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MEMORANDUM

TO	Peter Weaver, STPA	**FILE NO.**	S-1977-07
FROM	Jocelyn MacDonald	**SHIFT:**	0630 to 1830
TEL	(902) 539-3012	**CC:**	Geoffrey Verner, STPA
FAX	(902) 539-3381		Terry Smith, ALL-TECH
DATE	16 January, 2013		
		STPA NO.	**TP6B-P3-0517**

SUBJECT: **15 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 PM_{10}) and Total Volatile Organic Compound (TVOC) concentrations for air monitoring performed on the 15 January 2013. Brad Kelly 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 sunny periods
- Temperature: approximately 0°C
- Wind Direction: 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 PM_{10} 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 PM_{10} were below the established Site Action Level for this parameter of 155 $\mu g/m^3$.

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 Brad Kelly 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.

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Table 1.0
Real-time Airborne Dust as PM_{10} 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 ($\mu g/m^3$)	Dust asPM_{10} 15 Minute Average Concentration ($\mu g/m^3$)	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 100m North of Rail America Repair Shop. (N46°08.950´ W060°11.875´)	0730	155	12	8.0	0.05	Northwest	Downwind	Excavators and trucks operating	No observations seen to affect sampling integrity
2 100m North of Rail America Repair Shop. (N46°08.950´ W060°11.875´)	0800	155	12	8.0	0.05	Northwest	Downwind	Excavators and trucks operating	No observations seen to affect sampling integrity
3 100m North of Rail America Repair Shop. (N46°08.950´ W060°11.875´)	0815	155	13	8.0	0.05	Northwest	Downwind	Excavators and trucks operating	No observations seen to affect sampling integrity
4 100m North of Rail America Repair Shop. (N46°08.950´ W060°11.875´)	0900	155	15	8.0	0.05	Northwest	Downwind	Excavators and trucks operating	No observations seen to affect sampling integrity
5 100m North of Rail America Repair Shop. (N46°08.950´ W060°11.875´)	0940	155	22	8.0	0.05	Northwest	Downwind	Excavators 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 ($\mu g/m^3$)	Dust asPM_{10} 15 Minute Average Concentration ($\mu g/m^3$)	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]
6 100m North of Rail America Repair Shop. (N46°08.950´ W060°11.875´)	1000	155	21	8.0	0.05	Northwest	Downwind	Excavators and trucks operating	No observations seen to affect sampling integrity
7 100m North of Rail America Repair Shop. (N46°08.950´ W060°11.875´)	1045	155	14	8.0	0.05	Northwest	Downwind	Excavators and trucks operating	No observations seen to affect sampling integrity
8 100m North of Rail America Repair Shop. (N46°08.950´ W060°11.875´)	1100	155	14	8.0	0.05	Northwest	Downwind	Excavators and trucks operating	No observations seen to affect sampling integrity
9 100m North of Rail America Repair Shop. (N46°08.950´ W060°11.875´)	1135	155	14	8.0	0.05	Northwest	Downwind	Excavators and trucks operating	No observations seen to affect sampling integrity
10 100m North of Rail America Repair Shop. (N46°08.950´ W060°11.875´)	1200	155	13	8.0	0.05	Northwest	Downwind	Excavators and trucks operating	No observations seen to affect sampling integrity
11 100m North of Rail America Repair Shop. (N46°08.950´ W060°11.875´)	1225	155	13	8.0	0.05	Northwest	Downwind	Excavators 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 ($\mu g/m^3$)	Dust asPM_{10} 15 Minute Average Concentration ($\mu g/m^3$)	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]
12 100m North of Rail America Repair Shop. (N46°08.950´ W060°11.875´)	1300	155	12	8.0	0.05	Northwest	Downwind	Excavators and trucks operating	No observations seen to affect sampling integrity
13 100m North of Rail America Repair Shop. (N46°08.950´ W060°11.875´)	1340	155	13	8.0	0.05	Northwest	Downwind	Excavators and trucks operating	No observations seen to affect sampling integrity
14 100m North of Rail America Repair Shop. (N46°08.950´ W060°11.875´)	1400	155	14	8.0	0.05	Northwest	Downwind	Excavators and trucks operating	No observations seen to affect sampling integrity
15 100m North of Rail America Repair Shop. (N46°08.950´ W060°11.875´)	1420	155	13	8.0	0.05	Northwest	Downwind	Excavators and trucks operating	No observations seen to affect sampling integrity
16 100m North of Rail America Repair Shop. (N46°08.950´ W060°11.875´)	1500	155	11	8.0	0.05	Northwest	Downwind	Excavators 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 ($\mu g/m^3$)	Dust asPM_{10} 15 Minute Average Concentration ($\mu g/m^3$)	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]
17 100m North of Rail America Repair Shop. (N46°08.950´ W060°11.875´)	1545	155	10	8.0	0.05	Northwest	Downwind	Excavators and trucks operating	No observations seen to affect sampling integrity
18 100m North of Rail America Repair Shop. (N46°08.950´ W060°11.875´)	1600	155	10	8.0	0.05	Northwest	Downwind	Excavators and trucks operating	Odour observed, believed to be site related
19 100m North of Rail America Repair Shop. (N46°08.950´ W060°11.875´)	1615	155	11	8.0	0.05	Northwest	Downwind	Excavators and trucks operating	No observations seen to affect sampling integrity
20 100m North of Rail America Repair Shop. (N46°08.950´ W060°11.875´)	1700	155	11	8.0	0.05	Northwest	Downwind	No activity observed on site	No observations seen to affect sampling integrity
21 100m North of Rail America Repair Shop. (N46°08.950´ W060°11.875´)	1730	155	11	8.0	0.05	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 PM_{10}) Budget

Item ID for Reference	Location	Duration	Hourly Dust Concentration Average ($\mu g/m^3$)	Actual Cumulative Dust Budget Value ($\mu g/m^3$)	Dust Budget Exceedance Value ($\mu g/m^3$)(1)	Remaining Dust Budget Value ($\mu g/m^3$)	Forecasted Dust Budget ($\mu g/m^3$)
1	100m North of Rail America Repair Shop.	0700 to 0759	12	12	1005	993	303
2	100m North of Rail America Repair Shop.	0800 to 0859	13	25	1005	980	283
3	100m North of Rail America Repair Shop.	0900 to 0959	19	44	1005	961	275
4	100m North of Rail America Repair Shop.	1000 to 1059	18	62	1005	943	259
5	100m North of Rail America Repair Shop.	1100 to 1159	14	76	1005	929	240
6	100m North of Rail America Repair Shop.	1200 to 1259	13	89	1005	916	220
7	100m North of Rail America Repair Shop.	1300 to 1359	13	102	1005	903	200
8	100m North of Rail America Repair Shop.	1400 to 1459	14	116	1005	889	180

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)
9	100m North of Rail America Repair Shop.	1500 to 1559	11	127	1005	878	158
10	100m North of Rail America Repair Shop.	1600 to 1659	11	138	1005	867	168
11	100m North of Rail America Repair Shop.	1700 to 1759	11	149	1005	856	146

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

Budget (Forecast): 990 µg/m³ > (Budget to that point) + (Highest hourly average to that point X 1hr) + (33 µg/m³ X (remaining work hours -1 hour))
This is based on a 10-h workday, but the formula would be modified to add 15 µg/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	100m North of Rail America Repair Shop.	0700 to 0759	0.05	0.05	8.0	7.95	NO
2	100m North of Rail America Repair Shop.	0800 to 0859	0.1	0.15	8.0	7.85	NO
3	100m North of Rail America Repair Shop.	0900 to 0959	0.1	0.25	8.0	7.75	NO
4	100m North of Rail America Repair Shop.	1000 to 1059	0.1	0.35	8.0	7.65	NO
5	100m North of Rail America Repair Shop.	1100 to 1159	0.1	0.45	8.0	7.55	NO
6	100m North of Rail America Repair Shop.	1200 to 1259	0.1	0.55	8.0	7.45	NO
7	100m North of Rail America Repair Shop.	1300 to 1359	0.1	0.65	8.0	7.35	NO
8	100m North of Rail America Repair Shop.	1400 to 1459	0.1	0.75	8.0	7.25	NO
9	100m North of Rail America Repair Shop.	1500 to 1559	0.1	0.85	8.0	7.15	NO

10	100m North of Rail America Repair Shop.	1600 to 1659	0.1	0.95	8.0	7.05	NO
11	100m North of Rail America Repair Shop.	1700 to 1759	0.1	1.05	8.0	6.95	NO

Calculations

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

- Actual PM_{10} Cumulative Dust Budget ($\mu g/m^3$) = the sum of all downwind hourly averages

- Forecasted Dust Budget Value ($\mu g/m^3$) = 990 $\mu g/m^3$ > (Budget to that point) + (Highest hourly average to that point x 1hr) + (33 $\mu g/m^3$ as background x (remaining work hours -1 hour))

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