Valleyfield Ash Lagoons

Annual Environmental Monitoring Review 2016

SLR Ref: 405.00481.00033.001
Version No:1
March 2017

CONTENTS

TABLES

FIGURES

APPENDICES

DRAWINGS

1.0 INTRODUCTION

1.1 Scope of Works

SLR Consulting Limited (SLR) has been retained by Scottish Power Generation Ltd (SPGL) to prepare the annual monitoring report for their ash lagoons at Valleyfield, High Valleyfield, Fife.

The site is operated and managed in accordance with PPC Permit No. PPC/A/1004266. Condition 10.4.1 of the Permit states:

> *'The Operator shall report to SEPA on the basis of aggregated data once a year the results of monitoring carried out in compliance with Conditions 8.2.3, 10.1.12, and 11.7.1. This report shall give an explanation and interpretation of any trends or exceedences of Trigger levels in the monitoring data submitted. This report shall be submitted to SEPA, in writing, by 31st March each year.'*

This report presents and reviews the monitoring data for the period 1st January 2016 to 31st December 2016.

All laboratory certificates detailing the chemical analysis data for the period are presented in Appendix A and supporting time series plots and reports are presented in Appendices B - J. A site monitoring plan is also presented as Drawing No.1. The environmental monitoring requirements at Valleyfield are based on those outlined in the PPC Permit unless these have been amended by the Valleyfield Ash Lagoons Management Plans (LON ENV PPC 7725, 2009) and are detailed in Table 1-1.

Table 1-1
Summary Monitoring Requirements at Valleyfield Ash Lagoons

Type of Sample	Location	Suite
Groundwater	VF1, VF3D, VF5, VF7, VF8, VF9, VF10, VF11 and VF12	*Quarterly* Water level, Electrical Conductivity, pH, Antimony, Arsenic, Boron, Cadmium, Chromium, Chloride, Magnesium, Manganese, Naphthalene Molybdenum, Selenium, Sodium, Sulphate and Vanadium
Leachate	VF4 and VF6	*Quarterly* Electrical Conductivity, pH, Antimony, Arsenic, Boron, Cadmium, Chromium, Chloride, Magnesium, Manganese, Naphthalene Molybdenum, Selenium, Sodium, Sulphate and Vanadium
Surface Water	River Forth upstream and downstream of site Toe Drain Discharge Water Supernatant Lagoon Water	*Quarterly* Electrical Conductivity, pH, Antimony, Arsenic, Boron, Cadmium, Chromium, Chloride, Magnesium, Manganese, Naphthalene Molybdenum, Selenium, Sodium, Sulphate and Vanadium
Gas	All Perimeter Boreholes	*Quarterly* Methane, Carbon Dioxide, Oxygen, Atmospheric Pressure, Differential Pressure.
Ash Characterisation	PFA samples	*Quarterly*

Type of Sample	Location	Suite
WAC Test		Waste Acceptance Criteria (WAC) testing (2 Batch test) and leachability testing for pH, Antimony, Arsenic, Boron, Cadmium, Chromium, Chloride, Magnesium, Manganese, Naphthalene ,Molybdenum, Selenium, Sodium, Sulphate and Vanadium

It is noted that at the request of ScottishPower the full monitoring suite detailed in Table 10.1.12 of the PPC Permit has been analysed in third and fourth quarter of this monitoring period for groundwater, leachate, toe drain and estuarine (surface water) samples. This report has been prepared in accordance with the 2009 Valleyfield Ash Lagoons Management Plans.

Details of remedial actions or additional monitoring completed by SPGL, over and above that specified in the PPC Permit, are presented in the appropriate sections of this report.

1.2 Report Structure

This report is structured as follows:

- Section 2.0 Presents the results of leachate quality and level from 'in-waste' boreholes;
- Section 3.0 Presents a summary of the supernatant water quality collected;
- Section 4.0 Presents the results of surface water quality monitoring;
- Section 5.0 Assesses groundwater quality and the results of routine groundwater level monitoring;
- Section 6.0 Presents perimeter landfill gas monitoring data;
- Section 7.0 Provides information on the topography of the ash lagoons, waste type and quantity; and
- Section 8.0 Presents actions and recommendations.

2.0 LEACHATE QUALITY AND LEVELS

2.1 'Leachate' Quality

Condition 10.1.2. of the PPC Permit requires that 'leachate' monitoring is conducted in boreholes VF4 and VF6; the 'PFA boreholes'. In accordance with the Permit requirements and the revised monitoring protocol as detailed in the Valleyfield Management Plans (2009), monitoring has been undertaken for the PFA boreholes VF4 and VF6 on a quarterly basis during this monitoring period and the following determinands reported herein:

- electrical conductivity
- antimony
- cadmium
- magnesium
- molybdenum
- selenium
- pH
- arsenic
- chloride
- manganese
- naphthalene
- boron
- chromium
- sulphate
- sodium
- vanadium

In the instance where concentrations of determinands are reported below the limit of detection (LoD), these data points are presented on the charts as the reported LoD (i.e. <0.05 mg/l shall be plotted as 0.05 mg/l).

A summary of the 'leachate' quality recorded in the 'PFA' boreholes during the monitoring period is summarised below in Table 2-1 with time-series plots of selected determinands presented in Appendix B. Leachate analysis data are presented electronically in Appendix A.

Table 2-1
Summary of 'Leachate' Quality 2016

Determinand	Unit	Count	VF4			VF6		
			Min	Mean	Max	Min	Mean	Max
Chloride	mg/l	4	8,860	10,515	11,500	3,000	5,973	7,540
Conductivity	mS/cm	4	22.3	24.9	27.4	8.44	14.0	18.7
pH	pH Units	4	7.63	7.77	7.90	7.89	7.99	8.15
Sulphate	mg/l	4	1,350	1,523	1,650	470	695	816
Antimony	mg/l	4	0.000160	0.000185	0.000236	0.000213	0.000699	0.001250
Arsenic	mg/l	4	0.00127	0.00535	0.01700	0.02460	0.03238	0.04280
Boron	mg/l	4	3.77	6.66	9.74	5.07	7.55	10.00
Cadmium	mg/l	4	0.000080	0.000573	0.001440	0.000083	0.000970	0.003020
Chromium	mg/l	4	0.00120	0.00208	0.00352	0.00110	0.00129	0.00164
Magnesium	mg/l	4	410.0	518.5	580.0	29.6	47.4	64.2
Manganese	mg/l	4	0.0370	0.0689	0.1070	0.0116	0.0413	0.0597
Molybdenum	mg/l	4	0.218	0.265	0.387	0.302	0.422	0.466
Selenium	mg/l	4	0.00139	0.01646	0.05670	0.00081	0.02100	0.06770
Sodium	mg/l	4	3,900	5,308	5,990	1,680	2,653	3,500
Vanadium	mg/l	4	0.00024	0.00077	0.00130	0.00996	0.02494	0.04030
Naphthalene	mg/l	4	<0.0001	-	<0.0001	<0.0001	-	<0.0001

Review of the data collected indicates that:

- Chloride, sulphate, chromium, magnesium, manganese, and sodium have all recorded higher maximum concentrations in VF4 than in VF6 during 2016, as was the case in 2015 and reflects VF4 in closer to the Forth in comparison to VF6;

- Antimony generally presents higher concentrations in VF6 than those recorded at VF4 with VF4 presenting very stable concentrations in a narrow range;
- Magnesium and manganese concentrations are, in general, significantly higher in VF4 than recorded in VF6, which continues the trend observed in 2011, 2012, 2013, 2014 and 2015;
- Naphthalene was not detected above the laboratory limit of detection (<0.0001mg/l) during 2016 in either borehole;
- Boron concentrations are generally higher in VF6 than those in VF4 and within historic ranges. Samples collected from VF4 on 07/03/2016 recorded the highest concentration (9.74 mg/l) of boron in this borehole since monitoring commenced, with concentrations falling significantly to 3.77 mg/l for samples collected on 06/06/2016;
- Cadmium concentrations have remained within historical ranges at both monitoring locations, samples collected on 06/06/2016 from both VF4 and VF6 showed higher concentrations of 0.00144 and 0.00302 mg/l respectively however no discernible trends are observed when concentrations fell significantly in the third quarter of 2016;
- Vanadium recorded in VF6 is higher than that recorded in VF4 during this monitoring period. Concentrations of vanadium in VF4 are very stable and low, existing in a narrow range, whilst VF6 shows more variability; and
- All concentrations are largely comparable to those recorded during previous monitoring events at site.

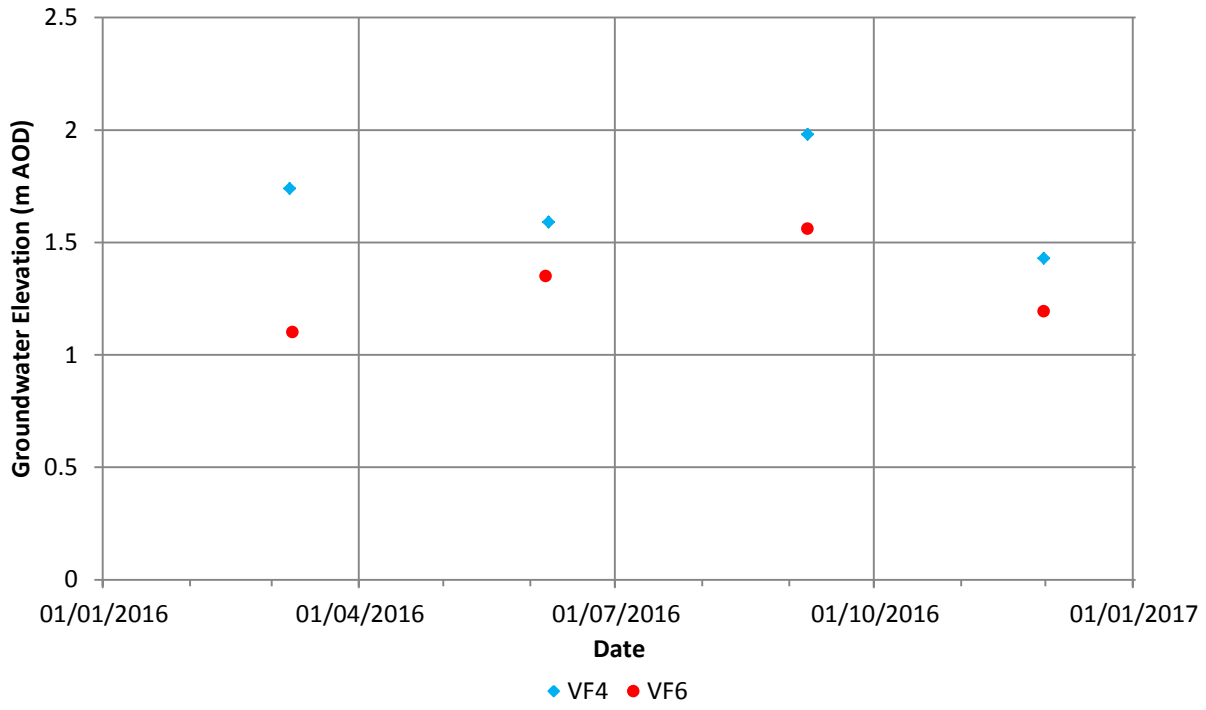
No leachate composition control and trigger levels are specified in the PPC Permit or in the Leachate Management Plan[1] submitted to SEPA in November 2009.

2.2 'Leachate' Levels

A summary of 'leachate' elevations collected on a quarterly basis during the review period are presented as a time-series plot below in Figure 2-1. A summary of all 'leachate' elevation data, showing long term trends is presented in Appendix C.

[1] SLR Consulting Limited, November 2009, *Valleyfield Ash Lagoons Leachate Management Plan*, Condition 6.4.1, SLR Ref 405-0481-00020-001.

Figure 2-1
Summary of 'Leachate' Elevations in PFA boreholes 2016



Review of Figure 2-1 indicates that VF4 records higher elevations (between 1.43 to 1.98 m above ordnance datum (AOD)) than PFA borehole VF6 (between 1.10 and 1.56 m AOD) over all four monitoring rounds.

Review of Appendix C indicates that the 'leachate' elevations recorded during 2016 are largely representative of elevations recorded since monitoring commenced in accordance with the PPC Permit.

3.0 SUPERNATANT WATER QUALITY

Prior to closure of Longannet Power Station and cessation of ash deposition supernatant water samples were obtained from the active PFA lagoon on a quarterly basis during the monitoring periods, and analysed in accordance with that detailed in the Valleyfield Groundwater Management Plan[2] submitted to SEPA in November 2009. However, following site closure, on 31/03/2016, supernatant water was no longer generated and sample collection was no longer possible. As such, the lagoons were only active during QM1, after which no samples were taken.

A summary of the supernatant water quality data collected for 2016 is presented below in Table 3-1.

Table 3-1
Summary of Supernatant Water Quality 2016

Determinand	Unit	Concentration (07/03/2016)
Antimony	mg/l	0.0337
Arsenic	mg/l	0.132
Boron	mg/l	7.38
Cadmium	mg/l	<0.001
Chromium	mg/l	0.0913
Magnesium	mg/l	965
Manganese	mg/l	0.00471
Molybdenum	mg/l	0.41
Selenium	mg/l	0.444
Sodium	mg/l	8190
Vanadium	mg/l	0.467
Chloride	mg/l	17500
Conductivity	mS/cm	36.8
pH	pH Units	9.28
Sulphate	mg/l	2500
Naphthalene (aq)	mg/l	<0.0001

Time series plots of supernatant water quality are presented in Appendix D and confirm together with review of Table 3-1 that during the monitoring period:

- Concentrations of antimony, arsenic, boron, cadmium, molybdenum and vanadium are within historical ranges;
- Selenium recorded for supernatant samples collected on 07/03/206 were the highest since monitoring commenced at 0.444 mg/l, and
- naphthalene was not detected above the laboratory LoD (<0.0001mg/l) during the review period.

[2] SLR Consulting Limited, November 2009, *Valleyfield Ash Lagoons Groundwater Management Plan and HRA Review*, Condition 10.4.1, SLR Ref 405-0481-00020-003.

4.0 SURFACE WATER QUALITY

4.1 Toe Drain Water Quality

In accordance with Table 10.1.12 of the Permit, and the monitoring protocol proposed in the Groundwater Management Plan[2], discharge water quality monitoring data was collected on a quarterly basis from the Toe Drain. The location of the sampling point is shown on the monitoring plan presented as Drawing No.1.

Time series plots of the toe drain water quality are presented in Appendix E with a summary of quality data presented below in Table 4-1.

Table 4-1
Summary of Toe Drain Water Quality 2016

Determinand	Unit	No of readings	Minimum	Average	Maximum
Antimony	mg/l	4	0.000966	0.001429	0.00192
Arsenic	mg/l	4	0.00607	0.0097325	0.0184
Boron	mg/l	4	4.42	8.0325	11.4
Cadmium	mg/l	4	0.000171	0.00096	0.00255
Chromium	mg/l	4	<0.0012	0.00127	0.00136
Magnesium	mg/l	4	219	235.25	265
Manganese	mg/l	4	0.11	0.1165	0.12
Molybdenum	mg/l	4	0.582	0.6405	0.667
Selenium	mg/l	4	0.00144	0.067	0.0503
Vanadium	mg/l	4	0.0403	0.064	0.0598
Conductivity	mg/l	4	22	26.131	26
Sulphate	mg/l	4	1430	1547.5	1630
Chloride	mS/cm	4	9230	10507.5	11000
pH	pH Units	4	8.08	8.2325	8.41
Sodium	mg/l	4	4530	5590	6740
Naphthalene (aq)	mg/l	4	<0.0001	-	<0.0001

Review of the time-series plots and Table 4-1 confirms the following:

- Concentrations for many of determinands show a general decreasing trend in concentrations for the 2016 monitoring period (antimony, arsenic, cadmium, selenium and vanadium);
- Boron concentrations for samples collected on 07/03/2016 were the highest at 11.4 mg/l since monitoring commenced. It is noted that samples collected on 06/06/2016 showed a significant fall in boron to 4.42 mg/l, returning to concentrations that have been very stable and recorded between 2011-2015 at 7.52 and 8.74 mg/l during the third and fourth monitoring rounds in 2016.
- Calcium concentrations have generally decreased however samples collected on 06/06/2016 presented the highest concentrations (0.00255 mg/l) since the first quarter of 2014. It is noted that concentrations fell significantly during Q3 and Q4 2016 to the lowest concentrations (0.000171 mg/l) on 29/11/2016 since monitoring commenced;
- Molybdenum concentrations have remained very stable since 2011;
- Vanadium concentrations decreased steadily during 2016 and for samples collected on 29/11/2016 presented the lowest concentrations (0.0403 mg/l) since 2009; and

- Naphthalene has not been detected above the laboratory reporting limited (<0.0001mg/l) during the 2016 review period.

4.2 Estuarine Water Quality

In accordance with the PPC Permit, and the monitoring protocol proposed in the Groundwater Management Plan and Hydrogeological Risk Assessment (HRA) Review[2], surface water quality data is collected from the River Forth upstream and downstream of the site on a quarterly basis. Time-series plots of selected determinands are presented in Appendix F with summary statistics presented in Table 4-2.

Table 4-2
Summary of Estuarine Water Quality 2016

Determinand	Unit	Upstream Water (ES2)				Downstream Water (ES1)			
		Count	Min	Mean	Max	Count	Min	Mean	Max
Chloride	mg/l	4	16,200	16,750	17,600	4	16,200	17,075	17,900
Conductivity	mS/cm	4	30.8	34.5	36.6	4	33.4	36.7	38.4
pH	Units	4	7.82	7.86	7.89	4	7.8	8.0	8.5
Sulphate	mg/l	4	2,190	2,245	2,320	4	2,320	2,365	2,400
Antimony	mg/l	4	<0.00016	0.00176	0.00574	4	0.000471	0.002620	0.006650
Arsenic	mg/l	4	0.00185	0.01897	0.05550	4	0.00229	0.02616	0.05820
Boron	mg/l	4	2.42	3.23	3.79	4	3.02	3.43	4.31
Cadmium	mg/l	4	<0.00008	0.00254	0.00951	4	<0.00008	0.00319	0.01080
Chromium	mg/l	4	<0.0012	0.0050	0.0072	4	<0.0012	0.0105	0.0210
Magnesium	mg/l	4	905	1,004	1,070	4	965	1,071	1,110
Manganese	mg/l	4	0.00736	0.02289	0.0507	4	0.00155	0.01261	0.027
Molybdenum	mg/l	4	0.00501	0.03593	0.05650	4	<0.0024	0.0612	0.165
Selenium	mg/l	4	<0.00081	0.0639925	0.178	4	<0.00081	0.08118	0.19100
Sodium	mg/l	4	7,390	8182.5	8,790	4	7,930	8,798	9,700
Vanadium	mS/cm	4	0.00149	0.00374	0.00780	4	<0.0024	0.0276	0.0873
Napthalene	Units	4	<0.00001	-	<0.00001	4	<0.00001	-	<0.00001

Review of the time-series plots and Table 4-2 indicates that:

- concentrations of the majority of determinands remained within historic ranges with samples collected on 06/06/2016 presenting slightly elevated concentrations (lower concentrations were then recorded in September and November 2016);
- arsenic concentrations for samples collected on 06/06/2016, 0.0582 and 0.0555 mg/l for ES1 and ES2 respectively, were the highest since 2011. It is noted that concentrations for samples collected on 06/09/2016 were significantly lower at 0.00229 and 0.00461 mg/l for ES1 and ES2 respectively, remaining low during the fourth 2016 quarterly sampling round;
- cadmium concentrations were generally low and very stable throughout 2016, however it is noted that samples collected on 06/06/2016 presented higher concentrations at 0.0108 and 0.00951 mg/l for ES1 and ES1 respectively with ES1 presenting its highest concentration since monitoring began. Concentrations for cadmium in samples collected on 06/09/2016 fell significantly to 0.00008 and 0.00048 mg/l for ES1 and ES2 respectively, remaining low during the fourth 2016 quarterly sampling round;
- molybdenum concentrations for samples collected at ES1 on 07/03/2016 were the highest since 2012 at 0.165 mg/l with samples collected at ES2 on 07/03/2016 were significantly lower at 0.0548 mg/l. Concentrations of molybdenum in samples collected on 06/06/2016 were very low at 0.0024 and 0.00501 mg/l for ES1 and ES2 respectively;
- selenium concentrations for samples collected on 06/06/2016 were the highest since 2010 at 0.191 and 1.178 mg/l for ES1 and ES2 respectively. Concentrations for selenium in samples collected 06/09/2016 fell significantly to 0.00081 and 0.00486 mg/l for ES1 and ES2 respectively;
- vanadium concentrations were generally very stable and low however samples collected for ES1 on 07/03/2016 were the highest since 2012 at 0.0873 mg/l. Samples collected from ES1 on 06/06/2016 presented vanadium concentration significantly lower at 0.0024 mg/l;
- in general there is little difference between upstream and downstream estuarine water during 2015; and
- samples collected during the third and fourth 2016 quarterly rounds presented very stable and low concentrations for each determinand and no specific trends are noted in the monitoring record.

5.0 GROUNDWATER QUALITY AND ELEVATION

Groundwater elevation and quality sampling was undertaken from boreholes specified in Table 10.1.12 of the PPC Permit on a quarterly basis. It should be noted that the monitoring suite analysed is that stated in Table 13 of the Groundwater Management Plan and HRA Review[2], which is a revision to that stated in the original PPC Permit.

5.1 Groundwater Quality

Time-series plots of selected determinands for the review period are presented in Appendix G with raw data presented in Appendix A.

Review of the monitoring data indicates the following:

- Antimony concentrations are generally very low remaining significantly below both control and trigger levels in all boreholes for 2016 with the exception of samples collected from VF1 during the first quarterly monitoring event of 2016 where the trigger level (0.00625 mg/l) was exceeded with a concentration of 0.00782 mg/l. It is noted that concentrations for samples collected at VF1 fell below the LoD (<0.0016 mg/l) in the second and third monitoring events of 2016;
- Boron and molybdenum concentrations are generally very stable, existing in a narrow range (excluding VF8 and VF10) and within the historic ranges at all monitoring locations. VF8 and VF10 continue to present the highest concentrations of boron in monitored boreholes;
- Cadmium concentrations are within historic ranges at all monitoring locations during 2016 however several recorded elevated concentrations during the second quarterly monitoring round (only): VF3D, VF5, VF7, VF8, VF9 and VF10. Concentrations for all monitoring locations for the third and fourth 2016 quarterly monitoring events show a significant decrease and return the values typical of the long term monitoring record;
- Selenium concentrations presented within historic ranges for all monitoring locations. It is noted that the first and second quarterly monitoring events recorded concentrations within the typical ranges historically recorded by each monitoring well however in the third and fourth 2016 quarterly monitoring events concentrations fell significantly for all monitoring wells to below 0.00462 mg/l;
- Vanadium concentrations are very low and stable, existing within historic monitoring data ranges;
- Concentrations recorded in all groundwater monitoring boreholes have generally not shown any significant rising trends; and
- naphthalene has not been recorded above the LoD (<0.0001mg/l) throughout the review period.

Further review of the priority determinands is presented in Appendix H and Section 5.2 of this report.

5.2 Groundwater Trigger Events

For the purposes of this report groundwater quality data has been assessed against the control and trigger levels specified in Table 14 of the Groundwater Management Plan and HRA Review[2], submitted to SEPA in November 2009 which have been determined in accordance with Permit Condition 10.3.2 and are considered more appropriate for assessing groundwater quality at site than those originally stated in the PPC Permit.

Control charts showing concentrations recorded in each borehole and borehole specific control and trigger levels are presented in Appendix H.

Table 5-1 below summarises trigger events that have occurred during the review period and the results of repeat sampling (*see italics*). It should be noted that a trigger event occurs only when both the control level and the trigger level have been exceeded.

Table 5-1
Summary of Groundwater Trigger Events Exceedences in 2016

Determinand	Borehole	Control and Trigger Level	Concentration (sample date)
Cadmium	VF3D	Control Level : 0.00032 mg/l Trigger Level : 0.00036 mg/l	0.000561 mg/l (07/06/2016) *0.000409 mg/l (29/06/2016)*
	VF9	Control Level : 0.00171 mg/l Trigger Level : 0.00036 mg/l	0.00493 mg/l (06/06/2016)*(due to sampling error no repeat sample obtained)*
	VF10	Control Level : 0.00157 mg/l Trigger Level : 0.00036 mg/l	0.0017 mg/l (07/06/2016) *0.00217 mg/l (29/06/2016)*
Boron	VF8	Control Level : 6.12 mg/l Trigger Level : 4.924 mg/l	6.38 mg/l (07/09/216) *0.0179 mg/l (21/09/2016)*

Review of Table 5-1 indicates that during the review period, trigger events (as stated in the Groundwater Management Plan and HRA Review) for boron occurred at borehole VF8 in the third quarter of 2016 and for cadmium at boreholes VF3D, VF9 and VF10 in the second quarter of 2016. No trigger events were recorded for antimony or vanadium throughout the review period.

Following review of the control charts the following observations are made:

- Boron concentrations at monitoring location VF8 exceeded control levels during September 2016, however repeat sampling presented significantly lower concentrations below both control and trigger levels. Concentrations remained below both control and trigger levels for samples collected in the fourth 2016 quarterly monitoring event; and
- Cadmium concentrations for monitoring locations VF3D (0.000561 mg/l), VF9 (0.00493 mg/l) and VF10 (0.0017 mg/l) all presented an exceedance both control and trigger levels in June 2016 however subsequent sampling in 2016 in September and November at all locations showed a significant fall in concentrations, and below the borehole specific trigger levels.

5.3 Groundwater Elevations

Groundwater elevations were obtained from the groundwater monitoring boreholes on a quarterly basis in accordance with the PPC Permit.

All groundwater elevations are compared to tide prediction levels for Kincardine obtained from the Admiralty easytide website (http://easytide.ukho.gov.uk) to determine whether measurements have been collected at high or low tide or during flood or ebb. A time-series plot of groundwater elevations for the review period is presented below, with summary statistics presented in Table 5-2. A groundwater hydrograph of the entire monitoring record is presented in Appendix I.

Figure 5-1
Summary of Groundwater Elevations (m AOD) at Valleyfield Ash Lagoons 2016

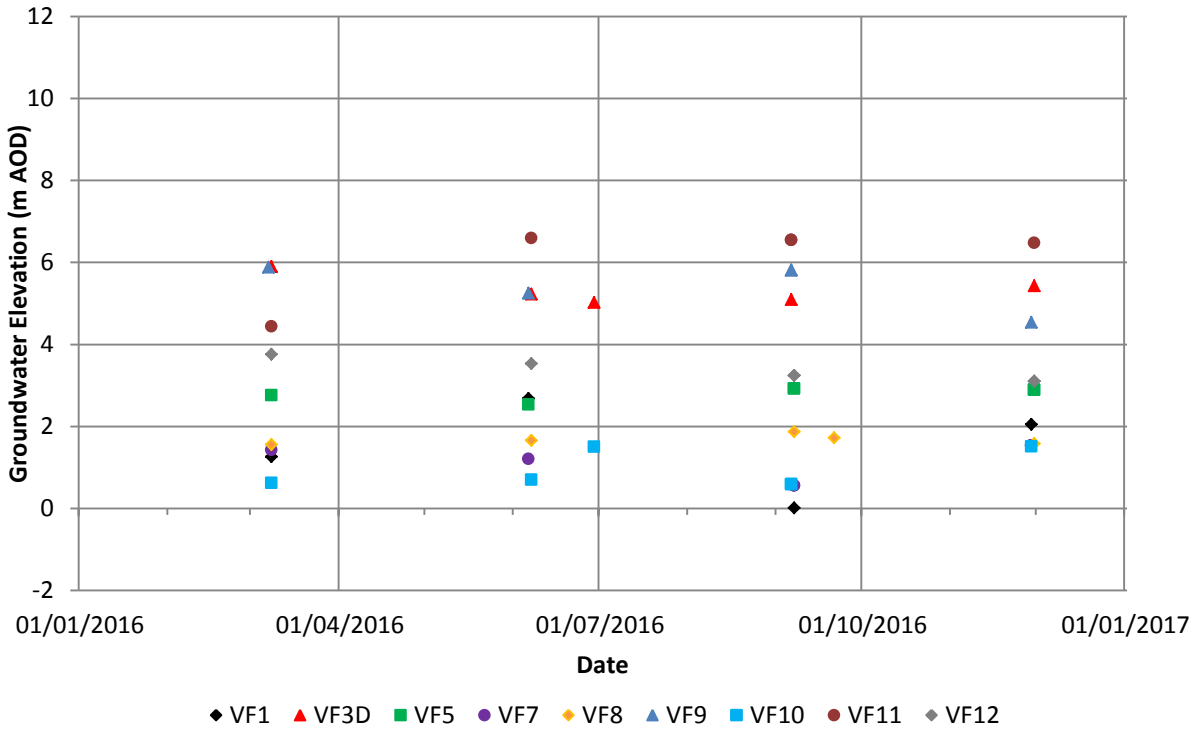


Table 5-2
Summary of Groundwater Elevations (2016)

Borehole	Groundwater Elevations in mAOD				
	No of readings	Minimum	Mean	Maximum	Range (m)
VF1	4	0.010	1.500	2.680	2.670
VF3D	5	5.020	5.335	5.900	0.880
VF5	6	2.530	2.818	2.920	0.390
VF7	6	0.555	1.133	1.530	0.975
VF8	5	1.560	1.678	1.870	0.310
VF9	4	4.539	5.369	5.880	1.341
VF10	5	0.590	0.984	1.508	0.918
VF11	4	4.440	6.033	6.590	2.150
VF12	6	3.106	3.330	3.760	0.654

Review of Figure 5-1 and Table 5-2 suggests that the range in groundwater elevations over the monitoring period within each monitoring location is generally less than 1.0 m. VF1 has the greatest range suggesting that groundwater here is strongly influenced by the tide. The eastern boreholes VF5 and VF8 record the lowest ranges on site of less than 0.5 m. Groundwater elevations are greatest in boreholes VF3D, VF9, VF11 and VF12, located within the centre and north of the site, with the lowest elevations recorded in boreholes VF1, VF7, VF8 and VF10, which are located along the perimeter. This confirms that the groundwater flow direction is from the lagoons in a radial direction towards the east, south and west (i.e. towards the estuary), as stated in Section 3.2 of the Groundwater Management Plan and HRA Review report.

Borehole VF11 continues to record groundwater elevations above ground level confirming that this borehole monitors an artesian aquifer.

Review of the long term groundwater elevations, presented in Appendix I, indicates that the range of groundwater elevations in most of the boreholes is generally less than two metres. VF1 recorded its highest groundwater elevation during monitoring on 06/06/2016 at 2.68 m AOD since monitoring commenced. In summary, with the exception of VF1 on 06/06/2016, groundwater elevations recorded in 2016 have remained within elevations recorded in the baseline and long term monitoring record.

6.0 GAS MONITORING DATA

Perimeter landfill gas concentrations were monitored in all perimeter groundwater monitoring boreholes and the two PFA boreholes on a quarterly basis. Readings of methane, carbon dioxide, oxygen, atmospheric pressure and differential pressure were taken during each monitoring event.

Time-series plots of methane and carbon dioxide concentrations recorded during the review period are presented in Appendix J, together with long term monitoring data. Summary statistics for oxygen, atmospheric pressure and differential pressure are presented in Table 6-1 with exceedences of trigger levels for methane and carbon dioxide presented in Table 6-2. It should be noted that the trigger levels which the results are compared with in Table 6-2 are the site specific trigger levels proposed in the Gas Management Plan[3] rather than those stated in the PPC Permit, which are the default trigger levels for non-hazardous waste landfill sites. Control charts are also presented within Appendix J.

Review of Table 6-2 highlights the following:

- Methane:
    - VF12 presented three exceedances of its methane trigger level (7.9 % vol.) on 07/062016 (18.6 % vol.), 07/09/2016 (15.3 % vol.) and 30/11/2016 (12.1 % vol.). Repeat testing conducted recorded methane concentrations below the trigger lev with 3.6, 7.4 and 1.4 % vol respectively; and
    - Monitoring locations VF1, VF4, VF6, VF7, VF8, VF9, VF10 and VF11 recorded their highest concentrations of methane during this monitoring period, however concentrations remained significantly below trigger levels.
- Carbon dioxide:
    - VF5 recorded two incidents of carbon dioxide trigger level (1.5 % vol.) exceedance on 07/09/2016 and 30/11/2016 with concentrations of 2.5 and 2.3 % vol respectively. Repeat sampling conduced recorded carbon dioxide concentrations below the trigger level with concentrations of 1.2 % vol on both exceedance incidents;
    - VF7 recorded two incidents of carbon dioxide trigger level (1.5 % vol.) exceedance on 07/09/2016 and 30/11/2016 with concentrations of 2.4 and 2.2 % vol respectively. Repeat sampling conduced recorded carbon dioxide concentrations below the trigger level with concentrations of 1.4 and 0.9 % vol on 07/09/2016 and 30/11/2016 respectively;
    - VF12 recorded an exceedance of its carbon dioxide trigger level (2.1 % vol.) on 07/09/2016 with a concentration of 2.4 % vol. It is noted that repeat sampling conducted recorded a concentration of 1.3 % vol.; and
    - VF10 continues to record the highest concentrations of carbon dioxide in monitored boreholes however concentrations remain below its trigger level (7.4 % vol.).
- Due to heavy rain, standpipes of monitoring wells VF3D and VF11 on 08/03/2016 were both flooded and gas analysis was not possible.

[3] SLR Consulting Limited, September 2009, *Valleyfield Ash Lagoons - Gas Management Plan*, Condition 8.1.1.

Table 6-1
Summary of Oxygen, Atmospheric Pressure and Differential Pressure in Groundwater Monitoring Boreholes - 2016

Borehole	No of readings	Oxygen (%)			Atmospheric Pressure (mb)			Differential Pressure (mb)		
		min	mean	max	min	mean	max	min	mean	max
VF1	4	16.4	18.0	18.9	1004	1017	1028	-2.16	-0.33	0.43
VF3D	3	19.5	20.2	21.2	1017	1022	1027	-0.19	0.48	1.07
VF4	4	19.5	20.3	21.6	1011	1019	1028	0.00	0.07	0.24
VF5	6	13.5	15.7	18	1005	1018	1027	-0.10	0.51	2.12
VF6	4	20.0	20.3	20.8	1004	1017	1026	-0.12	-0.01	0.17
VF7	6	17.1	17.5	17.8	1004	1019	1029	0.12	1.66	3.21
VF8	4	19.3	20.0	20.6	1003	1017	1028	-13.67	-3.40	0.05
VF9	4	0	3.3	6.3	1011	1019	1027	-0.07	0.19	0.65
VF10	4	7.9	11.0	16.9	1005	1018	1028	0.03	0.11	0.17
VF11	3	19.4	20.3	21	1017	1022	1027	-0.02	0.00	0.02
VF12	7	0.2	11.3	21.3	1003	1019	1029	-27.69	2.00	21.87

Table 6-2
Summary of Methane and Carbon Dioxide Concentrations and Trigger Events in Gas Monitoring Boreholes - 2016

Boreholes	No of Readings	Methane (%v/v)					Carbon Dioxide (%v/v)				
		Minimum	Average	Maximum	Trigger Level	Trigger Events – Monitoring round: initial conc. (repeat conc.)	Minimum	Average	Maximum	Trigger Level	Trigger Events – Monitoring round: initial conc. (repeat conc.)
VF1	4	0.0	0.1	0.4	1.0	-	0.3	0.5	0.7	1.5	-
VF3D	3	0.2	0.3	0.4	3.4	-	0.1	0.2	0.2	1.5	-
VF4	4	0.0	0.1	0.4	1.0	-	0	0.2	0.7	1.5	-
VF5	6	0.4	3.2	7.3	12.8	-	0.8	1.5	2.5	1.5	QM3: 2.5 (1.2) QM4: 2.3 (1.2)
VF6	4	0.0	0.1	0.4	1.0	-	0.1	0.3	0.3	1.5	-
VF7	6	0.0	0.2	0.4	1.0	-	0.9	1.5	2.4	1.5	QM3: 2.4 (1.4) QM4: 2.2 (0.9)
VF8	4	0.0	0.1	0.4	1.0	-	0.1	0.5	1.4	1.5	-
VF9	4	0.0	0.1	0.4	1.0	-	0.1	0.4	0.9	1.5	-
VF10	4	0.0	0.1	0.4	1.0	-	2	4.9	6.4	7.4	-
VF11	3	0.0	0.3	0.5	1.0	-	0.1	0.2	0.2	1.5	-
VF12	7	1.4	8.6	18.6	7.9	QM2: 18.6 (3.6) QM3: 15.3 (7.4) QM4: 12.1 (1.4)	0.5	1.3	2.4	2.1	QM2: 2.4 (1.3)

Note: Trigger levels are those stated in the Gas Management Plan, September 2009.

7.0 WASTE CHARACTERISATION

7.1 Topography of Site and Waste Inputs

Details of the site topography, waste inputs, the volume of cenospheres removed from site and the remaining lagoon capacities are reported separately to SEPA under separate conditions of the site PPC Permit.

No significant engineering works have been undertaken at the site during the reporting period and ash deposition occurred only during the first quarter of 2016.

7.2 Waste Characterisation

In accordance with the PPC Permit, sampling of the waste has been undertaken for the period whilst the Valleyfield site continued to accept ash from Longannet Power Station and the monitoring quarter immediately after (March and June 2016).

A single sample of the PFA waste was obtained as part of the quarterly monitoring suite in first and second quarters of 2016, which has undergone a 2-batch leachability testing, together with analysis of the solid waste. Results are presented in Appendix A.

The results from 2016 suggest that the solid waste typically has an alkaline pH of between 9.16 and 9.77, while organic carbon content is recorded at 11.8 and 6.76 % (classed as hazardous wastel) for samples collected 07/03/2016 and 06/06/2016 respectively, which is largely comparable to previous results. It is noted that leached dissolved organic carbon was below the LoD for samples collected in 2016. The vast majority of parameters, and in particular substances such as PAHs and PCBs, fall below the laboratory method detection limit.

Concentrations recorded during 2016 are similar to those recorded as part of the PPC Application and the previous Annual Monitoring Reviews.

8.0 ACTIONS AND RECOMMENDATIONS

The condition of the boreholes remains satisfactory after the remediation works undertaken in November / December 2013. The gas and groundwater monitoring equipment also remains in satisfactory condition and conforms to the original monitoring borehole designs agreed during the PPC permitting works.

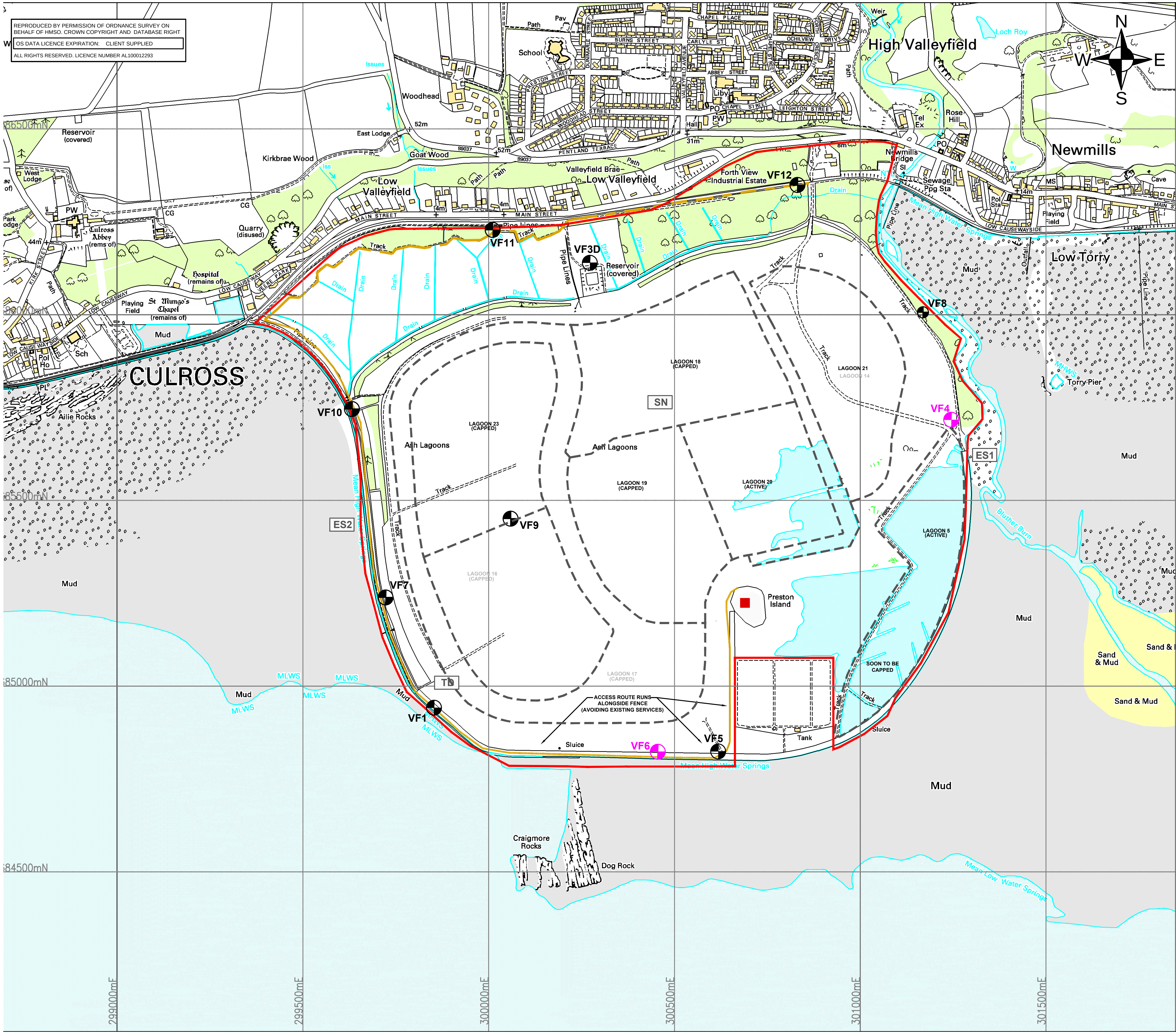
Longannet Power Station has ceased the deposition of ash to the Valleyfield Ash Lagoons, however it is proposed that quarterly monitoring in accordance with the details set out in the PPC Permit and supporting Management Plans continues during the post-closure phase until a timescale for monitoring reduction or cessation is agreed with SEPA.

9.0 CLOSURE

This report has been prepared by SLR Consulting Limited with all reasonable skill, care and diligence, and taking account of the manpower and resources devoted to it by agreement with the client. Information reported herein is based on the interpretation of data collected and has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of Scottish Power Generation Ltd; no warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR.

SLR disclaims any responsibility to the client and others in respect of any matters outside the agreed scope of the work.



LEGEND

(red line)	INSTALLATION BOUNDARY
(dash-dot line)	ACCESS ROAD
TD	TOE DRAIN MONITORING POINT
SN	SUPERNATANT WATER MONITORING POINT
ES	ESTUARINE MONITORING POINT
VF6	PFA MONITORING BOREHOLE
VF1	DEEP GROUNDWATER MONITORING BOREHOLE

0	IG	ZR	01/15	
Revision	By	Chk'd By	Date	Comments

SCOTTISHPOWER
Energy Wholesale

SLR
4 THE ROUNDAL
RODDINGLAW BUSINESS
PARK, GOGAR
EDINBURGH. EH12 9DB
T: 0131 335 6830
F: 0131 335 6831
www.slrconsulting.com

Site
VALLEYFIELD ASH LAGOONS

Project
ANNUAL MONITORING REVIEW 2014

Drawing Title
BOREHOLE MONITORING LOCATIONS

Scale	Date
1:10,000 @ A3	JANUARY 2015

Drawing Number	Revision
1	0

ALcontrol Laboratories

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: mkt@alcontrol.com
Website: www.alcontrol.com

SLR Consulting Ltd
Floor 2
4/5 Lochside View
Edinburgh Park
Edinburgh
Lanarkshire
EH12 9DH

Attention: Zak Ritchie

CERTIFICATE OF ANALYSIS

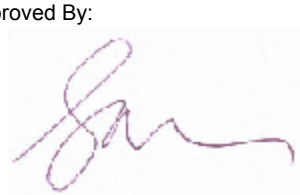
Date:	17 March 2016
Customer:	H_SLR_EDH
Sample Delivery Group (SDG):	160309-113
Your Reference:	405.00481.00033
Location:	Valleyfields
Report No:	353745

We received 16 samples on Wednesday March 09, 2016 and 16 of these samples were scheduled for analysis which was completed on Thursday March 17, 2016. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:



Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	160309-113	**Location:**	Valleyfields	**Order Number:**	405/8371
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	353745
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
13060782	ES1			07/03/2016
13060783	ES2			07/03/2016
13060787	PFA			07/03/2016
13060785	SN			07/03/2016
13060784	TD			07/03/2016
13060790	VF1			08/03/2016
13060788	VF4			07/03/2016
13060793	VF5			08/03/2016
13060794	VF6			08/03/2016
13060795	VF7			08/03/2016
13060796	VF8			08/03/2016
13060789	VF9			07/03/2016
13060797	VF10			08/03/2016
13060798	VF11			08/03/2016
13060799	VF12			08/03/2016
13060792	VF3D			08/03/2016

Only received samples which have had analysis scheduled will be shown on the following pages.

ALcontrol Laboratories

CERTIFICATE OF ANALYSIS

Validated

SDG:	160309-113	**Location:**	Valleyfields	**Order Number:**	405/8371
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	353745
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

Saline Water (Sal W)

Results Legend

- X — Test
- N — No Determination Possible

Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container	Anions by Kone (w)	Conductivity (at 20 deg.C)	Dissolved Metals by ICP-MS	Metals by iCap-OES Dissolved (W)	PAH Spec MS - Aqueous (W)	pH Value
13060782	ES1			0.5l glass bottle (AL					X	
				500ml Plastic (ALE2	X	X				X
				HNO3 Filtered (ALE			X	X		
13060783	ES2			0.5l glass bottle (AL					X	
				500ml Plastic (ALE2	X	X				X
				HNO3 Filtered (ALE			X	X		
13060785	SN			0.5l glass bottle (AL					X	
				500ml Plastic (ALE2	X	X				X
				HNO3 Filtered (ALE			X	X		
13060784	TD			0.5l glass bottle (AL					X	
				500ml Plastic (ALE2	X	X				X
				HNO3 Filtered (ALE			X	X		
13060790	VF1			0.5l glass bottle (AL					X	
				500ml Plastic (ALE2	X	X				X
				HNO3 Filtered (ALE			X	X		
13060788	VF4			0.5l glass bottle (AL					X	
				500ml Plastic (ALE2	X	X				X
				HNO3 Filtered (ALE			X	X		
13060793	VF5			0.5l glass bottle (AL					X	
				500ml Plastic (ALE2	X	X				X
				HNO3 Filtered (ALE			X	X		
13060794	VF6			0.5l glass bottle (AL					X	
				500ml Plastic (ALE2	X	X				X
				HNO3 Filtered (ALE			X	X		
13060795	VF7			0.5l glass bottle (AL					X	
				500ml Plastic (ALE2	X	X				X
				HNO3 Filtered (ALE			X	X		
13060796	VF8			0.5l glass bottle (AL					X	
				500ml Plastic (ALE2	X	X				X
				HNO3 Filtered (ALE			X	X		
13060789	VF9			0.5l glass bottle (AL					X	
				500ml Plastic (ALE2	X	X				X
				HNO3 Filtered (ALE			X	X		
13060797	VF10			0.5l glass bottle (AL					X	
				500ml Plastic (ALE2	X	X				X
				HNO3 Filtered (ALE			X	X		
13060798	VF11			0.5l glass bottle (AL					X	

Test		
Anions by Kone (w)	All	NDPs: 0 Tests: 15
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 15
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 15
Metals by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 15
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 15
pH Value	All	NDPs: 0 Tests: 15

15:37:22 17/03/2016

CERTIFICATE OF ANALYSIS

SDG:	160309-113	**Location:**	Valleyfields	**Order Number:**	405/8371
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	353745
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

Saline Water (Sal W)

Results Legend

X **Test**

N **No Determination Possible**

			Lab Sample No(s)	13060798			13060799			13060792	
			Customer Sample Reference	VF11			VF12			VF3D	
			AGS Reference								
			Depth (m)								
			Container	500ml Plastic (ALE2	HNO3 Filtered (ALE	0.5l glass bottle (AL	500ml Plastic (ALE2	HNO3 Filtered (ALE	0.5l glass bottle (AL	500ml Plastic (ALE2	HNO3 Filtered (ALE
Anions by Kone (w)	All	NDPs: 0 Tests: 15		X			X			X	
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 15		X			X			X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 15			X			X			X
Metals by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 15			X			X			X
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 15				X			X		
pH Value	All	NDPs: 0 Tests: 15		X			X			X	

CERTIFICATE OF ANALYSIS

SDG:	160309-113	**Location:**	Valleyfields	**Order Number:**	405/8371
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	353745
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

SOLID

Results Legend

X **Test**

N **No Determination Possible**

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
			13060787	PFA			250g Amber Jar (AL / 400g Tub (ALE214) / 60g VOC (ALE215)
ANC at pH4 and ANC at pH 6	All	NDPs: 0 Tests: 1	X				
Anions by Kone (w)	All	NDPs: 0 Tests: 1		X			
CEN Readings	All	NDPs: 0 Tests: 1		X			
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1		X			
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1		X			
Fluoride	All	NDPs: 0 Tests: 1		X			
GRO by GC-FID (S)	All	NDPs: 0 Tests: 1					X
Loss on Ignition in soils	All	NDPs: 0 Tests: 1	X				
Mercury Dissolved	All	NDPs: 0 Tests: 1		X			
Mineral Oil	All	NDPs: 0 Tests: 1	X				
PAH Value of soil	All	NDPs: 0 Tests: 1	X				
PCBs by GCMS	All	NDPs: 0 Tests: 1	X				
pH	All	NDPs: 0 Tests: 1		X			
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1		X			
Sample description	All	NDPs: 0 Tests: 1	X				

CERTIFICATE OF ANALYSIS

SDG:	160309-113	**Location:**	Valleyfields	**Order Number:**	405/8371
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	353745
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

SOLID

Results Legend

X **Test**

N **No Determination Possible**

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
			13060787	PFA			250g Amber Jar (AL / 400g Tub (ALE214) / 60g VOC (ALE215)
Total Dissolved Solids	All	NDPs: 0 Tests: 1					X
Total Organic Carbon	All	NDPs: 0 Tests: 1					X

CERTIFICATE OF ANALYSIS

SDG:	160309-113	**Location:**	Valleyfields	**Order Number:**	405/8371
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	353745
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

Sample Descriptions

Grain Sizes

very fine	<0.063mm	**fine**	0.063mm - 0.1mm	**medium**	0.1mm - 2mm	**coarse**	2mm - 10mm	**very coarse**	>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Grain size	Inclusions	Inclusions 2
13060787	PFA		Grey	Sandy Silt Loam	0.063 - 2.00 mm	None	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

CERTIFICATE OF ANALYSIS

SDG:	160309-113	**Location:**	Valleyfields	**Order Number:**	405/8371
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	353745
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	ES1	ES2	PFA	SN	TD	VF1
			Depth (m)	.	.	.	.	.	.
			Sample Type	Saline Water (Sal W)	Saline Water (Sal W)	Soil/Solid	Saline Water (Sal W)	Saline Water (Sal W)	Saline Water (Sal W)
			Date Sampled	07/03/2016	07/03/2016	07/03/2016	07/03/2016	07/03/2016	08/03/2016
			Sample Time	.	.	.	.	.	.
			Date Received	09/03/2016	09/03/2016	09/03/2016	09/03/2016	09/03/2016	09/03/2016
			SDG Ref	160309-113	160309-113	160309-113	160309-113	160309-113	160309-113
			Lab Sample No.(s)	13060782	13060783	13060787	13060785	13060784	13060790
			AGS Reference						
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120		37.2 #	36.6 #		36.8 #	22.9 #	24.3 #
Antimony (diss.filt)	<0.00016 mg/l	TM152		0.00665	<0.00016		0.0337	0.00192	0.00782
Arsenic (diss.filt)	<0.00012 mg/l	TM152		0.0379 #	0.0139 #		0.132 #	0.00821 #	0.00903 #
Boron (diss.filt)	<0.0094 mg/l	TM152		4.31 #	3.79 #		7.38 #	11.4 #	0.974 #
Cadmium (diss.filt)	<0.0001 mg/l	TM152		<0.001 #	0.000109 #		<0.001 #	0.00083 #	<0.001 #
Chromium (diss.filt)	<0.00022 mg/l	TM152		0.021 #	0.00547 #		0.0913 #	0.00136 #	0.00397 #
Manganese (diss.filt)	<0.00004 mg/l	TM152		0.00909 #	0.0165 #		0.00471 #	0.119 #	0.179 #
Molybdenum (diss.filt)	<0.00024 mg/l	TM152		0.165 #	0.0548 #		0.41 #	0.582 #	0.0382 #
Selenium (diss.filt)	<0.00039 mg/l	TM152		0.124 #	0.0723 #		0.444 #	0.0202 #	0.0394 #
Vanadium (diss.filt)	<0.00024 mg/l	TM152		0.0873 #	0.00327 #		0.467 #	0.0598 #	<0.0024 #
Sulphate	<2 mg/l	TM184		2320 #	2320 #		2500 #	1430 #	923 #
Chloride	<2 mg/l	TM184		16200 #	17600 #		17500 #	9230 #	11800 #
Sodium (diss.filt)	<0.076 mg/l	TM228		7990 #	7390 #		8190 #	4530 #	4410 #
Magnesium (diss.filt)	<0.036 mg/l	TM228		1110 #	970 #		965 #	219 #	558 #
pH	<1 pH Units	TM256		8.5 #	7.85 #		9.28 #	8.41 #	7.4 #
Moisture Content Ratio (% of as received sample)	%	PM024				40			
Loss on ignition	<0.7 %	TM018				7.28 M			
Mineral oil >C10-C40	<1 mg/kg	TM061				3.73			
Mineral Oil Surrogate % recovery**	%	TM061				92			
Organic Carbon, Total	<0.2 %	TM132				11.8 M			
pH	1 pH Units	TM133				9.77 M			
PCB congener 28	<0.003 mg/kg	TM168				<0.003 M			
PCB congener 52	<0.003 mg/kg	TM168				<0.003 M			
PCB congener 101	<0.003 mg/kg	TM168				<0.003 M			
PCB congener 118	<0.003 mg/kg	TM168				<0.003 M			
PCB congener 138	<0.003 mg/kg	TM168				<0.003 M			
PCB congener 153	<0.003 mg/kg	TM168				<0.003 M			
PCB congener 180	<0.003 mg/kg	TM168				<0.003 M			
Sum of detected PCB 7 Congeners	<0.021 mg/kg	TM168				<0.021			
ANC @ pH 4	<0.03 mol/kg	TM182				0.276			
ANC @ pH 6	<0.03 mol/kg	TM182				0.166			
Polyaromatic hydrocarbons, Total 17	<10 mg/kg	TM213				<10			

CERTIFICATE OF ANALYSIS

SDG:	160309-113	**Location:**	Valleyfields	**Order Number:**	405/8371
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	353745
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	VF4	VF5	VF6	VF7	VF8	VF9
			Depth (m)	.	.	.	.	.	.
			Sample Type	Saline Water (Sal W)	Saline Water (Sal W)	Saline Water (Sal W)	Saline Water (Sal W)	Saline Water (Sal W)	Saline Water (Sal W)
			Date Sampled	07/03/2016	08/03/2016	08/03/2016	08/03/2016	08/03/2016	07/03/2016
			Sample Time	.	.	.	.	.	.
			Date Received	09/03/2016	09/03/2016	09/03/2016	09/03/2016	09/03/2016	09/03/2016
			SDG Ref	160309-113	160309-113	160309-113	160309-113	160309-113	160309-113
			Lab Sample No.(s)	13060788	13060793	13060794	13060795	13060796	13060789
			AGS Reference						
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120		22.3 #	16.1 #	18.7 #	20.3 #	26.6 #	26.2 #
Antimony (diss.filt)	<0.00016 mg/l	TM152		0.000167	0.000429	0.00125	0.000189	<0.00016	<0.0016
Arsenic (diss.filt)	<0.00012 mg/l	TM152		0.00171 #	0.00838 #	0.0257 #	0.00582 #	0.0073 #	0.00584 #
Boron (diss.filt)	<0.0094 mg/l	TM152		9.74 #	1.97 #	10 #	0.458 #	0.961 #	1.57 #
Cadmium (diss.filt)	<0.0001 mg/l	TM152		0.000596 #	<0.0001 #	0.000617 #	<0.0001 #	0.000504 #	<0.001 #
Chromium (diss.filt)	<0.00022 mg/l	TM152		0.0024 #	0.00312 #	0.00164 #	0.00219 #	0.00388 #	0.00382 #
Manganese (diss.filt)	<0.00004 mg/l	TM152		0.107 #	0.0252 #	0.0514 #	0.312 #	0.296 #	0.455 #
Molybdenum (diss.filt)	<0.00024 mg/l	TM152		0.387 #	0.00084 #	0.463 #	0.0123 #	0.347 #	0.105 #
Selenium (diss.filt)	<0.00039 mg/l	TM152		0.00573 #	0.106 #	0.0142 #	0.0246 #	0.0469 #	0.0351 #
Vanadium (diss.filt)	<0.00024 mg/l	TM152		<0.00024 #	0.00842 #	0.0403 #	<0.00024 #	0.000286 #	0.00491 #
Sulphate	<2 mg/l	TM184		1350 #	241 #	816 #	484 #	1650 #	748 #
Chloride	<2 mg/l	TM184		8860 #	7160 #	7540 #	9970 #	10800 #	11800 #
Sodium (diss.filt)	<0.076 mg/l	TM228		3900 #	3190 #	3500 #	3200 #	4790 #	5330 #
Magnesium (diss.filt)	<0.036 mg/l	TM228		410 #	279 #	54.7 #	497 #	594 #	696 #
pH	<1 pH Units	TM256		7.63 #	8.38 #	8.15 #	7.43 #	7.67 #	7.27 #

CERTIFICATE OF ANALYSIS

SDG:	160309-113	**Location:**	Valleyfields	**Order Number:**	405/8371
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	353745
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	VF10	VF11	VF12	VF3D		
			Depth (m)	.	.	.	.		
			Sample Type	Saline Water (Sal W)	Saline Water (Sal W)	Saline Water (Sal W)	Saline Water (Sal W)		
			Date Sampled	08/03/2016	08/03/2016	08/03/2016	08/03/2016		
			Sample Time	.	.	.	.		
			Date Received	09/03/2016	09/03/2016	09/03/2016	09/03/2016		
			SDG Ref	160309-113	160309-113	160309-113	160309-113		
			Lab Sample No.(s)	13060797	13060798	13060799	13060792		
			AGS Reference						
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120		16.4 #	1.97 #	1.24 #	5.43 #		
Antimony (diss.filt)	<0.00016 mg/l	TM152		0.00185	<0.00016	0.000402	0.000239		
Arsenic (diss.filt)	<0.00012 mg/l	TM152		0.00701 #	0.000463 #	0.0006 #	0.00226 #		
Boron (diss.filt)	<0.0094 mg/l	TM152		9.78 #	0.334 #	0.343 #	0.944 #		
Cadmium (diss.filt)	<0.0001 mg/l	TM152		0.000439 #	<0.0001 #	<0.0001 #	<0.0001 #		
Chromium (diss.filt)	<0.00022 mg/l	TM152		0.00263 #	0.00286 #	0.0019 #	0.00186 #		
Manganese (diss.filt)	<0.00004 mg/l	TM152		0.269 #	0.0762 #	0.0624 #	0.178 #		
Molybdenum (diss.filt)	<0.00024 mg/l	TM152		0.233 #	0.000458 #	0.00193 #	0.00136 #		
Selenium (diss.filt)	<0.00039 mg/l	TM152		0.0233 #	0.00239 #	0.00075 #	0.0132 #		
Vanadium (diss.filt)	<0.00024 mg/l	TM152		0.000437 #	0.000626 #	0.000606 #	0.00108 #		
Sulphate	<2 mg/l	TM184		625 #	15.2 #	<2 #	2.3 #		
Chloride	<2 mg/l	TM184		6710 #	477 #	254 #	1860 #		
Sodium (diss.filt)	<0.076 mg/l	TM228		3190 #	299 #	140 #	903 #		
Magnesium (diss.filt)	<0.036 mg/l	TM228		226 #	28.9 #	19.9 #	96.5 #		
pH	<1 pH Units	TM256		7.61 #	7.52 #	8.02 #	7.75 #		

CERTIFICATE OF ANALYSIS

SDG:	160309-113	**Location:**	Valleyfields	**Order Number:**	405/8371
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	353745
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

GRO by GC-FID (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

	Customer Sample R	Depth (m)	Sample Type	Date Sampled	Sample Time	Date Received	SDG Ref	Lab Sample No.(s)	AGS Reference
	PFA	.	Soil/Solid	07/03/2016	.	09/03/2016	160309-113	13060787	

Component	LOD/Units	Method	
Methyl tertiary butyl ether (MTBE)	<0.005 mg/kg	TM089	<0.01 #
Benzene	<0.01 mg/kg	TM089	<0.02 M
Toluene	<0.002 mg/kg	TM089	<0.004 M
Ethylbenzene	<0.003 mg/kg	TM089	<0.006 M
m,p-Xylene	<0.006 mg/kg	TM089	<0.012 M
o-Xylene	<0.003 mg/kg	TM089	<0.006 M
sum of detected mpo xylene by GC	<0.009 mg/kg	TM089	<0.009
sum of detected BTEX by GC	<0.024 mg/kg	TM089	<0.024

CERTIFICATE OF ANALYSIS

SDG:	160309-113	**Location:**	Valleyfields	**Order Number:**	405/8371
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	353745
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

PAH Spec MS - Aqueous (W)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	ES1	ES2	SN	TD	VF1	VF4
			Depth (m)	.	.	.	.	.	.
			Sample Type	Saline Water (Sal W)	Saline Water (Sal W)	Saline Water (Sal W)	Saline Water (Sal W)	Saline Water (Sal W)	Saline Water (Sal W)
			Date Sampled	07/03/2016	07/03/2016	07/03/2016	07/03/2016	08/03/2016	07/03/2016
			Sample Time	.	.	.	.	.	.
			Date Received	09/03/2016	09/03/2016	09/03/2016	09/03/2016	09/03/2016	09/03/2016
			SDG Ref	160309-113	160309-113	160309-113	160309-113	160309-113	160309-113
			Lab Sample No.(s)	13060782	13060783	13060785	13060784	13060790	13060788
			AGS Reference						
Naphthalene (aq)	<0.0001 mg/l	TM178		<0.0001 #	<0.0001 #	<0.0001 #	<0.0001 #	<0.0001 #	<0.0001 #
Acenaphthene (aq)	<0.000015	TM178		<0.000015 #	<0.000015 #	0.000026 #	<0.000015 #	<0.000015 #	<0.000015 #
Acenaphthylene (aq)	<0.000011	TM178		<0.000011 #	<0.000011 #	<0.000011 #	<0.000011 #	<0.000011 #	<0.000011 #
Fluoranthene (aq)	<0.000017	TM178		<0.000017 #	<0.000017 #	<0.000017 #	<0.000017 #	<0.000017 #	<0.000017 #
Anthracene (aq)	<0.000015	TM178		<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #
Phenanthrene (aq)	<0.000022	TM178		<0.000022 #	<0.000022 #	<0.000022 #	<0.000022 #	<0.000022 #	<0.000022 #
Fluorene (aq)	<0.000014	TM178		<0.000014 #	<0.000014 #	<0.000014 #	<0.000014 #	<0.000014 #	<0.000014 #
Chrysene (aq)	<0.000013	TM178		<0.000013 #	<0.000013 #	<0.000013 #	<0.000013 #	<0.000013 #	<0.000013 #
Pyrene (aq)	<0.000015	TM178		<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #
Benzo(a)anthracene (aq)	<0.000017	TM178		<0.000017 #	<0.000017 #	<0.000017 #	<0.000017 #	<0.000017 #	<0.000017 #
Benzo(b)fluoranthene (aq)	<0.000023	TM178		<0.000023 #	<0.000023 #	<0.000023 #	<0.000023 #	<0.000023 #	<0.000023 #
Benzo(k)fluoranthene (aq)	<0.000027	TM178		<0.000027 #	<0.000027 #	<0.000027 #	<0.000027 #	<0.000027 #	<0.000027 #
Benzo(a)pyrene (aq)	<0.000009	TM178		<0.000009 #	<0.000009 #	<0.000009 #	<0.000009 #	<0.000009 #	<0.000009 #
Dibenzo(a,h)anthracene (aq)	<0.000016	TM178		<0.000016 #	<0.000016 #	<0.000016 #	<0.000016 #	<0.000016 #	<0.000016 #
Benzo(g,h,i)perylene (aq)	<0.000016	TM178		<0.000016 #	<0.000016 #	<0.000016 #	<0.000016 #	<0.000016 #	<0.000016 #
Indeno(1,2,3-cd)pyrene (aq)	<0.000014	TM178		<0.000014 #	<0.000014 #	<0.000014 #	<0.000014 #	<0.000014 #	<0.000014 #
PAH, Total Detected USEPA 16 (aq)	<0.000344	TM178		<0.000344	<0.000344	<0.000344	<0.000344	<0.000344	<0.000344

CERTIFICATE OF ANALYSIS

SDG:	160309-113	**Location:**	Valleyfields	**Order Number:**	405/8371
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	353745
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

PAH Spec MS - Aqueous (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	VF5	VF6	VF7	VF8	VF9	VF10
			Depth (m)	.	.	.	.	.	.
			Sample Type	Saline Water (Sal W)	Saline Water (Sal W)	Saline Water (Sal W)	Saline Water (Sal W)	Saline Water (Sal W)	Saline Water (Sal W)
			Date Sampled	08/03/2016	08/03/2016	08/03/2016	08/03/2016	07/03/2016	08/03/2016
			Sample Time	.	.	.	.	.	.
			Date Received	09/03/2016	09/03/2016	09/03/2016	09/03/2016	09/03/2016	09/03/2016
			SDG Ref	160309-113	160309-113	160309-113	160309-113	160309-113	160309-113
			Lab Sample No.(s)	13060793	13060794	13060795	13060796	13060789	13060797
			AGS Reference						
Naphthalene (aq)	<0.0001 mg/l	TM178		<0.001 #	<0.0001 #	<0.0001 #	<0.0001 #	<0.0001 #	<0.0001 #
Acenaphthene (aq)	<0.000015	TM178		<0.00015 #	<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #
Acenaphthylene (aq)	<0.000011	TM178		<0.00011 #	<0.000011 #	<0.000011 #	<0.000011 #	<0.000011 #	<0.000011 #
Fluoranthene (aq)	<0.000017	TM178		<0.00017 #	<0.000017 #	<0.000017 #	<0.000017 #	<0.000017 #	<0.000017 #
Anthracene (aq)	<0.000015	TM178		<0.00015 #	<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #
Phenanthrene (aq)	<0.000022	TM178		<0.00022 #	<0.000022 #	<0.000022 #	<0.000022 #	<0.000022 #	<0.000022 #
Fluorene (aq)	<0.000014	TM178		<0.00014 #	<0.000014 #	<0.000014 #	<0.000014 #	<0.000014 #	<0.000014 #
Chrysene (aq)	<0.000013	TM178		<0.00013 #	<0.000013 #	<0.000013 #	<0.000013 #	<0.000013 #	<0.000013 #
Pyrene (aq)	<0.000015	TM178		<0.00015 #	<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #	0.000023 #
Benzo(a)anthracene (aq)	<0.000017	TM178		<0.00017 #	<0.000017 #	<0.000017 #	<0.000017 #	<0.000017 #	<0.000017 #
Benzo(b)fluoranthene (aq)	<0.000023	TM178		<0.00023 #	<0.000023 #	<0.000023 #	<0.000023 #	<0.000023 #	<0.000023 #
Benzo(k)fluoranthene (aq)	<0.000027	TM178		<0.00027 #	<0.000027 #	<0.000027 #	<0.000027 #	<0.000027 #	<0.000027 #
Benzo(a)pyrene (aq)	<0.000009	TM178		<0.00009 #	<0.000009 #	<0.000009 #	<0.000009 #	<0.000009 #	<0.000009 #
Dibenzo(a,h)anthracene (aq)	<0.000016	TM178		<0.00016 #	<0.000016 #	<0.000016 #	<0.000016 #	<0.000016 #	<0.000016 #
Benzo(g,h,i)perylene (aq)	<0.000016	TM178		<0.00016 #	<0.000016 #	<0.000016 #	<0.000016 #	<0.000016 #	<0.000016 #
Indeno(1,2,3-cd)pyrene (aq)	<0.000014	TM178		<0.00014 #	<0.000014 #	<0.000014 #	<0.000014 #	<0.000014 #	<0.000014 #
PAH, Total Detected USEPA 16 (aq)	<0.000344	TM178		<0.00344	<0.000344	<0.000344	<0.000344	<0.000344	<0.000344

CERTIFICATE OF ANALYSIS

SDG:	160309-113	**Location:**	Valleyfields	**Order Number:**	405/8371
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	353745
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

PAH Spec MS - Aqueous (W)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	VF11	VF12	VF3D			
			Depth (m)	.	.	.			
			Sample Type	Saline Water (Sal W)	Saline Water (Sal W)	Saline Water (Sal W)			
			Date Sampled	08/03/2016	08/03/2016	08/03/2016			
			Sample Time	.	.	.			
			Date Received	09/03/2016	09/03/2016	09/03/2016			
			SDG Ref	160309-113	160309-113	160309-113			
			Lab Sample No.(s)	13060798	13060799	13060792			
			AGS Reference						
Naphthalene (aq)	<0.0001 mg/l	TM178		<0.0001 #	<0.0001 #	<0.0001 #			
Acenaphthene (aq)	<0.000015	TM178		<0.000015 #	<0.000015 #	<0.000015 #			
Acenaphthylene (aq)	<0.000011	TM178		<0.000011 #	<0.000011 #	<0.000011 #			
Fluoranthene (aq)	<0.000017	TM178		<0.000017 #	0.000035 #	<0.000017 #			
Anthracene (aq)	<0.000015	TM178		<0.000015 #	<0.000015 #	<0.000015 #			
Phenanthrene (aq)	<0.000022	TM178		<0.000022 #	0.000029 #	<0.000022 #			
Fluorene (aq)	<0.000014	TM178		<0.000014 #	<0.000014 #	<0.000014 #			
Chrysene (aq)	<0.000013	TM178		<0.000013 #	<0.000013 #	<0.000013 #			
Pyrene (aq)	<0.000015	TM178		<0.000015 #	0.000073 #	<0.000015 #			
Benzo(a)anthracene (aq)	<0.000017	TM178		<0.000017 #	<0.000017 #	<0.000017 #			
Benzo(b)fluoranthene (aq)	<0.000023	TM178		<0.000023 #	<0.000023 #	<0.000023 #			
Benzo(k)fluoranthene (aq)	<0.000027	TM178		<0.000027 #	<0.000027 #	<0.000027 #			
Benzo(a)pyrene (aq)	<0.000009	TM178		<0.000009 #	<0.000009 #	<0.000009 #			
Dibenzo(a,h)anthracene (aq)	<0.000016	TM178		<0.000016 #	<0.000016 #	<0.000016 #			
Benzo(g,h,i)perylene (aq)	<0.000016	TM178		<0.000016 #	<0.000016 #	<0.000016 #			
Indeno(1,2,3-cd)pyrene (aq)	<0.000014	TM178		<0.000014 #	<0.000014 #	<0.000014 #			
PAH, Total Detected USEPA 16 (aq)	<0.000344	TM178		<0.000344	<0.000344	<0.000344			

CERTIFICATE OF ANALYSIS

SDG:	160309-113	**Location:**	Valleyfields	**Order Number:**	405/8371
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	353745
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Valleyfields
Mass Sample taken (kg)	0.146	**Natural Moisture Content (%)**	62.4
Mass of dry sample (kg)	0.175	**Dry Matter Content (%)**	61.6
Particle Size <4mm	>95%		

Case	
SDG	160309-113
Lab Sample Number(s)	13060787
Sampled Date	07-Mar-2016
Customer Sample Ref.	PFA
Depth (m)	

Solid Waste Analysis	**Result**	**Landfill Waste Acceptance Criteria Limits**		
		Inert Waste Landfill	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	11.8	3	5	6
Loss on Ignition (%)	7.28	-	-	10
Sum of BTEX (mg/kg)	<0.024	6	-	-
Sum of 7 PCBs (mg/kg)	<0.021	1	-	-
Mineral Oil (mg/kg)	3.73	500	-	-
PAH Sum of 17 (mg/kg)	<10	100	-	-
pH (pH Units)	9.77	-	<6	-
ANC to pH 6 (mol/kg)	0.166	-	-	-
ANC to pH 4 (mol/kg)	0.276	-	-	-

Eluate Analysis	**C_2 Conc^n in 10:1 eluate (mg/l)**		**A_2 10:1 conc^n leached (mg/kg)**		**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Arsenic	0.138	<0.00012	1.38	<0.0012	0.5	2	25
Barium	0.203	<0.00003	2.03	<0.0003	20	100	300
Cadmium	0.000145	<0.0001	0.00145	<0.001	0.04	1	5
Chromium	0.0499	<0.00022	0.499	<0.0022	0.5	10	70
Copper	<0.00085	<0.00085	<0.0085	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	0.0983	<0.00024	0.983	<0.0024	0.5	10	30
Nickel	<0.00015	<0.00015	<0.0015	<0.0015	0.4	10	40
Lead	0.000082	<0.00002	0.00082	<0.0002	0.5	10	50
Antimony	0.0471	<0.00016	0.471	<0.0016	0.06	0.7	5
Selenium	0.48	<0.00039	4.8	<0.0039	0.1	0.5	7
Zinc	<0.00041	<0.00041	<0.0041	<0.0041	4	50	200
Chloride	101	<2	1010	<20	800	15000	25000
Fluoride	1.01	<0.5	10.1	<5	10	150	500
Sulphate (soluble)	53.2	<2	532	<20	1000	20000	50000
Total Dissolved Solids	457	<5	4570	<50	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	<3	<3	<30	<30	500	800	1000

Leach Test Information

Date Prepared	10-Mar-2016
pH (pH Units)	9.83
Conductivity (µS/cm)	599.00
Temperature (°C)	18.60
Volume Leachant (Litres)	0.844

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation
Mcerts Certification does not apply to leachates
17/03/2016 15:37:28
15:37:22 17/03/2016

CERTIFICATE OF ANALYSIS

SDG:	160309-113	**Location:**	Valleyfields	**Order Number:**	405/8371
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	353745
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material		
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step		
TM018	BS 1377: Part 3 1990	Determination of Loss on Ignition		
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) and BTEX (MTBE) compounds by Headspace GC-FID (C4-C12)		
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water		
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser		
TM120	Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter		
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water		
TM132	In - house Method	ELTRA CS800 Operators Guide		
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils		
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters		
TM182	CEN/TC 292 - WI 292046-chacterization of waste-leaching Behaviour Tests- Acid and Base Neutralization Capacity Test	Determination of Acid Neutralisation Capacity (ANC) Using Autotitration in Soils		
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		
TM213	In-house Method	Rapid Determination of PAHs by GC-FID		
TM228	US EPA Method 6010B	Determination of Major Cations in Water by iCap 6500 Duo ICP-OES		
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter		
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC		

[1] Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

CERTIFICATE OF ANALYSIS

SDG:	160309-113	**Location:**	Valleyfields	**Order Number:**	405/8371
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	353745
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	13060782	13060783	13060787	13060785	13060784	13060790	13060788	13060793	13060794	13060795
Customer Sample Ref.	ES1	ES2	PFA	SN	TD	VF1	VF4	VF5	VF6	VF7
AGS Ref.										
Depth										
Type	SALINE_D	SALINE_D	SOLID	SALINE_D	SALINE_C	SALINE_D	SALINE_C	SALINE_C	SALINE_C	SALINE_C
ANC at pH4 and ANC at pH 6			15-Mar-2016							
Anions by Kone (w)	14-Mar-2016	11-Mar-2016	14-Mar-2016	11-Mar-2016	14-Mar-2016	11-Mar-2016	14-Mar-2016	11-Mar-2016	14-Mar-2016	11-Mar-2016
CEN 10:1 Leachate (1 Stage)			10-Mar-2016							
CEN Readings			11-Mar-2016							
Conductivity (at 20 deg.C)	15-Mar-2016	15-Mar-2016		15-Mar-2016	15-Mar-2016	15-Mar-2016	15-Mar-2016	15-Mar-2016	15-Mar-2016	15-Mar-2016
Dissolved Metals by ICP-MS	17-Mar-2016	17-Mar-2016	14-Mar-2016	17-Mar-2016	17-Mar-2016	17-Mar-2016	17-Mar-2016	17-Mar-2016	17-Mar-2016	17-Mar-2016
Dissolved Organic/Inorganic Carbon			14-Mar-2016							
Fluoride			14-Mar-2016							
GRO by GC-FID (S)			16-Mar-2016							
Loss on Ignition in soils			16-Mar-2016							
Mercury Dissolved			14-Mar-2016							
Metals by iCap-OES Dissolved (W)	15-Mar-2016	15-Mar-2016		15-Mar-2016	15-Mar-2016	15-Mar-2016	15-Mar-2016	11-Mar-2016	15-Mar-2016	15-Mar-2016
Mineral Oil			16-Mar-2016							
PAH Spec MS - Aqueous (W)	15-Mar-2016	14-Mar-2016		15-Mar-2016	15-Mar-2016	14-Mar-2016	14-Mar-2016	14-Mar-2016	15-Mar-2016	15-Mar-2016
PAH Value of soil			14-Mar-2016							
PCBs by GCMS			15-Mar-2016							
pH			11-Mar-2016							
pH Value	11-Mar-2016	11-Mar-2016		11-Mar-2016	11-Mar-2016	11-Mar-2016	11-Mar-2016	11-Mar-2016	11-Mar-2016	11-Mar-2016
Phenols by HPLC (W)			14-Mar-2016							
Sample description			10-Mar-2016							
Total Dissolved Solids			15-Mar-2016							
Total Organic Carbon			14-Mar-2016							

Lab Sample No(s)	13060796	13060789	13060797	13060798	13060799	13060792
Customer Sample Ref.	VF8	VF9	VF10	VF11	VF12	VF3D
AGS Ref.						
Depth						
Type	SALINE_D	SALINE_D	SALINE_C	SALINE_B	SALINE_B	SALINE_B
Anions by Kone (w)	14-Mar-2016	14-Mar-2016	11-Mar-2016	16-Mar-2016	14-Mar-2016	14-Mar-2016
Conductivity (at 20 deg.C)	15-Mar-2016	15-Mar-2016	15-Mar-2016	15-Mar-2016	15-Mar-2016	15-Mar-2016
Dissolved Metals by ICP-MS	17-Mar-2016	17-Mar-2016	17-Mar-2016	17-Mar-2016	17-Mar-2016	17-Mar-2016
Metals by iCap-OES Dissolved (W)	15-Mar-2016	15-Mar-2016	14-Mar-2016	11-Mar-2016	14-Mar-2016	15-Mar-2016
PAH Spec MS - Aqueous (W)	14-Mar-2016	15-Mar-2016	15-Mar-2016	15-Mar-2016	15-Mar-2016	14-Mar-2016
pH Value	11-Mar-2016	11-Mar-2016	11-Mar-2016	11-Mar-2016	11-Mar-2016	11-Mar-2016

SDG:	160309-113	**Location:**	Valleyfields	**Order Number:**	405/8371
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	353745
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

Appendix

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt . However, the integrity of the data may be compromised.

9. NDP - No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately.

11. Results relate only to the items tested.

12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%, they are generally wider for volatiles analysis, 50-150%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment . Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect .

14. **Product analyses** - Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

General

20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

21. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill /made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

24. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as “mixed hydrocarbons”. Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

Sample Deviations

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Holding time exceeded before sample received
5	Samples exceeded holding time before presevation was performed
§	Sampled on date not provided
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to sampled on date
&	Sample Holding Time exceeded - Late arrival of instructions.

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than : - Trace - Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

ALcontrol Laboratories

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: mkt@alcontrol.com
Website: www.alcontrol.com

SLR Consulting Ltd
Floor 2
4/5 Lochside View
Edinburgh Park
Edinburgh
Lanarkshire
EH12 9DH

Attention: Zak Ritchie

CERTIFICATE OF ANALYSIS

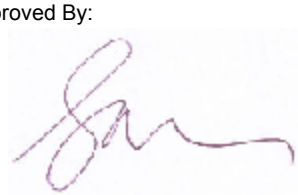
Date:	24 June 2016
Customer:	H_SLR_EDH
Sample Delivery Group (SDG):	160608-88
Your Reference:	405.00481.00033
Location:	Valleyfields
Report No:	366319

We received 15 samples on Wednesday June 08, 2016 and 15 of these samples were scheduled for analysis which was completed on Friday June 24, 2016. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:



Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	160608-88	**Location:**	Valleyfields	**Order Number:**	405/8478
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	366319
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
13558086	ES1			06/06/2016
13558087	ES2			06/06/2016
13558271	PFA			06/06/2016
13558085	TD			06/06/2016
13558079	VF1			06/06/2016
13558090	VF4			07/06/2016
13558080	VF5			06/06/2016
13558081	VF6			06/06/2016
13558083	VF7			06/06/2016
13558091	VF8			07/06/2016
13558084	VF9			06/06/2016
13558092	VF10			07/06/2016
13558093	VF11			07/06/2016
13558094	VF12			07/06/2016
13558088	VF3D			07/06/2016

Only received samples which have had analysis scheduled will be shown on the following pages.

SDG:	160608-88	**Location:**	Valleyfields	**Order Number:**	405/8478
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	366319
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

Saline Water (Sal W)

Results Legend

- **X** — **Test**
- **N** — **No Determination Possible**

	Lab Sample No(s)		13558086			13558087			13558085			13558079			13558090			13558080			13558081			13558083			13558091			13558084			13558092			13558093			13558094
	Customer Sample Reference		ES1			ES2			TD			VF1			VF4			VF5			VF6			VF7			VF8			VF9			VF10			VF11			VF12
	AGS Reference																																							
	Depth (m)																																							
	Container		0.5l glass bottle (AL	500ml Plastic (ALE2	HNO3 Filtered (ALE	0.5l glass bottle (AL	500ml Plastic (ALE2	HNO3 Filtered (ALE	0.5l glass bottle (AL	500ml Plastic (ALE2	HNO3 Filtered (ALE	0.5l glass bottle (AL	500ml Plastic (ALE2	HNO3 Filtered (ALE	0.5l glass bottle (AL	500ml Plastic (ALE2	HNO3 Filtered (ALE	0.5l glass bottle (AL	500ml Plastic (ALE2	HNO3 Filtered (ALE	0.5l glass bottle (AL	500ml Plastic (ALE2	HNO3 Filtered (ALE	0.5l glass bottle (AL	500ml Plastic (ALE2	HNO3 Filtered (ALE	0.5l glass bottle (AL	500ml Plastic (ALE2	HNO3 Filtered (ALE	0.5l glass bottle (AL	500ml Plastic (ALE2	HNO3 Filtered (ALE	0.5l glass bottle (AL	500ml Plastic (ALE2	HNO3 Filtered (ALE	0.5l glass bottle (AL	500ml Plastic (ALE2	HNO3 Filtered (ALE	0.5l glass bottle (AL
Anions by Kone (w)	All	NDPs: 0 Tests: 14		X			X			X			X			X			X			X			X			X			X			X			X		
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 14		X			X			X			X			X			X			X			X			X			X			X			X		
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 14			X			X			X			X			X			X			X			X			X			X			X			X	
Metals by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 14			X			X			X			X			X			X			X			X			X			X			X			X	
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 14	X			X			X			X			X			X			X			X			X			X			X			X			X
pH Value	All	NDPs: 0 Tests: 14		X			X			X			X			X			X			X			X			X			X			X			X		

CERTIFICATE OF ANALYSIS

SDG:	160608-88	**Location:**	Valleyfields	**Order Number:**	405/8478
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	366319
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

Saline Water (Sal W)

Results Legend

X Test

N No Determination Possible

			Lab Sample No(s)	13558094	13558088
			Customer Sample Reference	VF12	VF3D
			AGS Reference		
			Depth (m)		
			Container	500ml Plastic (ALE2	HNO3 Filtered (ALE	0.5l glass bottle (AL	500ml Plastic (ALE2	HNO3 Filtered (ALE
Anions by Kone (w)	All	NDPs: 0 Tests: 14		X			X	
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 14		X			X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 14			X			X
Metals by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 14			X			X
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 14				X		
pH Value	All	NDPs: 0 Tests: 14		X			X	

CERTIFICATE OF ANALYSIS

SDG:	160608-88	**Location:**	Valleyfields	**Order Number:**	405/8478
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	366319
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

SOLID

Results Legend

X **Test**

N **No Determination Possible**

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container		
			13558271	PFA			1kg TUB	250g Amber Jar (AL	60g VOC (ALE215)
ANC at pH4 and ANC at pH 6	All	NDPs: 0 Tests: 1						X	
Anions by Kone (w)	All	NDPs: 0 Tests: 1					X		
CEN Readings	All	NDPs: 0 Tests: 1					X		
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1					X		
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 1					X		
Fluoride	All	NDPs: 0 Tests: 1					X		
GRO by GC-FID (S)	All	NDPs: 0 Tests: 1							X
Loss on Ignition in soils	All	NDPs: 0 Tests: 1						X	
Mercury Dissolved	All	NDPs: 0 Tests: 1					X		
Mineral Oil	All	NDPs: 0 Tests: 1						X	
PAH Value of soil	All	NDPs: 0 Tests: 1						X	
PCBs by GCMS	All	NDPs: 0 Tests: 1						X	
pH	All	NDPs: 0 Tests: 1					X		
Phenols by HPLC (W)	All	NDPs: 0 Tests: 1					X		
Sample description	All	NDPs: 0 Tests: 1						X	

CERTIFICATE OF ANALYSIS

SDG:	160608-88	**Location:**	Valleyfields	**Order Number:**	405/8478
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	366319
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

SOLID

Results Legend

X **Test**

N **No Determination Possible**

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
			13558271	PFA			1kg TUB / 250g Amber Jar (AL / 60g VOC (ALE215)
Total Dissolved Solids	All	NDPs: 0 Tests: 1					X
Total Organic Carbon	All	NDPs: 0 Tests: 1					X

CERTIFICATE OF ANALYSIS

SDG:	160608-88	**Location:**	Valleyfields	**Order Number:**	405/8478
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	366319
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

Sample Descriptions

Grain Sizes

very fine	<0.063mm	**fine**	0.063mm - 0.1mm	**medium**	0.1mm - 2mm	**coarse**	2mm - 10mm	**very coarse**	>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Grain size	Inclusions	Inclusions 2
13558271	PFA		Grey	Sandy Silt Loam	0.063 - 2.00 mm	None	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

CERTIFICATE OF ANALYSIS

SDG:	160608-88	**Location:**	Valleyfields	**Order Number:**	405/8478
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	366319
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	ES1	ES2	PFA	TD	VF1	VF4
			Depth (m)	.	.	.	.	.	.
			Sample Type	Saline Water (Sal W)	Saline Water (Sal W)	Soil/Solid	Saline Water (Sal W)	Saline Water (Sal W)	Saline Water (Sal W)
			Date Sampled	06/06/2016	06/06/2016	06/06/2016	06/06/2016	06/06/2016	07/06/2016
			Sample Time	.	.	.	.	.	.
			Date Received	08/06/2016	08/06/2016	08/06/2016	08/06/2016	08/06/2016	08/06/2016
			SDG Ref	160608-88	160608-88	160608-88	160608-88	160608-88	160608-88
			Lab Sample No.(s)	13558086	13558087	13558271	13558085	13558079	13558090
			AGS Reference						
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120		37.7 #	34.4 #		22 #	17.1 #	24.8 #
Antimony (diss.filt)	<0.00016 mg/l	TM152		<0.0016	0.00574		0.000966	<0.00016	0.000236
Arsenic (diss.filt)	<0.00012 mg/l	TM152		0.0582 #	0.0555 #		0.0184 #	0.0156 #	0.017 #
Boron (diss.filt)	<0.0094 mg/l	TM152		3.02 #	3.27 #		4.42 #	0.361 #	3.77 #
Cadmium (diss.filt)	<0.0001 mg/l	TM152		0.0108 #	0.00951 #		0.00255 #	0.00101 #	0.00144 #
Chromium (diss.filt)	<0.00022 mg/l	TM152		0.00656 #	0.00627 #		0.00131 #	0.00177 #	0.00352 #
Manganese (diss.filt)	<0.00004 mg/l	TM152		0.00155 #	0.017 #		0.11 #	0.181 #	0.0841
Molybdenum (diss.filt)	<0.00024 mg/l	TM152		<0.0024 #	0.00501 #		0.665 #	0.00109 #	0.233 #
Selenium (diss.filt)	<0.00039 mg/l	TM152		0.191 #	0.178 #		0.0503 #	0.0534 #	0.0567 #
Vanadium (diss.filt)	<0.00024 mg/l	TM152		<0.0024 #	<0.0024 #		0.0523 #	<0.00024 #	<0.00024 #
Sulphate	<2 mg/l	TM184		2400 #	2190 #		1530 #	830 #	1520 #
Chloride	<2 mg/l	TM184		17900 #	16700 #		10900 #	10800 #	10800 #
Sodium (diss.filt)	<0.076 mg/l	TM228		7930 #	8790 #		6740 #	5100 #	5470 #
Magnesium (diss.filt)	<0.036 mg/l	TM228		965 #	1070 #		225 #	562 #	556 #
pH	<1 pH Units	TM256		7.8 #	7.89 #		8.23 #	7.44 #	7.68 #
Moisture Content Ratio (% of as received sample)	%	PM024				110			
Loss on ignition	<0.7 %	TM018				17.6 M			
Mineral oil >C10-C40	<1 mg/kg	TM061				17.4			
Mineral Oil Surrogate % recovery**	%	TM061				95.2			
Organic Carbon, Total	<0.2 %	TM132				6.76 M			
pH	1 pH Units	TM133				9.16 M			
PCB congener 28	<0.003 mg/kg	TM168				<0.003 M			
PCB congener 52	<0.003 mg/kg	TM168				<0.003 M			
PCB congener 101	<0.003 mg/kg	TM168				<0.003 M			
PCB congener 118	<0.003 mg/kg	TM168				<0.003 M			
PCB congener 138	<0.003 mg/kg	TM168				<0.003 M			
PCB congener 153	<0.003 mg/kg	TM168				<0.003 M			
PCB congener 180	<0.003 mg/kg	TM168				<0.003 M			
Sum of detected PCB 7 Congeners	<0.021 mg/kg	TM168				<0.021			
ANC @ pH 4	<0.03 mol/kg	TM182				0.269			
ANC @ pH 6	<0.03 mol/kg	TM182				0.129			
Polyaromatic hydrocarbons, Total 17	<10 mg/kg	TM213				<10			

CERTIFICATE OF ANALYSIS

SDG:	160608-88	**Location:**	Valleyfields	**Order Number:**	405/8478
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	366319
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	VF5	VF6	VF7	VF8	VF9	VF10
			Depth (m)	.	.	.	.	.	.
			Sample Type	Saline Water (Sal W)	Saline Water (Sal W)	Saline Water (Sal W)	Saline Water (Sal W)	Saline Water (Sal W)	Saline Water (Sal W)
			Date Sampled	06/06/2016	06/06/2016	06/06/2016	07/06/2016	06/06/2016	07/06/2016
			Sample Time	.	.	.	.	.	.
			Date Received	08/06/2016	08/06/2016	08/06/2016	08/06/2016	08/06/2016	08/06/2016
			SDG Ref	160608-88	160608-88	160608-88	160608-88	160608-88	160608-88
			Lab Sample No.(s)	13558080	13558081	13558083	13558091	13558084	13558092
			AGS Reference						
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120		20.1 #	15.4 #	14.4 #	25.8 #	23.1 #	15.6 #
Antimony (diss.filt)	<0.00016 mg/l	TM152		<0.00016	0.000213	<0.00016	<0.00016	<0.0016	0.00019
Arsenic (diss.filt)	<0.00012 mg/l	TM152		0.0178 #	0.0428 #	0.0203 #	0.0104 #	0.0505 #	0.022 #
Boron (diss.filt)	<0.0094 mg/l	TM152		1.79 #	5.07 #	0.323 #	3.62 #	1.23 #	10.1
Cadmium (diss.filt)	<0.0001 mg/l	TM152		0.00121 #	0.00302 #	0.0013 #	0.00141 #	0.00493 #	0.0017 #
Chromium (diss.filt)	<0.00022 mg/l	TM152		0.00193 #	0.0011 #	0.00144 #	0.00347 #	0.00674 #	0.00337 #
Manganese (diss.filt)	<0.00004 mg/l	TM152		0.0368 #	0.0425 #	0.305 #	0.0745	0.642	0.247
Molybdenum (diss.filt)	<0.00024 mg/l	TM152		0.00202 #	0.466 #	0.0108 #	0.295 #	0.0444 #	0.264 #
Selenium (diss.filt)	<0.00039 mg/l	TM152		0.0617 #	0.0677 #	0.0673 #	0.037 #	0.157 #	0.0705 #
Vanadium (diss.filt)	<0.00024 mg/l	TM152		0.0031 #	0.0254 #	<0.00024 #	0.000498 #	<0.0024 #	<0.00024 #
Sulphate	<2 mg/l	TM184		352 #	770 #	494 #	1550 #	771 #	569 #
Chloride	<2 mg/l	TM184		10300 #	7160 #	9430 #	12300 #	11900 #	6340 #
Sodium (diss.filt)	<0.076 mg/l	TM228		4990 #	3310 #	3580 #	5540 #	5030 #	3670 #
Magnesium (diss.filt)	<0.036 mg/l	TM228		453 #	40.9 #	497 #	583 #	578 #	236 #
pH	<1 pH Units	TM256		7.51 #	8.02 #	7.19 #	7.78 #	7.32 #	7.76 #

CERTIFICATE OF ANALYSIS

SDG:	160608-88	**Location:**	Valleyfields	**Order Number:**	405/8478
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	366319
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	VF11	VF12	VF3D			
			Depth (m)	.	.	.			
			Sample Type	Saline Water (Sal W)	Saline Water (Sal W)	Saline Water (Sal W)			
			Date Sampled	07/06/2016	07/06/2016	07/06/2016			
			Sample Time	.	.	.			
			Date Received	08/06/2016	08/06/2016	08/06/2016			
			SDG Ref	160608-88	160608-88	160608-88			
			Lab Sample No.(s)	13558093	13558094	13558088			
			AGS Reference						
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120		1.89 #	1.17 #	3.66 #			
Antimony (diss.filt)	<0.00016 mg/l	TM152		<0.00016	<0.00016	<0.00016			
Arsenic (diss.filt)	<0.00012 mg/l	TM152		0.00276 #	0.002 #	0.00964 #			
Boron (diss.filt)	<0.0094 mg/l	TM152		0.301 #	0.345 #	0.472 #			
Cadmium (diss.filt)	<0.0001 mg/l	TM152		0.000124 #	0.000174 #	0.000561 #			
Chromium (diss.filt)	<0.00022 mg/l	TM152		0.00131 #	0.000301 #	0.00119 #			
Manganese (diss.filt)	<0.00004 mg/l	TM152		0.0636	0.0548 #	0.124			
Molybdenum (diss.filt)	<0.00024 mg/l	TM152		<0.00024 #	<0.00024 #	0.00048 #			
Selenium (diss.filt)	<0.00039 mg/l	TM152		0.00909 #	0.00595 #	0.0306 #			
Vanadium (diss.filt)	<0.00024 mg/l	TM152		0.000492 #	<0.00024 #	0.000871 #			
Sulphate	<2 mg/l	TM184		<2 #	<2 #	<2 #			
Chloride	<2 mg/l	TM184		395 #	251 #	1330 #			
Sodium (diss.filt)	<0.076 mg/l	TM228		263 #	143 #	516 #			
Magnesium (diss.filt)	<0.036 mg/l	TM228		26.8 #	19.6 #	61.8 #			
pH	<1 pH Units	TM256		7.79 #	7.83 #	7.86 #			

CERTIFICATE OF ANALYSIS

SDG:	160608-88	**Location:**	Valleyfields	**Order Number:**	405/8478
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	366319
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

GRO by GC-FID (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

	Customer Sample R
	PFA
Depth (m)	.
Sample Type	Soil/Solid
Date Sampled	06/06/2016
Sample Time	.
Date Received	08/06/2016
SDG Ref	160608-88
Lab Sample No.(s)	13558271
AGS Reference	

Component	LOD/Units	Method	
Methyl tertiary butyl ether (MTBE)	<0.005 mg/kg	TM089	<0.005 #
Benzene	<0.01 mg/kg	TM089	<0.01 M
Toluene	<0.002 mg/kg	TM089	<0.002 M
Ethylbenzene	<0.003 mg/kg	TM089	<0.003 M
m,p-Xylene	<0.006 mg/kg	TM089	<0.006 M
o-Xylene	<0.003 mg/kg	TM089	<0.003 M
sum of detected mpo xylene by GC	<0.009 mg/kg	TM089	<0.009
sum of detected BTEX by GC	<0.024 mg/kg	TM089	<0.024

CERTIFICATE OF ANALYSIS

SDG:	160608-88	**Location:**	Valleyfields	**Order Number:**	405/8478
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	366319
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

PAH Spec MS - Aqueous (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	ES1	ES2	TD	VF1	VF4	VF5
			Depth (m)	.	.	.	.	.	.
			Sample Type	Saline Water (Sal W)	Saline Water (Sal W)	Saline Water (Sal W)	Saline Water (Sal W)	Saline Water (Sal W)	Saline Water (Sal W)
			Date Sampled	06/06/2016	06/06/2016	06/06/2016	06/06/2016	07/06/2016	06/06/2016
			Sample Time	.	.	.	.	.	.
			Date Received	08/06/2016	08/06/2016	08/06/2016	08/06/2016	08/06/2016	08/06/2016
			SDG Ref	160608-88	160608-88	160608-88	160608-88	160608-88	160608-88
			Lab Sample No.(s)	13558086	13558087	13558085	13558079	13558090	13558080
			AGS Reference						
Naphthalene (aq)	<0.0001 mg/l	TM178		<0.0001 #	<0.0001 #	<0.0001 #	<0.0001 #	<0.0001 #	<0.0001 #
Acenaphthene (aq)	<0.000015	TM178		<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #
Acenaphthylene (aq)	<0.000011	TM178		<0.000011 #	<0.000011 #	<0.000011 #	<0.000011 #	<0.000011 #	<0.000011 #
Fluoranthene (aq)	<0.000017	TM178		<0.000017 #	<0.000017 #	<0.000017 #	<0.000017 #	<0.000017 #	0.000022 #
Anthracene (aq)	<0.000015	TM178		<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #
Phenanthrene (aq)	<0.000022	TM178		<0.000022 #	<0.000022 #	<0.000022 #	<0.000022 #	<0.000022 #	<0.000022 #
Fluorene (aq)	<0.000014	TM178		<0.000014 #	<0.000014 #	<0.000014 #	<0.000014 #	<0.000014 #	<0.000014 #
Chrysene (aq)	<0.000013	TM178		<0.000013 #	<0.000013 #	<0.000013 #	<0.000013 #	<0.000013 #	0.000013 #
Pyrene (aq)	<0.000015	TM178		<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #	0.000023 #
Benzo(a)anthracene (aq)	<0.000017	TM178		<0.000017 #	<0.000017 #	<0.000017 #	<0.000017 #	<0.000017 #	0.000017 #
Benzo(b)fluoranthene (aq)	<0.000023	TM178		<0.000023 #	<0.000023 #	<0.000023 #	<0.000023 #	<0.000023 #	<0.000023 #
Benzo(k)fluoranthene (aq)	<0.000027	TM178		<0.000027 #	<0.000027 #	<0.000027 #	<0.000027 #	<0.000027 #	<0.000027 #
Benzo(a)pyrene (aq)	<0.000009	TM178		<0.000009 #	<0.000009 #	<0.000009 #	<0.000009 #	<0.000009 #	0.000014 #
Dibenzo(a,h)anthracene (aq)	<0.000016	TM178		<0.000016 #	<0.000016 #	<0.000016 #	<0.000016 #	<0.000016 #	<0.000016 #
Benzo(g,h,i)perylene (aq)	<0.000016	TM178		<0.000016 #	<0.000016 #	<0.000016 #	<0.000016 #	<0.000016 #	<0.000016 #
Indeno(1,2,3-cd)pyrene (aq)	<0.000014	TM178		<0.000014 #	<0.000014 #	<0.000014 #	<0.000014 #	<0.000014 #	<0.000014 #
PAH, Total Detected USEPA 16 (aq)	<0.000344	TM178		<0.000344	<0.000344	<0.000344	<0.000344	<0.000344	<0.000344

CERTIFICATE OF ANALYSIS

SDG:	160608-88	**Location:**	Valleyfields	**Order Number:**	405/8478
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	366319
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

PAH Spec MS - Aqueous (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	VF6	VF7	VF8	VF9	VF10	VF11
			Depth (m)	.	.	.	.	.	.
			Sample Type	Saline Water (Sal W)	Saline Water (Sal W)	Saline Water (Sal W)	Saline Water (Sal W)	Saline Water (Sal W)	Saline Water (Sal W)
			Date Sampled	06/06/2016	06/06/2016	07/06/2016	06/06/2016	07/06/2016	07/06/2016
			Sample Time	.	.	.	.	.	.
			Date Received	08/06/2016	08/06/2016	08/06/2016	08/06/2016	08/06/2016	08/06/2016
			SDG Ref	160608-88	160608-88	160608-88	160608-88	160608-88	160608-88
			Lab Sample No.(s)	13558081	13558083	13558091	13558084	13558092	13558093
			AGS Reference						
Naphthalene (aq)	<0.0001 mg/l	TM178		<0.0001 #	<0.0001 #	<0.0001 #	<0.0001 #	<0.0001 #	<0.0001 #
Acenaphthene (aq)	<0.000015	TM178		<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #
Acenaphthylene (aq)	<0.000011	TM178		<0.000011 #	<0.000011 #	<0.000011 #	<0.000011 #	<0.000011 #	<0.000011 #
Fluoranthene (aq)	<0.000017	TM178		<0.000017 #	<0.000017 #	<0.000017 #	<0.000017 #	<0.000017 #	<0.000017 #
Anthracene (aq)	<0.000015	TM178		<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #
Phenanthrene (aq)	<0.000022	TM178		<0.000022 #	<0.000022 #	<0.000022 #	<0.000022 #	<0.000022 #	<0.000022 #
Fluorene (aq)	<0.000014	TM178		<0.000014 #	<0.000014 #	<0.000014 #	<0.000014 #	<0.000014 #	<0.000014 #
Chrysene (aq)	<0.000013	TM178		<0.000013 #	<0.000013 #	<0.000013 #	<0.000013 #	<0.000013 #	<0.000013 #
Pyrene (aq)	<0.000015	TM178		<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #	0.000015 #	<0.000015 #
Benzo(a)anthracene (aq)	<0.000017	TM178		<0.000017 #	<0.000017 #	<0.000017 #	<0.000017 #	<0.000017 #	<0.000017 #
Benzo(b)fluoranthene (aq)	<0.000023	TM178		<0.000023 #	<0.000023 #	<0.000023 #	<0.000023 #	<0.000023 #	<0.000023 #
Benzo(k)fluoranthene (aq)	<0.000027	TM178		<0.000027 #	<0.000027 #	<0.000027 #	<0.000027 #	<0.000027 #	<0.000027 #
Benzo(a)pyrene (aq)	<0.000009	TM178		<0.000009 #	<0.000009 #	<0.000009 #	<0.000009 #	<0.000009 #	<0.000009 #
Dibenzo(a,h)anthracene (aq)	<0.000016	TM178		<0.000016 #	<0.000016 #	<0.000016 #	<0.000016 #	<0.000016 #	<0.000016 #
Benzo(g,h,i)perylene (aq)	<0.000016	TM178		<0.000016 #	<0.000016 #	<0.000016 #	<0.000016 #	<0.000016 #	<0.000016 #
Indeno(1,2,3-cd)pyrene (aq)	<0.000014	TM178		<0.000014 #	<0.000014 #	<0.000014 #	<0.000014 #	<0.000014 #	<0.000014 #
PAH, Total Detected USEPA 16 (aq)	<0.000344	TM178		<0.000344	<0.000344	<0.000344	<0.000344	<0.000344	<0.000344

CERTIFICATE OF ANALYSIS

SDG:	160608-88	**Location:**	Valleyfields	**Order Number:**	405/8478
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	366319
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

PAH Spec MS - Aqueous (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	VF12	VF3D
			Depth (m)	.	.
			Sample Type	Saline Water (Sal W)	Saline Water (Sal W)
			Date Sampled	07/06/2016	07/06/2016
			Sample Time	.	.
			Date Received	08/06/2016	08/06/2016
			SDG Ref	160608-88	160608-88
			Lab Sample No.(s)	13558094	13558088
			AGS Reference		
Naphthalene (aq)	<0.0001 mg/l	TM178		<0.0001 #	<0.0001 #
Acenaphthene (aq)	<0.000015	TM178		<0.000015 #	<0.000015 #
Acenaphthylene (aq)	<0.000011	TM178		<0.000011 #	<0.000011 #
Fluoranthene (aq)	<0.000017	TM178		<0.000017 #	<0.000017 #
Anthracene (aq)	<0.000015	TM178		<0.000015 #	<0.000015 #
Phenanthrene (aq)	<0.000022	TM178		<0.000022 #	0.000046 #
Fluorene (aq)	<0.000014	TM178		<0.000014 #	0.000017 #
Chrysene (aq)	<0.000013	TM178		<0.000013 #	<0.000013 #
Pyrene (aq)	<0.000015	TM178		0.000025 #	0.000019 #
Benzo(a)anthracene (aq)	<0.000017	TM178		<0.000017 #	<0.000017 #
Benzo(b)fluoranthene (aq)	<0.000023	TM178		<0.000023 #	<0.000023 #
Benzo(k)fluoranthene (aq)	<0.000027	TM178		<0.000027 #	<0.000027 #
Benzo(a)pyrene (aq)	<0.000009	TM178		<0.000009 #	<0.000009 #
Dibenzo(a,h)anthracene (aq)	<0.000016	TM178		<0.000016 #	<0.000016 #
Benzo(g,h,i)perylene (aq)	<0.000016	TM178		<0.000016 #	<0.000016 #
Indeno(1,2,3-cd)pyrene (aq)	<0.000014	TM178		<0.000014 #	<0.000014 #
PAH, Total Detected USEPA 16 (aq)	<0.000344	TM178		<0.000344	<0.000344

CERTIFICATE OF ANALYSIS

SDG:	160608-88	**Location:**	Valleyfields	**Order Number:**	405/8478
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	366319
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Valleyfields
Mass Sample taken (kg)	0.129	**Natural Moisture Content (%)**	43.6
Mass of dry sample (kg)	0.175	**Dry Matter Content (%)**	69.7
Particle Size <4mm	>95%		

Case	
SDG	160608-88
Lab Sample Number(s)	13558271
Sampled Date	06-Jun-2016
Customer Sample Ref.	PFA
Depth (m)	

Solid Waste Analysis	**Result**	**Landfill Waste Acceptance Criteria Limits**		
		Inert Waste Landfill	**Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill**	**Hazardous Waste Landfill**
Total Organic Carbon (%)	6.76	3	5	6
Loss on Ignition (%)	17.6	-	-	10
Sum of BTEX (mg/kg)	<0.024	6	-	-
Sum of 7 PCBs (mg/kg)	<0.021	1	-	-
Mineral Oil (mg/kg)	17.4	500	-	-
PAH Sum of 17 (mg/kg)	<10	100	-	-
pH (pH Units)	9.16	-	>6	-
ANC to pH 6 (mol/kg)	0.129	-	-	-
ANC to pH 4 (mol/kg)	0.269	-	-	-

Eluate Analysis	**C_2** Conc^n in 10:1 eluate (mg/l)		**A_2** 10:1 conc^n leached (mg/kg)		**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	Result	**Limit of Detection**	**Result**	**Limit of Detection**			
Arsenic	0.042	<0.00012	0.42	<0.0012	0.5	2	25
Barium	0.332	<0.00003	3.32	<0.0003	20	100	300
Cadmium	0.00531	<0.0001	0.0531	<0.001	0.04	1	5
Chromium	0.0548	<0.00022	0.548	<0.0022	0.5	10	70
Copper	0.00141	<0.00085	0.0141	<0.0085	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	0.316	<0.00024	3.16	<0.0024	0.5	10	30
Nickel	0.00494	<0.00015	0.0494	<0.0015	0.4	10	40
Lead	0.000737	<0.00002	0.00737	<0.0002	0.5	10	50
Antimony	0.0202	<0.00016	0.202	<0.0016	0.06	0.7	5
Selenium	0.238	<0.00039	2.38	<0.0039	0.1	0.5	7
Zinc	0.00207	<0.00041	0.0207	<0.0041	4	50	200
Chloride	2910	<100	29100	<1000	800	15000	25000
Fluoride	0.557	<0.5	5.57	<5	10	150	500
Sulphate (soluble)	534	<10	5340	<100	1000	20000	50000
Total Dissolved Solids	7420	<25	74200	<250	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	<3	<3	<30	<30	500	800	1000

Leach Test Information

Date Prepared	09-Jun-2016
pH (pH Units)	9.23
Conductivity (µS/cm)	8,780.00
Temperature (°C)	21.00
Volume Leachant (Litres)	0.861

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation
Mcerts Certification does not apply to leachates
24/06/2016 13:42:41
13:42:31 24/06/2016

CERTIFICATE OF ANALYSIS

SDG:	160608-88	**Location:**	Valleyfields	**Order Number:**	405/8478
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	366319
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material		
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step		
TM018	BS 1377: Part 3 1990	Determination of Loss on Ignition		
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) and BTEX (MTBE) compounds by Headspace GC-FID (C4-C12)		
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water		
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser		
TM120	Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter		
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water		
TM132	In - house Method	ELTRA CS800 Operators Guide		
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils		
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters		
TM182	CEN/TC 292 - WI 292046-chacterization of waste-leaching Behaviour Tests- Acid and Base Neutralization Capacity Test	Determination of Acid Neutralisation Capacity (ANC) Using Autotitration in Soils		
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		
TM213	In-house Method	Rapid Determination of PAHs by GC-FID		
TM228	US EPA Method 6010B	Determination of Major Cations in Water by iCap 6500 Duo ICP-OES		
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter		
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC		

[1] Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

CERTIFICATE OF ANALYSIS

SDG:	160608-88	**Location:**	Valleyfields	**Order Number:**	405/8478
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	366319
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	13558086	13558087	13558271	13558085	13558079	13558090	13558080	13558081	13558083	13558091
Customer Sample Ref.	ES1	ES2	PFA	TD	VF1	VF4	VF5	VF6	VF7	VF8
AGS Ref.										
Depth										
Type	SALINE_D	SALINE_D	SOLID	SALINE_C	SALINE_C	SALINE_C	SALINE_C	SALINE_C	SALINE_C	SALINE_C
ANC at pH4 and ANC at pH 6			10-Jun-2016							
Anions by Kone (w)	16-Jun-2016	13-Jun-2016	13-Jun-2016	13-Jun-2016	10-Jun-2016	13-Jun-2016	13-Jun-2016	13-Jun-2016	13-Jun-2016	16-Jun-2016
CEN 10:1 Leachate (1 Stage)			09-Jun-2016							
CEN Readings			10-Jun-2016							
Conductivity (at 20 deg.C)	13-Jun-2016	13-Jun-2016		13-Jun-2016	13-Jun-2016	13-Jun-2016	13-Jun-2016	13-Jun-2016	13-Jun-2016	13-Jun-2016
Dissolved Metals by ICP-MS	20-Jun-2016	20-Jun-2016	13-Jun-2016	20-Jun-2016	20-Jun-2016	24-Jun-2016	20-Jun-2016	20-Jun-2016	20-Jun-2016	24-Jun-2016
Dissolved Organic/Inorganic Carbon			13-Jun-2016							
Fluoride			13-Jun-2016							
GRO by GC-FID (S)			16-Jun-2016							
Loss on Ignition in soils			13-Jun-2016							
Mercury Dissolved			13-Jun-2016							
Metals by iCap-OES Dissolved (W)	15-Jun-2016	15-Jun-2016		15-Jun-2016	15-Jun-2016	16-Jun-2016	15-Jun-2016	15-Jun-2016	15-Jun-2016	16-Jun-2016
Mineral Oil			15-Jun-2016							
PAH Spec MS - Aqueous (W)	16-Jun-2016	16-Jun-2016		16-Jun-2016	16-Jun-2016	16-Jun-2016	16-Jun-2016	16-Jun-2016	16-Jun-2016	16-Jun-2016
PAH Value of soil			10-Jun-2016							
PCBs by GCMS			13-Jun-2016							
pH			10-Jun-2016							
pH Value	13-Jun-2016	14-Jun-2016		10-Jun-2016	14-Jun-2016	13-Jun-2016	15-Jun-2016	10-Jun-2016	14-Jun-2016	13-Jun-2016
Phenols by HPLC (W)			14-Jun-2016							
Sample description			09-Jun-2016							
Total Dissolved Solids			13-Jun-2016							
Total Organic Carbon			14-Jun-2016							

Lab Sample No(s)	13558084	13558092	13558093	13558094	13558088
Customer Sample Ref.	VF9	VF10	VF11	VF12	VF3D
AGS Ref.					
Depth					
Type	SALINE_D	SALINE_B	SALINE_A	SALINE_A	SALINE_A
Anions by Kone (w)	13-Jun-2016	13-Jun-2016	13-Jun-2016	13-Jun-2016	13-Jun-2016
Conductivity (at 20 deg.C)	13-Jun-2016	13-Jun-2016	13-Jun-2016	13-Jun-2016	13-Jun-2016
Dissolved Metals by ICP-MS	24-Jun-2016	24-Jun-2016	24-Jun-2016	20-Jun-2016	24-Jun-2016
Metals by iCap-OES Dissolved (W)	16-Jun-2016	16-Jun-2016	13-Jun-2016	13-Jun-2016	16-Jun-2016
PAH Spec MS - Aqueous (W)	16-Jun-2016	16-Jun-2016	16-Jun-2016	16-Jun-2016	16-Jun-2016
pH Value	14-Jun-2016	13-Jun-2016	13-Jun-2016	14-Jun-2016	10-Jun-2016

SDG:	160608-88	**Location:**	Valleyfields	**Order Number:**	405/8478
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	366319
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

Appendix

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt . However, the integrity of the data may be compromised.

9. NDP - No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately.

11. Results relate only to the items tested.

12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%, they are generally wider for volatiles analysis, 50-150%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment . Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect .

14. **Product analyses** - Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

General

20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

21. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill /made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

24. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as “mixed hydrocarbons”. Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

Sample Deviations

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Holding time exceeded before sample received
5	Samples exceeded holding time before presevation was performed
§	Sampled on date not provided
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to sampled on date
&	Sample Holding Time exceeded - Late arrival of instructions.

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than : - Trace - Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

ALcontrol Laboratories

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: mkt@alcontrol.com
Website: www.alcontrol.com

SLR Consulting Ltd
Floor 2
4/5 Lochside View
Edinburgh Park
Edinburgh
Lanarkshire
EH12 9DH

Attention: Zak Ritchie

CERTIFICATE OF ANALYSIS

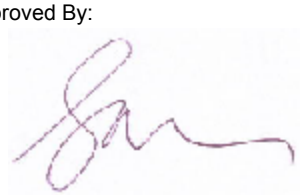
Date:	05 July 2016
Customer:	H_SLR_EDH
Sample Delivery Group (SDG):	160703-14
Your Reference:	405.00481.00033
Location:	Valleyfields
Report No:	367642

We received 2 samples on Friday July 01, 2016 and 2 of these samples were scheduled for analysis which was completed on Tuesday July 05, 2016. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Approved By:



Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	160703-14	**Location:**	Valleyfields	**Order Number:**	405/8514
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	367642
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
13699804	VF10			29/06/2016
13699803	VF3D			29/06/2016

Only received samples which have had analysis scheduled will be shown on the following pages.

CERTIFICATE OF ANALYSIS

SDG:	160703-14	**Location:**	Valleyfields	**Order Number:**	405/8514
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	367642
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

LIQUID

Results Legend

X **Test**

N **No Determination Possible**

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
			13699804	VF10			HNO3 Filtered (ALE
			13699803	VF3D			HNO3 Filtered (ALE
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 2	X				
			X				

CERTIFICATE OF ANALYSIS

SDG:	160703-14	**Location:**	Valleyfields	**Order Number:**	405/8514
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	367642
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

	Customer Sample R	VF10	VF3D
	Depth (m)	.	.
	Sample Type	Water(GW/SW)	Water(GW/SW)
	Date Sampled	29/06/2016	29/06/2016
	Sample Time	.	.
	Date Received	01/07/2016	01/07/2016
	SDG Ref	160703-14	160703-14
	Lab Sample No.(s)	13699804	13699803
	AGS Reference		
Component	**LOD/Units**	**Method**	
Cadmium (diss.filt)	<0.0001 mg/l	TM152	0.00217 #	0.000409 #

CERTIFICATE OF ANALYSIS

SDG:	160703-14	**Location:**	Valleyfields	**Order Number:**	405/8514
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	367642
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		

[1] Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

CERTIFICATE OF ANALYSIS

SDG:	160703-14	**Location:**	Valleyfields	**Order Number:**	405/8514
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	367642
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	13699804	13699803
Customer Sample Ref.	VF10	VF3D
AGS Ref.		
Depth		
Type	LIQUID	LIQUID
Dissolved Metals by ICP-MS	05-Jul-2016	05-Jul-2016

SDG:	160703-14	**Location:**	Valleyfields	**Order Number:**	405/8514
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	367642
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

Appendix

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt . However, the integrity of the data may be compromised.

9. NDP - No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately.

11. Results relate only to the items tested.

12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%, they are generally wider for volatiles analysis, 50-150%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment . Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect .

14. **Product analyses** - Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

General

20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

21. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill /made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

24. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as “mixed hydrocarbons”. Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

Sample Deviations

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Holding time exceeded before sample received
5	Samples exceeded holding time before presevation was performed
§	Sampled on date not provided
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to sampled on date
&	Sample Holding Time exceeded - Late arrival of instructions.

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than : - Trace - Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

ALcontrol Laboratories

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: customerservices@alcontrol.com
Website: www.alcontrol.com

SLR Consulting Ltd
Floor 2
4/5 Lochside View
Edinburgh Park
Edinburgh
Lanarkshire
EH12 9DH

Attention: Zak Ritchie

CERTIFICATE OF ANALYSIS

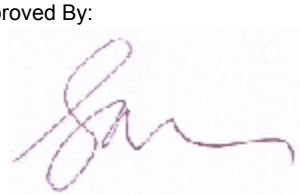
Date:	16 September 2016
Customer:	H_SLR_EDH
Sample Delivery Group (SDG):	160911-7
Your Reference:	405.00481.00033
Location:	Valleyfields
Report No:	378274

We received 15 samples on Friday September 09, 2016 and 15 of these samples were scheduled for analysis which was completed on Friday September 16, 2016. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALcontrol Laboratories Hawarden (Method codes TM) or ALcontrol Laboratories Aberdeen (Method codes S).

Approved By:



Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	160911-7	**Location:**	Valleyfields	**Order Number:**	405/8599
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	378274
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
14132054	ES1			06/09/2016
14132053	ES2			06/09/2016
14132060	PFA			06/09/2016
14132055	TD			07/09/2016
14132052	VF1			07/09/2016
14132051	VF4			07/09/2016
14132049	VF5			07/09/2016
14132050	VF6			07/09/2016
14132048	VF7			07/09/2016
14132056	VF8			07/09/2016
14132059	VF9			06/09/2016
14132047	VF10			06/09/2016
14132057	VF11			06/09/2016
14132058	VF12			07/09/2016
14132046	VF3D			06/09/2016

Only received samples which have had analysis scheduled will be shown on the following pages.

ALcontrol Laboratories

CERTIFICATE OF ANALYSIS

Validated

SDG: 160911-7
Job: H_SLR_EDH-58
Client Reference: 405.00481.00033
Location: Valleyfields
Customer: SLR Consulting Ltd
Attention: Zak Ritchie
Order Number: 405/8599
Report Number: 378274
Superseded Report:

LIQUID

Results Legend

X Test

N No Determination Possible

Lab Sample No(s)			14132055				14132052				14132051				14132049				14132050				14132048				14132056				14132059			
Customer Sample Reference			TD				VF1				VF4				VF5				VF6				VF7				VF8				VF9			
AGS Reference																																		
Depth (m)																																		
Container			0.5l glass bottle (ALE227	500ml Plastic (ALE208)	Dissolved Metals Preser	HNO3 Filtered (ALE204)	0.5l glass bottle (ALE227	500ml Plastic (ALE208)	Dissolved Metals Preser	HNO3 Filtered (ALE204)	0.5l glass bottle (ALE227	500ml Plastic (ALE208)	Dissolved Metals Preser	HNO3 Filtered (ALE204)	0.5l glass bottle (ALE227	500ml Plastic (ALE208)	Dissolved Metals Preser	HNO3 Filtered (ALE204)	0.5l glass bottle (ALE227	500ml Plastic (ALE208)	Dissolved Metals Preser	HNO3 Filtered (ALE204)	0.5l glass bottle (ALE227	500ml Plastic (ALE208)	Dissolved Metals Preser	HNO3 Filtered (ALE204)	0.5l glass bottle (ALE227	500ml Plastic (ALE208)	Dissolved Metals Preser	HNO3 Filtered (ALE204)	0.5l glass bottle (ALE227	500ml Plastic (ALE208)	Dissolved Metals Preser	HNO3 Filtered (ALE204)
Anions by Kone (w)	All	NDPs: 0 Tests: 12		X				X				X				X				X				X				X				X		
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 12		X				X				X				X				X				X				X				X		
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 12				X				X				X				X				X				X				X				X
Fluoride	All	NDPs: 0 Tests: 12		X				X				X				X				X				X				X				X		
Mercury Dissolved	All	NDPs: 0 Tests: 12			X				X				X				X				X				X				X				X	
Metals by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 12				X				X				X				X				X				X				X				X
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 12	X				X				X				X				X				X				X				X			
pH Value	All	NDPs: 0 Tests: 12		X				X				X				X				X				X				X				X		

ALcontrol Laboratories

CERTIFICATE OF ANALYSIS

Validated

SDG:	160911-7	**Location:**	Valleyfields	**Order Number:**	405/8599
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	378274
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

LIQUID

Results Legend

X — **Test**

N — **No Determination Possible**

Lab Sample No(s)			14132047				14132057				14132058				14132046			
Customer Sample Reference			VF10				VF11				VF12				VF3D			
AGS Reference																		
Depth (m)																		
Container			0.5l glass bottle (ALE227	500ml Plastic (ALE208)	Dissolved Metals Preser	HNO3 Filtered (ALE204)	0.5l glass bottle (ALE227	500ml Plastic (ALE208)	Dissolved Metals Preser	HNO3 Filtered (ALE204)	0.5l glass bottle (ALE227	500ml Plastic (ALE208)	Dissolved Metals Preser	HNO3 Filtered (ALE204)	0.5l glass bottle (ALE227	500ml Plastic (ALE208)	Dissolved Metals Preser	HNO3 Filtered (ALE204)
Anions by Kone (w)	All	NDPs: 0 Tests: 12		X				X				X				X		
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 12		X				X				X				X		
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 12				X				X				X				X
Fluoride	All	NDPs: 0 Tests: 12		X				X				X				X		
Mercury Dissolved	All	NDPs: 0 Tests: 12			X				X				X				X	
Metals by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 12				X				X				X				X
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 12	X				X				X				X			
pH Value	All	NDPs: 0 Tests: 12		X				X				X				X		

CERTIFICATE OF ANALYSIS

SDG:	160911-7	**Location:**	Valleyfields	**Order Number:**	405/8599
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	378274
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

Saline Water (Sal W)

Results Legend

X Test

N No Determination Possible

			Lab Sample No(s)								
			14132054							14132053	
			Customer Sample Reference								
			ES1							ES2	
			AGS Reference								
			Depth (m)								
			Container	0.5l glass bottle (ALE227	500ml Plastic (ALE209)	Dissolved Metals Preser	HNO3 Filtered (ALE204)	0.5l glass bottle (ALE227	500ml Plastic (ALE209)	Dissolved Metals Preser	HNO3 Filtered (ALE204)
Anions by Kone (w)	All	NDPs: 0 Tests: 2		X				X			
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 2		X				X			
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 2				X					X
Fluoride	All	NDPs: 0 Tests: 2		X				X			
Mercury Dissolved	All	NDPs: 0 Tests: 2			X				X		
Metals by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 2				X					X
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 2	X				X				
pH Value	All	NDPs: 0 Tests: 2		X				X			

CERTIFICATE OF ANALYSIS

SDG:	160911-7	**Location:**	Valleyfields	**Order Number:**	405/8599
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	378274
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	Depth (m)	Sample Type	Date Sampled	Sample Time	Date Received	SDG Ref	Lab Sample No.(s)	AGS Reference
			ES1	.	Saline Water (Sal W)	06/09/2016	.	09/09/2016	160911-7	14132054	
			ES2	.	Saline Water (Sal W)	06/09/2016	.	09/09/2016	160911-7	14132053	
			TD	.	Water(GW/SW)	07/09/2016	.	09/09/2016	160911-7	14132055	
			VF1	.	Water(GW/SW)	07/09/2016	.	09/09/2016	160911-7	14132052	
			VF4	.	Water(GW/SW)	07/09/2016	.	09/09/2016	160911-7	14132051	
			VF5	.	Water(GW/SW)	07/09/2016	.	09/09/2016	160911-7	14132049	
Fluoride	<0.5 mg/l	TM104									
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120									
Aluminium (diss.filt)	<0.002 mg/l	TM152									
Antimony (diss.filt)	<0.00016 mg/l	TM152									
Arsenic (diss.filt)	<0.00051 mg/l	TM152									
Boron (diss.filt)	<0.005 mg/l	TM152									
Cadmium (diss.filt)	<0.00008 mg/l	TM152									
Chromium (diss.filt)	<0.0012 mg/l	TM152									
Copper (diss.filt)	<0.00085 mg/l	TM152									
Manganese (diss.filt)	<0.00076 mg/l	TM152									
Molybdenum (diss.filt)	<0.00062 mg/l	TM152									
Nickel (diss.filt)	<0.00044 mg/l	TM152									
Selenium (diss.filt)	<0.00081 mg/l	TM152									
Vanadium (diss.filt)	<0.0013 mg/l	TM152									
Zinc (diss.filt)	<0.0013 mg/l	TM152									
Mercury (diss.filt)	<0.00001 mg/l	TM183									
Sulphate	<2 mg/l	TM184									
Chloride	<2 mg/l	TM184									
Calcium (diss.filt)	<0.012 mg/l	TM228									
Sodium (diss.filt)	<0.076 mg/l	TM228									
Magnesium (diss.filt)	<0.036 mg/l	TM228									
Potassium (diss.filt)	<1 mg/l	TM228									
pH	<1 pH Units	TM256									
Fluoride	<0.5 mg/l	TM104	0.841	0.789							
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120	38.4 #	36.1 #							
Aluminium (diss.filt)	<0.002 mg/l	TM152	0.00212	0.0053							
Antimony (diss.filt)	<0.00016 mg/l	TM152	0.000471	<0.00096							
Arsenic (diss.filt)	<0.00051 mg/l	TM152	0.00229	0.00461							
Boron (diss.filt)	<0.005 mg/l	TM152	3.07	3.43							
Cadmium (diss.filt)	<0.00008 mg/l	TM152	<0.00008	<0.00048							
Chromium (diss.filt)	<0.0012 mg/l	TM152	<0.0012	<0.0072							
Copper (diss.filt)	<0.00085 mg/l	TM152	<0.00085	0.00142							

CERTIFICATE OF ANALYSIS

SDG:	160911-7	**Location:**	Valleyfields	**Order Number:**	405/8599
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	378274
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	ES1	ES2	TD	VF1	VF4	VF5
			Depth (m)	.	.	.	.	.	.
			Sample Type	Saline Water (Sal W)	Saline Water (Sal W)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	06/09/2016	06/09/2016	07/09/2016	07/09/2016	07/09/2016	07/09/2016
			Sample Time	.	.	.	.	.	.
			Date Received	09/09/2016	09/09/2016	09/09/2016	09/09/2016	09/09/2016	09/09/2016
			SDG Ref	160911-7	160911-7	160911-7	160911-7	160911-7	160911-7
			Lab Sample No.(s)	14132054	14132053	14132055	14132052	14132051	14132049
			AGS Reference						
Manganese (diss.filt)	<0.00076 mg/l	TM152		0.0128	0.0507				
Molybdenum (diss.filt)	<0.00062 mg/l	TM152		0.0402	0.0565				
Nickel (diss.filt)	<0.00044 mg/l	TM152		0.000526	0.000569				
Selenium (diss.filt)	<0.00081 mg/l	TM152		<0.00081	<0.00486				
Vanadium (diss.filt)	<0.0013 mg/l	TM152		0.00656	<0.0078				
Zinc (diss.filt)	<0.0013 mg/l	TM152		0.00139	<0.0013				
Mercury (diss.filt)	<0.00001 mg/l	TM183		<0.00001	<0.00001				
Sulphate	<2 mg/l	TM184		2350	2200				
Chloride	<2 mg/l	TM184		17200	16200				
Calcium (diss.filt)	<0.012 mg/l	TM228		396	392				
Sodium (diss.filt)	<0.076 mg/l	TM228		9700	8160				
Magnesium (diss.filt)	<0.036 mg/l	TM228		1100	905				
Potassium (diss.filt)	<1 mg/l	TM228		363	346				
pH	<1 pH Units	TM256		7.9 #	7.86 #				

CERTIFICATE OF ANALYSIS

SDG:	160911-7	**Location:**	Valleyfields	**Order Number:**	405/8599
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	378274
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	VF6	VF7	VF8	VF9	VF10	VF11
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	07/09/2016	07/09/2016	07/09/2016	06/09/2016	06/09/2016	06/09/2016
			Sample Time	.	.	.	.	.	.
			Date Received	09/09/2016	09/09/2016	09/09/2016	09/09/2016	09/09/2016	09/09/2016
			SDG Ref	160911-7	160911-7	160911-7	160911-7	160911-7	160911-7
			Lab Sample No.(s)	14132050	14132048	14132056	14132059	14132047	14132057
			AGS Reference						
Fluoride	<0.5 mg/l	TM104		<0.5 #	<0.5 #	<0.5 #	<0.5 #	<0.5 #	<0.5 #
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120		8.44 #	20.3 #	26.8 #	26 #	16 #	1.79 #
Aluminium (diss.filt)	<0.002 mg/l	TM152		0.118 #	<0.002 #	<0.002 #	<0.002 #	<0.002 #	<0.002 #
Antimony (diss.filt)	<0.00016 mg/l	TM152		0.000952 #	<0.00016 #	<0.00016 #	<0.00016 #	<0.00016 #	<0.00016 #
Arsenic (diss.filt)	<0.00051 mg/l	TM152		0.0364 #	0.00124 #	0.000659 #	0.00233 #	0.00208 #	<0.00051 #
Boron (diss.filt)	<0.005 mg/l	TM152		6.39 #	0.477 #	6.38 #	0.901 #	7.02 #	0.311 #
Cadmium (diss.filt)	<0.00008 mg/l	TM152		0.000171 #	<0.00008 #	0.000143 #	<0.00008 #	0.000134 #	<0.00008 #
Chromium (diss.filt)	<0.0012 mg/l	TM152		<0.0012 #	<0.0012 #	<0.0012 #	<0.0012 #	<0.0012 #	<0.0012 #
Copper (diss.filt)	<0.00085 mg/l	TM152		<0.00085 #	<0.00085 #	0.00155 #	<0.00085 #	<0.00085 #	<0.00085 #
Manganese (diss.filt)	<0.00076 mg/l	TM152		0.0116 #	0.297 #	0.00999 #	0.44 #	0.244 #	0.0627 #
Molybdenum (diss.filt)	<0.00062 mg/l	TM152		0.302 #	0.0146 #	0.184 #	0.0489 #	0.278 #	0.00335 #
Nickel (diss.filt)	<0.00044 mg/l	TM152		<0.00044 #	0.000758 #	0.00128 #	0.000937 #	0.00071 #	<0.00044 #
Selenium (diss.filt)	<0.00081 mg/l	TM152		0.00127 #	<0.00081 #	<0.00081 #	<0.00081 #	<0.00081 #	<0.00081 #
Vanadium (diss.filt)	<0.0013 mg/l	TM152		0.0241 #	<0.0013 #	<0.0013 #	0.00367 #	<0.0013 #	<0.0013 #
Zinc (diss.filt)	<0.0013 mg/l	TM152		<0.0013 #	0.00272 #	0.00327 #	<0.0013 #	<0.0013 #	0.0015 #
Mercury (diss.filt)	<0.00001 mg/l	TM183		<0.00001 #	<0.00001 #	<0.00001 #	<0.00001 #	<0.00001 #	<0.00001 #
Sulphate	<2 mg/l	TM184		470 #	454 #	1660 #	759 #	597 #	6.9 #
Chloride	<2 mg/l	TM184		3000 #	9060 #	11200 #	11700 #	6430 #	380 #
Calcium (diss.filt)	<0.012 mg/l	TM228		298 #	776 #	535 #	1070 #	499 #	104 #
Sodium (diss.filt)	<0.076 mg/l	TM228		1680 #	3770 #	5930 #	5690 #	3160 #	256 #
Magnesium (diss.filt)	<0.036 mg/l	TM228		29.6 #	508 #	611 #	549 #	222 #	25.8 #
Potassium (diss.filt)	<1 mg/l	TM228		71 #	118 #	254 #	254 #	138 #	27.4 #
pH	<1 pH Units	TM256		7.89 #	7.45 #	7.53 #	7.69 #	7.66 #	7.6 #

CERTIFICATE OF ANALYSIS

SDG:	160911-7	**Location:**	Valleyfields	**Order Number:**	405/8599
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	378274
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	VF12	VF3D				
			Depth (m)	.	.				
			Sample Type	Water(GW/SW)	Water(GW/SW)				
			Date Sampled	07/09/2016	06/09/2016				
			Sample Time	.	.				
			Date Received	09/09/2016	09/09/2016				
			SDG Ref	160911-7	160911-7				
			Lab Sample No.(s)	14132058	14132046				
			AGS Reference						
Fluoride	<0.5 mg/l	TM104		<0.5 #	<0.5 #				
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120		1.27 #	2.8 #				
Aluminium (diss.filt)	<0.002 mg/l	TM152		<0.002 #	<0.002 #				
Antimony (diss.filt)	<0.00016 mg/l	TM152		<0.00016 #	<0.00016 #				
Arsenic (diss.filt)	<0.00051 mg/l	TM152		<0.00051 #	0.000528 #				
Boron (diss.filt)	<0.005 mg/l	TM152		0.308 #	0.407 #				
Cadmium (diss.filt)	<0.00008 mg/l	TM152		<0.00008 #	<0.00008 #				
Chromium (diss.filt)	<0.0012 mg/l	TM152		<0.0012 #	<0.0012 #				
Copper (diss.filt)	<0.00085 mg/l	TM152		<0.00085 #	<0.00085 #				
Manganese (diss.filt)	<0.00076 mg/l	TM152		0.0741 #	0.0977 #				
Molybdenum (diss.filt)	<0.00062 mg/l	TM152		0.000819 #	0.000763 #				
Nickel (diss.filt)	<0.00044 mg/l	TM152		0.000526 #	<0.00044 #				
Selenium (diss.filt)	<0.00081 mg/l	TM152		<0.00081 #	<0.00081 #				
Vanadium (diss.filt)	<0.0013 mg/l	TM152		<0.0013 #	0.00132 #				
Zinc (diss.filt)	<0.0013 mg/l	TM152		0.00341 #	0.00723 #				
Mercury (diss.filt)	<0.00001 mg/l	TM183		<0.00001 #	<0.00001 #				
Sulphate	<2 mg/l	TM184		<2 #	<2 #				
Chloride	<2 mg/l	TM184		286 #	903 #				
Calcium (diss.filt)	<0.012 mg/l	TM228		98.4 #	138 #				
Sodium (diss.filt)	<0.076 mg/l	TM228		143 #	378 #				
Magnesium (diss.filt)	<0.036 mg/l	TM228		22.5 #	48.7 #				
Potassium (diss.filt)	<1 mg/l	TM228		26.2 #	30.2 #				
pH	<1 pH Units	TM256		8.11 #	7.71 #				

CERTIFICATE OF ANALYSIS

SDG:	160911-7	**Location:**	Valleyfields	**Order Number:**	405/8599
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	378274
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

PAH Spec MS - Aqueous (W)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	Depth (m)	Sample Type	Date Sampled	Sample Time	Date Received	SDG Ref	Lab Sample No.(s)	AGS Reference
			ES1	.	Saline Water (Sal W)	06/09/2016	.	09/09/2016	160911-7	14132054	
			ES2	.	Saline Water (Sal W)	06/09/2016	.	09/09/2016	160911-7	14132053	
			TD	.	Water(GW/SW)	07/09/2016	.	09/09/2016	160911-7	14132055	
			VF1	.	Water(GW/SW)	07/09/2016	.	09/09/2016	160911-7	14132052	
			VF4	.	Water(GW/SW)	07/09/2016	.	09/09/2016	160911-7	14132051	
			VF5	.	Water(GW/SW)	07/09/2016	.	09/09/2016	160911-7	14132049	
Naphthalene (aq)	<0.0001 mg/l	TM178						<0.0001 #	<0.0001 #	<0.0001 #	<0.0001 #
Acenaphthene (aq)	<0.000015 mg/l	TM178						<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #
Acenaphthylene (aq)	<0.000011 mg/l	TM178						<0.000011 #	<0.000011 #	<0.000011 #	<0.000011 #
Fluoranthene (aq)	<0.000017 mg/l	TM178						<0.000017 #	<0.000017 #	<0.000017 #	<0.000017 #
Anthracene (aq)	<0.000015 mg/l	TM178						<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #
Phenanthrene (aq)	<0.000022 mg/l	TM178						<0.000022 #	<0.000022 #	<0.000022 #	<0.000022 #
Fluorene (aq)	<0.000014 mg/l	TM178						<0.000014 #	<0.000014 #	<0.000014 #	<0.000014 #
Chrysene (aq)	<0.000013 mg/l	TM178						<0.000013 #	<0.000013 #	<0.000013 #	<0.000013 #
Pyrene (aq)	<0.000015 mg/l	TM178						<0.000015 #	<0.000015 #	<0.000015 #	0.000016 #
Benzo(a)anthracene (aq)	<0.000017 mg/l	TM178						<0.000017 #	<0.000017 #	<0.000017 #	<0.000017 #
Benzo(b)fluoranthene (aq)	<0.000023 mg/l	TM178						<0.000023 #	<0.000023 #	<0.000023 #	<0.000023 #
Benzo(k)fluoranthene (aq)	<0.000027 mg/l	TM178						<0.000027 #	<0.000027 #	<0.000027 #	<0.000027 #
Benzo(a)pyrene (aq)	<0.000009 mg/l	TM178						<0.000009 #	<0.000009 #	<0.000009 #	<0.000009 #
Dibenzo(a,h)anthracene (aq)	<0.000016 mg/l	TM178						<0.000016 #	<0.000016 #	<0.000016 #	<0.000016 #
Benzo(g,h,i)perylene (aq)	<0.000016 mg/l	TM178						<0.000016 #	<0.000016 #	<0.000016 #	<0.000016 #
Indeno(1,2,3-cd)pyrene (aq)	<0.000014 mg/l	TM178						<0.000014 #	<0.000014 #	<0.000014 #	<0.000014 #
PAH, Total Detected USEPA 16 (aq)	<0.000344 mg/l	TM178						<0.000344	<0.000344	<0.000344	<0.000344
Naphthalene (aq)	<0.0001 mg/l	TM178	<0.0001 #		<0.0001 #						
Acenaphthene (aq)	<0.000015 mg/l	TM178	<0.000015 #		<0.000015 #						
Acenaphthylene (aq)	<0.000011 mg/l	TM178	<0.000011 #		<0.000011 #						
Fluoranthene (aq)	<0.000017 mg/l	TM178	<0.000017 #		0.000063 #						
Anthracene (aq)	<0.000015 mg/l	TM178	<0.000015 #		<0.000015 #						
Phenanthrene (aq)	<0.000022 mg/l	TM178	<0.000022 #		0.000029 #						
Fluorene (aq)	<0.000014 mg/l	TM178	<0.000014 #		<0.000014 #						
Chrysene (aq)	<0.000013 mg/l	TM178	<0.000013 #		0.000035 #						
Pyrene (aq)	<0.000015 mg/l	TM178	<0.000015 #		0.000065 #						
Benzo(a)anthracene (aq)	<0.000017 mg/l	TM178	<0.000017 #		0.000025 #						
Benzo(b)fluoranthene (aq)	<0.000023 mg/l	TM178	<0.000023 #		0.000044 #						
Benzo(k)fluoranthene (aq)	<0.000027 mg/l	TM178	<0.000027 #		<0.000027 #						
Benzo(a)pyrene (aq)	<0.000009 mg/l	TM178	<0.000009 #		0.00003 #						
Dibenzo(a,h)anthracene (aq)	<0.000016 mg/l	TM178	<0.000016		<0.000016						
Benzo(g,h,i)perylene (aq)	<0.000016 mg/l	TM178	<0.000016		0.000034						

CERTIFICATE OF ANALYSIS

SDG:	160911-7	**Location:**	Valleyfields	**Order Number:**	405/8599
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	378274
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

PAH Spec MS - Aqueous (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	ES1	ES2	TD	VF1	VF4	VF5
			Depth (m)	.	.	.	.	.	.
			Sample Type	Saline Water (Sal W)	Saline Water (Sal W)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	06/09/2016	06/09/2016	07/09/2016	07/09/2016	07/09/2016	07/09/2016
			Sample Time	.	.	.	.	.	.
			Date Received	09/09/2016	09/09/2016	09/09/2016	09/09/2016	09/09/2016	09/09/2016
			SDG Ref	160911-7	160911-7	160911-7	160911-7	160911-7	160911-7
			Lab Sample No.(s)	14132054	14132053	14132055	14132052	14132051	14132049
			AGS Reference						
Indeno(1,2,3-cd)pyrene (aq)	<0.000014 mg/l	TM178		<0.000014	0.000022				
PAH, Total Detected USEPA 16 (aq)	<0.000344 mg/l	TM178		<0.000344	0.000347				

CERTIFICATE OF ANALYSIS

SDG:	160911-7	**Location:**	Valleyfields	**Order Number:**	405/8599
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	378274
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

PAH Spec MS - Aqueous (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	VF6	VF7	VF8	VF9	VF10	VF11
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	07/09/2016	07/09/2016	07/09/2016	06/09/2016	06/09/2016	06/09/2016
			Sample Time	.	.	.	.	.	.
			Date Received	09/09/2016	09/09/2016	09/09/2016	09/09/2016	09/09/2016	09/09/2016
			SDG Ref	160911-7	160911-7	160911-7	160911-7	160911-7	160911-7
			Lab Sample No.(s)	14132050	14132048	14132056	14132059	14132047	14132057
			AGS Reference						
Naphthalene (aq)	<0.0001 mg/l	TM178		<0.0001 #	<0.0001 #	<0.0001 #	<0.0001 #	<0.0001 #	<0.0001 #
Acenaphthene (aq)	<0.000015 mg/l	TM178		<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #
Acenaphthylene (aq)	<0.000011 mg/l	TM178		<0.000011 #	<0.000011 #	<0.000011 #	<0.000011 #	<0.000011 #	<0.000011 #
Fluoranthene (aq)	<0.000017 mg/l	TM178		<0.000017 #	<0.000017 #	<0.000017 #	<0.000017 #	<0.000017 #	<0.000017 #
Anthracene (aq)	<0.000015 mg/l	TM178		<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #
Phenanthrene (aq)	<0.000022 mg/l	TM178		<0.000022 #	0.000024 #	<0.000022 #	<0.000022 #	<0.000022 #	<0.000022 #
Fluorene (aq)	<0.000014 mg/l	TM178		<0.000014 #	<0.000014 #	<0.000014 #	<0.000014 #	<0.000014 #	<0.000014 #
Chrysene (aq)	<0.000013 mg/l	TM178		<0.000013 #	<0.000013 #	<0.000013 #	<0.000013 #	<0.000013 #	<0.000013 #
Pyrene (aq)	<0.000015 mg/l	TM178		<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #
Benzo(a)anthracene (aq)	<0.000017 mg/l	TM178		<0.000017 #	<0.000017 #	<0.000017 #	<0.000017 #	<0.000017 #	<0.000017 #
Benzo(b)fluoranthene (aq)	<0.000023 mg/l	TM178		<0.000023 #	<0.000023 #	<0.000023 #	<0.000023 #	<0.000023 #	<0.000023 #
Benzo(k)fluoranthene (aq)	<0.000027 mg/l	TM178		<0.000027 #	<0.000027 #	<0.000027 #	<0.000027 #	<0.000027 #	<0.000027 #
Benzo(a)pyrene (aq)	<0.000009 mg/l	TM178		<0.000009 #	<0.000009 #	<0.000009 #	<0.000009 #	<0.000009 #	<0.000009 #
Dibenzo(a,h)anthracene (aq)	<0.000016 mg/l	TM178		<0.000016 #	<0.000016 #	<0.000016 #	<0.000016 #	<0.000016 #	<0.000016 #
Benzo(g,h,i)perylene (aq)	<0.000016 mg/l	TM178		<0.000016 #	<0.000016 #	<0.000016 #	<0.000016 #	<0.000016 #	<0.000016 #
Indeno(1,2,3-cd)pyrene (aq)	<0.000014 mg/l	TM178		<0.000014 #	<0.000014 #	<0.000014 #	<0.000014 #	<0.000014 #	<0.000014 #
PAH, Total Detected USEPA 16 (aq)	<0.000344 mg/l	TM178		<0.000344	<0.000344	<0.000344	<0.000344	<0.000344	<0.000344

CERTIFICATE OF ANALYSIS

SDG:	160911-7	**Location:**	Valleyfields	**Order Number:**	405/8599
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	378274
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

PAH Spec MS - Aqueous (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	VF12	VF3D				
			Depth (m)	.	.				
			Sample Type	Water(GW/SW)	Water(GW/SW)				
			Date Sampled	07/09/2016	06/09/2016				
			Sample Time	.	.				
			Date Received	09/09/2016	09/09/2016				
			SDG Ref	160911-7	160911-7				
			Lab Sample No.(s)	14132058	14132046				
			AGS Reference						
Naphthalene (aq)	<0.0001 mg/l	TM178		<0.0001 #	<0.0001 #				
Acenaphthene (aq)	<0.000015 mg/l	TM178		<0.000015 #	<0.000015 #				
Acenaphthylene (aq)	<0.000011 mg/l	TM178		<0.000011 #	<0.000011 #				
Fluoranthene (aq)	<0.000017 mg/l	TM178		<0.000017 #	0.000028 #				
Anthracene (aq)	<0.000015 mg/l	TM178		<0.000015 #	<0.000015 #				
Phenanthrene (aq)	<0.000022 mg/l	TM178		<0.000022 #	0.000074 #				
Fluorene (aq)	<0.000014 mg/l	TM178		<0.000014 #	0.000028 #				
Chrysene (aq)	<0.000013 mg/l	TM178		<0.000013 #	<0.000013 #				
Pyrene (aq)	<0.000015 mg/l	TM178		<0.000015 #	0.000044 #				
Benzo(a)anthracene (aq)	<0.000017 mg/l	TM178		<0.000017 #	0.000019 #				
Benzo(b)fluoranthene (aq)	<0.000023 mg/l	TM178		<0.000023 #	<0.000023 #				
Benzo(k)fluoranthene (aq)	<0.000027 mg/l	TM178		<0.000027 #	<0.000027 #				
Benzo(a)pyrene (aq)	<0.000009 mg/l	TM178		<0.000009 #	<0.000009 #				
Dibenzo(a,h)anthracene (aq)	<0.000016 mg/l	TM178		<0.000016 #	<0.000016 #				
Benzo(g,h,i)perylene (aq)	<0.000016 mg/l	TM178		<0.000016 #	<0.000016 #				
Indeno(1,2,3-cd)pyrene (aq)	<0.000014 mg/l	TM178		<0.000014 #	<0.000014 #				
PAH, Total Detected USEPA 16 (aq)	<0.000344 mg/l	TM178		<0.000344	<0.000344				

CERTIFICATE OF ANALYSIS

SDG:	160911-7	**Location:**	Valleyfields	**Order Number:**	405/8599
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	378274
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser		
TM120	Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters		
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		
TM228	US EPA Method 6010B	Determination of Major Cations in Water by iCap 6500 Duo ICP-OES		
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter		

[1] Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

Chemical testing (unless subcontracted) performed at ALcontrol Laboratories Hawarden (Method codes TM) or ALcontrol Laboratories Aberdeen (Method codes S).

CERTIFICATE OF ANALYSIS

SDG:	160911-7	**Location:**	Valleyfields	**Order Number:**	405/8599
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	378274
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	14132054	14132053	14132055	14132052	14132051	14132049	14132050	14132048	14132056	14132059
Customer Sample Ref.	ES1	ES2	TD	VF1	VF4	VF5	VF6	VF7	VF8	VF9
AGS Ref.										
Depth										
Type	SALINE_D	SALINE_D	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
Anions by Kone (w)	13-Sep-2016	13-Sep-2016	13-Sep-2016	13-Sep-2016	13-Sep-2016	13-Sep-2016	13-Sep-2016	13-Sep-2016	13-Sep-2016	13-Sep-2016
Conductivity (at 20 deg.C)	13-Sep-2016	13-Sep-2016	13-Sep-2016	13-Sep-2016	13-Sep-2016	13-Sep-2016	13-Sep-2016	13-Sep-2016	13-Sep-2016	13-Sep-2016
Dissolved Metals by ICP-MS	14-Sep-2016	14-Sep-2016	14-Sep-2016	14-Sep-2016	14-Sep-2016	14-Sep-2016	14-Sep-2016	14-Sep-2016	14-Sep-2016	14-Sep-2016
Fluoride	13-Sep-2016	14-Sep-2016	14-Sep-2016	14-Sep-2016	14-Sep-2016	14-Sep-2016	14-Sep-2016	14-Sep-2016	14-Sep-2016	14-Sep-2016
Mercury Dissolved	16-Sep-2016	16-Sep-2016	16-Sep-2016	16-Sep-2016	16-Sep-2016	16-Sep-2016	16-Sep-2016	16-Sep-2016	16-Sep-2016	16-Sep-2016
Metals by iCap-OES Dissolved (W)	14-Sep-2016	15-Sep-2016	15-Sep-2016	15-Sep-2016	15-Sep-2016	15-Sep-2016	15-Sep-2016	15-Sep-2016	15-Sep-2016	15-Sep-2016
PAH Spec MS - Aqueous (W)	15-Sep-2016	15-Sep-2016	15-Sep-2016	15-Sep-2016	15-Sep-2016	16-Sep-2016	15-Sep-2016	16-Sep-2016	15-Sep-2016	15-Sep-2016
pH Value	13-Sep-2016	14-Sep-2016	14-Sep-2016	14-Sep-2016	14-Sep-2016	14-Sep-2016	14-Sep-2016	14-Sep-2016	14-Sep-2016	14-Sep-2016

Lab Sample No(s)	14132047	14132057	14132058	14132046
Customer Sample Ref.	VF10	VF11	VF12	VF3D
AGS Ref.				
Depth				
Type	LIQUID	LIQUID	LIQUID	LIQUID
Anions by Kone (w)	13-Sep-2016	13-Sep-2016	13-Sep-2016	13-Sep-2016
Conductivity (at 20 deg.C)	13-Sep-2016	13-Sep-2016	13-Sep-2016	13-Sep-2016
Dissolved Metals by ICP-MS	14-Sep-2016	14-Sep-2016	14-Sep-2016	14-Sep-2016
Fluoride	14-Sep-2016	14-Sep-2016	14-Sep-2016	14-Sep-2016
Mercury Dissolved	16-Sep-2016	16-Sep-2016	16-Sep-2016	16-Sep-2016
Metals by iCap-OES Dissolved (W)	15-Sep-2016	15-Sep-2016	15-Sep-2016	14-Sep-2016
PAH Spec MS - Aqueous (W)	16-Sep-2016	15-Sep-2016	15-Sep-2016	16-Sep-2016
pH Value	14-Sep-2016	14-Sep-2016	14-Sep-2016	14-Sep-2016

SDG:	160911-7	**Location:**	Valleyfields	**Order Number:**	405/8599
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	378274
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

Appendix

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt . However, the integrity of the data may be compromised.

9. NDP - No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately.

11. Results relate only to the items tested.

12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%, they are generally wider for volatiles analysis, 50-150%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment . Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect .

14. **Product analyses** - Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

General

20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

21. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill /made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

24. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as “mixed hydrocarbons”. Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

Sample Deviations

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Holding time exceeded before sample received
5	Samples exceeded holding time before presevation was performed
§	Sampled on date not provided
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to sampled on date
&	Sample Holding Time exceeded - Late arrival of instructions.

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than : - Trace - Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

ALcontrol Laboratories

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: customerservices@alcontrol.com
Website: www.alcontrol.com

SLR Consulting Ltd
Floor 2
4/5 Lochside View
Edinburgh Park
Edinburgh
Lanarkshire
EH12 9DH

Attention: Zak Ritchie

CERTIFICATE OF ANALYSIS

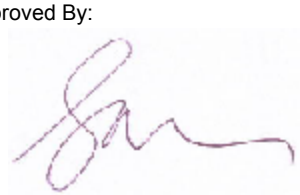
Date:	27 September 2016
Customer:	H_SLR_EDH
Sample Delivery Group (SDG):	160923-99
Your Reference:	405.00481.00033
Location:	Valleyfields
Report No:	379884

We received 1 sample on Thursday September 22, 2016 and 1 of these samples were scheduled for analysis which was completed on Tuesday September 27, 2016. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALcontrol Laboratories Hawarden (Method codes TM) or ALcontrol Laboratories Aberdeen (Method codes S).

Approved By:



Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	160923-99	**Location:**	Valleyfields	**Order Number:**	405/8629
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	379884
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
14204544	VF8			21/09/2016

Only received samples which have had analysis scheduled will be shown on the following pages.

CERTIFICATE OF ANALYSIS

SDG:	160923-99	**Location:**	Valleyfields	**Order Number:**	405/8629
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	379884
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

LIQUID

Results Legend

X **Test**

N **No Determination Possible**

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
			14204544	VF8			HNO3 Filtered (ALE204)
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1					X

CERTIFICATE OF ANALYSIS

SDG:	160923-99	**Location:**	Valleyfields	**Order Number:**	405/8629
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	379884
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Customer Sample Ref.	VF8
Depth (m)	.
Sample Type	Water(GW/SW)
Date Sampled	21/09/2016
Sample Time	.
Date Received	22/09/2016
SDG Ref	160923-99
Lab Sample No.(s)	14204544
AGS Reference	

Component	LOD/Units	Method	
Boron (diss.filt)	<0.005 mg/l	TM152	<0.0179 #

CERTIFICATE OF ANALYSIS

SDG:	160923-99	**Location:**	Valleyfields	**Order Number:**	405/8629
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	379884
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		

[1] Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

Chemical testing (unless subcontracted) performed at ALcontrol Laboratories Hawarden (Method codes TM) or ALcontrol Laboratories Aberdeen (Method codes S).

CERTIFICATE OF ANALYSIS

SDG:	160923-99	**Location:**	Valleyfields	**Order Number:**	405/8629
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	379884
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	14204544
Customer Sample Ref.	VF8
AGS Ref.	
Depth	
Type	LIQUID
Dissolved Metals by ICP-MS	27-Sep-2016

SDG:	160923-99	**Location:**	Valleyfields	**Order Number:**	405/8629
Job:	H_SLR_EDH-58	**Customer:**	SLR Consulting Ltd	**Report Number:**	379884
Client Reference:	405.00481.00033	**Attention:**	Zak Ritchie	**Superseded Report:**	

Appendix

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt . However, the integrity of the data may be compromised.

9. NDP - No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately.

11. Results relate only to the items tested.

12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%, they are generally wider for volatiles analysis, 50-150%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment . Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect .

14. **Product analyses** - Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

General

20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

21. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill /made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

24. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as “mixed hydrocarbons”. Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

Sample Deviations

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Holding time exceeded before sample received
5	Samples exceeded holding time before presevation was performed
§	Sampled on date not provided
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to sampled on date
&	Sample Holding Time exceeded - Late arrival of instructions.

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than : - Trace - Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: customerservices@alcontrol.com
Website: www.alsenviromental.co.uk

SLR Consulting Ltd
Floor 2
4/5 Lochside View
Edinburgh Park
Edinburgh
Lanarkshire
EH12 9DH

Attention: Adrian Cowe

CERTIFICATE OF ANALYSIS

Date:	13 December 2016
Customer:	H_SLR_EDH
Sample Delivery Group (SDG):	161203-86
Your Reference:	405.00481.00033.01
Location:	Valleyfield
Report No:	390094

We received 14 samples on Friday December 02, 2016 and 14 of these samples were scheduled for analysis which was completed on Tuesday December 13, 2016. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

Approved By:

Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	161203-86	**Client Reference:**	405.00481.00033.01	**Report Number:**	390094
Location:	Valleyfield	**Order Number:**	405/8729	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
14643494	ES1			29/11/2016
14643495	ES2			29/11/2016
14643496	TD			29/11/2016
14643497	VF1			29/11/2016
14643502	VF4			30/11/2016
14643503	VF5			30/11/2016
14643504	VF6			30/11/2016
14643498	VF7			29/11/2016
14643505	VF8			30/11/2016
14643499	VF9			29/11/2016
14643500	VF10			29/11/2016
14643506	VF11			30/11/2016
14643507	VF12			30/11/2016
14643501	VF3D			30/11/2016

Only received samples which have had analysis scheduled will be shown on the following pages.

CERTIFICATE OF ANALYSIS

SDG: 161203-86 **Client Reference:** 405.00481.00033.01 **Report Number:** 390094
Location: Valleyfield **Order Number:** 405/8729 **Superseded Report:**

LIQUID

Results Legend

- X **Test**
- N **No Determination Possible**

Lab Sample No(s)			14643494				14643495				14643496				14643497				14643502				14643503				14643504				14643498				14643505				14643499			
Customer Sample Reference			ES1				ES2				TD				VF1				VF4				VF5				VF6				VF7				VF8				VF9			
AGS Reference																																											
Depth (m)																																											
Container			0.5l glass bottle (ALE227	500ml Plastic (ALE208)	Dissolved Metals Preser	HNO3 Filtered (ALE204)	0.5l glass bottle (ALE227	500ml Plastic (ALE208)	Dissolved Metals Preser	HNO3 Filtered (ALE204)	0.5l glass bottle (ALE227	500ml Plastic (ALE208)	Dissolved Metals Preser	HNO3 Filtered (ALE204)	0.5l glass bottle (ALE227	500ml Plastic (ALE208)	Dissolved Metals Preser	HNO3 Filtered (ALE204)	0.5l glass bottle (ALE227	500ml Plastic (ALE208)	Dissolved Metals Preser	HNO3 Filtered (ALE204)	0.5l glass bottle (ALE227	500ml Plastic (ALE208)	Dissolved Metals Preser	HNO3 Filtered (ALE204)	0.5l glass bottle (ALE227	500ml Plastic (ALE208)	Dissolved Metals Preser	HNO3 Filtered (ALE204)	0.5l glass bottle (ALE227	500ml Plastic (ALE208)	Dissolved Metals Preser	HNO3 Filtered (ALE204)	0.5l glass bottle (ALE227	500ml Plastic (ALE208)	Dissolved Metals Preser	HNO3 Filtered (ALE204)	0.5l glass bottle (ALE227	500ml Plastic (ALE208)	Dissolved Metals Preser	HNO3 Filtered (ALE204)
Anions by Kone (w)	All	NDPs: 0 Tests: 14		X				X				X				X				X				X				X				X				X				X		
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 14		X				X				X				X				X				X				X				X				X				X		
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 14				X				X				X				X				X				X				X				X				X				X
Fluoride	All	NDPs: 0 Tests: 14		X				X				X				X				X				X				X				X				X				X		
Mercury Dissolved	All	NDPs: 0 Tests: 14			X				X				X				X				X				X				X				X				X				X	
Metals by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 14				X				X				X				X				X				X				X				X				X				X
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 14	X				X				X				X				X				X				X				X				X				X			
pH Value	All	NDPs: 0 Tests: 14		X				X				X				X				X				X				X				X				X				X		

Validated

CERTIFICATE OF ANALYSIS

SDG:	161203-86	**Client Reference:**	405.00481.00033.01	**Report Number:**	390094
Location:	Valleyfield	**Order Number:**	405/8729	**Superseded Report:**	

LIQUID

Results Legend

X **Test**

N **No Determination Possible**

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
			14643500	VF10			0.5l glass bottle (ALE227)
							500ml Plastic (ALE208)
							Dissolved Metals Preser
							HNO3 Filtered (ALE204)
							0.5l glass bottle (ALE227)
							500ml Plastic (ALE208)
							Dissolved Metals Preser
							HNO3 Filtered (ALE204)
			14643506	VF11			0.5l glass bottle (ALE227)
							500ml Plastic (ALE208)
							Dissolved Metals Preser
							HNO3 Filtered (ALE204)
			14643507	VF12			0.5l glass bottle (ALE227)
							500ml Plastic (ALE208)
							Dissolved Metals Preser
							HNO3 Filtered (ALE204)
			14643501	VF3D			0.5l glass bottle (ALE227)
							500ml Plastic (ALE208)
							Dissolved Metals Preser
							HNO3 Filtered (ALE204)
Anions by Kone (w)	All	NDPs: 0 Tests: 14		X			X
Conductivity (at 20 deg.C)	All	NDPs: 0 Tests: 14		X			X
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 14			X		X
Fluoride	All	NDPs: 0 Tests: 14		X			X
Mercury Dissolved	All	NDPs: 0 Tests: 14			X		X
Metals by iCap-OES Dissolved (W)	All	NDPs: 0 Tests: 14			X		X
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 14	X			X	
pH Value	All	NDPs: 0 Tests: 14		X			X

Validated

CERTIFICATE OF ANALYSIS

SDG:	161203-86	**Client Reference:**	405.00481.00033.01	**Report Number:**	390094
Location:	Valleyfield	**Order Number:**	405/8729	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	ES1	ES2	TD	VF1	VF4	VF5
			Depth (m)	-	-	-	-	-	-
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	29/11/2016	29/11/2016	29/11/2016	29/11/2016	30/11/2016	30/11/2016
			Sample Time	-	-	-	-	-	-
			Date Received	02/12/2016	02/12/2016	02/12/2016	02/12/2016	02/12/2016	02/12/2016
			SDG Ref	161203-86	161203-86	161203-86	161203-86	161203-86	161203-86
			Lab Sample No.(s)	14643494	14643495	14643496	14643497	14643502	14643503
			AGS Reference						
Fluoride	<0.5 mg/l	TM104		0.894 #	0.829 #	<0.5 #	<0.5 #	0.543 #	<0.5 #
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120		33.4 #	30.8 #	22.1 #	20 #	25.1 #	21.9 #
Aluminium (diss.filt)	<0.002 mg/l	TM152		<0.022 #	0.00822 #	0.0727 #	<0.002 #	<0.002 #	0.00568 #
Antimony (diss.filt)	<0.00016 mg/l	TM152		<0.00176 #	0.000172 #	0.00129 #	0.000172 #	<0.00016 #	<0.00016 #
Arsenic (diss.filt)	<0.00051 mg/l	TM152		0.00626 #	0.00185 #	0.00625 #	0.00116 #	0.00143 #	0.00106 #
Boron (diss.filt)	<0.005 mg/l	TM152		3.33 #	2.42 #	8.74 #	0.528 #	6.1 #	2.23 #
Cadmium (diss.filt)	<0.00008 mg/l	TM152		<0.00088 #	<0.00008 #	0.000171 #	<0.00008 #	<0.00008 #	<0.00008 #
Chromium (diss.filt)	<0.0012 mg/l	TM152		<0.0132 #	<0.0012 #	<0.0012 #	<0.0012 #	<0.0012 #	<0.0012 #
Copper (diss.filt)	<0.00085 mg/l	TM152		<0.00935 #	<0.00085 #	<0.00085 #	<0.00085 #	<0.00085 #	<0.00085 #
Manganese (diss.filt)	<0.00076 mg/l	TM152		0.027 #	0.00736 #	0.12 #	0.172 #	0.0474 #	0.0523 #
Molybdenum (diss.filt)	<0.00062 mg/l	TM152		0.0373 #	0.0274 #	0.648 #	0.00599 #	0.218 #	0.000733 #
Nickel (diss.filt)	<0.00044 mg/l	TM152		<0.00484 #	0.000631 #	<0.00044 #	<0.00044 #	0.000579 #	<0.00044 #
Selenium (diss.filt)	<0.00081 mg/l	TM152		<0.00891 #	<0.00081 #	0.00144 #	<0.00081 #	0.002 #	0.00162 #
Vanadium (diss.filt)	<0.0013 mg/l	TM152		<0.0143 #	0.00149 #	0.0403 #	<0.0013 #	<0.0013 #	0.00462 #
Zinc (diss.filt)	<0.0013 mg/l	TM152		<0.0143 #	<0.0013 #	<0.0013 #	<0.0013 #	<0.0013 #	<0.0013 #
Mercury (diss.filt)	<0.00001 mg/l	TM183		<0.00001 #	<0.00001 #	<0.00001 #	<0.00001 #	<0.00001 #	<0.00001 #
Sulphate	<2 mg/l	TM184		2390 #	2270 #	1630 #	817 #	1570 #	212 #
Chloride	<2 mg/l	TM184		17000 #	16500 #	10900 #	10500 #	10900 #	10100 #
Calcium (diss.filt)	<0.012 mg/l	TM228		387 #	361 #	1080 #	693 #	545 #	399 #
Sodium (diss.filt)	<0.076 mg/l	TM228		9570 #	8390 #	5510 #	4990 #	5990 #	4730 #
Magnesium (diss.filt)	<0.036 mg/l	TM228		1110 #	1070 #	265 #	560 #	528 #	486 #
Potassium (diss.filt)	<1 mg/l	TM228		433 #	390 #	290 #	175 #	270 #	217 #
pH	<1 pH Units	TM256		7.81 #	7.82 #	8.21 #	7.88 #	7.86 #	8 #

Validated

CERTIFICATE OF ANALYSIS

SDG:	161203-86	**Client Reference:**	405.00481.00033.01	**Report Number:**	390094
Location:	Valleyfield	**Order Number:**	405/8729	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	VF6	VF7	VF8	VF9	VF10	VF11
			Depth (m)	-	-	-	-	-	-
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	30/11/2016	29/11/2016	30/11/2016	29/11/2016	29/11/2016	30/11/2016
			Sample Time	-	-	-	-	-	-
			Date Received	02/12/2016	02/12/2016	02/12/2016	02/12/2016	02/12/2016	02/12/2016
			SDG Ref	161203-86	161203-86	161203-86	161203-86	161203-86	161203-86
			Lab Sample No.(s)	14643504	14643498	14643505	14643499	14643500	14643506
			AGS Reference						
Fluoride	<0.5 mg/l	TM104		<0.5 #	<0.5 #	<0.5 #	<0.5 #	<0.5 #	<0.5 #
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120		13.4 #	17.1 #	23.1 #	22.5 #	14 #	1.76 #
Aluminium (diss.filt)	<0.002 mg/l	TM152		0.163 #	0.00294 #	<0.002 #	0.00501 #	<0.002 #	<0.002 #
Antimony (diss.filt)	<0.00016 mg/l	TM152		0.000379 #	<0.00016 #	<0.00016 #	<0.00016 #	<0.00016 #	<0.00016 #
Arsenic (diss.filt)	<0.00051 mg/l	TM152		0.0246 #	0.00143 #	0.000881 #	0.00217 #	0.00182 #	<0.00051 #
Boron (diss.filt)	<0.005 mg/l	TM152		8.73 #	0.424 #	3.85 #	0.785 #	7.46 #	0.293 #
Cadmium (diss.filt)	<0.00008 mg/l	TM152		0.000083 #	<0.00008 #	<0.00008 #	<0.00008 #	<0.00008 #	<0.00008 #
Chromium (diss.filt)	<0.0012 mg/l	TM152		<0.0012 #	<0.0012 #	<0.0012 #	<0.0012 #	<0.0012 #	<0.0012 #
Copper (diss.filt)	<0.00085 mg/l	TM152		<0.00085 #	<0.00085 #	<0.00085 #	<0.00085 #	<0.00085 #	<0.00085 #
Manganese (diss.filt)	<0.00076 mg/l	TM152		0.0597 #	0.285 #	0.0417 #	0.427 #	0.243 #	0.0623 #
Molybdenum (diss.filt)	<0.00062 mg/l	TM152		0.458 #	0.0113 #	0.107 #	0.0405 #	0.262 #	<0.00062 #
Nickel (diss.filt)	<0.00044 mg/l	TM152		0.000467 #	0.000684 #	0.000867 #	0.000906 #	0.000624 #	<0.00044 #
Selenium (diss.filt)	<0.00081 mg/l	TM152		<0.00081 #	<0.00081 #	0.00104 #	<0.00081 #	<0.00081 #	<0.00081 #
Vanadium (diss.filt)	<0.0013 mg/l	TM152		0.00996 #	<0.0013 #	<0.0013 #	0.00248 #	<0.0013 #	<0.0013 #
Zinc (diss.filt)	<0.0013 mg/l	TM152		<0.0013 #	<0.0013 #	<0.0013 #	<0.0013 #	<0.0013 #	0.00243 #
Mercury (diss.filt)	<0.00001 mg/l	TM183		<0.00001 #	<0.00001 #	<0.00001 #	<0.00001 #	<0.00001 #	<0.00001 #
Sulphate	<2 mg/l	TM184		722 #	483 #	1350 #	763 #	601 #	24.8 #
Chloride	<2 mg/l	TM184		6190 #	8730 #	9610 #	11800 #	6370 #	377 #
Calcium (diss.filt)	<0.012 mg/l	TM228		1070 #	862 #	490 #	1150 #	494 #	111 #
Sodium (diss.filt)	<0.076 mg/l	TM228		2120 #	3680 #	5130 #	4400 #	3070 #	239 #
Magnesium (diss.filt)	<0.036 mg/l	TM228		64.2 #	544 #	553 #	619 #	243 #	30.2 #
Potassium (diss.filt)	<1 mg/l	TM228		267 #	159 #	220 #	172 #	145 #	25.5 #
pH	<1 pH Units	TM256		7.89 #	7.38 #	7.93 #	7.31 #	7.85 #	7.54 #

Validated

CERTIFICATE OF ANALYSIS

SDG:	161203-86	**Client Reference:**	405.00481.00033.01	**Report Number:**	390094
Location:	Valleyfield	**Order Number:**	405/8729	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	VF12	VF3D				
			Depth (m)	-	-				
			Sample Type	Water(GW/SW)	Water(GW/SW)				
			Date Sampled	30/11/2016	30/11/2016				
			Sample Time	-	-				
			Date Received	02/12/2016	02/12/2016				
			SDG Ref	161203-86	161203-86				
			Lab Sample No.(s)	14643507	14643501				
			AGS Reference						
Fluoride	<0.5 mg/l	TM104		<0.5 #	<0.5 #				
Conductivity @ 20 deg.C	<0.005 mS/cm	TM120		1.21 #	3.09 #				
Aluminium (diss.filt)	<0.002 mg/l	TM152		<0.002 #	<0.002 #				
Antimony (diss.filt)	<0.00016 mg/l	TM152		<0.00016 #	<0.00016 #				
Arsenic (diss.filt)	<0.00051 mg/l	TM152		0.000635 #	0.000755 #				
Boron (diss.filt)	<0.005 mg/l	TM152		0.33 #	0.514 #				
Cadmium (diss.filt)	<0.00008 mg/l	TM152		<0.00008 #	<0.00008 #				
Chromium (diss.filt)	<0.0012 mg/l	TM152		<0.0012 #	<0.0012 #				
Copper (diss.filt)	<0.00085 mg/l	TM152		<0.00085 #	<0.00085 #				
Manganese (diss.filt)	<0.00076 mg/l	TM152		0.0533 #	0.117 #				
Molybdenum (diss.filt)	<0.00062 mg/l	TM152		0.000951 #	0.00193 #				
Nickel (diss.filt)	<0.00044 mg/l	TM152		<0.00044 #	<0.00044 #				
Selenium (diss.filt)	<0.00081 mg/l	TM152		<0.00081 #	<0.00081 #				
Vanadium (diss.filt)	<0.0013 mg/l	TM152		<0.0013 #	<0.0013 #				
Zinc (diss.filt)	<0.0013 mg/l	TM152		0.00294 #	0.00196 #				
Mercury (diss.filt)	<0.00001 mg/l	TM183		<0.00001 #	<0.00001 #				
Sulphate	<2 mg/l	TM184		<2 #	9.1 #				
Chloride	<2 mg/l	TM184		271 #	985 #				
Calcium (diss.filt)	<0.012 mg/l	TM228		84.4 #	161 #				
Sodium (diss.filt)	<0.076 mg/l	TM228		150 #	397 #				
Magnesium (diss.filt)	<0.036 mg/l	TM228		19.2 #	55.1 #				
Potassium (diss.filt)	<1 mg/l	TM228		27.2 #	35.1 #				
pH	<1 pH Units	TM256		7.97 #	8.05 #				

Validated

CERTIFICATE OF ANALYSIS

SDG:	161203-86	**Client Reference:**	405.00481.00033.01	**Report Number:**	390094
Location:	Valleyfield	**Order Number:**	405/8729	**Superseded Report:**	

PAH Spec MS - Aqueous (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	ES1	ES2	TD	VF1	VF4	VF5
			Depth (m)	-	-	-	-	-	-
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	29/11/2016	29/11/2016	29/11/2016	29/11/2016	30/11/2016	30/11/2016
			Sample Time	-	-	-	-	-	-
			Date Received	02/12/2016	02/12/2016	02/12/2016	02/12/2016	02/12/2016	02/12/2016
			SDG Ref	161203-86	161203-86	161203-86	161203-86	161203-86	161203-86
			Lab Sample No.(s)	14643494	14643495	14643496	14643497	14643502	14643503
			AGS Reference						
Naphthalene (aq)	<0.0001 mg/l	TM178		<0.0001 #	<0.0001 #	<0.0001 #	<0.0001 #	<0.0001 #	<0.0001 #
Acenaphthene (aq)	<0.000015 mg/l	TM178		<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #
Acenaphthylene (aq)	<0.000011 mg/l	TM178		<0.000011 #	<0.000011 #	<0.000011 #	<0.000011 #	<0.000011 #	0.000015 #
Fluoranthene (aq)	<0.000017 mg/l	TM178		<0.000017 #	0.000022 #	<0.000017 #	<0.000017 #	<0.000017 #	0.000092 #
Anthracene (aq)	<0.000015 mg/l	TM178		<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #	0.000036 #
Phenanthrene (aq)	<0.000022 mg/l	TM178		<0.000022 #	<0.000022 #	<0.000022 #	<0.000022 #	<0.000022 #	0.000092 #
Fluorene (aq)	<0.000014 mg/l	TM178		<0.000014 #	<0.000014 #	<0.000014 #	<0.000014 #	<0.000014 #	0.000022 #
Chrysene (aq)	<0.000013 mg/l	TM178		<0.000013 #	<0.000013 #	<0.000013 #	<0.000013 #	<0.000013 #	0.000077 #
Pyrene (aq)	<0.000015 mg/l	TM178		<0.000015 #	0.000025 #	<0.000015 #	<0.000015 #	<0.000015 #	0.000124 #
Benzo(a)anthracene (aq)	<0.000017 mg/l	TM178		<0.000017 #	<0.000017 #	<0.000017 #	<0.000017 #	<0.000017 #	0.0001 #
Benzo(b)fluoranthene (aq)	<0.000023 mg/l	TM178		<0.000023 #	<0.000023 #	<0.000023 #	<0.000023 #	<0.000023 #	0.000121 #
Benzo(k)fluoranthene (aq)	<0.000027 mg/l	TM178		<0.000027 #	<0.000027 #	<0.000027 #	<0.000027 #	<0.000027 #	0.000051 #
Benzo(a)pyrene (aq)	<0.000009 mg/l	TM178		<0.000009 #	0.000013 #	<0.000009 #	<0.000009 #	<0.000009 #	0.0001 #
Dibenzo(a,h)anthracene (aq)	<0.000016 mg/l	TM178		<0.000016 #	<0.000016 #	<0.000016 #	<0.000016 #	<0.000016 #	0.000023 #
Benzo(g,h,i)perylene (aq)	<0.000016 mg/l	TM178		<0.000016 #	0.000022 #	<0.000016 #	<0.000016 #	<0.000016 #	0.000083 #
Indeno(1,2,3-cd)pyrene (aq)	<0.000014 mg/l	TM178		<0.000014 #	0.000016 #	<0.000014 #	<0.000014 #	<0.000014 #	0.00006 #
PAH, Total Detected USEPA 16 (aq)	<0.000344 mg/l	TM178		<0.000344	<0.000344	<0.000344	<0.000344	<0.000344	0.000996

Validated

CERTIFICATE OF ANALYSIS

SDG:	161203-86	**Client Reference:**	405.00481.00033.01	**Report Number:**	390094
Location:	Valleyfield	**Order Number:**	405/8729	**Superseded Report:**	

PAH Spec MS - Aqueous (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	VF6	VF7	VF8	VF9	VF10	VF11
			Depth (m)	-	-	-	-	-	-
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	30/11/2016	29/11/2016	30/11/2016	29/11/2016	29/11/2016	30/11/2016
			Sample Time	-	-	-	-	-	-
			Date Received	02/12/2016	02/12/2016	02/12/2016	02/12/2016	02/12/2016	02/12/2016
			SDG Ref	161203-86	161203-86	161203-86	161203-86	161203-86	161203-86
			Lab Sample No.(s)	14643504	14643498	14643505	14643499	14643500	14643506
			AGS Reference						
Naphthalene (aq)	<0.0001 mg/l	TM178		<0.0001 #	<0.0001 #	<0.0001 #	<0.0001 #	<0.0001 #	<0.0001 #
Acenaphthene (aq)	<0.000015 mg/l	TM178		<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #
Acenaphthylene (aq)	<0.000011 mg/l	TM178		<0.000011 #	<0.000011 #	<0.000011 #	<0.000011 #	<0.000011 #	<0.000011 #
Fluoranthene (aq)	<0.000017 mg/l	TM178		<0.000017 #	<0.000017 #	<0.000017 #	<0.000017 #	<0.000017 #	<0.000017 #
Anthracene (aq)	<0.000015 mg/l	TM178		<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #
Phenanthrene (aq)	<0.000022 mg/l	TM178		<0.000022 #	0.00003 #	<0.000022 #	<0.000022 #	<0.000022 #	<0.000022 #
Fluorene (aq)	<0.000014 mg/l	TM178		<0.000014 #	<0.000014 #	<0.000014 #	<0.000014 #	<0.000014 #	<0.000014 #
Chrysene (aq)	<0.000013 mg/l	TM178		<0.000013 #	<0.000013 #	<0.000013 #	<0.000013 #	<0.000013 #	<0.000013 #
Pyrene (aq)	<0.000015 mg/l	TM178		<0.000015 #	0.000022 #	<0.000015 #	<0.000015 #	<0.000015 #	<0.000015 #
Benzo(a)anthracene (aq)	<0.000017 mg/l	TM178		<0.000017 #	<0.000017 #	<0.000017 #	<0.000017 #	<0.000017 #	<0.000017 #
Benzo(b)fluoranthene (aq)	<0.000023 mg/l	TM178		<0.000023 #	<0.000023 #	<0.000023 #	<0.000023 #	<0.000023 #	<0.000023 #
Benzo(k)fluoranthene (aq)	<0.000027 mg/l	TM178		<0.000027 #	<0.000027 #	<0.000027 #	<0.000027 #	<0.000027 #	<0.000027 #
Benzo(a)pyrene (aq)	<0.000009 mg/l	TM178		<0.000009 #	<0.000009 #	<0.000009 #	<0.000009 #	<0.000009 #	<0.000009 #
Dibenzo(a,h)anthracene (aq)	<0.000016 mg/l	TM178		<0.000016 #	<0.000016 #	<0.000016 #	<0.000016 #	<0.000016 #	<0.000016 #
Benzo(g,h,i)perylene (aq)	<0.000016 mg/l	TM178		<0.000016 #	0.000017 #	<0.000016 #	<0.000016 #	<0.000016 #	<0.000016 #
Indeno(1,2,3-cd)pyrene (aq)	<0.000014 mg/l	TM178		<0.000014 #	<0.000014 #	<0.000014 #	<0.000014 #	<0.000014 #	<0.000014 #
PAH, Total Detected USEPA 16 (aq)	<0.000344 mg/l	TM178		<0.000344	<0.000344	<0.000344	<0.000344	<0.000344	<0.000344

Validated

CERTIFICATE OF ANALYSIS

SDG:	161203-86	**Client Reference:**	405.00481.00033.01	**Report Number:**	390094
Location:	Valleyfield	**Order Number:**	405/8729	**Superseded Report:**	

PAH Spec MS - Aqueous (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	VF12	VF3D
			Depth (m)	-	-
			Sample Type	Water(GW/SW)	Water(GW/SW)
			Date Sampled	30/11/2016	30/11/2016
			Sample Time	-	-
			Date Received	02/12/2016	02/12/2016
			SDG Ref	161203-86	161203-86
			Lab Sample No.(s)	14643507	14643501
			AGS Reference		
Naphthalene (aq)	<0.0001 mg/l	TM178		<0.0001 #	<0.0001 #
Acenaphthene (aq)	<0.000015 mg/l	TM178		<0.000015 #	<0.000015 #
Acenaphthylene (aq)	<0.000011 mg/l	TM178		<0.000011 #	<0.000011 #
Fluoranthene (aq)	<0.000017 mg/l	TM178		0.000036 #	<0.000017 #
Anthracene (aq)	<0.000015 mg/l	TM178		<0.000015 #	<0.000015 #
Phenanthrene (aq)	<0.000022 mg/l	TM178		0.000023 #	0.000042 #
Fluorene (aq)	<0.000014 mg/l	TM178		<0.000014 #	0.000017 #
Chrysene (aq)	<0.000013 mg/l	TM178		<0.000013 #	<0.000013 #
Pyrene (aq)	<0.000015 mg/l	TM178		0.000074 #	0.000023 #
Benzo(a)anthracene (aq)	<0.000017 mg/l	TM178		<0.000017 #	<0.000017 #
Benzo(b)fluoranthene (aq)	<0.000023 mg/l	TM178		<0.000023 #	<0.000023 #
Benzo(k)fluoranthene (aq)	<0.000027 mg/l	TM178		<0.000027 #	<0.000027 #
Benzo(a)pyrene (aq)	<0.000009 mg/l	TM178		<0.000009 #	<0.000009 #
Dibenzo(a,h)anthracene (aq)	<0.000016 mg/l	TM178		<0.000016 #	<0.000016 #
Benzo(g,h,i)perylene (aq)	<0.000016 mg/l	TM178		0.000019 #	<0.000016 #
Indeno(1,2,3-cd)pyrene (aq)	<0.000014 mg/l	TM178		<0.000014 #	<0.000014 #
PAH, Total Detected USEPA 16 (aq)	<0.000344 mg/l	TM178		<0.000344	<0.000344

CERTIFICATE OF ANALYSIS

SDG:	161203-86	**Client Reference:**	405.00481.00033.01	**Report Number:**	390094
Location:	Valleyfield	**Order Number:**	405/8729	**Superseded Report:**	

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser		
TM120	Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters		
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry		
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers		
TM228	US EPA Method 6010B	Determination of Major Cations in Water by iCap 6500 Duo ICP-OES		
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter		

[1] Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

CERTIFICATE OF ANALYSIS

SDG:	161203-86	**Client Reference:**	405.00481.00033.01	**Report Number:**	390094
Location:	Valleyfield	**Order Number:**	405/8729	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	14643494	14643495	14643496	14643497	14643502	14643503	14643504	14643498	14643505	14643499
Customer Sample Ref.	ES1	ES2	TD	VF1	VF4	VF5	VF6	VF7	VF8	VF9
AGS Ref.										
Depth										
Type	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
Anions by Kone (w)	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016
Conductivity (at 20 deg.C)	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016
Dissolved Metals by ICP-MS	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016
Fluoride	07-Dec-2016	07-Dec-2016	07-Dec-2016	07-Dec-2016	07-Dec-2016	07-Dec-2016	07-Dec-2016	07-Dec-2016	07-Dec-2016	07-Dec-2016
Mercury Dissolved	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016
Metals by iCap-OES Dissolved (W)	12-Dec-2016	12-Dec-2016	09-Dec-2016	12-Dec-2016	12-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016	12-Dec-2016	12-Dec-2016
PAH Spec MS - Aqueous (W)	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016
pH Value	08-Dec-2016	08-Dec-2016	07-Dec-2016	07-Dec-2016	07-Dec-2016	07-Dec-2016	07-Dec-2016	07-Dec-2016	07-Dec-2016	07-Dec-2016

Lab Sample No(s)	14643500	14643506	14643507	14643501
Customer Sample Ref.	VF10	VF11	VF12	VF3D
AGS Ref.				
Depth				
Type	LIQUID	LIQUID	LIQUID	LIQUID
Anions by Kone (w)	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016
Conductivity (at 20 deg.C)	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016
Dissolved Metals by ICP-MS	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016
Fluoride	07-Dec-2016	07-Dec-2016	07-Dec-2016	07-Dec-2016
Mercury Dissolved	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016
Metals by iCap-OES Dissolved (W)	13-Dec-2016	09-Dec-2016	09-Dec-2016	13-Dec-2016
PAH Spec MS - Aqueous (W)	09-Dec-2016	09-Dec-2016	09-Dec-2016	09-Dec-2016
pH Value	07-Dec-2016	08-Dec-2016	08-Dec-2016	08-Dec-2016

Appendix General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt . However, the integrity of the data may be compromised.

9. NDP - No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately.

11. Results relate only to the items tested.

12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%, they are generally wider for volatiles analysis, 50-150%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment . Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect .

14. **Product analyses** - Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

21. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

24. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as “mixed hydrocarbons”. Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

Sample Deviations

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Holding time exceeded before sample received**
5	**Samples exceeded holding time before presevation was performed**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to sampled on date**
&	**Sample Holding Time exceeded - Late arrival of instructions.**

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

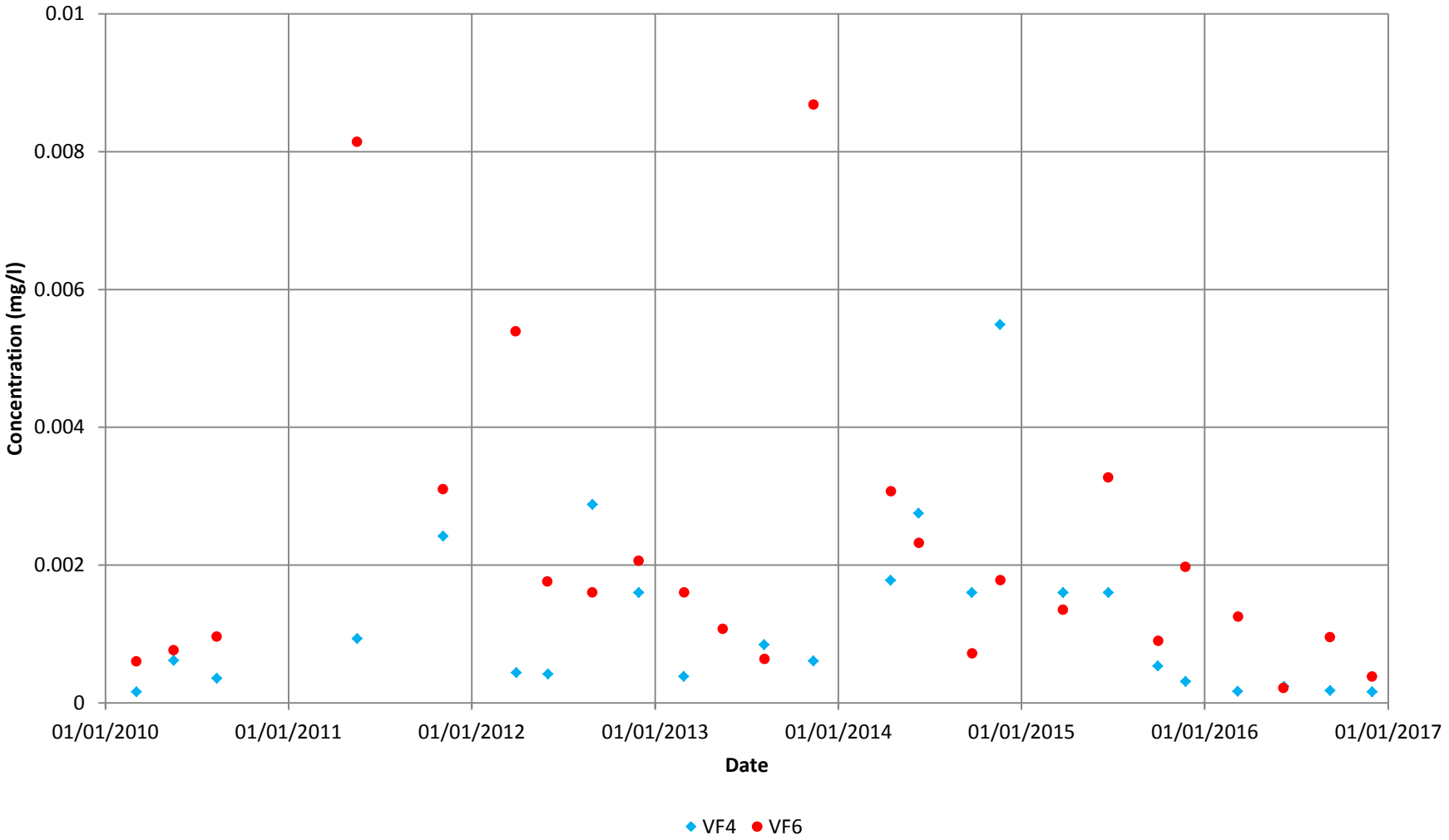
Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than : - Trace - Where only one or two asbestos fibres were identified.

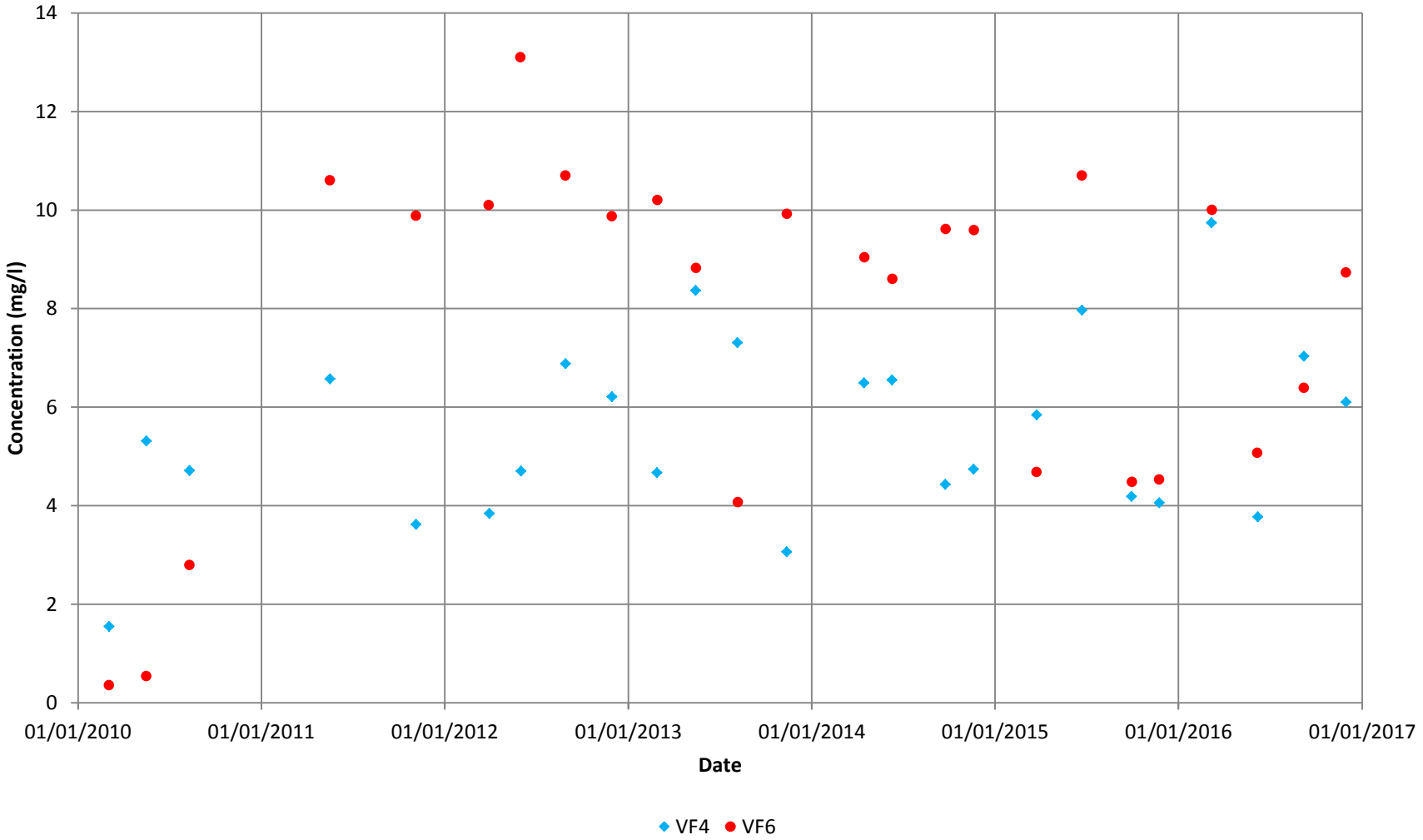
Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

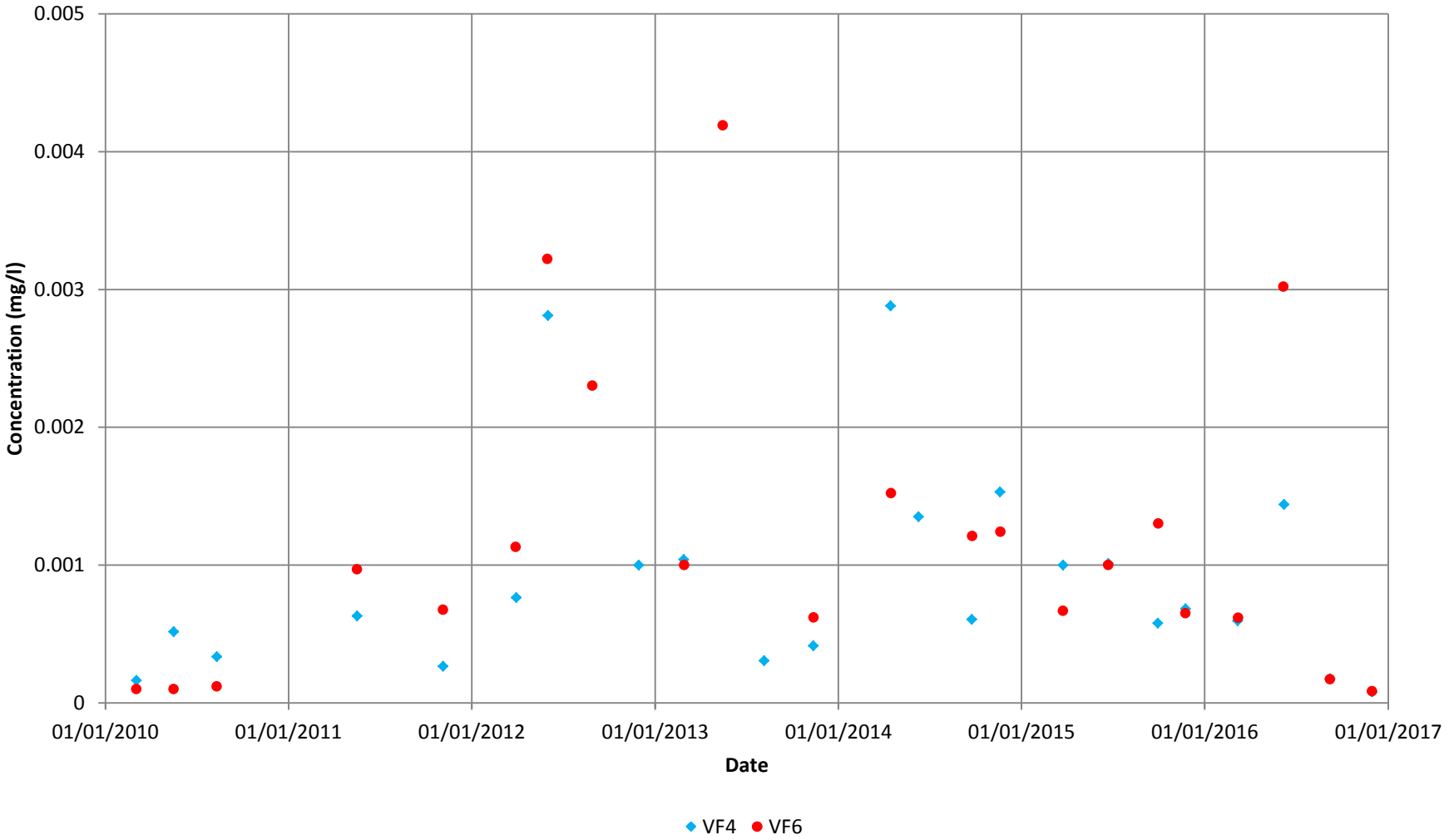
Valleyfield Ash Lagoons - 2016 Antimony Data
PFA Boreholes



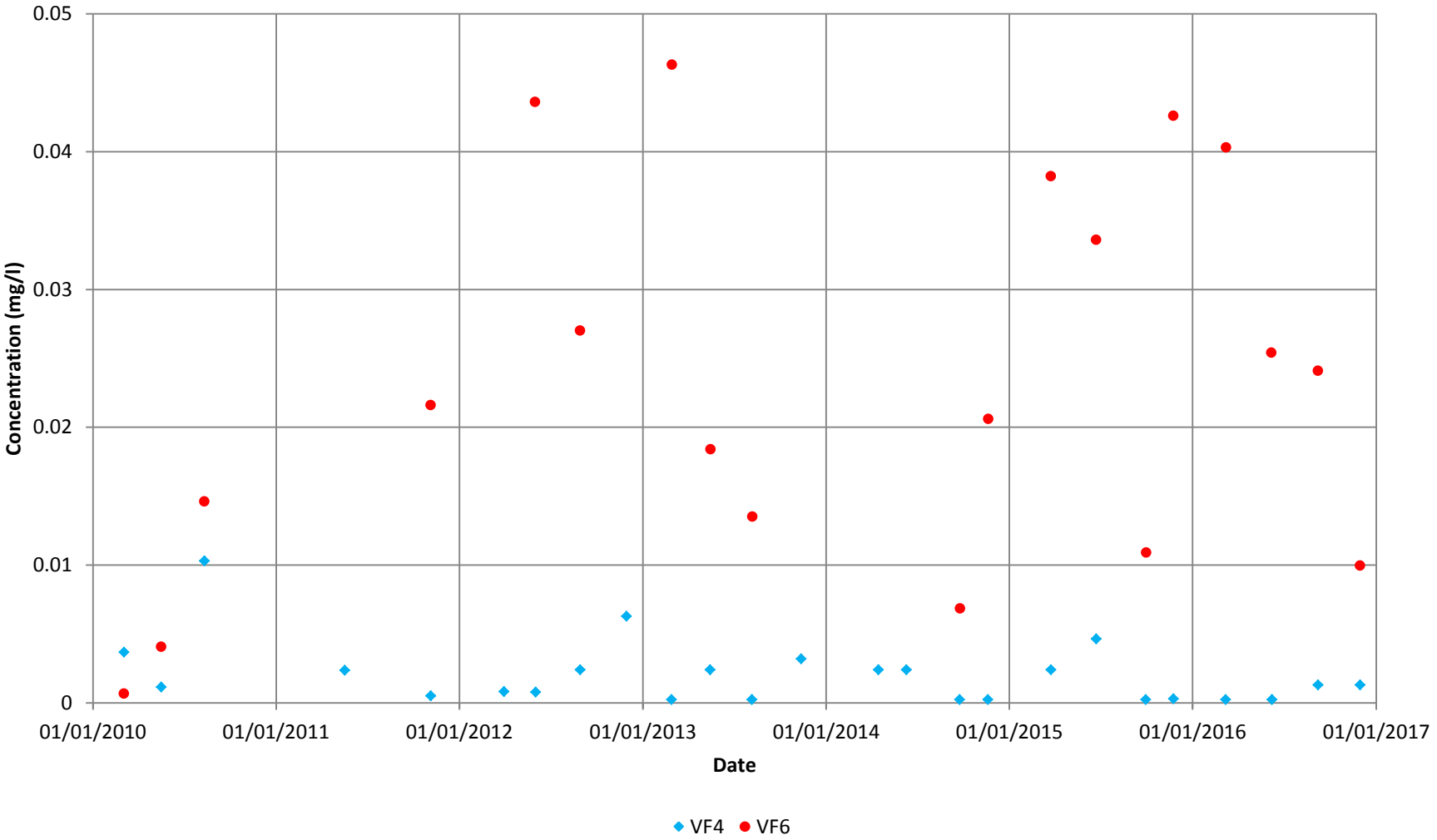
Valleyfield Ash Lagoons - 2016 Boron Data
PFA Boreholes



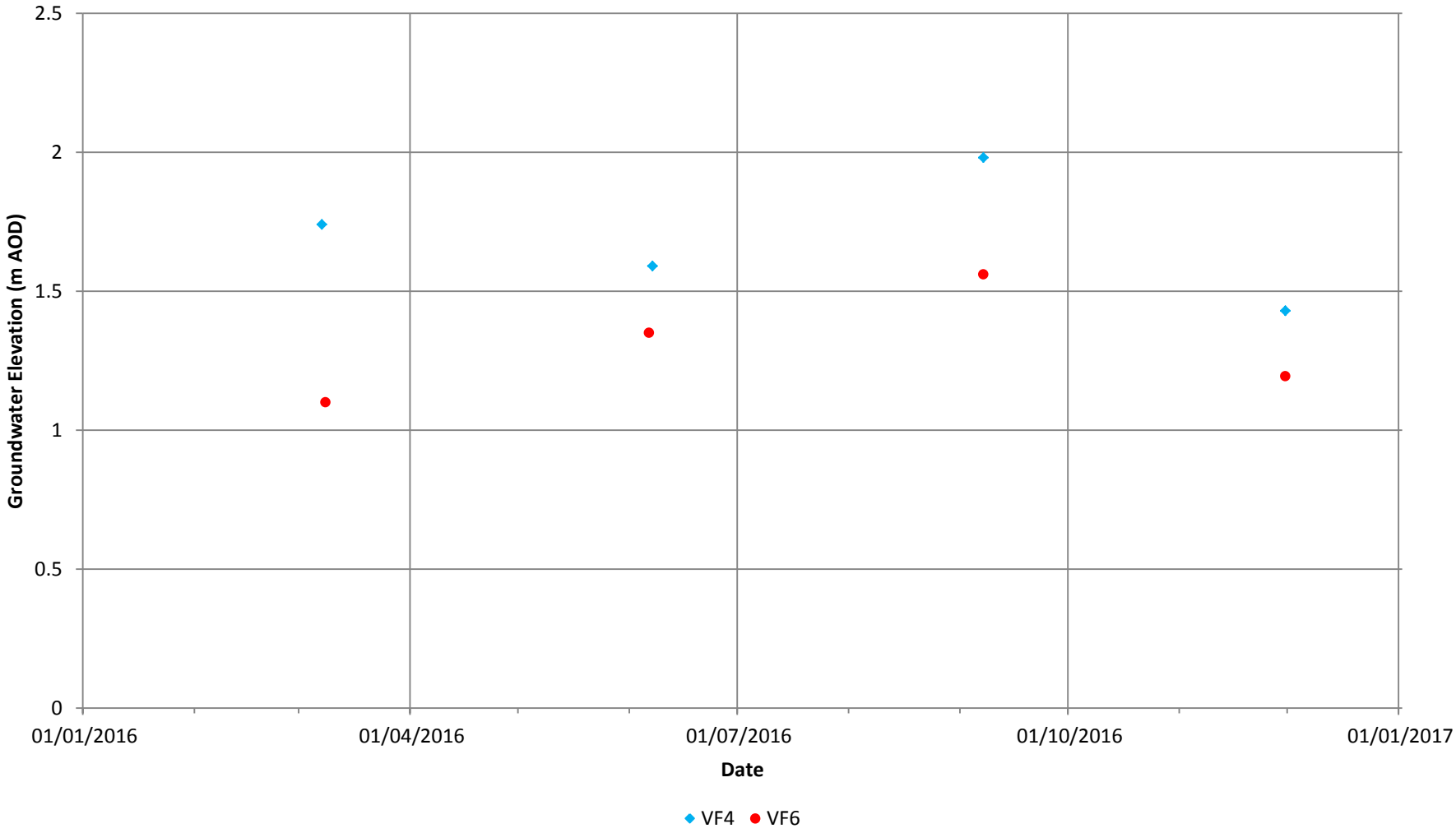
Valleyfield Ash Lagoons - 2016 Cadmium Data
PFA Boreholes



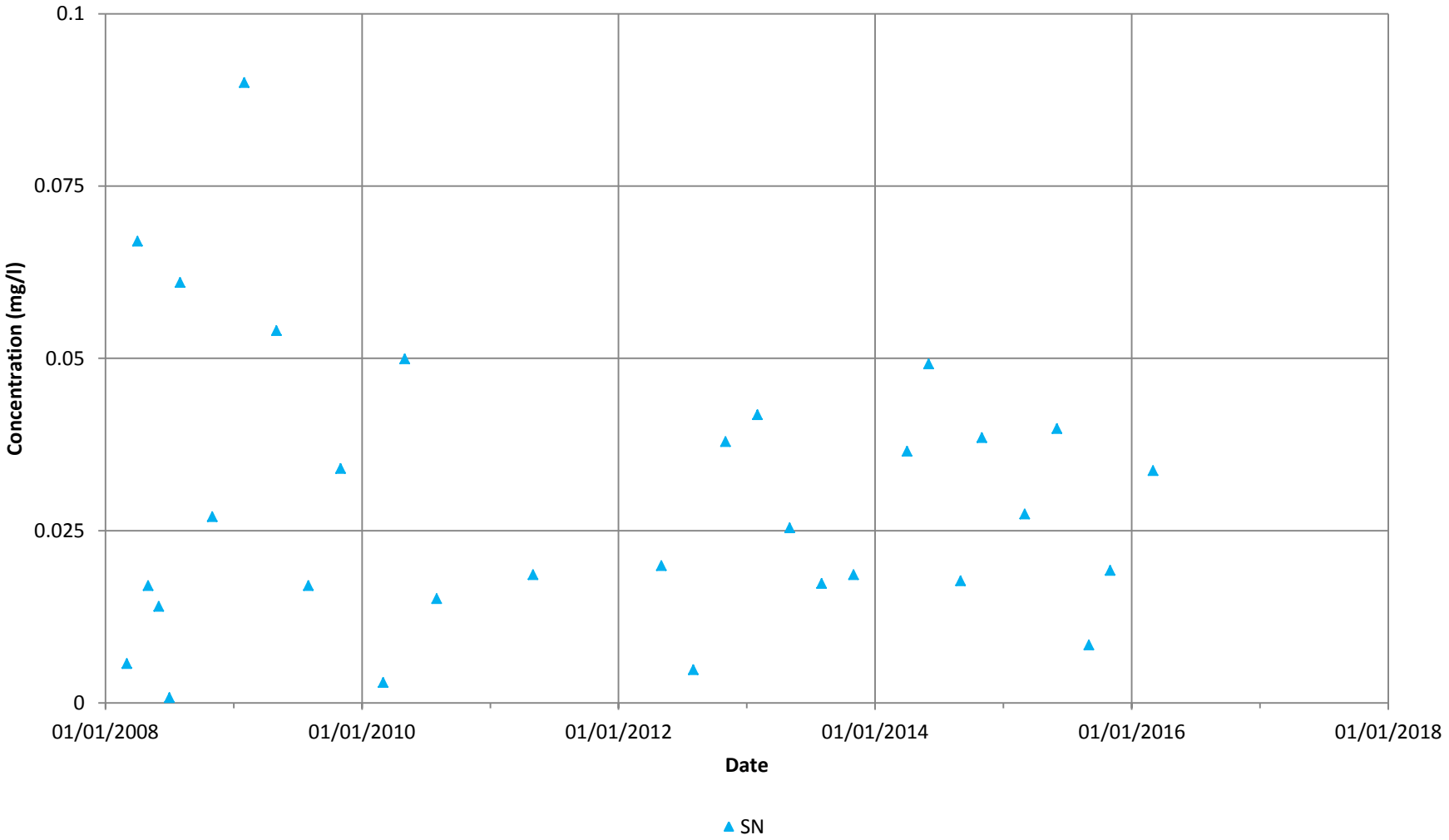
Valleyfield Ash Lagoons - 2016 Vanadium Data
PFA Boreholes



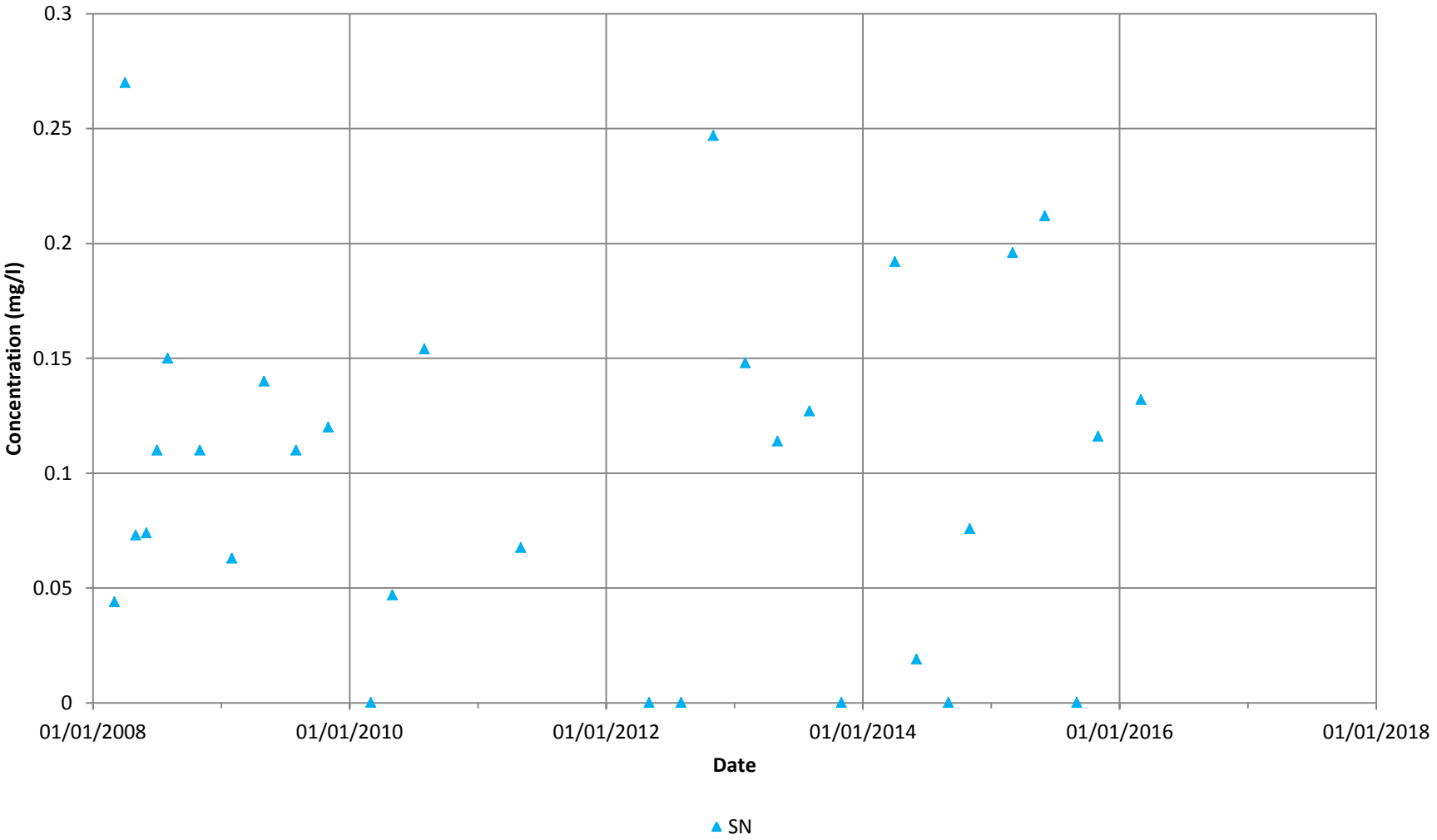
Valleyfield Ash Lagoons - Groundwater Elevation
PFA Boreholes



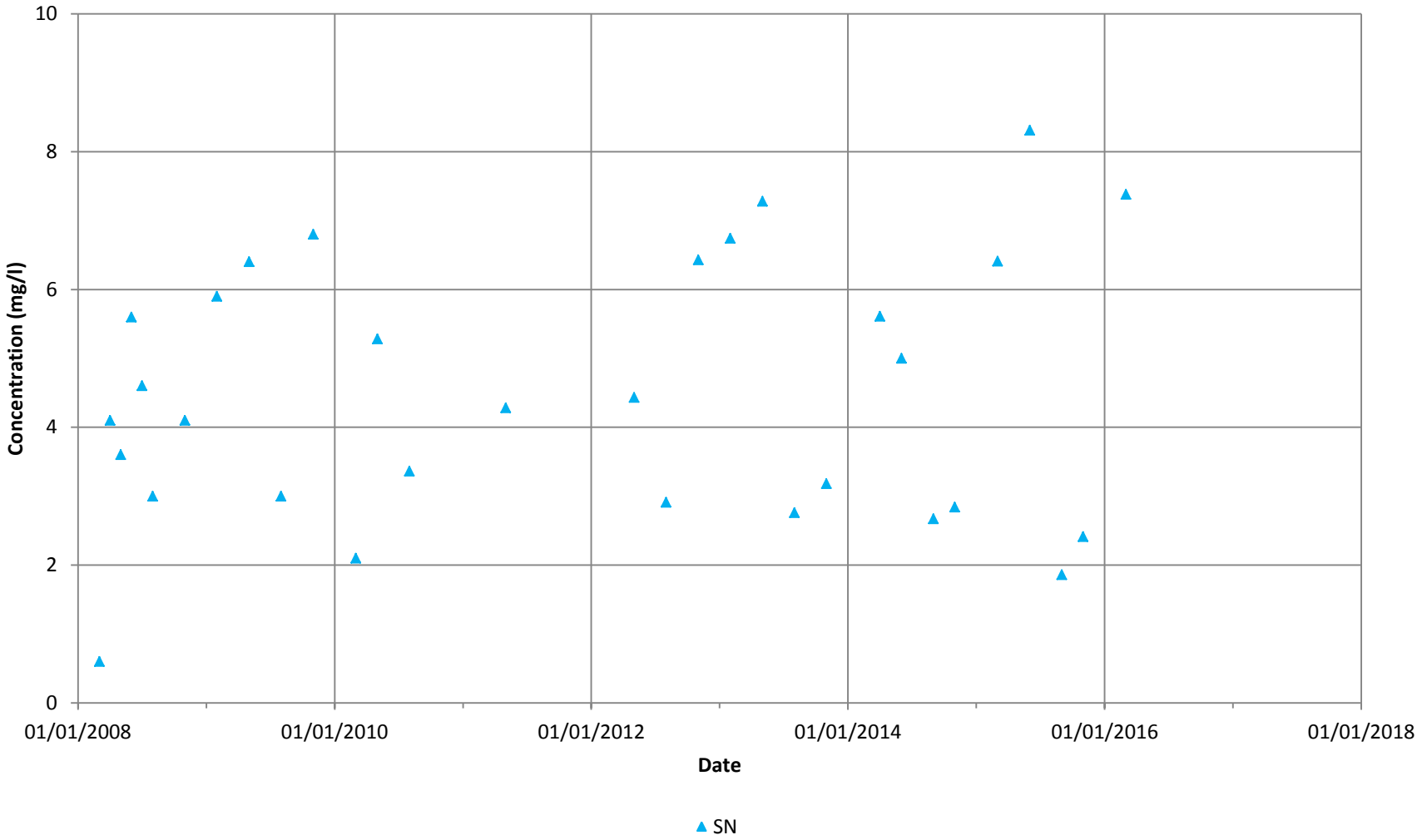
Valleyfield Ash Lagoons - Antimony Data
Supernatant



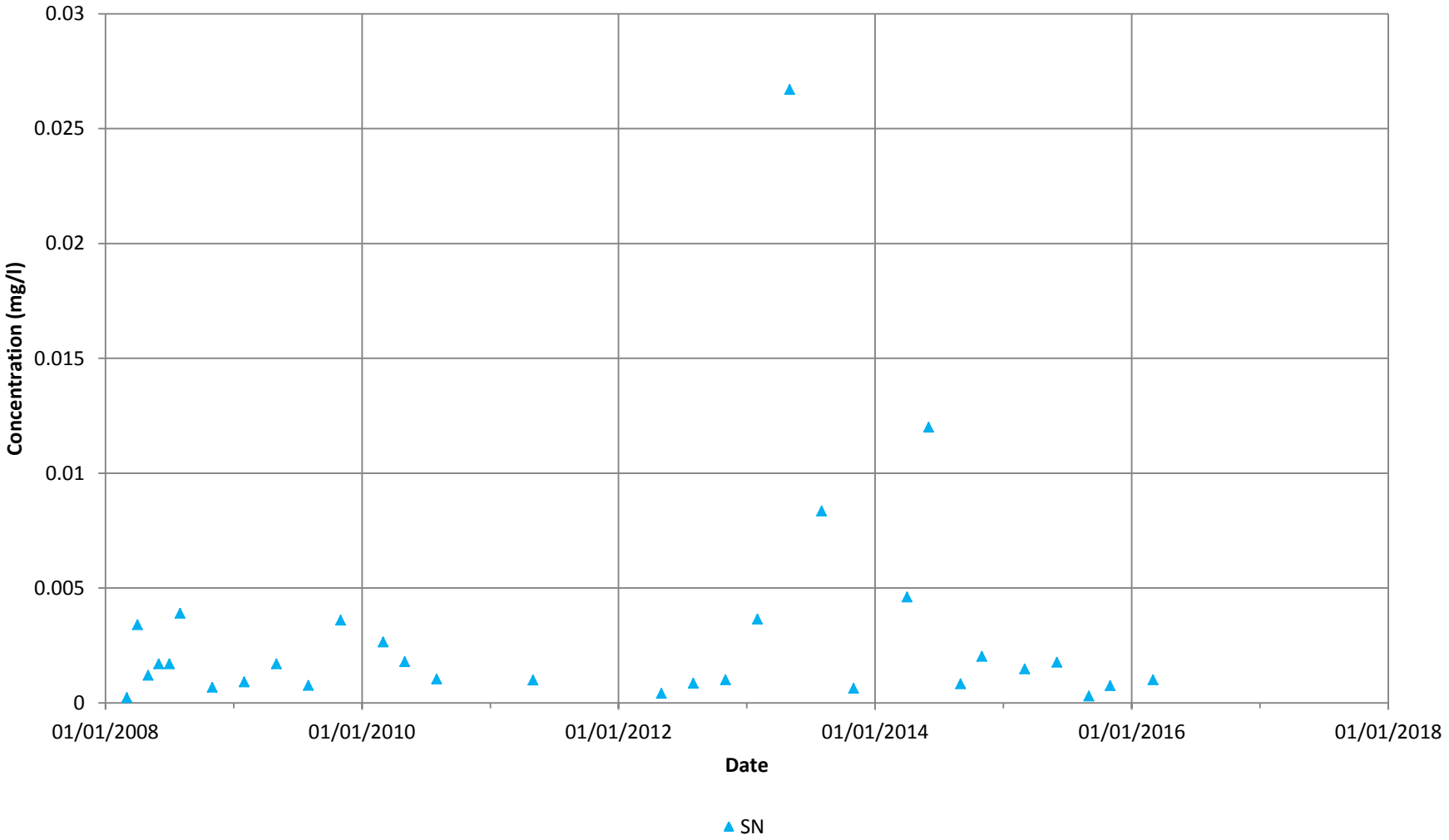
Valleyfield Ash Lagoons - Arsenic Data
Supernatant



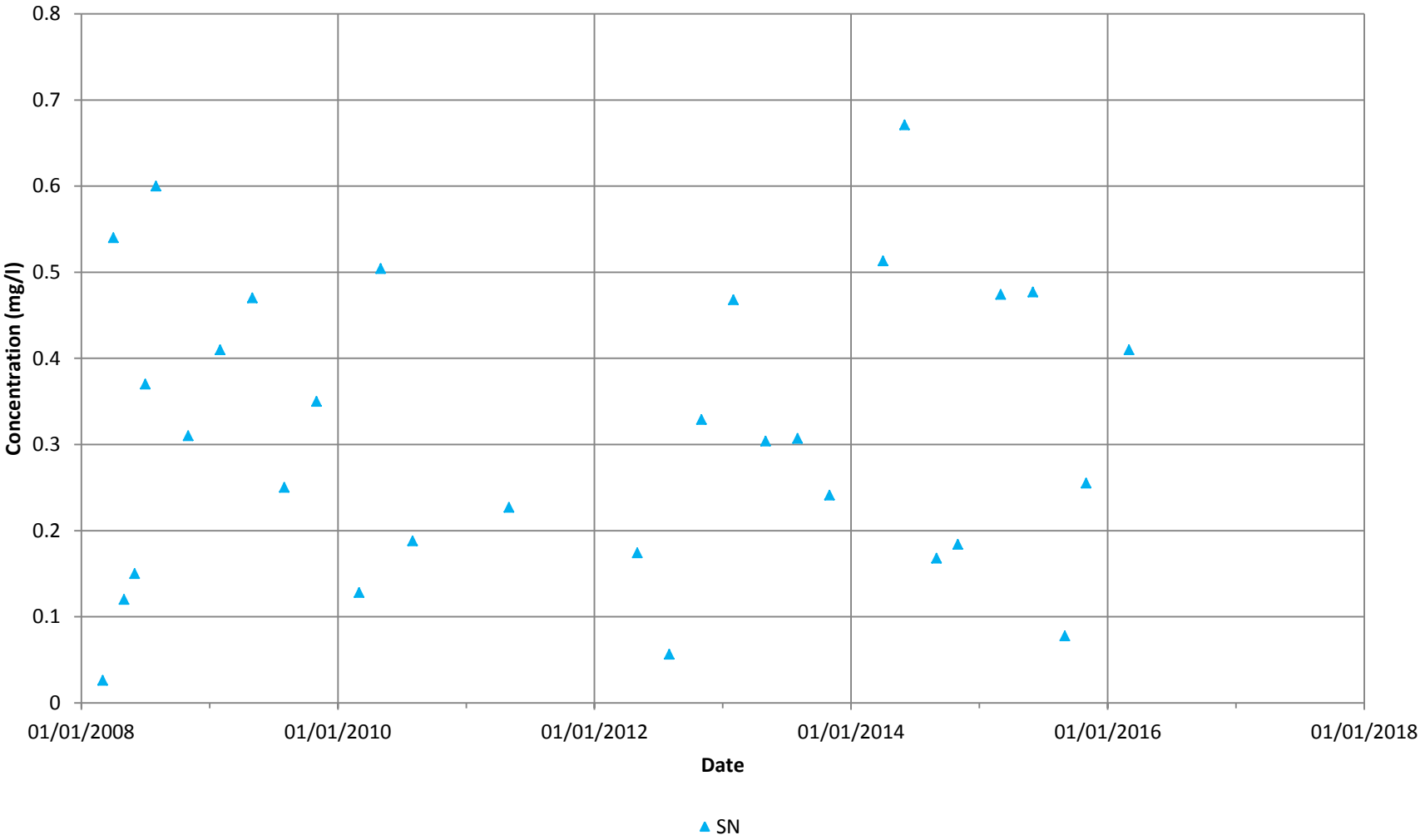
Valleyfield Ash Lagoons - Boron Data
Supernatant



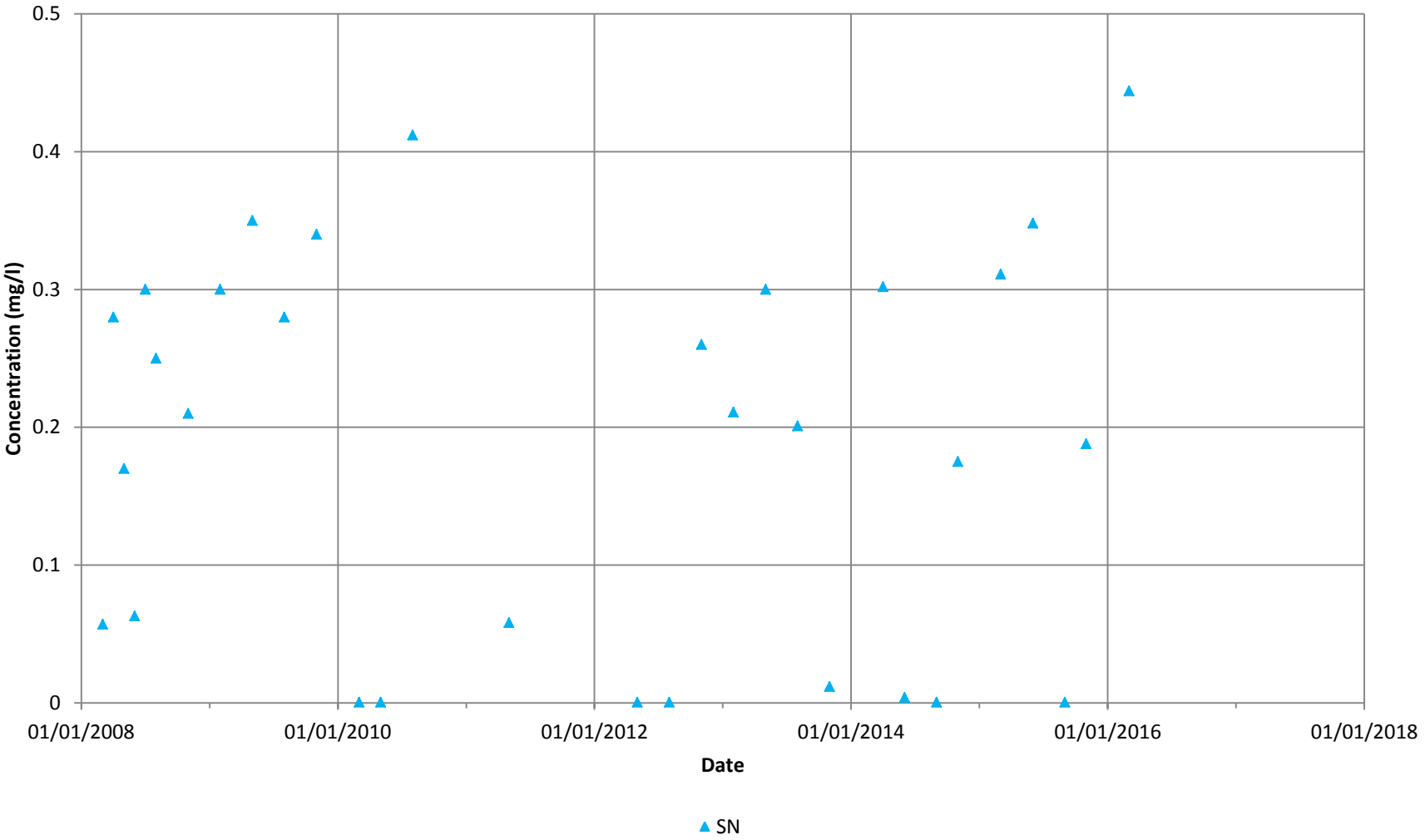
Valleyfield Ash Lagoons - Cadmium Data
Supernatant



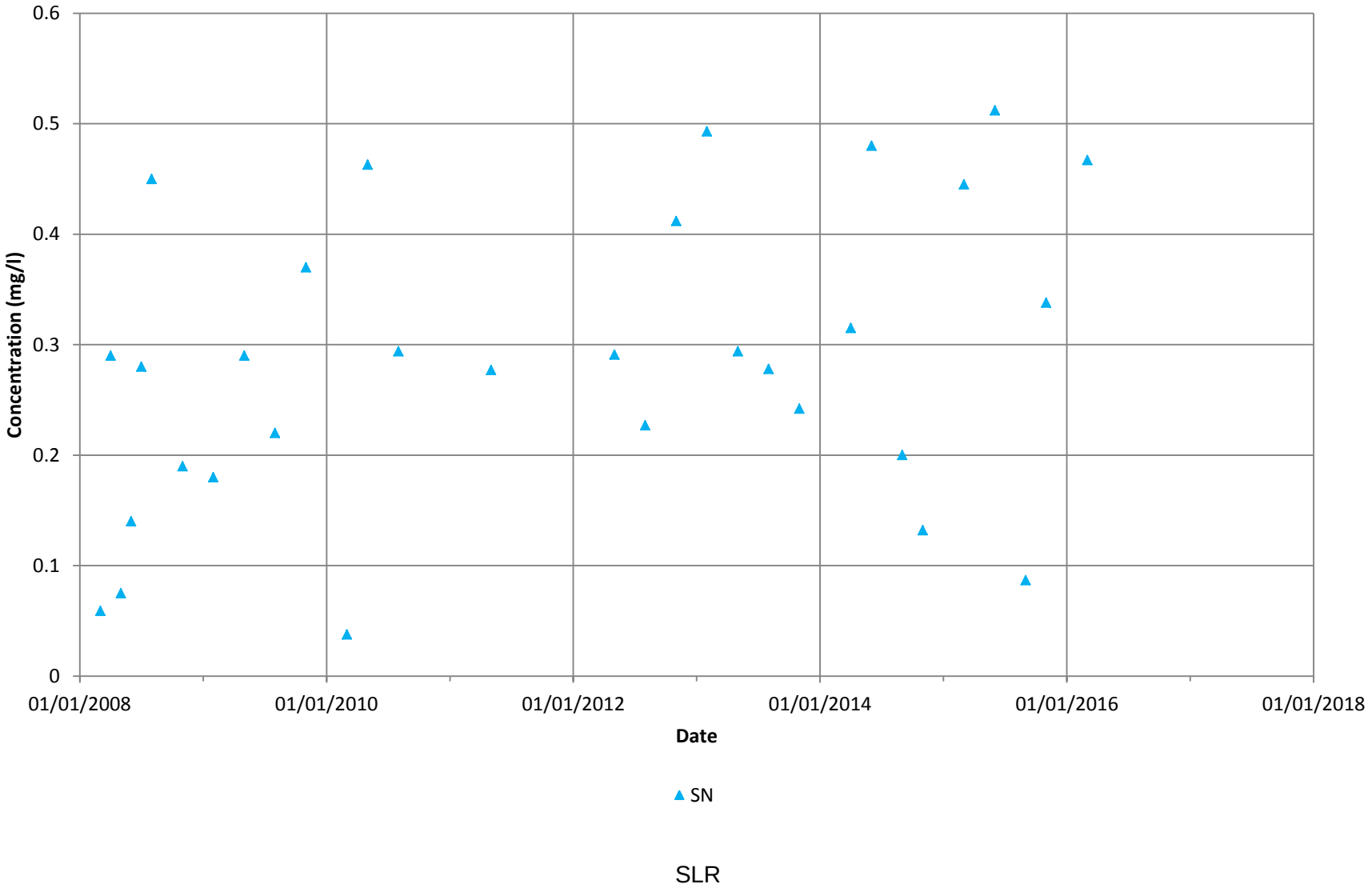
Valleyfield Ash Lagoons - Molybdenum Data Supernatant



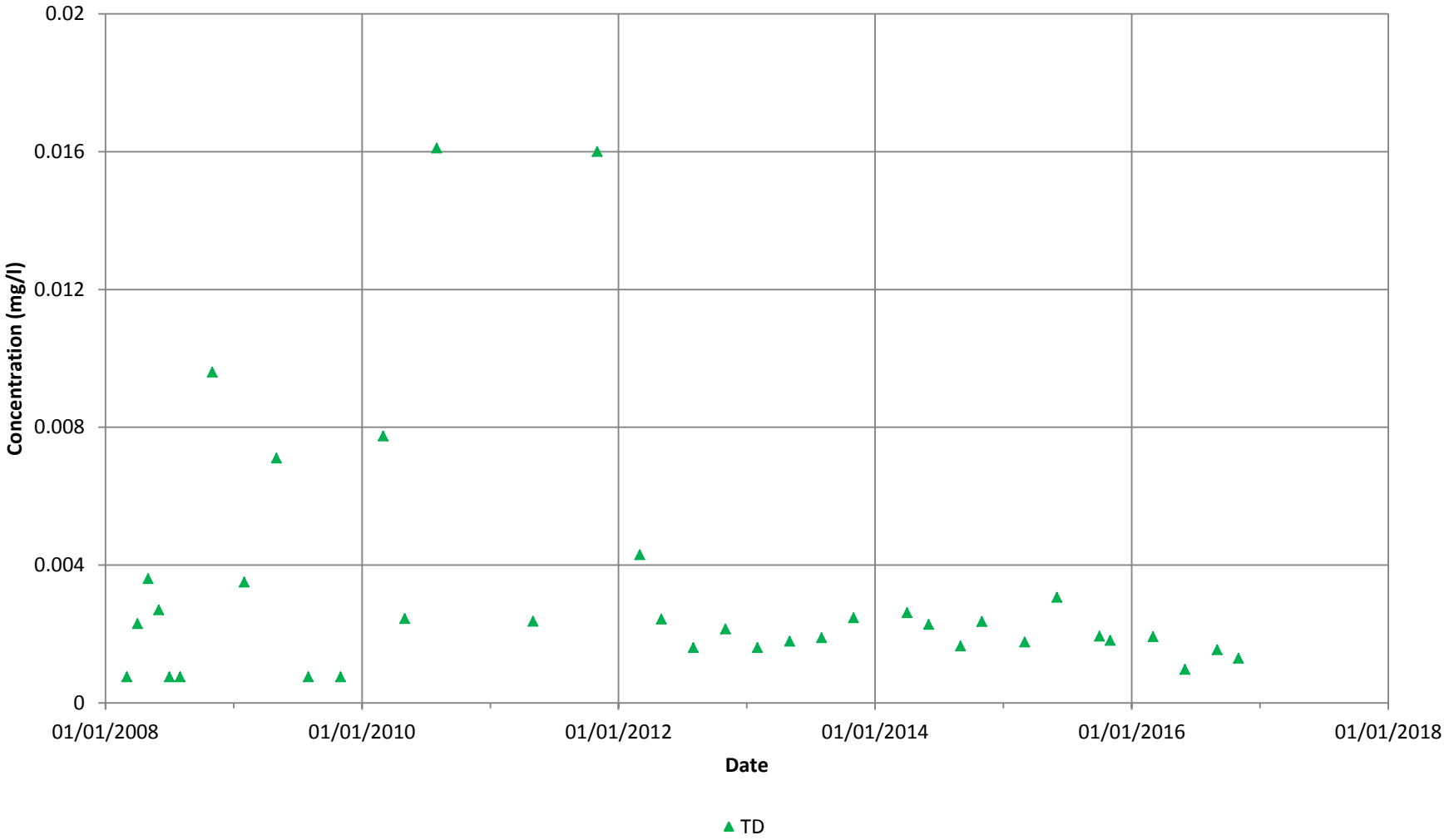
Valleyfield Ash Lagoons - Selenium Data
Supernatant



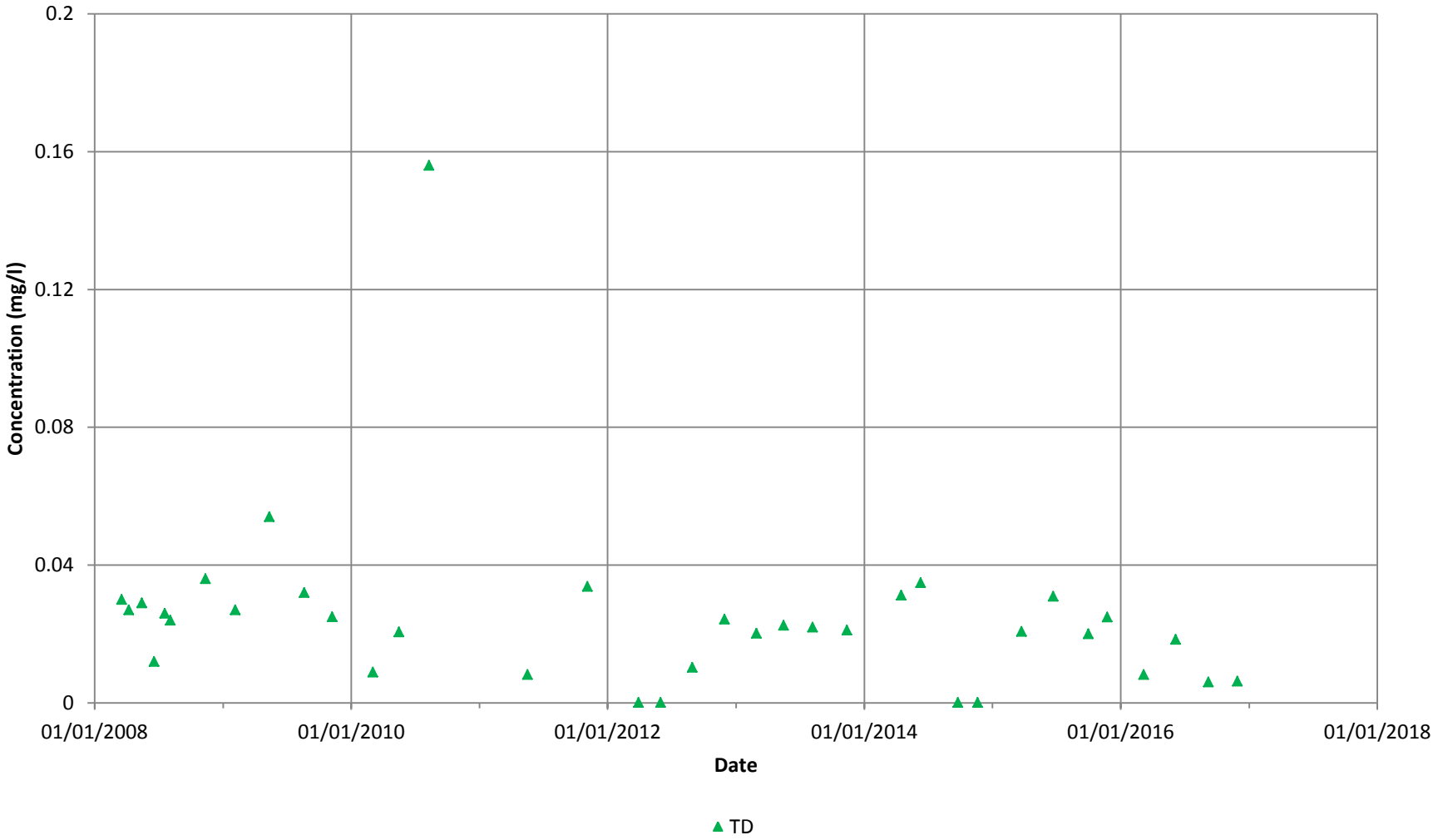
Valleyfield Ash Lagoons - Vanadium Data
Supernatant



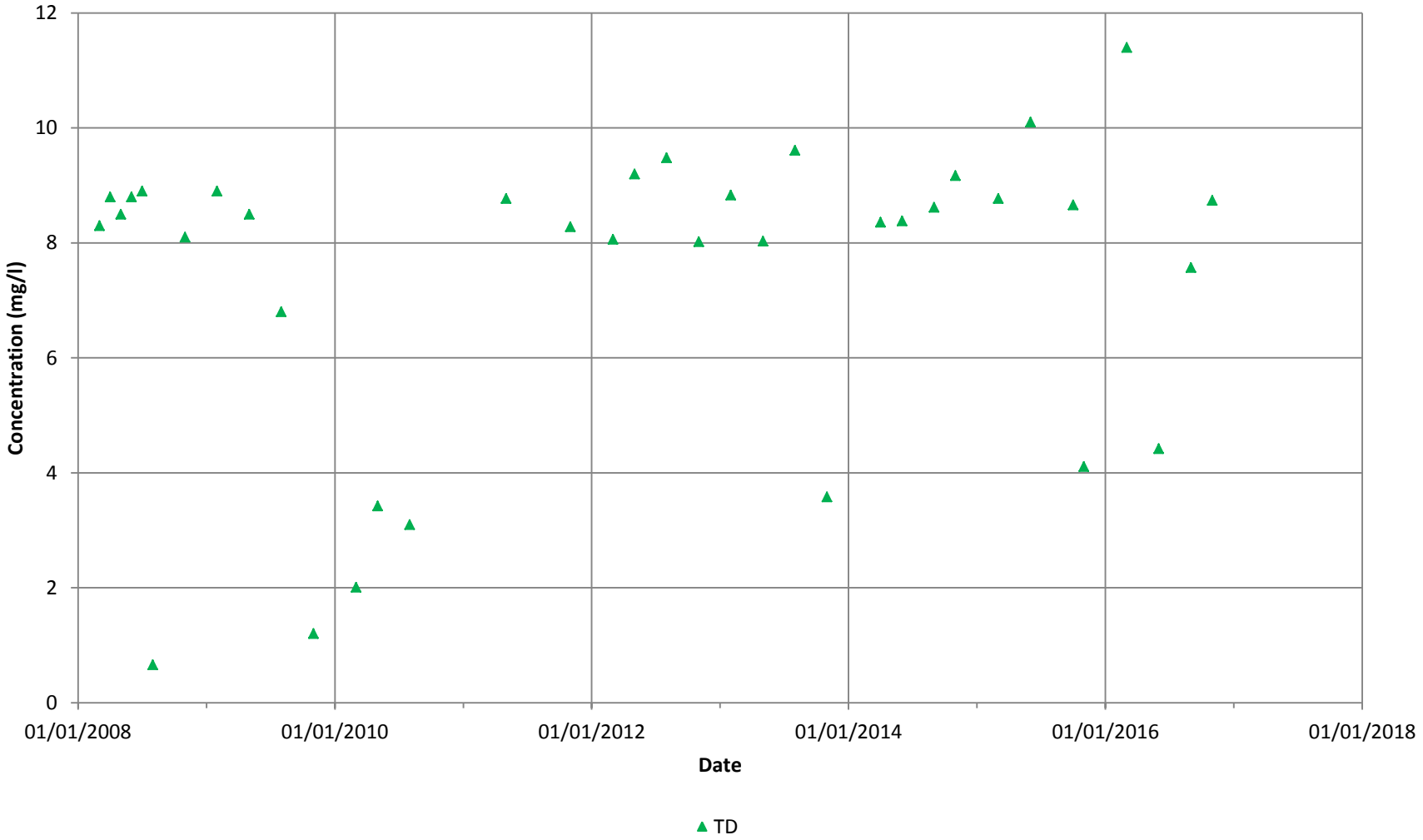
Valleyfield Ash Lagoons - Antimony Data
Toe Drain



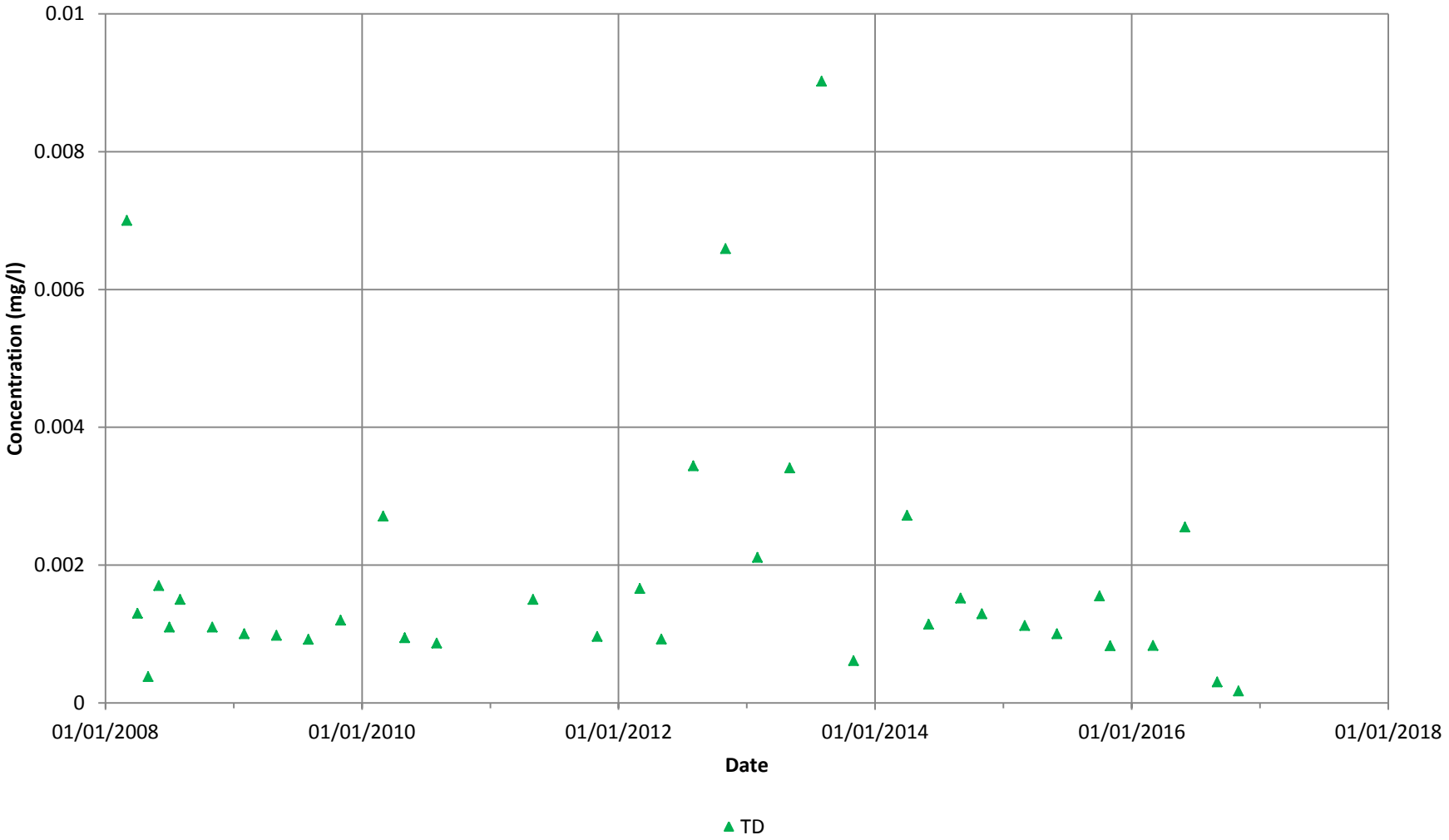
Valleyfield Ash Lagoons - Arsenic Data
Toe Drain



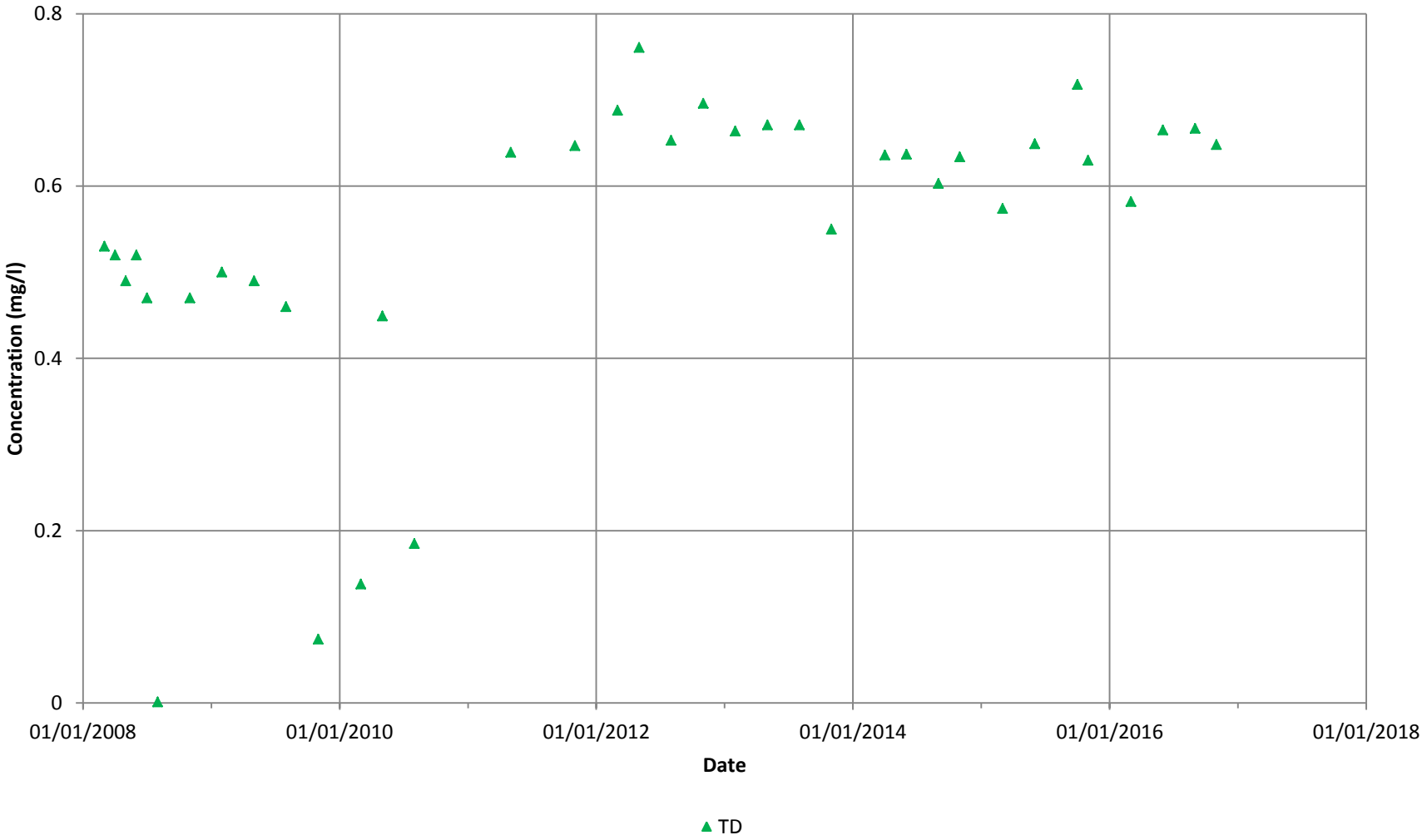
Valleyfield Ash Lagoons - Boron Data
Toe Drain



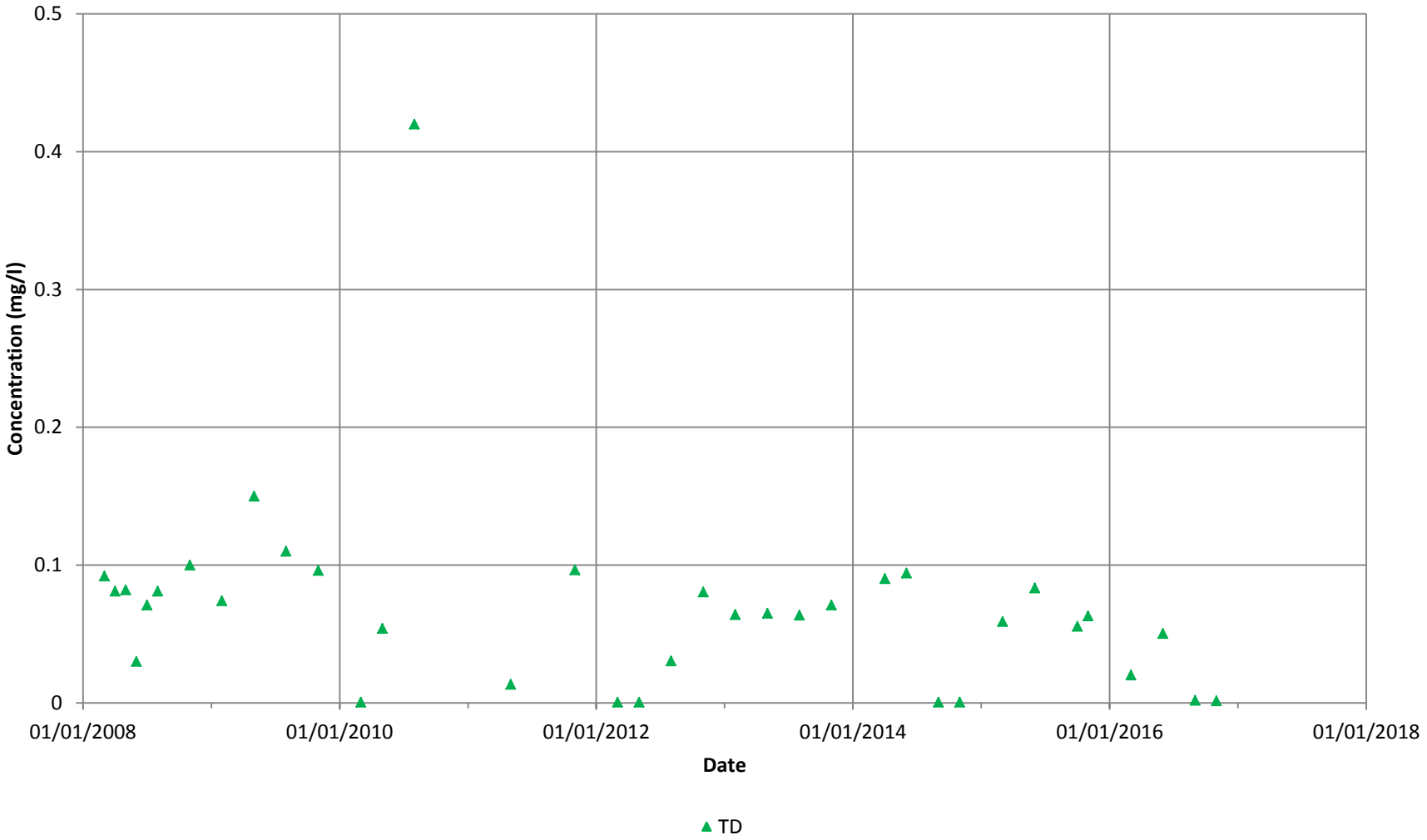
Valleyfield Ash Lagoons - Cadmium Data
Toe Drain



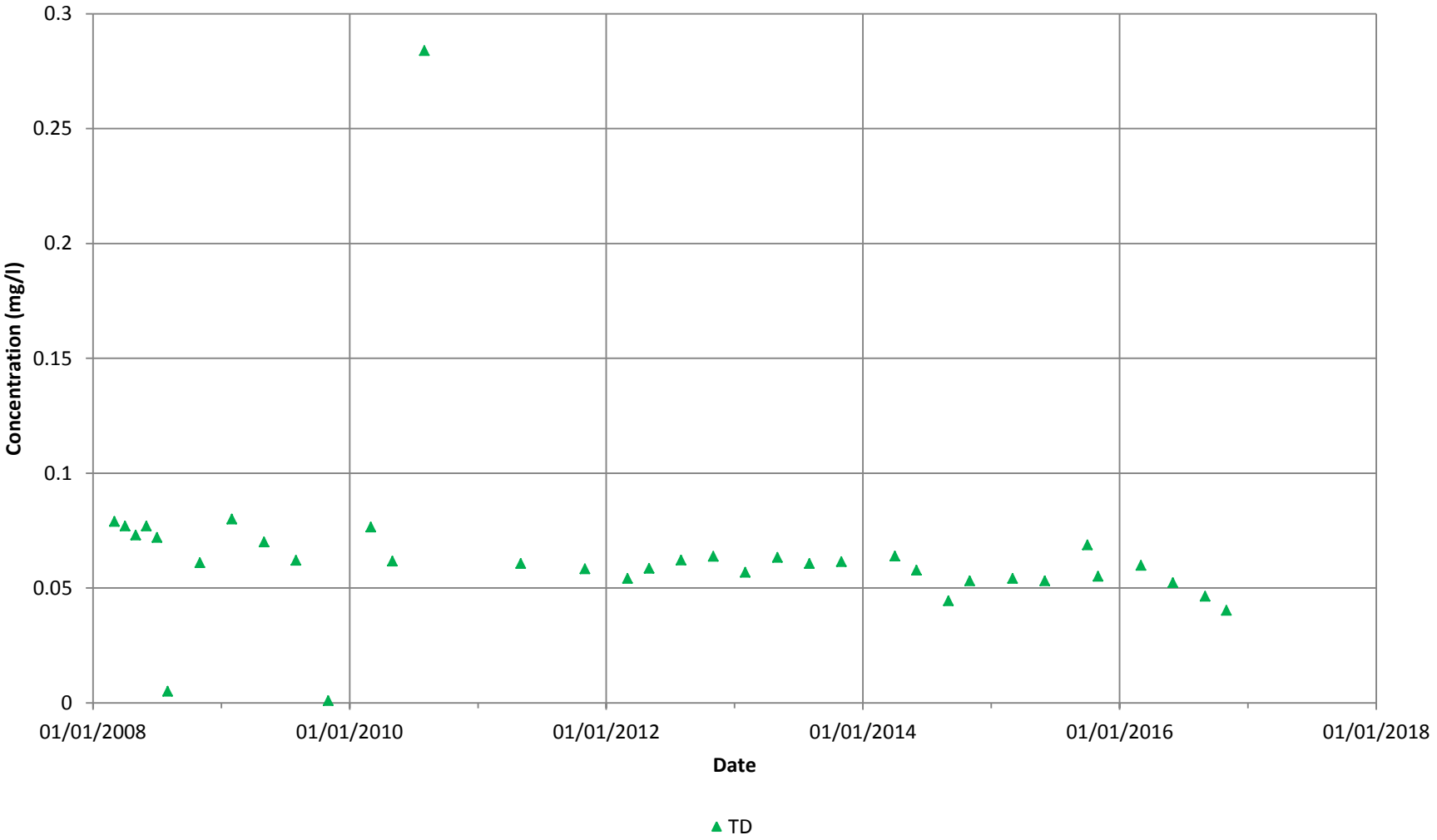
Valleyfield Ash Lagoons - Molybdenum Data
Toe Drain



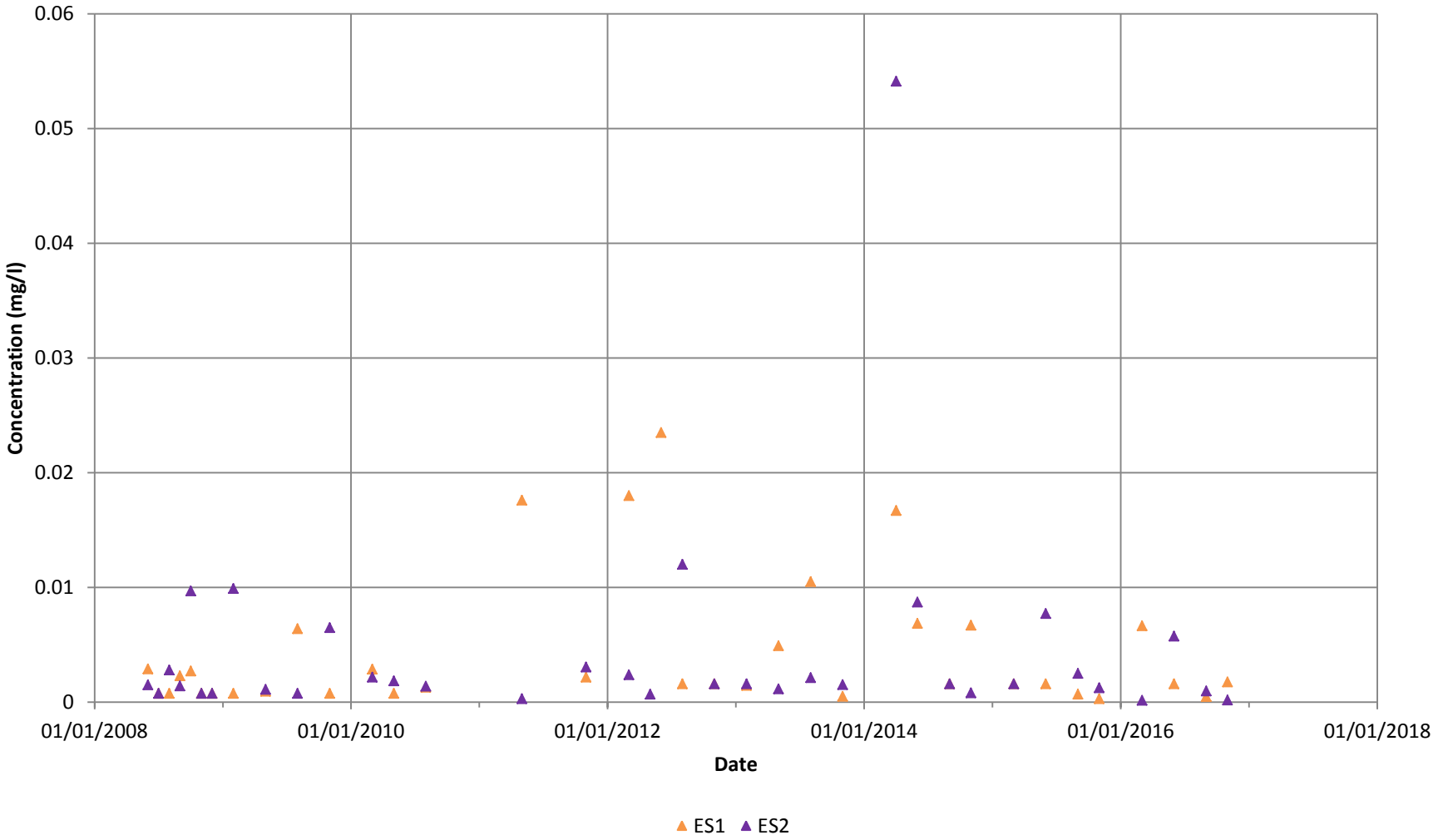
Valleyfield Ash Lagoons - Selenium Data
Toe Drain



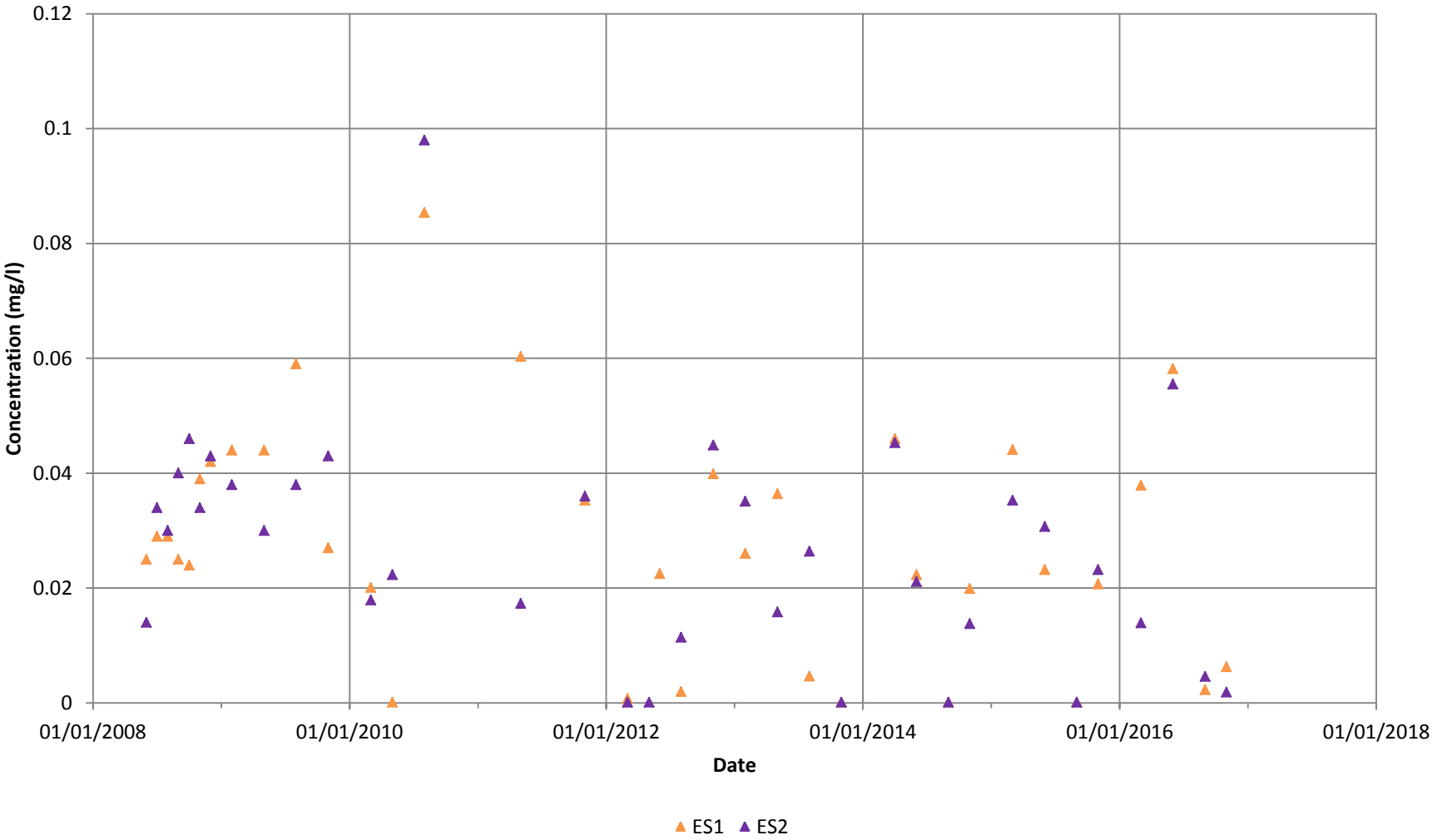
Valleyfield Ash Lagoons - Vanadium Data
Toe Drain



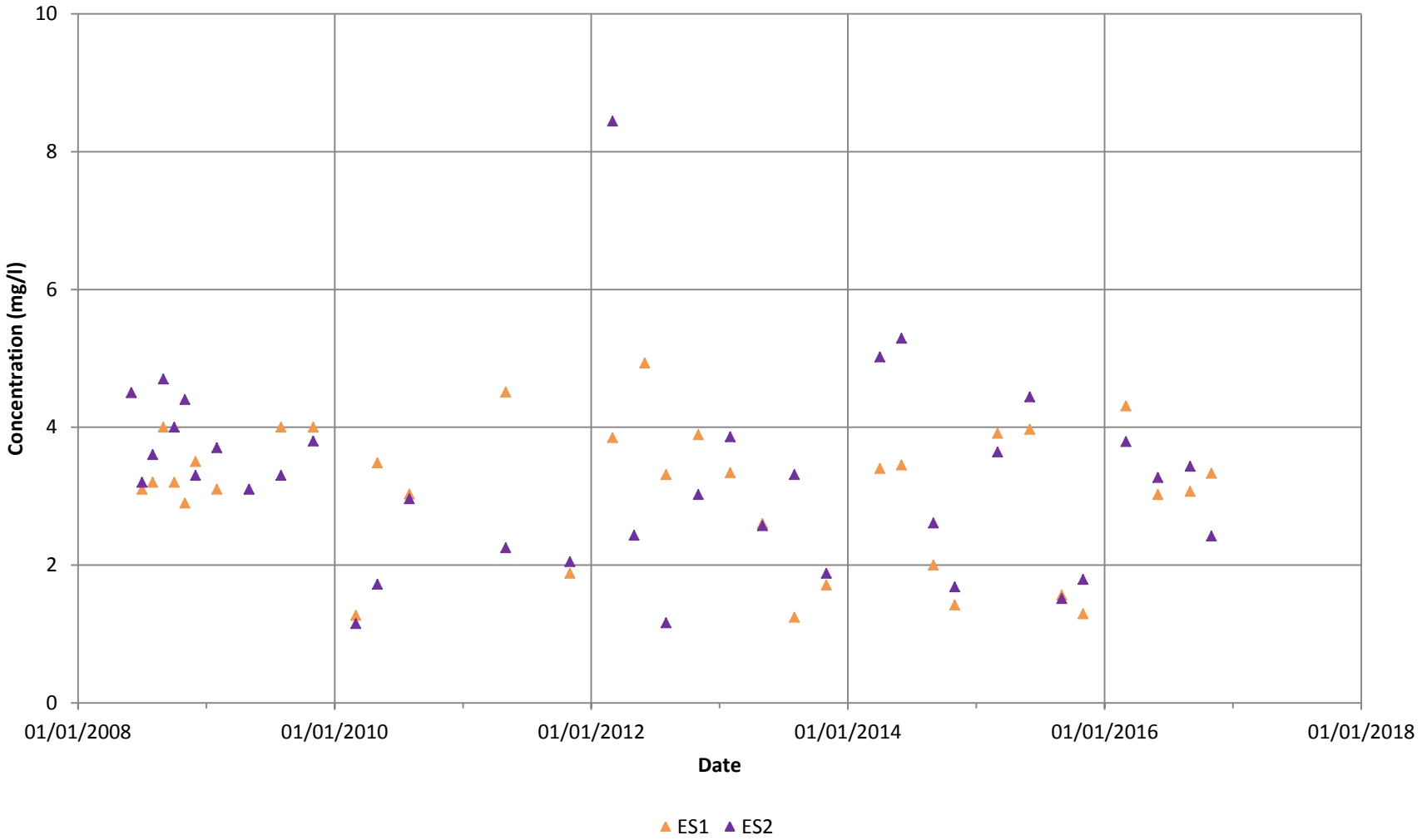
Valleyfield Ash Lagoons - Antimony Data
Estuarine Locations



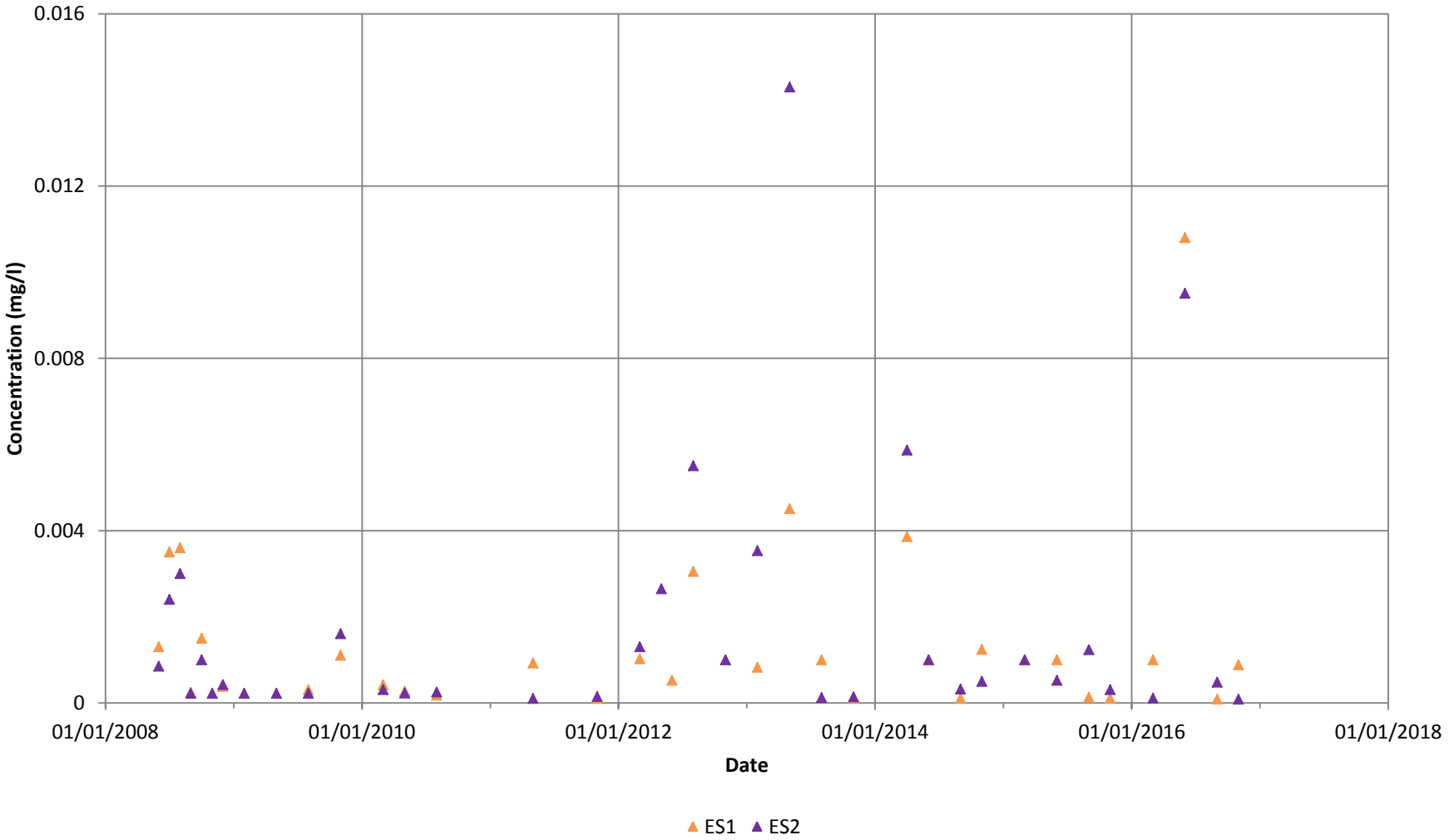
Valleyfield Ash Lagoons - Arsenic Data
Estuarine Locations



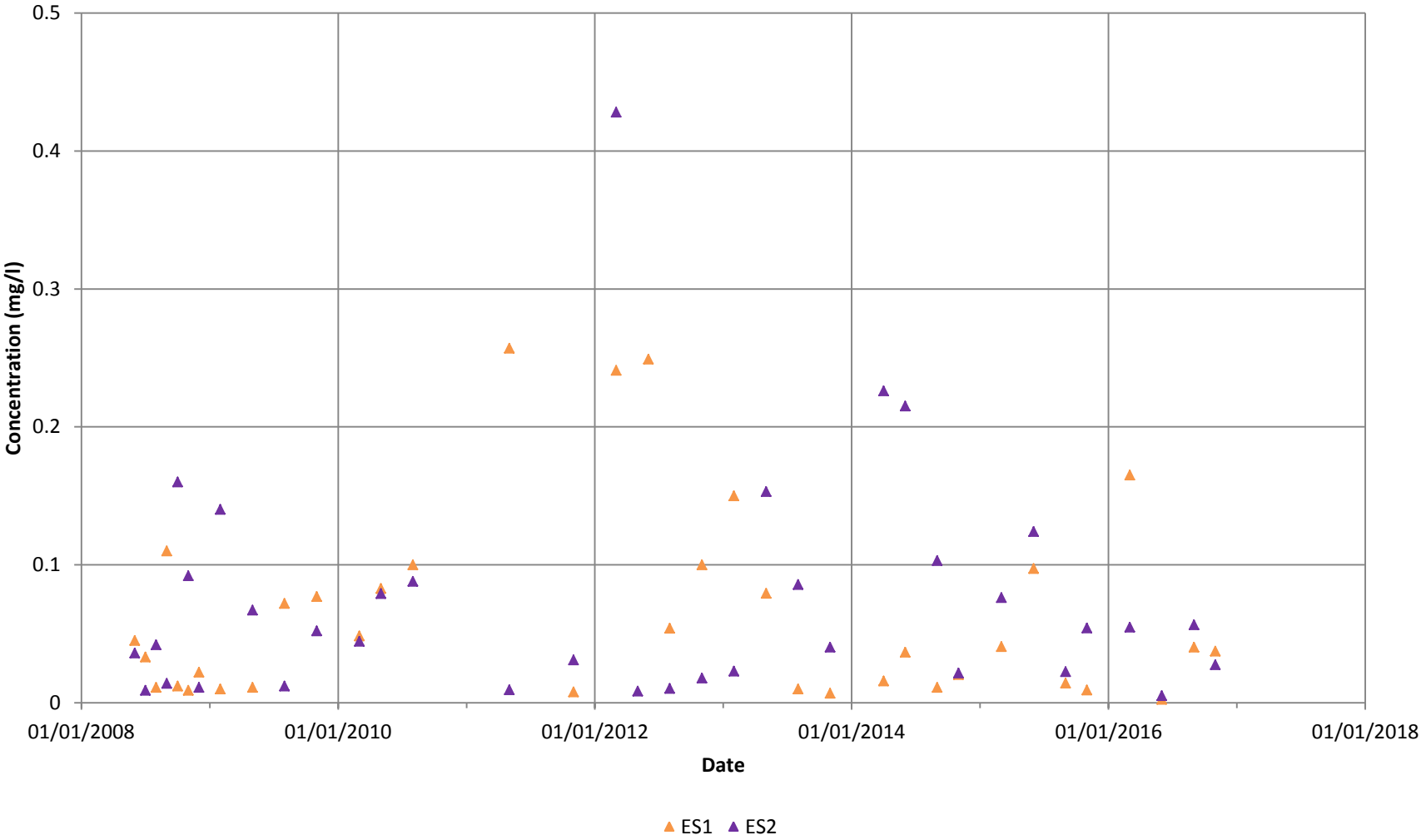
Valleyfield Ash Lagoons - Boron Data
Estuarine Locations



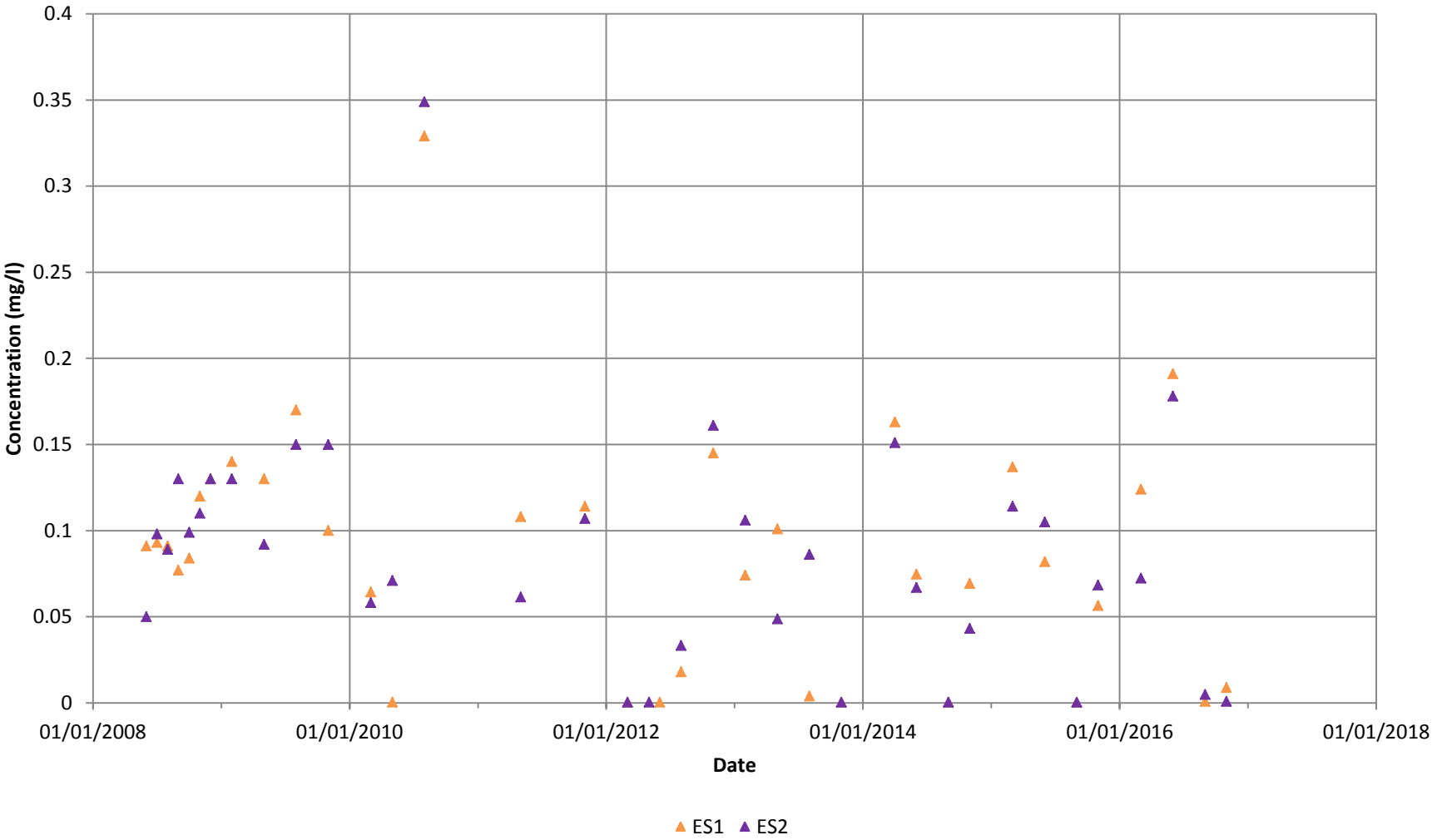
Valleyfield Ash Lagoons - Cadmium Data
Estuarine Locations



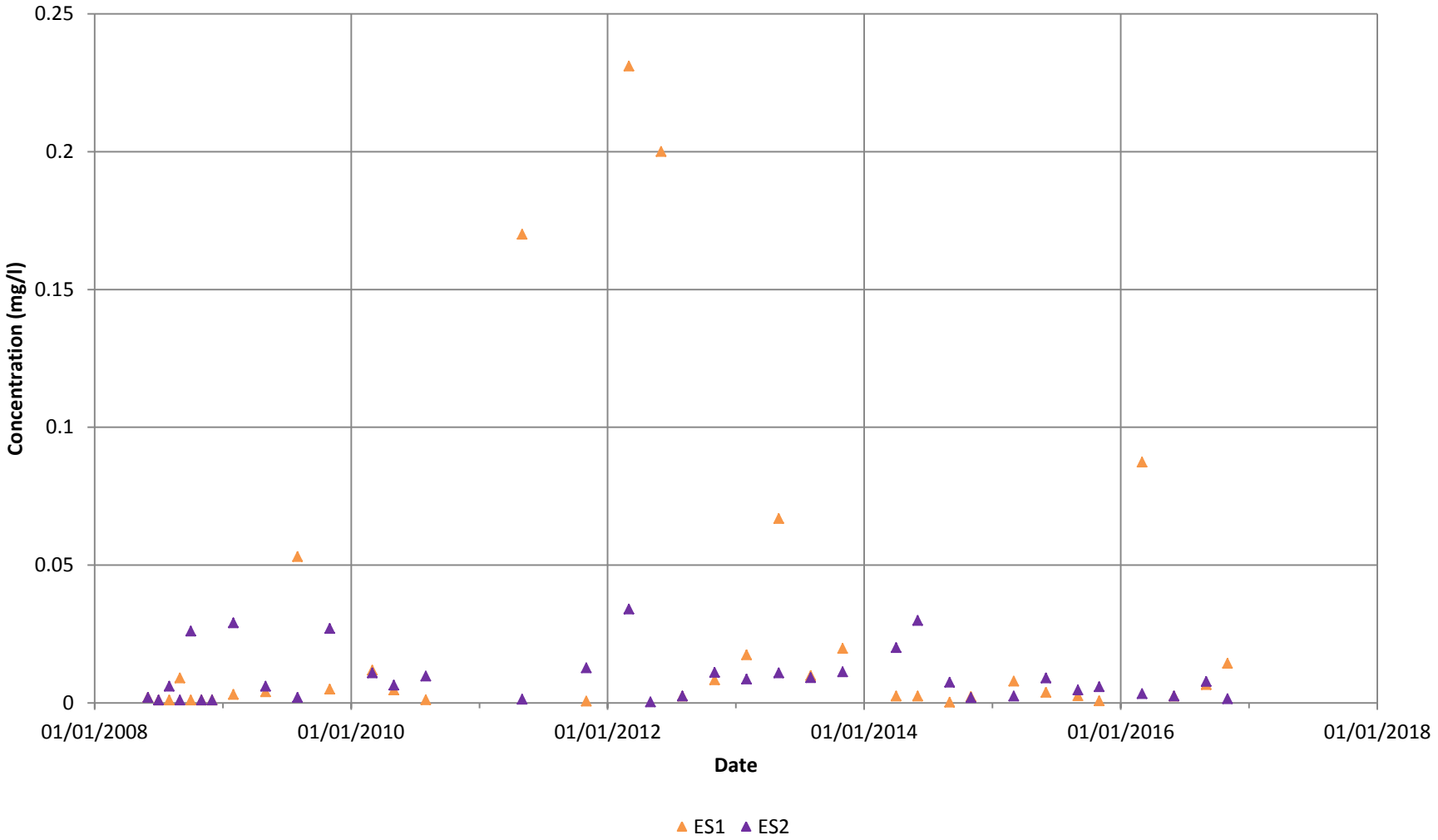
Valleyfield Ash Lagoons - Molybdenum Data
Estuarine Locations



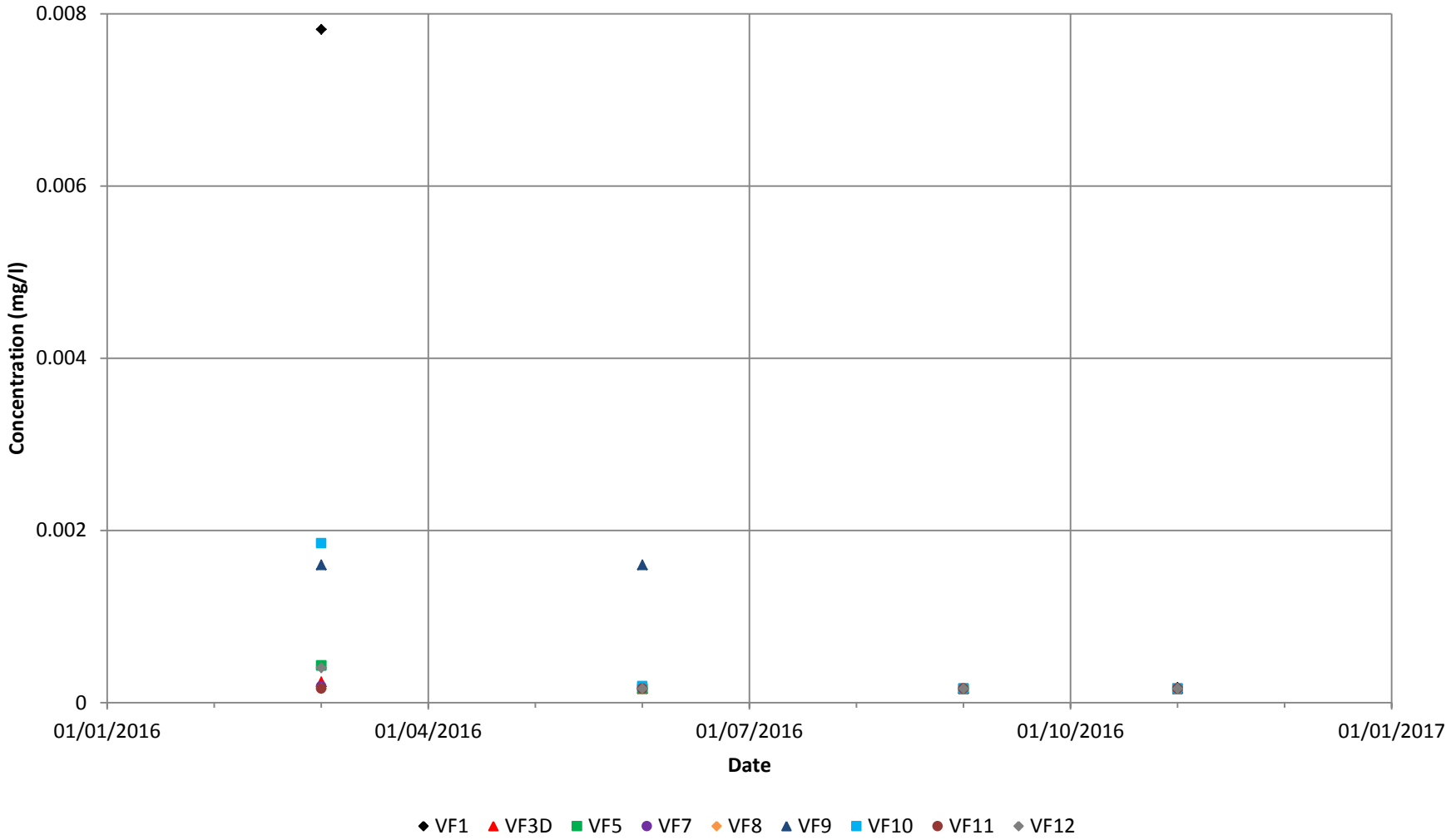
Valleyfield Ash Lagoons - Selenium Data
Estuarine Locations



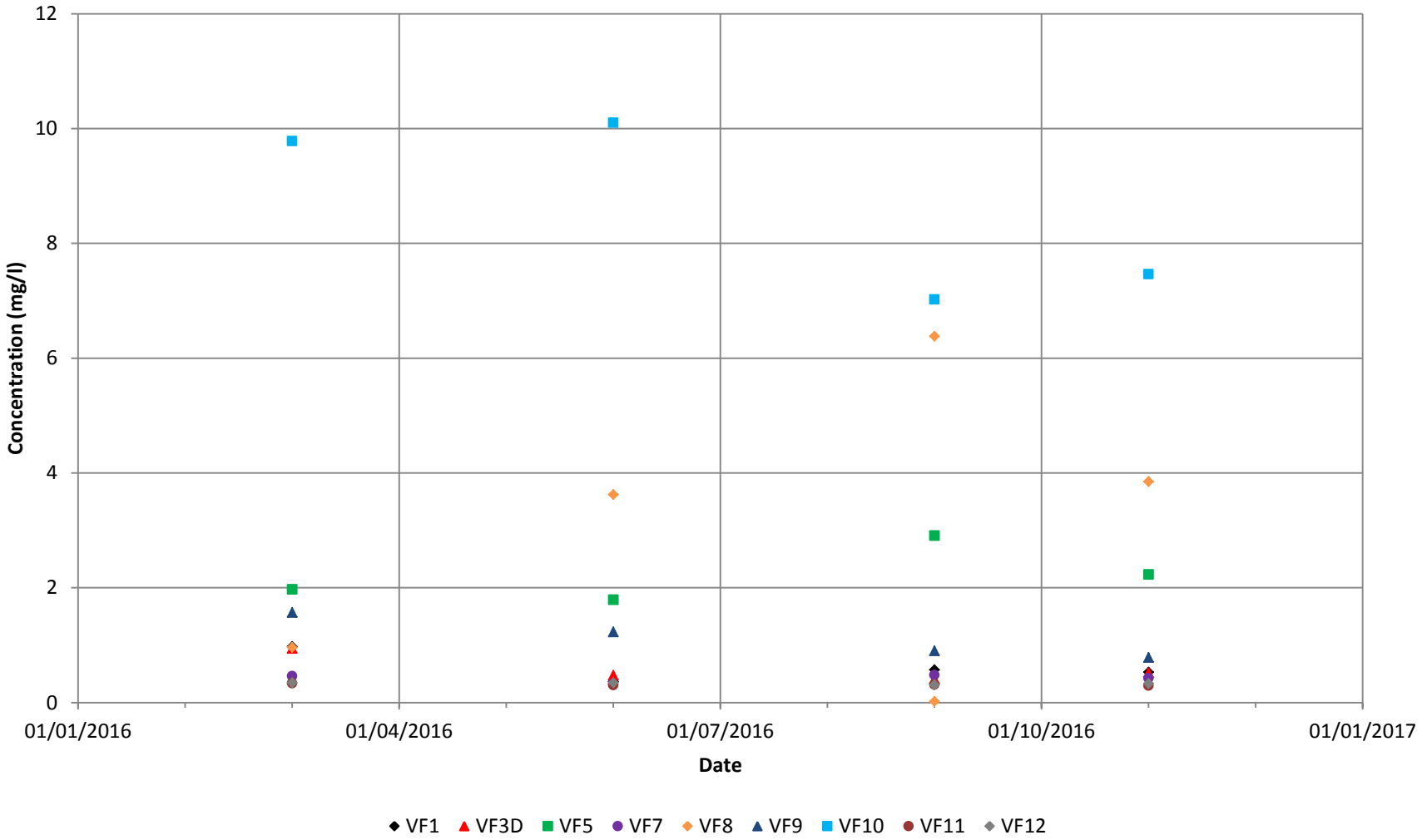
Valleyfield Ash Lagoons - Vanadium Data
Estuarine Locations



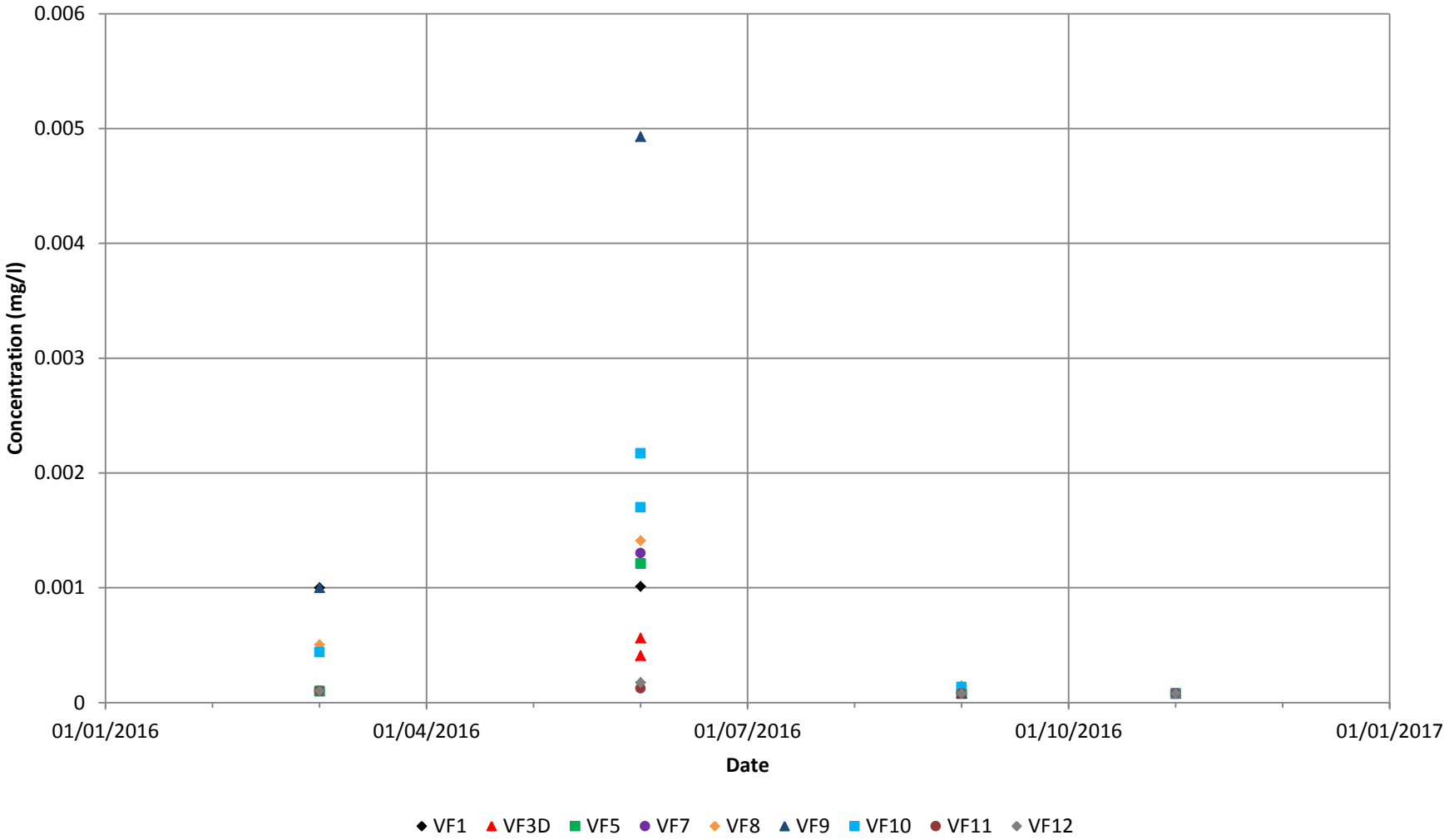
Valleyfield Ash Lagoons - 2016 Antimony Data
Groundwater Locations



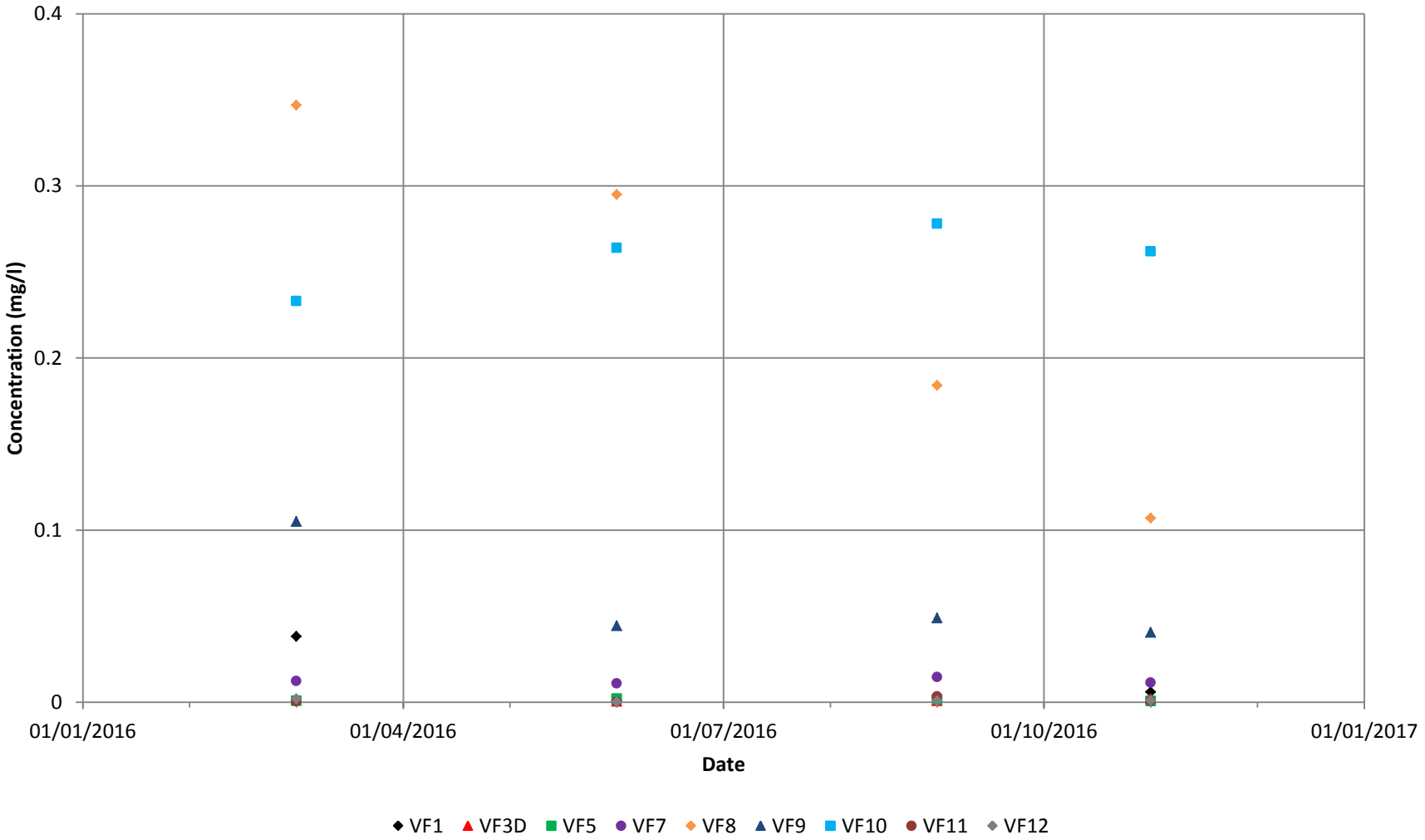
Valleyfield Ash Lagoons - 2016 Boron Data
Groundwater Locations



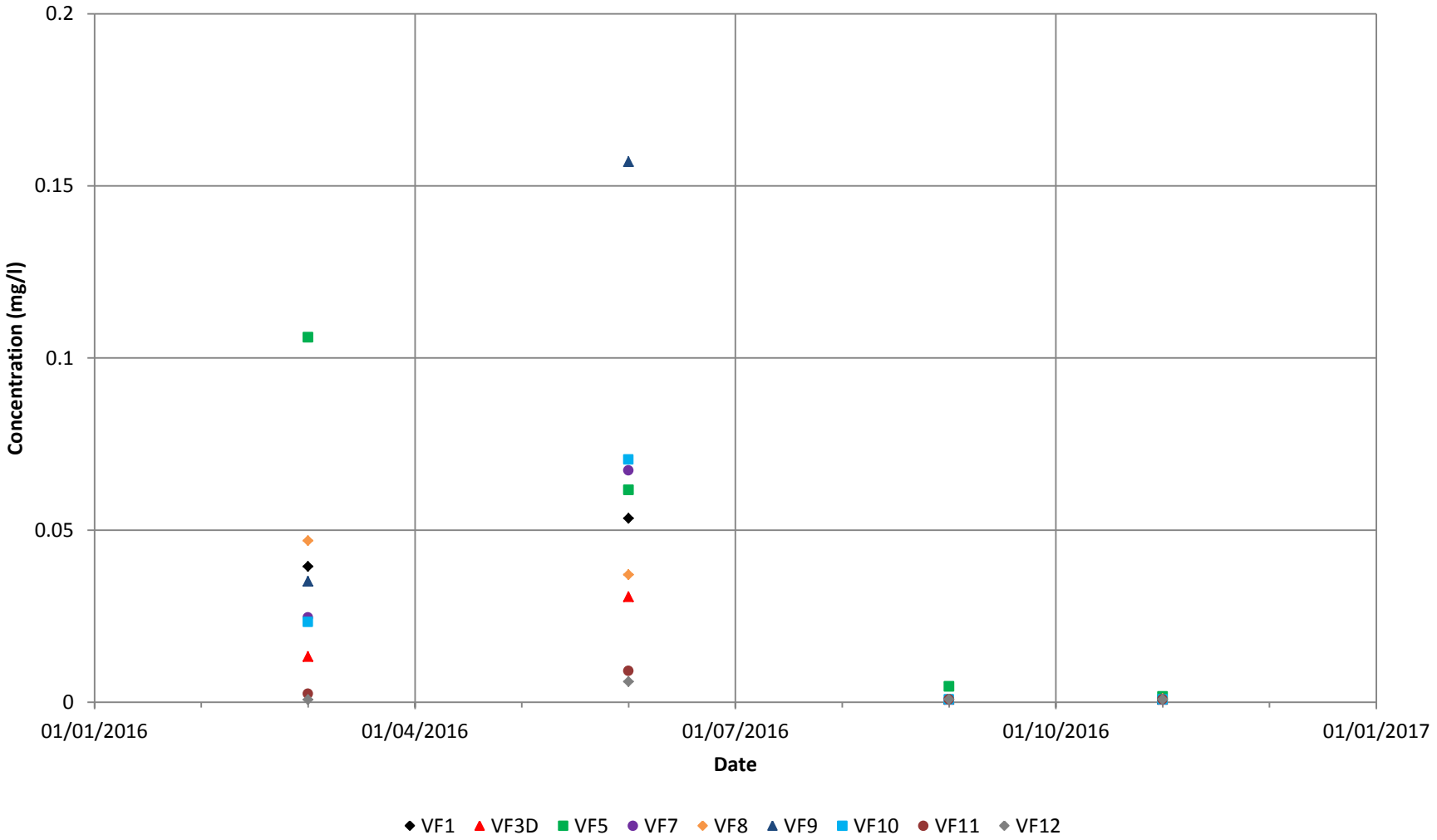
Valleyfield Ash Lagoons - 2016 Cadmium Data
Groundwater Locations



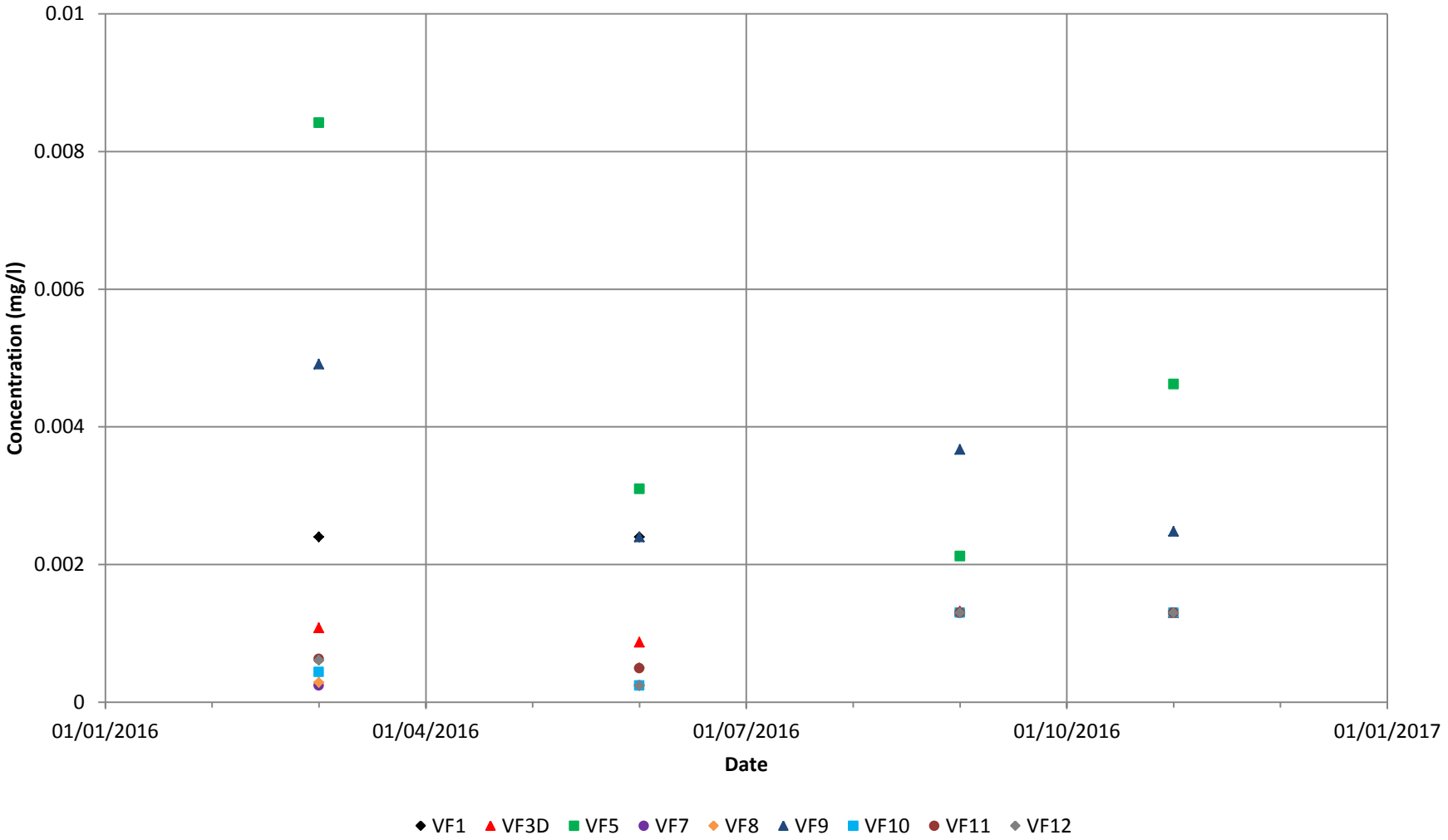
Valleyfield Ash Lagoons - 2016 Molybdenum Data
Groundwater Locations



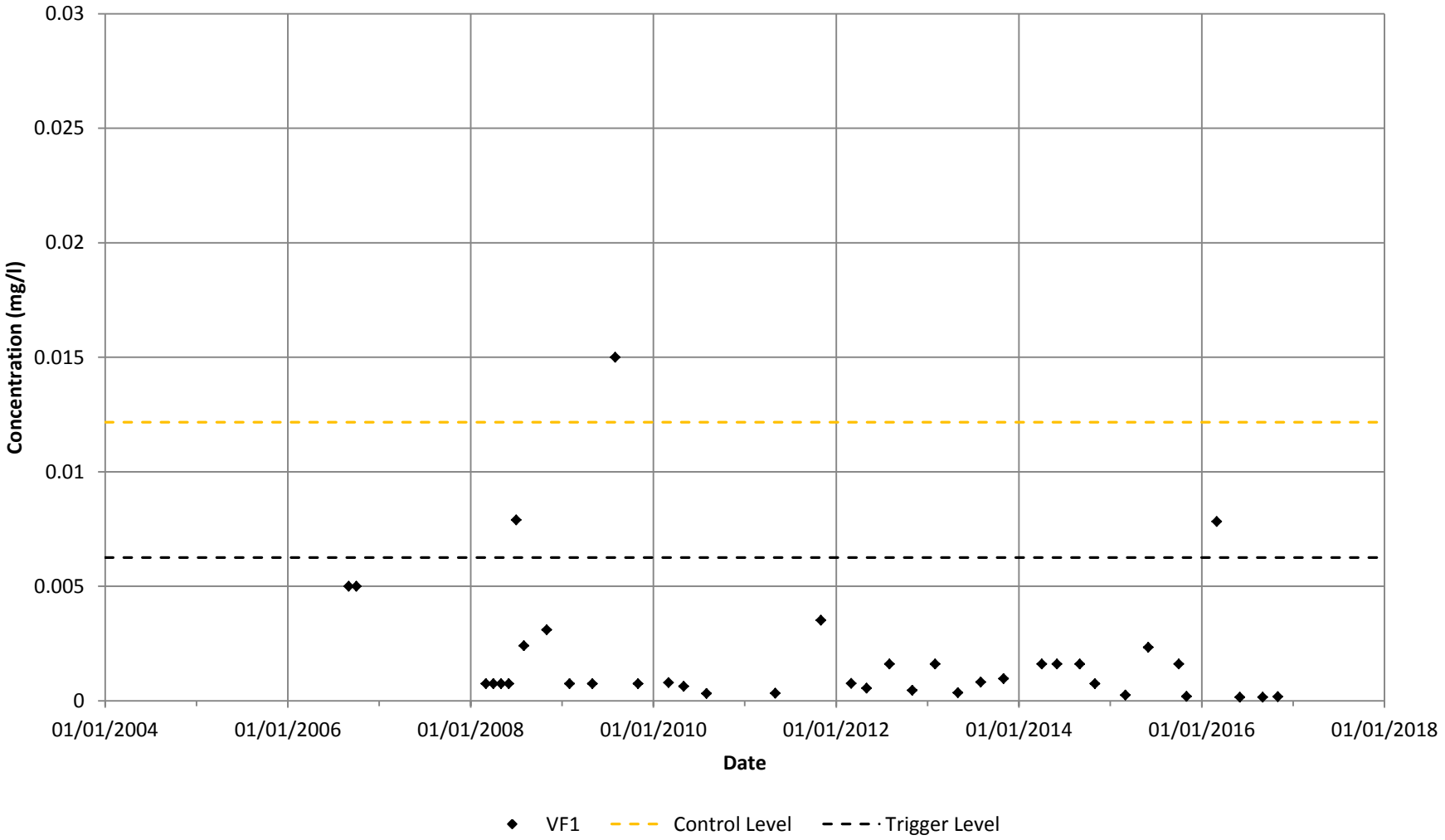
Valleyfield Ash Lagoons - 2016 Selenium Data
Groundwater Locations



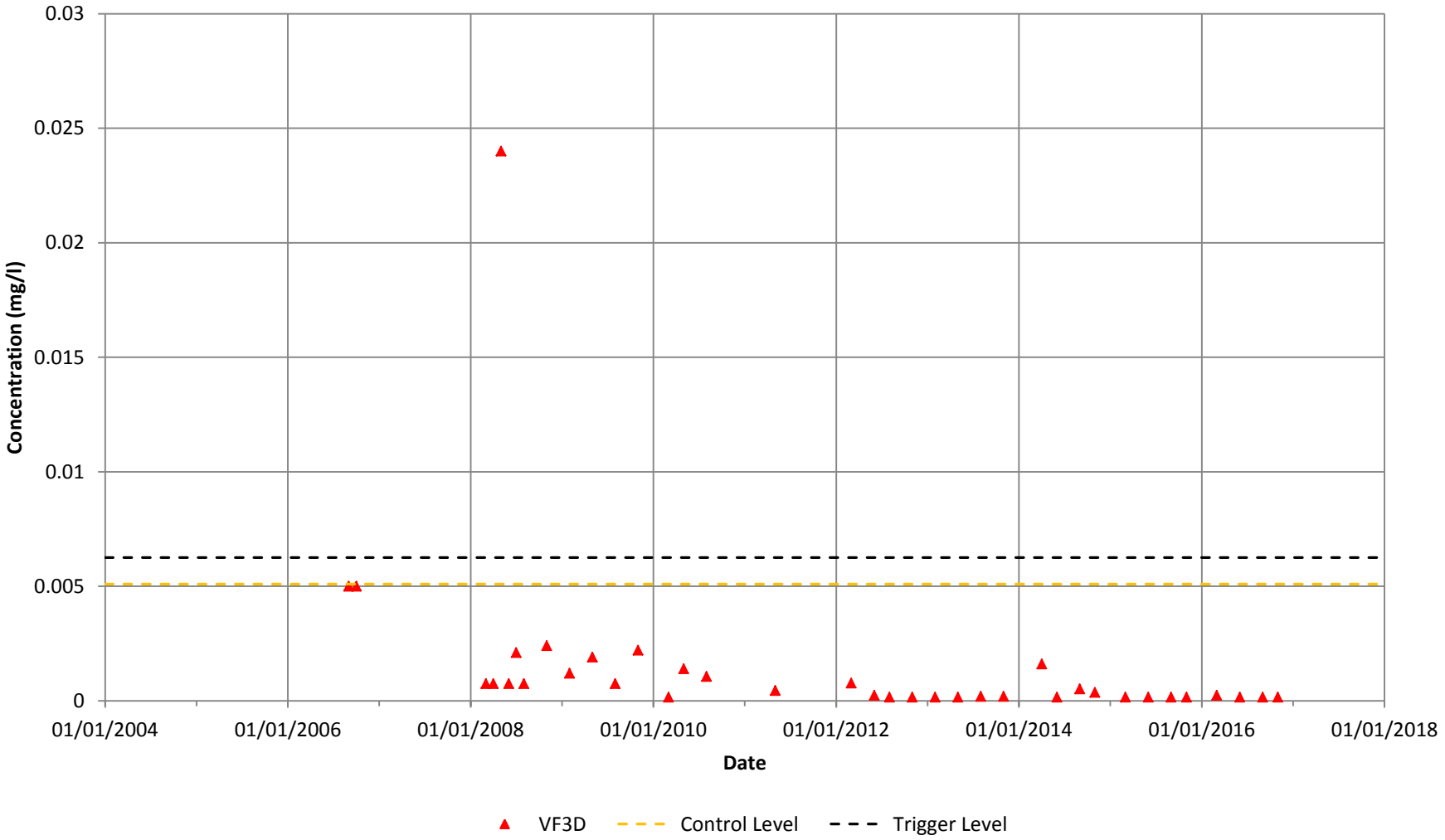
Valleyfield Ash Lagoons - 2016 Vanadium Data
Groundwater Locations



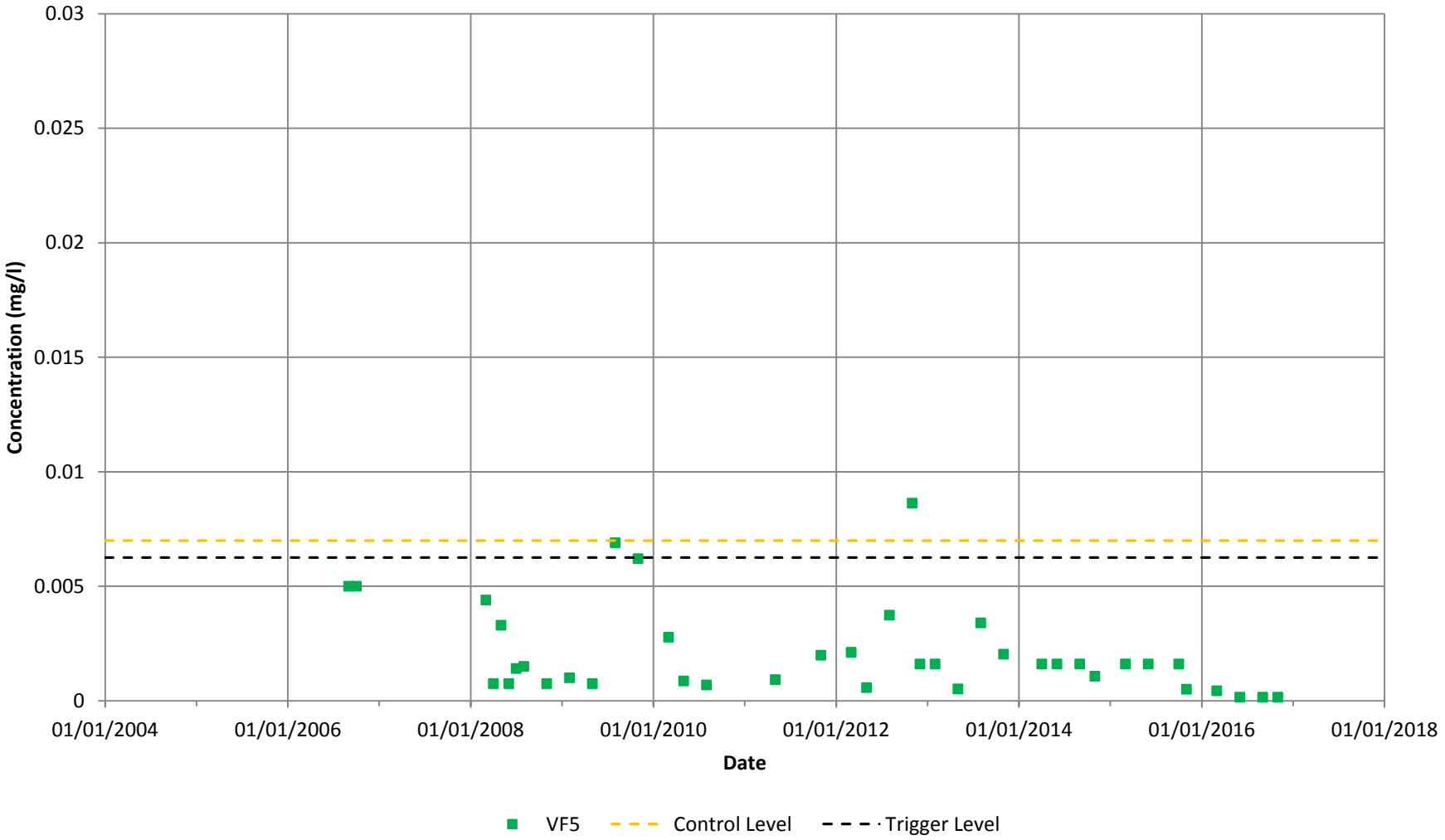
Valleyfield Ash Lagoons - Antimony Data
VF1



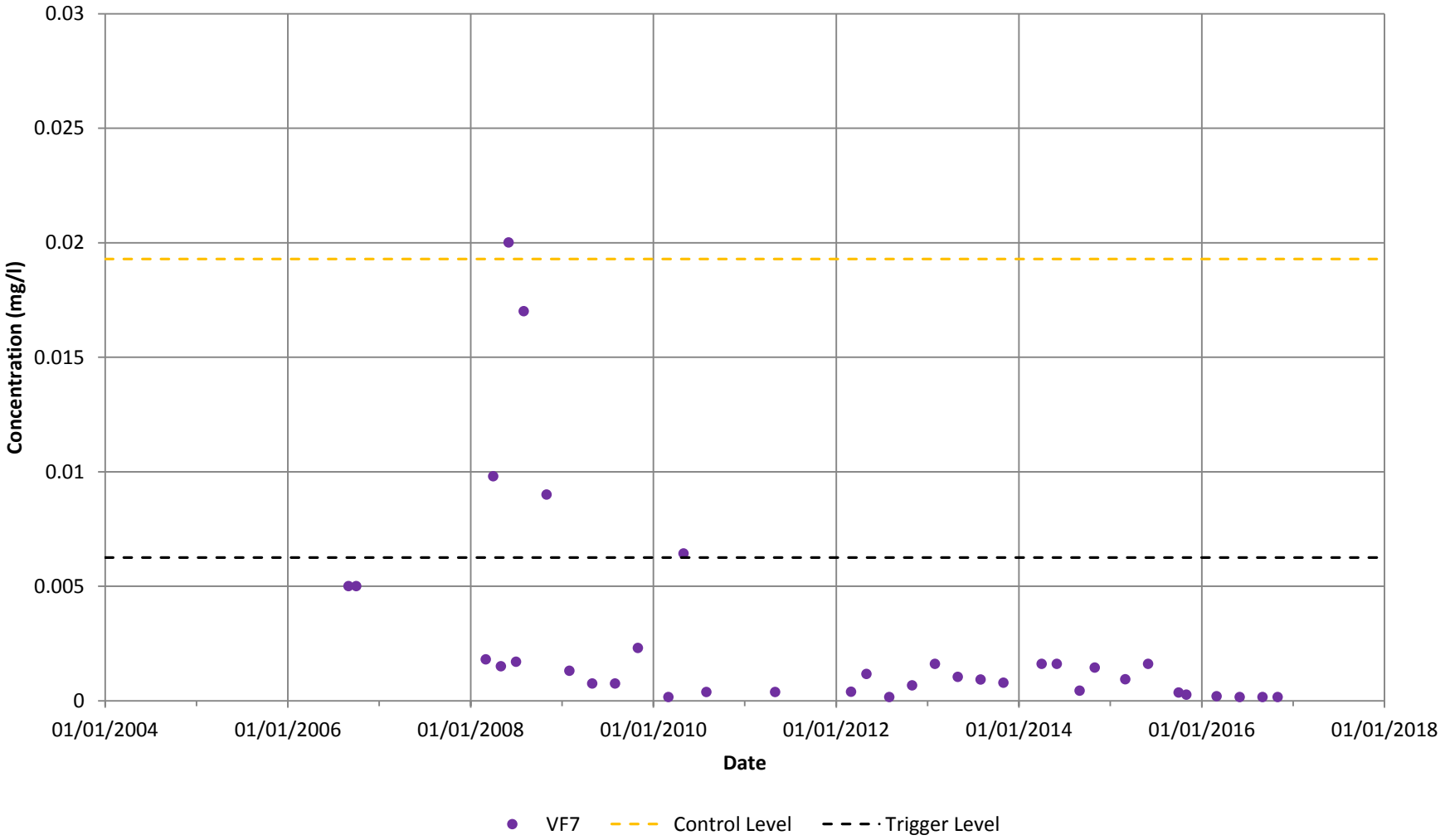
Valleyfield Ash Lagoons - Antimony Data
VF3D



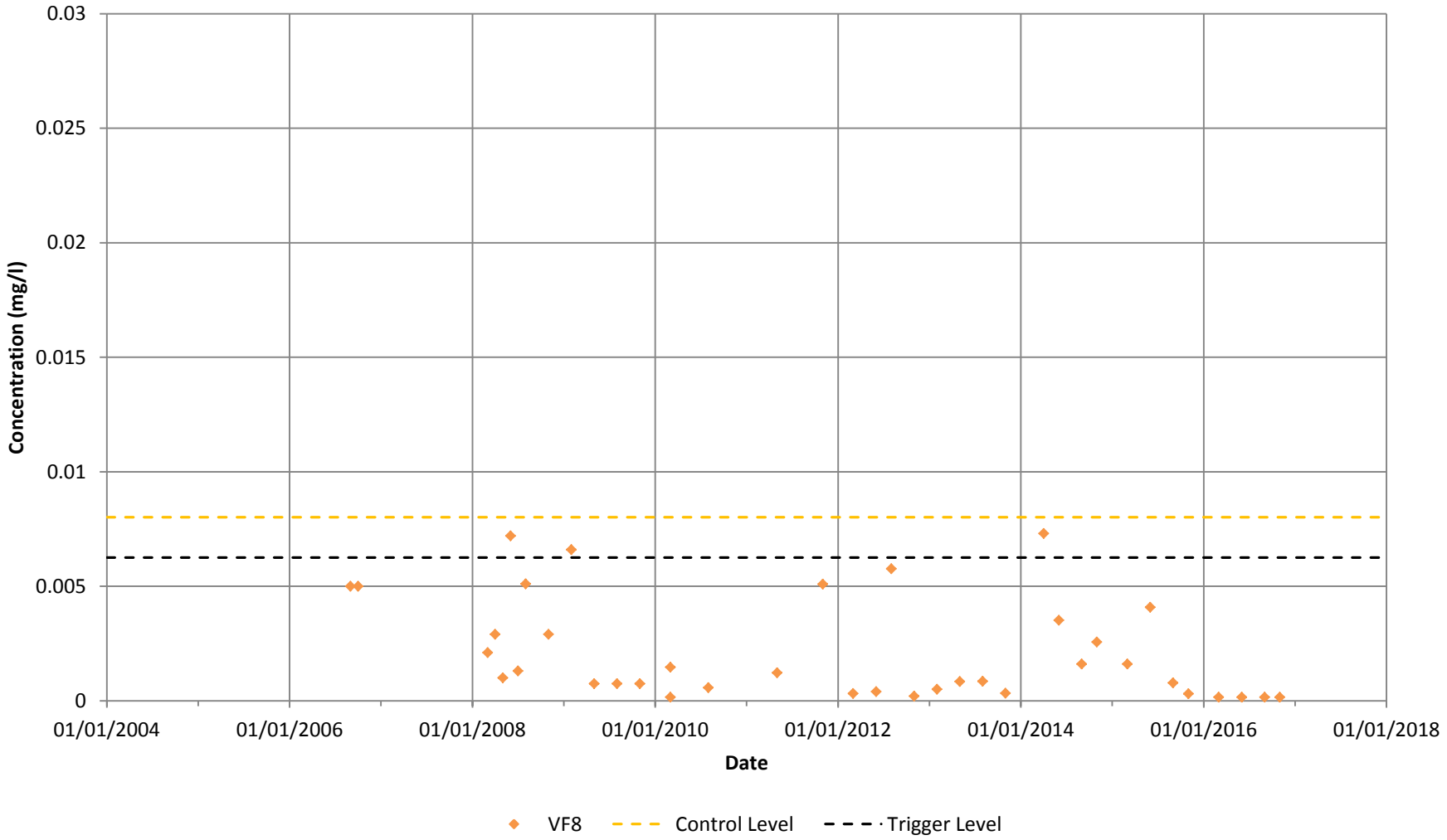
Valleyfield Ash Lagoons - Antimony Data
VF5



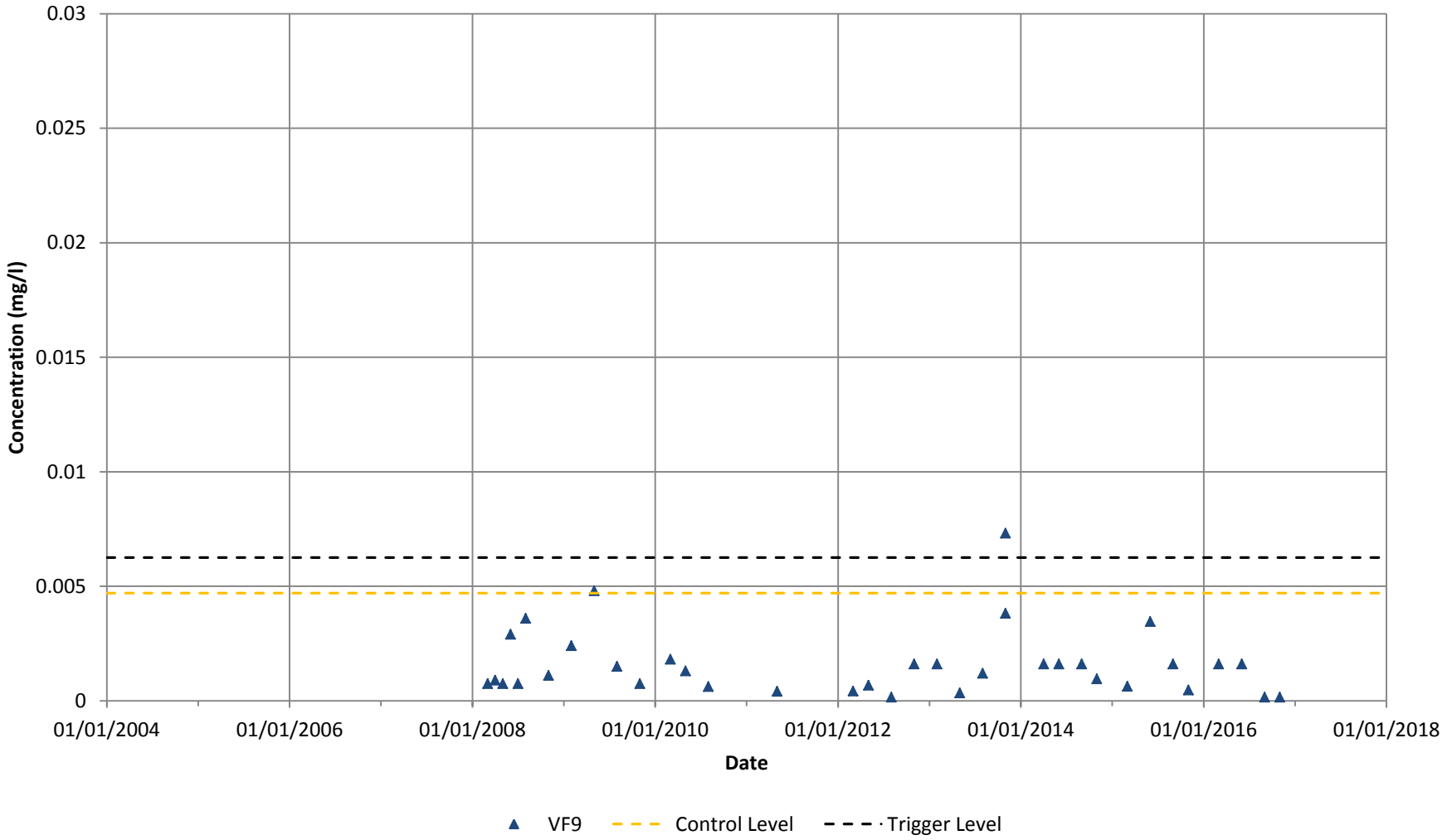
Valleyfield Ash Lagoons - Antimony Data
VF7



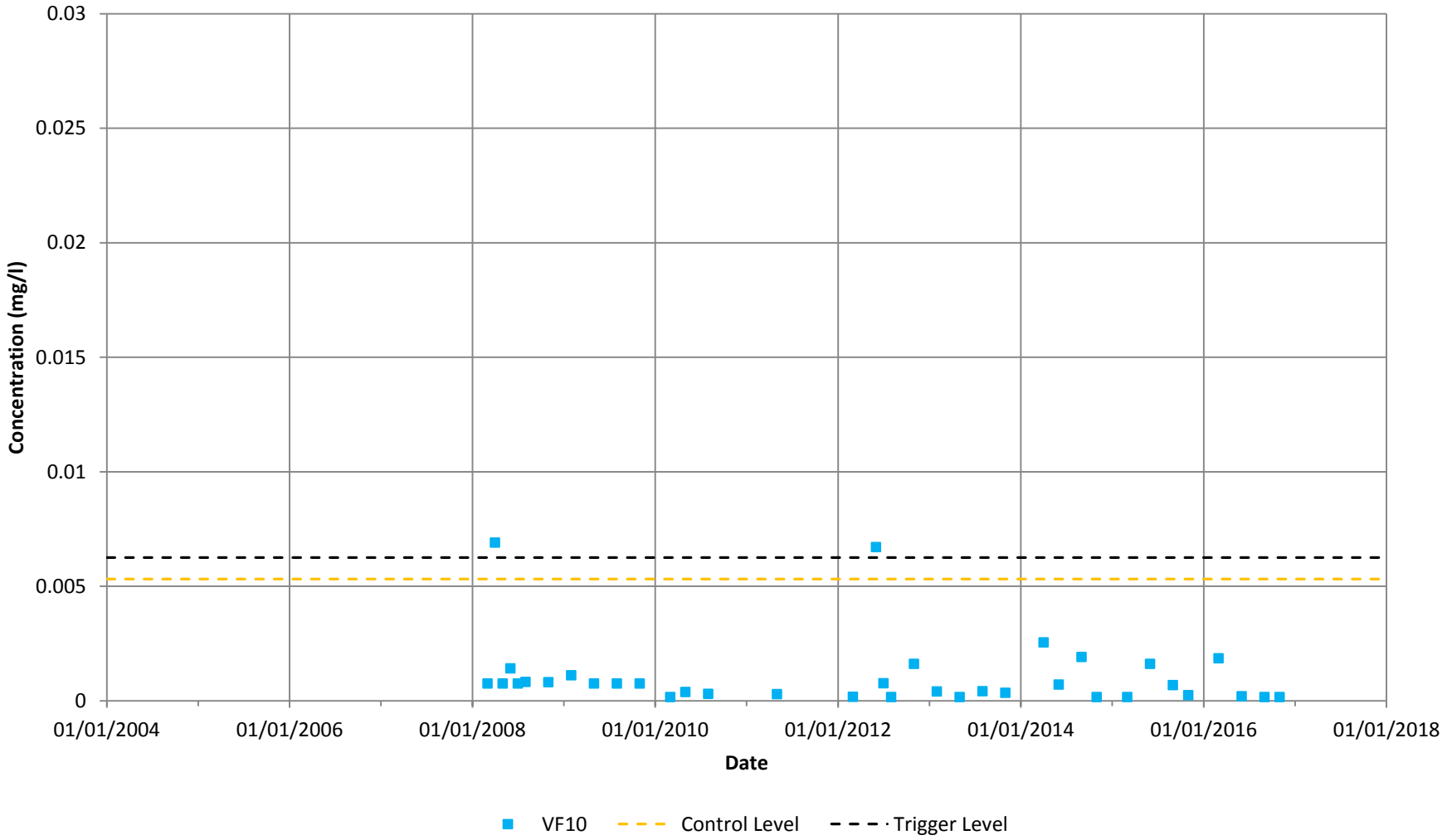
Valleyfield Ash Lagoons - Antimony Data
VF8



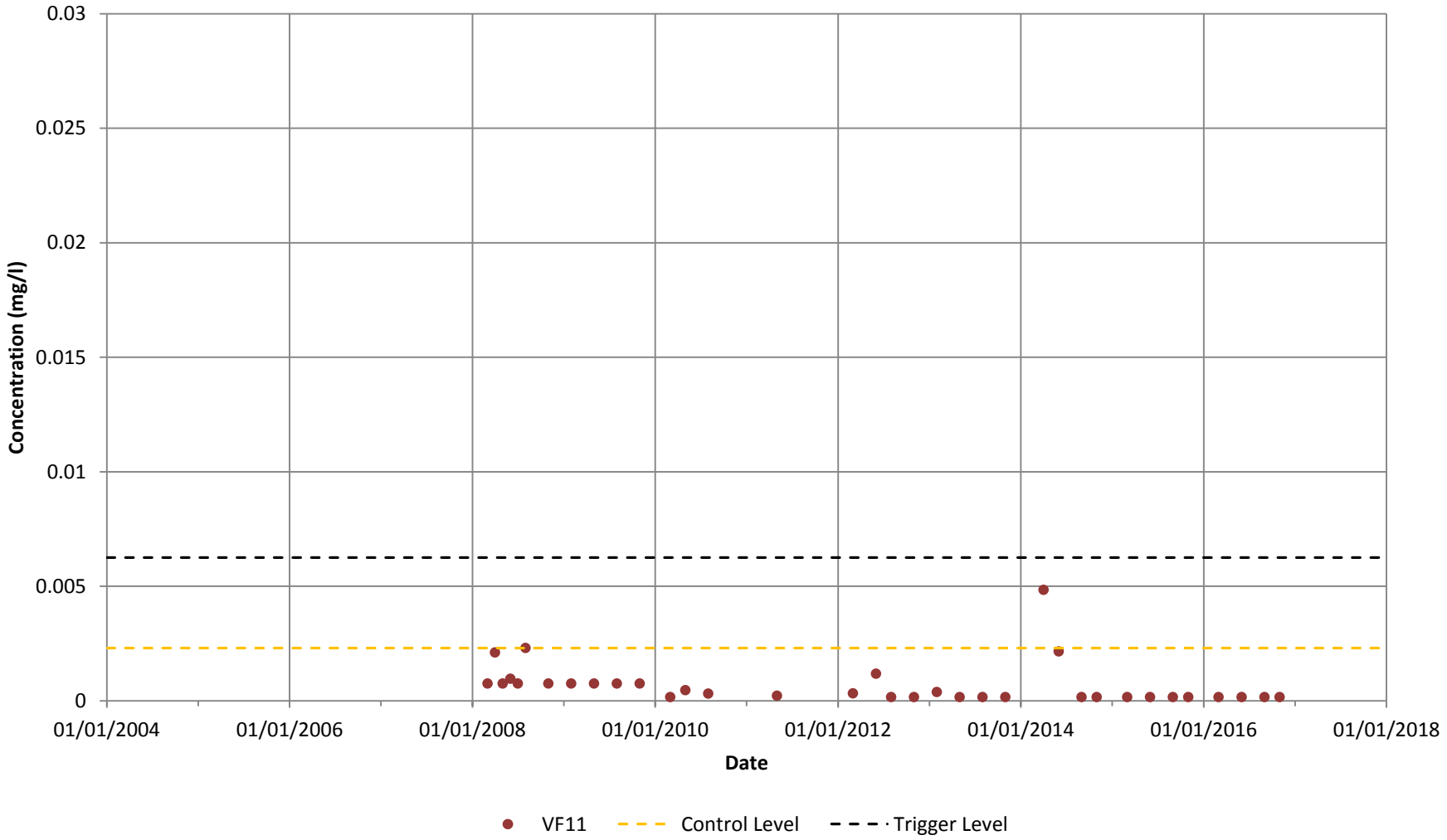
Valleyfield Ash Lagoons - Antimony Data
VF9



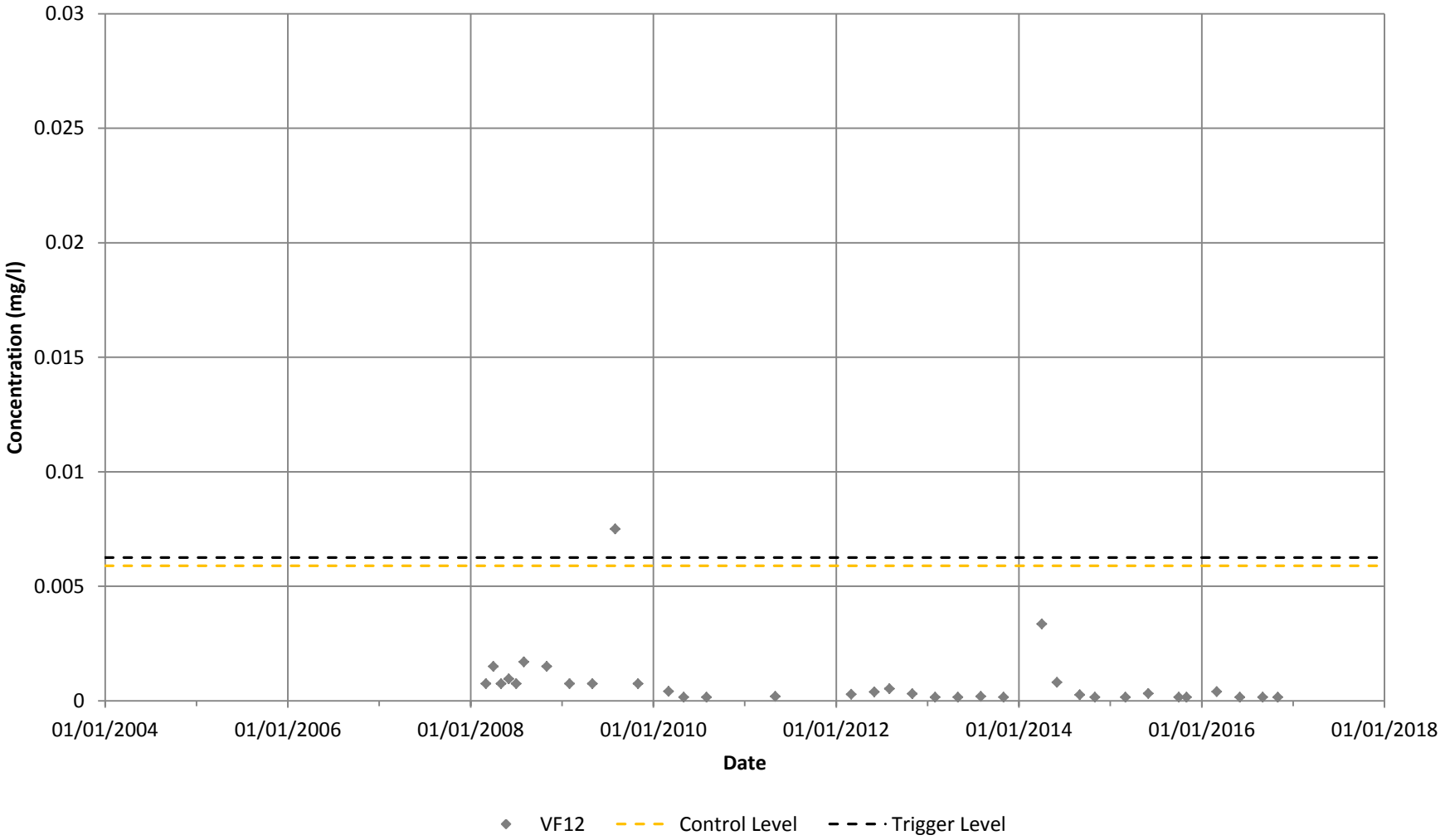
Valleyfield Ash Lagoons - Antimony Data
VF10



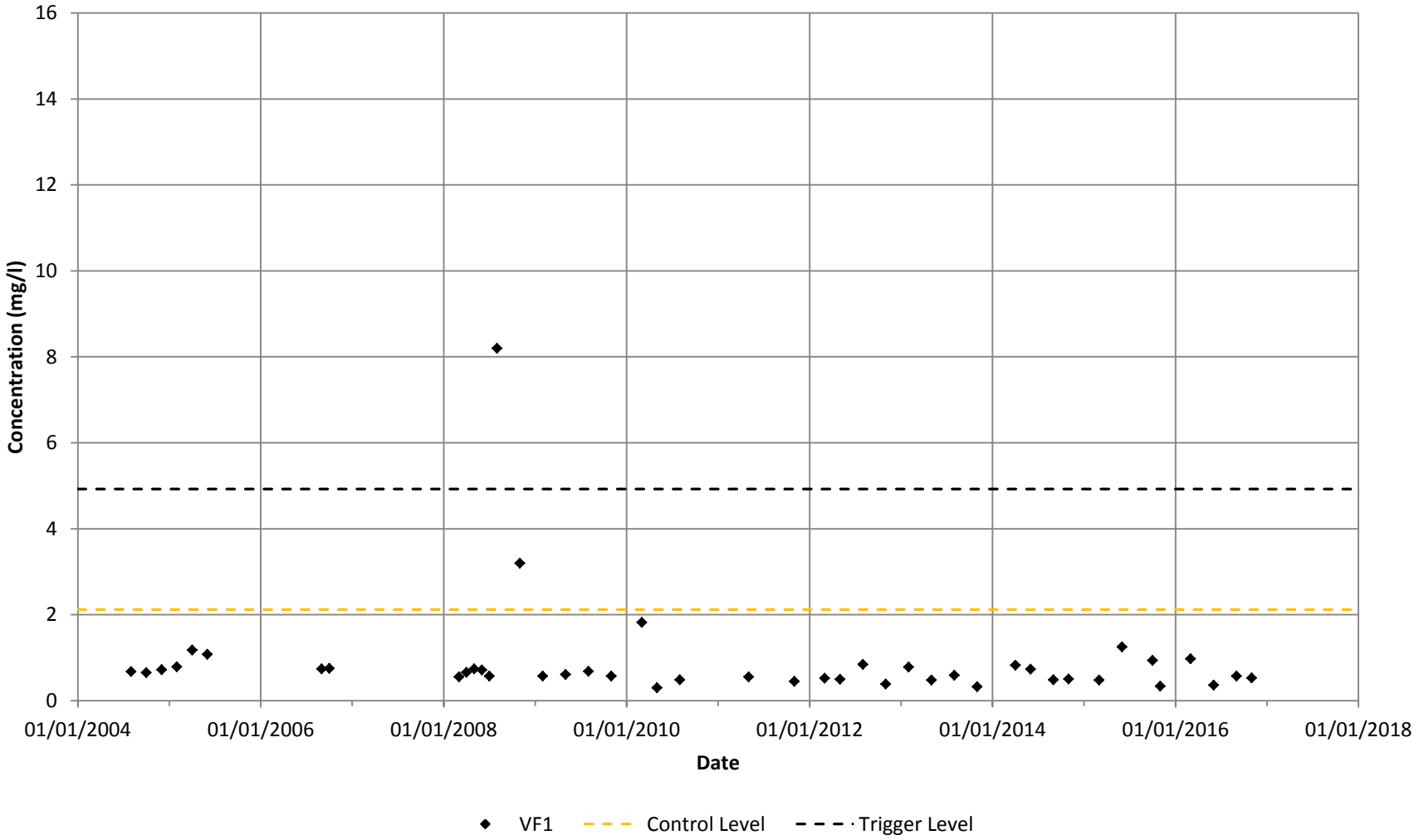
Valleyfield Ash Lagoons - Antimony Data
VF11



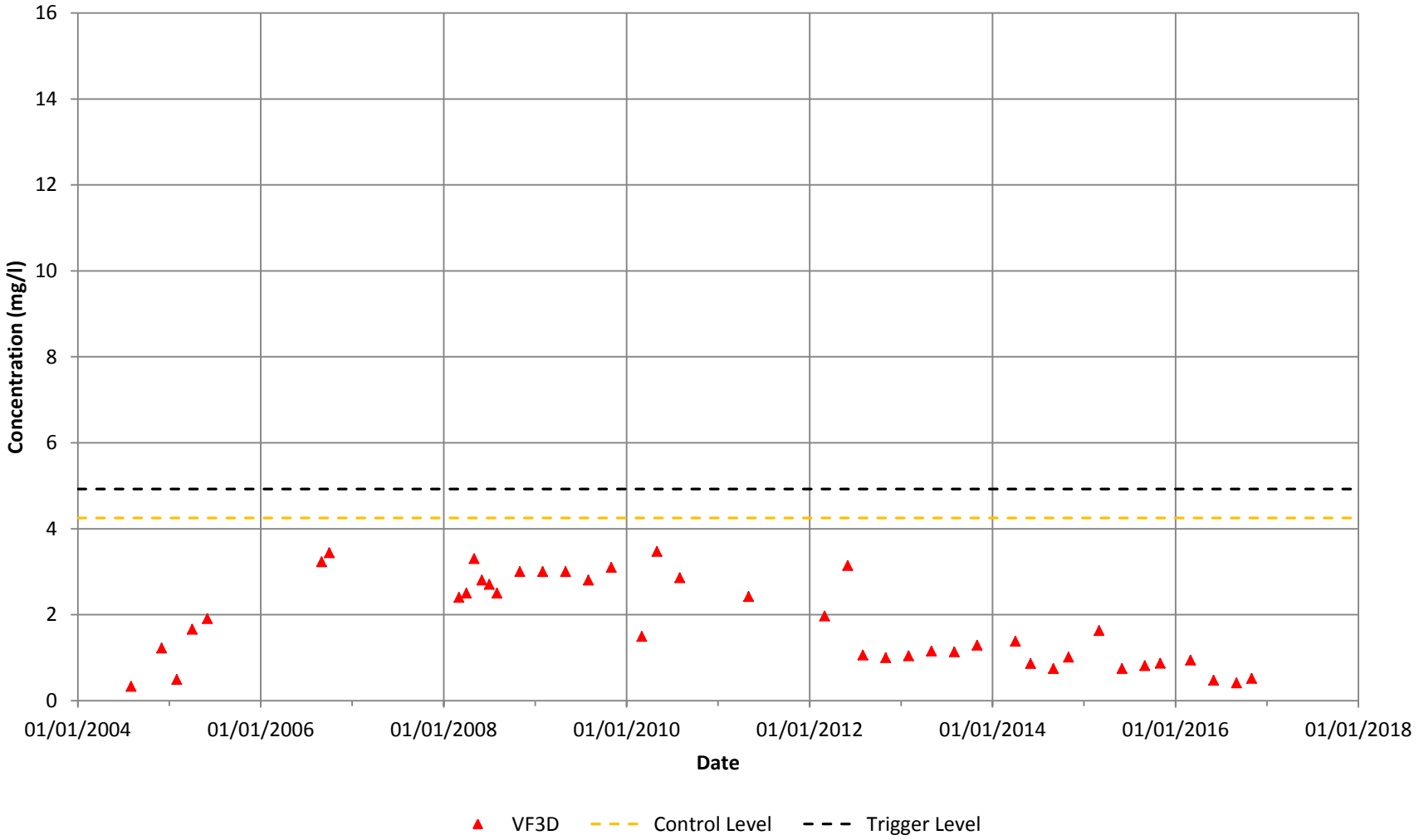
Valleyfield Ash Lagoons - Antimony Data
VF12



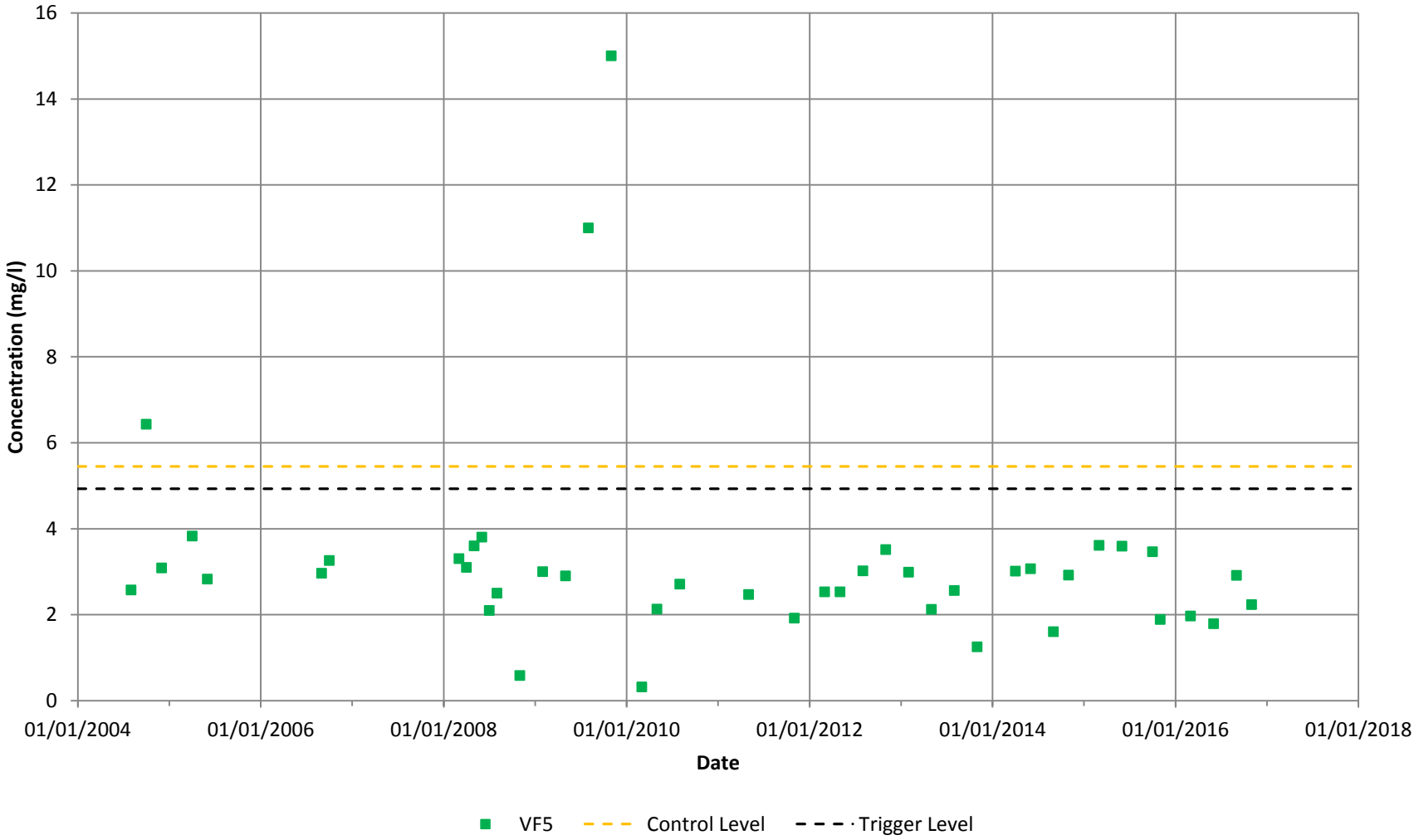
Valleyfield Ash Lagoons - Boron Data
VF1



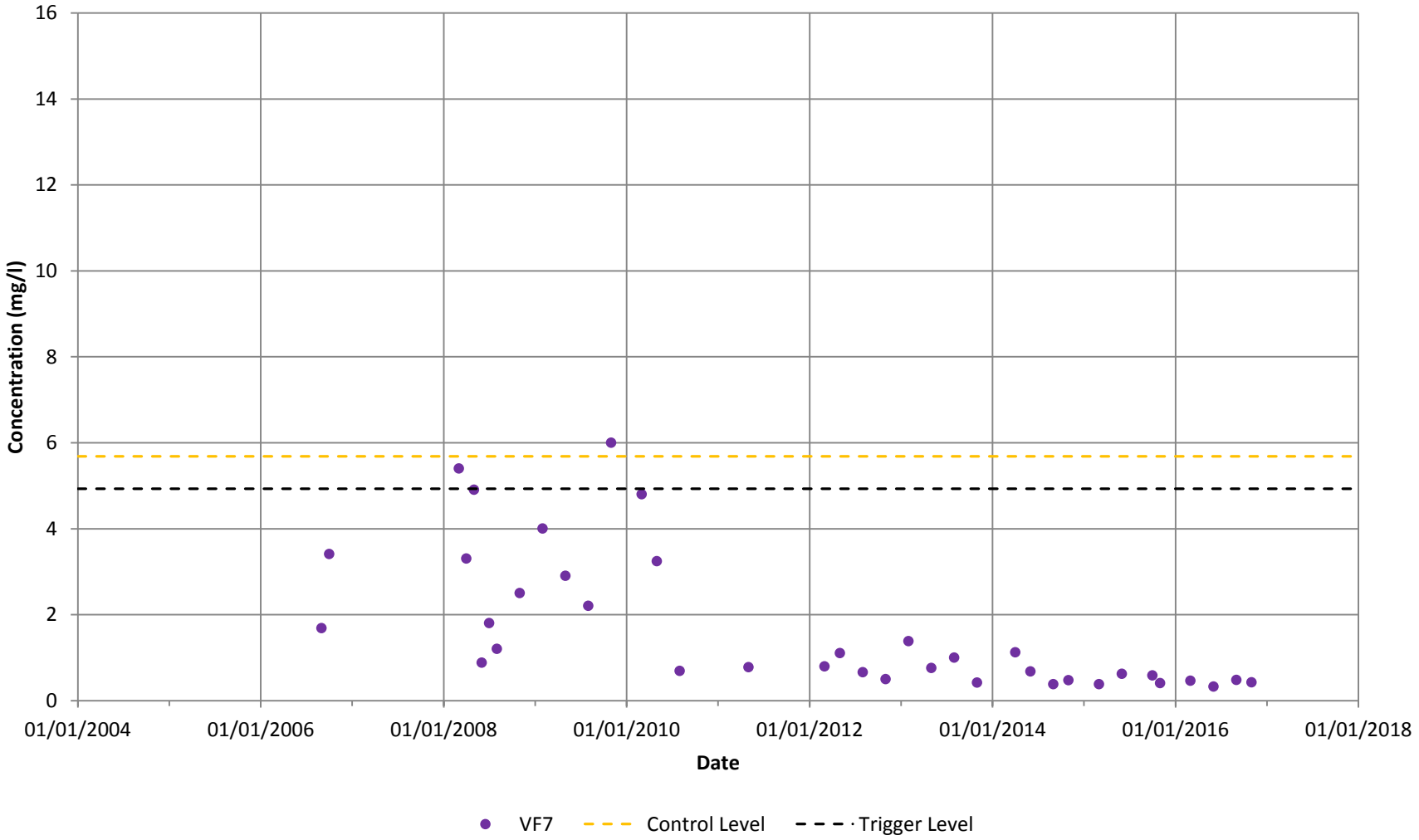
Valleyfield Ash Lagoons - Boron Data
VF3D



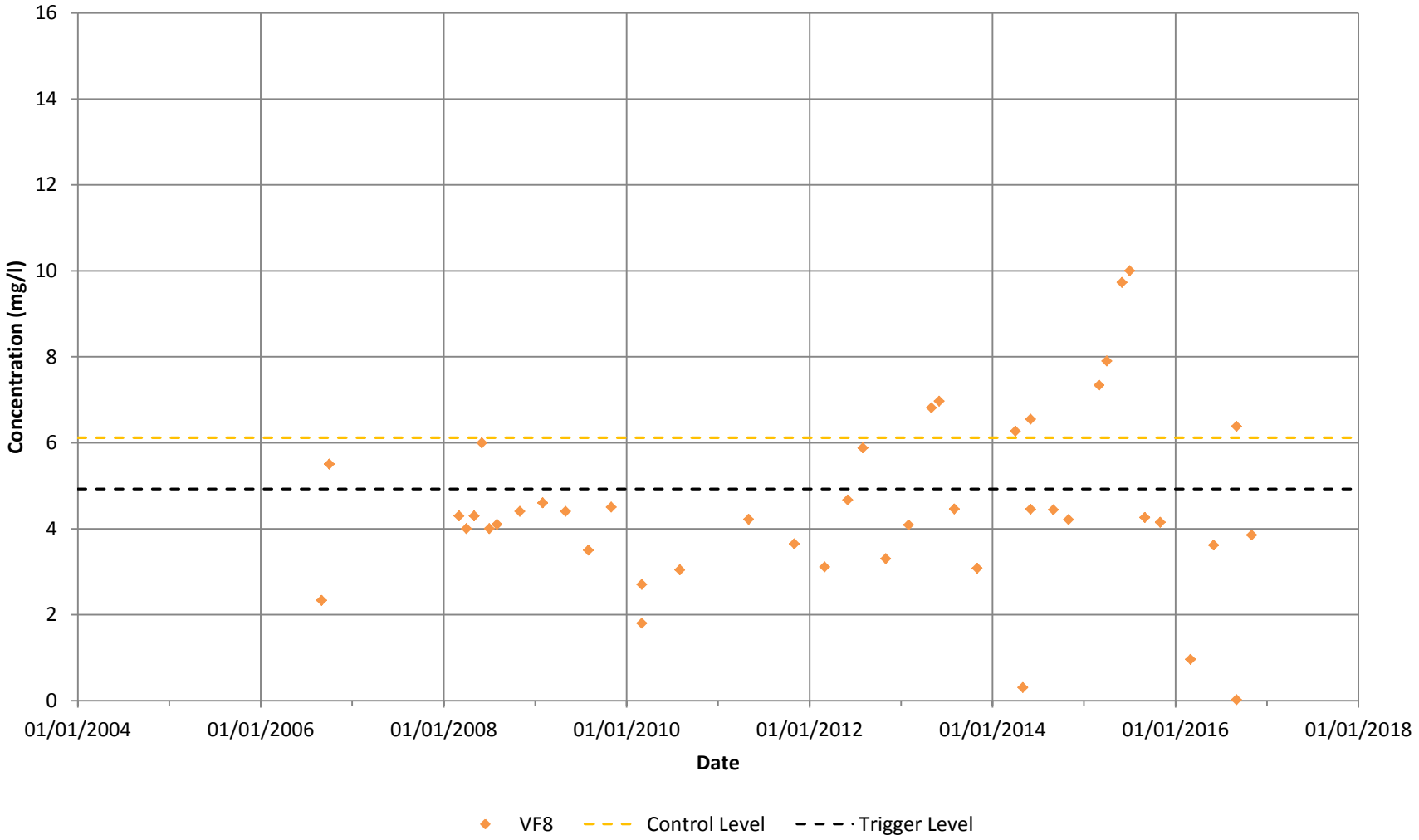
Valleyfield Ash Lagoons - Boron Data
VF5



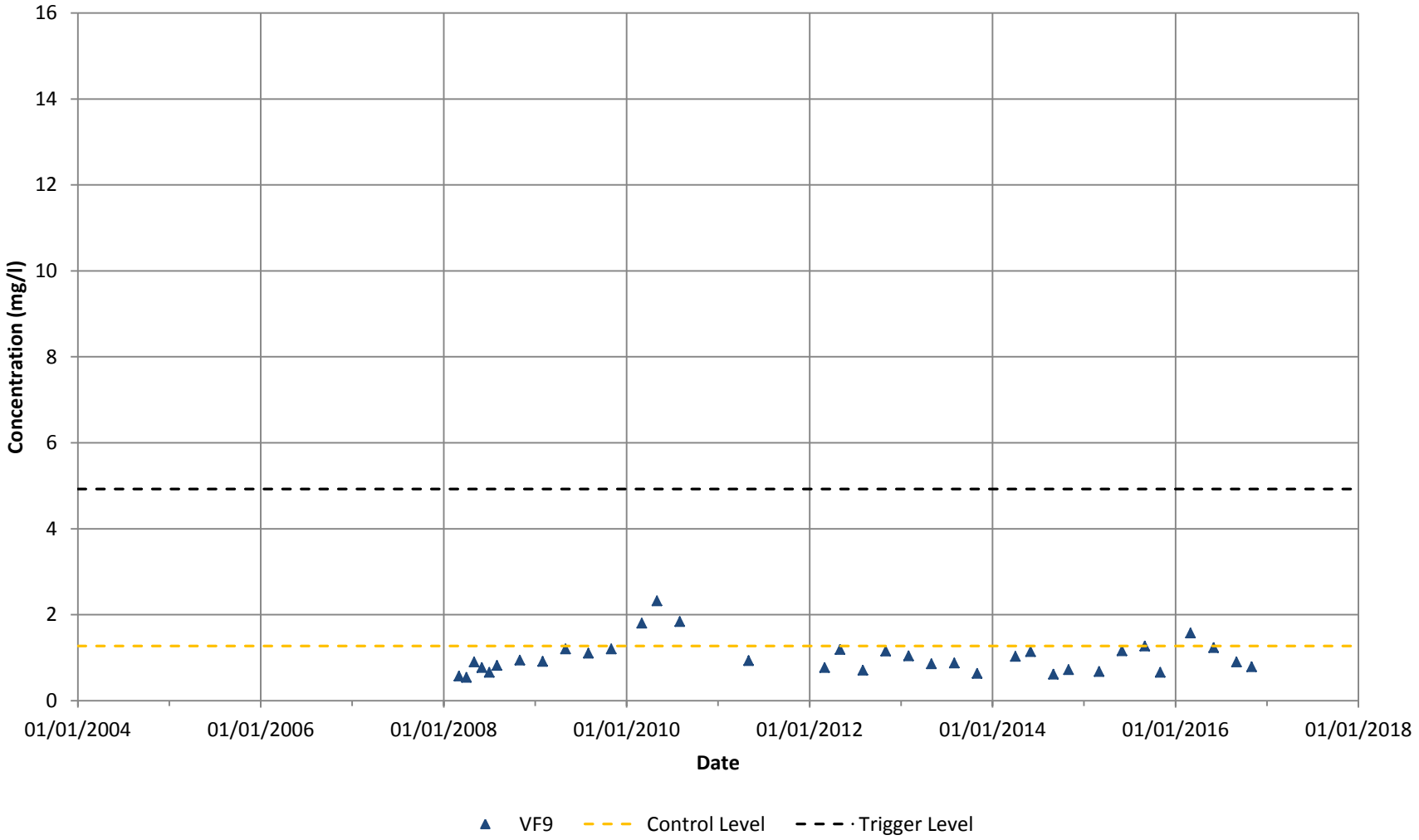
Valleyfield Ash Lagoons - Boron Data
VF7



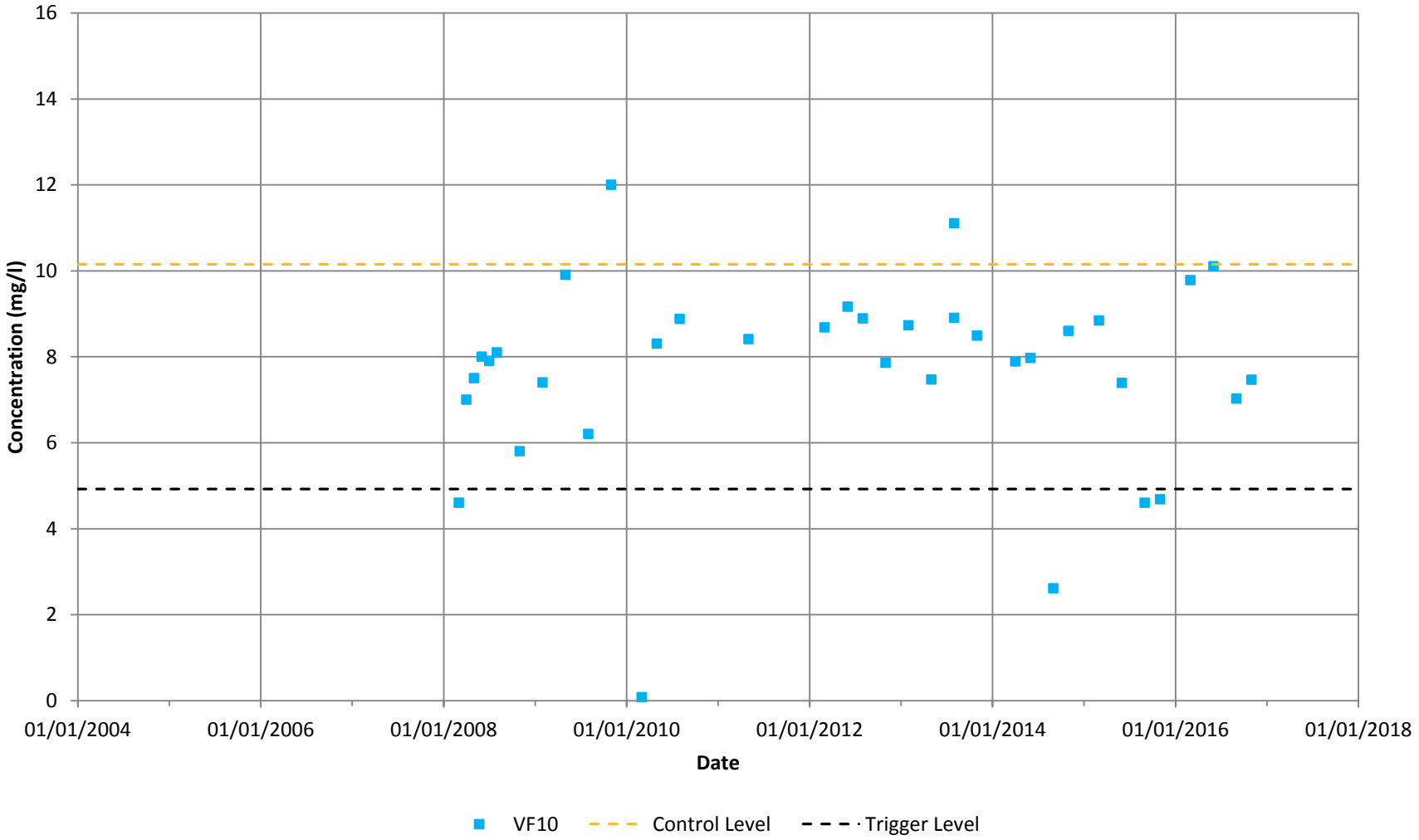
Valleyfield Ash Lagoons - Boron Data
VF8



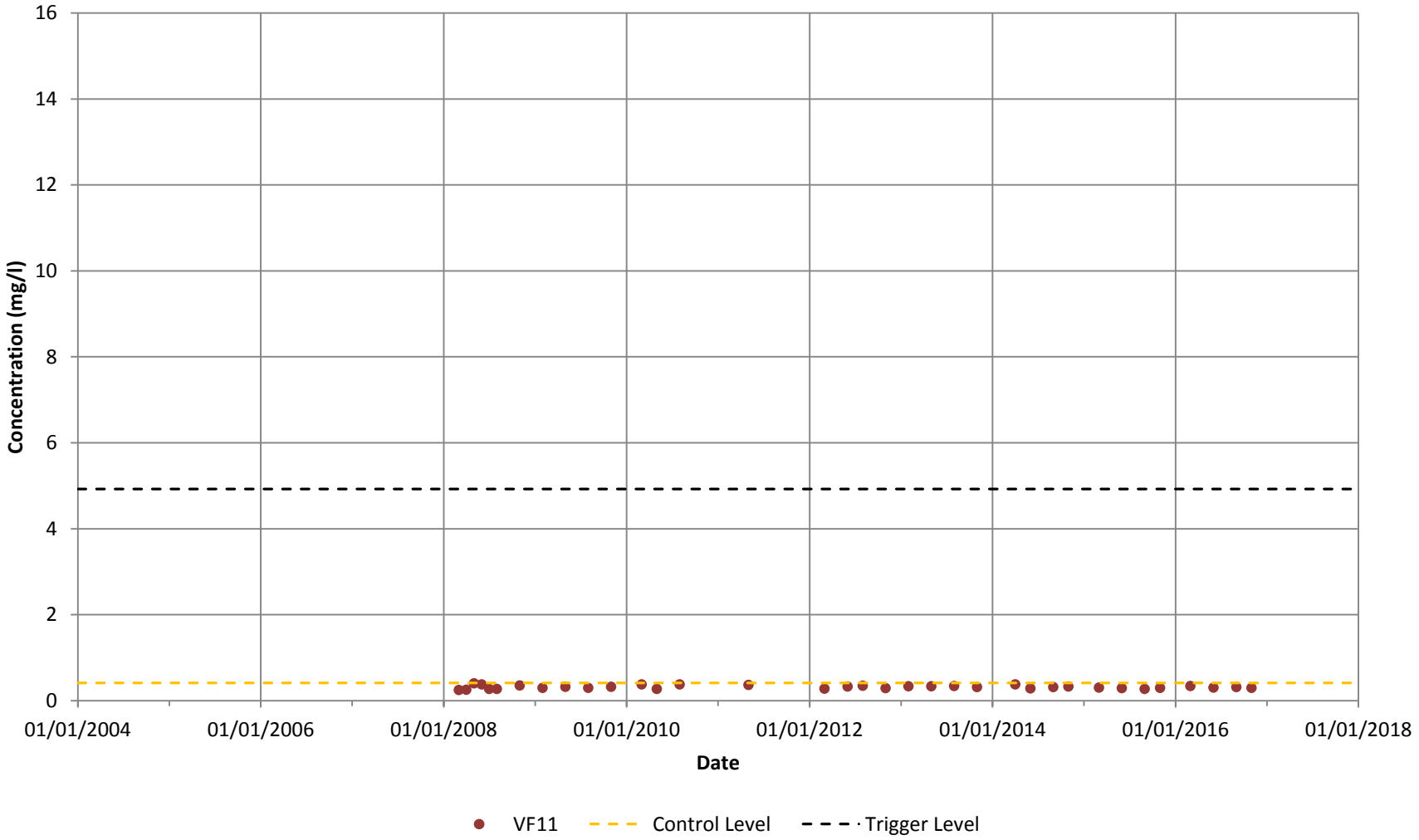
Valleyfield Ash Lagoons - Boron Data
VF9



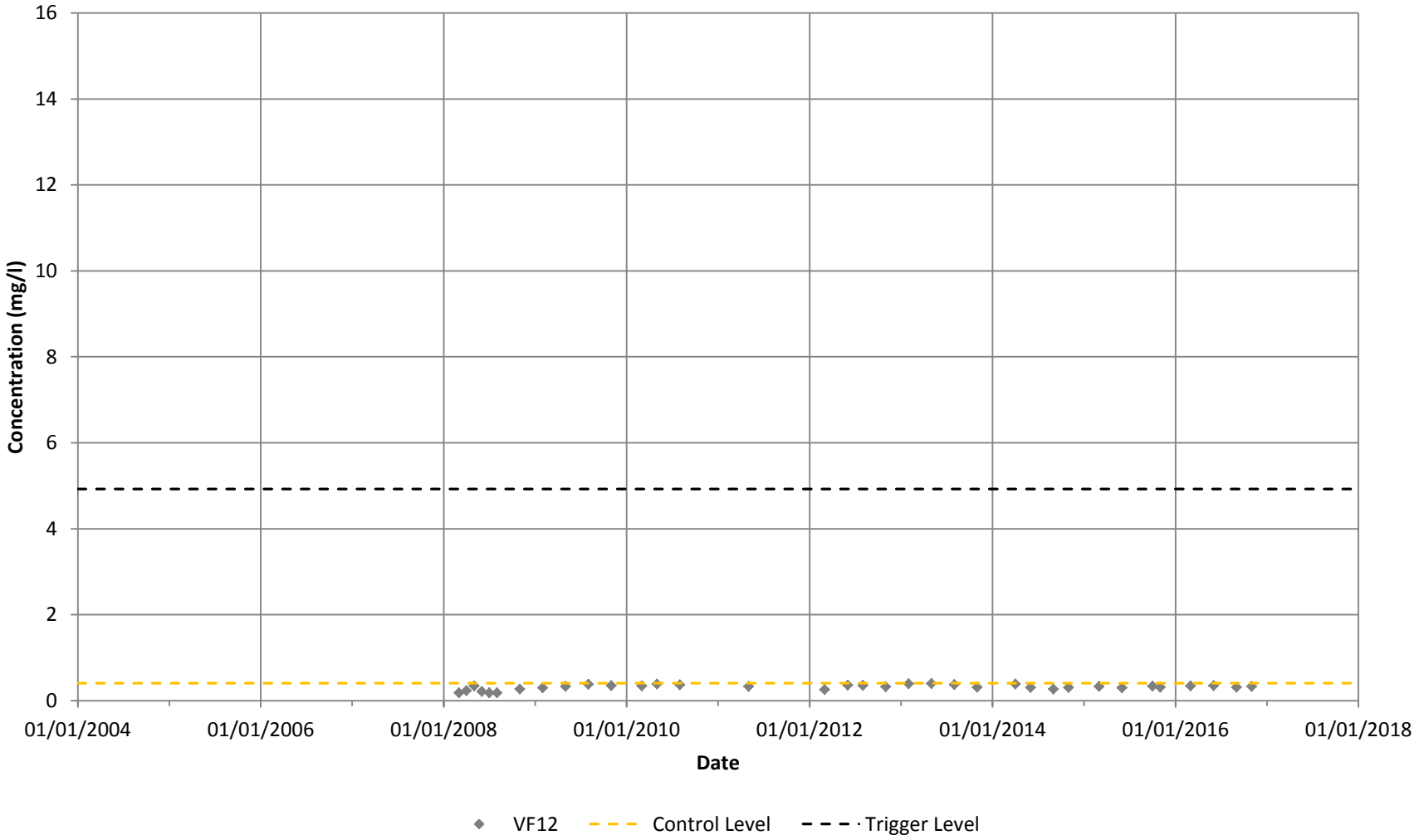
Valleyfield Ash Lagoons - Boron Data
VF10



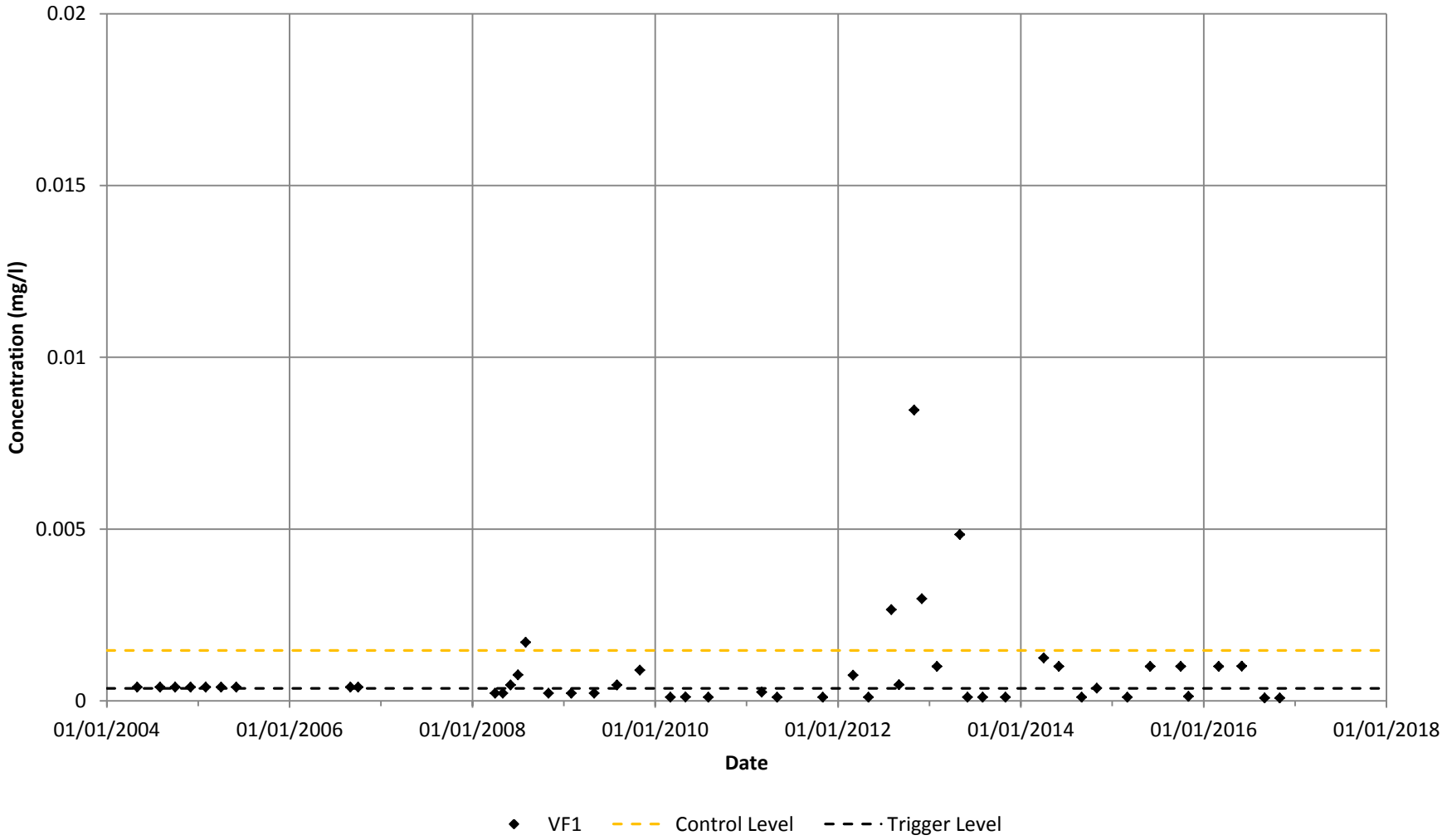
Valleyfield Ash Lagoons - Boron Data
VF11



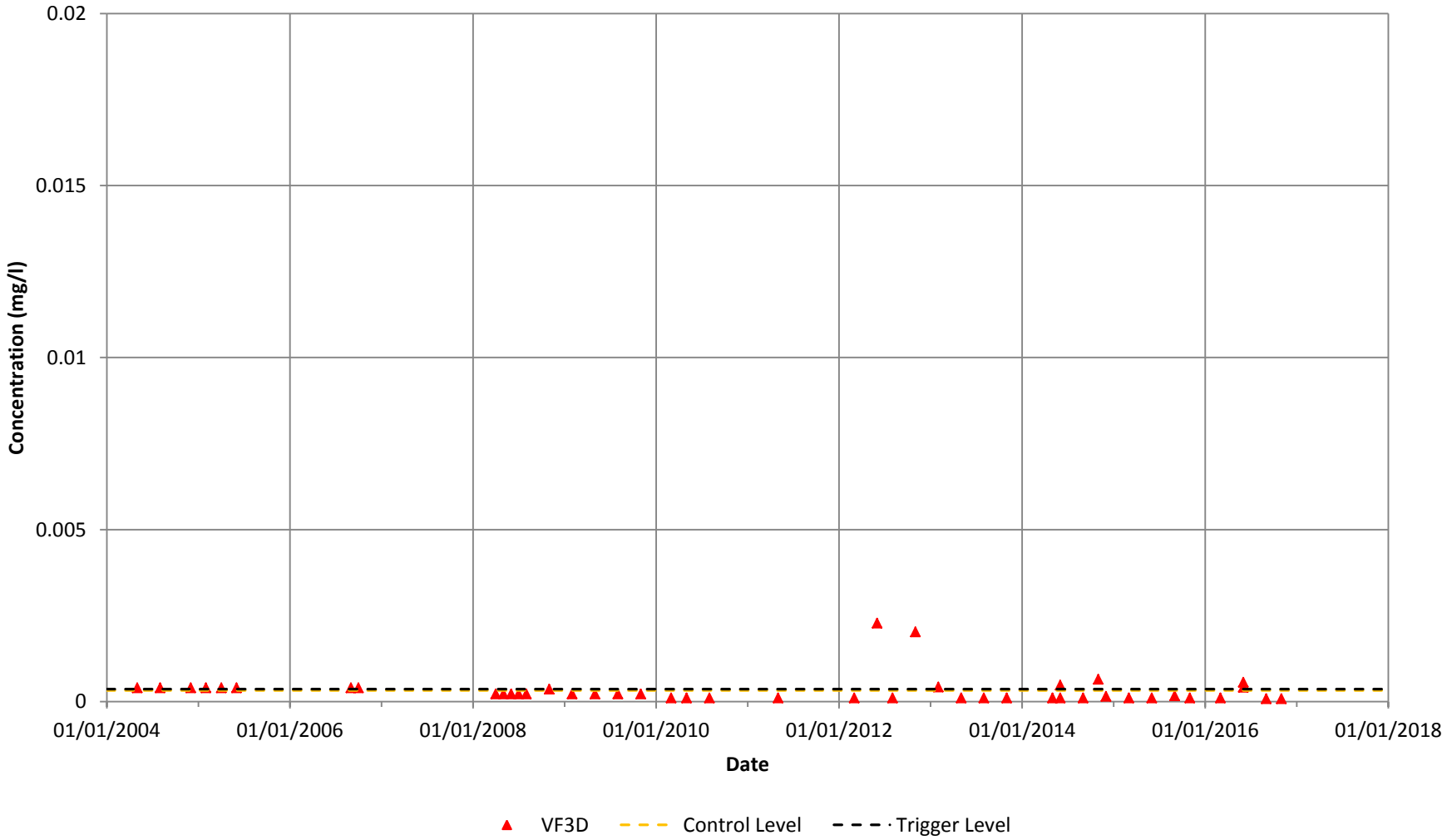
Valleyfield Ash Lagoons - Boron Data
VF12



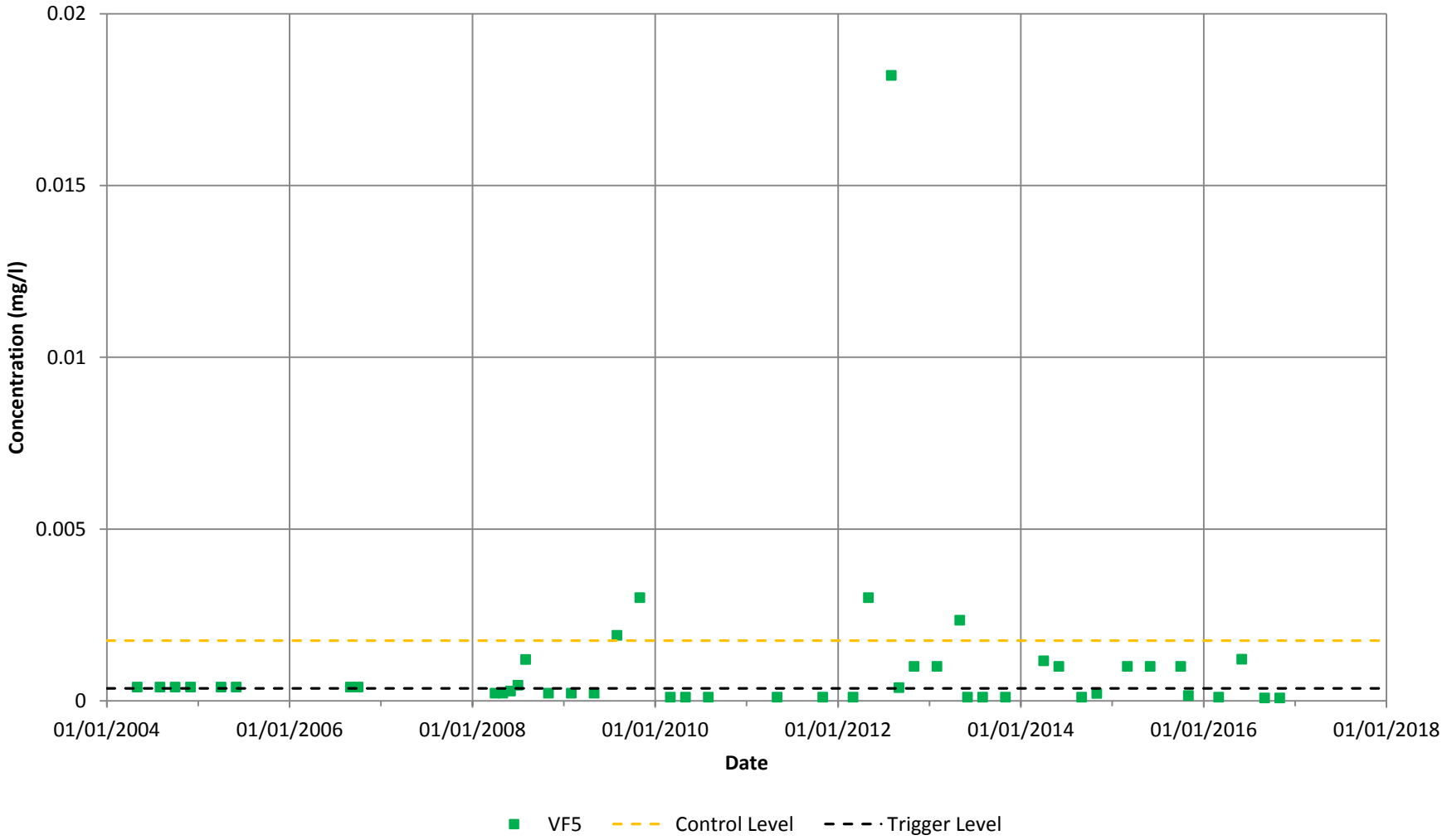
Valleyfield Ash Lagoons - Cadmium Data
VF1



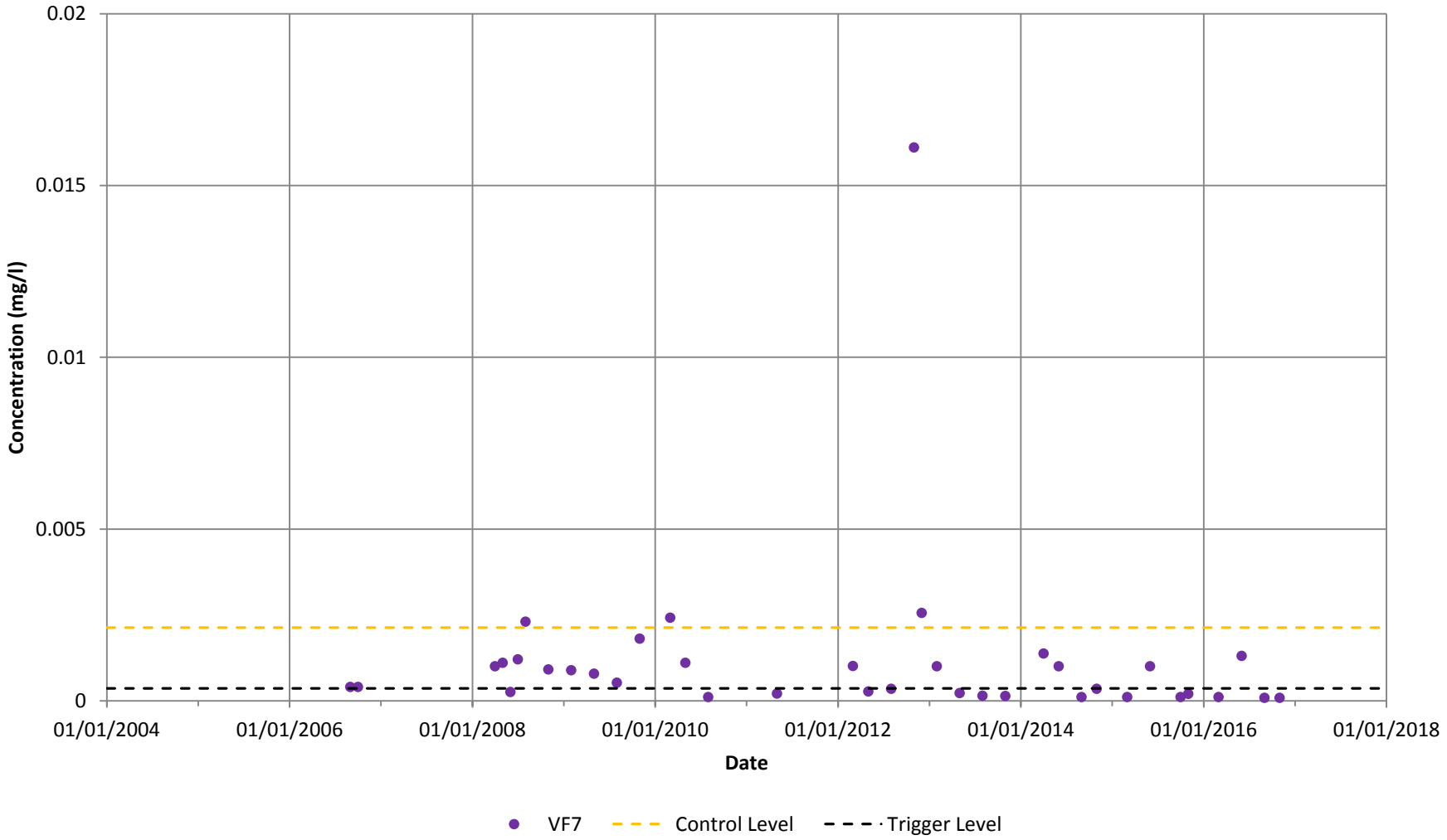
Valleyfield Ash Lagoons - Cadmium Data
VF3D



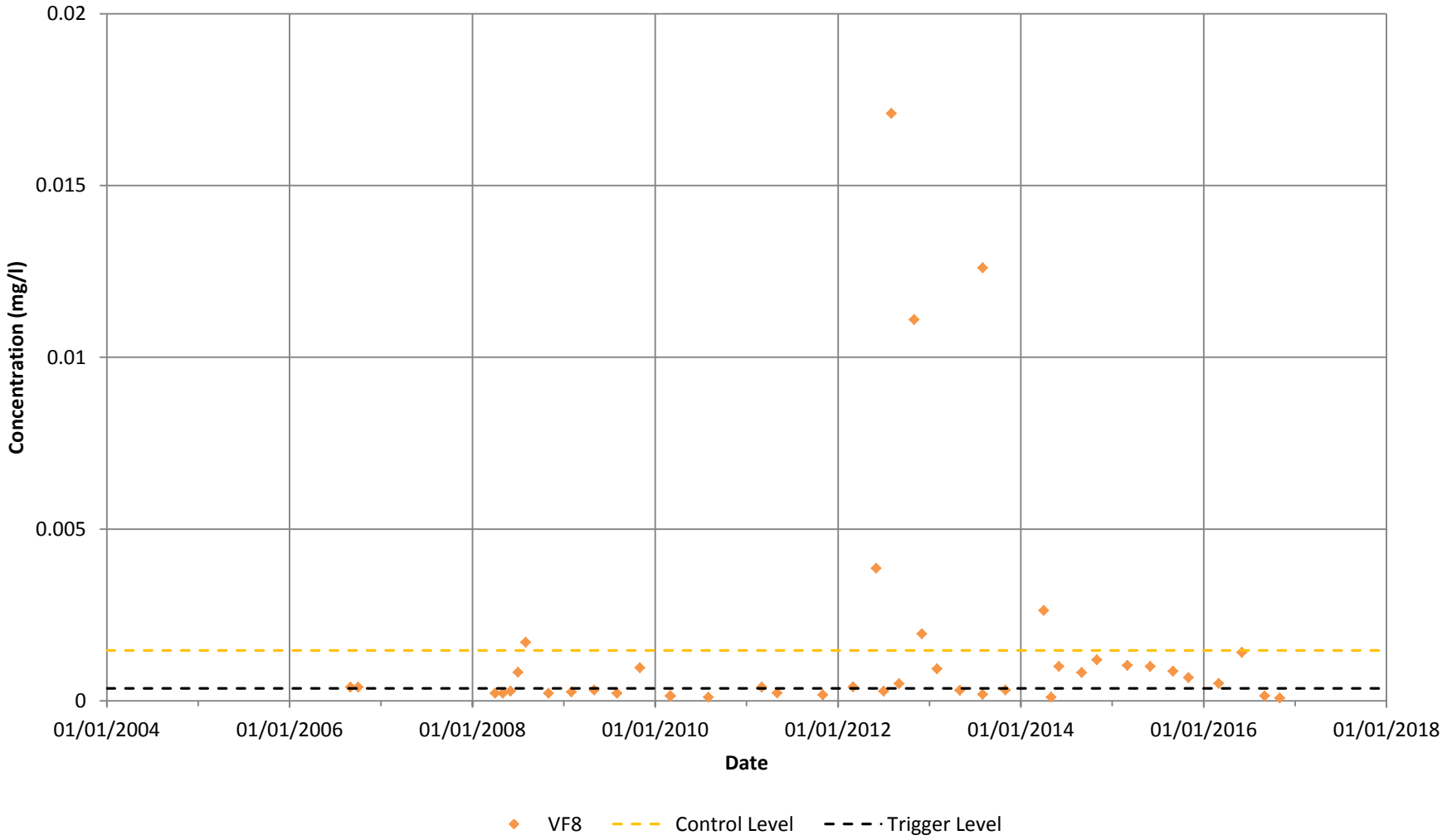
Valleyfield Ash Lagoons - Cadmium Data
VF5



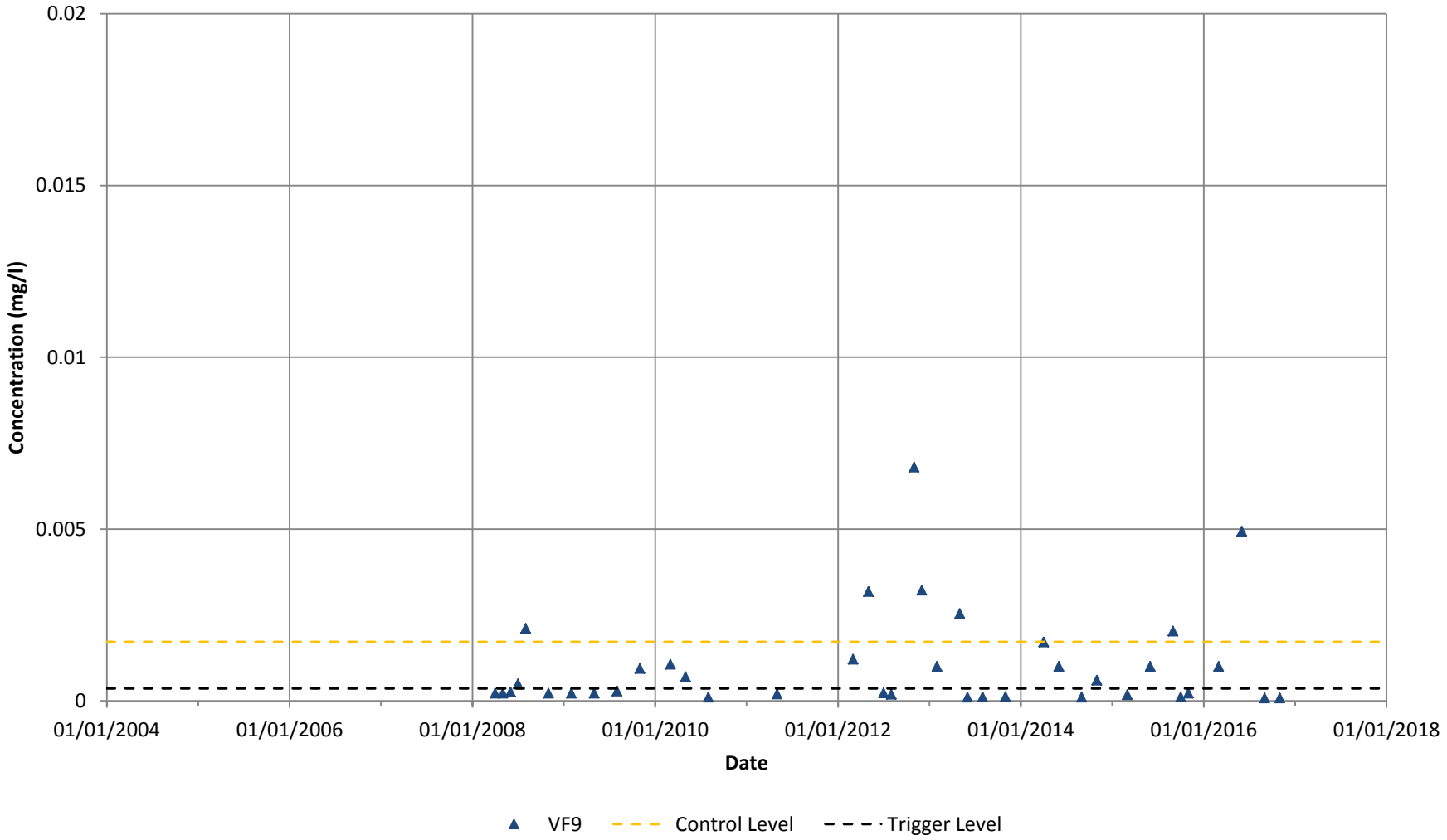
Valleyfield Ash Lagoons - Cadmium Data
VF7



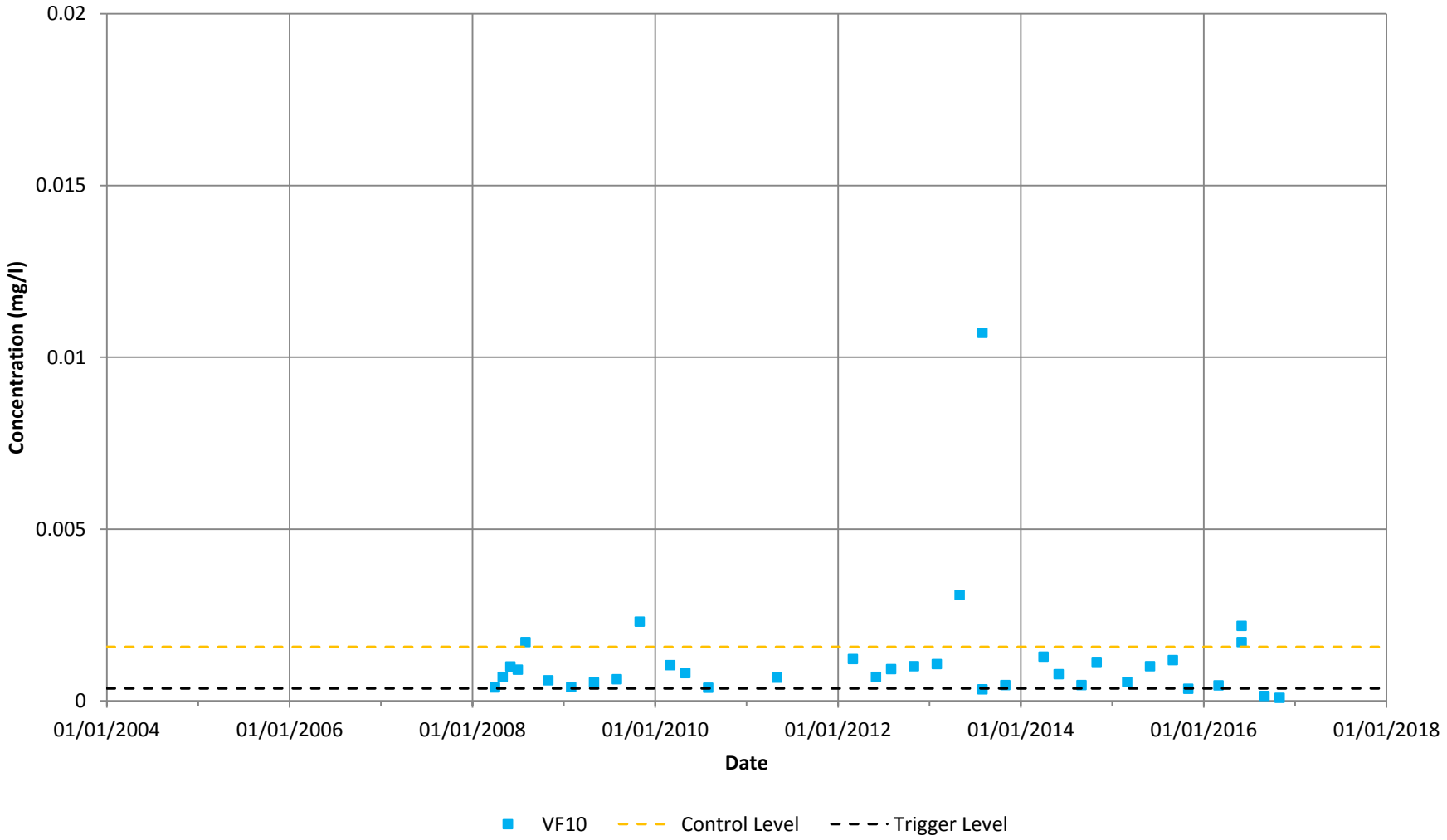
Valleyfield Ash Lagoons - Cadmium Data
VF8



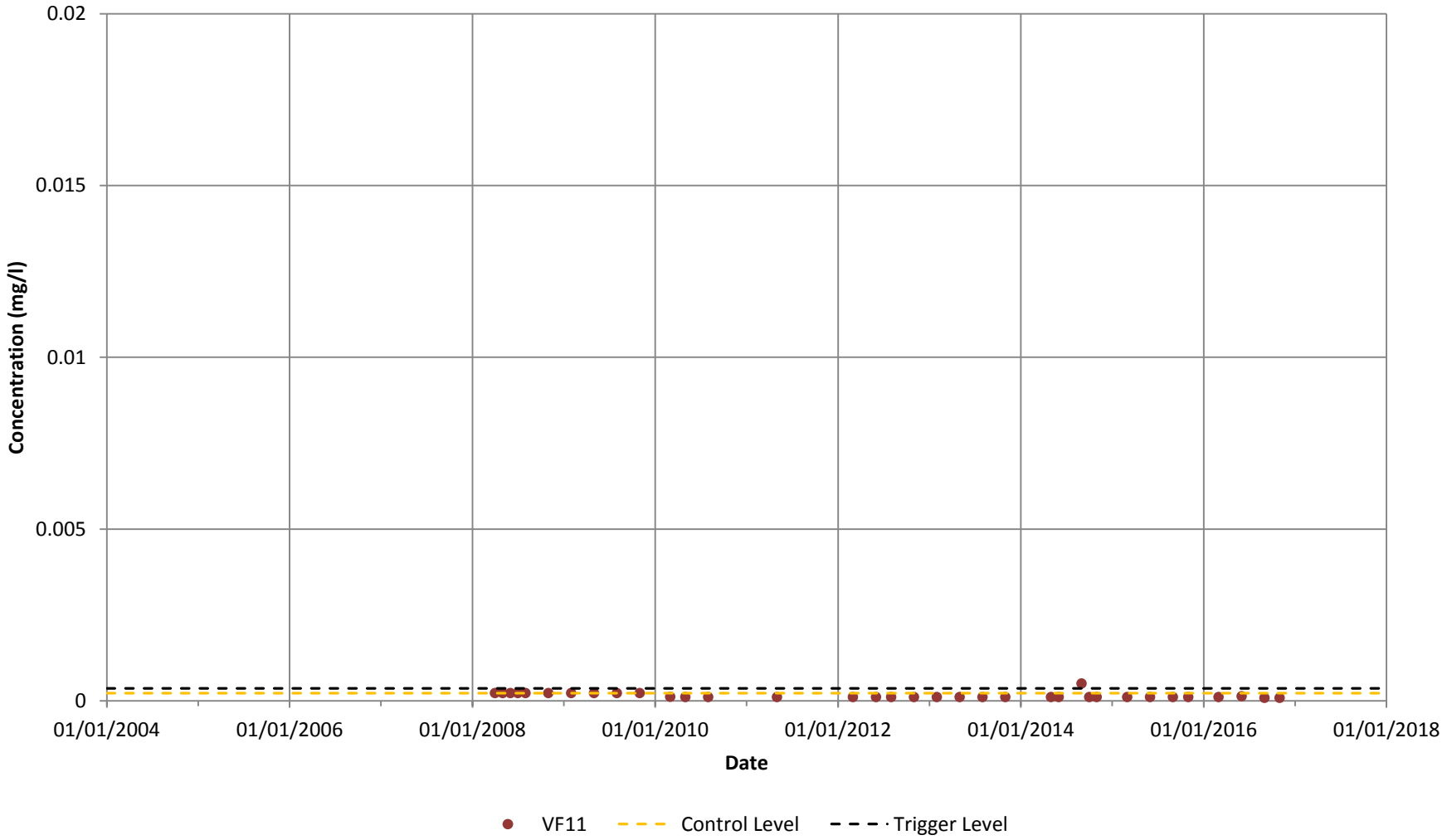
Valleyfield Ash Lagoons - Cadmium Data
VF9



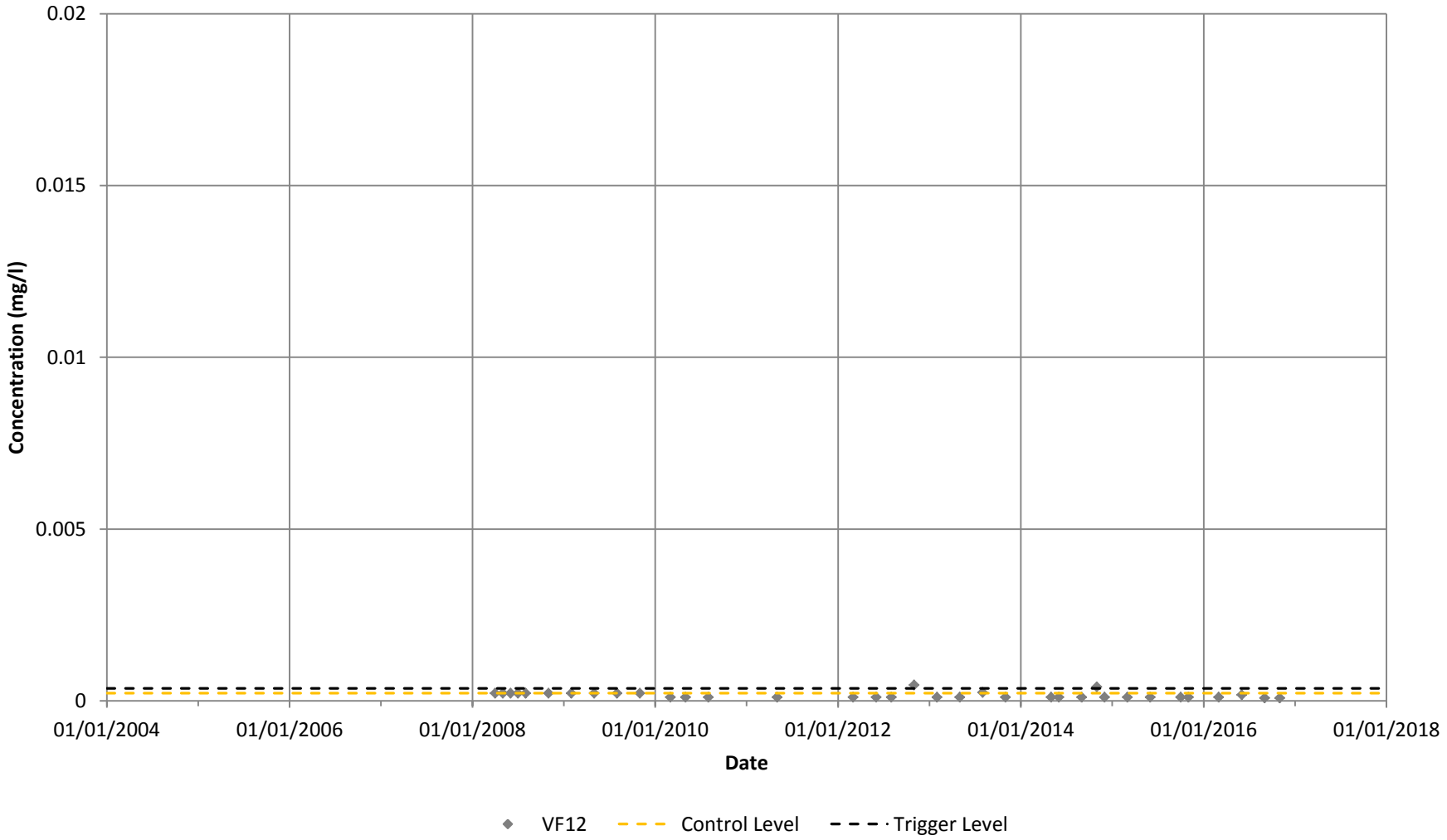
Valleyfield Ash Lagoons - Cadmium Data
VF10



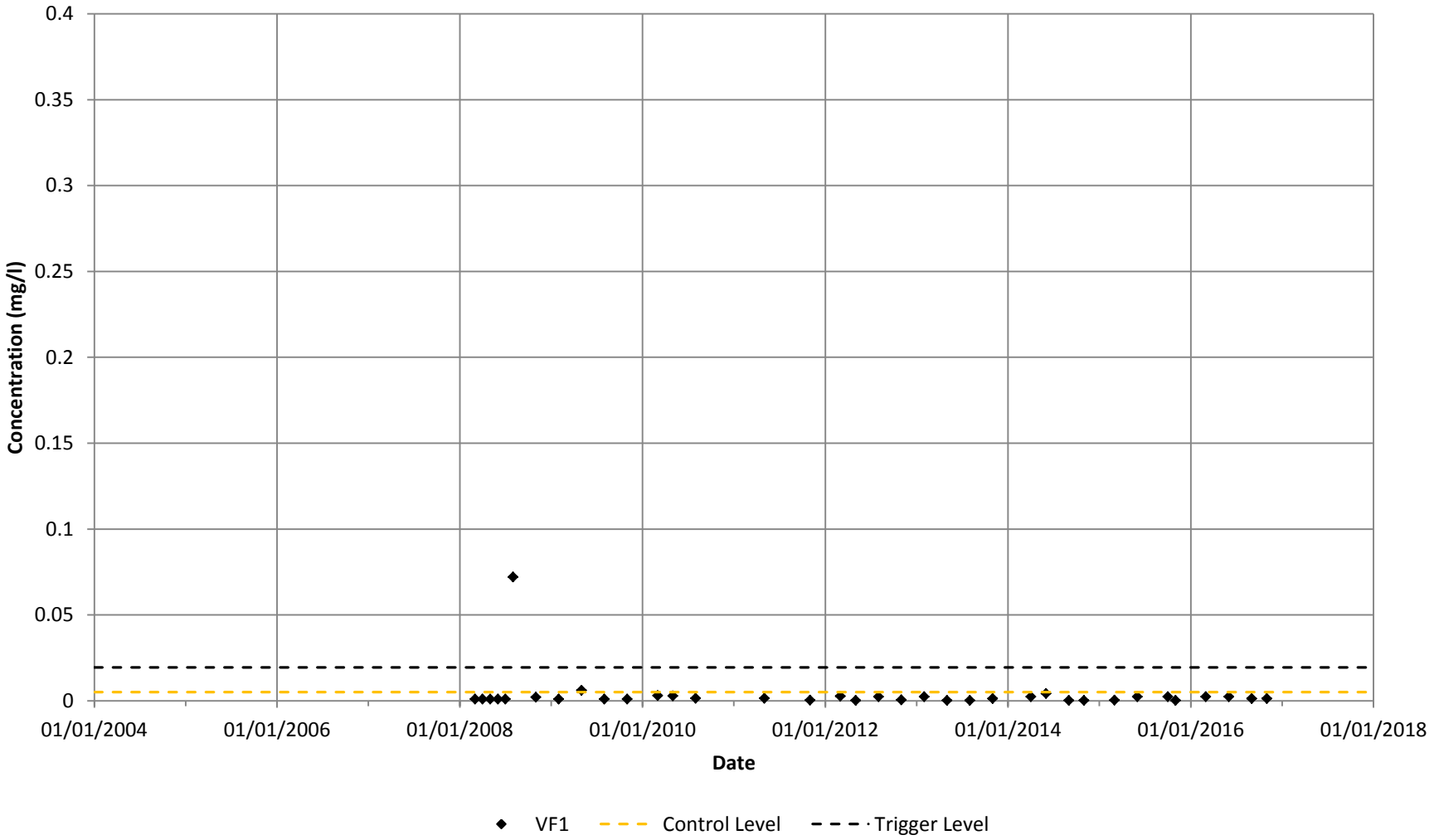
Valleyfield Ash Lagoons - Cadmium Data
VF11



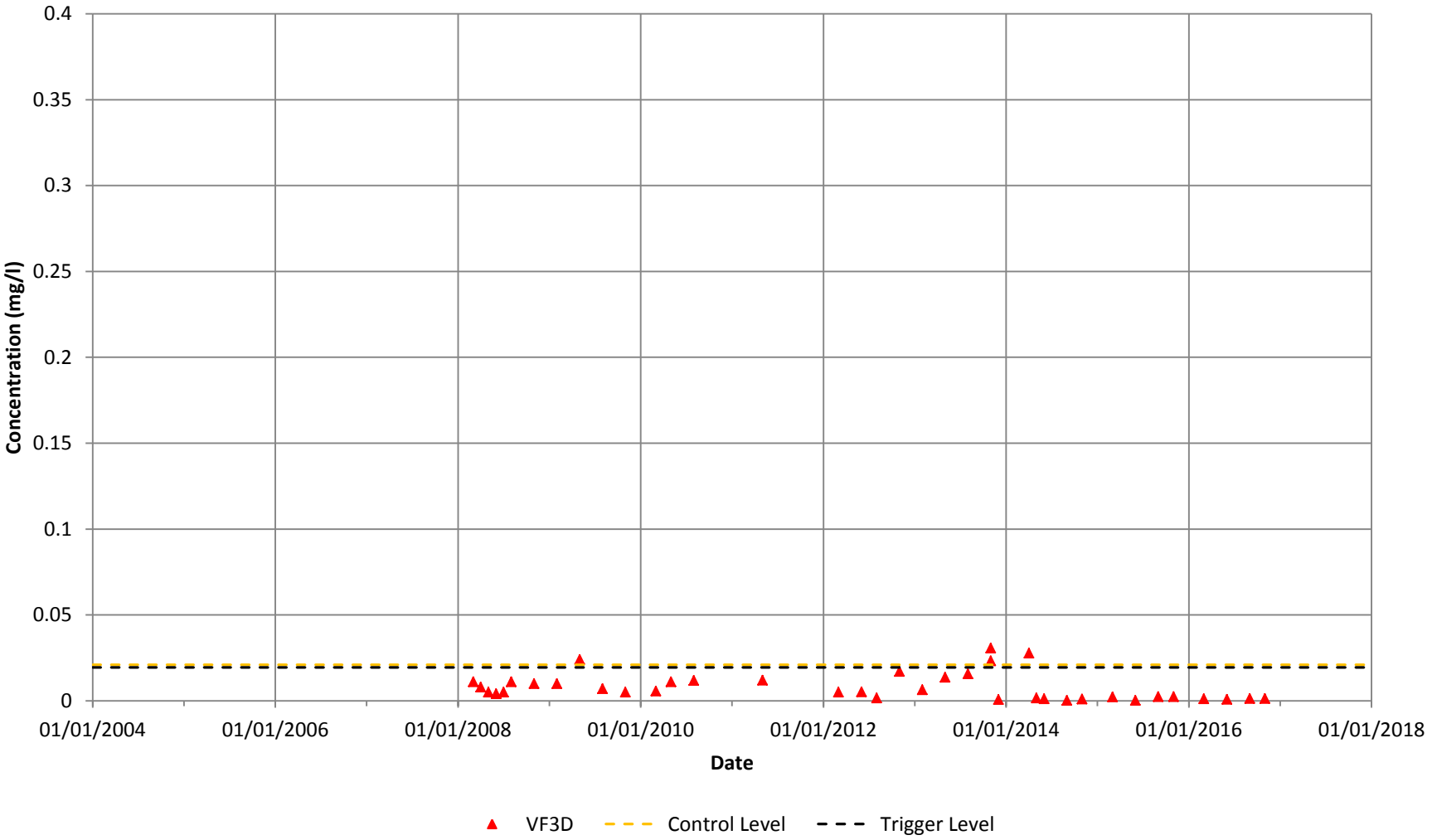
Valleyfield Ash Lagoons - Cadmium Data
VF12



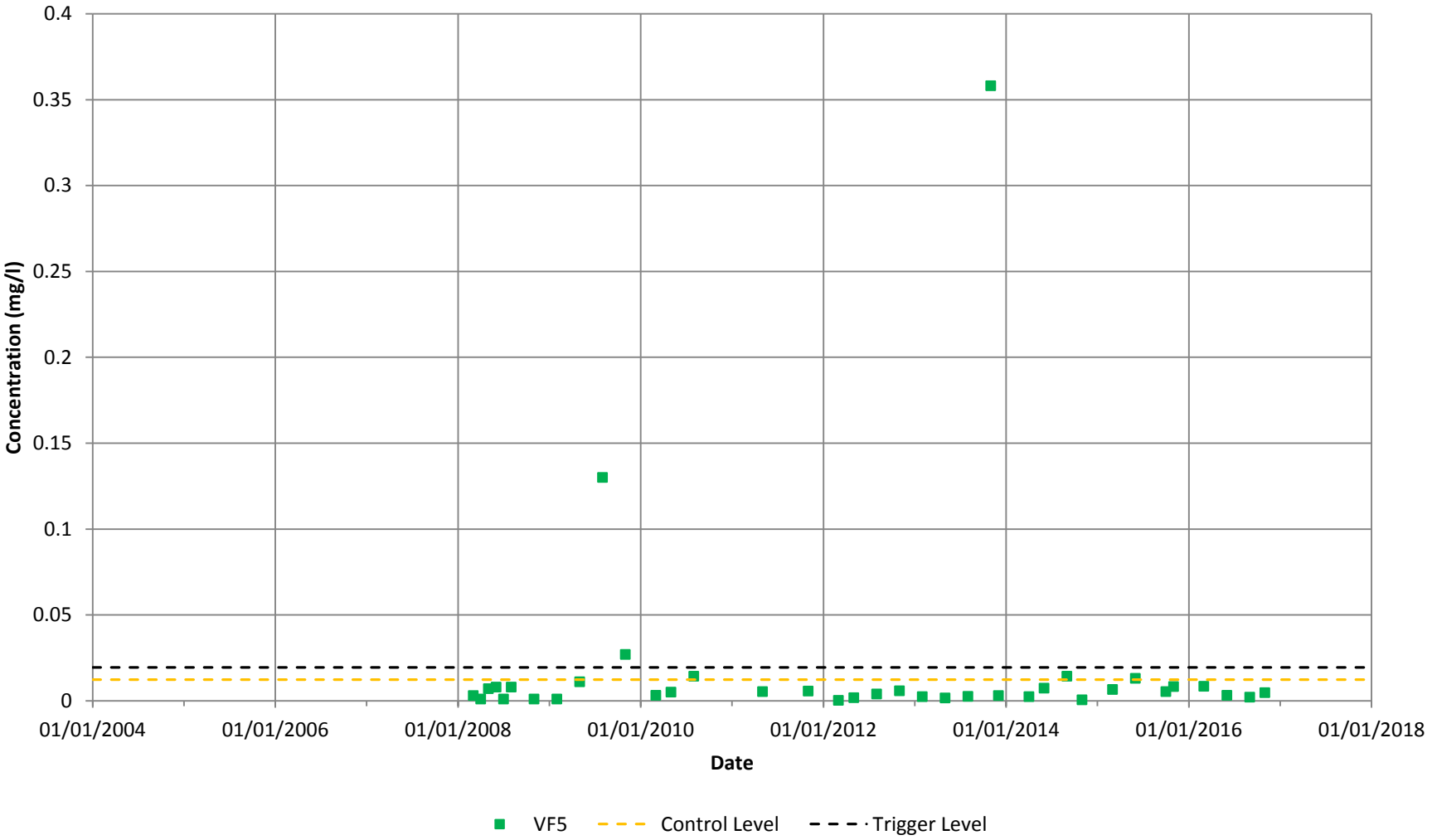
Valleyfield Ash Lagoons - Vanadium Data
VF1



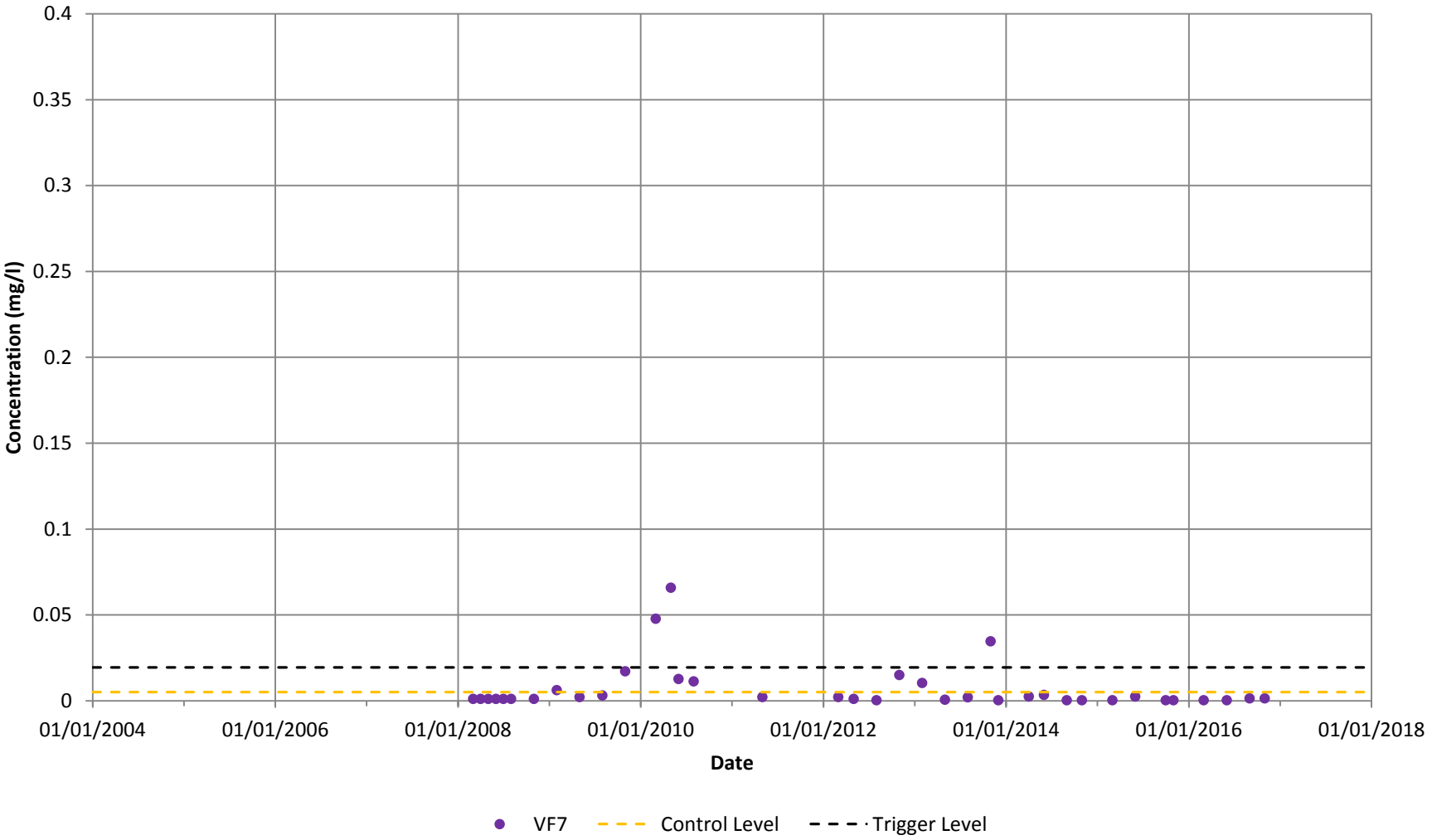
Valleyfield Ash Lagoons - Vanadium Data
VF3D



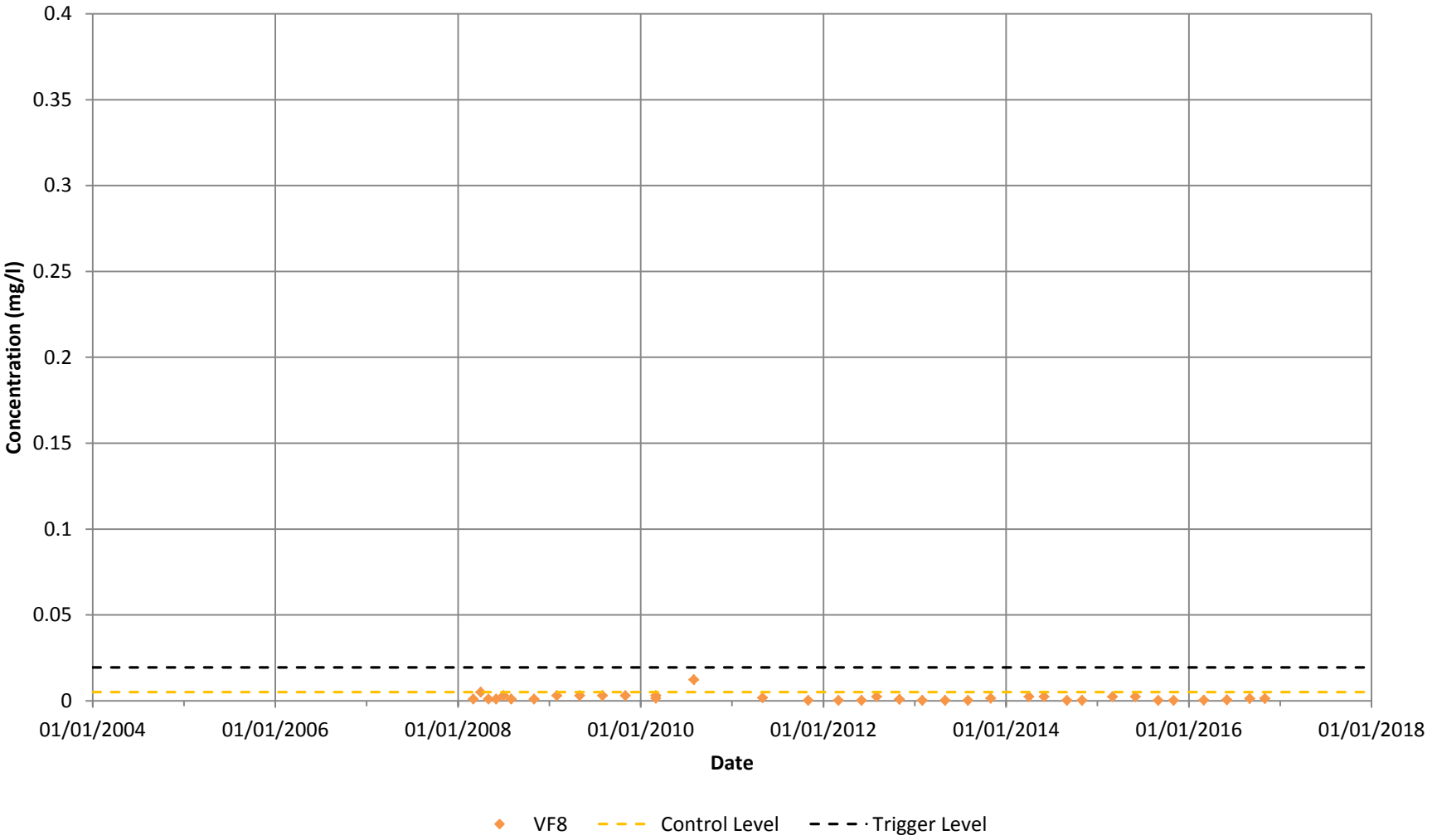
Valleyfield Ash Lagoons - Vanadium Data
VF5



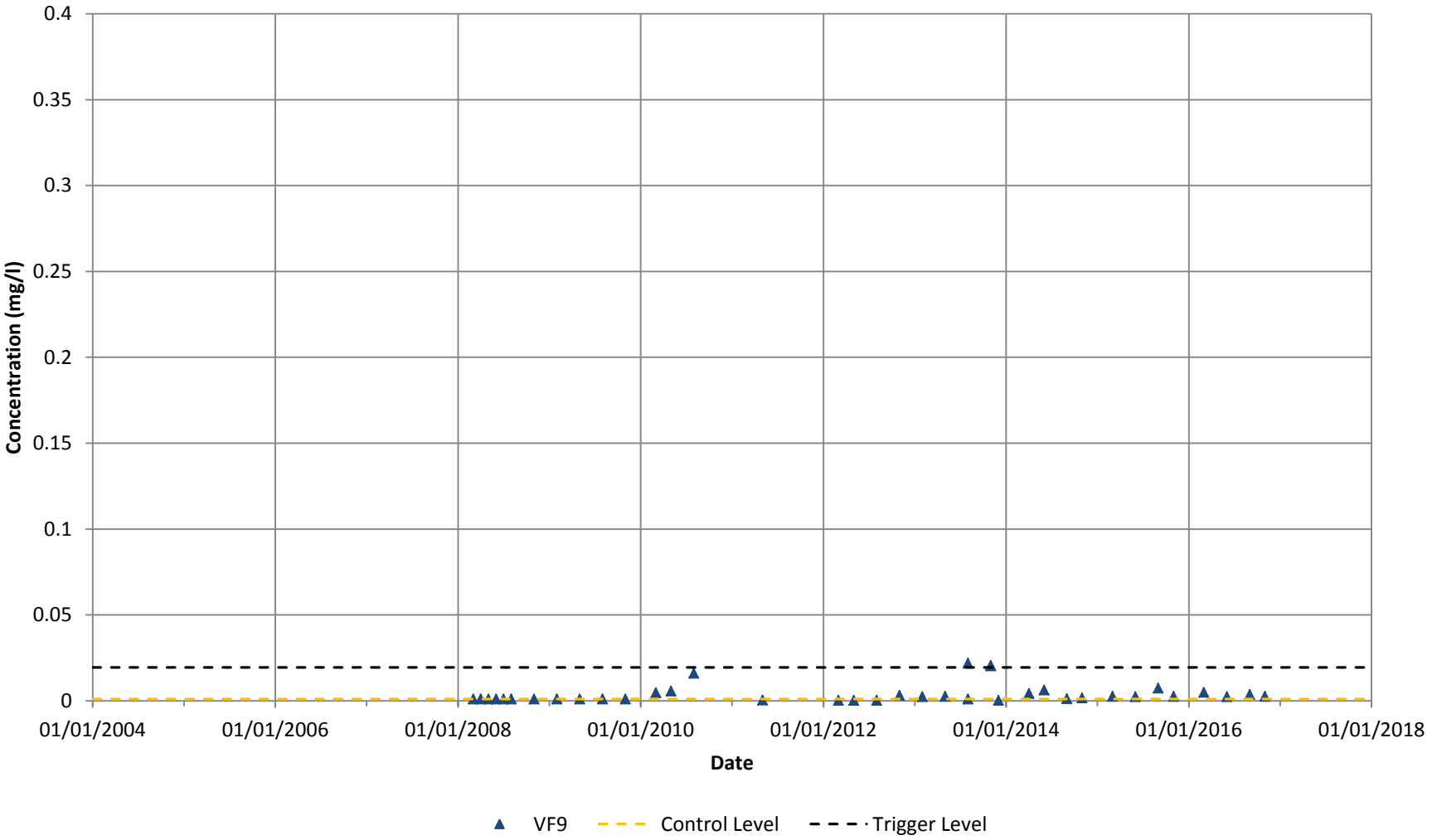
Valleyfield Ash Lagoons - Vanadium Data
VF7



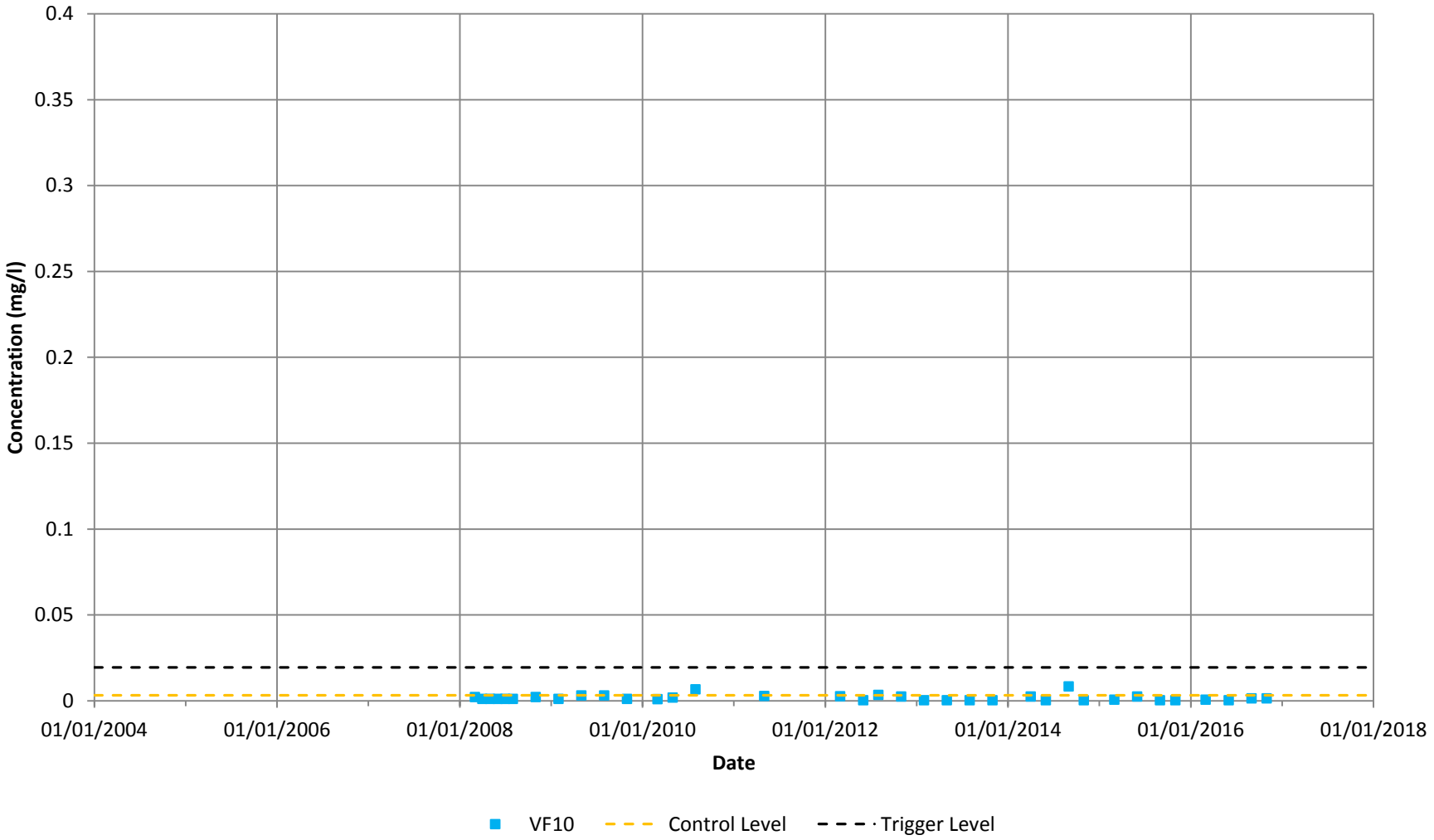
Valleyfield Ash Lagoons - Vanadium Data
VF8



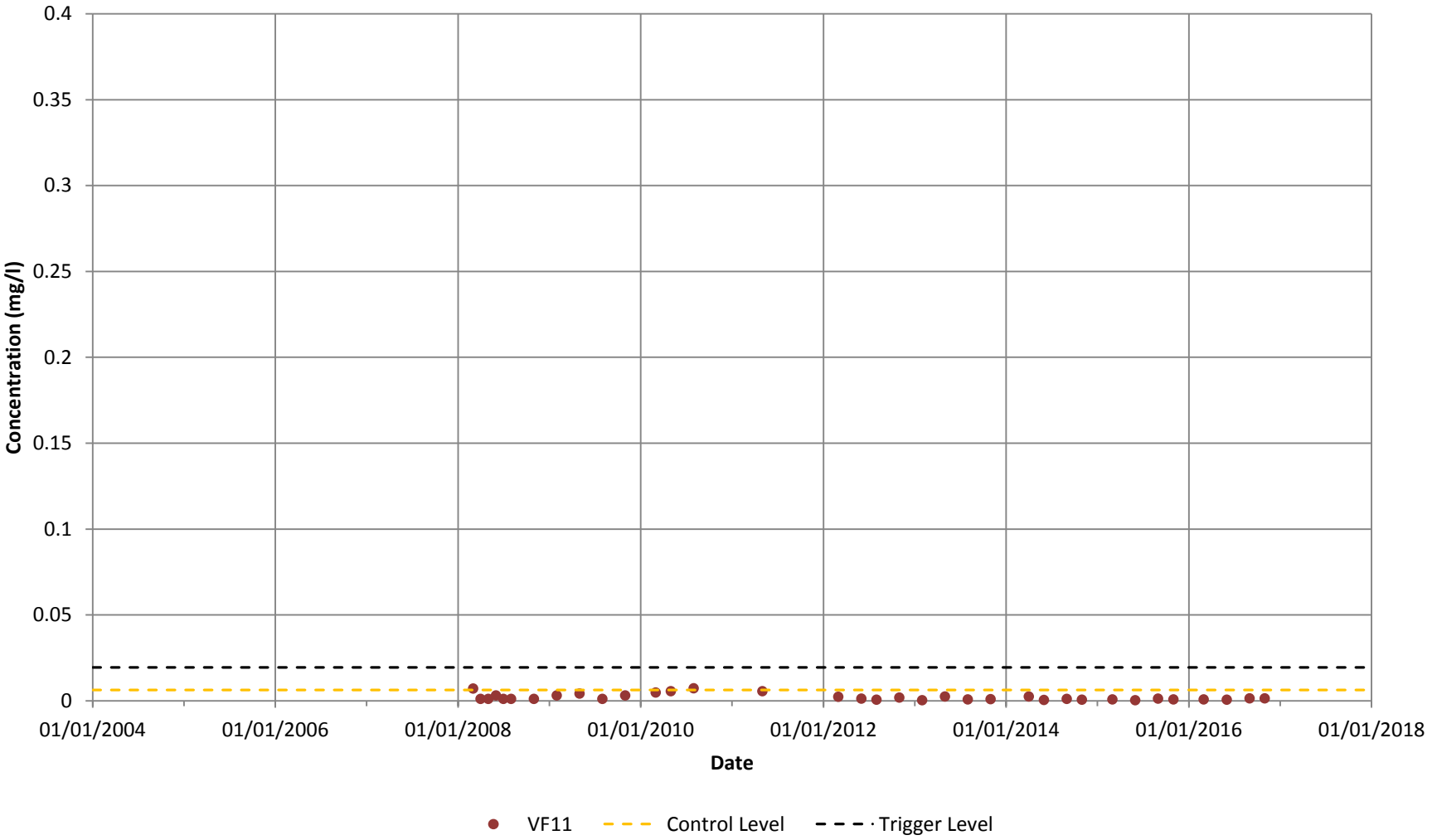
Valleyfield Ash Lagoons - Vanadium Data
VF9



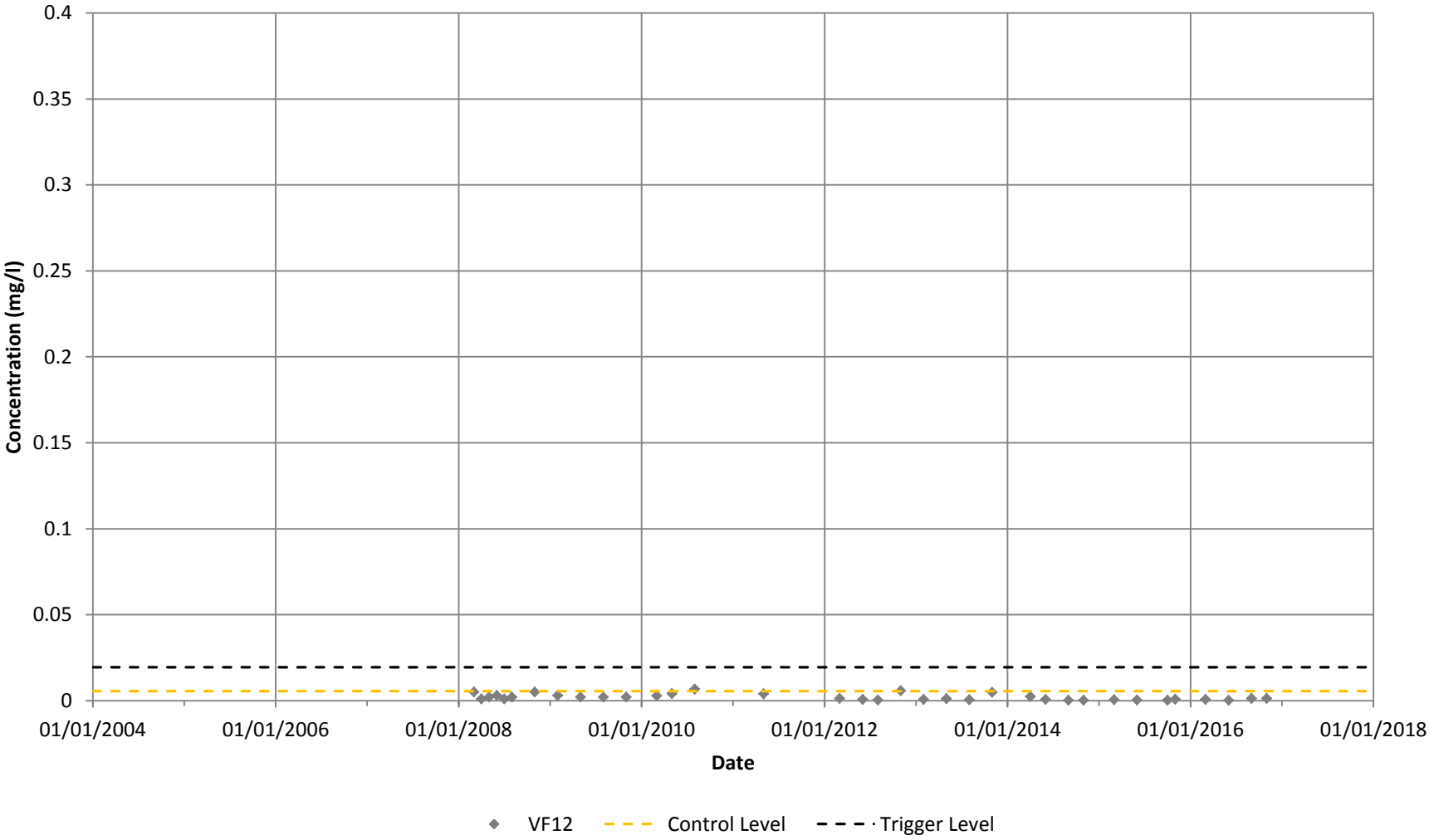
Valleyfield Ash Lagoons - Vanadium Data
VF10



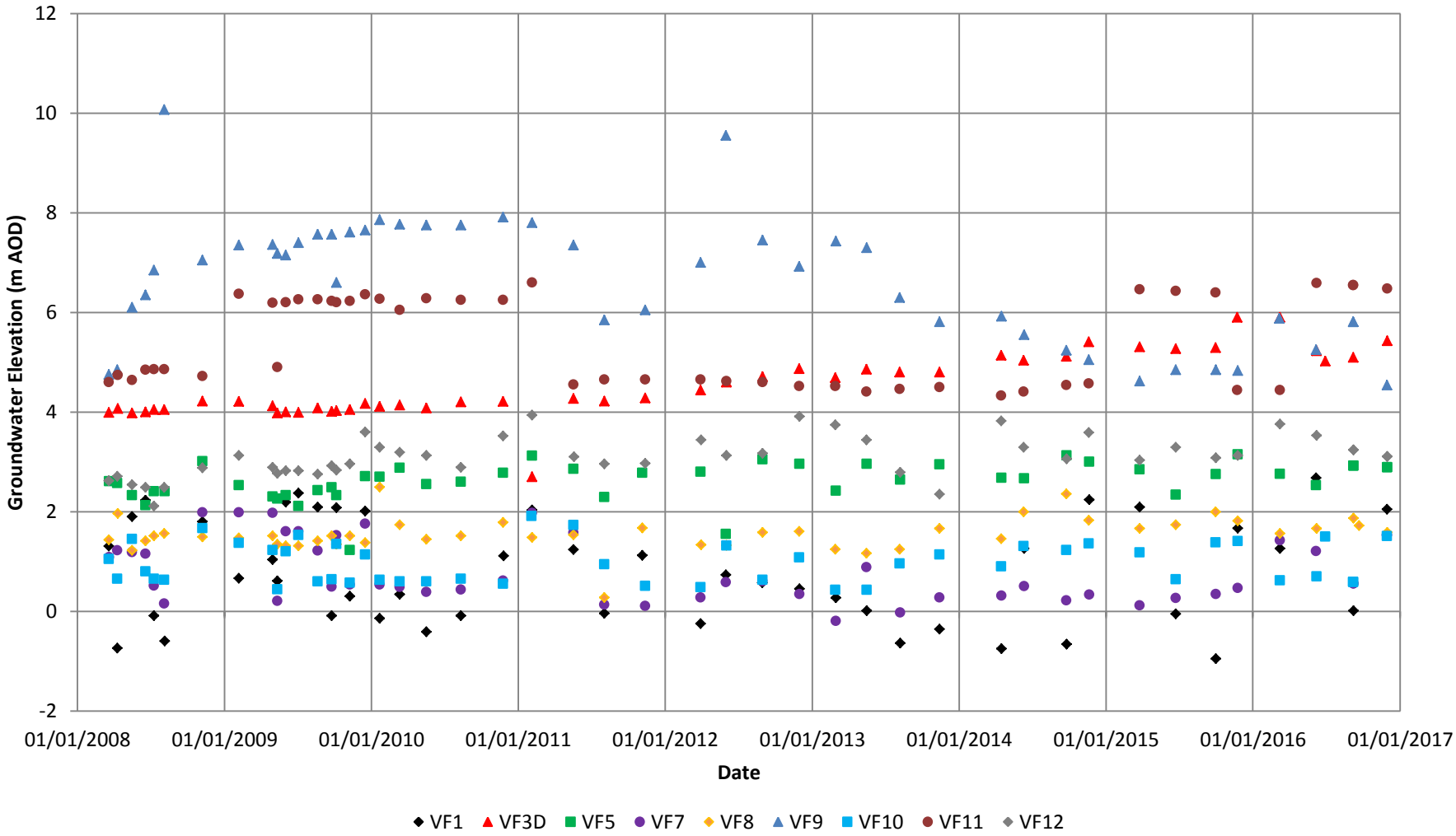
Valleyfield Ash Lagoons - Vanadium Data
VF11



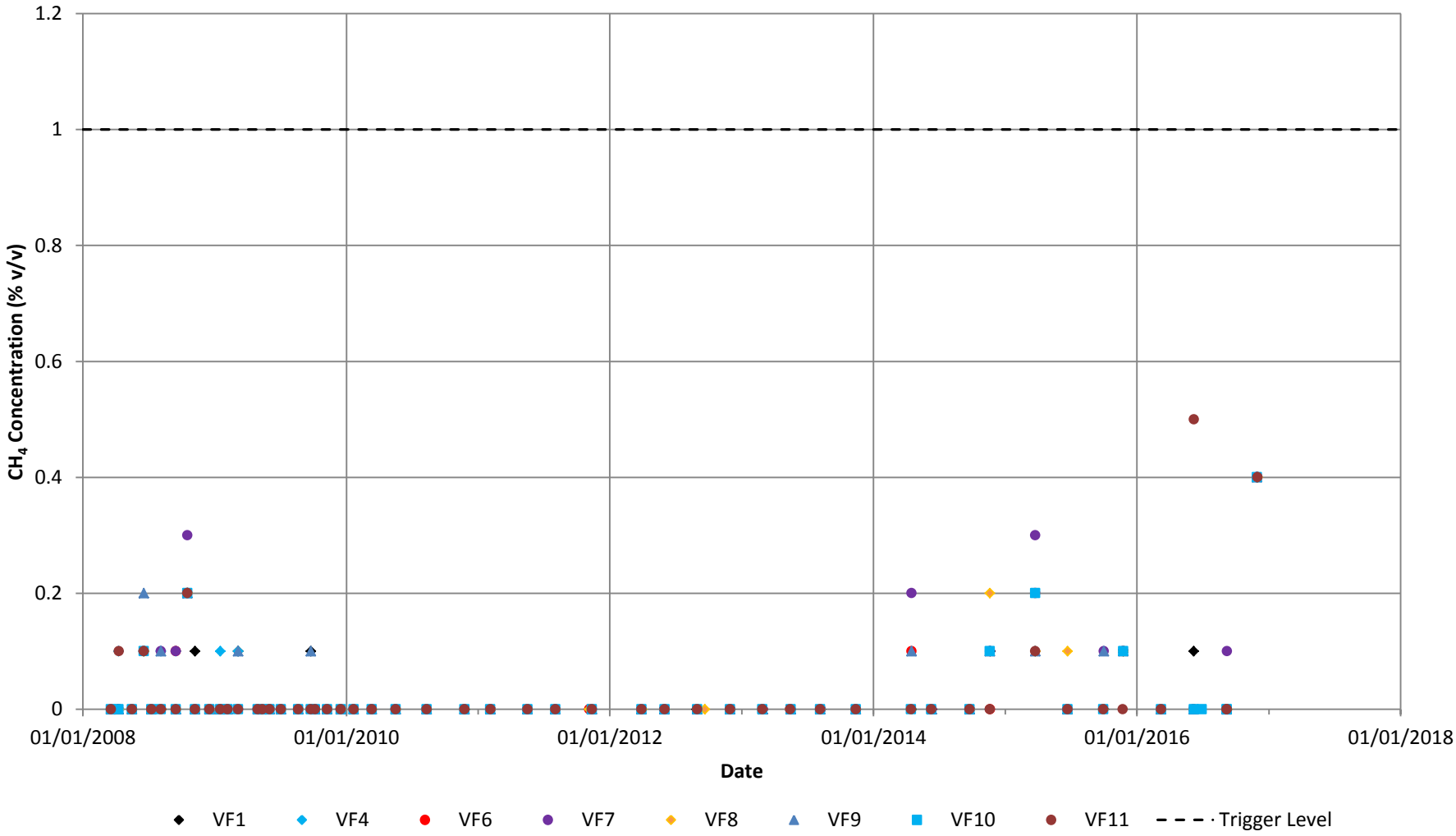
Valleyfield Ash Lagoons - Vanadium Data
VF12



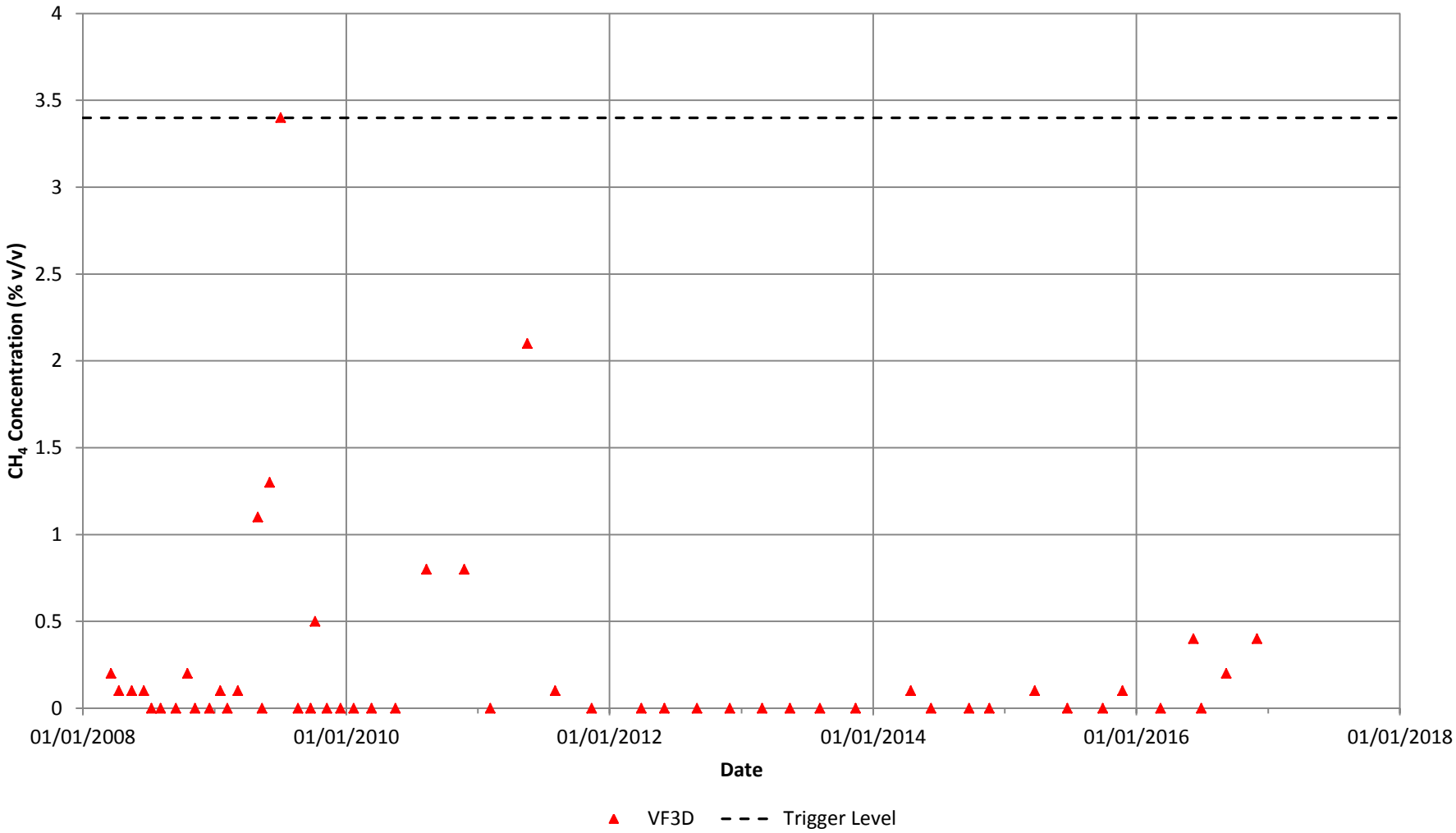
Valleyfield Ash Lagoons - Groundwater Elevation



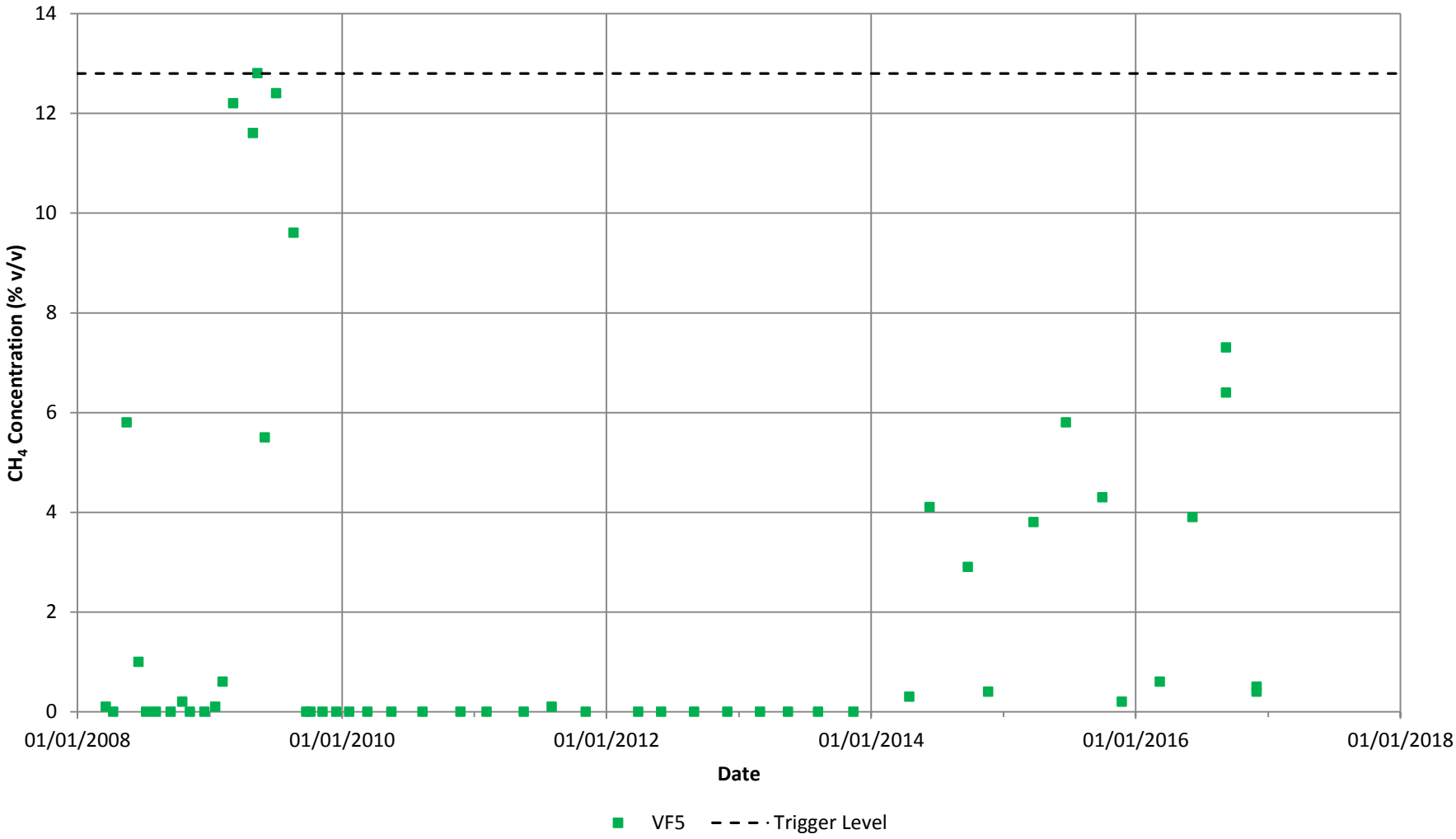
Valleyfield Ash Lagoons - Methane Concentration
Trigger Level (1 % v/v)



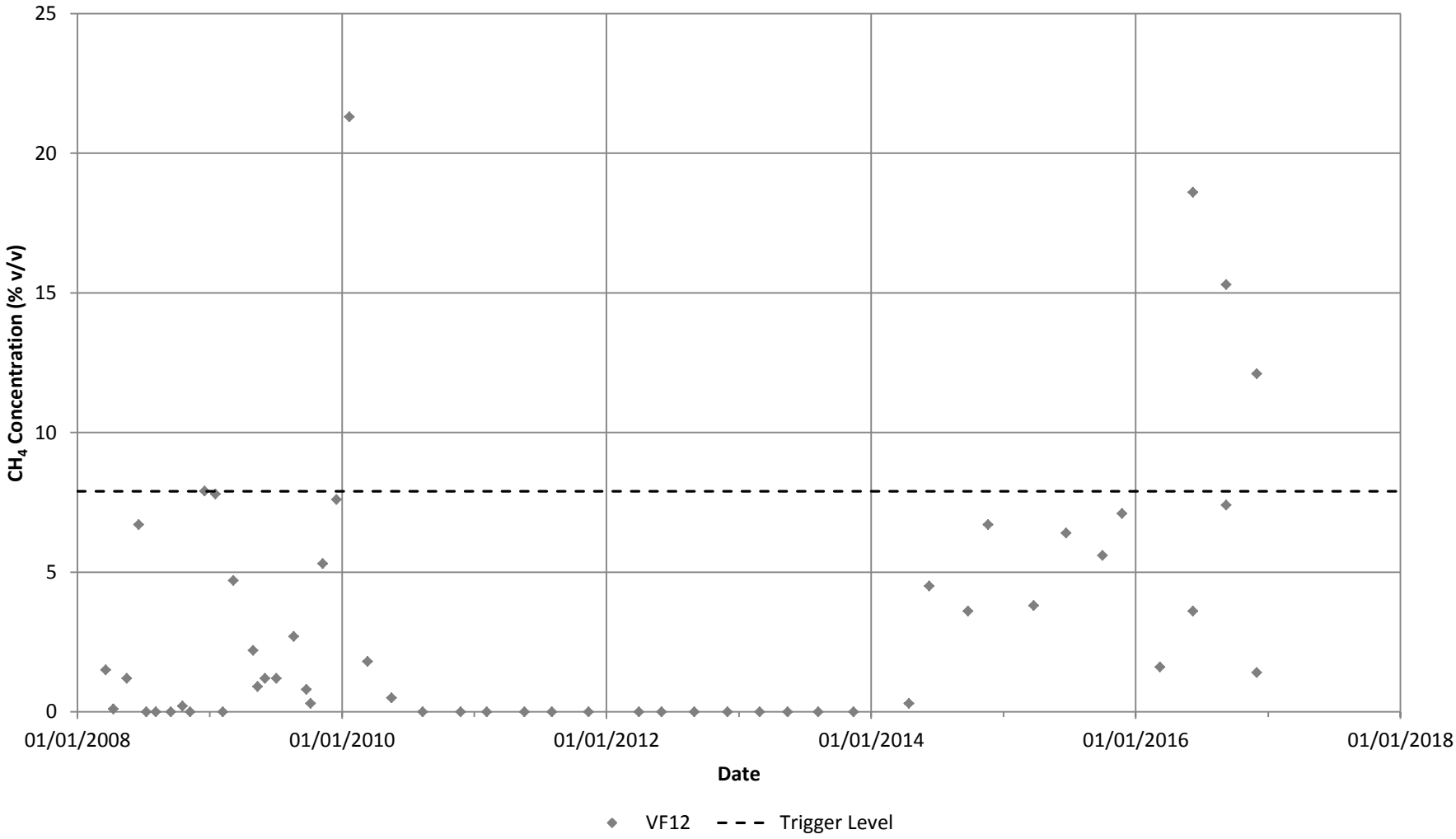
Valleyfield Ash Lagoons - Methane Concentration
VF3D Trigger Level (3.4 % v/v)



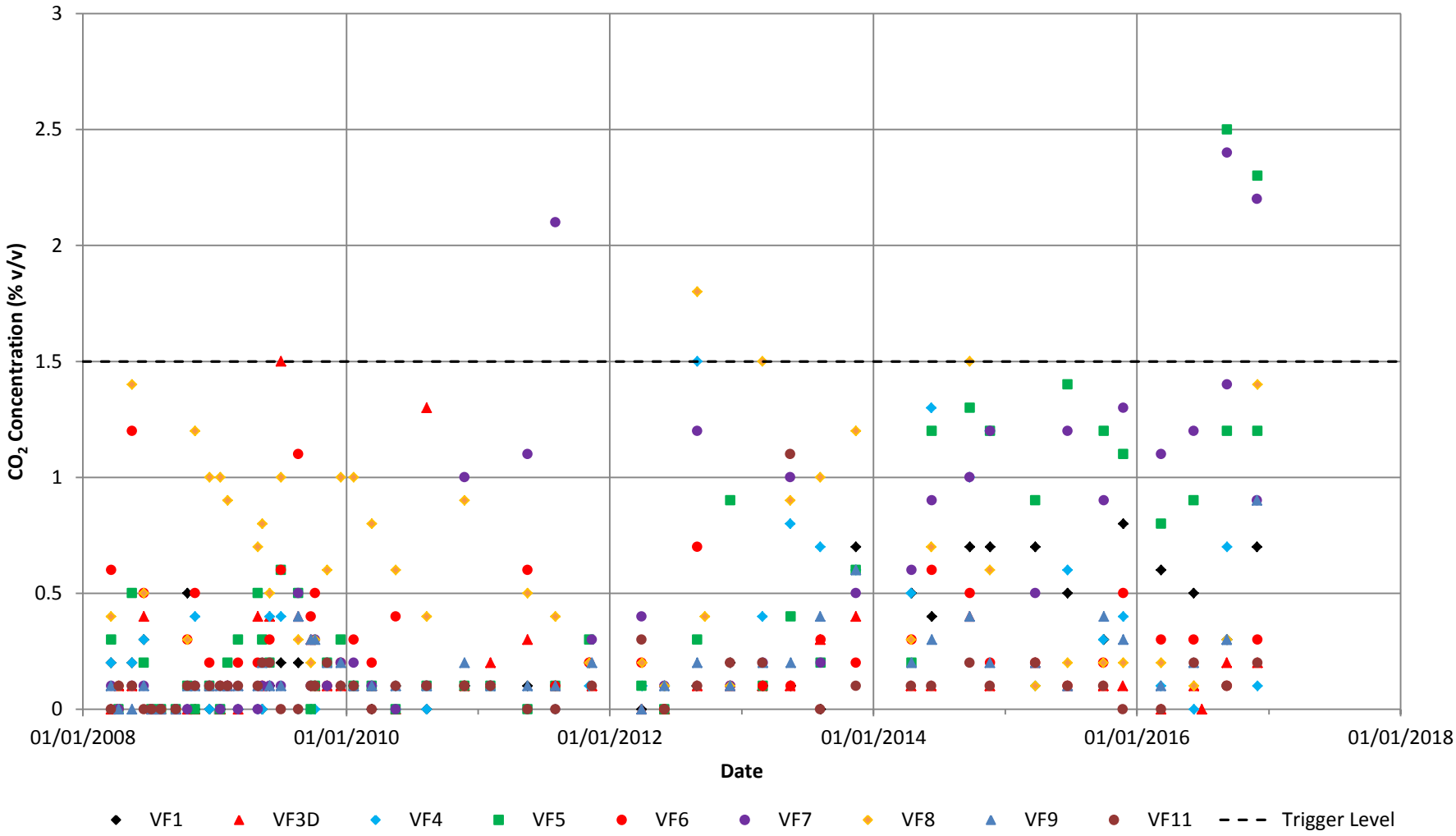
Valleyfield Ash Lagoons - Methane Concentration
VF5 Trigger Level (12.8 % v/v)



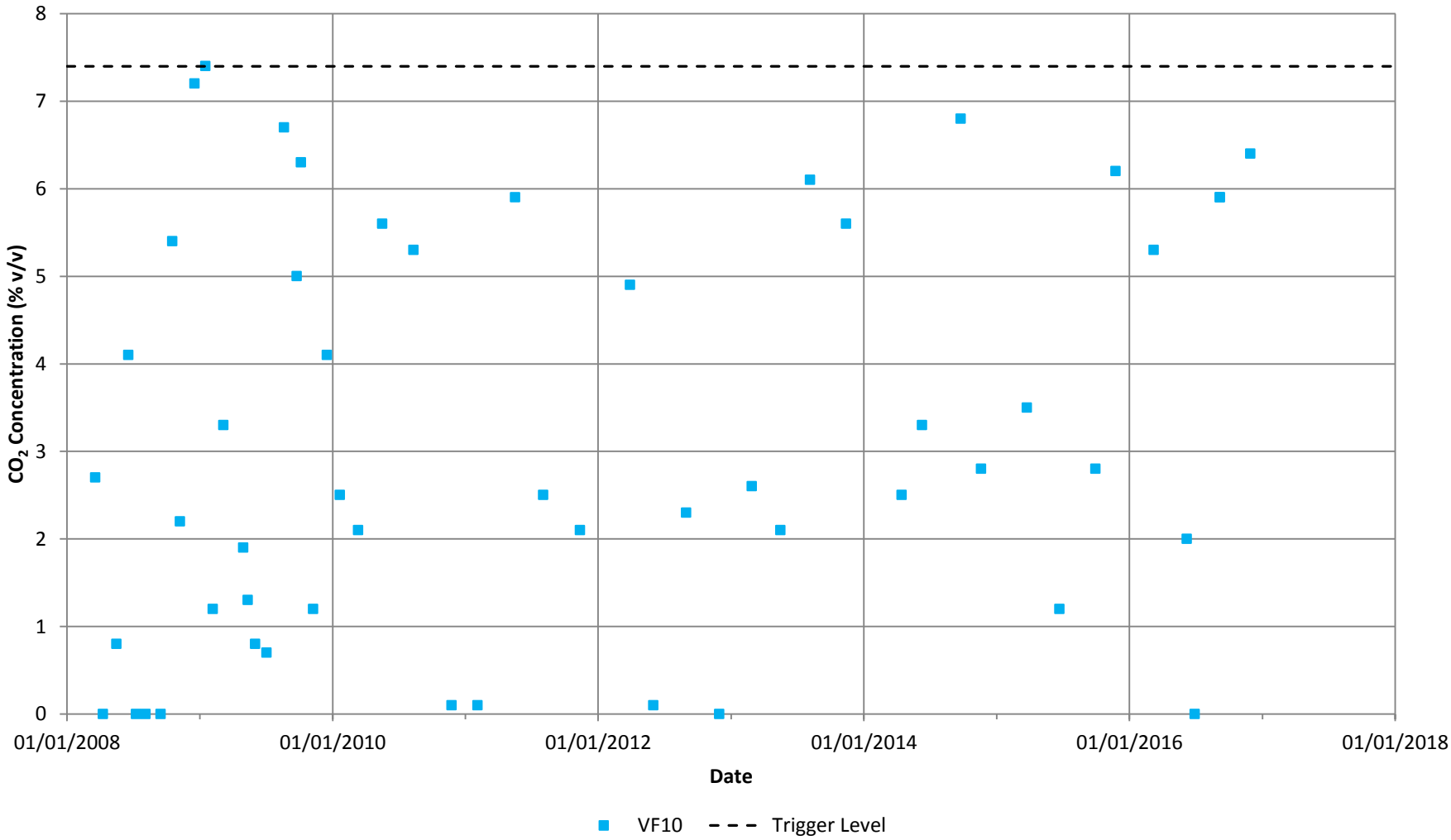
Valleyfield Ash Lagoons - Methane Concentration
VF12 Trigger Level (7.9 % v/v)



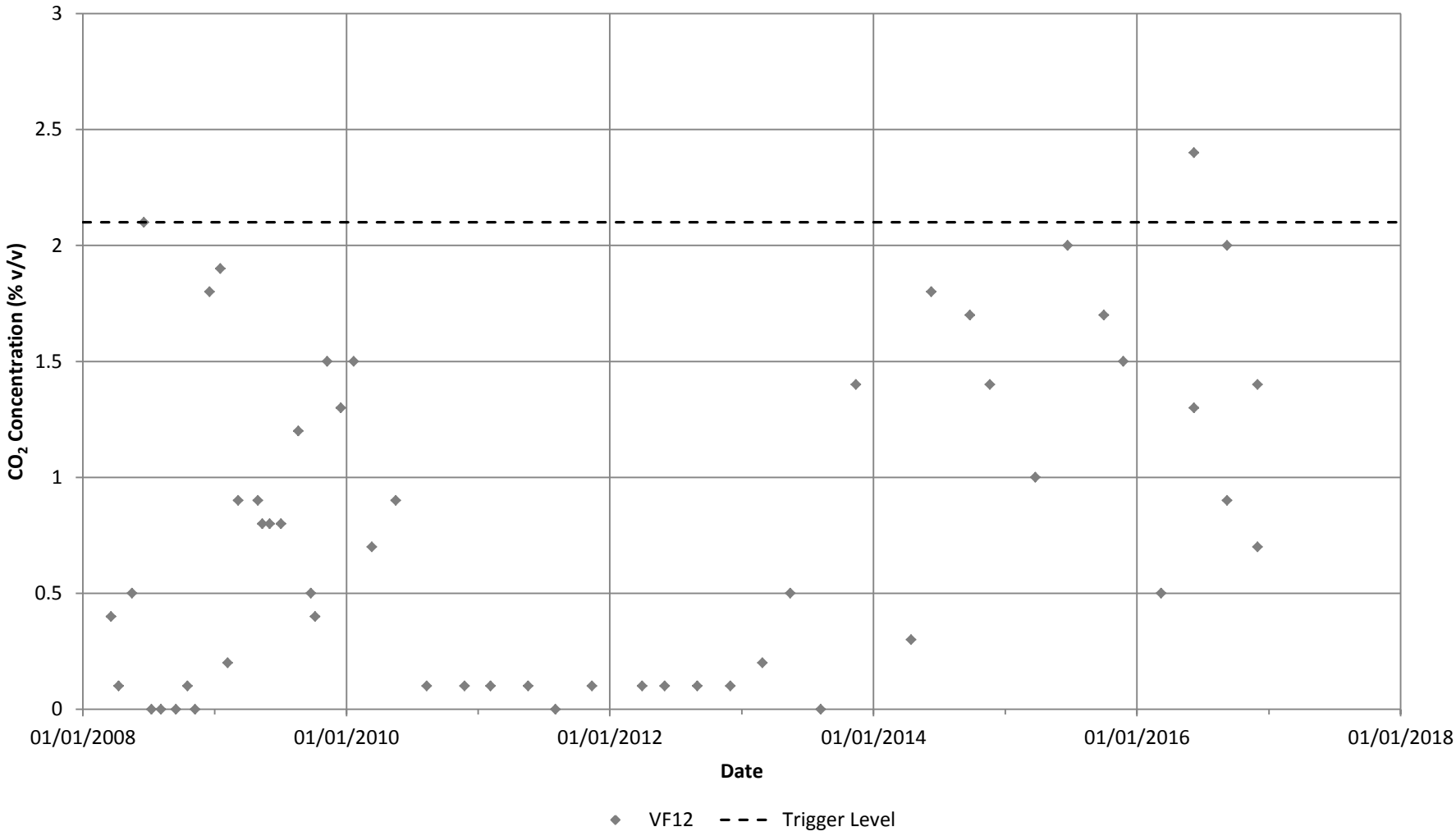
Valleyfield Ash Lagoons - Carbon Dioxide Concentration
Trigger Level (1.5 % v/v)



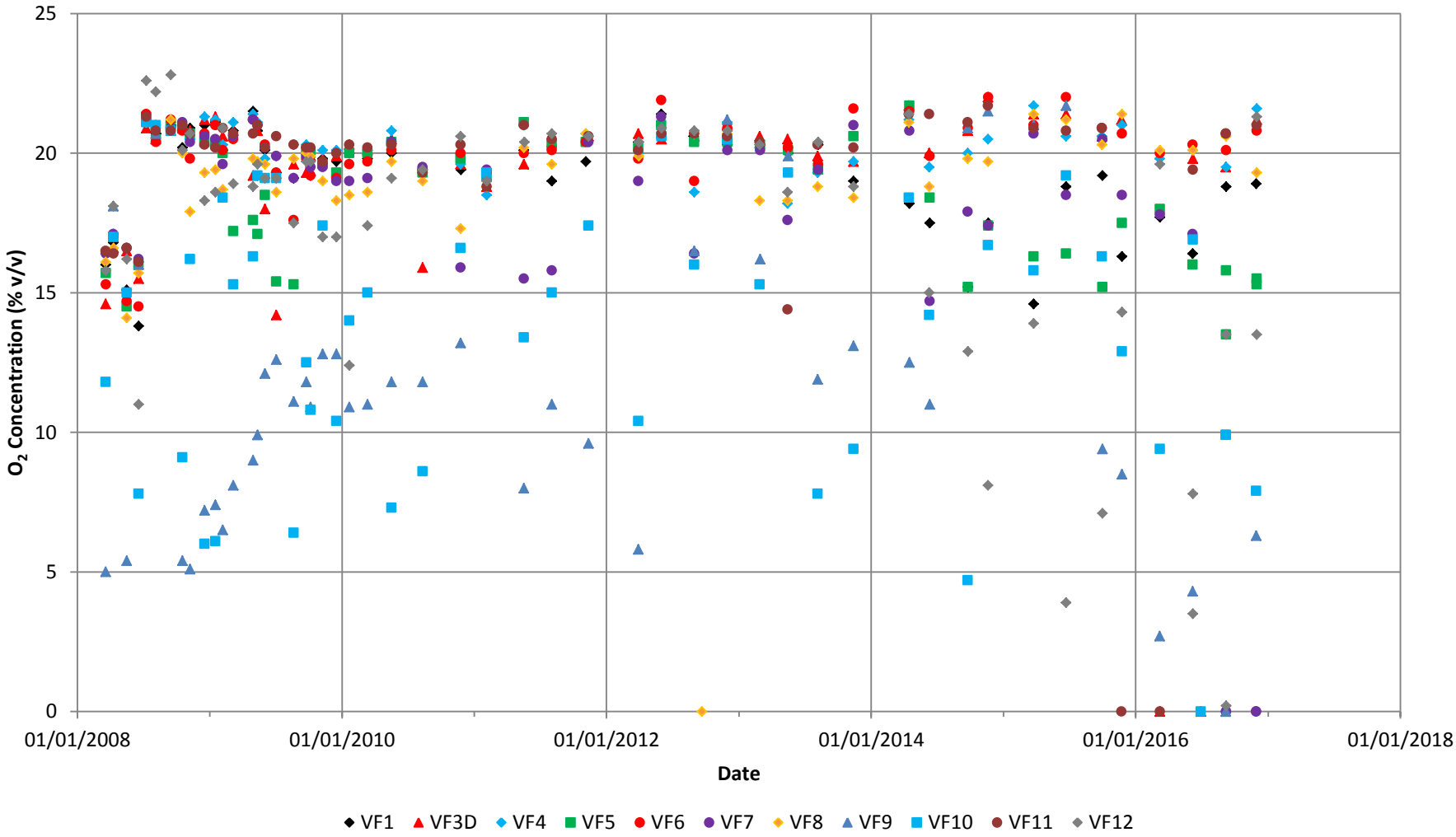
Valleyfield Ash Lagoons - Carbon Dioxide Concentration
VF10 Trigger Level (7.4 % v/v)



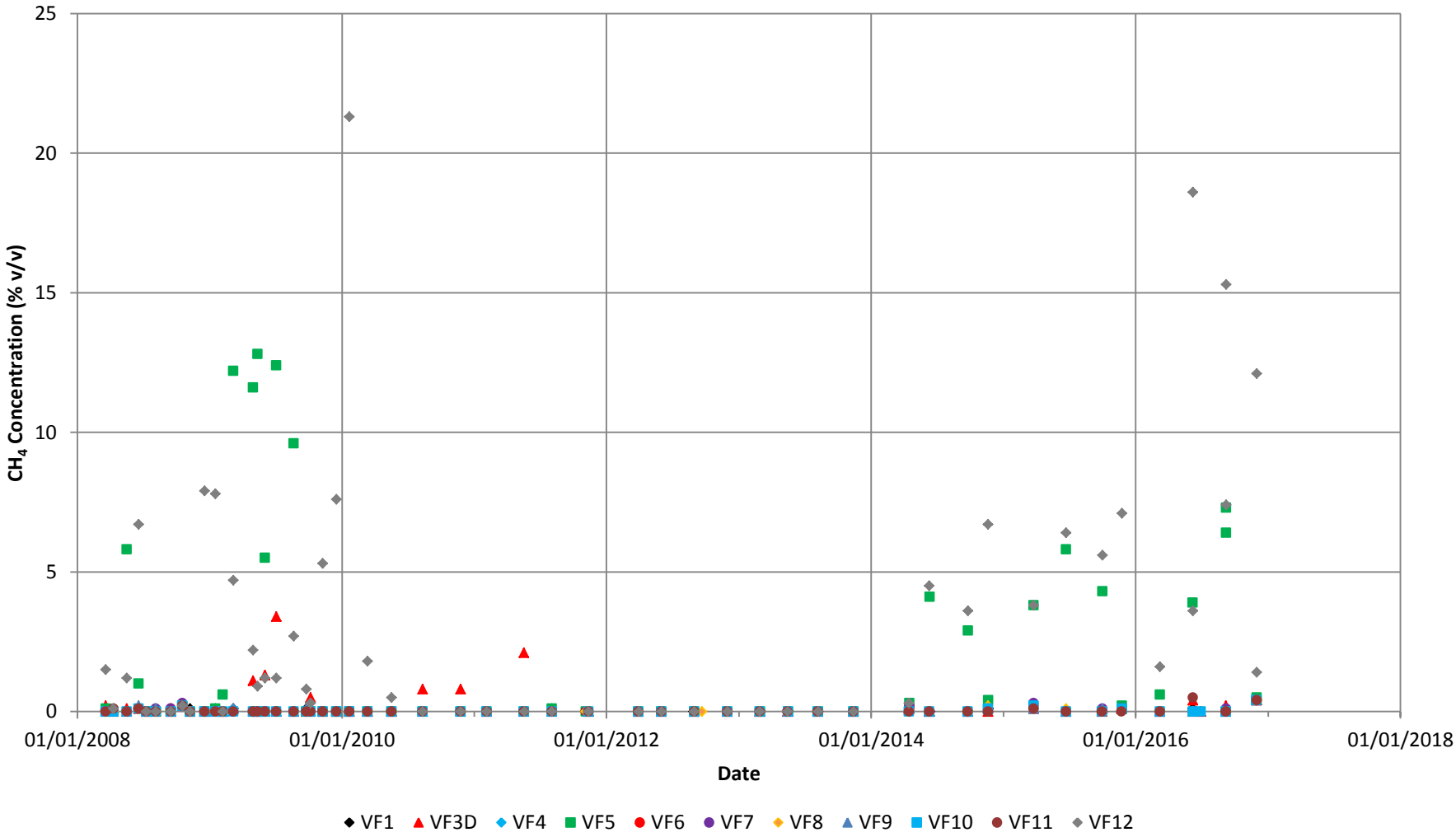
Valleyfield Ash Lagoons - Carbon Dioxide Concentration
VF12 Trigger Level (2.1 % v/v)



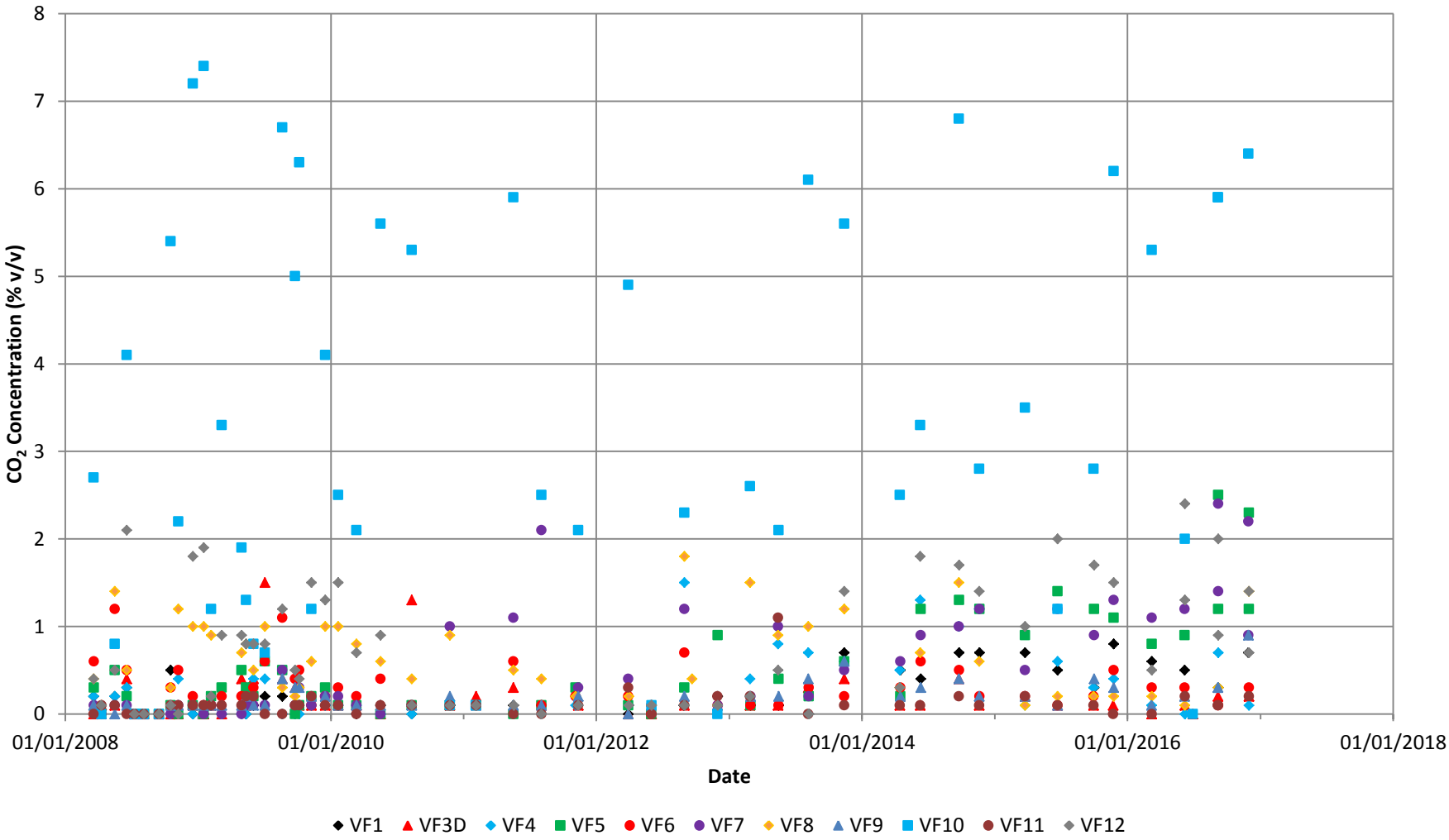
Valleyfield Ash Lagoons - Oxygen Concentration



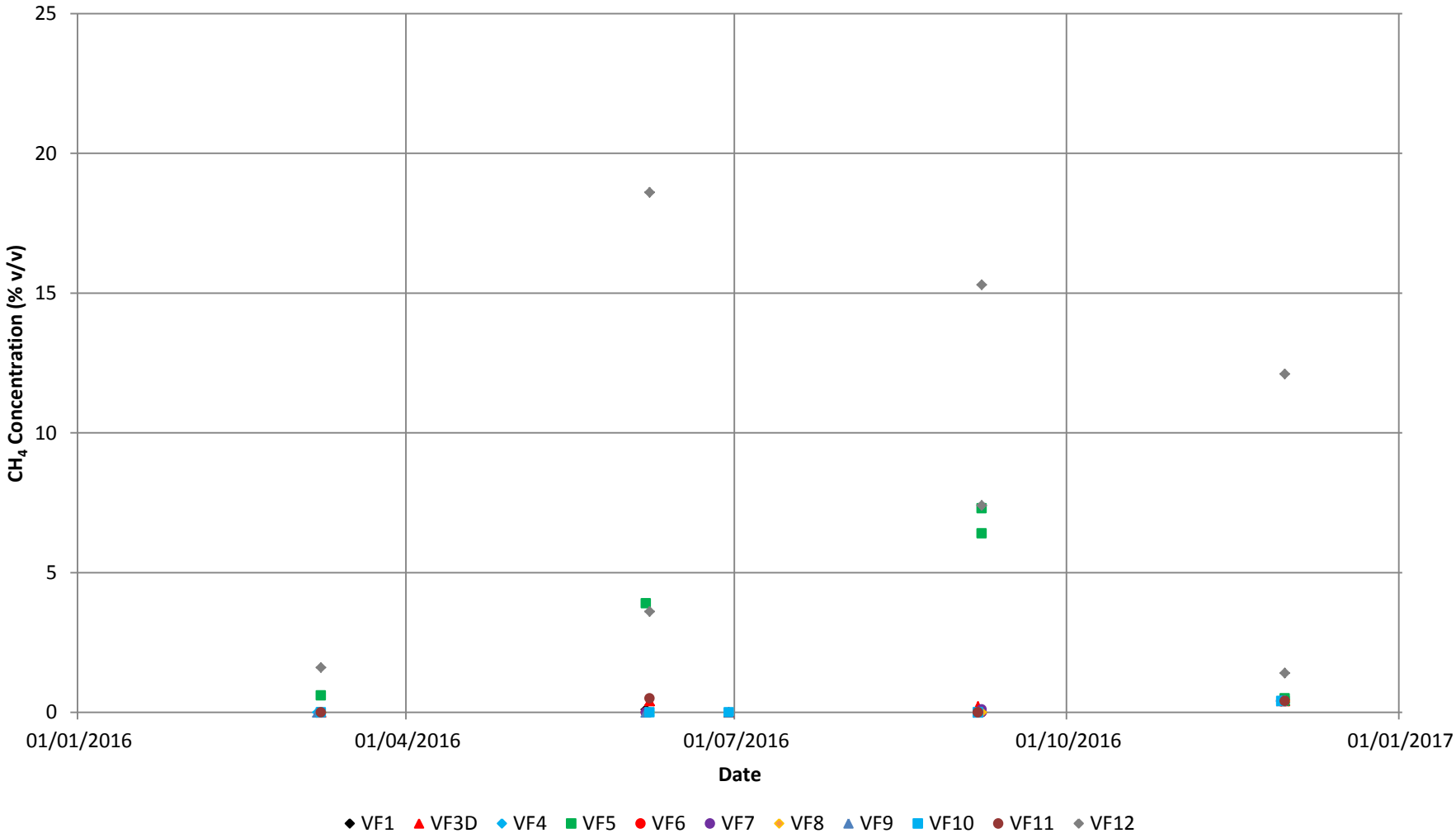
Valleyfield Ash Lagoons - Methane Concentration



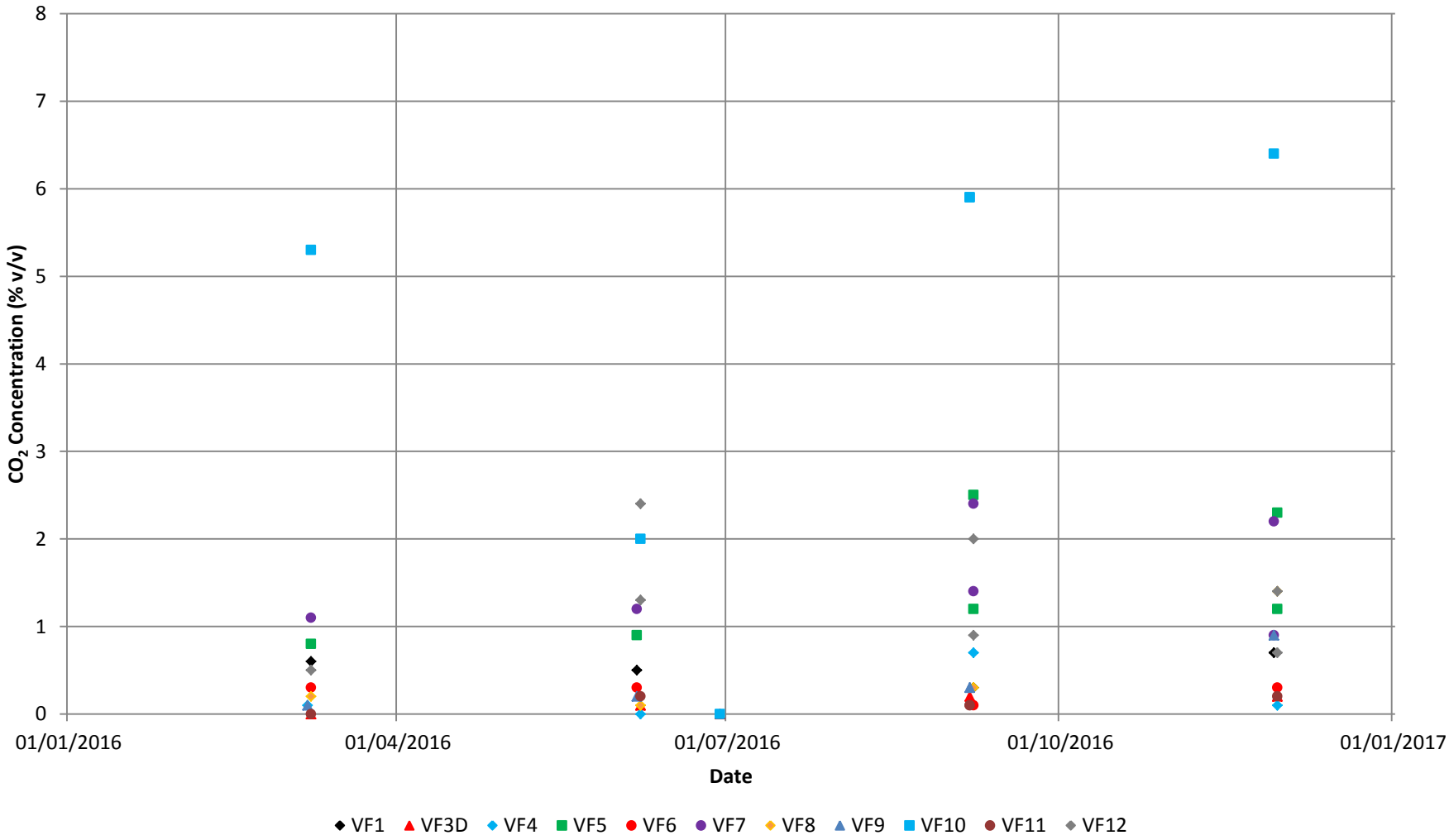
Valleyfield Ash Lagoons - Carbon Dioxide Concentration



Valleyfield Ash Lagoons - Methane Concentration 2016 Data



Valleyfield Ash Lagoons - Carbon Dioxide Concentration
2016 Data



ABERDEEN
214 Union Street,
Aberdeen AB10 1TL, UK
T: **+44 (0)1224 517405**

AYLESBURY
7 Wornal Park, Menmarsh Road,
Worminghall, Aylesbury,
Buckinghamshire HP18 9PH, UK
T: +44 (0)1844 337380

BELFAST
Suite 1 Potters Quay, 5 Ravenhill Road,
Belfast BT6 8DN, UK, Northern Ireland
T: +44 (0)28 9073 2493

BRADFORD-ON-AVON
Treenwood House, Rowden Lane,
Bradford-on-Avon, Wiltshire BA15 2AU,
UK
T: +44 (0)1225 309400

BRISTOL
Langford Lodge, 109 Pembroke Road,
Clifton, Bristol BS8 3EU, UK
T: +44 (0)117 9064280

CAMBRIDGE
8 Stow Court, Stow-cum-Quy,
Cambridge CB25 9AS, UK
T: + 44 (0)1223 813805

CARDIFF
Fulmar House, Beignon Close, Ocean
Way, Cardiff CF24 5PB, UK
T: +44 (0)29 20491010

CHELMSFORD
Unit 77, Waterhouse Business Centre,
2 Cromar Way, Chelmsford, Essex
CM1 2QE, UK
T: +44 (0)1245 392170

DUBLIN
7 Dundrum Business Park, Windy
Arbour, Dundrum, Dublin 14 Ireland
T: + 353 (0)1 2964667

EDINBURGH
4/5 Lochside View, Edinburgh Park,
Edinburgh EH12 9DH, UK
T: +44 (0)131 3356830

EXETER
69 Polsloe Road, Exeter EX1 2NF, UK
T: + 44 (0)1392 490152

GLASGOW
4 Woodside Place, Charing Cross,
Glasgow G3 7QF, UK
T: +44 (0)141 3535037

GRENOBLE
BuroClub, 157/155 Cours Berriat,
38028 Grenoble Cedex 1, France
T: +33 (0)4 76 70 93 41

GUILDFORD
65 Woodbridge Road, Guildford
Surrey GU1 4RD, UK
T: +44 (0)1483 889 800

LEEDS
Suite 1, Jason House, Kerry Hill,
Horsforth, Leeds LS18 4JR, UK
T: +44 (0)113 2580650

LONDON
83 Victoria Street,
London, SW1H 0HW, UK
T: +44 (0)203 691 5810

MAIDSTONE
19 Hollingworth Court, Turkey Mill,
Maidstone, Kent ME14 5PP, UK
T: +44 (0)1622 609242

MANCHESTER
8th Floor, Quay West, MediaCityUK,
Trafford Wharf Road,
Manchester M17 1HH, UK
T: +44 (0)161 872 7564

NEWCASTLE UPON TYNE
Sailors Bethel, Horatio Street,
Newcastle-upon-Tyne NE1 2PE, UK
T: +44 (0)191 2611966

NOTTINGHAM
Aspect House, Aspect Business Park,
Bennerley Road, Nottingham NG6 8WR,
UK
T: +44 (0)115 9647280

SHEFFIELD
Unit 2 Newton Business Centre,
Thorncliffe Park Estate, Newton
Chambers Road, Chapeltown,
Sheffield S35 2PW, UK
T: +44 (0)114 2455153

SHREWSBURY
2nd Floor, Hermes House, Oxon
Business Park, Shrewsbury SY3 5HJ,
UK
T: +44 (0)1743 239250

STAFFORD
8 Parker Court, Staffordshire Technology
Park, Beaconside, Stafford ST18 0WP,
UK
T: +44 (0)1785 241755

STIRLING
No. 68 Stirling Business Centre,
Wellgreen, Stirling FK8 2DZ, UK
T: +44 (0)1786 239900

WORCESTER
Suite 5, Brindley Court, Gresley Road,
Shire Business Park, Worcester WR4
9FD, UK
T: +44 (0)1905 751310

www.slrconsulting.com