

MEMORANDUM

TO	Peter Weaver, STPA	FILE NO.	S-1977-03
FROM	Jocelyn MacDonald	SHIFT:	0630 to 1930
TEL	(902) 539-3012	CC:	Geoffrey Verner, STPA Terry Smith, ALL-TECH
FAX	(902) 539-3381		
DATE	8 th January, 2013	STPA NO.	TP6B-P3-0513

**SUBJECT: 11 January 2013 Real-time Air Monitoring Results
Sydney Tar Ponds Agency – Solidification and Stabilization
FINAL REPORT**

Attached is a summary of Real-time particulate (as PM₁₀) and Total Volatile Organic Compound (TVOC) concentrations for air monitoring performed on the 9 January 2013. Kelly Morrison of ALL-TECH Environmental Services Cape Breton Limited (ALL-TECH) performed all air monitoring activities.

Weather conditions on the day of sampling:

- Mainly sunny
- Temperature: approximately 1°C
- Wind Direction: Northwest to North Northwest

Comments: *STPA has instructed ALL-TECH to perform air monitoring duties at one location downwind of solidification and stabilization activities. ALL-TECH was on-Site at 0630 hours and sampling began as soon as there was site activity. Air monitoring was performed during site construction activities.*

Real-time monitoring for dust as PM₁₀ was accomplished using a hand-held electronic TSI DustTrak aerosol monitor. Real-time monitoring for TVOC was accomplished using the hand-held MiniRAE 2000/3000 Photo-ionization Detector (PID).

All downwind concentrations (15-minute averages) of dust as PM₁₀ were below the established Site Action Level for this parameter of 155 µg/m³.

All downwind concentrations of TVOC were below the established action level for this parameter of 0.66 parts per million (volume) (ppm(v)). Each measurement is the average of a 15 minute sample. A minimum of 2 samples were taken downwind of the activity every hour. Levels above detection limit are noted in Table 1.0 of each report.

This report continues the practice of using a more conservative approach to estimating the cumulative Daily TVOCs value and forecasting of the Daily Budget for TVOCs (8 ppm(v)). Up to this point, TVOCs concentrations measured below the Detection Limit (DL) of the PID (0.1 ppm(v)) were shown as <DL or Not-detected (ND). There was no addition to the cumulative limit when a value <DL or ND was recorded. ALL-TECH is adopting a more conservative approach in estimating the cumulative value and forecasting the Daily Budget for TVOCs, by assigning a quantitative value of half the Detection Limit (0.5DL or 0.05 ppm(v)) to each measurement recorded at <DL. This recognizes the fact that the concentration could be any value up to the Detection Limit and assigns a mid-point value within the range. There are a number of factors of safety within the calculation of the Daily Limit. The use of 0.5DL for values below the level of detection adds to the conservatism of the approach to management of site activities. However, the comparison of the daily cumulative results to those from earlier reports will appear to show an increase in TVOCs concentration. It should be recognized that the use of 0.5DL for a 10 h workday will add about 12.5% of the Daily Budget Limit to the cumulative TVOCs concentration because of this change in methodology.

A Single-Sample Level has also been established for TVOC concentration in air at 0.66 ppm(v), or 0.66 ppm. This concentration level is included as *criteria* for the perimeter monitoring program to signal contractors and site managers to the presence of elevated concentrations of TVOCs. It is not linked directly to any health-based standard, but can be thought of as a point of information and communication about the real-time monitoring.

This report has been prepared by Kelly Morrison and reviewed by Dwayne Timmons. If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

Dwayne Timmons
ALL-TECH Environmental Services Cape Breton Ltd.

Copied via e-mail:

Geoffrey Verner	geoff@tarpondscleanup.ca
George Hennick	george@tarpondscleanup.ca
Lorraine MacNeil	lorraine@tarpondscleanup.ca
Jo-Ann MacMaster	joann@tarpondscleanup.ca
Holly Sampson	hsampson@craworld.com
Kevin MacPherson	kevinmacp@cbcl.ca
Terry Smith	tsmith@toalltech.com
Sue Lanoë	slanoe@alltechenvironmental.com
Darren Lawless	dlawless@toalltech.com
Kelly Morrison	kmorrison@alltechenvironmental.com
Jocelyn MacDonald	sydney@toalltech.com

Table 1.0
Real-time Airborne Dust as PM₁₀ and TVOC Concentration Results
Sydney Tar Ponds Agency – Solidification and Stabilization

Sample No. & Air Monitoring Location	Sample Start Time	Dust asPM ₁₀ 15 Minute Action Level (µg/m ³)	Dust asPM ₁₀ 15 Minute Average Concentration (µg/m ³)	TVOC Daily Budget Limit (ppm(v))	TVOC 15 Minute Average Concentration (ppm(v)) ¹	Wind Direction	Relative Position Related to Activity	Description of Activity	Observations that may affect sample result ²
1 75m Northeast of Portside Aggregates Ltd. (N46°09.261' W060°11.530')	0730	155	14	8.0	0.05	Northwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity
2 75m Northeast of Portside Aggregates Ltd. (N46°09.261' W060°11.530')	0825	155	24	8.0	0.05	Northwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity
3 75m Northeast of Portside Aggregates Ltd. (N46°09.261' W060°11.530')	0845	155	22	8.0	0.05	Northwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity
4 75m Northeast of Portside Aggregates Ltd. (N46°09.261' W060°11.530')	0900	155	25	8.0	0.05	Northwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity

¹ See NOTE (1) at end of Table

² See NOTE (2) at end of Table

Sample No. & Air Monitoring Location	Sample Start Time	Dust asPM ₁₀ 15 Minute Action Level (µg/m ³)	Dust asPM ₁₀ 15 Minute Average Concentration (µg/m ³)	TVOC Daily Budget Limit (ppm(v))	TVOC 15 Minute Average Concentration (ppm(v)) ¹	Wind Direction	Relative Position Related to Activity	Description of Activity	Observations that may affect sample result ²
5 75m Northeast of Portside Aggregates Ltd. (N46°09.261' W060°11.530')	0920	155	25	8.0	0.05	Northwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity
6 75m Northeast of Portside Aggregates Ltd. (N46°09.261' W060°11.530')	1000	155	16	8.0	0.05	Northwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity
7 75m Northeast of Portside Aggregates Ltd. (N46°09.261' W060°11.530')	1035	155	21	8.0	0.05	Northwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity
8 75m Northeast of Portside Aggregates Ltd. (N46°09.261' W060°11.530')	1100	155	19	8.0	0.05	Northwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity
9 75m Northeast of Portside Aggregates Ltd. (N46°09.261' W060°11.530')	1115	155	21	8.0	0.05	Northwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity

Sample No. & Air Monitoring Location	Sample Start Time	Dust asPM ₁₀ 15 Minute Action Level (µg/m ³)	Dust asPM ₁₀ 15 Minute Average Concentration (µg/m ³)	TVOC Daily Budget Limit (ppm(v))	TVOC 15 Minute Average Concentration (ppm(v)) ¹	Wind Direction	Relative Position Related to Activity	Description of Activity	Observations that may affect sample result ²
10 75m Northeast of Portside Aggregates Ltd. (N46°09.261' W060°11.530')	1200	155	11	8.0	0.05	Northwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity
11 75m Northeast of Railway America maintenance building (N46°08.941' W060°11.718')	1300	155	7	8.0	0.05	North Northwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity
12 75m Northeast of Railway America maintenance building (N46°08.941' W060°11.718')	1345	155	14	8.0	0.05	North Northwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity
13 75m Northeast of Railway America maintenance building (N46°08.941' W060°11.718')	1400	155	7	8.0	0.05	North Northwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity
14 75m Northeast of Railway America maintenance building (N46°08.941' W060°11.718')	1415	155	6	8.0	0.05	North Northwest	Downwind	Excavator and trucks operating	Visually high amounts of dust observed near sample location due to trucks on road disturbing dust.

Sample No. & Air Monitoring Location	Sample Start Time	Dust asPM ₁₀ 15 Minute Action Level (µg/m ³)	Dust asPM ₁₀ 15 Minute Average Concentration (µg/m ³)	TVOC Daily Budget Limit (ppm(v))	TVOC 15 Minute Average Concentration (ppm(v)) ¹	Wind Direction	Relative Position Related to Activity	Description of Activity	Observations that may affect sample result ²
15 75m Northeast of Railway America maintenance building (N46°08.941' W060°11.718')	1500	155	12	8.0	0.05	North Northwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity
16 75m Northeast of Railway America maintenance building (N46°08.941' W060°11.718')	1540	155	6	8.0	0.05	North Northwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity
17 75m Northeast of Railway America maintenance building (N46°08.941' W060°11.718')	1600	155	13	8.0	0.05	North Northwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity
18 75m Northeast of Railway America maintenance building (N46°08.941' W060°11.718')	1645	155	24	8.0	0.05	North Northwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity
19 75m Northeast of Railway America maintenance building (N46°08.941' W060°11.718')	1700	155	25	8.0	0.05	North Northwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity

Sample No. & Air Monitoring Location	Sample Start Time	Dust asPM ₁₀ 15 Minute Action Level (µg/m ³)	Dust asPM ₁₀ 15 Minute Average Concentration (µg/m ³)	TVOC Daily Budget Limit (ppm(v))	TVOC 15 Minute Average Concentration (ppm(v)) ¹	Wind Direction	Relative Position Related to Activity	Description of Activity	Observations that may affect sample result ²
20 75m Northeast of Railway America maintenance building (N46°08.941' W060°11.718')	1745	155	34	8.0	0.05	North Northwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity
21 75m Northeast of Railway America maintenance building (N46°08.941' W060°11.718')	1800	155	34	8.0	0.05	North Northwest	Downwind	Excavator and trucks operating	No observations seen to affect sampling integrity
22 75m Northeast of Railway America maintenance building (N46°08.941' W060°11.718')	1830	155	32	8.0	0.05	North Northwest	Downwind	No activity observed on site	No observations seen to affect sampling integrity

Notes: (1) The Detection Limit for VOCs using the PID is 0.1 ppm(v). Values less than the Detection Limit (<DL) or Not-detected (ND) are recorded at half the DL (0.05 ppm(v)) to provide a more conservative approach for the daily cumulative value, than assigning 0 ppm(v) for all values measured as <DL or ND. Hence, values in the table of 0.05 ppm(v) will have been recorded as <DL (or ND).

(2) Once the sample is started, it is completed at that location regardless of wind change during the 15 minutes. Significant wind changes, if any, during sampling would be noted in Observations.

*ND denotes that the result was below the instrument detection limit.

**Air sample duration for each monitoring event was 15 minutes. All samples reported are downwind in relation to the activity.

Table 2.0
Comparison of Downwind Daily Results for Dust (as PM₁₀) Budget

Item ID for Reference	Location	Duration	Hourly Dust Concentration Average (µg/m ³)	Actual Cumulative Dust Budget Value (µg/m ³)	Dust Budget Exceedance Value (µg/m ³) ⁽¹⁾	Remaining Dust Budget Value (µg/m ³)	Forecasted Dust Budget (µg/m ³)
1	75m Northeast of Portside Aggregates Ltd.	0700 to 0759	14	14	1005	991	322
2	75m Northeast of Portside Aggregates Ltd.	0800 to 0859	23	37	1005	968	321
3	75m Northeast of Portside Aggregates Ltd.	0900 to 0959	25	62	1005	943	315
4	75m Northeast of Portside Aggregates Ltd.	1000 to 1059	19	81	1005	924	301
5	75m Northeast of Portside Aggregates Ltd.	1100 to 1159	20	101	1005	904	288
6	75m Northeast of Portside Aggregates Ltd.	1200 to 1259	11	112	1005	893	266
7	75m Northeast of Railway America maintenance building	1300 to 1359	11	122	1005	883	243
8	75m Northeast of Railway America maintenance building	1400 to 1459	7	129	1005	876	217

Item ID for Reference	Location	Duration	Hourly Dust Concentration Average ($\mu\text{g}/\text{m}^3$)	Actual Cumulative Dust Budget Value ($\mu\text{g}/\text{m}^3$)	Dust Budget Exceedance Value ($\mu\text{g}/\text{m}^3$) ⁽¹⁾	Remaining Dust Budget Value ($\mu\text{g}/\text{m}^3$)	Forecasted Dust Budget ($\mu\text{g}/\text{m}^3$)
9	75m Northeast of Railway America maintenance building	1500 to 1559	9	138	1005	867	193
10	75m Northeast of Railway America maintenance building	1600 to 1659	19	156	1005	849	211
11	75m Northeast of Railway America maintenance building	1700 to 1759	30	186	1005	819	215
12	75m Northeast of Railway America maintenance building	1800 to 1859	33	219	1005	786	219

Notes: (1) Based on projected length of workday.

Budget (Forecast): $990 \mu\text{g}/\text{m}^3 > (\text{Budget to that point}) + (\text{Highest hourly average to that point} \times 1\text{hr}) + (33 \mu\text{g}/\text{m}^3 \times (\text{remaining work hours} - 1\text{ hour}))$
 This is based on a 10-h workday, but the formula would be modified to add $15 \mu\text{g}/\text{m}^3$ as background for each hour beyond 10, up to a total of 15 hours.
 *Individual values may not add to totals or accumulated values shown because of statistical rounding.

Table 3.0
Comparison of Downwind Daily Results for TVOC Budget

Item ID for Reference	Location	Duration	Hourly Total of TVOC Readings (ppm(v))	Cumulative TVOC Hourly Readings (ppm(v))	TVOC Budget Limit Value (ppm(v))	Remaining TVOC Budget Value (ppm(v))	Sustained Odours Observed (YES/NO)
1	75m Northeast of Portside Aggregates Ltd.	0700 to 0759	0.1	0.10	8.0	7.90	NO
2	75m Northeast of Portside Aggregates Ltd.	0800 to 0859	0.1	0.20	8.0	7.80	NO
3	75m Northeast of Portside Aggregates Ltd.	0900 to 0959	0.1	0.30	8.0	7.70	NO
4	75m Northeast of Portside Aggregates Ltd.	1000 to 1059	0.1	0.40	8.0	7.60	NO
5	75m Northeast of Portside Aggregates Ltd.	1100 to 1159	0.1	0.50	8.0	7.50	NO
6	75m Northeast of Portside Aggregates Ltd.	1200 to 1259	0.05	0.55	8.0	7.45	NO
7	75m Northeast of Railway America maintenance building	1300 to 1359	0.1	0.65	8.0	7.35	NO
8	75m Northeast of Railway America maintenance building	1400 to 1459	0.1	0.75	8.0	7.25	NO
9	75m Northeast of Railway America maintenance building	1500 to 1559	0.1	0.85	8.0	7.15	NO
10	75m Northeast of Railway America maintenance building	1600 to 1659	0.1	0.95	8.0	7.05	NO
11	75m Northeast of Railway America maintenance building	1700 to 1759	0.1	1.05	8.0	6.95	NO
12	75m Northeast of Railway America maintenance building	1800 to 1859	0.1	1.05	8.0	6.85	NO

Calculations

- **Hourly Average for Dust as PM₁₀ ($\mu\text{g}/\text{m}^3$) = the average of all downwind 15 minute readings within one hour**
- **Actual PM₁₀ Cumulative Dust Budget ($\mu\text{g}/\text{m}^3$) = the sum of all downwind hourly averages**
- **Forecasted Dust Budget Value ($\mu\text{g}/\text{m}^3$) = $990 \mu\text{g}/\text{m}^3 > (\text{Budget to that point}) + (\text{Highest hourly average to that point} \times 1\text{hr}) + (33 \mu\text{g}/\text{m}^3 \text{ as background} \times (\text{remaining work hours} - 1 \text{ hour}))$**

This is based on a 10-h workday, but the formula would be modified to add $15 \mu\text{g}/\text{m}^3$ as background for each hour beyond 10, up to a total of 15 hours.