



CONSULTING ENGINEERS  
& SCIENTISTS

# ***FINAL REPORT***

## **AMBIENT MONITORING REPORT OTTAWA LANDFILL OTTAWA, ONTARIO**

**Project Number: #W07-5258C**

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## 1. INTRODUCTION

RWDI AIR Inc. (RWDI) was retained by Waste Management Corporation of Canada (WM) to conduct an ambient monitoring program at the Carp Road facility in Ottawa Ontario. This monitoring program was undertaken to fulfill the requirements listed in the Minutes of Settlement, signed on September 27<sup>th</sup>, 2007 and subsequent documents. This ambient air quality monitoring program was also developed to take into account the results of discussions between community residents, the Ministry of Environment and Waste Management of Canada Inc.

The sampling methodologies were submitted to WM in a work plan dated September 20, 2007.

## 2. OVERVIEW OF AMBIENT AIR QUALITY MONITORING PROGRAM

Sampling was conducted between May and August 2008. The parameters monitored were as follows

- Total suspended particulate and metals (TSP)
- Volatile organic compounds (VOCs)
- Total Reduced Sulphur (TRS)

Monitoring for Total Suspended Particulate (TSP) was conducted at three locations around the landfill footprint. The monitoring locations were near the northeast corner, the southeast corner and the south west corner of the Ottawa Landfill. Samples were taken each day over a six-day period, in concurrence with the North America-wide particulate monitoring schedule, each month between the months of May and September, inclusive.

Monitoring for Volatile Organic Compounds (VOCs) was conducted upwind and downwind around the landfill footprint. Six (6) 1/2- hour samples were collected using adsorbent tubes for select VOC compounds. In addition, monitoring for VOCs also included

eight (8) 24-hour samples using Suma canisters for Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX). This additional sampling was conducted to fulfill the MOE request to perform monitoring for BTEX, particularly benzene.

For TRS, six pairs of samples were collected for reduced sulphur compounds including hydrogen sulphide (H<sub>2</sub>S), and mercaptans. These surveys included coincident sampling at locations both upwind and downwind from the facility.

An on-site meteorological station measured wind speed, wind direction, and ambient temperature concurrently with the field measurements.

In order to best maintain the important upwind and downwind positions, the sampling locations for VOC and TRS sampling varied between sample days to adjust to current meteorological conditions. The collected samples were sent for laboratory analysis and the results were compared to the applicable MOE Point of Impingement (POI) Limits. Sampling was conducted only during periods when the landfill is operating.

### **3. SAMPLING METHODOLOGY**

A number of quality assurance measures were implemented throughout the program. This section provides details with respect to samplers, media, methods and QA/QC procedures.

#### **3.1 Total Suspended Particulate (TSP)**

A total of nineteen sample sets were collected through the course of the ambient TSP measurement program. These sample sets were taken at three stationary locations along the Ottawa Landfill fenceline. The monitoring locations were near the northeast corner, the southeast corner and the south west corner of the landfill. Samples were collected from midnight to midnight (24-hour period), in concurrence with the North America-wide six day particulate monitoring schedule.

The monitoring method was in compliance with the methods specified by the MOE's Operations Manual for Air Quality Monitoring in Ontario and USEPA Method IO-2. The 24-hour samples were taken using standard high-volume (hi-vol) air samplers at a sampling rate of 40 CFM. Suspended particulate matter was collected on an 8"x10" Teflon coated glass fibre filters. The filters were submitted to Maxxam Analytics Inc. for gravimetric and inductively coupled plasma (ICP) analysis.

The particular metals that were examined on the TSP filters were Arsenic, Lead, Manganese, Chromium, Cadmium, Cobalt, Copper, Molybdenum, Selenium and Vanadium.

### **3.2 VOC Measurements**

Monitoring for VOCs was conducted in two ways:

- Eight (8) 24-hour samples using Suma canisters for Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX)
- Six (6) 1/2- hour samples using Adsorbent tubes for select VOC compounds.

Ambient air samples were collected concurrently at locations directly downwind and upwind of the landfill mound. In general, the downwind samples were focussed on capturing emissions from the landfill operations. The sampling locations (upwind and downwind) were pre-selected based on forecasts of wind direction provided by Environment Canada, information from the on-site meteorological station, and any directives provided by the MOE.

The sampling methods and analytical techniques used for VOC sampling were developed based on guidance from the MOE's Operations Manual for Point Source Air Quality Monitoring. The two sampling methodologies are described in more detail in the following sections.

### **3.2.1 24-hour BTEX**

Monitoring for Benzene, Toluene, Ethyl Benzene and Xylenes (BTEX) was conducted upwind and downwind around the landfill. 24-hour samples were taken every six days, in concurrence with the North America-wide monitoring schedule, for a total of seven sample pairs. The monitoring method was in compliance with the methods specified by USEPA Method TO-15 and the Technical Assistance Document for the National Ambient Air Toxics Trends and Assessment Program.

In preparation of campaign, RWDI staff trained Waste Management Staff on the installation, take-down and record-keeping of the sample collection process. Within one day of the sampling event RWDI provided the recommended upwind and downwind sampling locations based on wind forecasts from RWDI's Weather Watcher website. The samples were submitted to Maxxam Analytics Inc. for analysis.

### **3.2.2 30-minute VOC Scan**

Sampling for VOC's was based on the U.S. EPA Ambient Air Method TO-17 using adsorbent tubes. Air samples were collected using a diaphragm pump regulated with rotameters or mass flow controllers. The sample flow rates were nominally 240 ml/minute, resulting in total sample volumes of approximately 7.2 litres, as suggested by the MOE.

Samples were submitted to OSB Laboratories for analysis. The analysis was conducted using a gas chromatograph equipped with a mass spectrometer detector. Vinyl chloride was analyzed using selective ion mode to obtain lower detection limits. The VOC analysis method is comparable to EPA SW846 Method 8260B, NIOSH Method 2549 and equivalent to EPA Compendium Method TO-17.

### 3.3 Reduced Sulphur Measurements

Reduced sulphur samples were collected in the same location as the VOC samples. The samples were collected over a ½ - hour period, downwind and upwind of the landfill mound. The sampling locations were chosen based on meteorological conditions.

Samples were collected in three-litre Tedlar bags using a lung sampler. Once collected, the reduced sulphur samples were protected from sunlight until analyzed. The samples were sent to Air ZoneOne in Mississauga for analysis and were analyzed using gas chromatography / flame photometric detection. Analysis was completed within 24 hours of collection.

### 3.4 Meteorological Station

Continuous wind speed, wind direction, ambient temperature, and relative humidity measurements were collected from the on-site weather station installed by RWDI. Five-minute averages for wind speed and wind direction were collected during the 1/2-hour samples.

Rainfall data was also collected for days when the 24-hour TSP samples were collected. This information was also obtained from the Environment Canada station at the Ottawa International Airport. The rainfall data is presented in Table 1, below.

Table 1: Rainfall data for each 24-hour TSP Sample Period, (Ottawa International Airport)

<b>Date</b>	<b>Total rain (mm)</b>		<b>Date</b>	<b>Total Rain (mm)</b>
May 12	0.0		July 11	2.6
May 18	4.4		July 17	0.0
May 24	0.0		July 23	2.2
May 30	3.4		July 29	0.0
June 5	7.2		Aug 4	0.0
June 11	0.0		Aug 10	0.0

<b>Date</b>	<b>Total rain (mm)</b>		<b>Date</b>	<b>Total Rain (mm)</b>
June 17	13.8		Aug 16	0.0
June 23	6.0		Aug 22	0.0
June 29	13.0		Aug 28	0.0
July 5	0.0			

### **3.5 Quality Assurance Measures**

A number of common quality assurance measures were implemented during the sampling program to ensure the integrity of the results. These measures included detailed documentation of all field activities, calibration of all samplers and a number of laboratory-related measures including sample handling procedures and instrument calibrations.

All of the samplers were bench-tested and calibrated in RWDI's office prior to field deployment and calibrated again in the field before and after use. For example, all of the low flow samplers were calibrated against a certified primary dry cell standard, (i.e., dry cell calibrator) before and after sampling.

Chain of Custody forms were completed and submitted along with the exposed samples to the laboratory. Where required by the method, exposed samples were packed in coolers before transport.

### **3.6 Relevant Air Quality Limits**

Measured 24-hour TSP and BTEX concentrations from the ambient air quality monitoring program were compared to the respective Ontario Regulation 419/05 POI Limits.

Measured 1/2-hour VOC and reduced sulphur compound concentrations from the ambient air quality monitoring program were compared to their respective Ontario Regulation 419/05 POI Limits. Regulation 419/05 sets forth explicit standards for a source's contribution to



the concentration of airborne contaminants at the POI. The term POI is taken to be in the natural environment at the boundaries of the property.

#### 4. RESULTS

TSP samples were collected every six (6) days from May 12 to August 28. The results of the TSP analysis are presented in tables A-1 to A-10. Figures A-1 to A-19 illustrates the sampling location, the particulate matter concentrations and a wind rose representing the meteorological conditions occurring at the site during each sample event for the specific sampling periods where measured concentrations were in excess of the MOE POI Contribution Limit for TSP ( $120 \text{ ug/m}^3$ ). The wind rose shows the distribution of wind angles (blowing from).

Eight (8) BTEX sample sets have been collected and analyzed by the laboratory. The samples were collected on the following days:

- Monday June 23
- Saturday July 5
- Friday July 11
- Thursday July 17
- Wednesday July 23
- Tuesday July 29
- Tuesday Aug 5
- Sunday Aug 10

The results of the BTEX samples are presented in Table B. The BTEX sampling locations are presented in Figures B-1 to B-8, along with the wind rose for the sampling periods.

Twelve (12) VOC and twelve (12) reduced sulphur samples have been collected and analyzed by the laboratory. The samples were collected on the following days:

- Tuesday June 24
- Thursday June 26
- Tuesday July 22
- Thursday July 31
- Wednesday Aug 27
- Thursday Aug 28

The results of the VOC samples are presented in Tables C-1 to C-6. These tables include the following information:

- A summary of all measured data, in terms of upwind and downwind sample tube results in total nanograms (ng) as well as upwind and downwind results in terms of concentration, in micrograms of contaminant per cubic metre of air ( $\mu\text{g}/\text{m}^3$ ).
- A summary of all measured data, in terms of upwind and downwind sample tube results in total nanograms (ng) as well as upwind and downwind results in terms of concentration, in micrograms of contaminant per cubic metre of air ( $\mu\text{g}/\text{m}^3$ ).
- Comparison of upwind and downwind measured concentrations to the applicable air quality limits.
- A comparison of the upwind and downwind measured concentrations to determine the net impacts from the landfill facility.

The results of the TRS samples are presented in Tables D-1 to D-7. These tables include:

- A summary of all measured data, in terms of upwind and downwind results in parts per million as well as in micrograms of contaminant per cubic metre of air ( $\mu\text{g}/\text{m}^3$ ).
- Comparison of upwind and downwind measured concentrations to the applicable air quality limits.
- A comparison of the upwind and downwind measured concentrations to determine the net impacts from the landfill facility.

Sampling locations for TRS and 30-minute VOC are shown in Figures C-1 to C-6.

## 5. CONCLUSION

None of the ambient measurements for VOC or TRS showed concentrations that were greater than the relevant POI Limits. While some measurements of TSP show concentrations above POI limits, background particulate concentrations in the vicinity of the landfill are relatively high, due to nearby quarry operations and off-site traffic. Ambient sampling results indicate that off-site sources are producing concentrations of suspended particulate matter as high as or higher than the concentrations produced by landfill operations. This is evidenced by

the high particulate measurements recorded when the winds were blowing from off-site towards the ambient sampler locations.

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## **Tables A 1-11**

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**Table A-1: Summary of Total Particulate Results - May to August 2008**

Sample Date	24-hour Concentration (ug/m <sup>3</sup> )		
	HI VOL 1	HI VOL 2	HI VOL 3
	Northeast	Southeast	Southwest
<b>12-May-08</b>	143	72	0
18-May-08	16	20	25
24-May-08	14	24	13
<b>30-May-08</b>	198	348	57
<b>5-Jun-08</b>	190	107	33
<b>11-Jun-08</b>	71	162	30
17-Jun-08	107	0	14
23-Jun-08	0	42	19
29-Jun-08	0	96	26
5-Jul-08	0	68	18
<b>11-Jul-08</b>	0	146	23
<b>17-Jul-08</b>	126	427	31
<b>23-Jul-08</b>	149	238	30
<b>29-Jul-08</b>	0	204	57
4-Aug-08	31	90	20
10-Aug-08	16	20	0
16-Aug-08	39	12	30
<b>22-Aug-08</b>	167	176	43
<b>28-Aug-08</b>	182	156	58

**Note - The June 17 - Hi Vol 1 Sample did not run for the full 24 hours**

Limit	AAQC	120 ug/m <sup>3</sup>
	Maximum	427 ug/m <sup>3</sup>
	Maximum % of Limit	356%

Shaded cells indicate samples that are above the POI limit for Pollutant. Figures with wind roses have been presented for sampling dates with high TSP concentrations.

**Table A-2: Summary of Total Arsenic (As) Results - May to August 2008**

	24-hour Concentration (ug/m <sup>3</sup> )		
	HI VOL 1	HI VOL 2	HI VOL 3
Sample Date	Northeast	Southeast	Southwest
<b>12-May-08</b>	0.01	0.00	0.00
18-May-08	0.00	0.01	0.00
24-May-08	0.00	0.00	0.00
<b>30-May-08</b>	0.00	0.00	0.00
<b>5-Jun-08</b>	0.01	0.01	0.00
<b>11-Jun-08</b>	0.01	0.01	0.00
17-Jun-08	<b>0.02</b>	0.00	0.01
23-Jun-08	0.00	0.01	0.01
29-Jun-08	0.00	0.01	0.01
5-Jul-08	0.00	0.01	0.01
<b>11-Jul-08</b>	0.00	0.01	0.00
<b>17-Jul-08</b>	0.00	0.01	0.00
<b>23-Jul-08</b>	0.00	0.01	0.00
<b>29-Jul-08</b>	0.00	0.00	0.00
4-Aug-08	0.01	0.01	0.01
10-Aug-08	0.01	0.01	0.00
16-Aug-08	0.01	0.00	0.01
<b>22-Aug-08</b>	0.00	0.01	0.00
<b>28-Aug-08</b>	0.01	0.01	0.01

**Note - The June 17 - Hi Vol 1 Sample did not run for the full 24 hours**

Limit	AAQC	0.30 ug/m <sup>3</sup>
	Maximum	0.02 ug/m <sup>3</sup>
	Maximum % of Limit	6%

**Table A-3: Summary of Total Cadmium (Cd) Results - May to August 2008**

Sample Date	24-hour Concentration (ug/m <sup>3</sup> )		
	HI VOL 1	HI VOL 2	HI VOL 3
	Northeast	Southeast	Southwest
<b>12-May-08</b>	0.001	0.001	0.000
18-May-08	0.001	0.001	0.001
24-May-08	0.001	0.001	0.001
<b>30-May-08</b>	0.001	0.001	0.001
<b>5-Jun-08</b>	0.001	0.001	0.001
<b>11-Jun-08</b>	0.001	0.001	0.001
17-Jun-08	<b>0.006</b>	0.000	0.001
23-Jun-08	0.000	0.001	0.001
29-Jun-08	0.000	0.001	0.001
5-Jul-08	0.000	0.001	0.001
<b>11-Jul-08</b>	0.001	0.001	0.001
<b>17-Jul-08</b>	0.001	0.001	0.001
<b>23-Jul-08</b>	0.001	0.001	0.001
<b>29-Jul-08</b>	0.000	0.001	0.001
4-Aug-08	0.001	0.001	0.001
10-Aug-08	0.001	0.001	0.000
16-Aug-08	0.001	0.001	0.001
<b>22-Aug-08</b>	0.001	0.002	0.001
<b>28-Aug-08</b>	0.001	0.001	0.001

**Note - The June 17 - Hi Vol 1 Sample did not run for the full 24 hours**

Limit	AAQC	0.025 ug/m <sup>3</sup>
	Maximum	0.006 ug/m <sup>3</sup>
	Maximum % of Limit	22%

**Table A-4: Summary of Total Chromium (Cr) Results - May to August 2008**

Sample Date	24-hour Concentration (ug/m <sup>3</sup> )		
	HI VOL 1	HI VOL 2	HI VOL 3
	Northeast	Southeast	Southwest
<b>12-May-08</b>	0.05	0.05	0.00
18-May-08	0.05	0.04	0.04
24-May-08	0.04	0.04	0.04
<b>30-May-08</b>	0.05	0.06	0.05
<b>5-Jun-08</b>	0.05	0.05	0.04
<b>11-Jun-08</b>	0.05	0.05	0.04
17-Jun-08	<b>0.21</b>	0.00	0.05
23-Jun-08	0.00	0.05	0.05
29-Jun-08	0.00	0.05	0.05
5-Jul-08	0.00	0.05	0.05
<b>11-Jul-08</b>	0.05	0.05	0.05
<b>17-Jul-08</b>	0.05	0.05	0.05
<b>23-Jul-08</b>	0.05	0.05	0.05
<b>29-Jul-08</b>	0.00	0.05	0.05
4-Aug-08	0.05	0.05	0.06
10-Aug-08	0.05	0.05	0.00
16-Aug-08	0.05	0.05	0.05
<b>22-Aug-08</b>	0.05	0.08	0.05
<b>28-Aug-08</b>	0.05	0.05	0.05

**Note - The June 17 - Hi Vol 1 Sample did not run for the full 24 hours**

Limit	AAQC	1.5 ug/m <sup>3</sup>
	Maximum	0.21 ug/m <sup>3</sup>
	Maximum % of Limit	14%



**Table A-5: Summary of Total Cobalt (Co) Results - May to August 2008**

	24-hour Concentration (ug/m <sup>3</sup> )		
	HI VOL 1	HI VOL 2	HI VOL 3
Sample Date	Northeast	Southeast	Southwest
<b>12-May-08</b>	0.003	0.002	0.000
18-May-08	0.002	0.002	0.002
24-May-08	0.002	0.002	0.002
<b>30-May-08</b>	0.003	0.005	0.002
<b>5-Jun-08</b>	0.002	0.002	0.002
<b>11-Jun-08</b>	0.002	0.002	0.002
17-Jun-08	<b>0.007</b>	0.000	0.002
23-Jun-08	0.000	0.002	0.002
29-Jun-08	0.000	0.002	0.002
5-Jul-08	0.000	0.002	0.002
<b>11-Jul-08</b>	0.003	0.003	0.001
<b>17-Jul-08</b>	0.003	0.004	0.003
<b>23-Jul-08</b>	0.003	0.003	0.002
<b>29-Jul-08</b>	0.000	0.003	0.002
4-Aug-08	0.002	0.002	0.002
10-Aug-08	0.002	0.002	0.000
16-Aug-08	0.002	0.003	0.003
<b>22-Aug-08</b>	0.003	0.005	0.003
<b>28-Aug-08</b>	0.003	0.003	0.003

**Note - The June 17 - Hi Vol 1 Sample did not run for the full 24 hours**

Limit	AAQC	0.10 ug/m <sup>3</sup>
	Maximum	0.007 ug/m <sup>3</sup>
	Maximum % of Limit	7%

**Table A-6: Summary of Total Copper (Cu) Results - May to August 2008**

	24-hour Concentration (ug/m <sup>3</sup> )		
	HI VOL 1	HI VOL 2	HI VOL 3
Sample Date	Northeast	Southeast	Southwest
<b>12-May-08</b>	0.04	0.05	0.00
18-May-08	0.03	0.04	0.04
24-May-08	0.05	0.03	0.03
<b>30-May-08</b>	0.05	0.23	0.05
<b>5-Jun-08</b>	0.04	0.05	0.05
<b>11-Jun-08</b>	0.07	0.02	0.05
17-Jun-08	<b>0.11</b>	0.00	0.05
23-Jun-08	0.00	0.06	0.06
29-Jun-08	0.00	0.03	0.05
5-Jul-08	0.00	0.04	0.07
<b>11-Jul-08</b>	0.01	0.04	0.05
<b>17-Jul-08</b>	0.05	0.05	0.06
<b>23-Jul-08</b>	0.07	0.07	0.05
<b>29-Jul-08</b>	0.00	0.04	0.07
4-Aug-08	0.08	0.04	0.18
10-Aug-08	0.05	0.07	0.00
16-Aug-08	0.08	0.05	0.04
<b>22-Aug-08</b>	0.07	0.09	0.07
<b>28-Aug-08</b>	0.07	0.06	0.09

**Note - The June 17 - Hi Vol 1 Sample did not run for the full 24 hours**

Limit	AAQC	50 ug/m <sup>3</sup>
	Maximum	0.23 ug/m <sup>3</sup>
	Maximum % of Limit	0.5%

**Table A-7: Summary of Total Lead (Pb) Results - May to August 2008**

	24-hour Concentration (ug/m <sup>3</sup> )		
	HI VOL 1	HI VOL 2	HI VOL 3
Sample Date	Northeast	Southeast	Southwest
<b>12-May-08</b>	0.012	0.010	0.000
18-May-08	0.008	0.009	0.008
24-May-08	0.007	0.008	0.006
<b>30-May-08</b>	0.013	0.017	0.011
<b>5-Jun-08</b>	0.011	0.011	0.008
<b>11-Jun-08</b>	0.008	0.009	0.007
17-Jun-08	<b>0.031</b>	0.000	0.007
23-Jun-08	0.000	0.009	0.008
29-Jun-08	0.000	0.010	0.009
5-Jul-08	0.000	0.008	0.007
<b>11-Jul-08</b>	0.007	0.009	0.008
<b>17-Jul-08</b>	0.012	0.022	0.009
<b>23-Jul-08</b>	0.011	0.012	0.007
<b>29-Jul-08</b>	0.000	0.011	0.009
4-Aug-08	0.009	0.010	0.011
10-Aug-08	0.010	0.011	0.000
16-Aug-08	0.009	0.009	0.008
<b>22-Aug-08</b>	0.012	0.017	0.010
<b>28-Aug-08</b>	0.013	0.013	0.009

**Note - The June 17 - Hi Vol 1 Sample did not run for the full 24 hours**

Limit	AAQC	0.50 ug/m <sup>3</sup>
	Maximum	0.031 ug/m <sup>3</sup>
	Maximum % of Limit	6%

**Table A-8: Summary of Manganese (Mg) Results - May to August 2008**

	24-hour Concentration (ug/m <sup>3</sup> )		
	HI VOL 1	HI VOL 2	HI VOL 3
Sample Date	Northeast	Southeast	Southwest
<b>12-May-08</b>	0.07	0.04	0.00
18-May-08	0.02	0.02	0.02
24-May-08	0.02	0.02	0.02
<b>30-May-08</b>	0.09	0.19	0.04
<b>5-Jun-08</b>	0.08	0.05	0.02
<b>11-Jun-08</b>	0.04	0.06	0.02
17-Jun-08	<b>0.10</b>	0.00	0.02
23-Jun-08	0.00	0.03	0.02
29-Jun-08	0.00	0.04	0.02
5-Jul-08	0.00	0.03	0.02
<b>11-Jul-08</b>	0.02	0.06	0.02
<b>17-Jul-08</b>	0.06	0.13	0.02
<b>23-Jul-08</b>	0.06	0.12	0.02
<b>29-Jul-08</b>	0.00	0.08	0.04
4-Aug-08	0.02	0.04	0.02
10-Aug-08	0.02	0.02	0.00
16-Aug-08	0.03	0.05	0.03
<b>22-Aug-08</b>	0.07	0.09	0.03
<b>28-Aug-08</b>	0.08	0.08	0.04

**Note - The June 17 - Hi Vol 1 Sample did not run for the full 24 hours**

Limit	AAQC	2.50 ug/m <sup>3</sup>
	Maximum	0.19 ug/m <sup>3</sup>
	Maximum % of Limit	7%

**Table A-9: Summary of Total Molybdenum (Mo) Results - May to August 2008**

	24-hour Concentration (ug/m <sup>3</sup> )		
	HI VOL 1	HI VOL 2	HI VOL 3
Sample Date	Northeast	Southeast	Southwest
<b>12-May-08</b>	0.00	0.00	0.00
18-May-08	0.00	0.00	0.00
24-May-08	0.00	0.00	0.00
<b>30-May-08</b>	0.00	0.00	0.00
<b>5-Jun-08</b>	0.00	0.00	0.00
<b>11-Jun-08</b>	0.00	0.00	0.00
17-Jun-08	0.01	0.00	0.00
23-Jun-08	0.00	0.00	0.00
29-Jun-08	0.00	0.00	0.00
5-Jul-08	0.00	0.00	0.00
<b>11-Jul-08</b>	0.00	0.00	0.00
<b>17-Jul-08</b>	0.00	0.00	0.00
<b>23-Jul-08</b>	0.00	0.00	0.00
<b>29-Jul-08</b>	0.00	0.00	0.00
4-Aug-08	0.00	0.00	0.00
10-Aug-08	0.00	0.00	0.00
16-Aug-08	0.00	0.00	0.00
<b>22-Aug-08</b>	0.00	0.00	0.00
<b>28-Aug-08</b>	0.00	0.00	0.00

**Note - The June 17 - Hi Vol 1 Sample did not run for the full 24 hours**

Limit	AAQC	120 ug/m <sup>3</sup>
	Maximum	0.01 ug/m <sup>3</sup>
	Maximum % of Limit	0%

**Table A-10: Summary of Total Selenium (Se) Results - May to August 2008**

	24-hour Concentration (ug/m <sup>3</sup> )		
	HI VOL 1	HI VOL 2	HI VOL 3
Sample Date	Northeast	Southeast	Southwest
<b>12-May-08</b>	0.01	0.01	0.00
18-May-08	0.01	0.01	0.01
24-May-08	0.01	0.01	0.01
<b>30-May-08</b>	0.01	0.01	0.01
<b>5-Jun-08</b>	0.01	0.01	0.01
<b>11-Jun-08</b>	0.01	0.01	0.01
17-Jun-08	<b>0.03</b>	0.00	0.01
23-Jun-08	0.00	0.01	0.01
29-Jun-08	0.00	0.01	0.01
5-Jul-08	0.00	0.01	0.01
<b>11-Jul-08</b>	0.01	0.01	0.01
<b>17-Jul-08</b>	0.01	0.01	0.01
<b>23-Jul-08</b>	0.01	0.01	0.01
<b>29-Jul-08</b>	0.00	0.01	0.01
4-Aug-08	0.01	0.01	0.01
10-Aug-08	0.01	0.01	0.00
16-Aug-08	0.01	0.01	0.01
<b>22-Aug-08</b>	0.01	0.01	0.01
<b>28-Aug-08</b>	0.01	0.01	0.01

**Note - The June 17 - Hi Vol 1 Sample did not run for the full 24 hours**

Limit	AAQC	10.00 ug/m <sup>3</sup>
	Maximum	0.03 ug/m <sup>3</sup>
	Maximum % of Limit	0.3%

**Table A-11: Summary of Total Vanadium (V) Results - May to August 2008**

	24-hour Concentration (ug/m <sup>3</sup> )		
	HI VOL 1	HI VOL 2	HI VOL 3
Sample Date	Northeast	Southeast	Southwest
<b>12-May-08</b>	0.02	0.02	0.00
18-May-08	0.02	0.01	0.01
24-May-08	0.01	0.01	0.01
<b>30-May-08</b>	0.02	0.02	0.02
<b>5-Jun-08</b>	0.02	0.02	0.01
<b>11-Jun-08</b>	0.02	0.02	0.01
17-Jun-08	<b>0.07</b>	0.00	0.01
23-Jun-08	0.00	0.02	0.01
29-Jun-08	0.00	0.02	0.02
5-Jul-08	0.00	0.02	0.01
<b>11-Jul-08</b>	0.02	0.02	0.01
<b>17-Jul-08</b>	0.02	0.02	0.02
<b>23-Jul-08</b>	0.02	0.02	0.02
<b>29-Jul-08</b>	0.00	0.02	0.02
4-Aug-08	0.01	0.02	0.02
10-Aug-08	0.02	0.02	0.00
16-Aug-08	0.02	0.02	0.02
<b>22-Aug-08</b>	0.02	0.03	0.01
<b>28-Aug-08</b>	0.02	0.02	0.01

**Note - The June 17 - Hi Vol 1 Sample did not run for the full 24 hours**

Limit	AAQC	2.0 ug/m <sup>3</sup>
	Maximum	0.07 ug/m <sup>3</sup>
	Maximum % of Limit	3%

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## **Table B**

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**Table B:**  
**Ottawa Landfill - BTEX Results**

Sample Date		23-Jun				
Canister No.		2592		2615		
Sample Location		Downwind		Upwind		
Sample Duration (hr)		24		24		
CAS #	Parameter	Mass Collected	Concentration	Mass Collected	Concentration	Landfill Contribution
		(ppb)	(ug/m <sup>3</sup> )	(ppb)	(ug/m <sup>3</sup> )	
71-43-2	Benzene	<0.10	<0.3	<0.10	<0.3	<0.0
108-88-3	Toluene	0.30	1.13	0.20	0.75	0.38
100-41-4	Ethyl Benzene	<0.10	<0.4	<0.10	<0.4	<0.0
1330-20-7	Xylenes	<0.40	<1.7	<0.40	<1.7	<0.0

Sample Date		5-Jul				
Canister No.		T21672		T21652		
Sample Location		Downwind		Upwind		
Sample Duration (hr)		24		24		
CAS #	Parameter	Mass Collected	Concentration	Mass Collected	Concentration	Landfill Contribution
		(ppb)	(ug/m <sup>3</sup> )	(ppb)	(ug/m <sup>3</sup> )	
71-43-2	Benzene	<0.10	<0.3	<0.10	<0.3	<0.0
108-88-3	Toluene	0.20	0.75	0.20	0.75	0.00
100-41-4	Ethyl Benzene	<0.10	<0.4	<0.10	<0.4	<0.0
1330-20-7	Xylenes	<0.40	<1.7	<0.40	<1.7	<0.0

Sample Date		11-Jul				
Canister No.		T2440		T2468		
Sample Location		Downwind		Upwind		
Sample Duration (hr)		24		24		
CAS #	Parameter	Mass Collected	Concentration	Mass Collected	Concentration	Landfill Contribution
		(ppb)	(ug/m <sup>3</sup> )	(ppb)	(ug/m <sup>3</sup> )	
71-43-2	Benzene	<0.10	<0.3	<0.10	<0.3	<0.0
108-88-3	Toluene	0.20	0.75	0.30	1.13	0.38
100-41-4	Ethyl Benzene	<0.10	<0.4	<0.10	<0.4	<0.0
1330-20-7	Xylenes	<0.40	<1.7	<0.40	<1.7	<0.0

Sample Date		17-Jul				
Canister No.		7812		7850		
Sample Location		Downwind		Upwind		
Sample Duration (hr)		24		24		
CAS #	Parameter	Mass Collected	Concentration	Mass Collected	Concentration	Landfill Contribution
		(ppb)	(ug/m <sup>3</sup> )	(ppb)	(ug/m <sup>3</sup> )	
71-43-2	Benzene	<0.10	<0.3	<0.10	<0.3	<0.0
108-88-3	Toluene	<0.10	0.38	<0.10	0.38	0.00
100-41-4	Ethyl Benzene	<0.10	<0.4	<0.10	<0.4	<0.0
1330-20-7	Xylenes	<0.40	<1.7	<0.40	<1.7	<0.0

Sample Date		23-Jul				
Canister No.		2826		1238		
Sample Location		Downwind		Upwind		
Sample Duration (hr)		24		24		
CAS #	Parameter	Mass Collected	Concentration	Mass Collected	Concentration	Landfill Contribution
		(ppb)	(ug/m <sup>3</sup> )	(ppb)	(ug/m <sup>3</sup> )	
71-43-2	Benzene	<0.10	<0.3	<0.10	<0.3	0.31922
108-88-3	Toluene	0.20	0.75	0.20	0.75	1.13
100-41-4	Ethyl Benzene	<0.10	<0.4	<0.10	<0.4	0.43387
1330-20-7	Xylenes	<0.40	<1.7	<0.40	<1.7	1.73535

Sample Date		29-Jul				
Canister No.		7804		7864		
Sample Location		Downwind		Upwind		
Sample Duration (hr)		24		24		
CAS #	Parameter	Mass Collected	Concentration	Mass Collected	Concentration	Landfill Contribution
		(ppb)	(ug/m <sup>3</sup> )	(ppb)	(ug/m <sup>3</sup> )	
71-43-2	Benzene	<0.10	<0.3	<0.10	<0.3	<0.0
108-88-3	Toluene	0.30	1.13	0.20	0.75	-0.38
100-41-4	Ethyl Benzene	<0.10	<0.4	<0.10	<0.4	<0.0
1330-20-7	Xylenes	<0.40	<1.7	<0.40	<1.7	<0.0

Sample Date		05-Aug				
Canister No.		2759		2384		
Sample Location		Downwind		Upwind		
Sample Duration (hr)		24		24		
CAS #	Parameter	Mass Collected	Concentration	Mass Collected	Concentration	Landfill Contribution
		(ppb)	(ug/m <sup>3</sup> )	(ppb)	(ug/m <sup>3</sup> )	
71-43-2	Benzene	<0.10	<0.3	<0.10	<0.3	<0.0
108-88-3	Toluene	0.30	1.13	<0.10	0.38	-0.75
100-41-4	Ethyl Benzene	<0.10	<0.4	<0.10	<0.4	<0.0
1330-20-7	Xylenes	<0.40	<1.7	<0.40	<1.7	<0.0

Sample Date		10-Aug				
Canister No.		2601		2548		
Sample Location		Downwind		Upwind		
Sample Duration (hr)		24		24		
CAS #	Parameter	Mass Collected	Concentration	Mass Collected	Concentration	Landfill Contribution
		(ppb)	(ug/m <sup>3</sup> )	(ppb)	(ug/m <sup>3</sup> )	
71-43-2	Benzene	<0.10	<0.3	<0.10	<0.3	<0.0
108-88-3	Toluene	<0.10	0.38	<0.10	0.38	0.00
100-41-4	Ethyl Benzene	<0.10	<0.4	<0.10	<0.4	<0.0
1330-20-7	Xylenes	<0.40	<1.7	<0.40	<1.7	<0.0

Summary of Results			
Parameter	Max Downwind Concentration (ug/m <sup>3</sup> )	POI Limit (ug/m <sup>3</sup> )	% of POI Limit (%)
Benzene	<0.3	-	-
Toluene	1.13	2000	<1
Ethyl Benzene	<0.4	1000	<1
Xylenes	<1.7	730	<1

Note: Concentrations corrected to 101.325 Kpa and 10 °C

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**Tables C 1-6**

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**Table C-1 : Analytical Results for Ambient VOC Sampling at Ottawa Landfill**

REPORT: 07047b (Method - SCAN ATD-GC-MSD Cryogenic Oven Control)

CAS #	Laboratory Description COMPOUND	POI Ontario (ug/m <sup>3</sup> )	Tube: SS52 Date: June 24, 2008			Tube: SS54 Date: June 24, 2008			Net Landfill Contribution [3] (ug/m <sup>3</sup> )
			08080108	08080108	Upwind Percentage of POI Limit (%)	8062603	8062603	Downwind Percentage of POI Limit (%)	
			Upwind Measured Amount (ng)	Upwind Measured Concentration (ug/m <sup>3</sup> )		Downwind Measured Amount (ng)	Downwind Measured Concentration (ug/m <sup>3</sup> )		
--	Sample Volume (m <sup>3</sup> )	--	--	0.0070	--	--	0.0070	--	--
75-71-8	Dichlorodifluoromethane	1,500,000	4	0.57	<0.1%	2.2	0.31	<0.1%	background
75-45-6	Chlorodifluoromethane	1,050,000	ND	ND	ND	ND	ND	ND	ND
75-01-4	Vinyl Chloride [1]	3	ND	ND	ND	ND	ND	ND	ND
78-78-4	2-Methyl Butane	-	50	7.17	-	3.5	0.50	-	background
75-69-4	Trichlorofluoromethane	18,000	10.8	1.55	<0.1%	12.3	1.76	<0.1%	0.21
109-66-0	Pentane	-	4.3	0.62	-	2.8	0.40	-	background
64-17-5	Ethanol	19,000	9.5	1.36	<0.1%	7.6	1.09	<0.1%	background
75-35-4	1,1-Dichloroethene	30	ND	ND	ND	ND	ND	ND	ND
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroethane	2,400,000	3.9	0.56	<0.1%	5.3	0.76	<0.1%	0.20
108-20-3	Isopropyl Ether	220	ND	ND	ND	ND	ND	ND	ND
67-64-1	Acetone	48,000	19.1	2.74	<0.1%	20	2.86	<0.1%	0.12
67-63-0	Isopropyl Alcohol	24,000	9	1.29	<0.1%	9.5	1.36	<0.1%	0.07
107-83-5	2-Methyl Pentane	-	29	4.16	-	3.9	0.56	-	background
75-09-2	Dichloromethane	5,300	7.2	1.03	<0.1%	1.8	0.26	<0.1%	background
96-14-0	3-Methyl Pentane	-	ND	ND	-	ND	ND	-	ND
107-13-1	2-Propenitrile	180	ND	ND	ND	ND	ND	ND	ND
156-60-5	1,2-Dichloroethene (trans)	315	ND	ND	ND	ND	ND	ND	ND
110-54-3	Hexane	35,000	4.6	0.66	<0.1%	2	0.29	<0.1%	background
75-34-3	1,1-Dichloroethane	600	ND	ND	ND	ND	ND	ND	ND
123-72-8	n-Butanal	-	ND	ND	-	0.4	0.06	-	ND
156-59-2	1,2-Dichloroethene (cis)	315	ND	ND	ND	ND	ND	ND	ND
78-93-3	MEK	30,000	12.4	1.78	<0.1%	4.5	0.64	<0.1%	background
141-78-6	Ethyl Acetate	19,000	3.7	0.53	<0.1%	2.1	0.30	<0.1%	background
67-66-3	Chloroform	300	ND	ND	ND	ND	ND	ND	ND
591-76-4	2-Methyl Hexane	-	22	3.16	-	8.5	1.21	-	background
110-82-7	Cyclohexane	-	116	16.64	-	78	11.14	-	background
71-55-6	1,1,1-Trichloroethane	350,000	0.7	0.10	<0.1%	3	0.43	<0.1%	0.33
56-23-5	Carbon Tetrachloride	7	ND	ND	ND	26	3.71	52%	ND
589-34-4	3-Methyl Hexane	-	26	3.73	-	9.6	1.37	-	background
71-43-2	Benzene[2]	15	4.9	0.70	5%	3.4	0.49	3%	background
107-06-2	1,2-Dichloroethane	6	ND	ND	ND	ND	ND	ND	ND
142-82-5	Heptane	33,000	12.9	1.85	<0.1%	5.9	0.84	<0.1%	background
79-01-6	Trichloroethene	3,500	0.5	0.07	<0.1%	0.2	0.03	<0.1%	background
78-87-5	1,2-Dichloropropane	2,400	ND	ND	ND	ND	ND	ND	ND
108-87-2	Methyl Cyclohexane	-	61	8.75	-	23	3.29	-	background
108-10-1	MIBK	1,200	ND	ND	ND	ND	ND	ND	ND
108-88-3	Toluene	2,000	41	5.88	0%	28	4.00	0.2%	background
127-18-4	Tetrachloroethene	10,000	3.6	0.52	<0.1%	3.8	0.54	<0.1%	0.03
123-86-4	Butyl Acetate	735	ND	ND	ND	ND	ND	ND	ND
106-93-4	1,2-Dibromoethane	9	ND	ND	ND	ND	ND	ND	ND
108-90-7	Chlorobenzene	4,200	0.2	0.03	<0.1%	Trace	Trace	<0.1%	background
100-41-4	Ethyl Benzene	3,000	0.8	0.11	<0.1%	5.1	0.73	<0.1%	0.61
111-84-2	Nonane	-	0.6	0.09	-	2	0.29	-	0.20
8-38-3/106-42	m/p-Xylene	-	2.9	0.42	-	20	2.86	-	2.44
110-12-3	5-Methyl-2-Hexanone	460	ND	ND	ND	ND	ND	ND	ND
95-47-6	o-Xylene	-	0.9	0.13	-	5.7	0.81	-	0.69
100-42-5	Styrene	400	ND	ND	ND	1	0.14	<0.1%	ND
103-65-1	Propyl Benzene	-	0.3	0.04	-	0.9	0.13	-	0.09
10-14-4/622-96	m/p-Ethyl Toluene	-	0.3	0.04	-	0.7	0.10	-	0.06
124-18-5	Decane	40	1.8	0.26	1%	2.5	0.36	1%	0.10
108-67-8	1,3,5-Trimethylbenzene	-	0.8	0.11	-	1.4	0.20	-	0.09
611-14-3	o-Ethyl Toluene	-	0.2	0.03	-	0.4	0.06	-	0.03
95-63-6	1,2,4-Trimethylbenzene	500	1	0.14	<0.1%	1.5	0.21	<0.1%	0.07
535-77-3	m-Cymene	-	Trace	Trace	-	0.3	0.04	-	0.04
138-86-3	Limonene	-	0.4	0.06	-	1.3	0.19	-	0.13
99-87-6	p-Cymene	-	5.2	0.75	-	9.1	1.30	-	0.55
106-46-7	1,4-Dichlorobenzene	285	ND	ND	ND	ND	ND	ND	ND
526-73-8	1,2,3-Trimethylbenzene	-	0.4	0.06	-	1.2	0.17	-	0.11
95-50-1	1,2-Dichlorobenzene	37,000	ND	ND	ND	ND	ND	ND	ND
120-82-1	1,2,4-Trichlorobenzene	100	ND	ND	ND	ND	ND	ND	ND
91-20-3	Naphthalene	36	ND	ND	ND	1	0.14	0%	ND
-	TVOCs (Toulene)	-	1010	144.91	-	780	111.43	-	background
-	TVOCs (Quantified)	-	470	67.43	-	320	45.71	-	background
-	Molhave-Clausen TVOCs (Toulene)	-	1010	144.91	-	780	111.43	-	background

x

Notes:

[1] Vinyl Chloride assessed using SIM analysis, which has a lower detection limit.

[2] The limit for Benzene is 15 ug/m<sup>3</sup> based on the Settlement Agreement

[3] Net Landfill Contribution = Downwind Measured Concentration - Upwind Measured Concentration. Where the net landfill contribution was a negative number, the impacts were deemed to be from background sources.

POI = Half Hour Point of Impingement (Ontario Ministry of Environment)

TRACE = Characteristic ions present but too low to be quantified

**Table C-2 : Analytical Results for Ambient VOC Sampling at Ottawa Landfill**

REPORT: 07047b (Method - SCAN ATD-GC-MSD Cryogenic Oven Control)

CAS #	Laboratory Description COMPOUND	POI Ontario (ug/m <sup>3</sup> )	Tube: SS53 Date: June 26, 2008			Tube: SS55 Date: June 26, 2008			Net Landfill Contribution [3] (ug/m <sup>3</sup> )
			08080108	08080108	Upwind Percentage of POI Limit (%)	08062703	08062703	Downwind Percentage of POI Limit (%)	
			Upwind Measured Amount (ng)	Upwind Measured Concentration (ug/m <sup>3</sup> )		Downwind Measured Amount (ng)	Downwind Measured Concentration (ug/m <sup>3</sup> )		
--	Sample Volume (m <sup>3</sup> )	--	--	0.0069	--	--	0.0067	--	--
75-71-8	Dichlorodifluoromethane	1,500,000	5.2	0.76	<0.1%	10.3	1.54	<0.1%	0.78
75-45-6	Chlorodifluoromethane	1,050,000	ND	ND	ND	2.9	0.43	<0.1%	ND
75-01-4	Vinyl Chloride [1]	3	ND	ND	ND	ND	ND	ND	ND
78-78-4	2-Methyl Butane	-	25	3.64	-	71	10.60	-	6.96
75-69-4	Trichlorofluoromethane	18,000	10.8	1.57	<0.1%	15.4	2.30	<0.1%	0.73
109-66-0	Pentane	-	6.5	0.95	-	11.8	1.76	-	0.82
64-17-5	Ethanol	19,000	6.3	0.92	<0.1%	23	3.43	<0.1%	2.52
75-35-4	1,1-Dichloroethene	30	ND	ND	ND	0.6	0.09	0%	ND
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroethane	2,400,000	1.9	0.28	<0.1%	5.7	0.85	<0.1%	0.57
108-20-3	Isopropyl Ether	220	ND	ND	ND	ND	ND	ND	ND
67-64-1	Acetone	48,000	12.9	1.88	<0.1%	28	4.18	<0.1%	2.30
67-63-0	Isopropyl Alcohol	24,000	2.6	0.38	<0.1%	12.1	1.81	<0.1%	1.43
107-83-5	2-Methyl Pentane	-	13.7	1.99	-	56	8.36	-	6.36
75-09-2	Dichloromethane	5,300	6.8	0.99	<0.1%	8.7	1.30	<0.1%	0.31
96-14-0	3-Methyl Pentane	-	1.2	0.17	-	1.2	0.18	-	0.00
107-13-1	2-Propenitrile	180	ND	ND	ND	ND	ND	ND	ND
156-60-5	1,2-Dichloroethene (trans)	315	ND	ND	ND	ND	ND	ND	ND
110-54-3	Hexane	35,000	3	0.44	<0.1%	8	1.19	<0.1%	0.76
75-34-3	1,1-Dichloroethane	600	ND	ND	ND	ND	ND	ND	ND
123-72-8	n-Butanal	-	ND	ND	-	1	0.15	-	ND
156-59-2	1,2-Dichloroethene (cis)	315	ND	ND	ND	ND	ND	ND	ND
78-93-3	MEK	30,000	4.3	0.63	<0.1%	18.2	2.72	<0.1%	2.09
141-78-6	Ethyl Acetate	19,000	3.1	0.45	<0.1%	12.3	1.84	<0.1%	1.38
67-66-3	Chloroform	300	ND	ND	ND	ND	ND	ND	ND
591-76-4	2-Methyl Hexane	-	7.2	1.05	-	16.6	2.48	-	1.43
110-82-7	Cyclohexane	-	29	4.22	-	210	31.34	-	27.12
71-55-6	1,1,1-Trichloroethane	350,000	0.9	0.13	<0.1%	5.3	0.79	<0.1%	0.66
56-23-5	Carbon Tetrachloride	7	14	2.04	28%	33	4.93	68%	2.89
589-34-4	3-Methyl Hexane	-	11.4	1.66	-	14.1	2.10	-	0.45
71-43-2	Benzene[2]	15	3.6	0.52	3%	4.8	0.72	5%	0.19
107-06-2	1,2-Dichloroethane	6	ND	ND	ND	ND	ND	ND	ND
142-82-5	Heptane	33,000	4	0.58	<0.1%	4	0.60	<0.1%	0.01
79-01-6	Trichloroethene	3,500	0.6	0.09	<0.1%	1.2	0.18	<0.1%	0.09
78-87-5	1,2-Dichloropropane	2,400	ND	ND	ND	ND	ND	ND	ND
108-87-2	Methyl Cyclohexane	-	17.2	2.50	-	16.9	2.52	-	0.02
108-10-1	MIBK	1,200	ND	ND	ND	ND	ND	ND	ND
108-88-3	Toluene	2,000	18.4	2.68	0%	22	3.28	0.2%	0.61
127-18-4	Tetrachloroethene	10,000	6.4	0.93	<0.1%	4.7	0.70	<0.1%	background
123-86-4	Butyl Acetate	735	ND	ND	ND	ND	ND	ND	ND
106-93-4	1,2-Dibromoethane	9	ND	ND	ND	ND	ND	ND	ND
108-90-7	Chlorobenzene	4,200	0.2	0.03	<0.1%	Trace	Trace	<0.1%	background
100-41-4	Ethyl Benzene	3,000	1.2	0.17	<0.1%	1.2	0.18	<0.1%	0.00
111-84-2	Nonane	-	0.2	0.03	-	0.7	0.10	-	0.08
8-38-3/106-42	m/p-Xylene	-	3.4	0.49	-	3.1	0.46	-	background
110-12-3	5-Methyl-2-Hexanone	460	ND	ND	ND	ND	ND	ND	ND
95-47-6	o-Xylene	-	1.1	0.16	-	1.2	0.18	-	0.02
100-42-5	Styrene	400	ND	ND	ND	Trace	Trace	<0.1%	ND
103-65-1	Propyl Benzene	-	0.3	0.04	-	0.4	0.06	-	0.02
10-14-4/622-96	m/p-Ethyl Toluene	-	0.3	0.04	-	0.4	0.06	-	0.02
124-18-5	Decane	40	1.1	0.16	0%	3.2	0.48	1%	0.32
108-67-8	1,3,5-Trimethylbenzene	-	0.9	0.13	-	1	0.15	-	0.02
611-14-3	o-Ethyl Toluene	-	0.2	0.03	-	0.2	0.03	-	0.00
95-63-6	1,2,4-Trimethylbenzene	500	0.6	0.09	<0.1%	0.9	0.13	<0.1%	0.05
535-77-3	m-Cymene	-	Trace	Trace	-	Trace	Trace	-	0.00
138-86-3	Limonene	-	ND	ND	-	Trace	Trace	-	ND
99-87-6	p-Cymene	-	3.9	0.57	-	2.5	0.37	-	background
106-46-7	1,4-Dichlorobenzene	285	ND	ND	ND	Trace	Trace	<0.1%	ND
526-73-8	1,2,3-Trimethylbenzene	-	0.5	0.07	-	0.3	0.04	-	background
95-50-1	1,2-Dichlorobenzene	37,000	ND	ND	ND	ND	ND	ND	ND
120-82-1	1,2,4-Trichlorobenzene	100	ND	ND	ND	ND	ND	ND	ND
91-20-3	Naphthalene	36	ND	ND	ND	0.1	0.01	<0.1%	ND
-	TVOCs (Toulene)	-	460	66.96	-	1460	217.91	-	150.95
-	TVOCs (Quantified)	-	230	33.48	-	630	94.03	-	60.55
-	Molhave-Clausen TVOCs (Toulene)	-	460	66.96	-	1460	217.91	-	150.95

**Notes:**

[1] Vinyl Chloride assessed using SIM analysis, which has a lower detection limit.

[2] The limit for Benzene is 15 ug/m<sup>3</sup> based on the Settlement Agreement

[3] Net Landfill Contribution = Downwind Measured Concentration - Upwind Measured Concentration. Where the net landfill contribution was a negative number, the impacts were deemed to be from background sources.

POI = Half Hour Point of Impingement (Ontario Ministry of Environment)

TRACE = Characteristic ions present but too low to be quantified

**Table C-3 : Analytical Results for Ambient VOC Sampling at Ottawa Landfill**

REPORT: 07047b (Method - SCAN ATD-GC-MSD Cryogenic Oven Control)

CAS #	Laboratory Description COMPOUND	POI Ontario (ug/m <sup>3</sup> )	Tube: SS41 Date: July 22, 2008			Tube: SS42 Date: July 22, 2008			Net Landfill Contribution [3] (ug/m <sup>3</sup> )
			08080108	08080108	Upwind Percentage of POI Limit (%)	08080108	08080108	Downwind Percentage of POI Limit (%)	
			Upwind Measured Amount (ng)	Upwind Measured Concentration (ug/m <sup>3</sup> )		Downwind Measured Amount (ng)	Downwind Measured Concentration (ug/m <sup>3</sup> )		
--	Sample Volume (m <sup>3</sup> )	--	--	0.0071	--	--	0.0068	--	
75-71-8	Dichlorodifluoromethane	1,500,000	2.4	0.34	<0.1%	3.3	0.48	<0.1%	0.14
75-45-6	Chlorodifluoromethane	1,050,000	4.5	0.64	<0.1%	11.1	1.63	<0.1%	0.99
75-01-4	Vinyl Chloride [1]	3	Trace	Trace	<0.1%	Trace	Trace	<0.1%	0.00
78-78-4	2-Methyl Butane	-	27	3.82	-	16.9	2.48	-	background
75-69-4	Trichlorofluoromethane	18,000	15.7	2.22	<0.1%	14.6	2.14	<0.1%	background
109-66-0	Pentane	-	6.6	0.93	-	4.8	0.70	-	background
64-17-5	Ethanol	19,000	11.9	1.68	<0.1%	10.1	1.48	<0.1%	background
75-35-4	1,1-Dichloroethene	30	0.1	0.01	<0.1%	Trace	Trace	<0.1%	background
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroethane	2,400,000	5.5	0.78	<0.1%	3.9	0.57	<0.1%	background
108-20-3	Isopropyl Ether	220	ND	ND	ND	ND	ND	ND	ND
67-64-1	Acetone	48,000	15.5	2.19	<0.1%	21	3.08	<0.1%	0.89
67-63-0	Isopropyl Alcohol	24,000	2.9	0.41	<0.1%	2.7	0.40	<0.1%	background
107-83-5	2-Methyl Pentane	-	15.7	2.22	-	8.5	1.25	-	background
75-09-2	Dichloromethane	5,300	12	1.70	<0.1%	11.5	1.69	<0.1%	background
96-14-0	3-Methyl Pentane	-	2	0.28	-	2	0.29	-	0.01
107-13-1	2-Propenitrile	180	0.2	0.03	<0.1%	ND	ND	ND	background
156-60-5	1,2-Dichloroethene (trans)	315	ND	ND	ND	ND	ND	ND	ND
110-54-3	Hexane	35,000	10.9	1.54	<0.1%	5.9	0.87	<0.1%	background
75-34-3	1,1-Dichloroethane	600	ND	ND	ND	ND	ND	ND	ND
123-72-8	n-Butanal	-	2.6	0.37	-	2.2	0.32	-	background
156-59-2	1,2-Dichloroethene (cis)	315	ND	ND	ND	ND	ND	ND	ND
78-93-3	MEK	30,000	3.7	0.52	<0.1%	3.9	0.57	<0.1%	0.05
141-78-6	Ethyl Acetate	19,000	2.4	0.34	<0.1%	3.3	0.48	<0.1%	0.14
67-66-3	Chloroform	300	ND	ND	ND	ND	ND	ND	ND
591-76-4	2-Methyl Hexane	-	10.7	1.51	-	13.1	1.92	-	0.41
110-82-7	Cyclohexane	-	8.9	1.26	-	9.6	1.41	-	0.15
71-55-6	1,1,1-Trichloroethane	350,000	2.4	0.34	<0.1%	1.9	0.28	<0.1%	background
56-23-5	Carbon Tetrachloride	7	16.5	2.33	32%	16.2	2.38	33%	0.04
589-34-4	3-Methyl Hexane	-	11.5	1.63	-	13.9	2.04	-	0.41
71-43-2	Benzene[2]	15	3.5	0.50	3%	3.1	0.45	3%	background
107-06-2	1,2-Dichloroethane	6	ND	ND	ND	ND	ND	ND	ND
142-82-5	Heptane	33,000	4.1	0.58	<0.1%	3.5	0.51	<0.1%	background
79-01-6	Trichloroethene	3,500	1.2	0.17	<0.1%	0.8	0.12	<0.1%	background
78-87-5	1,2-Dichloropropane	2,400	ND	ND	ND	ND	ND	ND	ND
108-87-2	Methyl Cyclohexane	-	16.1	2.28	-	12.6	1.85	-	background
108-10-1	MIBK	1,200	ND	ND	ND	ND	ND	ND	ND
108-88-3	Toluene	2,000	37	5.23	0%	24	3.52	0.2%	background
127-18-4	Tetrachloroethene	10,000	7.3	1.03	<0.1%	4.4	0.65	<0.1%	background
123-86-4	Butyl Acetate	735	ND	ND	ND	ND	ND	ND	ND
106-93-4	1,2-Dibromoethane	9	ND	ND	ND	ND	ND	ND	ND
108-90-7	Chlorobenzene	4,200	0.5	0.07	<0.1%	0.1	0.01	<0.1%	background
100-41-4	Ethyl Benzene	3,000	3.9	0.55	<0.1%	3.8	0.56	<0.1%	0.01
111-84-2	Nonane	-	2.6	0.37	-	2.6	0.38	-	0.01
8-38-3/106-42	m/p-Xylene	-	11.4	1.61	-	11.7	1.72	-	0.10
110-12-3	5-Methyl-2-Hexanone	460	ND	ND	ND	ND	ND	ND	ND
95-47-6	o-Xylene	-	3.3	0.47	-	3.5	0.51	-	0.05
100-42-5	Styrene	400	2.6	0.37	<0.1%	1.4	0.21	<0.1%	background
103-65-1	Propyl Benzene	-	2	0.28	-	1.6	0.23	-	background
10-14-4/622-96	m/p-Ethyl Toluene	-	1.9	0.27	-	1.9	0.28	-	0.01
124-18-5	Decane	40	6.1	0.86	2%	7.9	1.16	3%	0.30
108-67-8	1,3,5-Trimethylbenzene	-	1.9	0.27	-	1.9	0.28	-	0.01
611-14-3	o-Ethyl Toluene	-	0.6	0.08	-	0.7	0.10	-	0.02
95-63-6	1,2,4-Trimethylbenzene	500	5.6	0.79	0%	5.4	0.79	0%	background
535-77-3	m-Cymene	-	0.5	0.07	-	0.4	0.06	-	background
138-86-3	Limonene	-	1	0.14	-	1.4	0.21	-	0.06
99-87-6	p-Cymene	-	5.4	0.76	-	6.4	0.94	-	0.17
106-46-7	1,4-Dichlorobenzene	285	3	0.42	0%	2.7	0.40	0%	background
526-73-8	1,2,3-Trimethylbenzene	-	1.9	0.27	-	1.7	0.25	-	background
95-50-1	1,2-Dichlorobenzene	37,000	0.1	0.01	<0.1%	0.1	0.01	<0.1%	0.00
120-82-1	1,2,4-Trichlorobenzene	100	ND	ND	ND	ND	ND	ND	ND
91-20-3	Naphthalene	36	4.1	0.58	2%	3.6	0.53	1%	background
-	TVOCs (Toulene)	-	1190	168.32	-	900	131.96	-	background
-	TVOCs (Quantified)	-	320	45.26	-	290	42.52	-	background
-	Molhave-Clausen TVOCs (Toulene)	-	1190	168.32	-	900	131.96	-	background

**Notes:**

[1] Vinyl Chloride assessed using SIM analysis, which has a lower detection limit.

[2] The limit for Benzene is 15 ug/m<sup>3</sup> based on the Settlement Agreement

[3] Net Landfill Contribution = Downwind Measured Concentration - Upwind Measured Concentration. Where the net landfill contribution was a negative number, the impacts were deemed to be from background sources.

POI = Half Hour Point of Impingement (Ontario Ministry of Environment)

TRACE = Characteristic ions present but too low to be quantified

**Table C-4 : Analytical Results for Ambient VOC Sampling at Ottawa Landfill**

REPORT: 07047b (Method - SCAN ATD-GC-MSD Cryogenic Oven Control)

CAS #	Laboratory Description COMPOUND	POI Ontario (ug/m <sup>3</sup> )	Tube: SS47 Date: July 31, 2008			Tube: SS45 Date: July 31, 2008			Net Landfill Contribution [3] (ug/m <sup>3</sup> )
			08080108	08080108	Upwind Percentage of POI Limit (%)	08080604	08080604	Downwind Percentage of POI Limit (%)	
			Upwind Measured Amount (ng)	Upwind Measured Concentration (ug/m <sup>3</sup> )		Downwind Measured Amount (ng)	Downwind Measured Concentration (ug/m <sup>3</sup> )		
--	Sample Volume (m <sup>3</sup> )	--	--	0.0067	--	--	0.0070	--	--
75-71-8	Dichlorodifluoromethane	1,500,000	5	0.75	<0.1%	8.2	1.18	<0.1%	0.43
75-45-6	Chlorodifluoromethane	1,050,000	6.6	0.99	<0.1%	6	0.86	<0.1%	background
75-01-4	Vinyl Chloride [1]	3	ND	ND	ND	Trace	Trace	<0.1%	ND
78-78-4	2-Methyl Butane	-	14.2	2.13	-	29	4.16	-	2.03
75-69-4	Trichlorofluoromethane	18,000	5.7	0.85	<0.1%	4.2	0.60	<0.1%	background
109-66-0	Pentane	-	1.9	0.28	-	3.5	0.50	-	0.22
64-17-5	Ethanol	19,000	7.8	1.17	<0.1%	24	3.44	<0.1%	2.28
75-35-4	1,1-Dichloroethene	30	ND	ND	ND	ND	ND	ND	ND
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroethane	2,400,000	0.7	0.10	<0.1%	1.8	0.26	<0.1%	0.15
108-20-3	Isopropyl Ether	220	ND	ND	ND	ND	ND	ND	ND
67-64-1	Acetone	48,000	13.8	2.07	<0.1%	28	4.02	<0.1%	1.95
67-63-0	Isopropyl Alcohol	24,000	4.7	0.70	<0.1%	9.4	1.35	<0.1%	0.65
107-83-5	2-Methyl Pentane	-	11.6	1.74	-	5.8	0.83	-	background
75-09-2	Dichloromethane	5,300	17.9	2.68	<0.1%	32	4.59	<0.1%	1.91
96-14-0	3-Methyl Pentane	-	0.4	0.06	-	0.2	0.03	-	background
107-13-1	2-Propenitrile	180	ND	ND	ND	ND	ND	ND	ND
156-60-5	1,2-Dichloroethene (trans)	315	ND	ND	ND	ND	ND	ND	ND
110-54-3	Hexane	35,000	3.8	0.57	<0.1%	2.6	0.37	<0.1%	background
75-34-3	1,1-Dichloroethane	600	ND	ND	ND	ND	ND	ND	ND
123-72-8	n-Butanal	-	0.2	0.03	-	5.5	0.79	-	0.76
156-59-2	1,2-Dichloroethene (cis)	315	ND	ND	ND	0.7	0.10	<0.1%	ND
78-93-3	MEK	30,000	5.8	0.87	<0.1%	23	3.30	<0.1%	2.43
141-78-6	Ethyl Acetate	19,000	2.7	0.40	<0.1%	9.8	1.41	<0.1%	1.00
67-66-3	Chloroform	300	ND	ND	ND	ND	ND	ND	ND
591-76-4	2-Methyl Hexane	-	11.4	1.71	-	11.1	1.59	-	background
110-82-7	Cyclohexane	-	2.3	0.34	-	1.5	0.22	-	background
71-55-6	1,1,1-Trichloroethane	350,000	ND	ND	ND	0.1	0.01	<0.1%	ND
56-23-5	Carbon Tetrachloride	7	ND	ND	ND	ND	ND	ND	ND
589-34-4	3-Methyl Hexane	-	11.8	1.77	-	10	1.43	-	background
71-43-2	Benzene[2]	15	2.8	0.42	3%	1.6	0.23	2%	background
107-06-2	1,2-Dichloroethane	6	ND	ND	ND	ND	ND	ND	ND
142-82-5	Heptane	33,000	5.3	0.79	<0.1%	6	0.86	<0.1%	0.07
79-01-6	Trichloroethene	3,500	0.3	0.04	<0.1%	0.5	0.07	<0.1%	0.03
78-87-5	1,2-Dichloropropane	2,400	ND	ND	ND	ND	ND	ND	ND
108-87-2	Methyl Cyclohexane	-	16.6	2.49	-	6.6	0.95	-	background
108-10-1	MIBK	1,200	ND	ND	ND	ND	ND	ND	ND
108-88-3	Toluene	2,000	29	4.34	0%	43	6.17	0.3%	1.83
127-18-4	Tetrachloroethene	10,000	5.2	0.78	<0.1%	7.8	1.12	<0.1%	0.34
123-86-4	Butyl Acetate	735	ND	ND	ND	ND	ND	ND	ND
106-93-4	1,2-Dibromoethane	9	ND	ND	ND	ND	ND	ND	ND
108-90-7	Chlorobenzene	4,200	Trace	Trace	<0.1%	0.3	0.04	<0.1%	0.04
100-41-4	Ethyl Benzene	3,000	1.9	0.28	<0.1%	9.9	1.42	<0.1%	1.14
111-84-2	Nonane	-	0.9	0.13	-	1.8	0.26	-	0.12
8-38-3/106-42	m/p-Xylene	-	6.7	1.00	-	26	3.73	-	2.73
110-12-3	5-Methyl-2-Hexanone	460	ND	ND	ND	ND	ND	ND	ND
95-47-6	o-Xylene	-	2.2	0.33	-	6.5	0.93	-	0.60
100-42-5	Styrene	400	1.4	0.21	<0.1%	3.8	0.55	0%	0.34
103-65-1	Propyl Benzene	-	0.7	0.10	-	2.8	0.40	-	0.30
10-14-4/622-96	m/p-Ethyl Toluene	-	0.9	0.13	-	3.1	0.44	-	0.31
124-18-5	Decane	40	3	0.45	1%	10.6	1.52	4%	1.07
108-67-8	1,3,5-Trimethylbenzene	-	1.6	0.24	-	4.2	0.60	-	0.36
611-14-3	o-Ethyl Toluene	-	0.3	0.04	-	1.3	0.19	-	0.14
95-63-6	1,2,4-Trimethylbenzene	500	1.9	0.28	<0.1%	8.1	1.16	0%	0.88
535-77-3	m-Cymene	-	0.2	0.03	-	1.2	0.17	-	0.14
138-86-3	Limonene	-	0.8	0.12	-	5.2	0.75	-	0.63
99-87-6	p-Cymene	-	8.9	1.33	-	62	8.90	-	7.56
106-46-7	1,4-Dichlorobenzene	285	1.1	0.16	<0.1%	3.8	0.55	0%	0.38
526-73-8	1,2,3-Trimethylbenzene	-	0.5	0.07	-	3.2	0.46	-	0.38
95-50-1	1,2-Dichlorobenzene	37,000	Trace	Trace	<0.1%	0.2	0.03	<0.1%	0.03
120-82-1	1,2,4-Trichlorobenzene	100	ND	ND	ND	ND	ND	ND	ND
91-20-3	Naphthalene	36	ND	ND	ND	ND	ND	ND	ND
-	TVOCs (Toulene)	-	860	128.74	-	1060	152.08	-	23.34
-	TVOCs (Quantified)	-	220	32.93	-	440	63.13	-	30.19
-	Molhave-Clausen TVOCs (Toulene)	-	860	128.74	-	1060	152.08	-	23.34

**Notes:**

[1] Vinyl Chloride assessed using SIM analysis, which has a lower detection limit.

[2] The limit for Benzene is 15 ug/m<sup>3</sup> based on the Settlement Agreement

[3] Net Landfill Contribution = Downwind Measured Concentration - Upwind Measured Concentration. Where the net landfill contribution was a negative number, the impacts were deemed to be from background sources.

POI = Half Hour Point of Impingement (Ontario Ministry of Environment)

TRACE = Characteristic ions present but too low to be quantified

**Table C-5 : Analytical Results for Ambient VOC Sampling at Ottawa Landfill**

REPORT: 07047b (Method - SCAN ATD-GC-MSD Cryogenic Oven Control)

CAS #	Laboratory Description COMPOUND	POI Ontario (ug/m <sup>3</sup> )	Tube: SS72 Date: Aug 27, 2008			Tube: SS74 Date: August 27, 2008			Net Landfill Contribution [3] (ug/m <sup>3</sup> )
			08080108	08080108	Upwind Percentage of POI Limit (%)	08090303	08090303	Downwind Percentage of POI Limit (%)	
			Upwind Measured Amount (ng)	Upwind Measured Concentration (ug/m <sup>3</sup> )		Downwind Measured Amount (ng)	Downwind Measured Concentration (ug/m <sup>3</sup> )		
--	Sample Volume (m <sup>3</sup> )	--	--	0.0208	--	--	0.0208	--	--
75-71-8	Dichlorodifluoromethane	1,500,000	5.5	0.26	<0.1%	5.2	0.25	<0.1%	background
75-45-6	Chlorodifluoromethane	1,050,000	0.9	0.04	<0.1%	1.3	0.06	<0.1%	0.02
75-01-4	Vinyl Chloride [1]	3	ND	ND	ND	ND	ND	ND	ND
78-78-4	2-Methyl Butane	-	30	1.44	-	47	2.26	-	0.81
75-69-4	Trichlorofluoromethane	18,000	34	1.64	<0.1%	33	1.59	<0.1%	background
109-66-0	Pentane	-	6.3	0.30	-	11.5	0.55	-	0.25
64-17-5	Ethanol	19,000	17.2	0.83	<0.1%	31	1.49	<0.1%	0.66
75-35-4	1,1-Dichloroethene	30	0.1	0.00	<0.1%	Trace	Trace	<0.1%	background
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroethane	2,400,000	14.9	0.72	<0.1%	14.2	0.68	<0.1%	background
108-20-3	Isopropyl Ether	220	ND	ND	ND	ND	ND	ND	ND
67-64-1	Acetone	48,000	63	3.03	<0.1%	41	1.97	<0.1%	background
67-63-0	Isopropyl Alcohol	24,000	4.9	0.24	<0.1%	3.3	0.16	<0.1%	background
107-83-5	2-Methyl Pentane	-	5.7	0.27	-	11.3	0.54	-	0.27
75-09-2	Dichloromethane	5,300	14.7	0.71	<0.1%	26	1.25	<0.1%	0.54
96-14-0	3-Methyl Pentane	-	3.3	0.16	-	6	0.29	-	0.13
107-13-1	2-Propenitrile	180	ND	ND	ND	ND	ND	ND	ND
156-60-5	1,2-Dichloroethene (trans)	315	ND	ND	ND	ND	ND	ND	ND
110-54-3	Hexane	35,000	3.4	0.16	<0.1%	6.2	0.30	<0.1%	0.13
75-34-3	1,1-Dichloroethane	600	ND	ND	ND	ND	ND	ND	ND
123-72-8	n-Butanal	-	12.9	0.62	-	6.4	0.31	-	background
156-59-2	1,2-Dichloroethene (cis)	315	ND	ND	ND	ND	ND	ND	ND
78-93-3	MEK	30,000	12.9	0.62	<0.1%	13.8	0.66	<0.1%	0.04
141-78-6	Ethyl Acetate	19,000	5.6	0.27	<0.1%	7.7	0.37	<0.1%	0.10
67-66-3	Chloroform	300	2.5	0.12	<0.1%	3.6	0.17	<0.1%	0.05
591-76-4	2-Methyl Hexane	-	14.1	0.68	-	25	1.20	-	0.52
110-82-7	Cyclohexane	-	3.1	0.15	-	4.2	0.20	-	0.05
71-55-6	1,1,1-Trichloroethane	350,000	9.7	0.47	<0.1%	9	0.43	<0.1%	background
56-23-5	Carbon Tetrachloride	7	68	3.27	45%	71	3.41	47%	0.14
589-34-4	3-Methyl Hexane	-	13.4	0.65	-	24	1.15	-	0.51
71-43-2	Benzene[2]	15	2.8	0.13	1%	6	0.29	2%	0.15
107-06-2	1,2-Dichloroethane	6	ND	ND	ND	ND	ND	ND	ND
142-82-5	Heptane	33,000	3.3	0.16	<0.1%	4.4	0.21	<0.1%	0.05
79-01-6	Trichloroethene	3,500	0.6	0.03	<0.1%	0.6	0.03	<0.1%	background
78-87-5	1,2-Dichloropropane	2,400	ND	ND	ND	ND	ND	ND	ND
108-87-2	Methyl Cyclohexane	-	11.3	0.54	-	13.1	0.63	-	0.09
108-10-1	MIBK	1,200	ND	ND	ND	ND	ND	ND	ND
108-88-3	Toluene	2,000	18.5	0.89	<0.1%	71	3.41	0.2%	2.52
127-18-4	Tetrachloroethene	10,000	3.2	0.15	<0.1%	3.5	0.17	<0.1%	0.01
123-86-4	Butyl Acetate	735	ND	ND	ND	ND	ND	ND	ND
106-93-4	1,2-Dibromoethane	9	ND	ND	ND	ND	ND	ND	ND
108-90-7	Chlorobenzene	4,200	1.3	0.06	<0.1%	0.5	0.02	<0.1%	background
100-41-4	Ethyl Benzene	3,000	2.5	0.12	<0.1%	9.4	0.45	<0.1%	0.33
111-84-2	Nonane	-	3.2	0.15	-	2	0.10	-	background
8-38-3/106-42	m/p-Xylene	-	7.4	0.36	-	37	1.78	-	1.42
110-12-3	5-Methyl-2-Hexanone	460	ND	ND	ND	ND	ND	ND	ND
95-47-6	o-Xylene	-	2.3	0.11	-	14.8	0.71	-	0.60
100-42-5	Styrene	400	1	0.05	<0.1%	1.1	0.05	<0.1%	0.00
103-65-1	Propyl Benzene	-	1.3	0.06	-	5.9	0.28	-	0.22
10-14-4/622-96	m/p-Ethyl Toluene	-	1	0.05	-	7.9	0.38	-	0.33
124-18-5	Decane	40	4.5	0.22	1%	5.3	0.25	1%	0.04
108-67-8	1,3,5-Trimethylbenzene	-	1.3	0.06	-	6.1	0.29	-	0.23
611-14-3	o-Ethyl Toluene	-	0.5	0.02	-	2	0.10	-	0.07
95-63-6	1,2,4-Trimethylbenzene	500	2	0.10	<0.1%	17.9	0.86	0%	0.76
535-77-3	m-Cymene	-	0.4	0.02	-	0.9	0.04	-	0.02
138-86-3	Limonene	-	0.8	0.04	-	0.6	0.03	-	background
99-87-6	p-Cymene	-	3.3	0.16	-	3.1	0.15	-	background
106-46-7	1,4-Dichlorobenzene	285	3.9	0.19	<0.1%	3.3	0.16	<0.1%	background
526-73-8	1,2,3-Trimethylbenzene	-	1.1	0.05	-	4.3	0.21	-	0.15
95-50-1	1,2-Dichlorobenzene	37,000	0.2	0.01	<0.1%	Trace	Trace	<0.1%	background
120-82-1	1,2,4-Trichlorobenzene	100	ND	ND	ND	ND	ND	ND	ND
91-20-3	Naphthalene	36	2.6	0.13	0%	3.5	0.17	0%	0.04
-	TVOCs (Toulene)	-	740	35.63	-	910	43.71	-	8.08
-	TVOCs (Quantified)	-	430	20.70	-	630	30.26	-	9.56
-	Molhave-Clausen TVOCs (Toulene)	-	740	35.63	-	910	43.71	-	8.08

**Notes:**

[1] Vinyl Chloride assessed using SIM analysis, which has a lower detection limit.

[2] The limit for Benzene is 15 ug/m<sup>3</sup> based on the Settlement Agreement

[3] Net Landfill Contribution = Downwind Measured Concentration - Upwind Measured Concentration. Where the net landfill contribution was a negative number, the impacts were deemed to be from background sources.

POI = Half Hour Point of Impingement (Ontario Ministry of Environment)

TRACE = Characteristic ions present but too low to be quantified

**Table C-6 : Analytical Results for Ambient VOC Sampling at Ottawa Landfill**

REPORT: 07047b (Method - SCAN ATD-GC-MSD Cryogenic Oven Control)

CAS #	Laboratory Description  COMPOUND	POI Ontario (ug/m <sup>3</sup> )	Tube: SS90 Date: Aug 28, 2008			Tube: SS71 Date: Aug 28, 2008			Net Landfill Contribution [3] (ug/m <sup>3</sup> )
			08080108	08080108	Upwind Percentage of POI Limit (%)	08090305	08090305	Downwind Percentage of POI Limit (%)	
			Upwind Measured Amount (ng)	Upwind Measured Concentration (ug/m <sup>3</sup> )		Downwind Measured Amount (ng)	Downwind Measured Concentration (ug/m <sup>3</sup> )		
--	Sample Volume (m <sup>3</sup> )	--	--	0.0200	--	--	0.0206	--	--
75-71-8	Dichlorodifluoromethane	1,500,000	5.7	0.29	<0.1%	4.7	0.23	<0.1%	background
75-45-6	Chlorodifluoromethane	1,050,000	0.7	0.04	<0.1%	1.6	0.08	<0.1%	0.04
75-01-4	Vinyl Chloride [1]	3	ND	ND	ND	ND	ND	ND	ND
78-78-4	2-Methyl Butane	-	28	1.40	-	19.5	0.95	-	background
75-69-4	Trichlorofluoromethane	18,000	33	1.65	<0.1%	29	1.41	<0.1%	background
109-66-0	Pentane	-	7.6	0.38	-	5.4	0.26	-	background
64-17-5	Ethanol	19,000	29	1.45	<0.1%	35	1.70	<0.1%	0.24
75-35-4	1,1-Dichloroethene	30	ND	ND	ND	Trace	Trace	<0.1%	ND
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroethane	2,400,000	13	0.65	<0.1%	11.9	0.58	<0.1%	background
108-20-3	Isopropyl Ether	220	ND	ND	ND	ND	ND	ND	ND
67-64-1	Acetone	48,000	46	2.31	<0.1%	38	1.84	<0.1%	background
67-63-0	Isopropyl Alcohol	24,000	3	0.15	<0.1%	6.1	0.30	<0.1%	0.15
107-83-5	2-Methyl Pentane	-	5.8	0.29	-	6.5	0.32	-	0.02
75-09-2	Dichloromethane	5,300	20	1.00	<0.1%	19.9	0.97	<0.1%	background
96-14-0	3-Methyl Pentane	-	2.9	0.15	-	6.7	0.33	-	0.18
107-13-1	2-Propenitrile	180	ND	ND	ND	ND	ND	ND	ND
156-60-5	1,2-Dichloroethene (trans)	315	ND	ND	ND	ND	ND	ND	ND
110-54-3	Hexane	35,000	3	0.15	<0.1%	3.2	0.16	<0.1%	0.00
75-34-3	1,1-Dichloroethane	600	ND	ND	ND	ND	ND	ND	ND
123-72-8	n-Butanal	-	ND	ND	-	4.8	0.23	-	ND
156-59-2	1,2-Dichloroethene (cis)	315	ND	ND	ND	ND	ND	ND	ND
78-93-3	MEK	30,000	13.7	0.69	<0.1%	14.9	0.72	<0.1%	0.04
141-78-6	Ethyl Acetate	19,000	16.1	0.81	<0.1%	127	6.16	<0.1%	5.36
67-66-3	Chloroform	300	2.2	0.11	<0.1%	2.3	0.11	<0.1%	0.00
591-76-4	2-Methyl Hexane	-	11.8	0.59	-	7.3	0.35	-	background
110-82-7	Cyclohexane	-	3	0.15	-	2.2	0.11	-	background
71-55-6	1,1,1-Trichloroethane	350,000	8.6	0.43	<0.1%	8.6	0.42	<0.1%	background
56-23-5	Carbon Tetrachloride	7	64	3.21	45%	65	3.15	44%	background
589-34-4	3-Methyl Hexane	-	15.3	0.77	-	7.9	0.38	-	background
71-43-2	Benzene[2]	15	5.1	0.26	2%	4.4	0.21	1%	background
107-06-2	1,2-Dichloroethane	6	ND	ND	ND	ND	ND	ND	ND
142-82-5	Heptane	33,000	2.8	0.14	<0.1%	1.8	0.09	<0.1%	background
79-01-6	Trichloroethene	3,500	1.3	0.07	<0.1%	0.6	0.03	<0.1%	background
78-87-5	1,2-Dichloropropane	2,400	ND	ND	ND	Trace	Trace	<0.1%	ND
108-87-2	Methyl Cyclohexane	-	9	0.45	-	6.7	0.33	-	background
108-10-1	MIBK	1,200	ND	ND	ND	ND	ND	ND	ND
108-88-3	Toluene	2,000	50	2.51	0%	96	4.66	0.2%	2.15
127-18-4	Tetrachloroethene	10,000	4.4	0.22	<0.1%	3.7	0.18	<0.1%	background
123-86-4	Butyl Acetate	735	ND	ND	ND	ND	ND	ND	ND
106-93-4	1,2-Dibromoethane	9	ND	ND	ND	ND	ND	ND	ND
108-90-7	Chlorobenzene	4,200	0.4	0.02	<0.1%	0.4	0.02	<0.1%	background
100-41-4	Ethyl Benzene	3,000	3.4	0.17	<0.1%	2.2	0.11	<0.1%	background
111-84-2	Nonane	-	1.8	0.09	-	1.3	0.06	-	background
8-38-3/106-42	m/p-Xylene	-	9.9	0.50	-	6.1	0.30	-	background
110-12-3	5-Methyl-2-Hexanone	460	ND	ND	ND	ND	ND	ND	ND
95-47-6	o-Xylene	-	3.3	0.17	-	2.1	0.10	-	background
100-42-5	Styrene	400	1	0.05	<0.1%	0.8	0.04	<0.1%	background
103-65-1	Propyl Benzene	-	1.5	0.08	-	0.9	0.04	-	background
10-14-4/622-96	m/p-Ethyl Toluene	-	1.7	0.09	-	0.9	0.04	-	background
124-18-5	Decane	40	4.8	0.24	1%	3.5	0.17	0%	background
108-67-8	1,3,5-Trimethylbenzene	-	1.5	0.08	-	0.9	0.04	-	background
611-14-3	o-Ethyl Toluene	-	0.5	0.03	-	0.3	0.01	-	background
95-63-6	1,2,4-Trimethylbenzene	500	3.5	0.18	<0.1%	2.3	0.11	<0.1%	background
535-77-3	m-Cymene	-	0.3	0.02	-	0.2	0.01	-	background
138-86-3	Limonene	-	0.8	0.04	-	0.7	0.03	-	background
99-87-6	p-Cymene	-	3.4	0.17	-	2.9	0.14	-	background
106-46-7	1,4-Dichlorobenzene	285	3.5	0.18	<0.1%	4.2	0.20	<0.1%	0.03
526-73-8	1,2,3-Trimethylbenzene	-	1.5	0.08	-	1	0.05	-	background
95-50-1	1,2-Dichlorobenzene	37,000	ND	ND	ND	Trace	Trace	<0.1%	ND
120-82-1	1,2,4-Trichlorobenzene	100	ND	ND	ND	ND	ND	ND	ND
91-20-3	Naphthalene	36	3.2	0.16	0%	3.5	0.17	0%	0.01
-	TVOCs (Toulene)	-	390	19.55	-	610	29.60	-	10.05
-	TVOCs (Quantified)	-	450	22.56	-	570	27.66	-	5.10
-	Molhave-Clausen TVOCs (Toulene)	-	390	19.55	-	610	29.60	-	10.05

**Notes:**

[1] Vinyl Chloride assessed using SIM analysis, which has a lower detection limit.

[2] The limit for Benzene is 15 ug/m<sup>3</sup> based on the Settlement Agreement

[3] Net Landfill Contribution = Downwind Measured Concentration - Upwind Measured Concentration. Where the net landfill contribution was a negative number, the impacts were deemed to be from background sources.

POI = Half Hour Point of Impingement (Ontario Ministry of Environment)

TRACE = Characteristic ions present but too low to be quantified



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**Tables D 1-7**

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**Table D1 : Analytical Results for Ambient TRS Sampling at Ottawa Landfill - June 24, 2008**

Laboratory: Air Zone One  
 Project Number: J8076-1  
 Client #: W07-5258C  
 Report Date: June 25, 2008  
 Analysis Date: June 25, 2008  
 Analytical Method: Gas Chromatography/Flame Photometric Detection (GC/FPD)  
 Sample Type: 3L Tedlar Bag

CAS #	COMPOUND	POI Ontario (ug/m <sup>3</sup> )	Detection Limit (ppm)	Detection Limit (ug/m <sup>3</sup> ) [1]	Upwind (ppm)	Upwind (ug/m <sup>3</sup> )	Downwind (ppm)	Downwind (ug/m <sup>3</sup> )	Net Landfill Impact [4] (ug/m <sup>3</sup> )
7783-06-4	Hydrogen Sulfide	30	0.01	14.2	<0.01	ND	<0.01	ND	ND
463-58-1	Carbonyl Sulfide	-	0.01	25	<0.01	ND	<0.01	ND	ND
74-93-1	Methyl mercaptan [2]	20	0.01	20	<0.01	ND	<0.01	ND	ND
75-08-1	Ethyl Mercaptan [2]	20	0.01	25.8	<0.01	ND	<0.01	ND	ND
75-18-3	Dimethyl Sulfide	30	0.01	25.8	<0.01	ND	<0.01	ND	ND
75-15-0	Carbon Disulfide	330	0.005	15.8	<0.005	ND	<0.005	ND	ND
75-33-2	Iso-Propyl mercaptan	-	0.01	31.7	<0.01	ND	<0.01	ND	ND
75-66-1	ter-Butyl mercaptan	-	0.01	37.5	<0.01	ND	<0.01	ND	ND
107-03-9	n-Propyl mercaptan	-	0.01	31.7	<0.01	ND	<0.01	ND	ND
110-02-1	Thiophene	-	0.01	35	<0.01	ND	<0.01	ND	ND
352-93-2	Diethyl sulfide	-	0.01	37.5	<0.01	ND	<0.01	ND	ND
109-79-5	n-Butyl mercaptan	-	0.01	37.5	<0.01	ND	<0.01	ND	ND
624-92-0	Dimethyl Disulfide	40	0.005	19.6	<0.005	ND	<0.005	ND	ND
554-14-3	2-Methyl thiophene	-	0.01	40.8	<0.01	ND	<0.01	ND	ND
616-44-4	3-Methyl thiophene	-	0.01	40.8	<0.01	ND	<0.01	ND	ND
110-66-7	Amyl mercaptan	-	0.01	43.3	<0.01	ND	<0.01	ND	ND
592-88-1	Di-allyl sulfide	-	0.01	47.5	<0.01	ND	<0.01	ND	ND
638-02-8	2,5-Dimethyl thiophene	-	0.01	46.7	<0.01	ND	<0.01	ND	ND
	Total Reduced Sulphurs [3]	40	-		<0.01	ND	<0.01	ND	ND

**Notes:**

[1] Conversion from ppm to ug/m<sup>3</sup> assumed a temperature of 20 degrees Celcius.

[2] The POI for this compound is based on total mercaptans as methyl mercaptan.

[3] Total Reduced Sulphurs calculated as the sum of all the detectable concentrations of the individual reduced sulphur compounds listed above.

[4] Net Landfill Impact = Downwind Measured Concentration - Upwind Measured Concentration.

ND: Compound concentration less than the detection limit, therefore, the compound was not detected.

Comment: The samples were analyzed 30 minutes after receipt by the lab

**Table D2 : Analytical Results for Ambient TRS Sampling at Ottawa Landfill - June 26, 2008**

Laboratory: Air Zone One  
 Project Number: J8076-2  
 Client #: W07-5258C  
 Report Date: June 30, 2008  
 Analysis Date: June 27, 2008  
 Analytical Method: Gas Chromatography/Flame Photometric Detection (GC/FPD)  
 Sample Type: 3L Tedlar Bag

CAS #	COMPOUND	POI Ontario (ug/m <sup>3</sup> )	Detection Limit (ppm)	Detection Limit (ug/m <sup>3</sup> ) [1]	Upwind (ppm)	Upwind (ug/m <sup>3</sup> )	Downwind (ppm)	Downwind (ug/m <sup>3</sup> )	Net Landfill Impact [4] (ug/m <sup>3</sup> )
7783-06-4	Hydrogen Sulfide	30	0.01	14.2	<0.01	ND	<0.01	ND	ND
463-58-1	Carbonyl Sulfide	-	0.01	25	<0.01	ND	<0.01	ND	ND
74-93-1	Methyl mercaptan [2]	20	0.01	20	<0.01	ND	<0.01	ND	ND
75-08-1	Ethyl Mercaptan [2]	20	0.01	25.8	<0.01	ND	<0.01	ND	ND
75-18-3	Dimethyl Sulfide	30	0.01	25.8	<0.01	ND	<0.01	ND	ND
75-15-0	Carbon Disulfide	330	0.005	15.8	<0.005	ND	<0.005	ND	ND
75-33-2	Iso-Propyl mercaptan	-	0.01	31.7	<0.01	ND	<0.01	ND	ND
75-66-1	ter-Butyl mercaptan	-	0.01	37.5	<0.01	ND	<0.01	ND	ND
107-03-9	n-Propyl mercaptan	-	0.01	31.7	<0.01	ND	<0.01	ND	ND
110-02-1	Thiophene	-	0.01	35	<0.01	ND	<0.01	ND	ND
352-93-2	Diethyl sulfide	-	0.01	37.5	<0.01	ND	<0.01	ND	ND
109-79-5	n-Butyl mercaptan	-	0.01	37.5	<0.01	ND	<0.01	ND	ND
624-92-0	Dimethyl Disulfide	40	0.005	19.6	<0.005	ND	<0.005	ND	ND
554-14-3	2-Methyl thiophene	-	0.01	40.8	<0.01	ND	<0.01	ND	ND
616-44-4	3-Methyl thiophene	-	0.01	40.8	<0.01	ND	<0.01	ND	ND
110-66-7	Amyl mercaptan	-	0.01	43.3	<0.01	ND	<0.01	ND	ND
592-88-1	Di-allyl sulfide	-	0.01	47.5	<0.01	ND	<0.01	ND	ND
638-02-8	2,5-Dimethyl thiophene	-	0.01	46.7	<0.01	ND	<0.01	ND	ND
	Total Reduced Sulphurs [3]	40			<0.01	ND	<0.01	ND	ND

**Notes:**

- [1] Conversion from ppm to ug/m<sup>3</sup> assumed a temperature of 20 degrees Celcius.
  - [2] The POI for this compound is based on total mercaptans as methyl mercaptan.
  - [3] Total Reduced Sulphurs calculated as the sum of all the detectable concentrations of the individual reduced sulphur compounds listed above.
  - [4] Net Landfill Impact = Downwind Measured Concentration - Upwind Measured Concentration.
- ND: Compound concentration less than the detection limit, therefore, the compound was not detected.
- Comment: The samples were analyzed 30 minutes after receipt by the lab

**Table D3 : Analytical Results for Ambient TRS Sampling at Ottawa Landfill - July 22, 2008**

Laboratory: Air Zone One  
 Project Number: J8076-3  
 Client #: W07-5258C  
 Report Date: July 28, 2008  
 Analysis Date: July 25, 2008  
 Analytical Method: Gas Chromatography/Flame Photometric Detection (GC/FPD)  
 Sample Type: 3L Tedlar Bag

CAS #	COMPOUND	POI Ontario (ug/m <sup>3</sup> )	Detection Limit (ppm)	Detection Limit (ug/m <sup>3</sup> ) [1]	Upwind (ppm)	Upwind (ug/m <sup>3</sup> )	Downwind (ppm)	Downwind (ug/m <sup>3</sup> )	Net Landfill Impact [4] (ug/m <sup>3</sup> )
7783-06-4	Hydrogen Sulfide	30	0.01	14.2	<0.01	ND	<0.01	ND	ND
463-58-1	Carbonyl Sulfide	-	0.01	25	<0.01	ND	<0.01	ND	ND
74-93-1	Methyl mercaptan [2]	20	0.01	20	<0.01	ND	<0.01	ND	ND
75-08-1	Ethyl Mercaptan [2]	20	0.01	25.8	<0.01	ND	<0.01	ND	ND
75-18-3	Dimethyl Sulfide	30	0.01	25.8	<0.01	ND	<0.01	ND	ND
75-15-0	Carbon Disulfide	330	0.005	15.8	<0.005	ND	<0.005	ND	ND
75-33-2	Iso-Propyl mercaptan	-	0.01	31.7	<0.01	ND	<0.01	ND	ND
75-66-1	ter-Butyl mercaptan	-	0.01	37.5	<0.01	ND	<0.01	ND	ND
107-03-9	n-Propyl mercaptan	-	0.01	31.7	<0.01	ND	<0.01	ND	ND
110-02-1	Thiophene	-	0.01	35	<0.01	ND	<0.01	ND	ND
352-93-2	Diethyl sulfide	-	0.01	37.5	<0.01	ND	<0.01	ND	ND
109-79-5	n-Butyl mercaptan	-	0.01	37.5	<0.01	ND	<0.01	ND	ND
624-92-0	Dimethyl Disulfide	40	0.005	19.6	<0.005	ND	<0.005	ND	ND
554-14-3	2-Methyl thiophene	-	0.01	40.8	<0.01	ND	<0.01	ND	ND
616-44-4	3-Methyl thiophene	-	0.01	40.8	<0.01	ND	<0.01	ND	ND
110-66-7	Amyl mercaptan	-	0.01	43.3	<0.01	ND	<0.01	ND	ND
592-88-1	Di-allyl sulfide	-	0.01	47.5	<0.01	ND	<0.01	ND	ND
638-02-8	2,5-Dimethyl thiophene	-	0.01	46.7	<0.01	ND	<0.01	ND	ND
	Total Reduced Sulphurs [3]	40			<0.01	ND	<0.01	ND	ND

**Notes:**

[1] Conversion from ppm to ug/m<sup>3</sup> assumed a temperature of 20 degrees Celcius.

[2] The POI for this compound is based on total mercaptans as methyl mercaptan.

[3] Total Reduced Sulphurs calculated as the sum of all the detectable concentrations of the individual reduced sulphur compounds listed above.

[4] Net Landfill Impact = Downwind Measured Concentration - Upwind Measured Concentration.

ND: Compound concentration less than the detection limit, therefore, the compound was not detected.

Comment: The samples were analyzed 30 minutes after receipt by the lab

**Table D4: Analytical Results for Ambient TRS Sampling at Ottawa Landfill - July 31, 2008**

Laboratory: Air Zone One  
 Project Number: J8076-4  
 Client #: W07-5258C  
 Report Date: August 1, 2008  
 Analysis Date: July 31, 2008  
 Analytical Method: Gas Chromatography/Flame Photometric Detection (GC/FPD)  
 Sample Type: 3L Tedlar Bag

CAS #	COMPOUND	POI Ontario (ug/m <sup>3</sup> )	Detection Limit (ppm)	Detection Limit (ug/m <sup>3</sup> ) [1]	Upwind (ppm)	Upwind (ug/m <sup>3</sup> )	Downwind (ppm)	Downwind (ug/m <sup>3</sup> )	Net Landfill Impact [4] (ug/m <sup>3</sup> )
7783-06-4	Hydrogen Sulfide	30	0.01	14.2	<0.01	ND	<0.01	ND	ND
463-58-1	Carbonyl Sulfide	-	0.01	25	<0.01	ND	<0.01	ND	ND
74-93-1	Methyl mercaptan [2]	20	0.01	20	<0.01	ND	<0.01	ND	ND
75-08-1	Ethyl Mercaptan [2]	20	0.01	25.8	<0.01	ND	<0.01	ND	ND
75-18-3	Dimethyl Sulfide	30	0.01	25.8	<0.01	ND	<0.01	ND	ND
75-15-0	Carbon Disulfide	330	0.005	15.8	<0.005	ND	<0.005	ND	ND
75-33-2	Iso-Propyl mercaptan	-	0.01	31.7	<0.01	ND	<0.01	ND	ND
75-66-1	ter-Butyl mercaptan	-	0.01	37.5	<0.01	ND	<0.01	ND	ND
107-03-9	n-Propyl mercaptan	-	0.01	31.7	<0.01	ND	<0.01	ND	ND
110-02-1	Thiophene	-	0.01	35	<0.01	ND	<0.01	ND	ND
352-93-2	Diethyl sulfide	-	0.01	37.5	<0.01	ND	<0.01	ND	ND
109-79-5	n-Butyl mercaptan	-	0.01	37.5	<0.01	ND	<0.01	ND	ND
624-92-0	Dimethyl Disulfide	40	0.005	19.6	<0.005	ND	<0.005	ND	ND
554-14-3	2-Methyl thiophene	-	0.01	40.8	<0.01	ND	<0.01	ND	ND
616-44-4	3-Methyl thiophene	-	0.01	40.8	<0.01	ND	<0.01	ND	ND
110-66-7	Amyl mercaptan	-	0.01	43.3	<0.01	ND	<0.01	ND	ND
592-88-1	Di-allyl sulfide	-	0.01	47.5	<0.01	ND	<0.01	ND	ND
638-02-8	2,5-Dimethyl thiophene	-	0.01	46.7	<0.01	ND	<0.01	ND	ND
	Total Reduced Sulphurs [3]	40			<0.01	ND	<0.01	ND	ND

**Notes:**

[1] Conversion from ppm to ug/m<sup>3</sup> assumed a temperature of 20 degrees Celcius.

[2] The POI for this compound is based on total mercaptans as methyl mercaptan.

[3] Total Reduced Sulphurs calculated as the sum of all the detectable concentrations of the individual reduced sulphur compounds listed above.

[4] Net Landfill Impact = Downwind Measured Concentration - Upwind Measured Concentration.

ND: Compound concentration less than the detection limit, therefore, the compound was not detected.

Comment: The samples were analyzed 30 minutes after receipt by the lab

**Table D5: Analytical Results for Ambient TRS Sampling at Ottawa Landfill - August 27, 2008**

Laboratory: Air Zone One  
 Project Number: J8076-5  
 Client #: W07-5258C  
 Report Date: August 28, 2008  
 Analysis Date: August 28, 2008  
 Analytical Method: Gas Chromatography/Flame Photometric Detection (GC/FPD)  
 Sample Type: 3L Tedlar Bag

CAS #	COMPOUND	POI Ontario (ug/m <sup>3</sup> )	Detection Limit (ppm)	Detection Limit (ug/m <sup>3</sup> ) [1]	Upwind (ppm)	Upwind (ug/m <sup>3</sup> )	Downwind (ppm)	Downwind (ug/m <sup>3</sup> )	Net Landfill Impact [4] (ug/m <sup>3</sup> )
7783-06-4	Hydrogen Sulfide	30	0.01	14.2	<0.01	ND	<0.01	ND	ND
463-58-1	Carbonyl Sulfide	-	0.01	25	<0.01	ND	<0.01	ND	ND
74-93-1	Methyl mercaptan [2]	20	0.01	20	<0.01	ND	<0.01	ND	ND
75-08-1	Ethyl Mercaptan [2]	20	0.01	25.8	<0.01	ND	<0.01	ND	ND
75-18-3	Dimethyl Sulfide	30	0.01	25.8	<0.01	ND	<0.01	ND	ND
75-15-0	Carbon Disulfide	330	0.005	15.8	<0.005	ND	<0.005	ND	ND
75-33-2	Iso-Propyl mercaptan	-	0.01	31.7	<0.01	ND	<0.01	ND	ND
75-66-1	ter-Butyl mercaptan	-	0.01	37.5	<0.01	ND	<0.01	ND	ND
107-03-9	n-Propyl mercaptan	-	0.01	31.7	<0.01	ND	<0.01	ND	ND
110-02-1	Thiophene	-	0.01	35	<0.01	ND	<0.01	ND	ND
352-93-2	Diethyl sulfide	-	0.01	37.5	<0.01	ND	<0.01	ND	ND
109-79-5	n-Butyl mercaptan	-	0.01	37.5	<0.01	ND	<0.01	ND	ND
624-92-0	Dimethyl Disulfide	40	0.005	19.6	<0.005	ND	<0.005	ND	ND
554-14-3	2-Methyl thiophene	-	0.01	40.8	<0.01	ND	<0.01	ND	ND
616-44-4	3-Methyl thiophene	-	0.01	40.8	<0.01	ND	<0.01	ND	ND
110-66-7	Amyl mercaptan	-	0.01	43.3	<0.01	ND	<0.01	ND	ND
592-88-1	Di-allyl sulfide	-	0.01	47.5	<0.01	ND	<0.01	ND	ND
638-02-8	2,5-Dimethyl thiophene	-	0.01	46.7	<0.01	ND	<0.01	ND	ND
	Total Reduced Sulphurs [3]	40			<0.01	ND	<0.01	ND	ND

**Notes:**

- [1] Conversion from ppm to ug/m<sup>3</sup> assumed a temperature of 20 degrees Celcius.
  - [2] The POI for this compound is based on total mercaptans as methyl mercaptan.
  - [3] Total Reduced Sulphurs calculated as the sum of all the detectable concentrations of the individual reduced sulphur compounds listed above.
  - [4] Net Landfill Impact = Downwind Measured Concentration - Upwind Measured Concentration.
- ND: Compound concentration less than the detection limit, therefore, the compound was not detected.
- Comment: The samples were analyzed 30 minutes after receipt by the lab

**Table D6: Analytical Results for Ambient TRS Sampling at Ottawa Landfill - August 28, 2008**

Laboratory: Air Zone One  
 Project Number: J8076-6  
 Client #: W07-5258C  
 Report Date: August 29, 2008  
 Analysis Date: August 29, 2008  
 Analytical Method: Gas Chromatography/Flame Photometric Detection (GC/FPD)  
 Sample Type: 3L Tedlar Bag

CAS #	COMPOUND	POI Ontario (ug/m <sup>3</sup> )	Detection Limit (ppm)	Detection Limit (ug/m <sup>3</sup> ) [1]	Upwind (ppm)	Upwind (ug/m <sup>3</sup> )	Downwind (ppm)	Downwind (ug/m <sup>3</sup> )	Net Landfill Impact [4] (ug/m <sup>3</sup> )
7783-06-4	Hydrogen Sulfide	30	0.01	14.2	<0.01	ND	<0.01	ND	ND
463-58-1	Carbonyl Sulfide	-	0.01	25	<0.01	ND	<0.01	ND	ND
74-93-1	Methyl mercaptan [2]	20	0.01	20	<0.01	ND	<0.01	ND	ND
75-08-1	Ethyl Mercaptan [2]	20	0.01	25.8	<0.01	ND	<0.01	ND	ND
75-18-3	Dimethyl Sulfide	30	0.01	25.8	<0.01	ND	<0.01	ND	ND
75-15-0	Carbon Disulfide	330	0.005	15.8	<0.005	ND	<0.005	ND	ND
75-33-2	Iso-Propyl mercaptan	-	0.01	31.7	<0.01	ND	<0.01	ND	ND
75-66-1	ter-Butyl mercaptan	-	0.01	37.5	<0.01	ND	<0.01	ND	ND
107-03-9	n-Propyl mercaptan	-	0.01	31.7	<0.01	ND	<0.01	ND	ND
110-02-1	Thiophene	-	0.01	35	<0.01	ND	<0.01	ND	ND
352-93-2	Diethyl sulfide	-	0.01	37.5	<0.01	ND	<0.01	ND	ND
109-79-5	n-Butyl mercaptan	-	0.01	37.5	<0.01	ND	<0.01	ND	ND
624-92-0	Dimethyl Disulfide	40	0.005	19.6	<0.005	ND	<0.005	ND	ND
554-14-3	2-Methyl thiophene	-	0.01	40.8	<0.01	ND	<0.01	ND	ND
616-44-4	3-Methyl thiophene	-	0.01	40.8	<0.01	ND	<0.01	ND	ND
110-66-7	Amyl mercaptan	-	0.01	43.3	<0.01	ND	<0.01	ND	ND
592-88-1	Di-allyl sulfide	-	0.01	47.5	<0.01	ND	<0.01	ND	ND
638-02-8	2,5-Dimethyl thiophene	-	0.01	46.7	<0.01	ND	<0.01	ND	ND
	Total Reduced Sulphurs [3]	40			<0.01	ND	<0.01	ND	ND

**Notes:**

[1] Conversion from ppm to ug/m<sup>3</sup> assumed a temperature of 20 degrees Celcius.

[2] The POI for this compound is based on total mercaptans as methyl mercaptan.

[3] Total Reduced Sulphurs calculated as the sum of all the detectable concentrations of the individual reduced sulphur compounds listed above.

[4] Net Landfill Impact = Downwind Measured Concentration - Upwind Measured Concentration.

ND: Compound concentration less than the detection limit, therefore, the compound was not detected.

Comment: The samples were analyzed 30 minutes after receipt by the lab

**Table D7: Maximum Measured Downwind Concentrations and Net Landfill Contribution for TRS Contaminants**

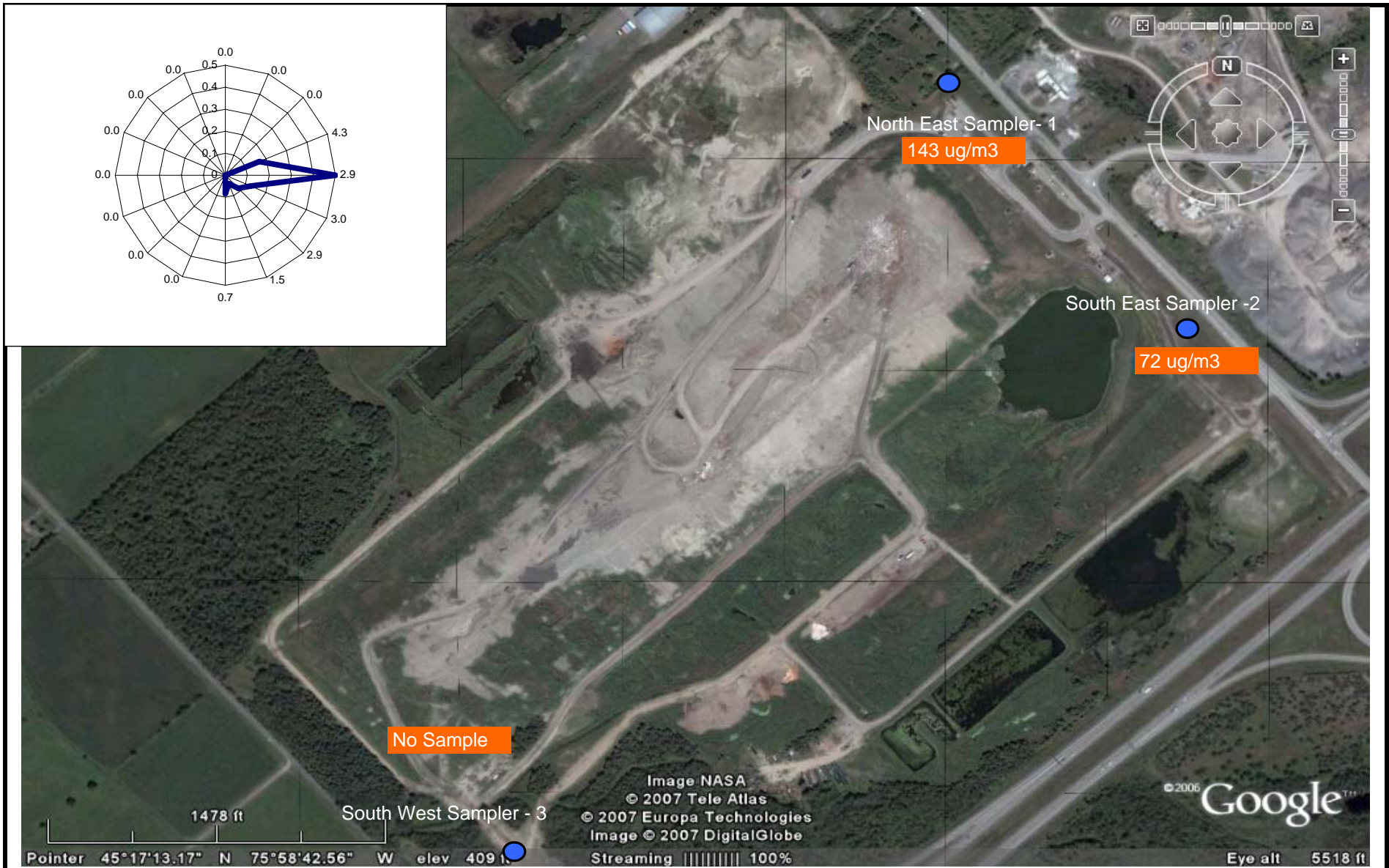
CAS #	Compound	POI Ontario (ug/m <sup>3</sup> )	Maximum Measured Downwind Concentration (ug/m <sup>3</sup> )	Maximum Net Landfill Impact (ug/m <sup>3</sup> )
7783-06-4	Hydrogen Sulfide	30	ND	ND
463-58-1	Carbonyl Sulfide	-	ND	ND
74-93-1	Methyl mercaptan	20	ND	ND
75-08-1	Ethyl Mercaptan	20	ND	ND
75-18-3	Dimethyl Sulfide	30	ND	ND
75-15-0	Carbon Disulfide	330	ND	ND
75-33-2	Iso-Propyl mercaptan	-	ND	ND
75-66-1	ter-Butyl mercaptan	-	ND	ND
107-03-9	n-Propyl mercaptan	-	ND	ND
110-02-1	Thiophene	-	ND	ND
352-93-2	Diethyl sulfide	-	ND	ND
109-79-5	n-Butyl mercaptan	-	ND	ND
624-92-0	Dimethyl Disulfide	40	ND	ND
554-14-3	2-Methyl thiophene	-	ND	ND
616-44-4	3-Methyl thiophene	-	ND	ND
110-66-7	Amyl mercaptan	-	ND	ND
592-88-1	Di-allyl sulfide	-	ND	ND
638-02-8	2,5-Dimethyl thiophene	-	ND	ND
-	Total Reduced Sulphurs	40	ND	ND



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**Figures A 1-19**

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**TSP Sampling Locations**

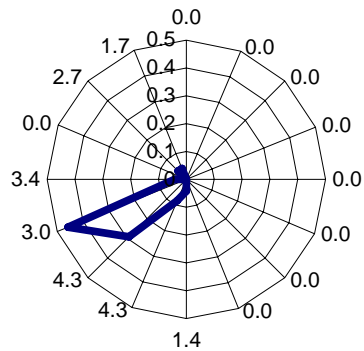
Ottawa Landfill--Ottawa, Ontario

Project #W07-5258C

Figure No.: A1

Date: May 12, 2008





**TSP Sampling Locations**

Ottawa Landfill--Ottawa, Ontario

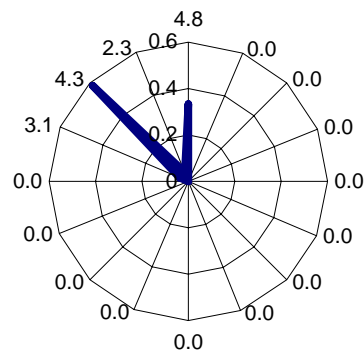
Project #W07-5258C

Figure No.: A2

Date: May 18, 2008







**TSP Sampling Locations**

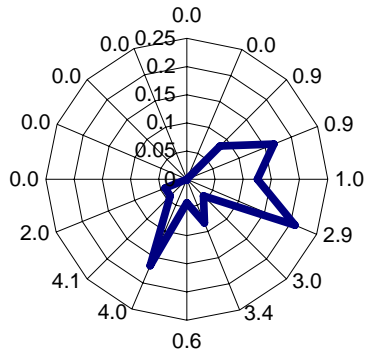
Ottawa Landfill--Ottawa, Ontario

Project #W07-5258C

Figure No.: A3

Date: May 24, 2008





**TSP Sampling Locations**

Ottawa Landfill--Ottawa, Ontario

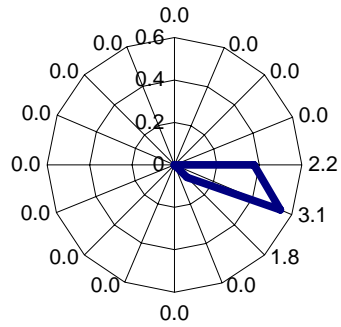
Project #W07-5258C

Figure No.: A4

Date: May 30, 2008







**TSP Sampling Locations**

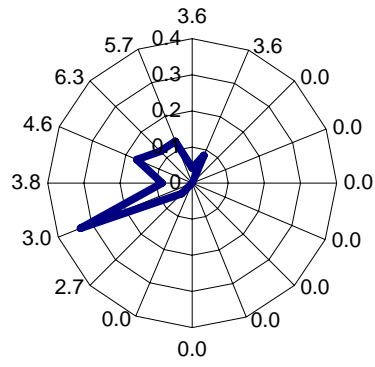
Ottawa Landfill--Ottawa, Ontario

Project #W07-5258C

Figure No.: A5

Date: June 5, 2008





**TSP Sampling Locations**

Ottawa Landfill--Ottawa, Ontario

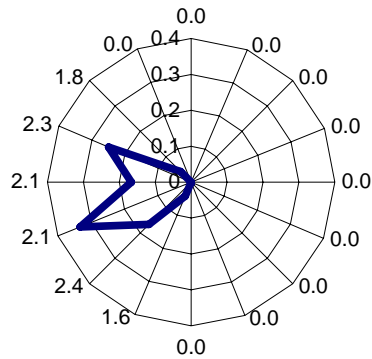
Project #W07-5258C

Figure No.: A6

Date: June 11, 2008







**TSP Sampling Locations**

Ottawa Landfill--Ottawa, Ontario

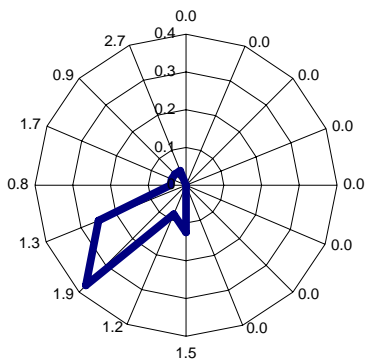
Project #W07-5258C

Figure No.: A7

Date: June 17, 2008







**TSP Sampling Locations**

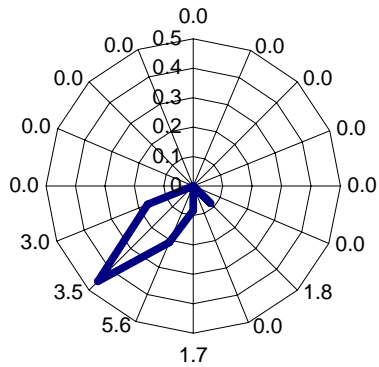
Ottawa Landfill--Ottawa, Ontario

Project #W07-5258C

Figure No.: A8

Date: June 23, 2008





**TSP Sampling Locations**

Ottawa Landfill--Ottawa, Ontario

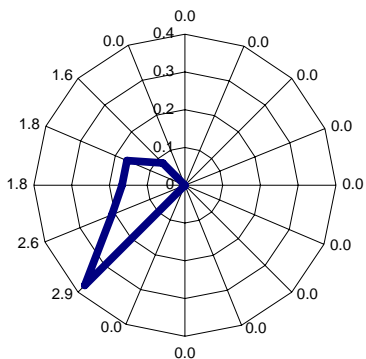
Project #W07-5258C

Figure No.: A9

Date: June 29, 2008







**TSP Sampling Locations**

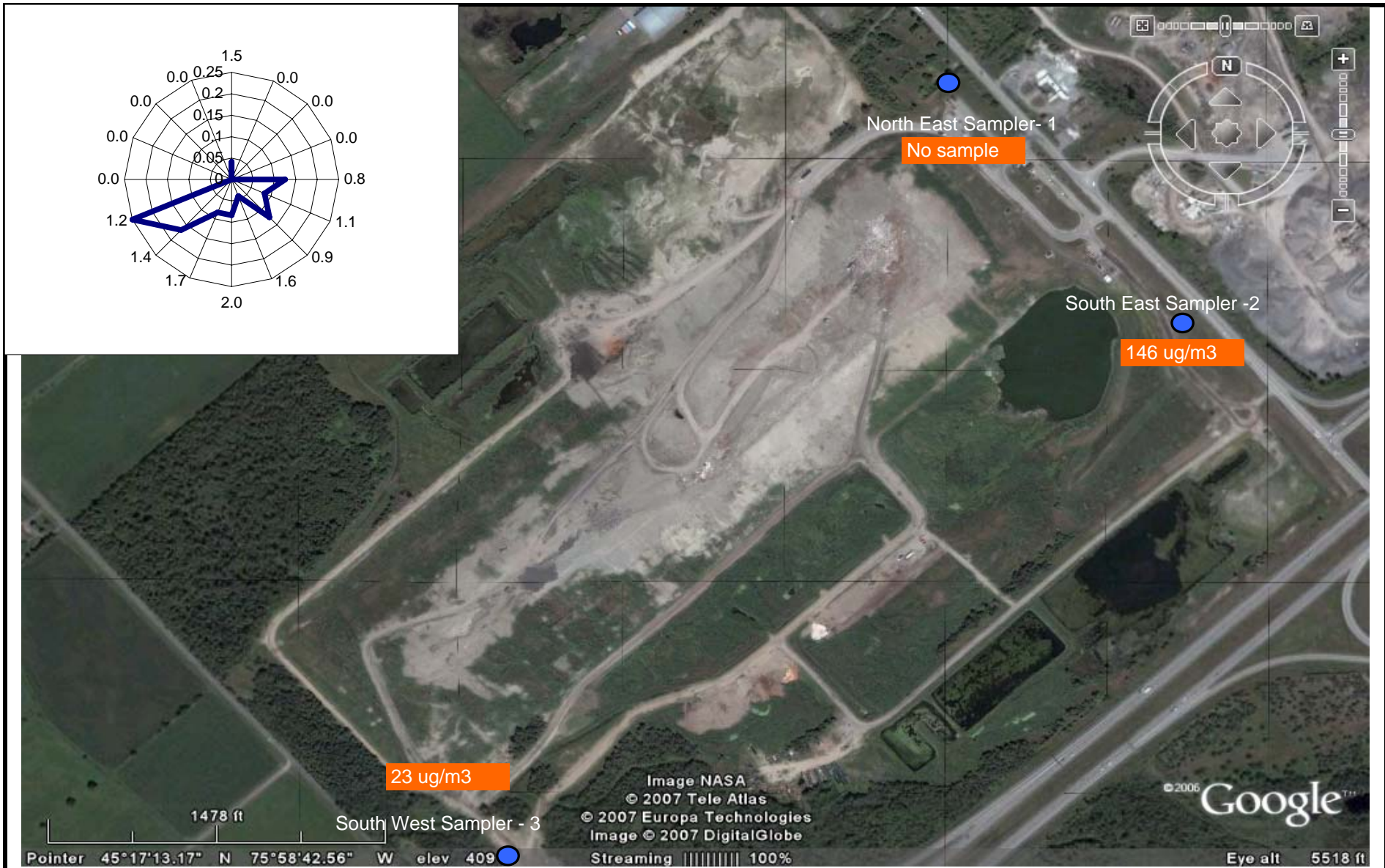
Ottawa Landfill--Ottawa, Ontario

Project #W07-5258C

Figure No.: A10

Date: July 5, 2008





**TSP Sampling Locations**

Ottawa Landfill--Ottawa, Ontario

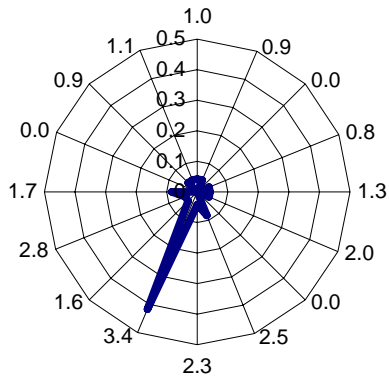
Project #W07-5258C

Figure No.: A11

Date: July 11, 2008







**TSP Sampling Locations**

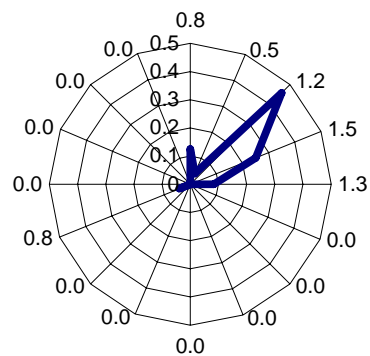
Ottawa Landfill--Ottawa, Ontario

Project #W07-5258C

Figure No.: A12

Date: July 17, 2008





**TSP Sampling Locations**

Ottawa Landfill--Ottawa, Ontario

Project #W07-5258C

Figure No.: A13

Date: July 23, 2008







**TSP Sampling Locations**

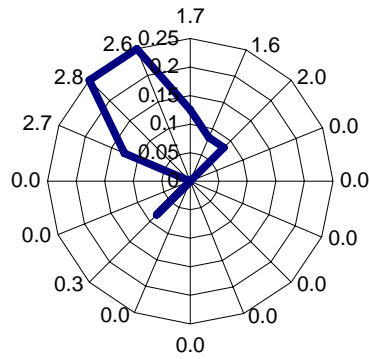
Ottawa Landfill--Ottawa, Ontario

Project #W07-5258C

Figure No.: A14

Date: July 29, 2008





**TSP Sampling Locations**

Ottawa Landfill--Ottawa, Ontario

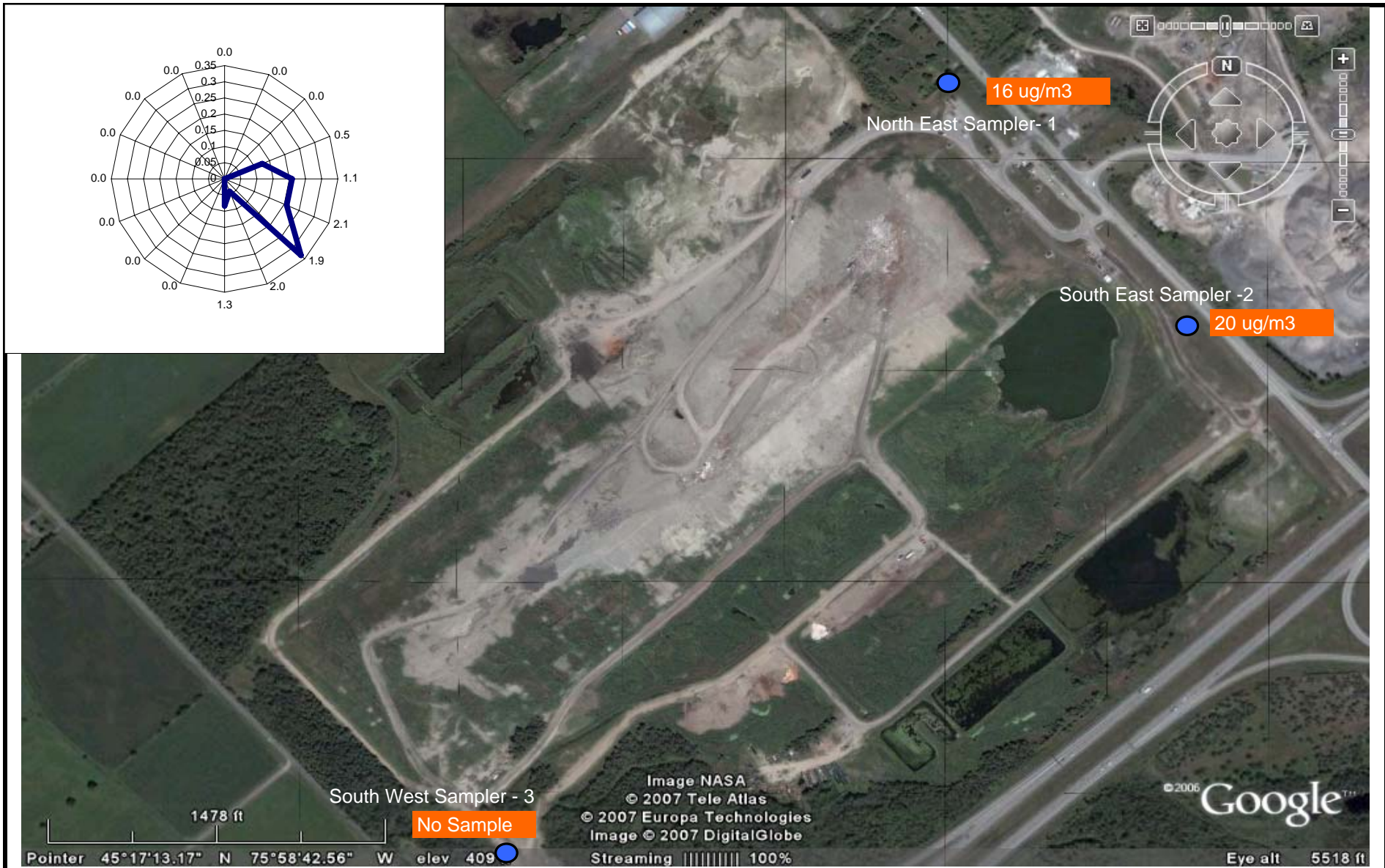
Project #W07-5258C

Figure No.: A15

Date: Aug 4, 2008







**TSP Sampling Locations**

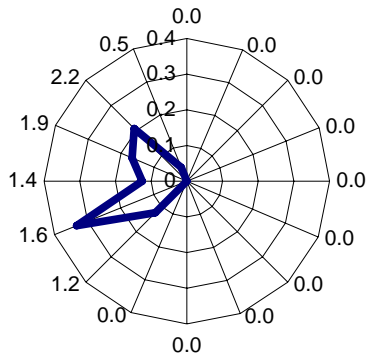
Ottawa Landfill--Ottawa, Ontario

Project #W07-5258C

Figure No.: A16

Date: Aug 10, 2008





**TSP Sampling Locations**

Ottawa Landfill--Ottawa, Ontario

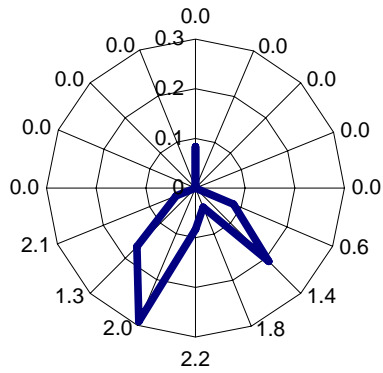
Project #W07-5258C

Figure No.: A17

Date: Aug 16, 2008







**TSP Sampling Locations**

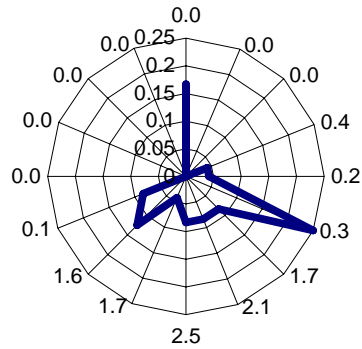
Ottawa Landfill--Ottawa, Ontario

Project #W07-5258C

Figure No.: A18

Date: Aug 22, 2008





**TSP Sampling Locations**

Ottawa Landfill--Ottawa, Ontario

Project #W07-5258C

Figure No.: A19

Date: Aug 28, 2008



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**Figures B 1-8**

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**BTEX Sampling - Recommended Locations for June 23, 2008**  
 Windrose from On-Site Meteorological Station Showing Winds Blowing From and Mean Wind Speeds

Ottawa Landfill--Ottawa, Ontario

Project #W07-5258C

Figure No.:

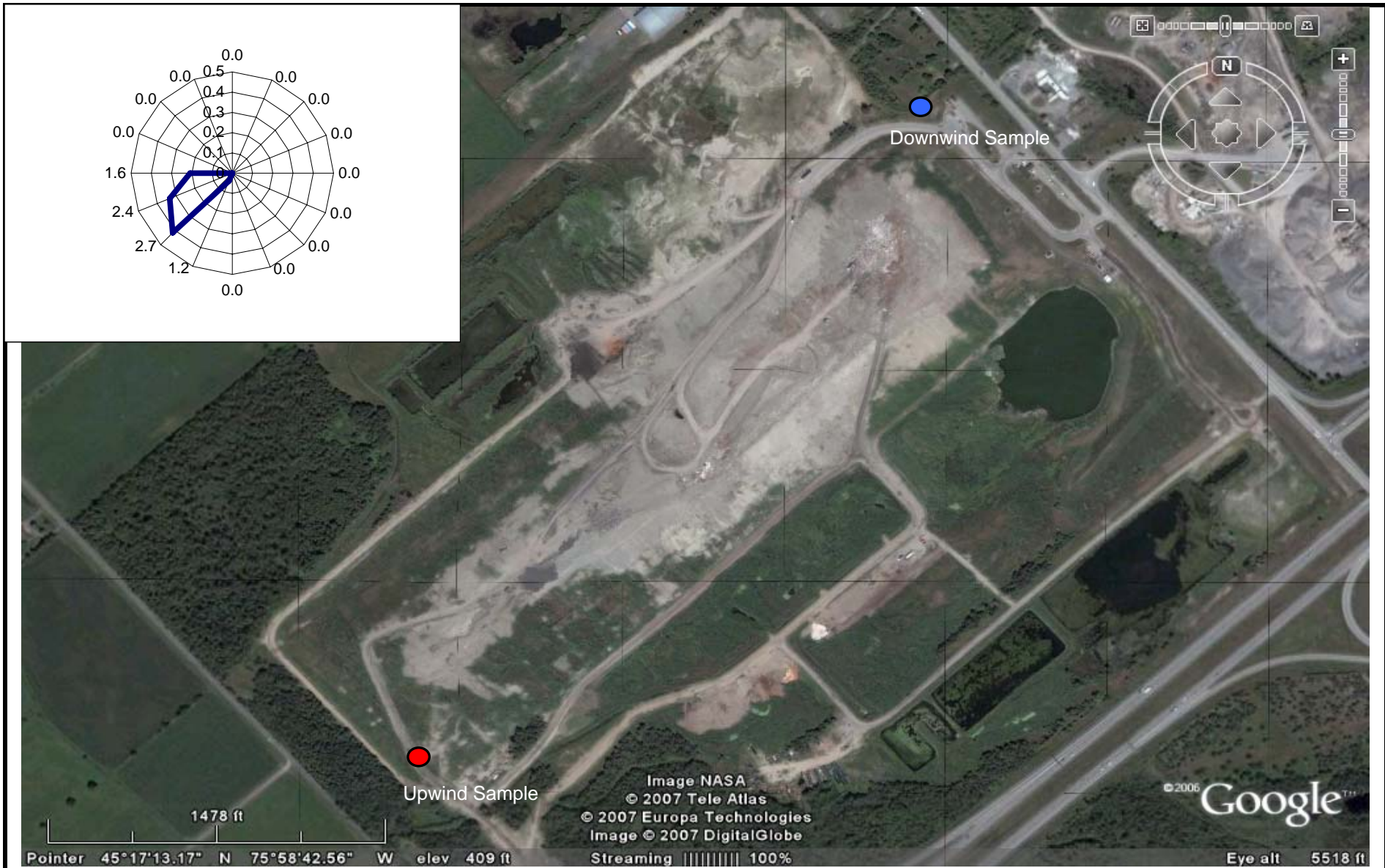
B1

Date:

June 23, 2008

**RWDI**





**BTEX Sampling - Recommended Locations for July 5, 2008**  
 Windrose from On-Site Meteorological Station Showing Winds Blowing From and Mean Wind Speeds

Ottawa Landfill--Ottawa, Ontario

Project #W07-5258C

Figure No.: B2

Date: July 5, 2008

**RWDI**





**BTEX Sampling - Recommended Locations for July 11, 2008**  
 Windrose from On-Site Meteorological Station Showing Winds Blowing From and Mean Wind Speeds

Ottawa Landfill--Ottawa, Ontario

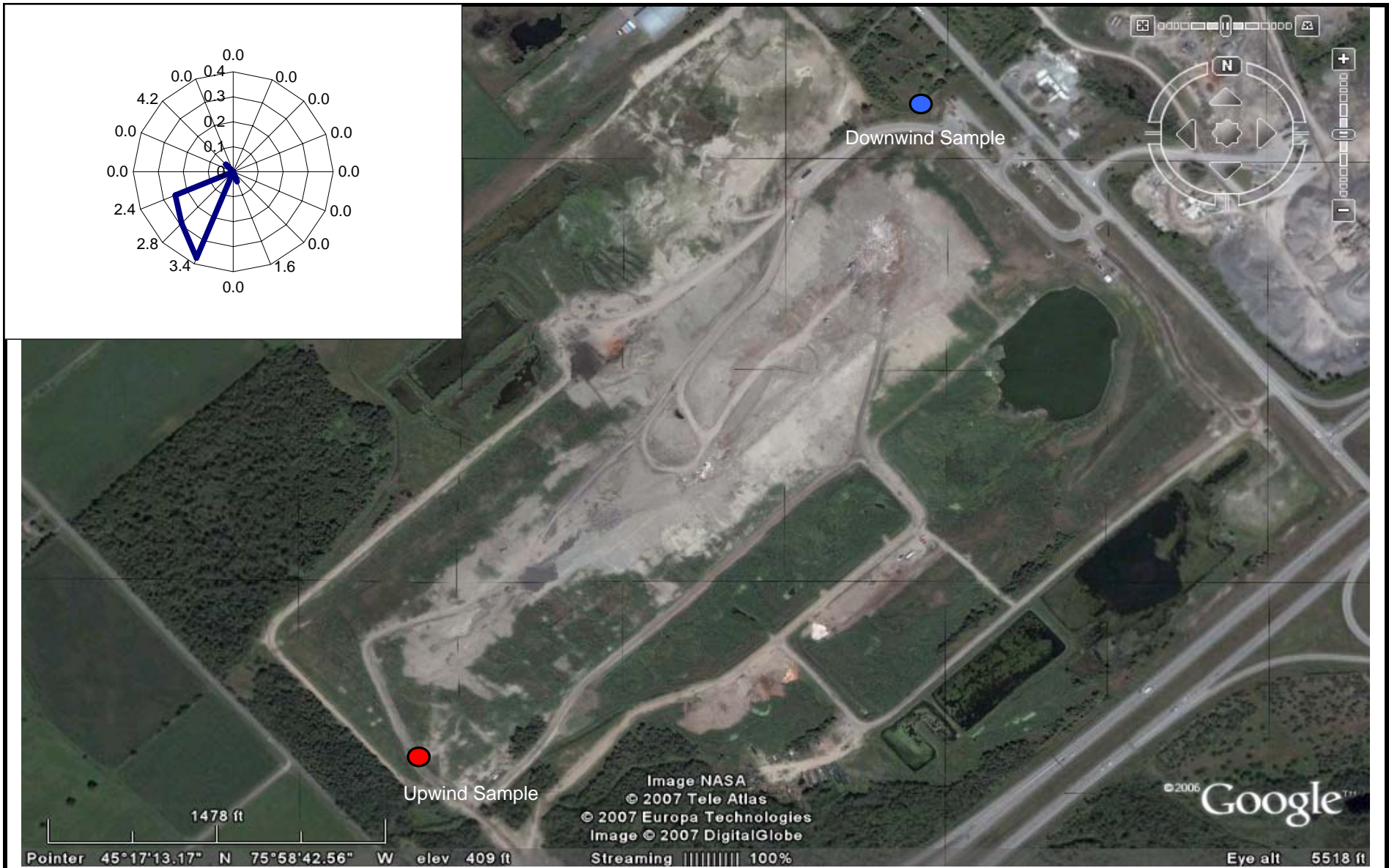
Project #W07-5258C

Figure No.: B3

Date: July 11, 2008







**BTEX Sampling - Recommended Locations for July 17, 2008**  
 Windrose from On-Site Meteorological Station Showing Winds Blowing From and Mean Wind Speeds

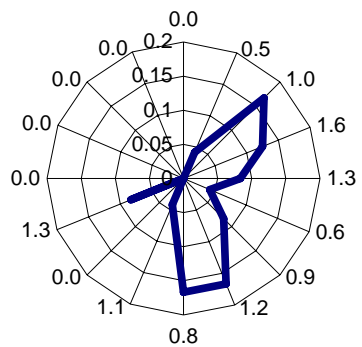
Ottawa Landfill--Ottawa, Ontario

Project #W07-5258C

Figure No.: B4

Date: July 17, 2008





**BTEX Sampling - Recommended Locations for July 23, 2008**  
 Windrose from On-Site Meteorological Station Showing Winds Blowing From and Mean Wind Speeds

Ottawa Landfill--Ottawa, Ontario

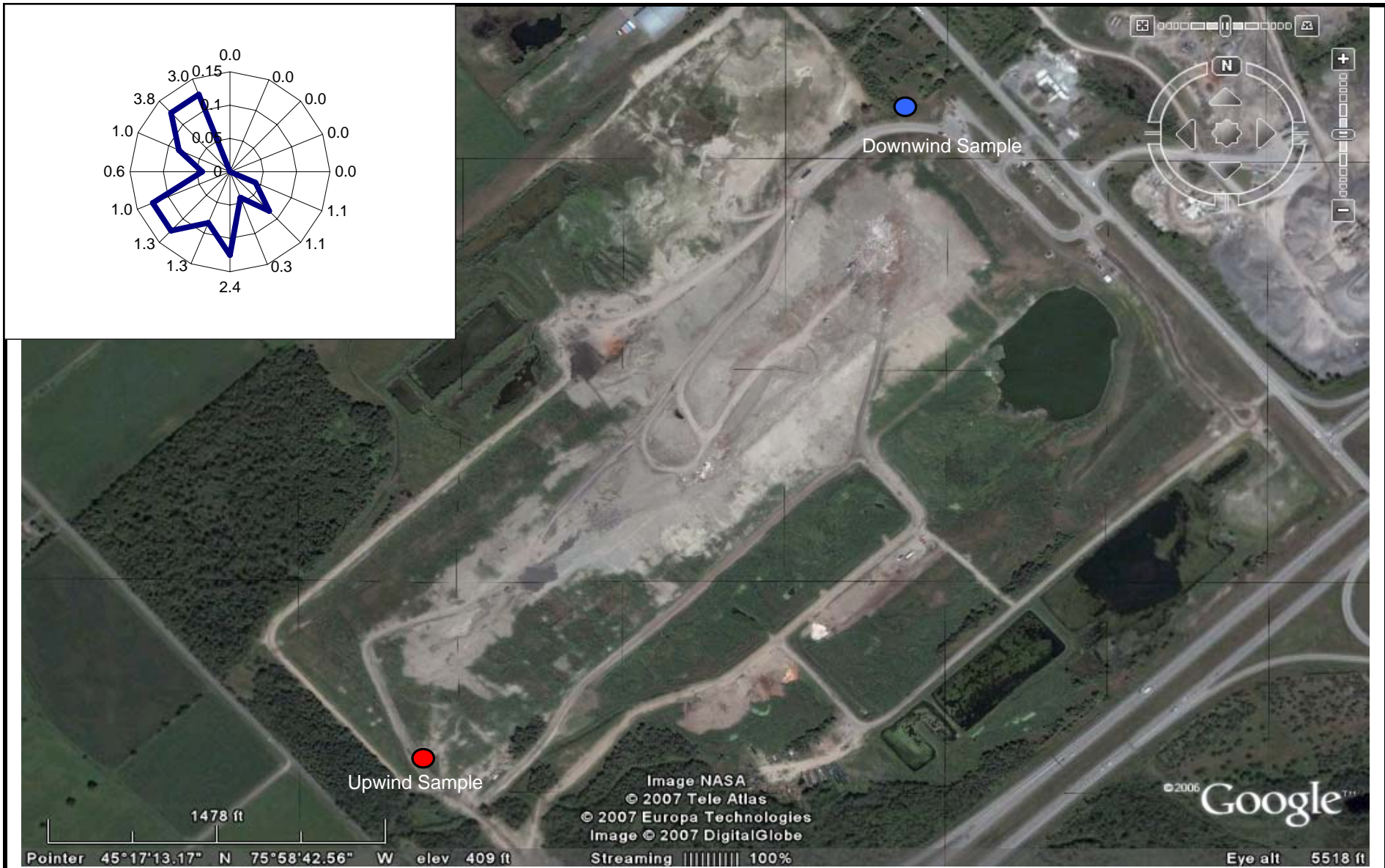
Project #W07-5258C

Figure No.: B5

Date: July 23, 2008







**BTEX Sampling - Recommended Locations for July 29, 2008**  
 Windrose from On-Site Meteorological Station Showing Winds Blowing From and Mean Wind Speeds

Ottawa Landfill--Ottawa, Ontario

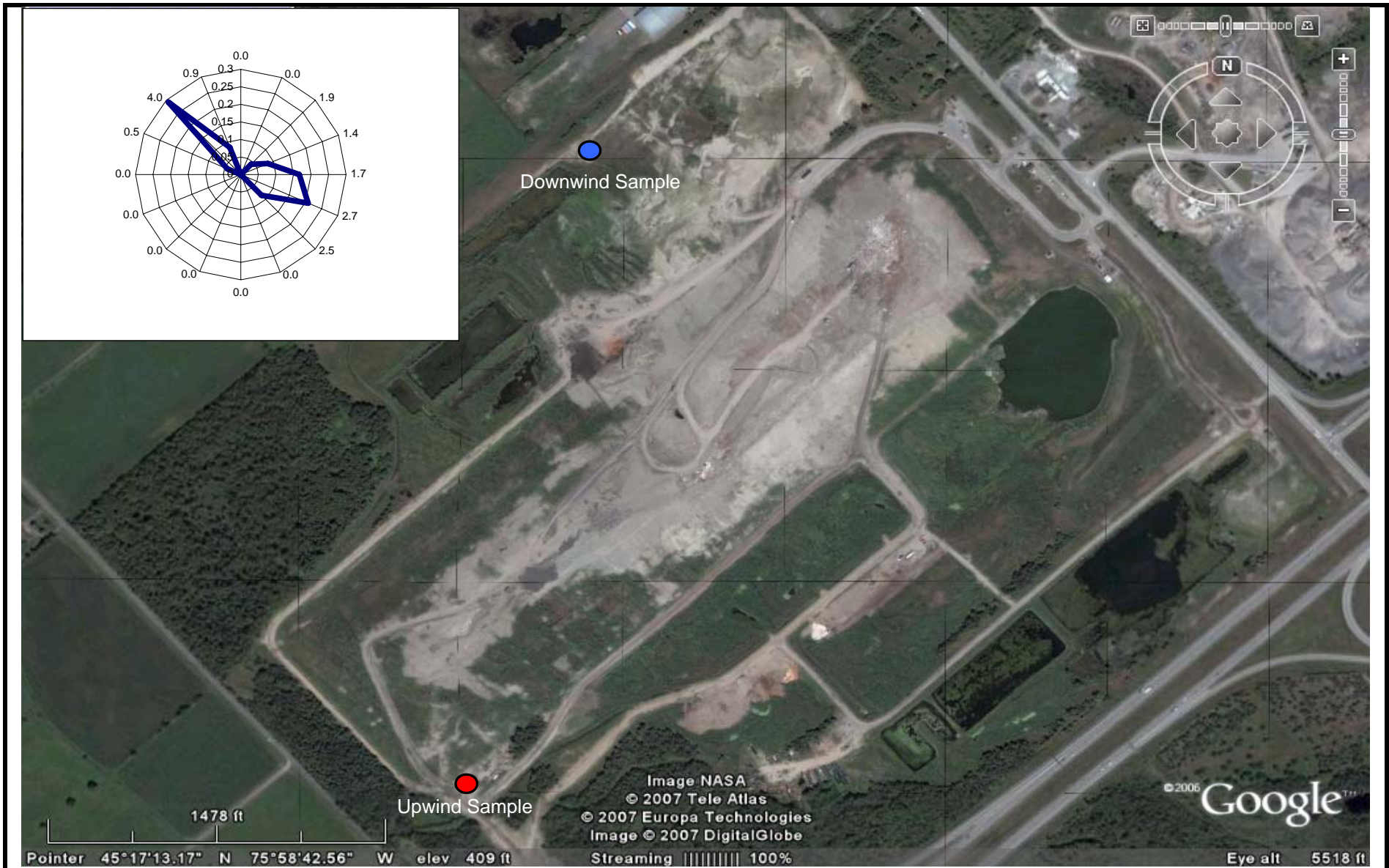
Project #W07-5258C

Figure No.: B6

Date: July 29, 2008







**BTEX Sampling - Recommended Locations for August 5, 2008**  
 Windrose from On-Site Meteorological Station Showing Winds Blowing From and Mean Wind Speeds

Ottawa Landfill--Ottawa, Ontario

Project #W07-5258C

Figure No.:

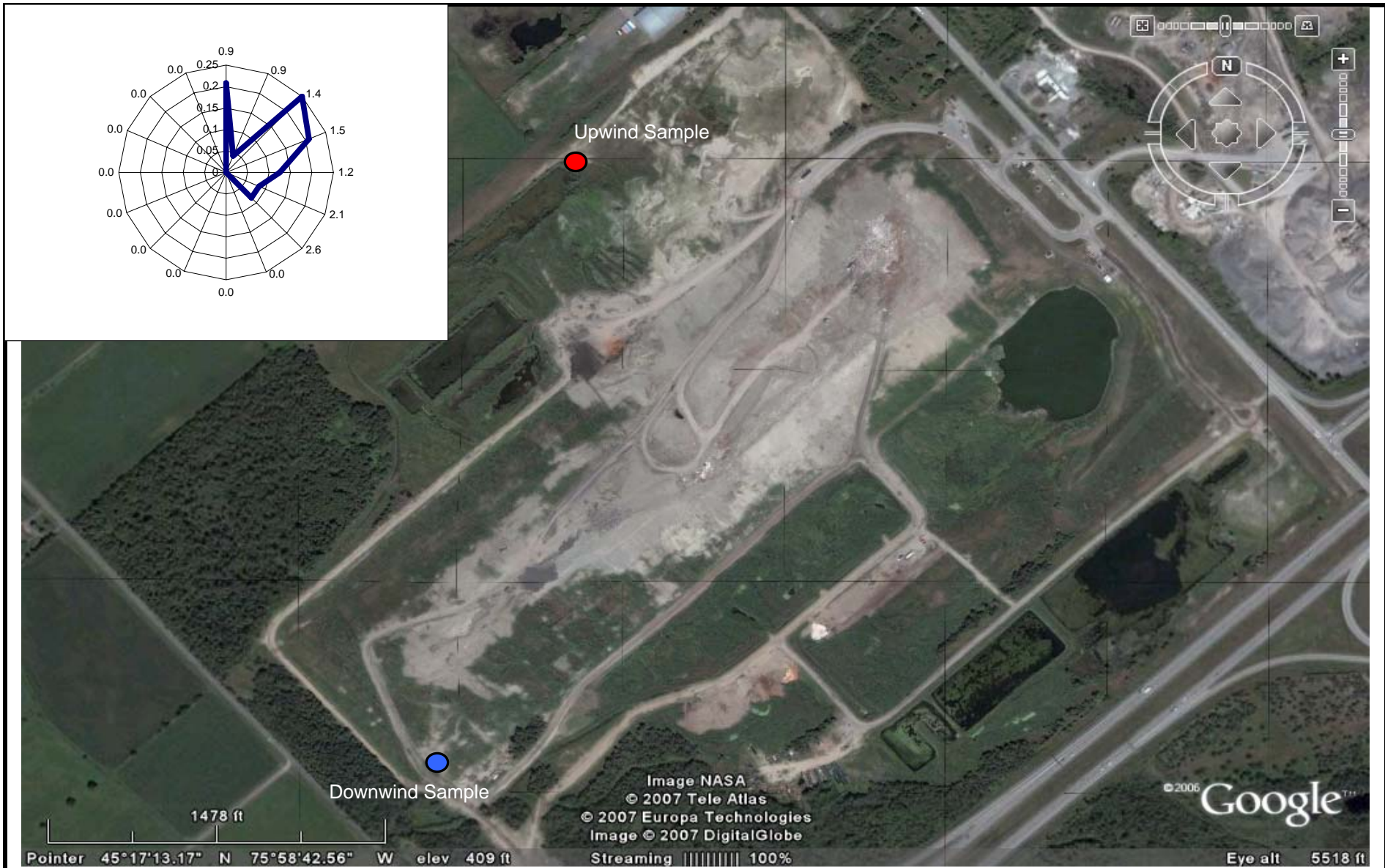
B7

Date:

August 5, 2008

**RWDI**





**BTEX Sampling - Recommended Locations for August 10, 2008**  
 Windrose from On-Site Meteorological Station Showing Winds Blowing From and Mean Wind Speeds

Ottawa Landfill--Ottawa, Ontario

Project #W07-5258C

Figure No.: B8

Date: August 10, 2008

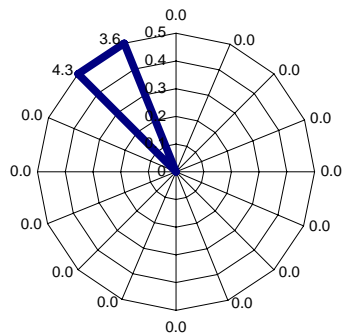


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**Figures C 1-6**

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**VOC and TRS Sampling Locations for June 24, 2008**

Ottawa Landfill--Ottawa, Ontario

Project #W07-5258C

Figure No.:

C1

Date:

June 24, 2008

**RWDI**



**VOC and TRS Sampling Locations for June 26, 2008**

Ottawa Landfill--Ottawa, Ontario

Project #W07-5258C

Figure No.:

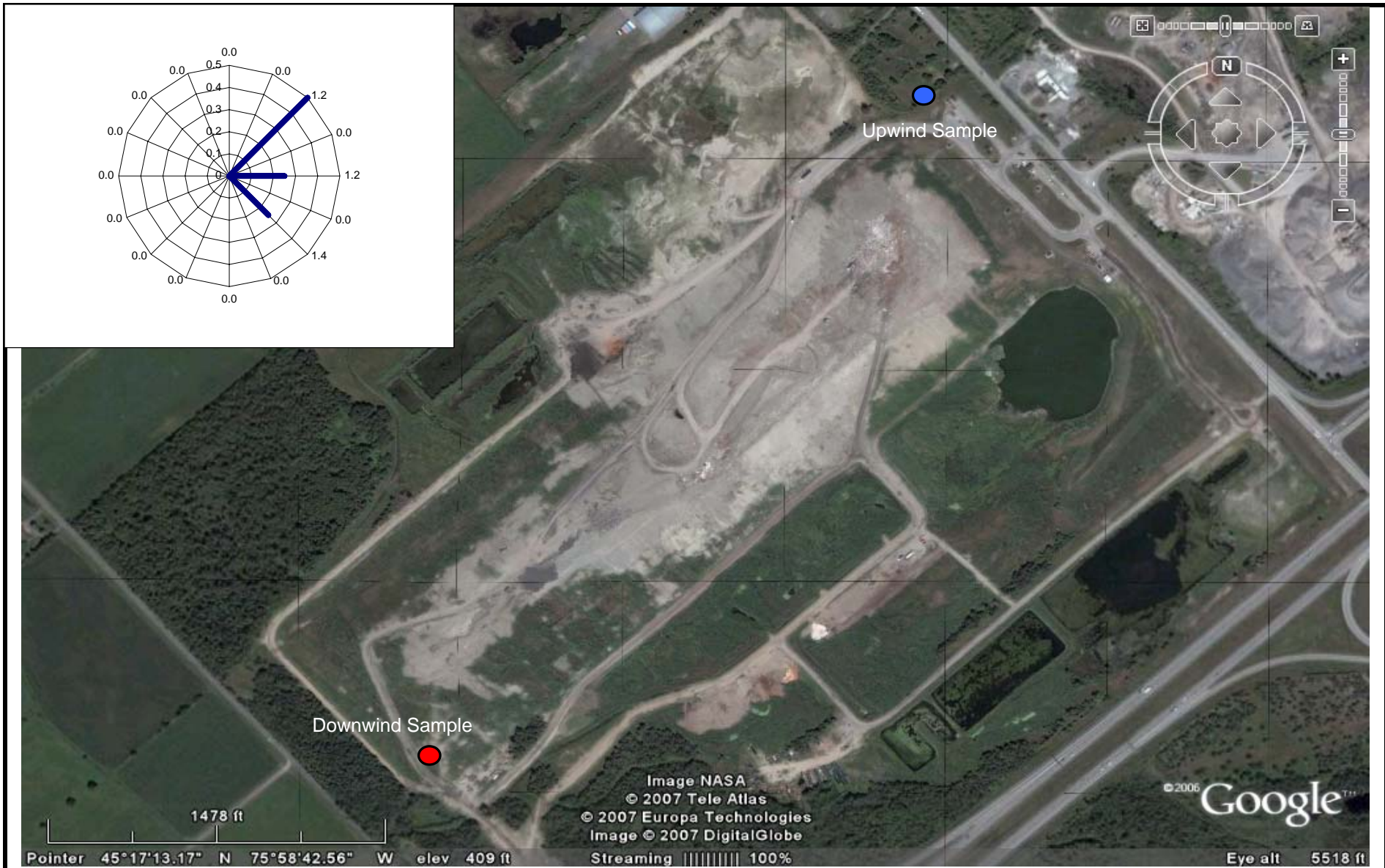
C2

Date:

June 26, 2008

**RWDI**





VOC and TRS Sampling Locations for July 22, 2008

Ottawa Landfill--Ottawa, Ontario

Project #W07-5258C

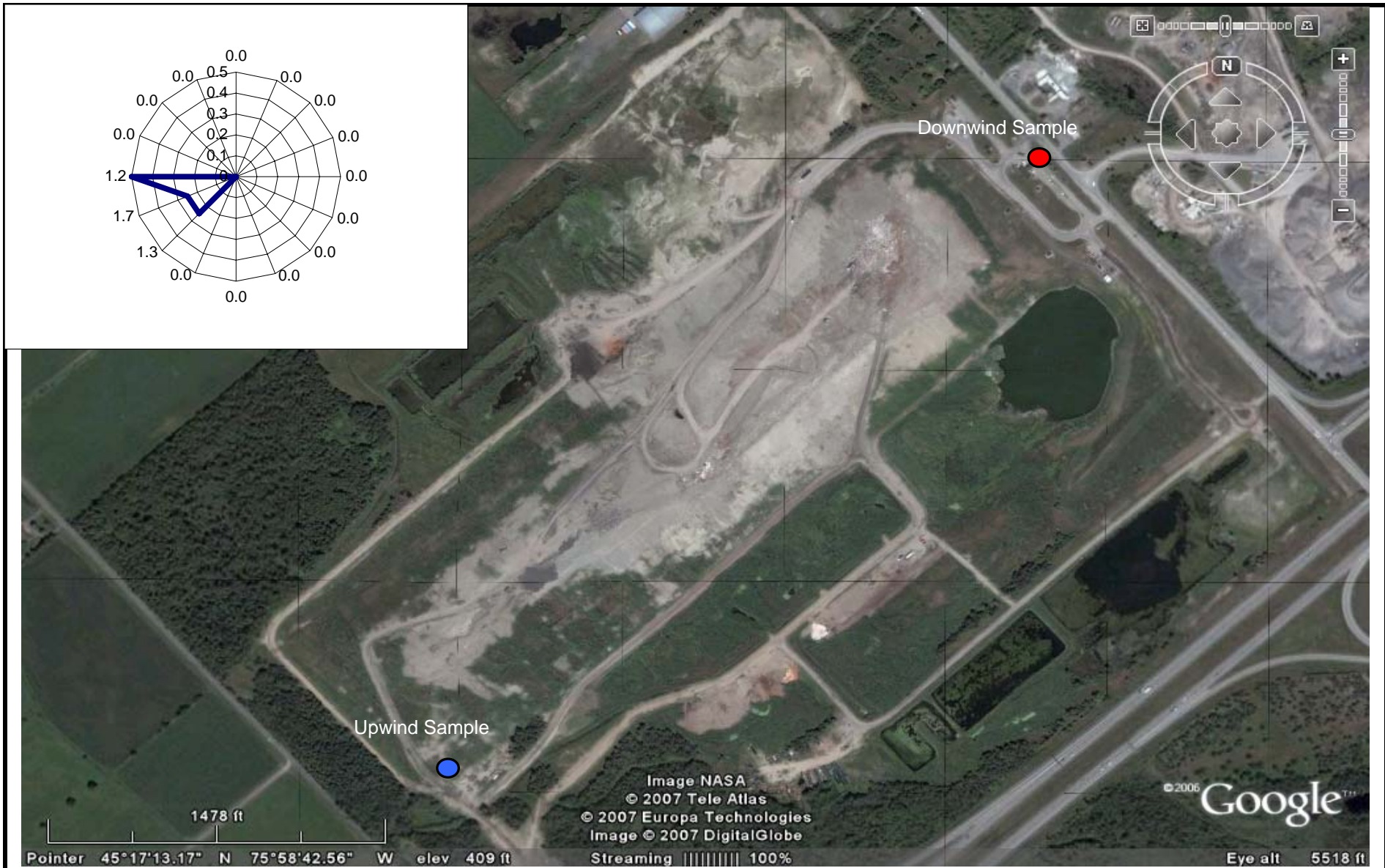
Figure No.:

C3

Date:

July 22, 2008

**RWDI**



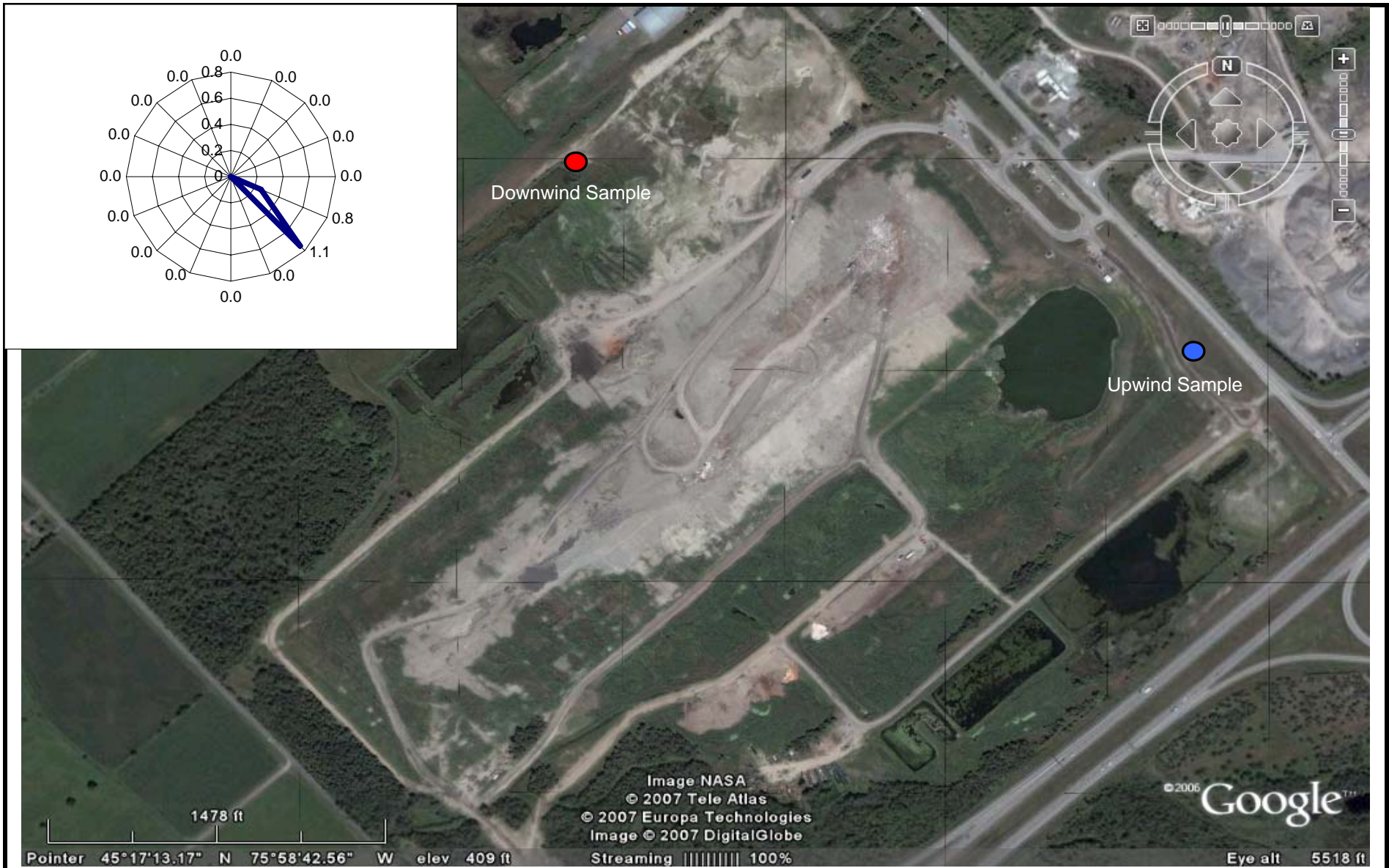
**VOC and TRS Sampling Locations for July 31, 2008**

Figure No.: C4

Date: July 31, 2008







VOC and TRS Sampling Locations for August 27, 2008

Ottawa Landfill--Ottawa, Ontario

Project #W07-5258C

Figure No.:

C5

Date:

August 27, 2008

**RWDI**



**VOC and TRS Sampling Locations for August 28, 2008**

Ottawa Landfill--Ottawa, Ontario

Project #W07-5258C

Figure No.:	C6
Date:	August 28, 2008

