GENIVAR

Project No. 111-26648-00.100.0414018

November 20, 2013

Lyndsay Waller, B.Sc., EP
The Regional Municipality of Durham
605 Rossland Road East
P.O. Box 623
Whitby, Ontario
L1N 6A3

Re: Soil Testing Plan Results and Summary
Durham York Energy Centre – 2013 Soil Sampling Plots

Dear Ms. Waller:

GENIVAR Inc. (GENIVAR) was retained by The Regional Municipality of Durham (Durham) to conduct soil sampling as detailed in The *Durham York Energy Centre Soils Testing Plan* (Soil Testing Plan) document which was approved by the Ministry of the Environment (MOE) after a second revision on February 8, 2013. The Soil Testing Plan was prepared to satisfy Conditions 7(10), 13(4) and 15(4) of Certificate of Approval #7306-8FDKNX (CofA). The preparation of this report has been completed within one month of receipt of the laboratory results, in accordance with Condition 15(4) of the CofA.

1. Background

The Durham York Energy Centre (facility) is an energy from municipal solid waste operation currently being constructed in the Municipality of Clarington, Ontario. The site property is located on the west side of Osborne Road, southeast of the Courtice Road and Highway 401 interchange, and north of the Courtice Water Pollution Control Plant (CWPCP) and the CN Railway, as shown in **Figure 1**. Approval for the operation of the facility was received from the MOE under the *Environmental Assessment Act* (EPA) on November 3, 2010. Three (3) applications for CofA under the EPA for waste; air and noise; and stormwater were approved as a multi-media CofA (#7306-8FDKNX) by the MOE on June 28, 2011.

During the baseline study undertaken in the Environmental Assessment (EA) for the facility, 23 soil samples were collected at 17 sampling locations from areas surrounding the site. The results for the parameters analyzed during the baseline study satisfied the Table 1 Standards, where applicable; and the results of the baseline study determined the appropriate analysis suite that should be included in the Soil Testing Plan.

126 Don Hillock Drive, Unit 2, Aurora, Ontario L4G 0G9
Telephone: 905-727-3080 • Fax: 905-727-0463 • www.genivar.com

2. Scope

The principal objective of the soil sampling conducted during this portion of the Soil Testing Plan is to quantify background (baseline) contaminant concentrations prior to the operation of the facility, which will assist in determining if the facility emission dispersion after commencement of operations results in changes to soil contaminant concentrations.

3. Methodology

3.1 Plot Set-Up Procedures

GENIVAR field staff and Durham representatives met at the EFW facility on August 22, 2013 and proceeded to determine the appropriate soil sampling plot locations. Ambient air monitoring stations have already been established at the upwind and downwind sampling locations and in accordance with section 13 (4) (a) of the CofA, the Soil Testing Plot locations were positioned in close proximity to the monitoring stations. In the future, an additional soil sampling plot location will be established on the facility site but this station will be used to monitor low level fugitive emissions. The upwind plot site was established on the CWPCP property, which is located approximately 1 kilometer (km) south of the facility. The ambient air monitoring station and soil sampling plot are positioned near the western extent of the CWPCP property, as shown in **Figure 2**. The downwind ambient air monitoring station is located on the western extent of a parcel of private property leased by Durham. The downwind property is located on the southeast corner of Baseline and Rundle Roads in Clarington, approximately 2.5 kms from the facility, as shown in **Figure 3**.

Once the sample locations were established with the Durham representatives, GENIVAR field staff began constructing the soil sampling plots. The four corners of the grid were laid out using a cloth measuring tape, creating a ten meter by ten meter square. Metal posts were installed in the ground at each of the four corners to mark the outer parameters of the grid. Nine, 3.3 by 3.3 meter squares were then created within the ten meter squared box, which were then marked with wooden stakes that were pounded into the ground for reference. At the upwind sample location, string was then wrapped around the four corner posts and the twelve inner stakes, which helped to define the exact boundaries of the grid. Tall grasses and shrubs restricted string from being used at the downwind location so extra attention was paid to the grid boundaries to ensure accurate sampling. The entire grid setup was left in place at the downwind location because it is positioned in an area that was hidden from the public and was not likely to be disturbed. The upwind location was removed except for the southeast corner post which will be used as a reference location for future sampling events. The respective sample grid construction can be seen in the attached **Photo log**.

Both sample grids were measured from a fixed point to ensure that reassembly can occur in the exact location during subsequent sampling events. GENIVAR personnel located GPS referenced mapping and found the fixed points that were measured by GENIVAR staff in the field. This procedure allowed for a more accurate GPS reference, compared to a hand held GPS unit.

3.2 Soil Sampling

After the plot grids were established the physical soil sampling was carried out. GENIVAR field staff used a stainless steel sampling probe to collect an equal quantity of soil at each of the nine squares within the respective grids. The probe was decontaminated with the use of a specialized inert detergent mixed with water, and was rinsed with de-ionised water, between sampling at each of the nine segments of both grids. The soil from each grid was placed into a bucket which had been decontaminated before use and was again cleaned between the upwind and downwind locations. Nitrile gloves were replaced after each sample was collected to reduce the potential for cross-contamination of the samples.

An equivalent quantity of soil was collected from each segment of the two grids from a depth of zero to two centimeters below ground surface. The entire contents of the bucket was gently mixed to create a composite sample and then placed into the laboratory supplied glass jars. The sample jars were stored at a temperature of less than 10 °C and handled under chain of custody procedures until received at the laboratory on the same day as sampling. The laboratory supplied four, amber coloured, glass jars (three 250 ml jars, one 120 ml jar) to submit for analysis. A total of two soil samples were submitted for analysis to AGAT Laboratories (AGAT), located in Mississauga, Ontario. AGAT is a Canadian Association for Laboratory Accreditation (CALA) certified laboratory as required in the Soil Testing Plan. The samples were analysed for select metal parameters, PAHs, and PCDDs/PCDFs as outlined in the approved Soil Testing Plan.

3.3 Quality Assurance and Quality Control

Prior to sampling, the sample jars were inspected to ensure that the Teflon liners under the lids were in place and that the jars were clean and unused. The sample containers were labelled with the sample identifications, the project number, and the sampling date and time. A laboratory supplied chain of custody was completed. One copy of the chain of custody was left with the samples at the laboratory, and one copy was retained for the project file.

As part of the quality assurance/quality control (QA/QC) program for the project, one field-prepared duplicate sample was collected by GENIVAR at each of the two sample grids. As instructed by the MOE in The Soil Testing Plan document, Durham representatives retained the two duplicate samples and have stored them in a cool, dark, dry place. It is noted that lengthy storage periods of the soil samples in excess of the O.Reg. 153 “holding times” will affect the laboratory results for some parameters, if analysis of the duplicate samples is carried out in the future.

AGAT performed QA/QC procedures as outlined in their CALA procedures. These procedures included, but were not limited to, analysis of lab duplicates and blanks as well as analysis of surrogate recovery, as outlined in the Certificates of Analysis provided.

3.4 Field Documentation

As per The Soil Testing Plan, field notes were recorded by GENIVAR field staff during the execution of the background (baseline) sampling event. A summary of the notes taken is provided in Table 3.4.1 below.

Table 3.4.1 Field Note Summary

Note Categories (As per MOE)	Notes
Site name and photograph	Durham York Energy Center, site photographs are included in the attached **Photo log**
GPS coordinates for sample plot locations	Upwind (center of grid) – NAD 83, 17 680038, 4860021 Downwind (center of grid) – NAD 83, 17 681966, 4861859
Field personnel's name	Trevor Swift, CET and Stephen Heikkila, EIT
Date, time and location of sample collection	August 22, 2013, 8:00 am to 2:30 pm, Upwind and Downwind plot locations
Sample number/ID	Upwind grid – 'UPWIND' Downwind grid – 'DOWNWIND'
Whether QA/QC samples were collected	QA/QC samples were collected from both sample locations and are being held by Durham as per The Soil Testing Plan.
Type of containers used for collection	AGAT requested that we submit soil in three, 250 ml amber, glass jars and one, 120 ml amber, glass jar for each sample location.
Whether samples were preserved	No preservative was used.
Sampling method and composite collection pattern/map of test plot area	See **Section 3 - Methodology** and **Figures 2** and **3**.
Unusual site conditions	The Downwind sample location was covered with waist high grasses and shrubs
Weather conditions	Overcast with sunny breaks, 23 degrees Celsius.

The field notes summarized above are maintained on file by GENIVAR if further reference is required.

4. Review and Evaluation

The laboratory Certificate of Analysis presenting the laboratory results was received by GENIVAR and Durham on October 21, 2013 and is attached to this report for reference.

As stated in The Soil Testing Plan, the soil samples are to be evaluated against the Table 1 Background Standards for Industrial property uses. The Table 1 Standards are considered to be representative of the upper limits of typical, province-wide background concentrations in soils that are not contaminated by point sources and are the most conservative standards for comparing soil quality data.

4.1 Metals

The metal parameters analyzed for the upwind and downwind sample locations satisfied the Table 1 Standards for industrial property uses. The results are summarized in the attached **Table 1**.

4.2 Polycyclic Aromatic Hydrocarbons

The PAH parameters analyzed for the upwind and downwind sample locations satisfied the Table 1 Standards for industrial property uses. The results are summarized in the attached **Table 2**.

4.3 Total Dioxins and Furans

The Total PCDD/PCDF results for both the upwind and downwind sample locations satisfied the Table 1 Standards for industrial property uses. The results are summarized in the attached **Table 3**.

5. Future Monitoring

In accordance with the testing period outlined in the Soil Testing Plan, the next soil sampling event is expected to be carried out in 2014, once the facility has become operational. The sampling event in 2014 will be the first event as part of a three year evaluation program.

6. Conclusions and Recommendations

The following are the conclusions of the Study:

- → The soil sampling plot grids have been established as outlined in the Soil Sampling Plan. GPS coordinates are available, and at least one steel post remains securely in the ground at each sampling location, for easy reassembly during future sampling events.
- → The composite samples collected from the upwind and downwind sample locations satisfied the Table 1 Background Standards for industrial property uses.
- → The Region of Durham has retained a duplicate sample, collected by GENIVAR, from each sample location as outlined in the Soil Sampling Plan.

The following recommendations are presented:

- → A contingency plan is presented within the Soil Sampling Plan in the event that a sample exceeds a value collected during the baseline sampling event or if a parameter concentration exceeds the Table 1 Standards. Since this study is the baseline sampling event, operations have not started at the facility and the parameter concentrations satisfied the Table 1 Standards, the contingency plan does not need to be implemented at the present time.

- The next soil sampling event should be carried out during the summer season, within the first year of operation for the facility, as part of the evaluation program.

We trust that this letter report satisfies the requirements of the Soil Sampling Plan at this time. Should you have any questions, please feel free to contact the undersigned.

Yours truly,
GENIVAR Inc.

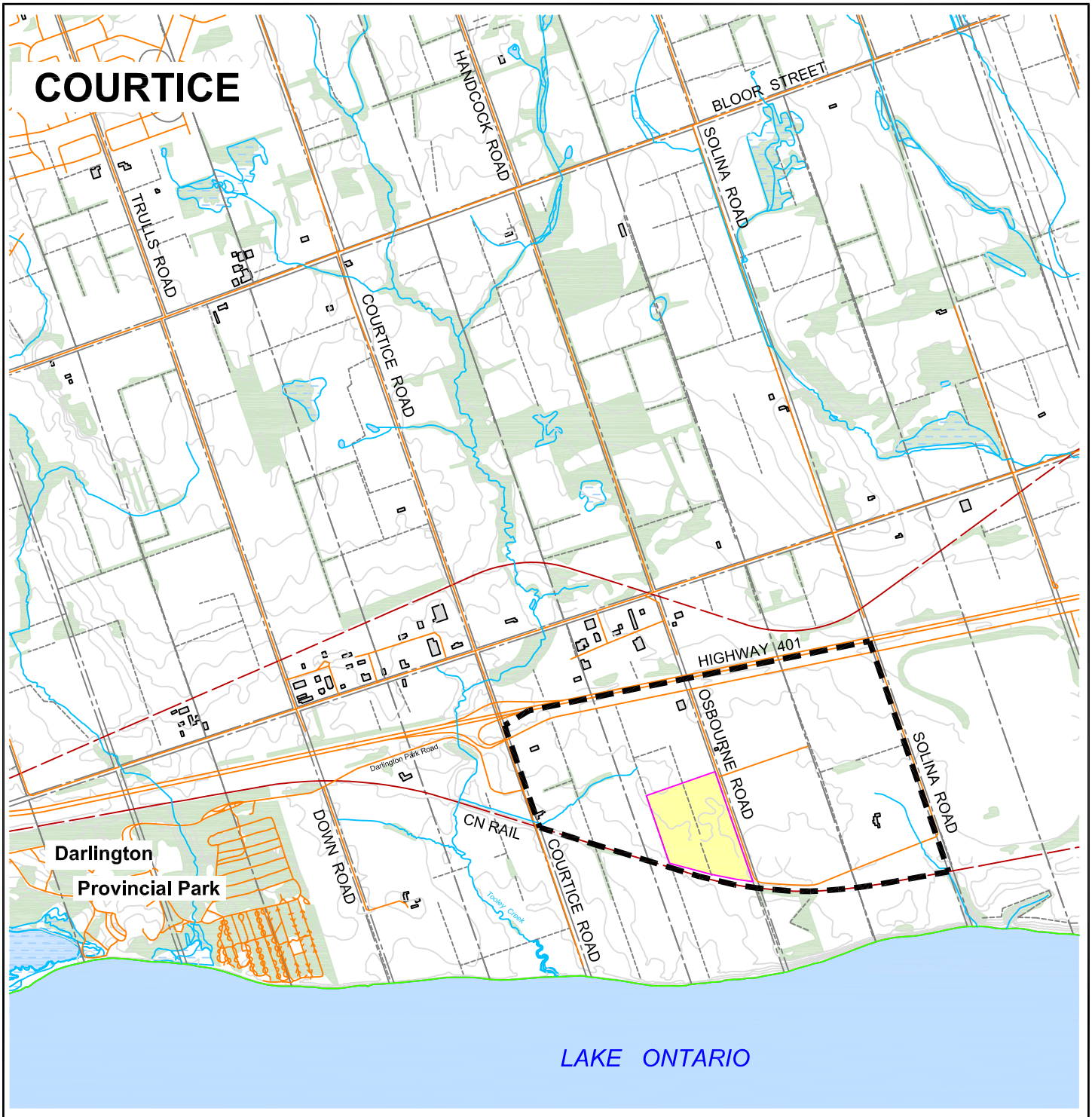
Trevor Swift, CET
Project Manager

Stephen J. Taziar, P.Eng.
Senior Project Engineer

TAS:nah

Attachments

- Figure 1 – Site Location Map
- Figure 2 – Upwind Sample Location Map
- Figure 3 – Downwind Sample Location Map
- Chemistry Summary Tables (Table 1 – Metals, Table 2 – PAHs, Table 3 – Dioxins and Furans)
- Photo Log
- Laboratory Certificate of Analysis



LEGEND

DURHAM YORK ENERGY CENTRE

CLARINGTON ENERGY PARK

250 0 250 metres

MAP SOURCE:
OBM 1:10000 BASE MAPPING, NAD 84, ZONE 17 DATUM.

LOCATION MAP

SOIL TESTING PLAN
DURHAM YORK ENERGY CENTRE
For Regional Municipalities of Durham and York

DATE: NOVEMBER 2013	SCALE: 1:25000
PROJECT: 111-26648-00 100	REF. NO.: 111-26648-00 100-3 F1_1-LM

GENIVAR

FIGURE 1

LEGEND

DURHAM YORK ENERGY CENTRE

UPWIND SAMPLING GRID

UPWIND AMBIENT AIR MONITORING STATION

0 45 90 180 270 360 metres

UPWIND SAMPLE LOCATION MAP

SOIL TESTING PLAN
DURHAM YORK ENERGY CENTRE
For Regional Municipalities of Durham and York

DATE: NOVEMBER 2013	SCALE: See Scale Bar
PROJECT: 111-26648-00 100	REF. NO.: 111-26648-00 100-3 F2

GENIVAR

FIGURE 2

LEGEND

DURHAM YORK ENERGY CENTRE

DOWNWIND SAMPLING GRID

DOWNWIND AMBIENT AIR MONITORING STATION

0 80 160 320 480 640 metres

DOWNWIND SAMPLE LOCATION MAP

SOIL TESTING PLAN
DURHAM YORK ENERGY CENTRE
For Regional Municipalities of Durham and York

DATE: NOVEMBER 2013	SCALE: See Scale Bar
PROJECT: 111-26648-00 100	REF. NO.: 111-26648-00 100-3 F3

GENIVAR

FIGURE 3

TABLE 1

SOIL CHEMICAL RESULTS - Metals

DURHAM YORK ENERGY CENTRE - SOIL TESTING PLAN

PARAMETER	MOE Table 1	Units	UPWIND	DOWNWIND
			Aug-13	Aug-13
Antimony	1.3	µg/g	<0.8	<0.8
Arsenic	18	µg/g	2	3
Barium	220	µg/g	87	68
Beryllium	2.5	µg/g	0.50	<0.5
Boron	36	µg/g	6	5
Cadmium	1.2	µg/g	<0.5	<0.5
Cobalt	21	µg/g	6.8	4.8
Chromium - total	70	µg/g	18	14
Chromium - hexavalent	0.66	µg/g	<0.2	<0.2
Copper	92	µg/g	15	11
Lead	120	µg/g	10	13
Molybdenum	2	µg/g	<0.5	<0.5
Nickel	82	µg/g	16	11
Phosphorus		µg/g	729	609
Selenium	1.5	µg/g	<0.8	<0.8
Silver	0.5	µg/g	<0.4	<0.4
Thallium	1	µg/g	<0.4	<0.4
Tin		µg/g	<1	<1
Vanadium	86	µg/g	27	24
Zinc	290	µg/g	63	51
Mercury	0.27	µg/g	<0.10	<0.10
Methyl Mercury as Hg		ng/g	<1.3	<1.3

NOTES:

1) MOE Table 1 = Soil, Ground Water and Sediment Standards for Use Under Condition for Res/Park/Instit/Ind/Com./Comm Property Uses, Part XV.1 of the Environmental Protection Act (April 2011) - Table 1: Full Depth Generic Site Condition Standards, Background

2) Blank - Indicates no Standard in MOE Table 1

TABLE 2

SOIL CHEMICAL RESULTS - Polycyclic Aromatic Hydrocarbons

DURHAM YORK ENERGY CENTRE - SOIL TESTING PLAN

PARAMETER	MOE Table 1	Units	UPWIND	DOWNWIND
			Aug-13	Aug-13
1,2-Benzofluorene		µg/g	<0.05	<0.05
2,3-Benzofluorene		µg/g	<0.05	<0.05
Fluorene	0.12	µg/g	<0.05	<0.05
Anthracene	0.16	µg/g	<0.05	<0.05
Benzo(a)pyrene	0.3	µg/g	<0.05	0.11

NOTES:

1) MOE Table 1 = Soil, Ground Water and Sediment Standards for Use Under Condition for Res/Park/Instit/Ind/Com./Comm Property Uses, Part XV.1 of the Environmental Protection Act (April 2011) - Table 1: Full Depth Generic Site Condition Standards, Background

2) PAH = Polycyclic Aromatic Hydrocarbons

3) Blank - Indicates no Standard in MOE Table 1

4) 1,2-Benzofluorene is a synonym for Benzo(a)Fluorene

5) 2,3-Benzofluorene is a synonym for Benzo(b)Fluorene

TABLE 3
SOIL CHEMICAL RESULTS - Dioxins & Furans
DURHAM YORK ENERGY CENTRE - SOIL TESTING PLAN

PARAMETER	MOE Table 1	Units	UPWIND	DOWNWIND
			Aug-13	Aug-13
2,3,7,8-Tetra CDD		ng/kg	<0.5	<0.4
1,2,3,7,8-Penta CDD		ng/kg	<0.6	<0.6
1,2,3,4,7,8-Hexa CDD		ng/kg	<0.6	<0.5
1,2,3,6,7,8-Hexa CDD		ng/kg	<0.6	<0.5
1,2,3,7,8,9-Hexa CDD		ng/kg	<0.5	0.5
1,2,3,4,6,7,8-Hepta CDD		ng/kg	8.20	17
Octa CDD		ng/kg	57	118
2,3,7,8-Tetra CDF		ng/kg	<0.4	<0.3
1,2,3,7,8-Penta CDF		ng/kg	<0.4	<0.8
2,3,4,7,8-Penta CDF		ng/kg	<0.4	<0.6
1,2,3,4,7,8-Hexa CDF		ng/kg	<0.6	<0.4
1,2,3,6,7,8-Hexa CDF		ng/kg	<0.6	<0.4
2,3,4,6,7,8-Hexa CDF		ng/kg	<0.6	0.7
1,2,3,7,8,9-Hexa CDF		ng/kg	<0.8	<0.5
1,2,3,4,6,7,8-Hepta CDF		ng/kg	2.1	4.9
1,2,3,4,7,8,9-Hepta CDF		ng/kg	<1	<0.6
Octa CDF		ng/kg	3	9
Total Tetrachlorodibenzodioxins		ng/kg	1.3	1.4
Total Pentachlorodibenzodioxins		ng/kg	<0.6	2.3
Total Hexachlorodibenzodioxins		ng/kg	3.6	4.3
Total Heptachlorodibenzodioxins		ng/kg	17.7	31.1
Total PCDDs		ng/kg	80	158
Total Tetrachlorodibenzofurans		ng/kg	3.1	4.7
Total Pentachlorodibenzofurans		ng/kg	1.3	3.3
Total Hexachlorodibenzofurans		ng/kg	2.4	6.5
Total Heptachlorodibenzofurans		ng/kg	5	12.3
Total PCDFs		ng/kg	14	36
2,3,7,8-Tetra CDD (TEF 1.0)		TEQ	0.25	0.2
1,2,3,7,8-Penta CDD (TEF 1.0)		TEQ	0.3	0.3
1,2,3,4,7,8-Hexa CDD (TEF 0.1)		TEQ	0.03	0.025
1,2,3,6,7,8-Hexa CDD (TEF 0.1)		TEQ	0.03	0.025
1,2,3,7,8,9-Hexa CDD (TEF 0.1)		TEQ	0.025	0.0544
1,2,3,4,6,7,8-Hepta CDD (TEF 0.01)		TEQ	0.0819	0.17
Octa CDD (TEF 0.0003)		TEQ	0.0172	0.0355
2,3,7,8-Tetra CDF (TEF 0.1)		TEQ	0.02	0.015
1,2,3,7,8-Penta CDF (TEF 0.03)		TEQ	0.006	0.012
2,3,4,7,8-Penta CDF (TEF 0.3)		TEQ	0.06	0.09
1,2,3,4,7,8-Hexa CDF (TEF 0.1)		TEQ	0.03	0.02
1,2,3,6,7,8-Hexa CDF (TEF 0.1)		TEQ	0.03	0.02
2,3,4,6,7,8-Hexa CDF (TEF 0.1)		TEQ	0.03	0.072
1,2,3,7,8,9-Hexa CDF (TEF 0.1)		TEQ	0.04	0.025
1,2,3,4,6,7,8-Hepta CDF (TEF 0.01)		TEQ	0.0508	0.049
1,2,3,4,7,8,9-Hepta CDF (TEF 0.01)		TEQ	0.005	0.003
Octa CDF (TEF 0.0003)		TEQ	0.00081	0.00284
Total PCDDs and PCDFs (TEQ)	7	TEQ ng/kg	0.977	1.12

NOTES:

1) MOE Table 1 = Soil, Ground Water and Sediment Standards for Use Under Condition for Res/Park/Instit/Ind/Com./Comm Property Uses, Part XV.1 of the Environmental Protection Act (April 2011) - Table 1: Full Depth Generic Site Condition Standards, Background

2) Blank - Indicates no Standard in MOE Table 1

3) TEQ - Toxic Equivalency

4) The TEQ standard for total dioxins and furans in MOE Table 1 is listed as 0.000007, for values in µg/g; which is equal to 7 for values in ng/kg.

Site Photographs
Soil Sampling Plan
Durham York Energy Center, Clarington, Ontario

Photograph-1: View of GENIVAR field staff assembling the upwind sampling location.

Photograph-2: View of the completed upwind sampling grid with the EFW facility in the background.

Photograph-3: View of GENIVAR field staff collecting the composite sample from the upwind sampling location.

Photograph-4: View of GENIVAR field staff decontaminating the sampling equipment between sample areas.

Photograph-5: View of the downwind sampling location.

Photograph-6: View of GENIVAR field staff sampling at the downwind location with the ambient air monitoring station in the background.

Certificate of Analysis

AGAT WORK ORDER: 13T750521

PROJECT NO: 111-26648-00

CLIENT NAME: GENIVAR INC **ATTENTION TO: Steve Taziar**

Metals Scan + Hg + CrVI (soil)

DATE RECEIVED: 2013-08-22 **DATE REPORTED: 2013-10-21**

		SAMPLE DESCRIPTION:		UPWIND	DOWNWIND
		SAMPLE TYPE:		Soil	Soil
		DATE SAMPLED:		8/22/2013	8/22/2013
Parameter	Unit	G / S	RDL	4684346	4684347
Antimony	µg/g		0.8	<0.8	<0.8
Arsenic	µg/g		1	2	3
Barium	µg/g		2	87	68
Beryllium	µg/g		0.5	0.5	<0.5
Boron	µg/g		5	6	5
Cadmium	µg/g		0.5	<0.5	<0.5
Cobalt	µg/g		0.5	6.8	4.8
Chromium	µg/g		2	18	14
Copper	µg/g		1	15	11
Lead	µg/g		1	10	13
Molybdenum	µg/g		0.5	<0.5	<0.5
Nickel	µg/g		1	16	11
Phosphorus	µg/g		5	729	609
Selenium	µg/g		0.8	<0.8	<0.8
Silver	µg/g		0.4	<0.4	<0.4
Thallium	µg/g		0.4	<0.4	<0.4
Tin	µg/g		1	<1	<1
Vanadium	µg/g		1	27	24
Zinc	µg/g		5	63	51
Mercury	µg/g		0.10	<0.10	<0.10
Chromium, Hexavalent	µg/g		0.2	<0.2	<0.2
Digestion, Soil			N/A	Y	Y
DG Metals/Inorg.				Y	Y
2:1 Extr.	N/A		N/A	Y	Y

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard
4684346-4684347

Certified By:

Certificate of Analysis

AGAT WORK ORDER: 13T750521

PROJECT NO: 111-26648-00

CLIENT NAME: GENIVAR INC **ATTENTION TO: Steve Taziar**

Methyl Mercury in Soil

DATE RECEIVED: 2013-08-22 **DATE REPORTED: 2013-10-21**

				SAMPLE DESCRIPTION:	UPWIND	DOWNWIND
				SAMPLE TYPE:	Soil	Soil
				DATE SAMPLED:	8/22/2013	8/22/2013
Parameter	Unit	G / S	RDL		4684346	4684347
Methyl Mercury as Hg	ng/g		1.3		<1.3	<1.3

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

4684346 Methyl Mercury analysis was subcontracted to Flett Research Ltd.

Certified By:

Certificate of Analysis

AGAT WORK ORDER: 13T750521

PROJECT NO: 111-26648-00

CLIENT NAME: GENIVAR INC **ATTENTION TO: Steve Taziar**

1,2- and 2,3-Benzofluorene [soil]

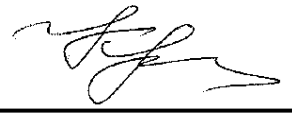
DATE RECEIVED: 2013-08-22 **DATE REPORTED: 2013-10-21**

		SAMPLE DESCRIPTION:		UPWIND	DOWNWIND
		SAMPLE TYPE:		Soil	Soil
		DATE SAMPLED:		8/22/2013	8/22/2013
Parameter	Unit	G / S	RDL	4684346	4684347
1,2-Benzofluorene (Toronto)	µg/g		0.05	<0.05	<0.05
2,3-Benzofluorene (Toronto)	µg/g		0.05	<0.05	<0.05
Moisture Content	%		0.1	10.1	14.8

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

4684346-4684347 Results are based on the dry weight of the soil.

Certified By:



Certificate of Analysis

AGAT WORK ORDER: 13T750521

PROJECT NO: 111-26648-00

CLIENT NAME: GENIVAR INC **ATTENTION TO: Steve Taziar**

PAHs (Soil)

DATE RECEIVED: 2013-08-22 **DATE REPORTED: 2013-10-21**

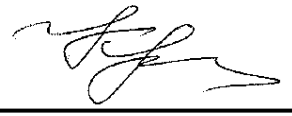
		SAMPLE DESCRIPTION:		UPWIND	DOWNWIND
		SAMPLE TYPE:		Soil	Soil
		DATE SAMPLED:		8/22/2013	8/22/2013
Parameter	**Unit**	**G / S**	**RDL**	**4684346**	**4684347**
Fluorene	µg/g		0.05	<0.05	<0.05
Anthracene	µg/g		0.05	<0.05	<0.05
Benzo(a)pyrene	µg/g		0.05	<0.05	0.11
Moisture Content	%		0.1	10.1	14.8
PAH Extr	NA			Y	Y
Surrogate	**Unit**	**Acceptable Limits**			
Chrysene-d12	%	50-140		76	98

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

4684346-4684347 Results are based on the dry weight of the soil.

Note: The result for Benzo(b)Fluoranthene is the total of the Benzo(b)&(j)Fluoranthene isomers because the isomers co-elute on the GC column.

Certified By:



Certificate of Analysis

AGAT WORK ORDER: 13T750521

PROJECT NO: 111-26648-00

CLIENT NAME: GENIVAR INC **ATTENTION TO: Steve Taziar**

O. Reg 153 Dioxins & Furans (Soil, WHO 2005)

DATE RECEIVED: 2013-08-22 **DATE REPORTED: 2013-10-21**

		SAMPLE DESCRIPTION:		UPWIND		DOWNWIND
		SAMPLE TYPE:		Soil		Soil
		DATE SAMPLED:		8/22/2013		8/22/2013
Parameter	Unit	G / S	RDL	4684346	RDL	4684347
2,3,7,8-Tetra CDD	ng/Kg		0.5	<0.5	0.4	<0.4
1,2,3,7,8-Penta CDD	ng/Kg		0.6	<0.6	0.6	<0.6
1,2,3,4,7,8-Hexa CDD	ng/Kg		0.6	<0.6	0.5	<0.5
1,2,3,6,7,8-Hexa CDD	ng/Kg		0.6	<0.6	0.5	<0.5
1,2,3,7,8,9-Hexa CDD	ng/Kg		0.5	<0.5	0.5	0.5
1,2,3,4,6,7,8-Hepta CDD	ng/Kg		0.9	8.2	0.9	17.0
Octa CDD	ng/Kg		1	57	1	118
2,3,7,8-Tetra CDF	ng/Kg		0.4	<0.4	0.3	<0.3
1,2,3,7,8-Penta CDF	ng/Kg		0.4	<0.4	0.8	<0.8
2,3,4,7,8-Penta CDF	ng/Kg		0.4	<0.4	0.6	<0.6
1,2,3,4,7,8-Hexa CDF	ng/Kg		0.6	<0.6	0.4	<0.4
1,2,3,6,7,8-Hexa CDF	ng/Kg		0.6	<0.6	0.4	<0.4
2,3,4,6,7,8-Hexa CDF	ng/Kg		0.6	<0.6	0.4	0.7
1,2,3,7,8,9-Hexa CDF	ng/Kg		0.8	<0.8	0.5	<0.5
1,2,3,4,6,7,8-Hepta CDF	ng/Kg		0.6	2.1	0.4	4.9
1,2,3,4,7,8,9-Hepta CDF	ng/Kg		1	<1	0.6	<0.6
Octa CDF	ng/Kg		1	3	1	9
Total Tetrachlorodibenzodioxins	ng/Kg		0.5	1.3	0.4	1.4
Total Pentachlorodibenzodioxins	ng/Kg		0.6	<0.6	0.6	2.3
Total Hexachlorodibenzodioxins	ng/Kg		0.6	3.6	0.5	4.3
Total Heptachlorodibenzodioxins	ng/Kg		0.9	17.7	0.9	31.1
Total PCDDs	ng/Kg		1	80	1	158
Total Tetrachlorodibenzofurans	ng/Kg		0.4	3.1	0.3	4.7
Total Pentachlorodibenzofurans	ng/Kg		0.4	1.3	0.8	3.3
Total Hexachlorodibenzofurans	ng/Kg		0.8	2.4	0.5	6.5
Total Heptachlorodibenzofurans	ng/Kg		1	5	0.6	12.3
Total PCDFs	ng/Kg		1	14	1	36
2,3,7,8-Tetra CDD (TEF 1.0)	TEQ			0.250		0.200
1,2,3,7,8-Penta CDD (TEF 1.0)	TEQ			0.300		0.300
1,2,3,4,7,8-Hexa CDD (TEF 0.1)	TEQ			0.0300		0.0250
1,2,3,6,7,8-Hexa CDD (TEF 0.1)	TEQ			0.0300		0.0250

Certified By:

Certificate of Analysis

AGAT WORK ORDER: 13T750521

PROJECT NO: 111-26648-00

CLIENT NAME: GENIVAR INC **ATTENTION TO: Steve Taziar**

O. Reg 153 Dioxins & Furans (Soil, WHO 2005)

DATE RECEIVED: 2013-08-22 **DATE REPORTED: 2013-10-21**

		SAMPLE DESCRIPTION:		UPWIND		DOWNWIND
		SAMPLE TYPE:		Soil		Soil
		DATE SAMPLED:		8/22/2013		8/22/2013
Parameter	Unit	G / S	RDL	4684346	RDL	4684347
1,2,3,7,8,9-Hexa CDD (TEF 0.1)	TEQ			0.0250		0.0544
1,2,3,4,6,7,8-Hepta CDD (TEF 0.01)	TEQ			0.0819		0.170
Octa CDD (TEF 0.0003)	TEQ			0.0172		0.0355
2,3,7,8-Tetra CDF (TEF 0.1)	TEQ			0.0200		0.0150
1,2,3,7,8-Penta CDF (TEF 0.03)	TEQ			0.00600		0.0120
2,3,4,7,8-Penta CDF (TEF 0.3)	TEQ			0.0600		0.0900
1,2,3,4,7,8-Hexa CDF (TEF 0.1)	TEQ			0.0300		0.0200
1,2,3,6,7,8-Hexa CDF (TEF 0.1)	TEQ			0.0300		0.0200
2,3,4,6,7,8-Hexa CDF (TEF 0.1)	TEQ			0.0300		0.0720
1,2,3,7,8,9-Hexa CDF (TEF 0.1)	TEQ			0.0400		0.0250
1,2,3,4,6,7,8-Hepta CDF (TEF 0.01)	TEQ			0.0508		0.0490
1,2,3,4,7,8,9-Hepta CDF (TEF 0.01)	TEQ			0.00500		0.00300
Octa CDF (TEF 0.0003)	TEQ			0.000810		0.00284
Total PCDDs and PCDFs (TEQ)	TEQ ng/Kg	7.0		0.977		1.12
Surrogate	**Unit**	**Acceptable Limits**				
13C-2378-TCDF	%	40-130		71		76
13C-12378-PeCDF	%	40-130		79		79
13C-23478-PeCDF	%	40-130		83		66
13C-123478-HxCDF	%	40-130		87		94
13C-123678-HxCDF	%	40-130		74		68
13C-234678-HxCDF	%	40-130		81		75
13C-123789-HxCDF	%	40-130		81		78
13C-1234678-HpCDF	%	40-130		82		75
13C-1234789-HpCDF	%	40-130		88		83
13C-2378-TCDD	%	40-130		81		88
13C-12378-PeCDD	%	40-130		99		86
13C-123478-HxCDD	%	40-130		102		108
13C-123678-HxCDD	%	40-130		88		81
13C-1234678-HpCDD	%	40-130		102		99
13C-OCDD	%	40-130		94		82

Certified By:

Certificate of Analysis

AGAT WORK ORDER: 13T750521

PROJECT NO: 111-26648-00

CLIENT NAME: GENIVAR INC **ATTENTION TO: Steve Taziar**

O. Reg 153 Dioxins & Furans (Soil, WHO 2005)

DATE RECEIVED: 2013-08-22 **DATE REPORTED: 2013-10-21**

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 1 (D&F)

4684346-4684347 The results have been corrected based on the surrogate percent recoveries.

Certified By: