

MEMORANDUM

| | | | |
|-------------|---------------------------------|-----------------|---|
| TO | Dawn MacNeil, STPA | FILE NO. | S-1573-16 |
| FROM | Sue Lanoë | SHIFT: | 0630 to 1830 |
| TEL | (902) 539-3012 | CC: | Shawn Bernon, STPA Wilfred Kaiser, STPA Terry Smith, ALL-TECH |
| FAX | (902) 539-3381 | STPA NO. | TP6B-SP-0464 |
| DATE | 8 th September, 2010 | | |

**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. Joe Perfect and Fred Hawryluk 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 Fred Hawryluk 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.

Copied via e-mail:

| | |
|-------------------|--|
| Shawn Bernon | shawn@tarpondscleanup.ca |
| Wilfred Kaiser | wilfred@tarpondscleanup.ca |
| George Hennick | george@tarpondscleanup.ca |
| Nancy LeDrew | nancy@tarpondscleanup.ca |
| Lorraine MacNeil | lorraine@tarpondscleanup.ca |
| Jo-Ann MacMaster | joann@tarpondscleanup.ca |
| Darren Gardiner | dgardiner@craworld.com |
| Kevin Mac Pherson | kevinmacp@cbcl.ca |
| Terry Smith | tsmith@toalltech.com |
| Sue Lanoë | slanoë@alltechenvironmental.com |
| Darren Lawless | dlawless@toalltech.com |
| Kelly Morrison | kmorrison@alltechenvironmental.com |
| Jocelyn MacDonald | sydney@toalltech.com |
| Kathy Harquail | kharquail@toalltech.com |

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 30m Northeast of Intercolonial St. fixed station (N46°08.596' W060°11.396') | 0700 | 155 | 5 | 8.0 | 0.05 | Southwest | Upwind | Background | No observations seen to affect sampling integrity |
| 2 30m Northeast of Ferry St. and Stable Dr. intersection (N46°08.914' W060°11.250') | 0700 | 155 | 14 | 8.0 | 0.05 | Southwest | Downwind | No activity observed on site | No observations seen to affect sampling integrity |
| 3 30m Northeast of Ferry St. and Stable Dr. intersection (N46°08.914' W060°11.250') | 0715 | 155 | 16 | 8.0 | 0.05 | Southwest | Downwind | No activity observed on site | No observations seen to affect sampling integrity |
| 4 30m Northeast of Intercolonial St. fixed station (N46°08.596' W060°11.396') | 0800 | 155 | 4 | 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

Sydney Tar Ponds Agency - Ambient Air Monitoring Program
 Real-time Air Monitoring Daily Report - DRAFT

| 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 30m Northeast of Ferry St. and Stable Dr. intersection (N46°08.914' W060°11.250') | 0800 | 155 | 15 | 8.0 | 0.05 | Southwest | Downwind | Excavator and trucks operating (N46°08.508' W060°11.349') | No observations seen to affect sampling integrity |
| 6 30m Northeast of Ferry St. and Stable Dr. intersection (N46°08.914' W060°11.250') | 0820 | 155 | 14 | 8.0 | 0.05 | Southwest | Downwind | Excavator and trucks operating (N46°08.508' W060°11.349') | No observations seen to affect sampling integrity |
| 7 30m Northeast of Intercolonial St. fixed station (N46°08.596' W060°11.396') | 0900 | 155 | 4 | 8.0 | 0.3 | Southwest | Upwind | Background | No observations seen to affect sampling integrity |
| 8 30m Northeast of Ferry St. and Stable Dr. intersection (N46°08.914' W060°11.250') | 0900 | 155 | 13 | 8.0 | 0.05 | Southwest | Downwind | Excavator and trucks operating (N46°08.508' W060°11.349') | No observations seen to affect sampling integrity |
| 9 30m Northeast of Ferry St. and Stable Dr. intersection (N46°08.914' W060°11.250') | 0930 | 155 | 10 | 8.0 | 0.05 | Southwest | Downwind | Excavator and trucks operating (N46°08.508' W060°11.349') | 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 30m Northeast of Intercolonial St. fixed station (N46°08.596' W060°11.396') | 1000 | 155 | 5 | 8.0 | 0.05 | Southwest | Upwind | Background | No observations seen to affect sampling integrity |
| 11 30m Northeast of Ferry St. and Stable Dr. intersection (N46°08.914' W060°11.250') | 1000 | 155 | 9 | 8.0 | 0.05 | Southwest | Downwind | Excavator and trucks operating (N46°08.508' W060°11.349') | No observations seen to affect sampling integrity |
| 12 30m Northeast of Ferry St. and Stable Dr. intersection (N46°08.914' W060°11.250') | 1025 | 155 | 7 | 8.0 | 0.05 | Southwest | Downwind | Excavator and trucks operating (N46°08.508' W060°11.349') | No observations seen to affect sampling integrity |
| 13 30m Northeast of Intercolonial St. fixed station (N46°08.596' W060°11.396') | 1100 | 155 | 6 | 8.0 | 0.05 | Southwest | Upwind | Background | No observations seen to affect sampling integrity |
| 14 30m Northeast of Ferry St. and Stable Dr. intersection (N46°08.914' W060°11.250') | 1100 | 155 | 10 | 8.0 | 0.05 | Southwest | Downwind | Excavator and trucks operating (N46°08.508' W060°11.349') | 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 |
|---|-------------------|---|--|----------------------------------|--|----------------|---------------------------------------|---|---|
| 15 30m Northeast of Ferry St. and Stable Dr. intersection (N46°08.914' W060°11.250') | 1120 | 155 | 8 | 8.0 | 0.05 | Southwest | Downwind | Excavator and trucks operating (N46°08.508' W060°11.349') | No observations seen to affect sampling integrity |
| 16 30m Northeast of Intercolonial St. fixed station (N46°08.596' W060°11.396') | 1200 | 155 | 7 | 8.0 | 0.05 | Southwest | Upwind | Background | No observations seen to affect sampling integrity |
| 17 30m Northeast of Ferry St. and Stable Dr. intersection (N46°08.914' W060°11.250') | 1200 | 155 | 5 | 8.0 | 0.05 | Southwest | Downwind | No activity observed on site | No observations seen to affect sampling integrity |
| 18 30m Northeast of Ferry St. and Stable Dr. intersection (N46°08.914' W060°11.250') | 1215 | 155 | 5 | 8.0 | 0.05 | Southwest | Downwind | No activity observed on site | No observations seen to affect sampling integrity |
| 19 30m Northeast of Intercolonial St. fixed station (N46°08.596' W060°11.396') | 1300 | 155 | 6 | 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 30m Northeast of Ferry St. and Stable Dr. intersection (N46°08.914' W060°11.250') | 1300 | 155 | 5 | 8.0 | 0.05 | Southwest | Downwind | Excavator operating (N46°08.508' W060°11.349') | No observations seen to affect sampling integrity |
| 21 30m Northeast of Ferry St. and Stable Dr. intersection (N46°08.914' W060°11.250') | 1325 | 155 | 7 | 8.0 | 0.05 | Southwest | Downwind | Excavator operating (N46°08.508' W060°11.349') | No observations seen to affect sampling integrity |
| 22 30m Northeast of Intercolonial St. fixed station (N46°08.596' W060°11.396') | 1400 | 155 | 7 | 8.0 | 0.05 | Southwest | Upwind | Background | No observations seen to affect sampling integrity |
| 23 30m Northeast of Ferry St. and Stable Dr. intersection (N46°08.914' W060°11.250') | 1400 | 155 | 10 | 8.0 | 0.05 | Southwest | Downwind | Excavator operating (N46°08.508' W060°11.349') | No observations seen to affect sampling integrity |
| 24 30m Northeast of Ferry St. and Stable Dr. intersection (N46°08.914' W060°11.250') | 1430 | 155 | 8 | 8.0 | 0.05 | Southwest | Downwind | Excavator operating (N46°08.508' W060°11.349') | 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 30m Northeast of Intercolonial St. fixed station (N46°08.596' W060°11.396') | 1500 | 155 | 8 | 8.0 | 0.05 | Southwest | Upwind | Background | No observations seen to affect sampling integrity |
| 26 30m Northeast of Ferry St. and Stable Dr. intersection (N46°08.914' W060°11.250') | 1500 | 155 | 11 | 8.0 | 0.05 | Southwest | Downwind | No activity observed on site | No observations seen to affect sampling integrity |
| 27 30m Northeast of Ferry St. and Stable Dr. intersection (N46°08.914' W060°11.250') | 1520 | 155 | 16 | 8.0 | 0.05 | Southwest | Downwind | Excavator operating (N46°08.508' W060°11.349') | No observations seen to affect sampling integrity |
| 28 30m Northeast of Intercolonial St. fixed station (N46°08.596' W060°11.396') | 1600 | 155 | 9 | 8.0 | 0.05 | Southwest | Upwind | Background | No observations seen to affect sampling integrity |
| 29 30m Northeast of Ferry St. and Stable Dr. intersection (N46°08.914' W060°11.250') | 1600 | 155 | 12 | 8.0 | 0.05 | Southwest | Downwind | Excavator operating (N46°08.508' W060°11.349') | 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 30m Northeast of Ferry St. and Stable Dr. intersection (N46°08.914' W060°11.250') | 1625 | 155 | 15 | 8.0 | 0.05 | Southwest | Downwind | Excavator operating (N46°08.508' W060°11.349') | No observations seen to affect sampling integrity |
| 31 30m Northeast of Intercolonial St. fixed station (N46°08.596' W060°11.396') | 1700 | 155 | 15 | 8.0 | 0.05 | Southwest | Upwind | Background | No observations seen to affect sampling integrity |
| 32 30m Northeast of Ferry St. and Stable Dr. intersection (N46°08.914' W060°11.250') | 1700 | 155 | 16 | 8.0 | 0.05 | Southwest | Downwind | No activity observed on site | No observations seen to affect sampling integrity |
| 33 30m Northeast of Ferry St. and Stable Dr. intersection (N46°08.914' W060°11.250') | 1730 | 155 | 17 | 8.0 | 0.05 | Southwest | 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. 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 | 30m Northeast of Ferry St. and Stable Dr. intersection | 0700 to 0759 | 15 | 15 | 1005 | 990 | 309 |
| 2 | 30m Northeast of Ferry St. and Stable Dr. intersection | 0800 to 0859 | 15 | 30 | 1005 | 975 | 291 |
| 3 | 30m Northeast of Ferry St. and Stable Dr. intersection | 0900 to 0959 | 12 | 42 | 1005 | 963 | 269 |
| 4 | 30m Northeast of Ferry St. and Stable Dr. intersection | 1000 to 1059 | 8 | 50 | 1005 | 955 | 244 |
| 5 | 30m Northeast of Ferry St. and Stable Dr. intersection | 1100 to 1159 | 9 | 59 | 1005 | 946 | 220 |
| 6 | 30m Northeast of Ferry St. and Stable Dr. intersection | 1200 to 1259 | 5 | 64 | 1005 | 941 | 192 |
| 7 | 30m Northeast of Ferry St. and Stable Dr. intersection | 1300 to 1359 | 6 | 70 | 1005 | 935 | 165 |
| 8 | 30m Northeast of Ferry St. and Stable Dr. intersection | 1400 to 1459 | 9 | 79 | 1005 | 926 | 141 |
| 9 | 30m Northeast of Ferry St. and Stable Dr. intersection | 1500 to 1559 | 14 | 93 | 1005 | 912 | 122 |

| 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 | 30m Northeast of Ferry St. and Stable Dr. intersection | 1600 to 1659 | 14 | 107 | 1005 | 898 | 135 |
| 11 | 30m Northeast of Ferry St. and Stable Dr. intersection | 1600 to 1659 | 17 | 124 | 1005 | 881 | 122 |

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 | 30m Northeast of Ferry St. and Stable Dr. intersection | 0700 to 0759 | 0.1 | 0.1 | 8.0 | 7.9 | NO |
| 2 | 30m Northeast of Ferry St. and Stable Dr. intersection | 0800 to 0859 | 0.1 | 0.2 | 8.0 | 7.8 | NO |
| 3 | 30m Northeast of Ferry St. and Stable Dr. intersection | 0900 to 0959 | 0.1 | 0.3 | 8.0 | 7.7 | NO |
| 4 | 30m Northeast of Ferry St. and Stable Dr. intersection | 1000 to 1059 | 0.1 | 0.4 | 8.0 | 7.6 | NO |
| 5 | 30m Northeast of Ferry St. and Stable Dr. intersection | 1100 to 1159 | 0.1 | 0.5 | 8.0 | 7.5 | NO |
| 6 | 30m Northeast of Ferry St. and Stable Dr. intersection | 1200 to 1259 | 0.1 | 0.6 | 8.0 | 7.4 | NO |
| 7 | 30m Northeast of Ferry St. and Stable Dr. intersection | 1300 to 1359 | 0.1 | 0.7 | 8.0 | 7.3 | NO |
| 8 | 30m Northeast of Ferry St. and Stable Dr. intersection | 1400 to 1459 | 0.1 | 0.8 | 8.0 | 7.2 | NO |
| 9 | 30m Northeast of Ferry St. and Stable Dr. 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(v)) | Cumulative TVOC Hourly Readings (ppm(v)) | TVOC Budget Limit Value (ppm(v)) | Remaining TVOC Budget Value (ppm(v)) | Sustained Odours Observed (YES/NO) |
|-----------------------|--|--------------|--|--|----------------------------------|--------------------------------------|------------------------------------|
| 10 | 30m Northeast of Ferry St. and Stable Dr. intersection | 1600 to 1659 | 0.1 | 1.0 | 8.0 | 7.0 | NO |
| 11 | 30m Northeast of Ferry St. and Stable Dr. intersection | 1700 to 1759 | 0.1 | 1.1 | 8.0 | 6.9 | 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 ($\mu g/m^3$) = $990 \mu g/m^3 > (\text{Budget to that point}) + (\text{Highest hourly average to that point} \times 1\text{hr}) + (33 \mu g/m^3 \text{ as background} \times (\text{remaining work hours} - 1 \text{ hour}))$

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