01	<0.1	<0.1	<0.05	<0.008	<0.1	<0.05	0.01	<0.1	<0.05	<0.1	<0.1	<0.01	<0.3
					0.1	0.1	0.2	0.005	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
					0.5	0.5	1	0.025	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
					---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
					---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
					Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-DW10	Maxxam	Pump from Basin 1	11-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW10	Exova	Pump from Basin 1	11-Oct-13	7:00	<0.1	<0.1	<0.1	<0.005	<0.01	<0.1	<0.1	<0.05	<0.008	<0.1	<0.05	0.01	<0.1	<0.05	<0.1	<0.1	<0.01	<0.3
					0.1	0.1	0.2	0.005	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
					0.5	0.5	1	0.025	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
					---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
					---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
					Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-DW30c	Maxxam	Pump from Basin 3 (North)	11-Oct-13	15:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30c	Exova	Pump from Basin 3 (North)	11-Oct-13	15:00	<0.1	<0.1	<0.1	<0.005	<0.01	<0.1	<0.1	<0.05	<0.008	<0.1	<0.05	0.01	<0.1	<0.05	<0.1	<0.1	<0.01	<0.3
					0.1	0.1	0.2	0.005	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
					0.5	0.5	1	0.025	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
					---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
					---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
					Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-DW10	Maxxam	Pump from Basin 1	12-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW10	Exova	Pump from Basin 1	12-Oct-13	7:00	<0.1	<0.1	<0.1	<0.005	<0.01	<0.1	<0.1	<0.05	<0.008	<0.1	<0.05	<0.01	<0.1	<0.05	<0.1	<0.1	<0.01	<0.3
					0.1	0.1	0.2	0.005	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
					0.5	0.5	1	0.025	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
					---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
					---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
					Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good

APPENDIX B6.

WATER QUALITY CONTROL SAMPLE RESULTS - POLYCYCLIC AROMATIC HYDROCARBONS Maxxam vs Exova

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Lab	Sample Location	Sample Date	Sample Time	Acenaphthene µg/L	Acenaphthylene µg/L	Acridine µg/L	Anthracene µg/L	Benz[a]anthracene µg/L	Benzo[b+j]fluoranthene µg/L	Benzo[k]fluoranthene µg/L	Benzo[g,h,i]perylene µg/L	Benzo[a]pyrene µg/L	Chrysene µg/L	Dibenz[a,h]anthracene µg/L	Fluoranthene µg/L	Fluorene µg/L	Indeno[1,2,3-cd]pyrene µg/L	Naphthalene µg/L	Phenanthrene µg/L	Pyrene µg/L	Quinoline µg/L
13-DW30c	Maxxam	Pump from Basin 3 (North)	12-Oct-13	15:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW30c	Exova	Pump from Basin 3 (North)	12-Oct-13	15:00	<0.1	<0.1	<0.1	<0.005	<0.01	<0.1	<0.1	<0.05	<0.008	<0.1	<0.05	<0.01	<0.1	<0.05	<0.1	<0.1	<0.01	<0.3
					0.1	0.1	0.2	0.005	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
					0.5	0.5	1	0.025	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
					---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
					---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
					Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-DW23a	Maxxam	Basin 2 Discharge Line after Carbon Treatment	14-Oct-13	7:00	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DW23a	Exova	Basin 2 Discharge Line after Carbon Treatment	14-Oct-13	7:00	<0.1	<0.1	<0.1	<0.005	<0.01	0.20	0.10	<0.05	<0.008	<0.1	<0.05	<0.01	<0.1	<0.05	<0.1	<0.1	<0.01	<0.3
					0.1	0.1	0.2	0.005	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
					0.5	0.5	1	0.025	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
					---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
					---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
					Good	Good	Good	Good	Good	***Poor***	***Poor***	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good

Notes:

--- - not applicable

* - non-detectable concentrations are assessed at 95% of the detection limit

** - the reliable (reporting) detection limit (RDL) or practical detection limit (PDL) is defined as 5 times the DL

Good - evaluation indicates acceptable reproducibility

Poor - evaluation indicates poor reproducibility

APPENDIX B7.

WATER QUALITY CONTROL SAMPLE RESULTS - DISSOLVED HYDROCARBONS

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Date	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylenes mg/L	F1 C_6-C_{10} mg/L	F2 $C_{>10}$-C_{16} mg/L	F3 $C_{>16}$-C_{34} mg/L	F4 $C_{>34}$-C_{50} mg/L	Cl mg/L	TSS mg/L	Turbidity NTU
Trip Blank	28-Sep-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<2.0	1.3	<0.10
Trip Blank	28-Sep-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1.0	<1.0	<0.10
Trip Blank	29-Sep-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1.0	<1.0	<0.10
Trip Blank	29-Sep-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	---	---	---
Trip Blank	30-Sep-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1.0	<1.0	<0.10
Trip Blank	30-Sep-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1.0	---	<0.10
Trip Blank	01-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1.0	<1.0	<0.10
Trip Blank	02-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	03-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	04-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	04-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	05-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	05-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	06-Oct-13	---	---	---	---	---	---	---	---	<1.0	<1.0	<0.10
Trip Blank	06-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	---	---	---
Trip Blank	06-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	---	<0.10
Trip Blank	07-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	07-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.13	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	08-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	08-Oct-13	<0.0004	<0.002	<0.0004	<0.004	0.14	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	09-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	09-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	10-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.17	0.32	0.21	<1.0	<1.0	<0.10
Trip Blank	10-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	11-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	11-Oct-13	<0.0004	<0.002	<0.0004	<0.004	0.13	<0.10	<0.20	<0.20	<1.0	<3.0	<0.10
Trip Blank	12-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	12-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	13-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	13-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	14-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	1.3	<0.10
Trip Blank	14-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	15-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	0.16	0.34	<0.20	<1.0	<1.0	<0.10
Trip Blank	15-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	1.3	<0.10
Trip Blank	16-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	16-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	17-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	17-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	18-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	18-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	19-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	19-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	20-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	20-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	21-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	21-Oct-13	<0.0004	<0.002	<0.0004	<0.004	0.18	<0.10	<0.20	<0.20	<1.0	1.3	0.11
Trip Blank	22-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	6	<0.10
Trip Blank	22-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
		0.0004	**0.002**	**0.0004**	**0.004**	**0.1**	**0.1**	**0.2**	**0.2**	**1**	**1**	**0.1**

APPENDIX B7.

WATER QUALITY CONTROL SAMPLE RESULTS - DISSOLVED HYDROCARBONS

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Date	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylenes mg/L	F1 C_6-C_{10} mg/L	F2 $C_{>10}$-C_{16} mg/L	F3 $C_{>16}$-C_{34} mg/L	F4 $C_{>34}$-C_{50} mg/L	Cl mg/L	TSS mg/L	Turbidity NTU
Field Blank	28-Sep-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<2.0	<1.0	<0.10
Field Blank	28-Sep-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1.0	<1.0	<0.10
Field Blank	29-Sep-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1.0	1.3	<0.10
Field Blank	29-Sep-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1.0	<1.0	<0.10
Field Blank	30-Sep-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1.0	<1.0	0.34
Field Blank	30-Sep-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1.0	<1.0	<0.10
Field Blank	01-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1.0	<1.0	<0.10
Field Blank	01-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	<1.0	---	<0.10
Field Blank	02-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	02-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	2	<0.10
Field Blank	03-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	03-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	---	---	---
Field Blank	03-Oct-13	---	---	---	---	---	---	---	---	<1.0	---	0.24
Field Blank	04-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	04-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	0.15
Field Blank	05-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	05-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	1.3	<0.10
Field Blank	06-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	0.14
Field Blank	07-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.13	<0.20	0.2	<1.0	<1.0	<0.10
Field Blank	07-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.15	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	08-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	08-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.17	0.20	0.22	<1.0	<1.0	<0.10
Field Blank	09-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	10-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	1.3	<0.10
Field Blank	10-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.11	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	11-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	11-Oct-13	<0.0004	<0.002	<0.0004	<0.004	0.17	<0.10	<0.20	<0.20	<1.0	<1.0	0.12
Field Blank	11-Oct-13	<0.0004	<0.002	<0.0004	<0.004	0.17	<0.10	<0.20	<0.20	<1.0	<1.0	0.12
Field Blank	12-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	12-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	13-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	13-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	14-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	14-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	15-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	15-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	2.7	<0.10
Field Blank	16-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	16-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	17-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	17-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	18-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	18-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	19-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	19-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	20-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	20-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	21-Oct-13	<0.0004	<0.002	<0.0004	<0.004	0.12	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	22-Oct-13	<0.0004	<0.002	<0.0004	<0.004	0.12	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Spike	03-Oct-13	0.053	0.053	0.048	0.15	<0.1	---	---	---	---	---	---
Spike	04-Oct-13	0.053	0.050	0.047	0.15	<0.1	---	---	---	---	---	---
Spike	04-Oct-13	0.043	0.043	0.041	0.13	<0.1	<0.71	<1.4	<1.4	---	---	---
Spike	05-Oct-13	0.051	0.052	0.047	0.16	<0.1	---	---	---	---	---	---
Spike	07-Oct-13	0.043	0.045	0.041	0.14	<0.1	---	---	---	---	---	---
Spike	10-Oct-13	0.036	0.041	0.038	0.13	<0.1	0.78	1.4	0.35	---	---	---
Spike	11-Oct-13	0.039	0.041	0.039	0.13	0.65	1	1.9	0.57	---	---	---
Spike	11-Oct-13	0.039	0.037	0.036	0.108	<0.20	<0.20	<0.1	<0.1	---	---	---
Spike	16-Oct-13	0.048	0.051	0.047	0.16	<0.1	0.61	1	<0.20	---	---	---
Spike	16-Oct-13	0.042	0.041	0.04	0.13	<0.1	0.72	1.3	0.26	---	---	---
Spike	16-Oct-13	0.046	0.044	0.042	0.122	<0.20	<0.20	0.8	<0.1	---	---	---
		0.0004	**0.002**	**0.0004**	**0.004**	**0.1**	**0.1**	**0.2**	**0.2**	**1**	**1**	**0.1**

Notes:

--- - not analyzed

APPENDIX B8.

WATER QUALITY CONTROL SAMPLE RESULTS - POLYCYCLIC AROMATIC HYDROCARBONS

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Date	Acenaphthene µg/L	Acenaphthylene µg/L	Acridine µg/L	Anthracene µg/L	Benz[a]anthracene µg/L	Benzo[b+j]fluoranthene µg/L	Benzo[k]fluoranthene µg/L	Benzo[g,h,i]perylene µg/L	Benzo[a]pyrene µg/L	Chrysene µg/L	Dibenz[a,h]anthracene µg/L	Fluoranthene µg/L	Fluorene µg/L	Indeno[1,2,3-cd]pyrene µg/L	Naphthalene µg/L	Phenanthrene µg/L	Pyrene µg/L	Quinoline µg/L
Trip Blank	28-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	0.01	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	28-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	30-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	01-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	0.012	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	02-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	03-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	04-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	04-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	05-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	05-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	06-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	07-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	07-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	08-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	08-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	09-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	09-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	10-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	10-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	11-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	11-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	12-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	12-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	13-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	13-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	14-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	14-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	15-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	15-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	16-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	16-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	17-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	17-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	18-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	18-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	19-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	19-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	20-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	20-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	21-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	21-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	22-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	22-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
		0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2

APPENDIX B8.

WATER QUALITY CONTROL SAMPLE RESULTS - POLYCYCLIC AROMATIC HYDROCARBONS

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Date	Acenaphthene µg/L	Acenaphthylene µg/L	Acridine µg/L	Anthracene µg/L	Benz[a]anthracene µg/L	Benzo[b+j]fluoranthene µg/L	Benzo[k]fluoranthene µg/L	Benzo[g,h,i]perylene µg/L	Benzo[a]pyrene µg/L	Chrysene µg/L	Dibenz[a,h]anthracene µg/L	Fluoranthene µg/L	Fluorene µg/L	Indeno[1,2,3-cd]pyrene µg/L	Naphthalene µg/L	Phenanthrene µg/L	Pyrene µg/L	Quinoline µg/L
Field Blank	28-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	28-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	30-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0097	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	30-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	01-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	02-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	02-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	03-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	04-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	04-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	05-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	05-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	06-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	07-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	07-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	08-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	08-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	09-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	10-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	10-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	11-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	11-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	12-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	12-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	13-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	13-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	14-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	14-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	15-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	15-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	16-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	16-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	17-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	17-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	18-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	18-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	19-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	19-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	20-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	20-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	21-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	22-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
		0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2

Notes:

--- - not analyzed

APPENDIX C

WATER QUALITY DATA – WATER BODY AND WATERCOURSES

APPENDIX C1.

WATER QUALITY RESULTS - WATER BODIES AND WATERCOURSES

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Depth	Sample Date	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylenes mg/L	F1[††] C_6-C_{10} mg/L	F2 $C_{>10}$-C_{16} mg/L	F3 $C_{>16}$-C_{34} mg/L	F4 $C_{>34}$-C_{50} mg/L	Chloride mg/L	TSS mg/L	Turbidity NTU
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	24-Sep-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.1	<0.2	<0.2	---	---	---
13-SW16	Downstream Fen Upstream of Ken Baker Road	20	25-Sep-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	6.0	---	---
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	20	25-Sep-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	6.1	---	---
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	28-Sep-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	6.7	---	---
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	29-Sep-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	6.9	89	32
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	30-Sep-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	6.6	17	14
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	30-Sep-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	6.3	3.3	7.5
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	01-Oct-13	<0.00040	<0.00040	<0.00040	<0.00080	<0.1	<0.10	<0.20	<0.20	6.3	6.7	9.4
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	01-Oct-13	<0.00040	<0.00040	<0.00040	<0.00080	<0.1	<0.10	<0.20	<0.20	6.3	6.7	11
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	02-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	6.1	21	12
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	02-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	6.2	3.3	7.4
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	03-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	6	6	5
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	03-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	6	<1.0	5.4
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	04-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	5.9	3.3	5.7
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	04-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	5.8	3.3	6.6
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	05-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	6.1	4.7	8.5
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	05-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	6.1	6.7	8.3
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	06-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	6.6	21	10
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	06-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	0.46	<0.20	6.7	53	21
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	07-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	6.9	5.3	9
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	07-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	6.5	16	1.5
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	08-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	6.8	66	16
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	09-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	0.22	6.8	33	20
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	09-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	6.8	1.3	9.8
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	10-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.17	0.33	<0.20	6.8	2	10
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	10-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	6.7	2.7	11
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	11-Oct-13	<0.0004	<0.002	<0.0004	<0.004	0.57	0.2	0.41	0.24	6.9	11	9.9
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	11-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	6	1.3	7.9
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	12-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	6	1.3	7.9
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	13-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.12	0.55	<0.26	6.6	3.3	8.7
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	14-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	6.4	9.3	11
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	15-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	6.3	4.7	12
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	16-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	3.8	5.3	3.7
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	16-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	4.3	6.7	5.1
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	17-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	3.7	1.3	1.1
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	18-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	4.3	1.3	2.2
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	19-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	4.6	3.3	2.3
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	20-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	3.6	3.3	3.4
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	21-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	3.6	2.7	1.4
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	22-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	4.3	17	6.2
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	23-Oct-13	<0.00040	<0.00040	<0.00040	<0.00080	<0.1	<0.10	<0.20	<0.20	4.1	3.3	2.6
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	29-Oct-13	<0.00040	<0.00040	<0.00040	<0.00080	<0.1	<0.10	<0.20	<0.20	4	2.7	1.4
13-SW26	Downstream Fen Upstream of Pad 21	10	25-Sep-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	---	---	---	---	---	---
13-SW26	Downstream Fen Upstream of Pad 21	---	30-Sep-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	8.5	210	54
13-SW26	Downstream Fen Upstream of Pad 21	---	01-Oct-13	<0.00040	<0.00040	<0.00040	<0.00080	<0.1	<0.10	<0.20	<0.20	3.4	290	100
13-SW26	Downstream Fen Upstream of Pad 21	---	02-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	3.9	47	9.4
13-SW26	Downstream Fen Upstream of Pad 21	---	03-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	3.4	6.7	2.7
13-SW26	Downstream Fen Upstream of Pad 21	---	04-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	2.3	4.7	2.8
13-SW26 dup	Downstream Fen Upstream of Pad 21	---	04-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	3	15	11
13-SW26	Downstream Fen Upstream of Pad 21	---	05-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	4.1	6.7	3.1
13-SW26 dup	Downstream Fen Upstream of Pad 21	---	05-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	3.9	4.7	2.3
13-SW26	Downstream Fen Upstream of Pad 21	---	06-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	0.2	<0.20	1.7	15	6.5
13-SW26 dup	Downstream Fen Upstream of Pad 21	---	06-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	1.5	4	1.2
13-SW26	Downstream Fen Upstream of Pad 21	---	07-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	1.8	2	0.95
13-SW26 dup	Downstream Fen Upstream of Pad 21	---	07-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	1.8	2	1.9
13-SW26	Downstream Fen Upstream of Pad 21	---	08-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	1.8	11	4.7
13-SW26 dup	Downstream Fen Upstream of Pad 21	---	08-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.12	<0.20	<0.20	1.6	3.3	1.5
AENV Freshwater Aquatic Life*				**0.370**	**0.002**	**0.09**	**0.2**	**NS**	**NS**	**NS**	**NS**	**120**	**NS**	**NS**

APPENDIX C1.

WATER QUALITY RESULTS - WATER BODIES AND WATERCOURSES

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Depth	Sample Date	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylenes mg/L	F1[††] C_6-C_{10} mg/L	F2 $C_{>10}$-C_{16} mg/L	F3 $C_{>16}$-C_{34} mg/L	F4 $C_{>34}$-C_{50} mg/L	Chloride mg/L	TSS mg/L	Turbidity NTU
13-SW26	Downstream Fen Upstream of Pad 21	---	09-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	1.5	8.7	2.6
13-SW26 dup	Downstream Fen Upstream of Pad 21	---	09-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	1.7	8.7	3
13-SW26	Downstream Fen Upstream of Pad 21	---	10-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	1.2	7.3	2.8
13-SW26 dup	Downstream Fen Upstream of Pad 21	---	10-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	1.7	36	19
13-SW26	Downstream Fen Upstream of Pad 21	---	11-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.15	0.24	<0.20	1.5	6	1
13-SW26	Downstream Fen Upstream of Pad 21	---	12-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	1.2	<1.0	0.7
13-SW26	Downstream Fen Upstream of Pad 21	---	13-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.17	0.27	0.38	1.3	49	14
13-SW26 dup	Downstream Fen Upstream of Pad 21	---	13-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.17	<0.27	<0.38	1.1	51	17
13-SW26	Downstream Fen Upstream of Pad 21	---	14-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1	10	2.9
13-SW26	Downstream Fen Upstream of Pad 21	---	15-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	1.7	6.7	7.7
13-SW26	Downstream Fen Upstream of Pad 21	---	16-Oct-13	<0.00040	***0.0022***	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	4	1.6
13-SW26	Downstream Fen Upstream of Pad 21	---	17-Oct-13	<0.00040	***0.0045***	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	2	3.3	1.8
13-SW26	Downstream Fen Upstream of Pad 21	---	18-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	2.3	8	2.8
13-SW26	Downstream Fen Upstream of Pad 21	---	19-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	3.0	21	4.5
13-SW26 dup	Downstream Fen Upstream of Pad 21	---	19-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	3.4	25	14
13-SW26	Downstream Fen Upstream of Pad 21	---	20-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	2.8	6	2.9
13-SW26	Downstream Fen Upstream of Pad 21	---	21-Oct-13	<0.0004	***0.0052***	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	3	220	30
13-SW26	Downstream Fen Upstream of Pad 21	---	22-Oct-13	<0.0004	***0.0029***	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	3.1	33	7
13-SW26	Downstream Fen Upstream of Pad 21	---	23-Oct-13	<0.00040	<0.00040	<0.00040	<0.00080	<0.1	<0.10	<0.20	<0.20	3.1	29	4.1
13-SW26 dup	Downstream Fen Upstream of Pad 21	---	23-Oct-13	<0.00040	<0.00040	<0.00040	<0.00080	<0.1	<0.10	<0.20	<0.20	3.1	4.7	1.4
13-SW7	Basin 1	50	25-Sep-13	0.00041	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	---	---
13-SW7	Basin 1	110	25-Sep-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	---	---
13-SW7 dup	Basin 1	110	25-Sep-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	---	---
13-SW7	Basin 1	---	28-Sep-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	1.1	---	---
13-SW7	Basin 1	---	28-Sep-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	0.14	<0.20	<0.20	1.2	---	---
13-SW7 dup	Basin 1	---	28-Sep-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	2.8	---	---
13-SW7	Basin 1	---	29-Sep-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	---	---
13-SW7	Basin 1	---	30-Sep-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	1.6	4	2.2
13-SW7	Basin 1	---	30-Sep-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
13-SW7	Basin 1	---	01-Oct-13	0.0022	***0.0079***	0.0021	0.012	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	0.5
13-SW7	Basin 1	---	02-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	1.3	0.97
13-SW7	Basin 1	---	03-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	2.7	0.69
13-SW7	Basin 1	---	04-Oct-13	0.00043	0.0011	<0.0004	0.0015	<0.1	<0.10	<0.20	<0.20	<1.0	2	0.66
13-SW7	Basin 1	---	05-Oct-13	<0.0004	0.00096	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	0.66
13-SW7	Basin 1	50	06-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	1	2	0.64
13-SW7	Basin 1	50	07-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	1.4	1.3	0.77
13-SW7	Basin 1	50	08-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	1.4	6	0.74
13-SW7 dup	Basin 1	---	08-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.13	<0.20	<0.20	6.7	7.3	9.7
13-SW22	Basin 1	50	25-Sep-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	---	---
13-SW22	Basin 1	100	25-Sep-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	0.23	<0.20	<1.0	---	---
13-SW22	Basin 1	---	28-Sep-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	---	---
13-SW22	Basin 1	---	29-Sep-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	---	---
13-SW22	Basin 1	---	30-Sep-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	2.7	1.3
13-SW22	Basin 1	---	01-Oct-13	<0.0004	<0.002	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	1.3	0.51
13-SW22	Basin 1	---	02-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	2.7	0.61
13-SW22	Basin 1	---	03-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	2	1.5
13-SW22	Basin 1	---	04-Oct-13	<0.0004	0.00049	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	0.49
13-SW22	Basin 1	---	05-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	2.7	0.59
13-SW22	Basin 1	50	06-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	0.65
13-SW22	Basin 1	50	07-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	1.5	3.3	0.88
13-SW22	Basin 1	50	08-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	2	1.7
13-SW23	Basin 1	---	29-Sep-13	<0.0004	<0.002	<0.0004	<0.004	0.14	<0.10	<0.20	<0.20	<1.0	---	0.47
AENV Freshwater Aquatic Life*				**0.370**	**0.002**	**0.09**	**0.2**	**NS**	**NS**	**NS**	**NS**	**120**	**NS**	**NS**

APPENDIX C1.

WATER QUALITY RESULTS - WATER BODIES AND WATERCOURSES

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Depth	Sample Date	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylenes mg/L	F1 ††C_6-C_{10} mg/L	F2 $C_{>10}$-C_{16} mg/L	F3 $C_{>16}$-C_{34} mg/L	F4 $C_{>34}$-C_{50} mg/L	Chloride mg/L	TSS mg/L	Turbidity NTU
13-SW31	Basin 3	50	25-Sep-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	---	---
13-SW31	Basin 3	130	25-Sep-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	---	---
13-SW31	Basin 3	---	28-Sep-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	---	---
13-SW31	Basin 3	---	28-Sep-13	0.0005	***0.0021***	0.00042	0.0026	<0.1	<0.10	<0.20	<0.20	<1.0	---	---
13-SW31	Basin 3	---	29-Sep-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	---	---
13-SW31	Basin 3	---	30-Sep-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	2.7	1.6
13-SW31	Basin 3	---	01-Oct-13	<0.00040	0.00045	<0.00040	<0.00080	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	0.7
13-SW31 dup	Basin 3	---	01-Oct-13	<0.00040	<0.00040	<0.00040	<0.00080	<0.1	<0.10	<0.20	<0.20	<1.0	5.3	1.7
13-SW31	Basin 3	---	02-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	6	0.51
13-SW31	Basin 3	---	03-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	2.7	0.6
13-SW31	Basin 3	---	04-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	0.48
13-SW31	Basin 3	---	05-Oct-13	<0.0004	0.0012	<0.0004	0.00095	<0.1	<0.10	<0.20	<0.20	<1.0	7.3	1.2
13-SW31	Basin 3	50	06-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	7.3	1.2
13-SW31	Basin 3	50	07-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	---	---	---
13-SW31	Basin 3	50	08-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	2	0.43
13-SW12	Basin 4	surface	25-Sep-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	2	---
13-SW12	Basin 4	depth	25-Sep-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	---	---
13-SW12	Basin 4	---	29-Sep-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	---	---
13-SW12	Basin 4	---	29-Sep-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	---	---
13-SW12	Basin 4	---	30-Sep-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	1.3	0.99
13-SW12	Basin 4	---	01-Oct-13	<0.00040	<0.00040	<0.00040	<0.00080	<0.1	<0.10	<0.20	<0.20	<1.0	20	7.8
13-SW12	Basin 4	---	02-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	22	0.63
13-SW12	Basin 4	---	03-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	1.3	0.5
13-SW12	Basin 4	---	04-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	2	0.76
13-SW12	Basin 4	---	05-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	0.64
13-SW12	Basin 4	50	06-Oct-13	<0.0004	<0.002	0.00055	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	15	2.1
13-SW12	Basin 4	50	07-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	1.1	13	1.3
13-SW12	Basin 4	50	08-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.14	<0.20	<0.20	1.1	<1.0	0.67
13-SW12	Basin 4	---	09-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	1.0	<1.0	0.43
13-SW12	Basin 4	---	10-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	0.56
13-SW12	Basin 4	---	11-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.2	0.42	0.24	<1.0	2.7	0.5
13-SW12	Basin 4	---	12-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.16	0.28	<0.20	<1.0	<1.0	0.53
13-SW12	Basin 4	---	13-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.11	0.55	0.2	<1.0	<1.0	0.58
13-SW12	Basin 4	---	14-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	4.0	0.64
13-SW12	Basin 4	---	15-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	1.3	0.66
13-SW12	Basin 4	---	16-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	2.7	0.57
13-SW12	Basin 4	---	17-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	3.3	0.73
13-SW12	Basin 4	---	18-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	2.0	1.2
13-SW12	Basin 4	---	19-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	0.77
13-SW12	Basin 4	---	20-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	0.54
13-SW12	Basin 4	---	21-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	0.88
13-SW12	Basin 4	---	22-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	1.1
13-SW12	Basin 4	---	23-Oct-13	<0.00040	<0.00040	<0.00040	<0.00080	<0.1	<0.10	<0.20	<0.20	1.1	11	2.8
13-SW42	Discharge Fen Upstream of Wolf River		29-Sep-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	1.9	---	---
13-SW42	Discharge Fen Upstream of Wolf River	---	30-Sep-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	1.7	8	17
13-SW42	Discharge Fen Upstream of Wolf River	---	01-Oct-13	<0.00040	<0.00040	<0.00040	<0.00080	<0.1	<0.10	<0.20	<0.20	2.2	17	50
13-SW42	Discharge Fen Upstream of Wolf River	---	02-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	2.3	2	11
13-SW42	Discharge Fen Upstream of Wolf River	---	03-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	2.1	4	11
13-SW42	Discharge Fen Upstream of Wolf River	---	04-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	1.9	6	14
13-SW42	Discharge Fen Upstream of Wolf River	---	05-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	1.9	6.7	15
13-SW42	Discharge Fen Upstream of Wolf River	---	06-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	2.2	6	13
13-SW42	Discharge Fen Upstream of Wolf River	---	07-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	2.2	4	10
13-SW42	Discharge Fen Upstream of Wolf River	---	08-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	2.1	5.3	18
13-SW42	Discharge Fen Upstream of Wolf River	---	09-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	1.9	2	10
AENV Freshwater Aquatic Life*				**0.370**	**0.002**	**0.09**	**0.2**	**NS**	**NS**	**NS**	**NS**	**120**	**NS**	**NS**

APPENDIX C1.

WATER QUALITY RESULTS - WATER BODIES AND WATERCOURSES

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Depth	Sample Date	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylenes mg/L	F1 ††C_6-C_{10} mg/L	F2 $C_{>10}$-C_{16} mg/L	F3 $C_{>16}$-C_{34} mg/L	F4 $C_{>34}$-C_{50} mg/L	Chloride mg/L	TSS mg/L	Turbidity NTU
13-SW42	Discharge Fen Upstream of Wolf River	---	10-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	1.8	31	45
13-SW42	Discharge Fen Upstream of Wolf River	---	11-Oct-13	<0.0004	<0.002	<0.0004	<0.004	0.26	<0.10	0.28	<0.20	2.1	210	56
13-SW42 dup	Discharge Fen Upstream of Wolf River	---	11-Oct-13	<0.0004	<0.002	<0.0004	<0.004	0.31	<0.10	0.2	<0.20	1.9	190	130
13-SW42	Discharge Fen Upstream of Wolf River	---	12-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	2.2	22	32
13-SW42	Discharge Fen Upstream of Wolf River	---	13-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	2.1	33	31
13-SW42	Discharge Fen Upstream of Wolf River	---	14-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	1.6	3.3	11
13-SW42 dup	Discharge Fen Upstream of Wolf River	---	14-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.15	0.31	<0.20	1.7	6	14
13-SW42	Discharge Fen Upstream of Wolf River	---	15-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	1.7	4	14
13-SW42	Discharge Fen Upstream of Wolf River	---	16-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	1.3	14	21
13-SW42	Discharge Fen Upstream of Wolf River	---	16-Oct-13	<0.001	<0.001	<0.001	<0.001	<0.20	<0.20	<0.1	<0.1	1.8	21	39.8
13-SW42	Discharge Fen Upstream of Wolf River	---	17-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	2	9.3	24
13-SW42	Discharge Fen Upstream of Wolf River	---	18-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	2.1	23	28
13-SW42	Discharge Fen Upstream of Wolf River	---	19-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	1.9	10	21
13-SW42	Discharge Fen Upstream of Wolf River	---	20-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	0.12	0.62	<0.20	1.7	3.3	11
13-SW42	Discharge Fen Upstream of Wolf River	---	21-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	1.7	47	46
13-SW42 dup	Discharge Fen Upstream of Wolf River	---	21-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	1.8	16	23
13-SW42	Discharge Fen Upstream of Wolf River	---	22-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	2.3	4.7	13
13-SW42 dup	Discharge Fen Upstream of Wolf River	---	22-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	2.4	4.7	12
13-SW42	Discharge Fen Upstream of Wolf River	---	23-Oct-13	<0.00040	<0.00040	<0.00040	<0.00080	<0.1	<0.10	<0.20	<0.20	2.1	3.3	9.8
13-SW42 dup	Discharge Fen Upstream of Wolf River	---	23-Oct-13	<0.00040	<0.00040	<0.00040	<0.00080	<0.1	<0.10	<0.20	<0.20	2.1	10	20
13-SW42	Discharge Fen Upstream of Wolf River	---	29-Oct-13	<0.00040	<0.00040	<0.00040	<0.00080	<0.1	<0.10	<0.20	<0.20	2	10	25
13-SW42 dup	Discharge Fen Upstream of Wolf River	---	29-Oct-13	<0.00040	<0.00040	<0.00040	<0.00080	<0.1	<0.10	<0.20	<0.20	2	19	32
13-SW43	Wolf River Downstream	---	04-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	1.3	1.5
13-SW43	Wolf River Downstream	---	05-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	4.7	2
13-SW43	Wolf River Downstream	---	06-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	11	2.2
13-SW43	Wolf River Downstream	---	07-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	1.6	4	1.8
13-SW43	Wolf River Downstream	---	08-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	1.5
13-SW43	Wolf River Downstream	---	20-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	4.7	1.7
13-SW44	Wolf River Upstream	---	04-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	4	1.2
13-SW44	Wolf River Upstream	---	05-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	2	1
13-SW44	Wolf River Upstream	---	06-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	1.1	<1.0	1.2
13-SW44	Wolf River Upstream	---	07-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	1.6	1.3	1
13-SW44	Wolf River Upstream	---	08-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	1.1	<1.0	1
13-SW44	Wolf River Upstream	---	20-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	1.3
13-SW27	Downstream Fen Downstream of Pad 21	---	12-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	0.27	<0.20	2.9	7.3	8.6
13-SW27 dup	Downstream Fen Downstream of Pad 21	---	12-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	2.5	5.3	8.9
13-SW27	Downstream Fen Downstream of Pad 21	---	13-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.17	<0.27	<0.38	2	37	11
13-SW27	Downstream Fen Downstream of Pad 21	---	14-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.18	0.35	0.22	1.7	8.7	8.1
13-SW27	Downstream Fen Downstream of Pad 21	---	15-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	1.1	66	12
13-SW27 dup	Downstream Fen Downstream of Pad 21	---	15-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	1.4	4.7	1.8
13-SW27	Downstream Fen Downstream of Pad 21	---	16-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	2.1	10	7.3
13-SW27	Downstream Fen Downstream of Pad 21	---	17-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	2.3	77	23
13-SW27 dup	Downstream Fen Downstream of Pad 21	---	17-Oct-13	<0.00040	***0.0047***	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	1.7	25	7.3
13-SW27	Downstream Fen Downstream of Pad 21	---	18-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	2.3	6	7.4
13-SW27 dup	Downstream Fen Downstream of Pad 21	---	18-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	2.5	11	8.3
13-SW27	Downstream Fen Downstream of Pad 21	---	19-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	2.6	6.7	8.2
13-SW27	Downstream Fen Downstream of Pad 21	---	20-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	2.6	12	9.1
13-SW27 dup	Downstream Fen Downstream of Pad 21	---	20-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	2.1	6	7.6
13-SW27	Downstream Fen Downstream of Pad 21	---	21-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	2.7	67	19
13-SW27	Downstream Fen Downstream of Pad 21	---	22-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	2.7	37	8.3
13-SW27	Downstream Fen Downstream of Pad 21	---	23-Oct-13	<0.00040	<0.00040	<0.00040	<0.00080	<0.1	<0.10	<0.20	<0.20	2.6	4	7.7
AENV Freshwater Aquatic Life*				**0.370**	**0.002**	**0.09**	**0.2**	**NS**	**NS**	**NS**	**NS**	**120**	**NS**	**NS**

APPENDIX C1.

WATER QUALITY RESULTS - WATER BODIES AND WATERCOURSES

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Depth	Sample Date	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylenes mg/L	F1 $^{\dagger\dagger}C_6$-C_{10} mg/L	F2 $C_{>10}$-C_{16} mg/L	F3 $C_{>16}$-C_{34} mg/L	F4 $C_{>34}$-C_{50} mg/L	Chloride mg/L	TSS mg/L	Turbidity NTU
13-SW39	Downstream Fen West of Ken Baker Road	---	03-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	18	6	4.2
13-SW39	Downstream Fen West of Ken Baker Road	---	04-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	18	2	1.6
13-SW39	Downstream Fen West of Ken Baker Road	---	05-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	18	71	27
13-SW39	Downstream Fen West of Ken Baker Road	---	17-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	6.3	290	56
13-SW39	Downstream Fen West of Ken Baker Road	---	18-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	7.2	51	12
13-SW39	Downstream Fen West of Ken Baker Road	---	19-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	7.1	300	48
13-SW39	Downstream Fen West of Ken Baker Road	---	20-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	4.6	1.3	3
13-SW39	Downstream Fen West of Ken Baker Road	---	21-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	4.7	78	18
13-SW39	Downstream Fen West of Ken Baker Road	---	22-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	4.9	49	9.6
13-SW39	Downstream Fen West of Ken Baker Road	---	23-Oct-13	<0.00040	<0.00040	<0.00040	<0.00080	<0.1	<0.10	<0.20	<0.20	5.5	4.7	3.2
13-SW39	Downstream Fen West of Ken Baker Road	---	29-Oct-13	<0.00040	<0.00040	<0.00040	<0.00080	<0.1	<0.10	<0.20	<0.20	4.2	1.3	2
13-SW46	NE Control Lake	---	25-Sep-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	9.3	---
13-SW47	Borrow Pit	---	25-Sep-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	---
13-DP1	Drive point southwest of Pad 21		28-Sep-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.71	<1.4	<1.4	4.2	550	250
13-DP1	Drive point southwest of Pad 21	---	29-Sep-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	---	---	---
13-DP1	Drive point southwest of Pad 21	175	30-Sep-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	---	---	---	---	---	---
13-DP1	Drive point southwest of Pad 21	---	01-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	---	---	---
13-DP1	Drive point southwest of Pad 21	126	02-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	6.5	1200	190
13-DP1	Drive point southwest of Pad 21	---	03-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	---	---	---
13-DP1	Drive point southwest of Pad 21	---	04-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.71	<1.4	<1.4	4.9	540	780
13-DP1	Drive point southwest of Pad 21	138	05-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	---	---	---
13-DP1	Drive point southwest of Pad 21	150	06-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.10	<0.10	<0.20	<0.20	---	---	---
13-DP1	Drive point southwest of Pad 21	158	07-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	---	---	---
13-DP1	Drive point southwest of Pad 21	164	08-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	---	---	---
13-DP1	Drive point southwest of Pad 21	---	09-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	---	---	---	---	---	---
13-DP1	Drive point southwest of Pad 21	---	10-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	---	---	---	---	---	---
13-DP1	Drive point southwest of Pad 21	---	13-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	4.1	650	240
13-DP1	Drive point southwest of Pad 21	---	14-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	3.3	350	290
13-DP1	Drive point southwest of Pad 21	---	15-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	3.6	770	390
13-DP1	Drive point southwest of Pad 21	---	16-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	3.3	430	570
13-DP1	Drive point southwest of Pad 21	---	17-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	3.7	1500	1200
13-DP1	Drive point southwest of Pad 21	---	19-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	3.8	350	130
13-DP1	Drive point southwest of Pad 21	---	20-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	2.8	290	400
13-DP1	Drive point southwest of Pad 21	---	21-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	3	780	590
13-DP1	Drive point southwest of Pad 21	---	22-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	3.7	870	250
13-DP1	Drive point southwest of Pad 21	---	23-Oct-13	<0.00040	<0.00040	<0.00040	<0.00080	<0.1	<0.10	<0.20	<0.20	3.6	730	430
13-DP2	Drive point SW of Basin 4		28-Sep-13	<0.0004	0.0015	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	5.7	4600	<0.10
13-DP2	Drive point SW of Basin 4		29-Sep-13	<0.0004	0.00057	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	3.4	---	<0.10
13-DP2	Drive point SW of Basin 4	---	29-Sep-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	4.2	3000	<0.10
13-DP2	Drive point SW of Basin 4	191	30-Sep-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	---	---	---	---	---	---
13-DP2	Drive point SW of Basin 4	---	01-Oct-13	<0.0004	0.0007	<0.0004	<0.0008	<0.1	<0.77	<1.6	<1.6	3.6	---	---
13-DP2	Drive point SW of Basin 4	205	02-Oct-13	<0.0004	<0.64	<0.0004	<0.0008	<0.1	---	---	---	---	---	---
13-DP2	Drive point SW of Basin 4	134	08-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	3.4	170	160
13-DP2	Drive point SW of Basin 4	---	15-Oct-13	<0.0004	<0.0020	<0.0004	<0.0040	<0.1	<0.10	0.26	<0.20	1.3	97	27
13-DP2	Drive point SW of Basin 4	Exova	15-Oct-13	<0.001	<0.001	<0.001	<0.001	<0.20	<0.20	<0.1	<0.1	0.9	120	49.7
13-DP2	Drive point SW of Basin 4	---	18-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	3.5	890	810
13-DP2	Drive point SW of Basin 4	---	22-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	1.7	75	35
13-DP2 dup	Drive point SW of Basin 4	---	22-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	1.5	74	30
AENV Freshwater Aquatic Life*				**0.370**	**0.002**	**0.09**	**0.2**	**NS**	**NS**	**NS**	**NS**	**120**	**NS**	**NS**

APPENDIX C1.

WATER QUALITY RESULTS - WATER BODIES AND WATERCOURSES

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Depth	Sample Date	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylenes mg/L	F1 ††C_6-C_{10} mg/L	F2 $C_{>10}$-C_{16} mg/L	F3 $C_{>16}$-C_{34} mg/L	F4 $C_{>34}$-C_{50} mg/L	Chloride mg/L	TSS mg/L	Turbidity NTU
13-DP3	Drive point S of Basin 3 near E Ladder Road		28-Sep-13	<0.0004	***0.0033***	<0.0004	<0.0008	<0.1	<0.10	0.25	<0.20	2.7	---	<0.10
13-DP3	Drive point S of Basin 3 near E Ladder Road	---	29-Sep-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	2	---	<0.10
13-DP3	Drive point S of Basin 3 near E Ladder Road	87	30-Sep-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	1.2	2000	970
13-DP3	Drive point S of Basin 3 near E Ladder Road	---	30-Sep-13	<0.0004	0.0010	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	1.9	700	63
13-DP3	Drive point S of Basin 3 near E Ladder Road	---	01-Oct-13	<0.0004	0.00089	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	1.2	560	280
13-DP3	Drive point S of Basin 3 near E Ladder Road	96	02-Oct-13	<0.0004	0.00057	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	1.2	590	61
13-DP3	Drive point S of Basin 3 near E Ladder Road	115	08-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	1.9	380	180
13-DP3	Drive point S of Basin 3 near E Ladder Road	---	15-Oct-13	<0.0004	<0.0020	<0.0004	<0.0040	<0.1	<0.10	<0.20	<0.20	---	---	---
13-DP3	Drive point S of Basin 3 near E Ladder Road	---	22-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	---	---	---	---	---	---
13-DP4	Drive point N of Basin 3 near E Ladder Road	---	28-Sep-13	<0.0004	0.0014	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	3.4	---	<0.10
13-DP4 dup	Drive point N of Basin 3 near E Ladder Road	---	28-Sep-13	<0.0004	0.0011	<0.0004	<0.0008	<0.1	<0.10	0.24	<0.20	3	---	<0.10
13-DP4	Drive point N of Basin 3 near E Ladder Road	---	29-Sep-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	1.9	740	270
13-DP4	Drive point N of Basin 3 near E Ladder Road	75	30-Sep-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	1.2	400	140
13-DP4	Drive point N of Basin 3 near E Ladder Road	---	01-Oct-13	<0.0004	0.0014	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	490	300
13-DP4 dup	Drive point N of Basin 3 near E Ladder Road	---	01-Oct-13	<0.0004	0.0016	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	1.1	450	270
13-DP4	Drive point N of Basin 3 near E Ladder Road	82	02-Oct-13	<0.0004	0.0014	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	1400	69
13-DP4 dup	Drive point N of Basin 3 near E Ladder Road	---	02-Oct-13	---	---	---	---	---	---	---	---	1.5	3300	250
13-DP4	Drive point N of Basin 3 near E Ladder Road	---	03-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	2.7	0.79
13-DP4	Drive point N of Basin 3 near E Ladder Road	117	08-Oct-13	<0.0004	0.0012	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	1.8	160	190
13-DP4	Drive point N of Basin 3 near E Ladder Road	---	15-Oct-13	<0.0004	<0.002	<0.0004	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	800	550
13-DP4	Drive point N of Basin 3 near E Ladder Road	---	22-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	1.8	220	44
13-DP4	Drive point N of Basin 3 near E Ladder Road	140	29-Oct-13	<0.00040	<0.00040	<0.00040	<0.00080	<0.1	<0.10	<0.20	<0.20	<1.0	63	26
13-DP5	Drive point W side of Basin 3	---	28-Sep-13	<0.0004	***0.16***	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	6.7	51000	<0.10
13-DP5	Drive point W side of Basin 3	---	29-Sep-13	<0.0004	***0.220***	0.0006	<0.004	<0.1	<0.10	<0.20	<0.20	5.5	1400	620
13-DP5	Drive point W side of Basin 3	85	30-Sep-13	<0.00040	***0.150***	0.0005	<0.0040	<0.1	<0.10	<0.20	<0.20	4.5	830	360
13-DP5	Drive point W side of Basin 3	---	01-Oct-13	<0.0004	***0.100***	0.00045	<0.0008	<0.1	<0.10	<0.20	<0.20	4.8	840	550
13-DP5	Drive point W side of Basin 3	91	02-Oct-13	<0.0004	***0.025***	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	4.5	410	490
13-DP5	Drive point W side of Basin 3	110	08-Oct-13	<0.0004	***0.003***	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	---	---	---
13-DP5	Drive point W side of Basin 3	---	15-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	---	---	---
13-DP5	Drive point W side of Basin 3	---	22-Oct-13	<0.0004	0.00065	<0.0004	<0.0008	<0.1	---	---	---	---	---	---
13-DP6	Drive point S side of Basin 3	---	28-Sep-13	<0.0004	***0.08***	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	16	1000	2700
13-DP6	Drive point S side of Basin 3	---	29-Sep-13	<0.0004	***0.0026***	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	2.8	130	63
13-DP6	Drive point S side of Basin 3	78	30-Sep-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	1.5	200	64
13-DP6	Drive point S side of Basin 3	---	01-Oct-13	<0.0004	0.0013	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	1.8	100	37
13-DP6	Drive point S side of Basin 3	105	02-Oct-13	<0.0004	0.0018	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	2	67	16
13-DP6	Drive point S side of Basin 3	98	08-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	3.7	52	59
13-DP6	Drive point S side of Basin 3	---	15-Oct-13	<0.00040	<0.0020	<0.0004	<0.0040	<0.1	<0.10	<0.20	<0.20	2	240	120
13-DP6	Drive point S side of Basin 3	---	22-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	2.6	29	15
13-DP6	Drive point S side of Basin 3	108	29-Oct-13	<0.00040	<0.00040	<0.00040	<0.00080	<0.1	<0.10	<0.20	<0.20	2.3	78	32
13-DP7	Drive point E side of Basin 3	---	28-Sep-13	<0.0004	***0.018***	<0.0004	<0.0008	<0.1	0.14	<0.20	<0.20	5.1	---	<0.10
13-DP7	Drive point E side of Basin 3	---	29-Sep-13	<0.0004	***0.010***	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	4.3	1000	990
13-DP7	Drive point E side of Basin 3	101	30-Sep-13	<0.00040	***0.008***	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	3.3	340	230
13-DP7	Drive point E side of Basin 3	---	01-Oct-13	<0.0004	***0.010***	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	3.3	950	510
13-DP7	Drive point E side of Basin 3	104	02-Oct-13	<0.0004	0.002	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	3.6	770	260
13-DP7	Drive point E side of Basin 3	120	08-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	4.2	---	460
13-DP7	Drive point E side of Basin 3	---	15-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	2.4	40	59
13-DP7	Drive point E side of Basin 3	---	22-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	---	---	---	---	---	---
13-DP7	Drive point E side of Basin 3	225	29-Oct-13	<0.00040	<0.00040	<0.00040	<0.00080	<0.1	<0.11	<0.23	<0.23	---	---	---
Minimal Detection Limit				**0.0004**	**0.002**	**0.0004**	**0.004**	**0.1**	**0.1**	**0.2**	**0.2**	**1**	**1**	**0.1**
AENV Freshwater Aquatic Life*				**0.370**	**0.002**	**0.09**	**0.2**	**NS**	**NS**	**NS**	**NS**	**120**	**NS**	**NS**

Notes:

--- - not analyzed

NS - guideline not specified

* - Alberta Environment Surface Water Quality Guidelines for use in Alberta (AENV, 1999)

Italics - indicates values do not meet applicable guidelines

APPENDIX C2.

WATER QUALITY RESULTS - WATER BODIES AND WATERCOURSES

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Depth	Sample Date	Acenaphthene µg/L	Acenaphthylene µg/L	Acridine µg/L	Anthracene µg/L	Benz[a]anthracene µg/L	Benzo[b+j]fluoranthene µg/L	Benzo[k]fluoranthene µg/L	Benzo[g,h,i]perylene µg/L	Benzo[a]pyrene µg/L	Chrysene µg/L	Dibenz[a,h]anthracene µg/L	Fluoranthene µg/L	Fluorene µg/L	Indeno[1,2,3-cd]pyrene µg/L	Naphthalene µg/L	Phenanthrene µg/L	Pyrene µg/L	Quinoline µg/L
13-SW16	Downstream Fen Upstream of Ken Baker Road	20	25-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	20	25-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	28-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	29-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	30-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	30-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	01-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	01-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	02-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	02-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	03-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	03-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	04-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	04-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	05-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	05-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	06-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	06-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	07-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	07-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	08-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	09-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	09-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	10-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	10-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	11-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	12-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	13-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	14-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	15-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	16-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	16-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	17-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	18-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	19-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	20-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	21-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	22-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	23-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	29-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW26	Downstream Fen Upstream of Pad 21	---	30-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW26	Downstream Fen Upstream of Pad 21	---	01-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW26	Downstream Fen Upstream of Pad 21	---	02-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW26	Downstream Fen Upstream of Pad 21	---	03-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW26	Downstream Fen Upstream of Pad 21	---	04-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW26 dup	Downstream Fen Upstream of Pad 21	---	04-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW26	Downstream Fen Upstream of Pad 21	---	05-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW26 dup	Downstream Fen Upstream of Pad 21	---	05-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW26	Downstream Fen Upstream of Pad 21	---	06-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW26 dup	Downstream Fen Upstream of Pad 21	---	06-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
AENV Freshwater Aquatic Life*				**5.8^**	**NS**	**4.4^**	**0.012^**	**0.018^**	**NS**	**NS**	**NS**	**0.015^**	**NS**	**NS**	**0.015^**	**3^**	**NS**	**1.1^**	**0.4^**	**0.025^**	**3.4^**

APPENDIX C2.

WATER QUALITY RESULTS - WATER BODIES AND WATERCOURSES

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Depth	Sample Date	Acenaphthene µg/L	Acenaphthylene µg/L	Acridine µg/L	Anthracene µg/L	Benz[a]anthracene µg/L	Benzo[b+j]fluoranthene µg/L	Benzo[k]fluoranthene µg/L	Benzo[g,h,i]perylene µg/L	Benzo[a]pyrene µg/L	Chrysene µg/L	Dibenz[a,h]anthracene µg/L	Fluoranthene µg/L	Fluorene µg/L	Indeno[1,2,3-cd]pyrene µg/L	Naphthalene µg/L	Phenanthrene µg/L	Pyrene µg/L	Quinoline µg/L
13-SW26	Downstream Fen Upstream of Pad 21	---	07-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW26 dup	Downstream Fen Upstream of Pad 21	---	07-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW26	Downstream Fen Upstream of Pad 21	---	08-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW26 dup	Downstream Fen Upstream of Pad 21	---	08-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW26	Downstream Fen Upstream of Pad 21	---	09-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW26	Downstream Fen Upstream of Pad 21	---	09-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW26	Downstream Fen Upstream of Pad 21	---	10-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW26 dup	Downstream Fen Upstream of Pad 21	---	10-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW26	Downstream Fen Upstream of Pad 21	---	11-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW26	Downstream Fen Upstream of Pad 21	---	12-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW26	Downstream Fen Upstream of Pad 21	---	13-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW26 dup	Downstream Fen Upstream of Pad 21	---	13-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW26	Downstream Fen Upstream of Pad 21	---	14-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW26	Downstream Fen Upstream of Pad 21	---	15-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW26	Downstream Fen Upstream of Pad 21	---	16-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW26	Downstream Fen Upstream of Pad 21	---	17-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW26	Downstream Fen Upstream of Pad 21	---	18-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW26	Downstream Fen Upstream of Pad 21	---	19-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW26 dup	Downstream Fen Upstream of Pad 21	---	19-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW26	Downstream Fen Upstream of Pad 21	---	20-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW26	Downstream Fen Upstream of Pad 21	---	21-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW26	Downstream Fen Upstream of Pad 21	---	22-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW26	Downstream Fen Upstream of Pad 21	---	23-Oct-13	<0.12	<0.12	<0.24	<0.012	<0.010	<0.010	<0.010	<0.010	<0.0089	<0.010	<0.0089	<0.012	<0.060	<0.010	<0.12	<0.060	<0.024	<0.24
13-SW26 dup	Downstream Fen Upstream of Pad 21	---	23-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW7	Basin 1	50	25-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	0.13	<0.050	<0.020	<0.20
13-SW7	Basin 1	110	25-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW7 dup	Basin 1	110	25-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW7	Basin 1	---	28-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW7 dup	Basin 1	---	28-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW7	Basin 1	---	28-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW7	Basin 1	---	29-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	0.015	<0.0085	<0.0085	<0.030	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW7	Basin 1	---	30-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	0.26	<0.050	<0.020	<0.20
13-SW7 dup	Basin 1	---	30-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW7	Basin 1	---	01-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	0.32	<0.050	<0.020	<0.20
13-SW7	Basin 1	---	02-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW7	Basin 1	---	03-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	0.019	<0.0075	<0.010	<0.050	<0.0085	<0.10	0.054	<0.020	<0.20
13-SW7	Basin 1	---	04-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	0.18	<0.050	<0.020	<0.20
13-SW7	Basin 1	---	05-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.011	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW7	Basin 1	50	06-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW7	Basin 1	50	07-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW7	Basin 1	50	08-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW7 dup	Basin 1	50	08-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW22	Basin 1	50	25-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW22	Basin 1	100	25-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW22	Basin 1		28-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW22	Basin 1		29-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW22	Basin 1	---	30-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW22	Basin 1	---	01-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	0.11	<0.050	<0.020	<0.20
AENV Freshwater Aquatic Life*				**5.8^**	**NS**	**4.4^**	**0.012^**	**0.018^**	**NS**	**NS**	**NS**	**0.015^**	**NS**	**NS**	**0.015^**	**3^**	**NS**	**1.1^**	**0.4^**	**0.025^**	**3.4^**

APPENDIX C2.

WATER QUALITY RESULTS - WATER BODIES AND WATERCOURSES

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Depth	Sample Date	Acenaphthene µg/L	Acenaphthylene µg/L	Acridine µg/L	Anthracene µg/L	Benz[a]anthracene µg/L	Benzo[b+j]fluoranthene µg/L	Benzo[k]fluoranthene µg/L	Benzo[g,h,i]perylene µg/L	Benzo[a]pyrene µg/L	Chrysene µg/L	Dibenz[a,h]anthracene µg/L	Fluoranthene µg/L	Fluorene µg/L	Indeno[1,2,3-cd]pyrene µg/L	Naphthalene µg/L	Phenanthrene µg/L	Pyrene µg/L	Quinoline µg/L
13-SW22	Basin 1	---	02-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW22	Basin 1	---	03-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW22	Basin 1	---	04-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	0.12	<0.050	<0.020	<0.20
13-SW22	Basin 1	---	05-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW22	Basin 1	50	06-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW22	Basin 1	50	07-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW22	Basin 1	50	08-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW31	Basin 3	50	25-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW31	Basin 3	130	25-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW31	Basin 3	---	28-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW31	Basin 3	---	28-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW31	Basin 3	---	29-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW31	Basin 3	---	30-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW31	Basin 3	---	01-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW31	Basin 3	---	02-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW31	Basin 3	---	03-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW31	Basin 3	---	04-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW31	Basin 3	---	05-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW31	Basin 3	50	06-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW31	Basin 3	50	07-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW31	Basin 3	50	08-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.011	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW12	Basin 4	surface	25-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW12	Basin 4	depth	25-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW12	Basin 4		29-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW12	Basin 4		29-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW12	Basin 4	---	30-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW12	Basin 4	---	01-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW12	Basin 4	---	02-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW12	Basin 4	---	03-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW12	Basin 4	---	04-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW12	Basin 4	---	05-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW12	Basin 4	50	06-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW12	Basin 4	50	07-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW12	Basin 4	50	08-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW12	Basin 4	---	09-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW12	Basin 4	---	10-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW12	Basin 4	---	11-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW12	Basin 4	---	12-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW12	Basin 4	---	13-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW12	Basin 4	---	14-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW12	Basin 4	---	15-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW12	Basin 4	---	16-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW12	Basin 4	---	17-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW12	Basin 4	---	18-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW12	Basin 4	---	19-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW12	Basin 4	---	20-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW12	Basin 4	---	21-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW12	Basin 4	---	22-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW12	Basin 4	---	23-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
AENV Freshwater Aquatic Life*				**5.8^**	**NS**	**4.4^**	**0.012^**	**0.018^**	**NS**	**NS**	**NS**	**0.015^**	**NS**	**NS**	**0.015^**	**3^**	**NS**	**1.1^**	**0.4^**	**0.025^**	**3.4^**

APPENDIX C2.

WATER QUALITY RESULTS - WATER BODIES AND WATERCOURSES

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Depth	Sample Date	Acenaphthene µg/L	Acenaphthylene µg/L	Acridine µg/L	Anthracene µg/L	Benz[a]anthracene µg/L	Benzo[b+j]fluoranthene µg/L	Benzo[k]fluoranthene µg/L	Benzo[g,h,i]perylene µg/L	Benzo[a]pyrene µg/L	Chrysene µg/L	Dibenz[a,h]anthracene µg/L	Fluoranthene µg/L	Fluorene µg/L	Indeno[1,2,3-cd]pyrene µg/L	Naphthalene µg/L	Phenanthrene µg/L	Pyrene µg/L	Quinoline µg/L
13-SW42	Discharge Fen Upstream of Wolf River		29-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW42	Discharge Fen Upstream of Wolf River	---	30-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	0.011	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW42	Discharge Fen Upstream of Wolf River	---	01-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW42	Discharge Fen Upstream of Wolf River	---	02-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW42	Discharge Fen Upstream of Wolf River	---	03-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW42	Discharge Fen Upstream of Wolf River	---	04-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW42	Discharge Fen Upstream of Wolf River	---	05-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW42	Discharge Fen Upstream of Wolf River	---	06-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW42	Discharge Fen Upstream of Wolf River	---	07-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW42	Discharge Fen Upstream of Wolf River	---	08-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW42	Discharge Fen Upstream of Wolf River	---	09-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW42	Discharge Fen Upstream of Wolf River	---	10-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW42	Discharge Fen Upstream of Wolf River	---	11-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW42 dup	Discharge Fen Upstream of Wolf River	---	11-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW42	Discharge Fen Upstream of Wolf River	---	12-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW42	Discharge Fen Upstream of Wolf River	---	13-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW42	Discharge Fen Upstream of Wolf River	---	14-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW42 dup	Discharge Fen Upstream of Wolf River	---	14-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW42	Discharge Fen Upstream of Wolf River	---	15-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW42	Discharge Fen Upstream of Wolf River	---	16-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW42	Discharge Fen Upstream of Wolf River	---	16-Oct-13	<0.1	<0.1	<0.1	<0.005	<0.01	<0.1	<0.1	<0.05	<0.008	<0.1	<0.05	<0.01	<0.1	<0.05	<0.1	<0.1	<0.01	<0.3
13-SW42	Discharge Fen Upstream of Wolf River	---	17-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW42	Discharge Fen Upstream of Wolf River	---	18-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW42	Discharge Fen Upstream of Wolf River	---	19-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW42	Discharge Fen Upstream of Wolf River	---	20-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW42	Discharge Fen Upstream of Wolf River	---	21-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW42 dup	Discharge Fen Upstream of Wolf River	---	21-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW42	Discharge Fen Upstream of Wolf River	---	22-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW42 dup	Discharge Fen Upstream of Wolf River	---	22-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW42	Discharge Fen Upstream of Wolf River	---	23-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW42 dup	Discharge Fen Upstream of Wolf River	---	23-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW42	Discharge Fen Upstream of Wolf River	---	29-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW42 dup	Discharge Fen Upstream of Wolf River	---	29-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW43	Wolf River Downstream	---	04-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW43	Wolf River Downstream	---	05-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW43	Wolf River Downstream	---	06-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW43	Wolf River Downstream	---	07-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW43	Wolf River Downstream	---	08-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW43	Wolf River Downstream	---	20-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW44	Wolf River Upstream	---	04-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW44	Wolf River Upstream	---	05-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW44	Wolf River Upstream	---	06-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW44	Wolf River Upstream	---	07-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW44	Wolf River Upstream	---	08-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW44	Wolf River Upstream	---	20-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW27	Downstream Fen Downstream of Pad 21	---	12-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW27 dup	Downstream Fen Downstream of Pad 21	---	12-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW27	Downstream Fen Downstream of Pad 21	---	13-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW27	Downstream Fen Downstream of Pad 21	---	14-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
AENV Freshwater Aquatic Life*				**5.8^**	**NS**	**4.4^**	**0.012^**	**0.018^**	**NS**	**NS**	**NS**	**0.015^**	**NS**	**NS**	**0.015^**	**3^**	**NS**	**1.1^**	**0.4^**	**0.025^**	**3.4^**

APPENDIX C2.

WATER QUALITY RESULTS - WATER BODIES AND WATERCOURSES

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Depth	Sample Date	Acenaphthene µg/L	Acenaphthylene µg/L	Acridine µg/L	Anthracene µg/L	Benz[a]anthracene µg/L	Benzo[b+j]fluoranthene µg/L	Benzo[k]fluoranthene µg/L	Benzo[g,h,i]perylene µg/L	Benzo[a]pyrene µg/L	Chrysene µg/L	Dibenz[a,h]anthracene µg/L	Fluoranthene µg/L	Fluorene µg/L	Indeno[1,2,3-cd]pyrene µg/L	Naphthalene µg/L	Phenanthrene µg/L	Pyrene µg/L	Quinoline µg/L
13-SW27	Downstream Fen Downstream of Pad 21	---	15-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW27 dup	Downstream Fen Downstream of Pad 21	---	15-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW27	Downstream Fen Downstream of Pad 21	---	16-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW27	Downstream Fen Downstream of Pad 21	---	17-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW27 dup	Downstream Fen Downstream of Pad 21	---	17-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW27	Downstream Fen Downstream of Pad 21	---	18-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW27 dup	Downstream Fen Downstream of Pad 21	---	18-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW27	Downstream Fen Downstream of Pad 21	---	19-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW27	Downstream Fen Downstream of Pad 21	---	20-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW27 dup	Downstream Fen Downstream of Pad 21	---	20-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW27	Downstream Fen Downstream of Pad 21	---	21-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW27	Downstream Fen Downstream of Pad 21		22-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW27	Downstream Fen Downstream of Pad 21	---	23-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW39	Downstream Fen West of Ken Baker Road	---	03-Oct-13	<0.21	<0.21	<0.42	<0.021	<0.018	<0.018	<0.018	<0.018	<0.016	<0.018	<0.016	<0.021	<0.10	<0.018	<0.21	<0.10	<0.042	<0.42
13-SW39	Downstream Fen West of Ken Baker Road	---	04-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW39	Downstream Fen West of Ken Baker Road	---	05-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW39	Downstream Fen West of Ken Baker Road	---	17-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW39	Downstream Fen West of Ken Baker Road	---	18-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW39	Downstream Fen West of Ken Baker Road	---	19-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW39	Downstream Fen West of Ken Baker Road	---	20-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW39	Downstream Fen West of Ken Baker Road	---	21-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW39	Downstream Fen West of Ken Baker Road	---	22-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW39	Downstream Fen West of Ken Baker Road	---	23-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW39	Downstream Fen West of Ken Baker Road		29-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DP1	Drive point southwest of Pad 21		28-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.012	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DP1	Drive point southwest of Pad 21	126	02-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	0.17	<0.050	<0.020	<0.20
13-DP1	Drive point southwest of Pad 21	---	03-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	0.18	<0.050	<0.020	<0.20
13-DP1	Drive point southwest of Pad 21	---	04-Oct-13	<0.32	<0.32	<0.64	<0.032	<0.027	<0.027	<0.027	<0.027	<0.024	<0.027	<0.024	<0.032	<0.16	<0.027	<0.32	<0.16	<0.064	<0.64
13-DP1	Drive point southwest of Pad 21	138	05-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	0.14	<0.050	<0.020	<0.20
13-DP1	Drive point southwest of Pad 21	---	13-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DP1	Drive point southwest of Pad 21	---	14-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DP1	Drive point southwest of Pad 21	---	15-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DP1	Drive point southwest of Pad 21	---	16-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DP1	Drive point southwest of Pad 21	---	17-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DP1	Drive point southwest of Pad 21	---	19-Oct-13	<0.13	<0.13	<0.25	<0.013	<0.011	<0.011	<0.011	<0.011	<0.0094	<0.011	<0.0094	<0.013	<0.063	<0.011	<0.13	<0.063	<0.025	<0.25
13-DP1	Drive point southwest of Pad 21	---	20-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	0.01	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DP1	Drive point southwest of Pad 21	---	21-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DP1	Drive point southwest of Pad 21	---	22-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DP1	Drive point southwest of Pad 21	---	23-Oct-13	<0.15	<0.15	<0.29	<0.015	<0.013	<0.013	<0.013	<0.013	<0.011	<0.013	<0.011	<0.015	<0.074	<0.013	<0.15	<0.074	<0.029	<0.29
13-DP2	Drive point SW of Basin 4		28-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DP2	Drive point SW of Basin 4		29-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DP2	Drive point SW of Basin 4		29-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DP2	Drive point SW of Basin 4	---	15-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DP2	Drive point SW of Basin 4	---	15-Oct-13	<0.1	<0.1	<0.1	<0.005	<0.01	<0.1	<0.1	<0.05	<0.008	<0.1	<0.05	<0.01	<0.1	<0.05	<0.1	<0.1	<0.01	<0.3
AENV Freshwater Aquatic Life*				**5.8^**	**NS**	**4.4^**	**0.012^**	**0.018^**	**NS**	**NS**	**NS**	**0.015^**	**NS**	**NS**	**0.015^**	**3^**	**NS**	**1.1^**	**0.4^**	**0.025^**	**3.4^**

APPENDIX C2.

WATER QUALITY RESULTS - WATER BODIES AND WATERCOURSES

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Depth	Sample Date	Acenaphthene µg/L	Acenaphthylene µg/L	Acridine µg/L	Anthracene µg/L	Benz[a]anthracene µg/L	Benzo[b+j]fluoranthene µg/L	Benzo[k]fluoranthene µg/L	Benzo[g,h,i]perylene µg/L	Benzo[a]pyrene µg/L	Chrysene µg/L	Dibenz[a,h]anthracene µg/L	Fluoranthene µg/L	Fluorene µg/L	Indeno[1,2,3-cd]pyrene µg/L	Naphthalene µg/L	Phenanthrene µg/L	Pyrene µg/L	Quinoline µg/L
13-DP2	Drive point SW of Basin 4	---	18-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DP2	Drive point SW of Basin 4	---	22-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DP2 dup	Drive point SW of Basin 4	---	22-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DP3	Drive point S of Basin 3 near E Ladder Road		28-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.013	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DP3	Drive point S of Basin 3 near E Ladder Road		29-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DP3	Drive point S of Basin 3 near E Ladder Road	---	30-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DP3 dup	Drive point S of Basin 3 near E Ladder Road	86.5	30-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DP3	Drive point S of Basin 3 near E Ladder Road	---	01-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	0.13	<0.050	<0.020	<0.20
13-DP3	Drive point S of Basin 3 near E Ladder Road	95.5	02-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	0.11	<0.050	<0.020	<0.20
13-DP3	Drive point S of Basin 3 near E Ladder Road	---	15-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	0.12	<0.050	<0.020	<0.20
13-DP4	Drive point N of Basin 3 near E Ladder Road		28-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DP4 dup	Drive point N of Basin 3 near E Ladder Road		28-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.014	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.021	<0.050	<0.0085	0.15	0.067	<0.020	<0.20
13-DP4	Drive point N of Basin 3 near E Ladder Road		29-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	0.12	<0.050	<0.020	<0.20
13-DP4	Drive point N of Basin 3 near E Ladder Road	75	30-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DP4	Drive point N of Basin 3 near E Ladder Road	---	01-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	0.13	<0.050	<0.020	<0.20
13-DP4 dup	Drive point N of Basin 3 near E Ladder Road	---	01-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	0.11	<0.050	<0.020	<0.20
13-DP4	Drive point N of Basin 3 near E Ladder Road	---	02-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	0.11	<0.050	<0.020	<0.20
13-DP4 dup	Drive point N of Basin 3 near E Ladder Road	82	02-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	0.10	<0.050	<0.020	<0.20
13-DP4	Drive point N of Basin 3 near E Ladder Road	---	03-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DP4	Drive point N of Basin 3 near E Ladder Road	---	15-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	0.12	<0.050	<0.020	<0.20
13-DP4	Drive point N of Basin 3 near E Ladder Road	---	22-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DP4	Drive point N of Basin 3 near E Ladder Road	140	29-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DP5	Drive point W side of Basin 3		28-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	***0.025***	<0.050	<0.0085	0.12	<0.050	<0.020	<0.20
13-DP5	Drive point W side of Basin 3		29-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	0.012	<0.050	<0.0085	0.2	<0.050	<0.020	<0.20
13-DP5	Drive point W side of Basin 3	85	30-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	0.2	<0.050	<0.020	<0.20
13-DP5	Drive point W side of Basin 3	---	01-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	0.2	<0.050	<0.020	<0.20
13-DP5	Drive point W side of Basin 3	91	02-Oct-13	<0.11	<0.11	<0.22	<0.011	<0.0094	<0.0094	<0.0094	<0.0094	<0.0083	<0.0094	<0.0083	<0.011	<0.056	<0.0094	0.15	<0.056	<0.022	<0.22
13-DP6	Drive point S side of Basin 3		28-Sep-13	<0.20	<0.20	<0.40	<0.020	<0.017	<0.017	<0.017	<0.017	<0.015	<0.017	<0.015	***0.031***	<0.10	<0.017	<0.20	<0.10	<0.040	<0.59
13-DP6	Drive point S side of Basin 3		29-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	0.1	<0.050	<0.020	<0.20
13-DP6	Drive point S side of Basin 3	78	30-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DP6	Drive point S side of Basin 3	---	01-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	0.11	<0.050	<0.020	<0.20
13-DP6	Drive point S side of Basin 3	105	02-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	0.11	<0.050	<0.020	<0.20
13-DP6	Drive point S side of Basin 3	---	15-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	0.13	<0.050	<0.020	<0.20
13-DP6	Drive point S side of Basin 3	---	22-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DP6	Drive point S side of Basin 3	108	29-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DP7	Drive point E side of Basin 3		28-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.014	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DP7	Drive point E side of Basin 3		29-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	0.12	<0.050	<0.020	<0.20
13-DP7	Drive point E side of Basin 3	101	30-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	0.11	<0.050	<0.020	<0.20
13-DP7	Drive point E side of Basin 3	---	01-Oct-13	<0.11	<0.11	<0.22	<0.011	<0.0093	<0.0093	<0.0093	<0.0093	<0.0082	<0.0093	<0.0082	<0.011	<0.055	<0.0093	0.13	<0.055	<0.022	<0.22
13-DP7	Drive point E side of Basin 3	104	02-Oct-13	<0.12	<0.12	<0.23	<0.012	<0.0099	<0.0099	<0.0099	<0.0099	<0.0087	<0.0099	<0.0087	<0.012	<0.058	<0.0099	0.13	<0.058	<0.023	<0.23
13-DP7	Drive point E side of Basin 3	---	15-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Minimal Detection Limit				**0.1**	**0.1**	**0.2**	**0.01**	**0.0085**	**0.0085**	**0.0085**	**0.0085**	**0.0075**	**0.0085**	**0.0075**	**0.01**	**0.05**	**0.0085**	**0.1**	**0.05**	**0.02**	**0.2**
AENV Freshwater Aquatic Life*				**5.8^**	**NS**	**4.4^**	**0.012^**	**0.018^**	**NS**	**NS**	**NS**	**0.015^**	**NS**	**NS**	**0.015^**	**3^**	**NS**	**1.1^**	**0.4^**	**0.025^**	**3.4^**

Notes:

--- - not analyzed

NS - not specified

* - Alberta Environment Surface Water Quality Guidelines for use in Alberta (AENV, 1999)

Italics - indicates values do not meet applicable guidelines

APPENDIX C3.

SURFACE WATER QUALITY RESULTS - TOTAL METALS

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Depth	Sample Date	Hg mg/L
13-SW12	Basin 4	surface	25-Sep-13	0.00000072
13-SW46	NE Control Lake	---	25-Sep-13	0.0000010
13-SW47	Borrow Pit	---	25-Sep-13	0.00000045
Minimal Detection Limit				-
AENV Freshwater Aquatic Life*				**0.000013[f]/ 0.000005[g]**

Notes:

--- - not analyzed

[f] - acute aquatic life guideline from Alberta Environment Surface Water Quality Guidelines for Use in Alberta (AENV, 1999)

[g] - chronic aquatic life guideline from Alberta Environment Surface Water Quality Guidelines for Use in Alberta (AENV, 1999)

* - Alberta Environment Surface Water Quality Guidelines for Use in Alberta (AENV, 1999)

Italics - indicates values do not meet applicable guidelines

APPENDIX C4.

WATER QUALITY CONTROL SAMPLE RESULTS - DISSOLVED HYDROCARBONS

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Depth cm	Sample Date	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylenes mg/L	F1 C_6-C_{10} mg/L	F2 $C_{>10}$-C_{16} mg/L	F3 $C_{>16}$-C_{34} mg/L	F4 $C_{>34}$-C_{50} mg/L	Cl mg/L	TSS mg/L	Turbidity NTU
13-SW7	Basin 1	110	25-Sep-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	---	---
13-SW7 dup	Basin 1	110	25-Sep-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	---	---
				0.0004	0.0004	0.0004	0.0008	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.002	0.002	0.004	0.5	0.5	1	1	5	---	---
				---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	---	---
13-SW16	Downstream Fen Upstream of Ken Baker Road	20	25-Sep-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	6.0	---	---
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	20	25-Sep-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	6.1	---	---
				0.0004	0.0004	0.0004	0.0008	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.002	0.002	0.004	0.5	0.5	1	1	5	---	---
				---	---	---	---	---	---	---	---	0.1	---	---
				---	---	---	---	---	---	---	---	2	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	---	---
13-DP4	Drive point N of Basin 3 near E Ladder Road	---	28-Sep-13	<0.0004	0.0014	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	3.4	---	<0.10
13-DP4 dup	Drive point N of Basin 3 near E Ladder Road	---	28-Sep-13	<0.0004	0.0011	<0.0004	<0.0008	<0.1	<0.10	0.24	<0.20	3.0	---	<0.10
				0.0004	0.0004	0.0004	0.0008	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.002	0.002	0.004	0.5	0.5	1	1	5	---	0.5
				---	0.0003	---	---	---	---	---	---	0.4	---	---
				---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	---	Good
13-SW7	Basin 1	---	28-Sep-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	0.14	<0.20	<0.20	1.2	---	---
13-SW7 dup	Basin 1	---	28-Sep-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	2.8	---	---
				0.0004	0.0004	0.0004	0.0008	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.002	0.002	0.004	0.5	0.5	1	1	5	---	---
				---	---	---	---	---	---	---	---	1.6	---	---
				---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	---	---
13-SW12	Basin 4	---	29-Sep-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1	---	---
13-SW12 dup	Basin 4	---	29-Sep-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1	---	---
				0.0004	0.0004	0.0004	0.0008	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.002	0.002	0.004	0.5	0.5	1	1	5	---	---
				---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	---	---
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	30-Sep-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	6.6	17	14
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	30-Sep-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	6.3	3.3	7.5
				0.0004	0.0004	0.0004	0.0008	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.002	0.002	0.004	0.5	0.5	1	1	5	5	0.5
				---	---	---	---	---	---	---	---	0.3	13.7	6.5
				---	---	---	---	---	---	---	---	5	---	60
				Good	Good	Good	Good	Good	Good	Good	Good	Good	***Poor***	***Poor***
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	01-Oct-13	<0.00040	<0.00040	<0.00040	<0.00080	<0.1	<0.10	<0.20	<0.20	6.3	6.7	9.4
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	01-Oct-13	<0.00040	<0.00040	<0.00040	<0.00080	<0.1	<0.10	<0.20	<0.20	<1.0	5.3	1.7
				0.0004	0.0004	0.0004	0.0008	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.002	0.002	0.004	0.5	0.5	1	1	5	5	0.5
				---	---	---	---	---	---	---	---	---	1.4	7.7
				---	---	---	---	---	---	---	---	---	23	139
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	***Poor***

APPENDIX C4.

WATER QUALITY CONTROL SAMPLE RESULTS - DISSOLVED HYDROCARBONS

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Depth cm	Sample Date	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylenes mg/L	F1 C_6-C_{10} mg/L	F2 $C_{>10}$-C_{16} mg/L	F3 $C_{>16}$-C_{34} mg/L	F4 $C_{>34}$-C_{50} mg/L	Cl mg/L	TSS mg/L	Turbidity NTU
13-DP4	Drive point N of Basin 3 near E Ladder Road	---	01-Oct-13	<0.0004	0.0014	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	490	300
13-DP4 dup	Drive point N of Basin 3 near E Ladder Road	---	01-Oct-13	<0.0004	0.0016	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	1.1	450	270
				0.0004	0.0004	0.0004	0.0008	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.002	0.002	0.004	0.5	0.5	1	1	5	5	0.5
				---	0.0002	---	---	---	---	---	---	---	40	30
				---	---	---	---	---	---	---	---	---	9	11
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	01-Oct-13	<0.00040	<0.00040	<0.00040	<0.00080	<0.1	<0.10	<0.20	<0.20	6.3	6.7	9.4
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	01-Oct-13	<0.00040	<0.00040	<0.00040	<0.00080	<0.1	<0.10	<0.20	<0.20	6.3	6.7	11
				0.0004	0.0004	0.0004	0.0008	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.002	0.002	0.004	0.5	0.5	1	1	5	5	0.5
				---	---	---	---	---	---	---	---	0	0	1.6
				---	---	---	---	---	---	---	---	0	0	16
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-SW31	Basin 3	---	01-Oct-13	<0.00040	0.00045	<0.00040	<0.00080	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	0.7
13-SW31 dup	Basin 3	---	01-Oct-13	<0.00040	<0.00040	<0.00040	<0.00080	<0.1	<0.10	<0.20	<0.20	<1.0	5.3	1.7
				0.0004	0.0004	0.0004	0.0008	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.002	0.002	0.004	0.5	0.5	1	1	5	5	0.5
				---	---	---	---	---	---	---	---	---	---	1
				---	---	---	---	---	---	---	---	---	---	83
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	***Poor***
13-DP4	Drive point N of Basin 3 near E Ladder Road	82	02-Oct-13	<0.0004	0.0014	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	1400	69
13-DP4 dup	Drive point N of Basin 3 near E Ladder Road	---	02-Oct-13	---	---	---	---	---	---	---	---	1.5	3300	250
				0.0004	0.0004	0.0004	0.0008	0.1	0.1	0.2	0.2	1	1	0.1
				---	---	---	---	---	---	---	---	5	5	0.5
				---	---	---	---	---	---	---	---	---	1900	181
				---	---	---	---	---	---	---	---	---	81	113
				---	---	---	---	---	---	---	---	Good	***Poor***	***Poor***
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	03-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	6	6	5
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	03-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	6	<1.0	5.4
				0.0004	0.0004	0.0004	0.0008	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.002	0.002	0.004	0.5	0.5	1	1	5	5	0.5
				---	---	---	---	---	---	---	---	0	---	0.4
				---	---	---	---	---	---	---	---	0	---	8
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	04-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	5.9	3.3	5.7
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	04-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	5.8	3.3	6.6
				0.0004	0.0004	0.0004	0.0008	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.002	0.002	0.004	0.5	0.5	1	1	5	5	0.5
				---	---	---	---	---	---	---	---	0.1	0	0.9
				---	---	---	---	---	---	---	---	2	---	15
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-SW26	Downstream Fen Upstream of Pad 21	---	04-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	2.3	4.7	2.8
13-SW26 dup	Downstream Fen Upstream of Pad 21	---	04-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	3	15	11
				0.0004	0.0004	0.0004	0.0008	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.002	0.002	0.004	0.5	0.5	1	1	5	5	0.5
				---	---	---	---	---	---	---	---	0.7	10.3	8.2
				---	---	---	---	---	---	---	---	---	---	119
				Good	Good	Good	Good	Good	Good	Good	Good	Good	***Poor***	***Poor***

APPENDIX C4.

WATER QUALITY CONTROL SAMPLE RESULTS - DISSOLVED HYDROCARBONS

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Depth cm	Sample Date	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylenes mg/L	F1 C_6-C_{10} mg/L	F2 $C_{>10}$-C_{16} mg/L	F3 $C_{>16}$-C_{34} mg/L	F4 $C_{>34}$-C_{50} mg/L	Cl mg/L	TSS mg/L	Turbidity NTU
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	05-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	6.1	4.7	8.5
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	05-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	6.1	6.7	8.3
				0.0004	0.0004	0.0004	0.0008	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.002	0.002	0.004	0.5	0.5	1	1	5	5	0.5
				---	---	---	---	---	---	---	---	0	2	0.2
				---	---	---	---	---	---	---	---	0	---	2
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-SW26	Downstream Fen Upstream of Pad 21	---	05-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	4.1	6.7	3.1
13-SW26 dup	Downstream Fen Upstream of Pad 21	---	05-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	3.9	4.7	2.3
				0.0004	0.0004	0.0004	0.0008	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.002	0.002	0.004	0.5	0.5	1	1	5	5	0.5
				---	---	---	---	---	---	---	---	0.2	2	0.8
				---	---	---	---	---	---	---	---	---	---	30
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	06-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.10	<0.10	<0.20	<0.20	6.6	21	10
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	06-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.10	<0.10	0.46	<0.20	6.7	53	21
				0.0004	0.0004	0.0004	0.0008	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.002	0.002	0.004	0.5	0.5	1	1	5	5	0.5
				---	---	---	---	---	---	---	---	0.1	32	11
				---	---	---	---	---	---	---	---	2	86	71
				Good	Good	Good	Good	Good	Good	Good	Good	Good	***Poor***	***Poor***
13-SW26	Downstream Fen Upstream of Pad 21	---	06-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.10	<0.10	0.2	<0.20	1.7	15	6.5
13-SW26 dup	Downstream Fen Upstream of Pad 21	---	06-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.10	<0.10	<0.20	<0.20	1.5	4	1.2
				0.0004	0.0004	0.0004	0.0008	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.002	0.002	0.004	0.5	0.5	1	1	5	5	0.5
				---	---	---	---	---	---	---	---	0.2	11	5.3
				---	---	---	---	---	---	---	---	---	---	138
				Good	Good	Good	Good	Good	Good	Good	Good	Good	***Poor***	***Poor***
13-SW26	Downstream Fen Upstream of Pad 21	---	07-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	1.8	2	0.95
13-SW26 dup	Downstream Fen Upstream of Pad 21	---	07-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	1.8	2	1.9
				0.0004	0.0004	0.0004	0.0008	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.002	0.002	0.004	0.5	0.5	1	1	5	5	0.5
				---	---	---	---	---	---	---	---	0	0	0.95
				---	---	---	---	---	---	---	---	---	---	67
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	***Poor***
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	07-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	6.9	5.3	9
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	07-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	6.5	16	1.5
				0.0004	0.0004	0.0004	0.0008	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.002	0.002	0.004	0.5	0.5	1	1	5	5	0.5
				---	---	---	---	---	---	---	---	0.4	10.7	7.5
				---	---	---	---	---	---	---	---	6	100	143
				Good	Good	Good	Good	Good	Good	Good	Good	Good	***Poor***	***Poor***
13-SW26	Downstream Fen Upstream of Pad 21	---	08-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	1.8	11	4.7
13-SW26 dup	Downstream Fen Upstream of Pad 21	---	08-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.12	<0.20	<0.20	1.6	3.3	1.5
				0.0004	0.0004	0.0004	0.0008	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.002	0.002	0.004	0.5	0.5	1	1	5	5	0.5
				---	---	---	---	---	---	---	---	0.2	7.7	3.2
				---	---	---	---	---	---	---	---	---	---	103
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	***Poor***

APPENDIX C4.

WATER QUALITY CONTROL SAMPLE RESULTS - DISSOLVED HYDROCARBONS

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Depth cm	Sample Date	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylenes mg/L	F1 C_6-C_{10} mg/L	F2 $C_{>10}$-C_{16} mg/L	F3 $C_{>16}$-C_{34} mg/L	F4 $C_{>34}$-C_{50} mg/L	Cl mg/L	TSS mg/L	Turbidity NTU
13-SW7	Basin 1	50	08-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	1.4	6	0.74
13-SW7 dup	Basin 1	---	08-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.13	<0.20	<0.20	6.7	7.3	9.7
				0.0004	0.0004	0.0004	0.0008	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.002	0.002	0.004	0.5	0.5	1	1	5	5	0.5
				---	---	---	---	---	---	---	---	5.3	1.3	8.96
				---	---	---	---	---	---	---	---	---	20	172
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	***Poor***
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	09-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	0.22	6.8	33	20
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	09-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	6.8	1.3	9.8
				0.0004	0.0004	0.0004	0.0008	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.002	0.002	0.004	0.5	0.5	1	1	5	5	0.5
				---	---	---	---	---	---	---	---	0	31.7	10.2
				---	---	---	---	---	---	---	---	0	---	68
				Good	Good	Good	Good	Good	Good	Good	Good	Good	***Poor***	***Poor***
13-SW26	Downstream Fen Upstream of Pad 21	---	09-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	1.5	8.7	2.6
13-SW26 dup	Downstream Fen Upstream of Pad 21	---	09-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	1.7	8.7	3
				0.0004	0.0004	0.0004	0.0008	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.002	0.002	0.004	0.5	0.5	1	1	5	5	0.5
				---	---	---	---	---	---	---	---	0.2	0	0.4
				---	---	---	---	---	---	---	---	---	0	14
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	10-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.17	0.33	<0.20	6.8	2	10
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	10-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	6.7	2.7	11
				0.0004	0.0004	0.0004	0.0008	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.002	0.002	0.004	0.5	0.5	1	1	5	5	0.5
				---	---	---	---	---	---	---	---	0.1	0.7	1
				---	---	---	---	---	---	---	---	1	---	10
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-SW26	Downstream Fen Upstream of Pad 21	---	10-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	1.2	7.3	2.8
13-SW26 dup	Downstream Fen Upstream of Pad 21	---	10-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	1.7	36	19
				0.0004	0.0004	0.0004	0.0008	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.002	0.002	0.004	0.5	0.5	1	1	5	5	0.5
				---	---	---	---	---	---	---	---	0.5	28.7	16.2
				---	---	---	---	---	---	---	---	---	133	149
				Good	Good	Good	Good	Good	Good	Good	Good	Good	***Poor***	***Poor***
13-SW42	Discharge Fen Upstream of Wolf River	---	11-Oct-13	<0.0004	<0.002	<0.0004	<0.004	0.26	<0.10	0.28	<0.20	2.1	210	56
13-SW42 dup	Discharge Fen Upstream of Wolf River	---	11-Oct-13	<0.0004	<0.002	<0.0004	<0.004	0.31	<0.10	0.2	<0.20	1.9	190	130
				0.0004	0.0004	0.0004	0.0008	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.002	0.002	0.004	0.5	0.5	1	1	5	5	0.5
				---	---	---	---	0.05	---	0.08	---	0.2	20	74
				---	---	---	---	---	---	---	---	---	10	80
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	***Poor***
13-SW27	Downstream Fen Downstream of Pad 21	---	12-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	0.27	<0.20	2.9	7.3	8.6
13-SW27 dup	Downstream Fen Downstream of Pad 21	---	12-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	2.5	5.3	8.9
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	5	0.5
				---	---	---	---	---	---	---	---	0.4	2	0.3
				---	---	---	---	---	---	---	---	---	32	3
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good

APPENDIX C4.

WATER QUALITY CONTROL SAMPLE RESULTS - DISSOLVED HYDROCARBONS

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Depth cm	Sample Date	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylenes mg/L	F1 C_6-C_{10} mg/L	F2 $C_{>10}$-C_{16} mg/L	F3 $C_{>16}$-C_{34} mg/L	F4 $C_{>34}$-C_{50} mg/L	Cl mg/L	TSS mg/L	Turbidity NTU
13-SW26	Downstream Fen Upstream of Pad 21	---	13-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.17	0.27	0.38	1.3	49	14
13-SW26 dup	Downstream Fen Upstream of Pad 21	---	13-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.17	<0.27	<0.38	1.1	51	17
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	5	0.5
				---	---	---	---	---	---	---	---	0.2	2	3
				---	---	---	---	---	---	---	---	---	4	19
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-SW42	Discharge Fen Upstream of Wolf River	---	14-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	1.6	3.3	11
13-SW42 dup	Discharge Fen Upstream of Wolf River	---	14-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.15	0.31	<0.20	1.7	6	14
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	5	0.5
				---	---	---	---	---	---	---	---	0.1	2.7	3
				---	---	---	---	---	---	---	---	---	---	24
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-SW27	Downstream Fen Downstream of Pad 21	---	15-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	1.1	66	12
13-SW27 dup	Downstream Fen Downstream of Pad 21	---	15-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	1.4	4.7	1.8
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	5	0.5
				---	---	---	---	---	---	---	---	0.3	61.3	10.2
				---	---	---	---	---	---	---	---	---	---	148
				Good	Good	Good	Good	Good	Good	Good	Good	Good	***Poor***	***Poor***
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	16-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	3.8	5.3	3.7
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	16-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	4.3	6.7	5.1
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	5	0.5
				---	---	---	---	---	---	---	---	0.5	1.4	1.4
				---	---	---	---	---	---	---	---	---	23	32
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-SW27	Downstream Fen Downstream of Pad 21	---	17-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	2.3	77	23
13-SW27 dup	Downstream Fen Downstream of Pad 21	---	17-Oct-13	<0.00040	0.0047	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	1.7	25	7.3
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	5	0.5
				---	---	---	---	---	---	---	---	0.6	52	15.7
				---	---	---	---	---	---	---	---	---	102	104
				Good	Good	Good	Good	Good	Good	Good	Good	Good	***Poor***	***Poor***
13-SW27	Downstream Fen Downstream of Pad 21	---	18-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	2.3	6	7.4
13-SW27 dup	Downstream Fen Downstream of Pad 21	---	18-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	2.5	11	8.3
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	5	0.5
				---	---	---	---	---	---	---	---	0.2	5	0.9
				---	---	---	---	---	---	---	---	---	59	11
				Good	Good	Good	Good	Good	Good	Good	Good	Good	***Poor***	Good
13-SW26	Downstream Fen Upstream of Pad 21	---	19-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	3.0	21	4.5
13-SW26 dup	Downstream Fen Upstream of Pad 21	---	19-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	3.4	25	14
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	5	0.5
				---	---	---	---	---	---	---	---	0.4	4	9.5
				---	---	---	---	---	---	---	---	---	17	103
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	***Poor***

APPENDIX C4.

WATER QUALITY CONTROL SAMPLE RESULTS - DISSOLVED HYDROCARBONS

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Depth cm	Sample Date	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylenes mg/L	F1 C_6-C_{10} mg/L	F2 $C_{>10}$-C_{16} mg/L	F3 $C_{>16}$-C_{34} mg/L	F4 $C_{>34}$-C_{50} mg/L	Cl mg/L	TSS mg/L	Turbidity NTU
13-SW27	Downstream Fen Downstream of Pad 21	---	20-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	---	---	---
13-SW27 dup	Downstream Fen Downstream of Pad 21	---	20-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	---	---	---
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	---	---	---
				---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	---	---	---
13-SW42	Discharge Fen Upstream of Wolf River	---	21-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	2.3	4.7	13
13-SW42 dup	Discharge Fen Upstream of Wolf River	---	21-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	2.4	4.7	12
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	5	0.5
				---	---	---	---	---	---	---	---	0.1	0	1
				---	---	---	---	---	---	---	---	---	---	8
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-DP2	Drive point SW of Basin 4	---	22-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	1.7	75	35
13-DP2 dup	Drive point SW of Basin 4	---	22-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	1.5	74	30
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	5	0.5
				---	---	---	---	---	---	---	---	0.2	1	5
				---	---	---	---	---	---	---	---	---	1	15
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-SW26	Downstream Fen Upstream of Pad 21	---	23-Oct-13	<0.00040	<0.00040	<0.00040	<0.00080	<0.1	<0.10	<0.20	<0.20	3.1	29	4.1
13-SW26 dup	Downstream Fen Upstream of Pad 21	---	23-Oct-13	<0.00040	<0.00040	<0.00040	<0.00080	<0.1	<0.10	<0.20	<0.20	3.1	4.7	1.4
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	5	0.5
				---	---	---	---	---	---	---	---	0	24.3	2.7
				---	---	---	---	---	---	---	---	---	---	98
				Good	Good	Good	Good	Good	Good	Good	Good	Good	***Poor***	***Poor***
13-SW42	Discharge Fen Upstream of Wolf River	---	23-Oct-13	<0.00040	<0.00040	<0.00040	<0.00080	<0.1	<0.10	<0.20	<0.20	2.1	3.3	9.8
13-SW42 dup	Discharge Fen Upstream of Wolf River	---	23-Oct-13	<0.00040	<0.00040	<0.00040	<0.00080	<0.1	<0.10	<0.20	<0.20	2.1	10	20
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	5	0.5
				---	---	---	---	---	---	---	---	0	6.7	10.2
				---	---	---	---	---	---	---	---	---	---	68
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	***Poor***
13-SW42	Discharge Fen Upstream of Wolf River	---	29-Oct-13	<0.00040	<0.00040	<0.00040	<0.00080	<0.1	<0.10	<0.20	<0.20	2	10	25
13-SW42 dup	Discharge Fen Upstream of Wolf River	---	29-Oct-13	<0.00040	<0.00040	<0.00040	<0.00080	<0.1	<0.10	<0.20	<0.20	2	19	32
				0.0004	0.002	0.0004	0.004	0.1	0.1	0.2	0.2	1	1	0.1
				0.002	0.01	0.002	0.02	0.5	0.5	1	1	5	5	0.5
				---	---	---	---	---	---	---	---	0	9	7
				---	---	---	---	---	---	---	---	---	62	25
				Good	Good	Good	Good	Good	Good	Good	Good	Good	***Poor***	Good

Notes:

--- - not applicable

* - non-detectable concentrations are assessed at 95% of the detection limit

** - the reliable (reporting) detection limit (RDL) or practical detection limit (PDL) is defined as 5 times the DL

Good - evaluation indicates acceptable reproducibility

Poor - evaluation indicates poor reproducibility

APPENDIX C5.

WATER QUALITY CONTROL SAMPLE RESULTS - POLYCYCLIC AROMATIC HYDROCARBONS

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Depth	Sample	Acenaphthene	Acenaphthylene	Acridine	Anthracene	Benz[a]anthracene	Benzo[b+j]fluoranthene	Benzo[k]fluoranthene	Benzo[g,h,i]perylene	Benzo[a]pyrene	Chrysene	Dibenz[a,h]anthracene	Fluoranthene	Fluorene	Indeno[1,2,3-cd]pyrene	Naphthalene	Phenanthrene	Pyrene	Quinoline
		cm	Date	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
13-SW7	Basin 1	110	25-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW7 dup	Basin 1	110	25-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-SW16	Downstream Fen Upstream of Ken Baker Road	20	25-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	20	25-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-SW7	Basin 1	---	28-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW7 dup	Basin 1	---	28-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	30-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	30-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-SW7	Basin 1	---	30-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	0.26	<0.050	<0.020	<0.20
13-SW7 dup	Basin 1	---	30-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-DP3	Drive point S of Basin 3 near E Ladder Road	---	30-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DP3 dup	Drive point S of Basin 3 near E Ladder Road	86.5	30-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good

APPENDIX C5.

WATER QUALITY CONTROL SAMPLE RESULTS - POLYCYCLIC AROMATIC HYDROCARBONS

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Depth	Sample	Acenaphthene	Acenaphthylene	Acridine	Anthracene	Benz[a]anthracene	Benzo[b+j]fluoranthene	Benzo[k]fluoranthene	Benzo[g,h,i]perylene	Benzo[a]pyrene	Chrysene	Dibenz[a,h]anthracene	Fluoranthene	Fluorene	Indeno[1,2,3-cd]pyrene	Naphthalene	Phenanthrene	Pyrene	Quinoline
		cm	Date	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	01-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	01-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-DP4	Drive point N of Basin 3 near E Ladder Road	---	01-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	0.13	<0.050	<0.020	<0.20
13-DP4 dup	Drive point N of Basin 3 near E Ladder Road	---	01-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	0.11	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---		---	---	---	---	---	---	---	---	0.02	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	02-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	02-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-DP4	Drive point N of Basin 3 near E Ladder Road	---	02-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	0.11	<0.050	<0.020	<0.20
13-DP4 dup	Drive point N of Basin 3 near E Ladder Road	82	02-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	0.1	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---		---	---	---	---	---	---	---	---	0.01	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	03-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	03-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	04-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	04-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good

APPENDIX C5.

WATER QUALITY CONTROL SAMPLE RESULTS - POLYCYCLIC AROMATIC HYDROCARBONS

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Depth	Sample	Acenaphthene	Acenaphthylene	Acridine	Anthracene	Benz[a]anthracene	Benzo[b+j]fluoranthene	Benzo[k]fluoranthene	Benzo[g,h,i]perylene	Benzo[a]pyrene	Chrysene	Dibenz[a,h]anthracene	Fluoranthene	Fluorene	Indeno[1,2,3-cd]pyrene	Naphthalene	Phenanthrene	Pyrene	Quinoline
		cm	Date	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
13-SW26	Downstream Fen Upstream of Pad 21	---	04-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW26 dup	Downstream Fen Upstream of Pad 21	---	04-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	05-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	05-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-SW26	Downstream Fen Upstream of Pad 21	---	05-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW26 dup	Downstream Fen Upstream of Pad 21	---	05-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	06-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	06-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-SW26	Downstream Fen Upstream of Pad 21	---	06-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW26 dup	Downstream Fen Upstream of Pad 21	---	06-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	07-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	07-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good

APPENDIX C5.

WATER QUALITY CONTROL SAMPLE RESULTS - POLYCYCLIC AROMATIC HYDROCARBONS

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Depth	Sample	Acenaphthene	Acenaphthylene	Acridine	Anthracene	Benz[a]anthracene	Benzo[b+j]fluoranthene	Benzo[k]fluoranthene	Benzo[g,h,i]perylene	Benzo[a]pyrene	Chrysene	Dibenz[a,h]anthracene	Fluoranthene	Fluorene	Indeno[1,2,3-cd]pyrene	Naphthalene	Phenanthrene	Pyrene	Quinoline
		cm	Date	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
13-SW26	Downstream Fen Upstream of Pad 21	---	07-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW26 dup	Downstream Fen Upstream of Pad 21	---	07-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-SW26	Downstream Fen Upstream of Pad 21	---	08-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW26 dup	Downstream Fen Upstream of Pad 21	---	08-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-SW7	Basin 1	50	08-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW7 dup	Basin 1	50	08-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	09-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	09-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	10-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	10-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-SW26	Downstream Fen Upstream of Pad 21	---	10-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW26 dup	Downstream Fen Upstream of Pad 21	---	10-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good

APPENDIX C5.

WATER QUALITY CONTROL SAMPLE RESULTS - POLYCYCLIC AROMATIC HYDROCARBONS

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Depth	Sample	Acenaphthene	Acenaphthylene	Acridine	Anthracene	Benz[a]anthracene	Benzo[b+j]fluoranthene	Benzo[k]fluoranthene	Benzo[g,h,i]perylene	Benzo[a]pyrene	Chrysene	Dibenz[a,h]anthracene	Fluoranthene	Fluorene	Indeno[1,2,3-cd]pyrene	Naphthalene	Phenanthrene	Pyrene	Quinoline
		cm	Date	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
13-SW42	Discharge Fen Upstream of Wolf River	---	11-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW42 dup	Discharge Fen Upstream of Wolf River	---	11-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-SW27	Downstream Fen Downstream of Pad 21	---	12-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW27 dup	Downstream Fen Downstream of Pad 21	---	12-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-SW26	Downstream Fen Upstream of Pad 21	---	13-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW26 dup	Downstream Fen Upstream of Pad 21	---	13-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-SW42	Downstream Fen Downstream of Pad 21	---	14-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW42 dup	Downstream Fen Downstream of Pad 21	---	14-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-SW27	Downstream Fen Downstream of Pad 21	---	15-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW27 dup	Downstream Fen Downstream of Pad 21	---	15-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-SW16	Downstream Fen Upstream of Ken Baker Road	---	16-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW16 dup	Downstream Fen Upstream of Ken Baker Road	---	16-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good

APPENDIX C5.

WATER QUALITY CONTROL SAMPLE RESULTS - POLYCYCLIC AROMATIC HYDROCARBONS

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Depth	Sample	Acenaphthene	Acenaphthylene	Acridine	Anthracene	Benz[a]anthracene	Benzo[b+j]fluoranthene	Benzo[k]fluoranthene	Benzo[g,h,i]perylene	Benzo[a]pyrene	Chrysene	Dibenz[a,h]anthracene	Fluoranthene	Fluorene	Indeno[1,2,3-cd]pyrene	Naphthalene	Phenanthrene	Pyrene	Quinoline
		cm	Date	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
13-SW27	Downstream Fen Downstream of Pad 21	---	17-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW27 dup	Downstream Fen Downstream of Pad 21	---	17-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-SW27	Downstream Fen Downstream of Pad 21	---	18-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW27 dup	Downstream Fen Downstream of Pad 21	---	18-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-SW26	Downstream Fen Upstream of Pad 21	---	19-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW26 dup	Downstream Fen Upstream of Pad 21	---	19-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-SW27	Downstream Fen Downstream of Pad 21	---	20-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW27 dup	Downstream Fen Downstream of Pad 21	---	20-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-SW42	Discharge Fen Upstream of Wolf River	---	21-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW42 dup	Discharge Fen Upstream of Wolf River	---	21-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-DP2	Drive point SW of Basin 4	---	22-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-DP2 dup	Drive point SW of Basin 4	---	22-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good

APPENDIX C5.

WATER QUALITY CONTROL SAMPLE RESULTS - POLYCYCLIC AROMATIC HYDROCARBONS

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Location	Sample Depth	Sample	Acenaphthene	Acenaphthylene	Acridine	Anthracene	Benz[a]anthracene	Benzo[b+j]fluoranthene	Benzo[k]fluoranthene	Benzo[g,h,i]perylene	Benzo[a]pyrene	Chrysene	Dibenz[a,h]anthracene	Fluoranthene	Fluorene	Indeno[1,2,3-cd]pyrene	Naphthalene	Phenanthrene	Pyrene	Quinoline
		cm	Date	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
13-SW42	Discharge Fen Upstream of Wolf River	---	22-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW42 dup	Discharge Fen Upstream of Wolf River	---	22-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-SW26	Downstream Fen Upstream of Pad 21	---	23-Oct-13	<0.12	<0.12	<0.24	<0.012	<0.010	<0.010	<0.010	<0.010	<0.0089	<0.010	<0.0089	<0.012	<0.060	<0.010	<0.12	<0.060	<0.024	<0.24
13-SW26 dup	Downstream Fen Upstream of Pad 21	---	23-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-SW42	Discharge Fen Upstream of Wolf River	---	23-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW42 dup	Discharge Fen Upstream of Wolf River	---	23-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good
13-SW42	Discharge Fen Upstream of Wolf River	---	29-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW42 dup	Discharge Fen Upstream of Wolf River	---	29-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
				0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
				0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
				---	---	---	---	---		---	---	---	---	---	---	---	---	---	---	---	---
				---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
				Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good

Notes:

--- - not applicable

* - non-detectable concentrations are assessed at 95% of the detection limit

** - the reliable (reporting) detection limit (RDL) or practical detection limit (PDL) is defined as 5 times the DL

Good - evaluation indicates acceptable reproducibility

Poor - evaluation indicates poor reproducibility

APPENDIX C6.

WATER QUALITY CONTROL SAMPLE RESULTS - DISSOLVED HYDROCARBONS

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Lab	Sample Location	Sample Depth cm	Sample Date	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylenes mg/L	F1 C_6-C_{10} mg/L	F2 $C_{>10}$-C_{16} mg/L	F3 $C_{>16}$-C_{34} mg/L	F4 $C_{>34}$-C_{50} mg/L	Cl mg/L	TSS mg/L	Turbidity NTU
13-SW42	Maxxam	Discharge Fen Upstream of Wolf River	---	16-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	1.3	14	21
13-SW42	Exova	Discharge Fen Upstream of Wolf River	---	16-Oct-13	<0.001	<0.001	<0.001	<0.001	<0.20	<0.20	<0.1	<0.1	1.8	21	39.8
					0.0004	0.0004	0.0004	0.0008	0.1	0.1	0.2	0.2	1	1	0.1
					0.002	0.002	0.002	0.004	0.5	0.5	1	1	5	5	0.5
					---	---	---	---	---	---	---	---	0.5	7	18.8
					---	---	---	---	---	---	---	---	---	40	62
					Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	***Poor***

Notes:

--- - not applicable

* - non-detectable concentrations are assessed at 95% of the detection limit

** - the reliable (reporting) detection limit (RDL) or practical detection limit (PDL) is defined as 5 times the DL

Good - evaluation indicates acceptable reproducibility

Poor - evaluation indicates poor reproducibility

APPENDIX C7.

WATER QUALITY CONTROL SAMPLE RESULTS - POLYCYCLIC AROMATIC HYDROCARBONS

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Lab	Sample Location	Sample Depth	Sample	Acenaphthene	Acenaphthylene	Acridine	Anthracene	Benz[a]anthracene	Benzo[b+j]fluoranthene	Benzo[k]fluoranthene	Benzo[g,h,i]perylene	Benzo[a]pyrene	Chrysene	Dibenz[a,h]anthracene	Fluoranthene	Fluorene	Indeno[1,2,3-cd]pyrene	Naphthalene	Phenanthrene	Pyrene	Quinoline
			cm	Date	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
13-SW42	Maxxam	Discharge Fen Upstream of Wolf River	---	16-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
13-SW42	Exova	Discharge Fen Upstream of Wolf River	---	16-Oct-13	<0.1	<0.1	<0.1	<0.005	<0.01	<0.1	<0.1	<0.05	<0.008	<0.1	<0.05	<0.01	<0.1	<0.05	<0.1	<0.1	<0.01	<0.3
					0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2
					0.5	0.5	1	0.05	0.0425	0.0425	0.0425	0.0425	0.0375	0.0425	0.0375	0.05	0.25	0.0425	0.5	0.25	0.1	1
					---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
					---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
					Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good

Notes:

--- - not applicable

* - non-detectable concentrations are assessed at 95% of the detection limit

** - the reliable (reporting) detection limit (RDL) or practical detection limit (PDL) is defined as 5 times the DL

Good - evaluation indicates acceptable reproducibility

Poor - evaluation indicates poor reproducibility

APPENDIX C8.

WATER QUALITY CONTROL SAMPLE RESULTS - DISSOLVED HYDROCARBONS

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Date	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylenes mg/L	F1 C_6-C_{10} mg/L	F2 $C_{>10}$-C_{16} mg/L	F3 $C_{>16}$-C_{34} mg/L	F4 $C_{>34}$-C_{50} mg/L	Cl mg/L	TSS mg/L	Turbidity NTU
Field Blank	25-Sep-13	<0.004	<0.002	<0.004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	---	---
Field Blank	25-Sep-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	---
Field Blank	28-Sep-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	0.29
Field Blank	28-Sep-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	---	---
Field Blank	29-Sep-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	0.24
Field Blank	29-Sep-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	---	---	---
Field Blank	30-Sep-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	1.3	0.46
Field Blank	30-Sep-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	3.3	1.5
Field Blank	30-Sep-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	01-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	01-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.1	<0.20	<0.20	<1.0	1.3	0.12
Field Blank	01-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20			
Field Blank	02-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	2.7	<0.10
Field Blank	02-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	1.3	<0.10
Field Blank	03-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	0.13
Field Blank	03-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	04-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	04-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	05-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	0.32
Field Blank	05-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	06-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	06-Oct-13	<0.0004	<0.002	<0.0004	<0.004	0.14	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	07-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	07-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	08-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	08-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	08-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	09-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	09-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	10-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	0.14
Field Blank	10-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	11-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.19	0.4	<0.20	<1.0	<3.0	0.13
Field Blank	12-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	13-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	14-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.17	0.35	<0.20	<1.0	<1.0	<0.10
Field Blank	15-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	0.27
Field Blank	15-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	16-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	0.46	<0.20	<1.0	1.3	<0.10
Field Blank	17-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	0.13
Field Blank	18-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	19-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	20-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	21-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	2.7	<0.10
Field Blank	22-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Field Blank	23-Oct-13	<0.00040	<0.00040	<0.00040	<0.00080	<0.1	<0.10	<0.20	<0.20	<1.0	5.3	<0.10
Field Blank	29-Oct-13	<0.00040	<0.00040	<0.00040	<0.00080	<0.1	<0.10	<0.20	<0.20	<1.0	2	<0.10
Trip Blank	25-Sep-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	---
Trip Blank	28-Sep-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	28-Sep-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	---	---
Trip Blank	29-Sep-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank dup	29-Sep-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	---	---
Trip Blank	29-Sep-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	---
Trip Blank	30-Sep-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	0.24
Trip Blank	30-Sep-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	0.12
Trip Blank	01-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	02-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	0.18
		0.0004	**0.0004**	**0.0004**	**0.0008**	**0.1**	**0.1**	**0.2**	**0.2**	**1**	**1**	**0.1**

APPENDIX C8.

WATER QUALITY CONTROL SAMPLE RESULTS - DISSOLVED HYDROCARBONS

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Date	Benzene mg/L	Toluene mg/L	Ethylbenzene mg/L	Xylenes mg/L	F1 C_6-C_{10} mg/L	F2 $C_{>10}$-C_{16} mg/L	F3 $C_{>16}$-C_{34} mg/L	F4 $C_{>34}$-C_{50} mg/L	Cl mg/L	TSS mg/L	Turbidity NTU
Trip Blank	03-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	1.3	---
Trip Blank	04-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	05-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	06-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	0.12
Trip Blank	07-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	08-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	3	<1.0	<0.10
Trip Blank	09-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	10-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.13	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	11-Oct-13	<0.0004	<0.002	<0.0004	<0.004	0.48	<0.10	<0.20	<0.20	<1.0	<1.0	0.14
Trip Blank	12-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	1.3	<0.10
Trip Blank	13-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	14-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	0.18	0.4	0.22	<1.0	<1.0	<0.10
Trip Blank	15-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	<3.0	<0.10
Trip Blank	15-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	4	0.1
Trip Blank	16-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	2	<0.10
Trip Blank	17-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	18-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	19-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	1.3	<0.10
Trip Blank	20-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	21-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	22-Oct-13	<0.00040	<0.0020	<0.00040	<0.0040	<0.1	<0.10	<0.20	<0.20	---	---	---
Trip Blank	22-Oct-13	---	---	---	---	---	---	---	---	<1.0	<1.0	<0.10
Trip Blank	22-Oct-13	<0.0004	<0.0004	<0.0004	<0.0008	<0.1	<0.10	<0.20	<0.20	<1.0	4.7	<0.10
Trip Blank	22-Oct-13	<0.0004	<0.002	<0.0004	<0.004	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	23-Oct-13	<0.00040	<0.00040	<0.00040	<0.00080	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
Trip Blank	29-Oct-13	<0.00040	<0.00040	<0.00040	<0.00080	<0.1	<0.10	<0.20	<0.20	<1.0	<1.0	<0.10
		0.0004	**0.0004**	**0.0004**	**0.0008**	**0.1**	**0.1**	**0.2**	**0.2**	**1**	**1**	**0.1**

Notes:

--- - not analyzed

APPENDIX C9.

WATER QUALITY CONTROL SAMPLE RESULTS - POLYCYCLIC AROMATIC HYDROCARBONS

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Date	Acenaphthene µg/L	Acenaphthylene µg/L	Acridine µg/L	Anthracene µg/L	Benz[a]anthracene µg/L	Benzo[b+j]fluoranthene µg/L	Benzo[k]fluoranthene µg/L	Benzo[g,h,i]perylene µg/L	Benzo[a]pyrene µg/L	Chrysene µg/L	Dibenz[a,h]anthracene µg/L	Fluoranthene µg/L	Fluorene µg/L	Indeno[1,2,3-cd]pyrene µg/L	Naphthalene µg/L	Phenanthrene µg/L	Pyrene µg/L	Quinoline µg/L
Field Blank	25-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	25-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	28-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	28-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	29-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	29-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	30-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	01-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank2	01-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	02-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	02-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	03-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	03-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	04-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	04-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	05-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	05-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	06-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	06-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	07-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	07-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	08-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	08-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	09-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	09-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	10-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	10-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	11-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	12-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	13-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	14-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	15-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	15-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	16-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	17-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	18-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	19-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	20-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	21-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	22-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	23-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Field Blank	29-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
		0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2

APPENDIX C9.

WATER QUALITY CONTROL SAMPLE RESULTS - POLYCYCLIC AROMATIC HYDROCARBONS

Canadian Natural Resources Limited

09-21-064-04 W4M

Sample Point	Sample Date	Acenaphthene µg/L	Acenaphthylene µg/L	Acridine µg/L	Anthracene µg/L	Benz[a]anthracene µg/L	Benzo[b+j]fluoranthene µg/L	Benzo[k]fluoranthene µg/L	Benzo[g,h,i]perylene µg/L	Benzo[a]pyrene µg/L	Chrysene µg/L	Dibenz[a,h]anthracene µg/L	Fluoranthene µg/L	Fluorene µg/L	Indeno[1,2,3-cd]pyrene µg/L	Naphthalene µg/L	Phenanthrene µg/L	Pyrene µg/L	Quinoline µg/L
Trip Blank	25-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	28-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	0.01	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	28-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	29-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	29-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank dup	29-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	30-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	30-Sep-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	01-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	02-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	03-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	04-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	05-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	06-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	07-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	08-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	09-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	10-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	11-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	12-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	13-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	14-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	15-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	15-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	16-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	17-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	18-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	19-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	20-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	21-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	22-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	22-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	22-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	23-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
Trip Blank	29-Oct-13	<0.10	<0.10	<0.20	<0.010	<0.0085	<0.0085	<0.0085	<0.0085	<0.0075	<0.0085	<0.0075	<0.010	<0.050	<0.0085	<0.10	<0.050	<0.020	<0.20
		0.1	0.1	0.2	0.01	0.0085	0.0085	0.0085	0.0085	0.0075	0.0085	0.0075	0.01	0.05	0.0085	0.1	0.05	0.02	0.2

Notes:

--- - not analyzed