

CASE STUDY - STETTLER BioLogix Application

Site Information – Located in Stettler, AB. Site was contaminated with BTEX/F1-F4 with BTEX/F1&F2 exceeding criteria.

Application – BioLogix was applied with a pump and hose spray while excavator bucket mixed in BioLogix solution with soils.

Results – Baseline soil sampling indicated elevated levels of petroleum hydrocarbons with BTEX & F2 data results exceeding AB Tier I criteria.

Summarized baseline data below includes the maximum recorded values from baseline sampling event. Delta's BioLogix treatment occurred June 18th, 2017 and post-treatment sampling events were conducted by a third party consultant typically at 30 day intervals i.e. 30, 60, 90 days until soils are below Tier I guidelines. First round of post treatment sampling confirmed treatment success within 30 days (results below Tier I guidelines).

| TREATMENT PILE 1 | | | Jun 18 2017 | Aug 18 2017 | Coarse | |
|-------------------------|------------|-------|-----------------|----------------------|-----------------|------------------------------|
| Parameter Name | Unit | DL | Baseline | After 30 Days | Criteria | <i>% reduction in Pile 1</i> |
| Benzene | mg/kg | 0.005 | 0.255 | 0.007 | 0.078 | 97.25 |
| Toluene | mg/kg | 0.02 | 1.19 | <0.020 | 0.12 | 100.00 |
| Ethylbenzene | mg/kg | 0.005 | 0.75 | <0.063 | 0.14 | 100.00 |
| Total Xylenes (m,p,o) | mg/kg | 0.03 | 2.94 | 0.22 | 1.9 | 92.52 |
| F1 C6-C10 | mg/kg | 10 | 90 | <10 | 230 | 100.00 |
| F2c C10-C16 | mg/kg | 50 | 1470 | <50 | 260 | 100.00 |
| F3c C16-C34 | mg/kg | 50 | 838 | 140 | 1700 | 83.29 |
| F4c C34-C50 | mg/kg | 100 | 453 | <100 | 3300 | 100.00 |
| Chrome to baseline @C50 | mg/kg | 100 | Yes | Yes | | nc |
| Moisture | %by weight | – | – | 15 | | nc |
| TREATMENT PILE 2 | | | Jun 18 2017 | Aug 18 2017 | Coarse | |
| Parameter Name | Unit | DL | Baseline | After 30 days | Criteria | <i>% reduction in Pile 2</i> |
| Benzene | mg/kg | 0.005 | 0.255 | <0.005 | 0.078 | 100.00 |
| Toluene | mg/kg | 0.02 | 1.19 | <0.010 | 0.12 | 100.00 |
| Ethylbenzene | mg/kg | 0.005 | 0.75 | <0.010 | 0.14 | 100.00 |
| Total Xylenes (m,p,o) | mg/kg | 0.03 | 2.94 | <0.030 | 1.9 | 100.00 |
| TREATMENT PILE 3 | | | Jun 18 2017 | Aug 18 2017 | Coarse | |
| Parameter Name | Unit | DL | Baseline | After 30 days | Criteria | <i>%reduction in Pile 3</i> |
| Benzene | mg/kg | 0.005 | 0.255 | <0.005 | 0.078 | 100.00 |
| Toluene | mg/kg | 0.02 | 1.19 | <0.02 | 0.12 | 100.00 |
| Ethylbenzene | mg/kg | 0.005 | 0.75 | <0.005 | 0.14 | 100.00 |
| Total Xylenes (m,p,o) | mg/kg | 0.03 | 2.94 | <0.030 | 1.9 | 100.00 |
| F1 C6-C10 | mg/kg | 10 | 90 | 21 | 230 | 76.67 |
| F2c C10-C16 | mg/kg | 50 | 1470 | <50 | 260 | 100.00 |
| F3c C16-C34 | mg/kg | 50 | 838 | 140 | 1700 | 83.29 |
| F4c C34-C50 | mg/kg | 100 | 453 | <100 | 3300 | 100.00 |
| Chrome to baseline @C50 | mg/kg | 100 | Yes | Yes | | – |
| Moisture | %by weight | – | – | 16 | | – |

| Treatment Pile 4 | | | Jun 18 2017 | Aug 18 2017 | Coarse | |
|-------------------------|------------|-------|-------------|---------------|----------|-------------------|
| Parameter Name | Unit | DL | Baseline | After 30 days | Criteria | %reduction Pile 4 |
| Benzene | mg/kg | 0.005 | 0.255 | <0.005 | 0.078 | 100.00 |
| Toluene | mg/kg | 0.02 | 1.19 | <0.020 | 0.12 | 100.00 |
| Ethylbenzene | mg/kg | 0.005 | 0.75 | <0.005 | 0.14 | 100.00 |
| Total Xylenes (m,p,o) | mg/kg | 0.03 | 2.94 | <0.030 | 1.9 | 100.00 |
| F1 C6-C10 | mg/kg | 10 | 90 | <10 | 230 | 100.00 |
| F2c C10-C16 | mg/kg | 50 | 1470 | <50 | 260 | 100.00 |
| F3c C16-C34 | mg/kg | 50 | 838 | 120 | 1700 | 85.68 |
| F4c C34-C50 | mg/kg | 100 | 453 | <100 | 3300 | 100.00 |
| Chrome to baseline @C50 | mg/kg | 100 | Yes | Yes | | — |
| Moisture | %by weight | — | — | 17 | | — |
| | | | | | | |

Notes:

Referenced lab report(s) treated results #1222031-2

Exceedances noted in red ink