

# **SYDNEY TAR PONDS AGENCY**

## **AMBIENT AIR MONITORING PROGRAM**

### **PRELIMINARY REPORT OF RESULTS FROM SAMPLING on 12 October 2011**

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In Preliminary Reports, the Sydney Tar Ponds Agency (STPA) provides the results from its Ambient Air Monitoring Program at the time the information is received from the Independent Air Monitoring Consultant (IAMC), ALL-TECH Environmental Services Cape Breton Limited (ALL-TECH). These monitoring results have been provided to the Sydney Tar Ponds Agency as soon as the data meet the acceptance criteria of ALL-TECH's assurance program.

A number of steps are carried out within the assurance program to produce validated information. The assurance program covers laboratory reports and data transcription, field instrument calibration checks (principally, related to sample volumes), calculation verification, precision and bias checks, and assessment of analysis of field blanks and duplicate samples. When validated, the monitoring data are published in a Monthly Report, which is also available to the public. The Monthly Report is the authoritative record of the monitoring results from the Ambient Air Monitoring Program (AAMP). When the Monthly Report is published, the associated Preliminary Reports of individual sampling Events will be taken down from the website. The data originally presented in these Preliminary Reports will be available in validated form in the related Monthly Report from the Sydney Tar Ponds Agency website. (<http://www.tarpondscleanup.ca/index.php?sid=3&cid=55>).

The Monthly Report requires a lengthy period for its production. This time period is necessary for completion of the assurance and validation steps listed above for the data, followed by production and review of a Draft Report, before finalization of the Monthly Report. In spite of the subsequent detailed review of data, it is unusual for concentration information presented in the Preliminary Reports to change. Most data quality concerns are dealt with during the initial acceptance review by the IAMC. The Monthly Report review typically addresses issues related to presentation and interpretation of the results.

By providing these Preliminary Reports, Sydney Tar Ponds Agency is eliminating the lengthy period from the time of a sampling Event before the validated data are available for use in the Final Monthly Report.

A map of the sampling locations is provided in Figure 1. A listing of sample locations and activities is provided in Table 1. Meteorological conditions on the day of sampling and the previous two days are summarized in Table 2. Analytical results are provided in the following tables:

#### Ambient Air Monitoring Program

Summary of Results for Polycyclic Aromatic Hydrocarbon (PAH) Analysis .....	Table 3
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Summary of Results for Volatile Organic Compound (VOC) Analysis.....	Table 7

*Ambient air quality criteria for the AAMP in the form of 24-hour time-weighted average concentrations have been adopted for most substances by the Sydney Tar Ponds Agency. These criteria are indicated in the Tables within this Preliminary Report.*

#### **ALL-TECH Comments on the Preliminary Report from Event 1482-109 on 12 October 2011**

*There were no concentrations measured during this Event that approached or exceeded the respective 24-hour time-weighted average criterion.*

*The sample for PAHs for Location 3 (Henry Street) and the samples for PAHs and PCBs for Location 4 (Rotary Drive) and Location 5 (Intercolonial Street) were lost due to a laboratory accident at Maxxam Analytics.*

**CAVEAT:**

**Sydney Tar Ponds Agency (Agency) provides these ambient air monitoring results as preliminary data. They have met acceptance criteria of the Independent Air Monitoring Consultant, but all data validation activities have not yet been completed.**

**Although it is unusual for changes to occur in the monitoring results from the values presented in these Reports of Preliminary Results, the Agency advocates care in using all data from Preliminary Reports and directs users to the Final Monthly Reports as the authoritative record of the Ambient Air Monitoring Program results.**

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**NOTE ON PRESENTATION OF MONITORING RESULTS**

The reports from the Ambient Air Monitoring Program will show many monitored substances are “less than” a numerical value. This is represented with the symbol “<” followed by a numerical value, which replaces earlier reporting within the AAMP that showed the equivalent result as “Not Detected”. The sign, “<”, indicates that the concentration in the sample is below the value specified as the Reportable Detection Limit (RDL) of the recommended laboratory method for analyzing the substance. ALL-TECH reports results using a conservative assumption when a substance is “not detected” that the substance might be present at the largest value that could be recorded as “not detected”. This is approximately equal to the concentration determined using magnitude of the RDL from the laboratory reports.

In the Preliminary Report, the monitoring results are expressed as less than the *equivalent concentration that would have resulted if the substance were present at the Reportable Detection Limit*. For example, a report of <0.56 ng/m<sup>3</sup> means the concentration of the substance may be present at any value from zero up to 0.56 ng/m<sup>3</sup>.

Differences in the numerical concentrations for the same substances in a Table, when both are shown as “less than”, simply reflect the differences in the volume of air (m<sup>3</sup>) collected by the individual sampler. Sampler volumes can vary slightly at each location and each time of use for the same sampler type.



**Figure 1: Ambient Air Monitoring Program Sampling Locations and Locations of Meteorological Stations**

**Table 1: Ambient Air Monitoring Program  
 Summary of Monitoring Activities at Sampling Locations  
 12 October 2011, Event 1482-109**

Location 1 Victoria Road	Location 2 Currys Lane	Location 3 Henry Street	Location 4 Rotary Drive	Location 5 Intercolonial Street	Location 6 DesBarres Street
PAHs L1-P-121011-73 <sup>(1)</sup>	PAHs L2-P-121011-76	PAHs L3-P-121011-74	PAHs+PCBs L4-P-121011-75	PAHs+PCBs L5-P-121011-72	PAHs+PCBs L6-P-121011-71
VOCs L1-V-121011-63	VOCs L2-V-121011-66		VOCs L4-V-121011-65	VOCs L5-V-121011-62	VOCs L6-V-121011-61
PM <sub>10</sub> L1-PM1-121011-53	PM <sub>10</sub> L2-PM1-121011-56		PM <sub>10</sub> L4-PM1-121011-55		PM <sub>10</sub> L6-PM1-121011-51
PM <sub>2.5</sub> (SHARP™5030) STPA-028		PM <sub>2.5</sub> (SHARP™5030) STPA-029	PM <sub>2.5</sub> (SHARP™5030) STPA-030		
PM <sub>2.5</sub> (PQ200) L1-PM2-121011-43		PM <sub>2.5</sub> (PQ200) L3-PM2-121011-64	PM <sub>2.5</sub> (PQ200) L4-PM2-121011-45		
	TSP+inorganics / trace metals L2-T-121011-46		TSP+inorganics / trace metals L4-T-121011-35	TSP+inorganics / trace metals L5-T-121011-52	
<b>Field Blanks</b>					
PAHs L1-P-121011-03	PAHs L2-P-121011-06		PM <sub>2.5</sub> (PQ200) L4-PM2-121011-05		PM <sub>10</sub> L6-PM1-121011-01
			TSP+inorganics / trace metals L4-T-121011-04		
<b>Field Duplicates</b>					

Notes:

(1) Sample ID: L1 (location) – P (sample type) – 121011 (date) – 73 (sample #).

**Table 2: Ambient Air Monitoring Program  
 Meteorological Conditions<sup>(1)</sup> on the Day of Sampling and Previous Two Days  
 12 October 2011, Event 1482-109**

Date	Weather Conditions	Mean Temperature (°C)	Prevailing Wind Direction	Maximum Gust Speed (km/h)	Total Precipitation (mm)	Average Relative Humidity (%)	Average Atmospheric Pressure (kPa)
12 October 2011	Mainly clear throughout the day and night.	7.6	Northeast	<31	0.0	71	101.96
11 October 2011	Mostly cloudy throughout the day and night with a few clear periods.	9.4	North	44	0.0	67	101.11
10 October 2011	Mainly clear throughout the day and night.	13.3	Northwest	48	0.0	62	100.22

Notes:

(1) Environment Canada. Sydney A and CS Nova Scotia. Daily Data Report for October 2011 ( [www.climate.weatheroffice.ec.gc.ca](http://www.climate.weatheroffice.ec.gc.ca) )

**Table 3: AAMP – Results for PAH Analysis  
 12 October 2011, Event 1482-109**

Parameter	24-Hour Time-Weighted Average Ambient Concentration																		24-Hour Time-Weighted Criteria <sup>(1)</sup> (ng/m <sup>3</sup> )
	Location 1 Victoria Road (ng/m <sup>3</sup> )			Location 2 Currys Lane (ng/m <sup>3</sup> )			Location 3 Henry Street (ng/m <sup>3</sup> )			Location 4 Rotary Drive (ng/m <sup>3</sup> )			Location 5 Intercolonial Street (ng/m <sup>3</sup> )			Location 6 DesBarres Street (ng/m <sup>3</sup> )			
	Sample	Field Blank	Field Duplicate	Sample	Field Blank	Field Duplicate	Sample	Field Blank	Field Duplicate	Sample	Field Blank	Field Duplicate	Sample	Field Blank	Field Duplicate	Sample	Field Blank	Field Duplicate	
Naphthalene	57.6	2.5		53.1	6.4											277.6			22 500
Acenaphthylene	2.74	<0.15		2.78	<0.15											3.47			NPV <sup>(2)</sup>
Acenaphthene	5.76	<0.15		3.75	0.21											9.46			NPV
Fluorene	6.05	0.21		3.75	0.24											8.20			NPV
Phenanthrene	9.22	0.40		7.19	0.37											10.09			NPV
Anthracene	1.18	<0.15		0.75	<0.15											1.07			NPV
Fluoranthene	0.92	<0.15		1.31	<0.15											1.17			NPV
Pyrene	0.63	<0.15		1.13	<0.15		(3)			(3)					(3)	0.66			NPV
Benzo[a]anthracene	<0.14	<0.15		0.19	<0.15											<0.16			NPV
Chrysene	0.20	<0.15		0.34	<0.15											<0.16			NPV
Benzo[b]fluoranthene	<0.14	<0.15		0.28	<0.15											<0.16			NPV
Benzo[a]pyrene	<0.14	<0.15		0.16	<0.15											<0.16			1.1
Indeno[1,2,3-cd]pyrene	<0.14	<0.15		0.19	<0.15											<0.16			NPV
Dibenz[a,h]anthracene	<0.14	<0.15		<0.16	<0.15											<0.16			NPV
Benzo[ghi]perylene	<0.14	<0.15		0.25	<0.15											<0.16			NPV
Benzo[k]fluoranthene	<0.14	<0.15		<0.16	<0.15											<0.16			NPV

Notes:  
 (1) Criteria have been adopted by STPA for AAMP program and derived from Ontario Ministry of Environment Regulation 419/05 and Ambient Air Quality revisions of February 2008.  
 (2) "NPV" means no published value in Ontario Ministry of Environment Regulation 419/05 and Ambient Air Quality revisions of February 2008.  
 (3) PAH sample lost during analysis at *Maxxam Analytics*.

Data validation is not complete for the results in this Preliminary Report.

**Table 4: AAMP – Results for PCB Analysis  
 12 October 2011, Event 1482-109**

Parameter	24-Hour Time-Weighted Average Ambient Concentration									24-Hour Time-Weighted Criteria <sup>(1)</sup> (ng/m <sup>3</sup> )
	Location 4 Rotary Drive (ng/m <sup>3</sup> )			Location 5 Intercolonial Street (ng/m <sup>3</sup> )			Location 6 DesBarres Street (ng/m <sup>3</sup> )			
	Sample	Field Blank	Field Duplicate	Sample	Field Blank	Field Duplicate	Sample	Field Blank	Field Duplicate	
Monochlorobiphenyls	(3)			(3)			<0.32			NPV <sup>(2)</sup>
Dichlorobiphenyls							<0.32			NPV
Trichlorobiphenyls							<0.32			NPV
Tetrachlorobiphenyls							<0.32			NPV
Pentachlorobiphenyls							<0.32			NPV
Hexachlorobiphenyls							<0.32			NPV
Heptachlorophenyls							<0.32			NPV
Octachlorobiphenyls							<0.32			NPV
Nona-, Deca-, chlorobiphenyls							<0.32			NPV
Total polychlorinated biphenyls							<0.32			150

Notes:

- (1) Criteria have been adopted by STPA for AAMP program and derived from Ontario Ministry of Environment Regulation 419/05 and Ambient Air Quality revisions of February 2008.
- (2) "NPV" means no published value in Ontario Ministry of Environment Regulation 419/05 and Ambient Air Quality revisions of February 2008.
- (3) PCB sample lost during analysis at *Maxxam Analytics*.

**Table 5: AAMP – Results for PM Analysis  
 12 October 2011, Event 1482-109**

Parameter	24-Hour Time-Weighted Average Ambient Concentration							24-Hour Time-Weighted Criteria ( $\mu\text{g}/\text{m}^3$ )
	Location 1 Victoria Road ( $\mu\text{g}/\text{m}^3$ )	Location 2 Currys Lane ( $\mu\text{g}/\text{m}^3$ )	Location 3 Henry Street ( $\mu\text{g}/\text{m}^3$ )	Location 4 Rotary Drive ( $\mu\text{g}/\text{m}^3$ )	Location 5 Intercolonial Street ( $\mu\text{g}/\text{m}^3$ )	Location 6 DesBarres Street ( $\mu\text{g}/\text{m}^3$ )	Mean for All Locations (for information only)	
TSP		48		9	27		28	120 <sup>(1)</sup>
TSP Field Blank				<0.21				
TSP Field Duplicate								
PM <sub>10</sub>	6	22		4		10	11	50 <sup>(2)</sup>
PM <sub>10</sub> Field Blank						<0.30		
PM <sub>10</sub> Field Duplicate								
PM <sub>2.5</sub> (SHARP™ 5030)	2.54		3.03	2.45			2.67	30 <sup>(2)</sup>
PM <sub>2.5</sub> (by filter)	1.75		2.83	1.41				30 <sup>(2)</sup>
PM <sub>2.5</sub> (by filter) Field Blank				0.46				
PM <sub>2.5</sub> (by filter) Field Duplicate								
Ratio: PM <sub>10</sub> /TSP		0.46		0.44			Cross-hatched cells denote that either: (a) indicated PM sampling is not conducted, or (b) indicated PM ratios cannot be calculated for measured data at this ambient station.	
Ratio: PM <sub>2.5</sub> /PM <sub>10</sub> <sup>(3)</sup>	0.42			0.61				

Notes:

- (1) Criterion adopted by STPA pursuant to Nova Scotia Environment Act (Air Quality Regulations) O.I.C. 2005-87 (February 25, 2005, effective March 1, 2005), N.S. Reg. 28/2005; as amended by O.I.C. 2009-342 (August 14, 2009), N.S. Reg. 261/2009.
- (2) Criteria have been adopted by STPA for AAMP program and derived from Ontario Ministry of Environment Regulation 419/05 and Ambient Air Quality revisions of February 2008.
- (3) Calculated using SHARP™ 5030 PM<sub>2.5</sub> data.

**Table 6: AAMP – Results for Inorganic Substances and Trace Metals in TSP Analysis  
 12 October 2011, Event 1482-109**

Parameter	24-Hour Time-Weighted Average Ambient Concentration									24-Hour Time-Weighted Criteria <sup>(1)</sup> ( $\mu\text{g}/\text{m}^3$ )
	Location 2 Currys Lane ( $\mu\text{g}/\text{m}^3$ )			Location 4 Rotary Drive ( $\mu\text{g}/\text{m}^3$ )			Location 5 Intercolonial Street ( $\mu\text{g}/\text{m}^3$ )			
	Sample	Field Blank	Field Duplicate	Sample	Field Blank	Field Duplicate	Sample	Field Blank	Field Duplicate	
Aluminum	0.56			<0.09	<0.08		0.27			NPV <sup>(2)</sup>
Antimony	<0.001			<0.001	<0.001		<0.001			25
Arsenic	<0.001			<0.001	<0.001		0.001			0.3
Barium	0.01			<0.009	<0.008		<0.008			10
Beryllium	<0.001			<0.001	<0.001		<0.001			0.01
Boron	<0.04			<0.04	<0.04		<0.04			120
Cadmium	<0.001			<0.001	<0.001		<0.001			2
Calcium	2.3			<0.3	<0.3		0.5			NPV
Chromium	0.002			0.001	0.001		0.002			1.5
Cobalt	<0.001			<0.001	<0.001		<0.001			0.1
Copper	0.036			0.043	<0.008		0.058			50
Iron	0.84			0.25	0.10		0.75			4
Lead	0.002			<0.001	<0.001		0.002			0.5
Lithium	<0.002			<0.002	<0.002		<0.002			NPV
Magnesium	0.36			0.12	<0.08		0.24			NPV
Manganese	0.030			<0.009	<0.008		0.016			2.5
Mercury	<0.00004			<0.00004	<0.00004		<0.00004			2
Molybdenum	<0.008			<0.009	<0.008		<0.008			120
Nickel	<0.002			<0.002	<0.002		<0.002			2

**Table 6: AAMP – Results for Inorganic Substances and Trace Metals in TSP Analysis  
 12 October 2011, Event 1482-109**

Parameter	24-Hour Time-Weighted Average Ambient Concentration									24-Hour Time-Weighted Criteria <sup>(1)</sup> ( $\mu\text{g}/\text{m}^3$ )
	Location 2 Currys Lane ( $\mu\text{g}/\text{m}^3$ )			Location 4 Rotary Drive ( $\mu\text{g}/\text{m}^3$ )			Location 5 Intercolonial Street ( $\mu\text{g}/\text{m}^3$ )			
	Sample	Field Blank	Field Duplicate	Sample	Field Blank	Field Duplicate	Sample	Field Blank	Field Duplicate	
<b>Potassium</b>	<0.2			<0.3	<0.2		<0.2			NPV <sup>(2)</sup>
<b>Selenium</b>	<0.001			<0.001	<0.001		<0.001			10
<b>Silver</b>	<0.001			<0.001	<0.001		<0.001			1
<b>Sodium</b>	0.6			0.7	<0.2		0.7			NPV
<b>Strontium</b>	0.006			<0.002	<0.002		<0.002			NPV
<b>Thallium</b>	<0.001			<0.001	<0.001		<0.001			NPV
<b>Tin</b>	<0.008			<0.009	<0.008		<0.008			10
<b>Uranium</b>	<0.002			<0.002	<0.002		<0.002			NPV
<b>Vanadium</b>	0.002			<0.001	<0.001		0.001			2
<b>Zinc</b>	<0.04			<0.04	<0.04		<0.04			120

Notes:

- (1) Criteria have been adopted by STPA for AAMP program and derived from Ontario Ministry of Environment Regulation 419/05 and Ambient Air Quality revisions of February 2008.  
 (2) "NPV" means no published value in Ontario Ministry of Environment Regulation 419/05 and Ambient Air Quality revisions of February 2008.

**Table 7: AAMP – Results for VOC Analysis  
 12 October 2011, Event 1482-109**

Parameter	24-Hour Time-Weighted Average Ambient Concentration															24-Hour Time-Weighted Criteria <sup>(1)</sup> (µg/m <sup>3</sup> )
	Location 1 Victoria Road (µg/m <sup>3</sup> )			Location 2 Currys Lane (µg/m <sup>3</sup> )			Location 4 Rotary Drive (µg/m <sup>3</sup> )			Location 5 Intercolonial Street (µg/m <sup>3</sup> )			Location 6 DesBarres Street (µg/m <sup>3</sup> )			
	Sample	Field Blank	Field Duplicate	Sample	Field Blank	Field Duplicate	Sample	Field Blank	Field Duplicate	Sample	Field Blank	Field Duplicate	Sample	Field Blank	Field Duplicate	
Dichlorodifluoromethane (Freon 12™)	2.662			2.692			2.676			2.664			2.672			500 000
1,2-Dichlorotetrafluoroethane (Freon 114™)	0.110			0.110			0.110			0.120			0.116			700 000
Trichlorofluoromethane (Freon 11™)	1.530			1.556			1.534			1.540			1.538			6000
Dichloromethane	0.458			0.162			0.468			0.184			0.190			220
1,1,2-Trichlorotrifluoroethane (Freon 113™)	0.658			0.662			0.666			0.682			0.674			800 000
1,1,1-Trichloroethane	0.036			0.036			0.036			0.040			0.038			115 000
Benzene	0.346			0.370			0.212			0.396			0.312			29 <sup>(2)</sup>
Carbon tetrachloride	0.494			0.486			0.498			0.500			0.508			2.4
Toluene	0.930			1.010			0.528			0.884			0.632			2000
Tetrachloroethene	0.214			0.074			0.032			0.082			0.076			360
Ethyl benzene	0.122			0.132			0.074			0.122			0.094			1000
<i>m</i> -, <i>p</i> -Xylene	0.404			0.444			0.242			0.406			0.324			730 <sup>(3)</sup>
<i>o</i> -Xylene	0.140			0.158			0.088			0.144			0.120			(3)
1,2,4-Trimethylbenzene	0.138			0.140			0.086			0.156			0.188			660
1,2,4-Trichlorobenzene	<0.082			<0.082			<0.082			<0.082			<0.082			400

Notes:

- (1) Criteria have been adopted by STPA for AAMP program and derived from Ontario Ministry of Environment Regulation 419/05 and Ambient Air Quality revisions of February 2008.
- (2) Criterion adopted by STPA for the AAMP and based on ATSDR MRL (July 2007) [www.atsdr.cdc.gov/toxprofiles/tp3.html](http://www.atsdr.cdc.gov/toxprofiles/tp3.html)
- (3) Value represents combined concentrations of *o*-, *m*-, and *p*-xylenes. Concentrations of *m*-, *p*-Xylene and *o*-Xylene are to be combined when comparing to the adopted criterion of 730 µg/m<sup>3</sup>.