

MEMORANDUM

TO	Dawn MacNeil, STPA	FILE NO.	S-1573-19
FROM	Sue Lanoë	SHIFT:	0630 to 1830
TEL	(902) 539-3012	CC:	Shawn Bernon, STPA Wilfred Kaiser, STPA Terry Smith, ALL-TECH
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DATE	8 th September, 2010	STPA NO.	TP6B-SP-0467

**SUBJECT: 7th September, 2010 Real-time Air Monitoring Results
Sydney Tar Ponds Agency – South Pond 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 7th of September, 2010. Dale MacDonald and Allan Poole of ALL-TECH Environmental Services Cape Breton Limited (ALL-TECH) performed all air monitoring activities.

Weather conditions on the day of sampling:

- Mainly cloudy with afternoon showers
- Temperature: approximately 21°C
- Wind Direction: Southwest

Comments: *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 and upwind concentrations (15-minute averages) of dust as PM₁₀ were below the established Site Action Level for this parameter of 155 µg/m³.

All downwind and upwind 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 and 1 sample upwind every hour. Levels above detection limit are noted in Table 1.0.

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 Dale MacDonald and reviewed by Jennifer Andrews. If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,



Sue Lanoë
Environmental Engineering Technologist
ALL-TECH Environmental Services Cape Breton Ltd.

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Table 1.0
Real-time Airborne Dust as PM₁₀ and TVOC Concentration Results
Sydney Tar Ponds Agency – South Pond 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 10m Southeast of Intercolonial St. fixed station (N46°08.571' W060°11.390')	0700	155	6	8.0	0.05	Southwest	Upwind	Background	No observations seen to affect sampling integrity
2 50m North of Stable Dr. and Ferry St. intersection (N46°08.912' W060°11.200')	0700	155	8	8.0	0.05	Southwest	Downwind	No activity observed on site	No observations seen to affect sampling integrity
3 50m North of Stable Dr. and Ferry St. intersection (N46°08.912' W060°11.200')	0735	155	14	8.0	0.05	Southwest	Downwind	Excavator and trucks operating (N46°08.372' W060°11.128')	No observations seen to affect sampling integrity
4 10m Southeast of Intercolonial St. fixed station (N46°08.571' W060°11.390')	0800	155	7	8.0	0.05	Southwest	Upwind	Background	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 50m North of Stable Dr. and Ferry St. intersection (N46°08.912' W060°11.200')	0800	155	11	8.0	0.05	Southwest	Downwind	Excavator and trucks operating (N46°08.372' W060°11.128')	No observations seen to affect sampling integrity
6 50m North of Stable Dr. and Ferry St. intersection (N46°08.912' W060°11.200')	0820	155	8	8.0	0.05	Southwest	Downwind	Excavator and trucks operating (N46°08.372' W060°11.128')	No observations seen to affect sampling integrity
7 10m Southeast of Intercolonial St. fixed station (N46°08.571' W060°11.390')	0900	155	6	8.0	0.05	Southwest	Upwind	Background	No observations seen to affect sampling integrity
8 50m North of Stable Dr. and Ferry St. intersection (N46°08.912' W060°11.200')	0900	155	10	8.0	0.05	Southwest	Downwind	Excavator and trucks operating (N46°08.372' W060°11.128')	No observations seen to affect sampling integrity
9 50m North of Stable Dr. and Ferry St. intersection (N46°08.912' W060°11.200')	0940	155	8	8.0	0.05	Southwest	Downwind	Excavator and trucks operating (N46°08.372' W060°11.128')	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 10m Southeast of Intercolonial St. fixed station (N46°08.571' W060°11.390')	1000	155	6	8.0	0.05	Southwest	Upwind	Background	No observations seen to affect sampling integrity
11 50m North of Stable Dr. and Ferry St. intersection (N46°08.912' W060°11.200')	1000	155	9	8.0	0.05	Southwest	Downwind	Excavator and trucks operating (N46°08.372' W060°11.128')	No observations seen to affect sampling integrity
12 50m North of Stable Dr. and Ferry St. intersection (N46°08.912' W060°11.200')	1020	155	8	8.0	0.05	Southwest	Downwind	Excavator and trucks operating (N46°08.372' W060°11.128')	No observations seen to affect sampling integrity
13 10m Southeast of Intercolonial St. fixed station (N46°08.571' W060°11.390')	1100	155	7	8.0	0.05	Southwest	Upwind	Background	No observations seen to affect sampling integrity
14 50m North of Stable Dr. and Ferry St. intersection (N46°08.912' W060°11.200')	1100	155	11	8.0	0.05	Southwest	Downwind	Excavator and trucks operating (N46°08.372' W060°11.128')	No observations seen to affect sampling integrity

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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 50m North of Stable Dr. and Ferry St. intersection (N46°08.912' W060°11.200')	1130	155	11	8.0	0.05	Southwest	Downwind	Excavator and trucks operating (N46°08.372' W060°11.128')	No observations seen to affect sampling integrity
16 10m Southeast of Intercolonial St. fixed station (N46°08.571' W060°11.390')	1200	155	7	8.0	0.05	Southwest	Upwind	Background	No observations seen to affect sampling integrity
17 50m North of Stable Dr. and Ferry St. intersection (N46°08.912' W060°11.200')	1200	155	7	8.0	0.05	Southwest	Downwind	No activity observed on site	No observations seen to affect sampling integrity
18 50m North of Stable Dr. and Ferry St. intersection (N46°08.912' W060°11.200')	1215	155	6	8.0	0.05	Southwest	Downwind	No activity observed on site	No observations seen to affect sampling integrity
19 10m Southeast of Intercolonial St. fixed station (N46°08.571' W060°11.390')	1300	155	7	8.0	0.05	Southwest	Upwind	Background	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 50m North of Stable Dr. and Ferry St. intersection (N46°08.912' W060°11.200')	1300	155	7	8.0	0.05	Southwest	Downwind	Excavator and trucks operating (N46°08.372' W060°11.128')	No observations seen to affect sampling integrity
21 50m North of Stable Dr. and Ferry St. intersection (N46°08.912' W060°11.200')	1345	155	25	8.0	0.05	Southwest	Downwind	Excavator and trucks operating (N46°08.372' W060°11.128')	No observations seen to affect sampling integrity
22 10m Southeast of Intercolonial St. fixed station (N46°08.571' W060°11.390')	1400	155	9	8.0	0.05	Southwest	Upwind	Background	No observations seen to affect sampling integrity
23 50m North of Stable Dr. and Ferry St. intersection (N46°08.912' W060°11.200')	1400	155	11	8.0	0.05	Southwest	Downwind	Excavator and trucks operating (N46°08.372' W060°11.128')	No observations seen to affect sampling integrity
24 50m North of Stable Dr. and Ferry St. intersection (N46°08.912' W060°11.200')	1445	155	10	8.0	0.05	Southwest	Downwind	Excavator and trucks operating (N46°08.372' W060°11.128')	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
25 10m Southeast of Intercolonial St. fixed station (N46°08.571' W060°11.390')	1500	155	9	8.0	0.05	Southwest	Upwind	Background	No observations seen to affect sampling integrity
26 50m North of Stable Dr. and Ferry St. intersection (N46°08.912' W060°11.200')	1500	155	10	8.0	0.05	Southwest	Downwind	Excavator and trucks operating (N46°08.372' W060°11.128')	No observations seen to affect sampling integrity
27 50m North of Stable Dr. and Ferry St. intersection (N46°08.912' W060°11.200')	1530	155	14	8.0	0.05	Southwest	Downwind	Excavator and trucks operating (N46°08.372' W060°11.128')	No observations seen to affect sampling integrity
28 10m Southeast of Intercolonial St. fixed station (N46°08.571' W060°11.390')	1600	155	10	8.0	0.05	Southwest	Upwind	Background	No observations seen to affect sampling integrity
29 50m North of Stable Dr. and Ferry St. intersection (N46°08.912' W060°11.200')	1600	155	12	8.0	0.05	Southwest	Downwind	Excavator and trucks operating (N46°08.372' W060°11.128')	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
30 50m North of Stable Dr. and Ferry St. intersection (N46°08.912' W060°11.200')	1625	155	12	8.0	0.05	Southwest	Downwind	Excavator and trucks operating (N46°08.372' W060°11.128')	No observations seen to affect sampling integrity
31 10m Southeast of Intercolonial St. fixed station (N46°08.571' W060°11.390')	1700	155	28	8.0	0.05	Southwest	Upwind	Background	No observations seen to affect sampling integrity
32 50m North of Stable Dr. and Ferry St. intersection (N46°08.912' W060°11.200')	1700	155	13	8.0	0.05	Southwest	Downwind	No activity observed on site	No observations seen to affect sampling integrity
33 50m North of Stable Dr. and Ferry St. intersection (N46°08.912' W060°11.200')	1730	155	15	8.0	0.05	Southwest	Downwind	No activity observed on site	No observations seen to affect sampling integrity

Notes: (1) 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. Highlighted rows (cream) are downwind samples; rows with no colour fill are upwind samples, 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	50m North of Stable Dr. and Ferry St. intersection	0700 to 0759	11	11	1005	994	301
2	50m North of Stable Dr. and Ferry St. intersection	0800 to 0859	10	21	1005	984	278
3	50m North of Stable Dr. and Ferry St. intersection	0900 to 0959	9	30	1005	975	254
4	50m North of Stable Dr. and Ferry St. intersection	1000 to 1059	9	39	1005	966	229
5	50m North of Stable Dr. and Ferry St. intersection	1100 to 1159	11	50	1005	955	207
6	50m North of Stable Dr. and Ferry St. intersection	1200 to 1259	7	57	1005	948	181
7	50m North of Stable Dr. and Ferry St. intersection	1300 to 1359	16	73	1005	932	169
8	50m North of Stable Dr. and Ferry St. intersection	1400 to 1459	11	84	1005	921	146
9	50m North of Stable Dr. and Ferry St. intersection	1500 to 1559	12	96	1005	909	125

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 ($\mu\text{g}/\text{m}^3$)
10	50m North of Stable Dr. and Ferry St. intersection	1600 to 1659	12	108	1005	897	137
11	50m North of Stable Dr. and Ferry St. intersection	1700 to 1759	14	122	1005	883	120

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)	Cumulative TVOC Hourly Readings (ppm)	TVOC Budget Limit Value (ppm)	Remaining TVOC Budget Value (ppm)	Sustained Odours Observed (YES/NO)
1	50m North of Stable Dr. and Ferry St. intersection	0700 to 0759	0.1	0.1	8.0	7.9	NO
2	50m North of Stable Dr. and Ferry St. intersection	0800 to 0859	0.1	0.2	8.0	7.8	NO
3	50m North of Stable Dr. and Ferry St. intersection	0900 to 0959	0.1	0.3	8.0	7.7	NO
4	50m North of Stable Dr. and Ferry St. intersection	1000 to 1059	0.1	0.4	8.0	7.6	NO
5	50m North of Stable Dr. and Ferry St. intersection	1100 to 1159	0.1	0.5	8.0	7.5	NO
6	50m North of Stable Dr. and Ferry St. intersection	1200 to 1259	0.1	0.6	8.0	7.4	NO
7	50m North of Stable Dr. and Ferry St. intersection	1300 to 1359	0.1	0.7	8.0	7.3	NO
8	50m North of Stable Dr. and Ferry St. intersection	1400 to 1459	0.1	0.8	8.0	7.2	NO
9	50m North of Stable Dr. and Ferry St. intersection	1500 to 1559	0.1	0.9	8.0	7.1	NO

Item ID for Reference	Location	Duration	Hourly Total of TVOC Readings (ppm)	Cumulative TVOC Hourly Readings (ppm)	TVOC Budget Limit Value (ppm)	Remaining TVOC Budget Value (ppm)	Sustained Odours Observed (YES/NO)
10	50m North of Stable Dr. and Ferry St. intersection	1600 to 1659	0.1	1.0	8.0	7.0	NO
11	50m North of Stable Dr. and Ferry St. intersection	1700 to 1759	0.1	1.1	8.0	6.9	NO

Calculations

- Hourly Average for Dust as PM_{10} ($\mu\text{g}/\text{m}^3$) = the average of all downwind 15 minute readings within one hour

- Actual PM_{10} 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.