



ESPERANCE PORTS
Sea & Land

TSP EXCEEDANCE REPORT

MONITORING PERIOD

2ND OCTOBER 2011

Revision	Prepared	Reviewed	Approved	Date	Description
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1. INTRODUCTION

On the 13th October 2011, the Esperance Ports Sea and Land (EPSL) became aware of laboratory results detailing dust (measured as Total Suspended Particles) exceeding the license criteria (refer to Table 1). Consistent with the latest Licence (L5099/1974/13) issued on the 24th February 2011 (amended 28th July 2011) requirement of Condition 9, this requires an exceedance report to be submitted to the DEC, within seven working days (24th October 2011).

Table 1. Emission Concentration Targets from the Port Environmental Licence (L5099/1974/13) issued to EPSL on 24th February 2011 (amended 28th July 2011).

Emission	Ambient concentration target
Nickel in air	0.14 µg/m ³
Dust as PM ₁₀	50 µg/m ³
Dust as TSP	90 µg/m ³
Silica in air	5 µg/m ³

2. INVESTIGATION

Measured Total Suspended Particulate (TSP) concentrations between 1227 hours on 02/10/2011 and 1230 hours on 03/10/2011 exceeded the TSP license (L5099/1974/13) target (Table 1) for TSP. The recorded TSP at the monitoring sites (refer to Figure 1) is as follows:

- Site 1: 140 ug/m³
- Site 2: 120 ug/m³
- Site 3: 120 ug/m³
- Site 5: 120 ug/m³

Note, to reflect the practical reporting errors, values exceeding 100 ug/m³ are rounded to the nearest 10 ug/m³ by MPL analytical laboratory.



Figure 1: Location of Air Quality Monitoring Stations

2.1 Port Activities

The following Port activities occurred during the monitoring period:

- Henry Oldendorff was along side Berth 2 between 1705 on 28th September 2011 and 1342 on 4th October 2011. Bulk nickel was not loaded during the exceedance period. The ship began loading with bulk nickel on 28th September and ceased loading at 1730 30th September 2011. Loading did not resume until 0815 on the 4th October 2011.
- 18,393 tonnes of iron ore averaged across 4 trains;
- 654 tonnes of nickel concentrate across 13 trucks; and
- 160 tonnes of sulphur was out loaded across 2 trucks.

2.2 Meteorological Activities

The wind directions for the 24 hour period in which the exceedance occurred are in the wind arc from ENE (1%), E (27%), ESE (32%), SE (22%), SSE (11%), S (2%), SSW (2%), SW (1%) and W (2%) (Figure 2). The maximum hourly average wind speed of 9.60 m/s (18.6 Knots) was recorded from the ESE between 1600 and 1700 hours on the 2nd October, typical of the afternoon winds in spring/summer on the Esperance coast. The 'Beaufort Wind Force Scale' is a measure of understanding wind speeds in descriptive terminology. A wind speed of 18.6 knots is described as a 'fresh winds' (17-21 knots) (BOM, 2011).

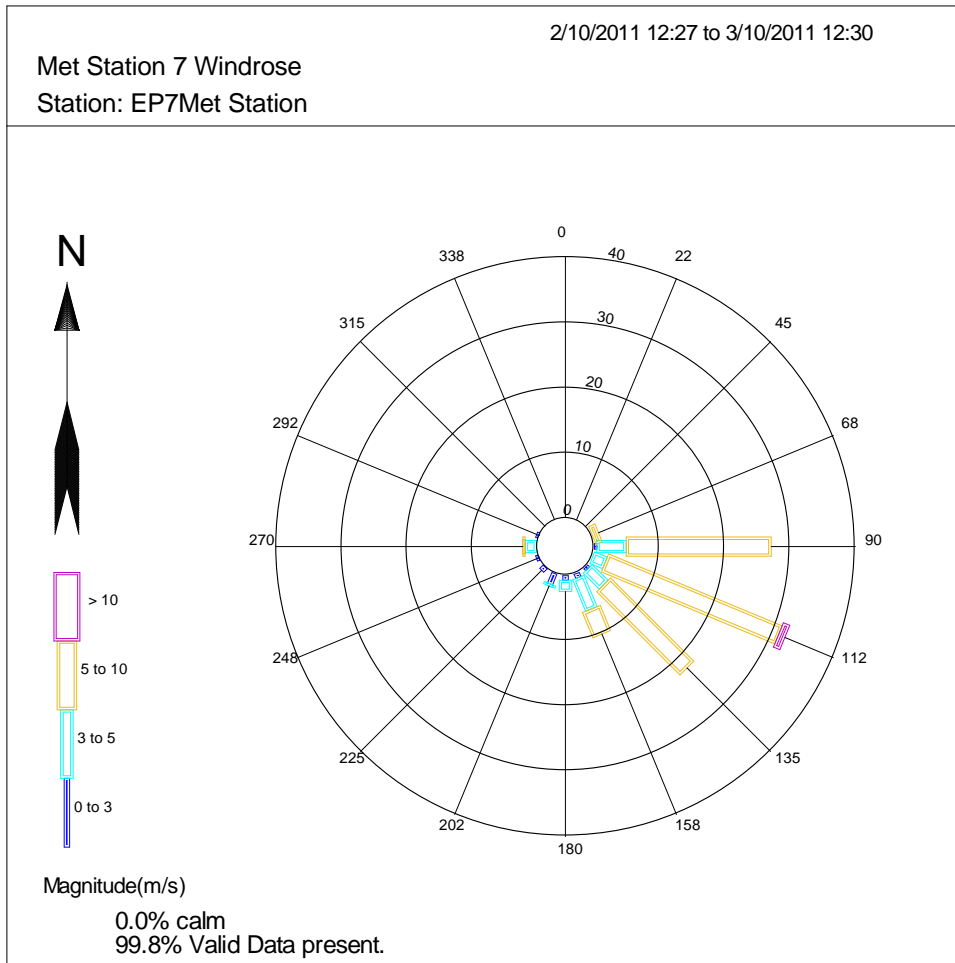


Figure 2: Wind rose for the monitoring period 1227 hrs 02/10/2011 to 1230 hrs 03/10/2011. Raw data source: EP7 monitoring station, Berth 3.

2.3 Reason for exceedance

The exceedance between the 2nd and 3rd October is most likely to be due to fresh easterly breezes (maximum of 9.6 m/s ESE) mobilising particulates from unsealed areas within from the beaches, the port and around town. There was a bulk nickel ship at berth, although loading ceased two days prior to the exceedance. Bulk nickel did not resume loading until 0815 on the 4th October 2011. Nickel contributed no greater than 0.007% of the TSP at any of the sites.

The exceedance at Site 1 and Site 2 were most likely due the winds mobilising particles from the nearby Port beach and from the unsealed areas of the port. Iron (0.79% Fe in TSP) and nickel (0.004% Ni in TSP) representing the products handled at the port, contributed less than 1% of the TSP at Site 1. Similarly, Site 2 showed iron (1.25% Fe in TSP) and nickel (0.007% Ni in TSP) contributed less than 2% of the TSP.

The exceedance at Site 3 is most likely due to unsealed surfaces on the Port unsealed reclaim area. Iron (1.1% Fe in TSP) and nickel (0.003% Ni in TSP) contributed less than 2% of the TSP.

The exceedance at Site 5 is unusual, but is most likely attributed to mobilised particulates from the beaches and unsealed surfaces around the town. Iron (0.26% Fe in TSP) and nickel (0.002% Ni in TSP) contributed less than 1% of the TSP.

3. CONCLUSIONS

The exceedances between the 2nd and 3rd October at Sites 1, 2, 3 and 5 are most likely to be due to strong easterly breezes (maximum of 9.6 m/s ESE) carrying dust and particulates from unsealed surfaces within the port and around town and from the town beaches. No ship loading occurred during the time of the exceedances.

3.1 Corrective Action

The event is due to meteorological conditions and the unsealed surfaces in the port and around the town of Esperance. EPSL already implements a dust binding agent on unsealed surfaces. No further action can be practically taken by EPSL to further reduce dust.

APPENDIX A MPL LABORATORY REPORT

CERTIFICATE OF ANALYSIS 115416

Client:

Esperance Ports - Sea and Land

PO Box 35

Esperance

WA 6450

Attention: N Norrish

Sample log in details:

Your Reference:

No. of samples:

Date samples received:

Date completed instructions received:

Location:

Dust Analysis

47 Hi Volume Filters

05/10/11

5/10/11

Analysis Details:

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by:

12/10/11


Date of Preliminary Report:

Not issued

Issue Date:

12/10/11

Results Approved By:



Joshua Lim
Operations Supervisor

MPL Reference: 115416

Revision No: R 00

Client Reference: Dust Analysis

Metals in High Volume Filters							
Our Reference:	UNITS	PQL	115416-1	115416-2	115416-3	115416-4	115416-5
Your Reference	--	--	EPL29	EPL30	EPL31	EPL32	EPL34
Location	--	--	Site 4	Site 3	Site 2	Site 1	Blank
Date Sampled			23/09/2011	23/09/2011	23/09/2011	23/09/2011	
Dust	mg/filter	0.1	60	38	56	61	4.2
Dust in Air	µg/m ³	0.1	36	23	31	37	[NA]
Iron	µg/filter	5	3,700	1,500	990	790	310
Iron in Air	µg/m ³	0.005	2.2	0.88	0.54	0.47	[NA]
Nickel	µg/filter	2	29	10	9	7	2
Nickel in Air	µg/m ³	0.002	0.017	0.006	0.005	0.004	[NA]
Lead	µg/filter	5	<5	<5	<5	<5	<5
Lead in Air	µg/m ³	0.005	<0.005	<0.005	<0.005	<0.005	[NA]
Lithium	µg/filter	2	<2	<2	<2	<2	<2
Lithium in Air	µg/m ³	0.001	<0.001	<0.001	<0.001	<0.001	[NA]
Sulfur	µg/filter	50	4,000	3,200	2,600	2,000	1,100
Sulfur in Air	µg/m ³	0.02	2.4	1.9	1.4	1.2	[NA]
Zinc	µg/filter	5	153	141	154	142	130
Zinc in Air	µg/m ³	0.002	0.090	0.080	0.090	0.080	[NA]

Metals in High Volume Filters							
Our Reference:	UNITS	PQL	115416-6	115416-7	115416-8	115416-9	115416-10
Your Reference	--	--	EPL47	EPL48	EPL49	EPL50	EPL51
Location	--	--	Site 4	Site 3	Site 2	Site 1	Site 5
Date Sampled			26/09/2011	26/09/2011	26/09/2011	26/09/2011	26/09/2011
Dust	mg/filter	0.1	26	26	30	23	22
Dust in Air	µg/m ³	0.1	16	16	17	14	14
Iron	µg/filter	5	470	420	590	360	390
Iron in Air	µg/m ³	0.005	0.29	0.26	0.34	0.22	0.24
Nickel	µg/filter	2	3	3	4	4	4
Nickel in Air	µg/m ³	0.002	0.002	<0.002	0.002	0.002	0.003
Lead	µg/filter	5	<5	<5	<5	<5	<5
Lead in Air	µg/m ³	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Lithium	µg/filter	2	<2	<2	<2	<2	<2
Lithium in Air	µg/m ³	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulfur	µg/filter	50	1,500	1,600	2,000	1,400	1,400
Sulfur in Air	µg/m ³	0.02	0.94	0.98	1.2	0.87	0.89
Zinc	µg/filter	5	137	147	147	132	142
Zinc in Air	µg/m ³	0.002	0.080	0.090	0.080	0.080	0.090

Client Reference: Dust Analysis

Metals in High Volume Filters	UNITS	PQL	115416-11	115416-12	115416-13	115416-14	115416-15
Our Reference:	--	--	EPL52	EPL59	EPL60	EPL61	EPL62
Your Reference	--	--	Blank	Site 4	Site 3	Site 2	Site 1
Location	--	--		28/09/2011	28/09/2011	28/09/2011	28/09/2011
Date Sampled							
Dust	mg/filter	0.1	4.5	53	50	84	53
Dust in Air	µg/m ³	0.1	[NA]	32	30	47	32
Iron	µg/filter	5	370	590	430	1,800	530
Iron in Air	µg/m ³	0.005	[NA]	0.36	0.26	1.0	0.33
Nickel	µg/filter	2	5	3	4	10	4
Nickel in Air	µg/m ³	0.002	[NA]	<0.002	0.002	0.006	0.002
Lead	µg/filter	5	<5	<5	<5	<5	<5
Lead in Air	µg/m ³	0.005	[NA]	<0.005	<0.005	<0.005	<0.005
Lithium	µg/filter	2	<2	<2	<2	<2	<2
Lithium in Air	µg/m ³	0.001	[NA]	<0.001	<0.001	<0.001	<0.001
Sulfur	µg/filter	50	1,200	2,100	2,100	2,100	1,900
Sulfur in Air	µg/m ³	0.02	[NA]	1.2	1.3	1.2	1.1
Zinc	µg/filter	5	149	137	144	160	141
Zinc in Air	µg/m ³	0.002	[NA]	0.080	0.090	0.090	0.090

Metals in High Volume Filters	UNITS	PQL	115416-16	115416-17	115416-18	115416-19	115416-20
Our Reference:	--	--	EPL63	EPL64	EPL65	EPL66	EPL67
Your Reference	--	--	Site 5	Blank	Site 4	Site 3	Site 2
Location	--	--			29/09/2011	29/09/2011	29/09/2011
Date Sampled			28/09/2011				
Dust	mg/filter	0.1	45	5.0	46	47	74
Dust in Air	µg/m ³	0.1	28	[NA]	30	31	45
Iron	µg/filter	5	410	290	530	610	2,000
Iron in Air	µg/m ³	0.005	0.25	[NA]	0.34	0.40	1.2
Nickel	µg/filter	2	3	3	3	4	11
Nickel in Air	µg/m ³	0.002	0.002	[NA]	<0.002	0.002	0.007
Lead	µg/filter	5	<5	<5	<5	<5	<5
Lead in Air	µg/m ³	0.005	<0.005	[NA]	<0.005	<0.005	<0.005
Lithium	µg/filter	2	<2	<2	<2	<2	<2
Lithium in Air	µg/m ³	0.001	<0.001	[NA]	<0.001	<0.001	<0.001
Sulfur	µg/filter	50	1,900	1,000	1,800	2,700	2,100
Sulfur in Air	µg/m ³	0.02	1.2	[NA]	1.2	1.8	1.3
Zinc	µg/filter	5	144	132	140	151	168
Zinc in Air	µg/m ³	0.002	0.090	[NA]	0.090	0.10	0.10

Client Reference: Dust Analysis

Metals in High Volume Filters	UNITS	PQL	115416-21	115416-22	115416-23	115416-24	115416-25
Our Reference:	--	--	EPL68	EPL69	EPL70	EPL71	EPL72
Your Reference	--	--	Site 1	Site 5	Blank	Site 4	Site 3
Location	--	--	29/09/2011	29/09/2011		30/09/2011	30/09/2011
Date Sampled							
Dust	mg/filter	0.1	51	46	3.7	82	71
Dust in Air	µg/m ³	0.1	33	30	[NA]	49	42
Iron	µg/filter	5	530	510	330	3,300	3,100
Iron in Air	µg/m ³	0.005	0.34	0.33	[NA]	2.0	1.8
Nickel	µg/filter	2	4	5	3	13	16
Nickel in Air	µg/m ³	0.002	0.003	0.003	[NA]	0.008	0.009
Lead	µg/filter	5	<5	<5	<5	<5	<5
Lead in Air	µg/m ³	0.005	<0.005	<0.005	[NA]	<0.005	<0.005
Lithium	µg/filter	2	<2	<2	<2	<2	<2
Lithium in Air	µg/m ³	0.001	<0.001	<0.001	[NA]	<0.001	<0.001
Sulfur	µg/filter	50	4,200	2,000	1,800	6,300	5,300
Sulfur in Air	µg/m ³	0.02	2.7	1.3	[NA]	3.7	3.1
Zinc	µg/filter	5	107	142	140	151	137
Zinc in Air	µg/m ³	0.002	0.070	0.090	[NA]	0.090	0.080

Metals in High Volume Filters	UNITS	PQL	115416-27	115416-28	115416-29	115416-30	115416-31
Our Reference:	--	--	EPL74	EPL75	EPL76	EPL77	EPL78
Your Reference	--	--	Site 1	Site 5	Blank	Site 4	Site 3
Location	--	--	30/09/2011	30/09/2011		1/10/2011	1/10/2011
Date Sampled							
Dust	mg/filter	0.1	61	43	<0.1	84	60
Dust in Air	µg/m ³	0.1	36	26	[NA]	54	39
Iron	µg/filter	5	1,400	670	280	3,000	2,900
Iron in Air	µg/m ³	0.005	0.85	0.40	[NA]	1.9	1.9
Nickel	µg/filter	2	10	4	2	15	14
Nickel in Air	µg/m ³	0.002	0.006	0.002	[NA]	0.009	0.009
Lead	µg/filter	5	<5	<5	<5	<5	<5
Lead in Air	µg/m ³	0.005	<0.005	<0.005	[NA]	<0.005	<0.005
Lithium	µg/filter	2	<2	<2	<2	<2	<2
Lithium in Air	µg/m ³	0.001	<0.001	<0.001	[NA]	<0.001	<0.001
Sulfur	µg/filter	50	3,800	3,500	790	13,455	5,900
Sulfur in Air	µg/m ³	0.02	2.2	2.1	[NA]	8.7	3.8
Zinc	µg/filter	5	150	139	88	147	143
Zinc in Air	µg/m ³	0.002	0.090	0.080	[NA]	0.10	0.090

Client Reference: Dust Analysis

Metals in High Volume Filters	UNITS	PQL	115416-32	115416-33	115416-34	115416-35	115416-36
Our Reference:	--	--	EPL79	EPL80	EPL81	EPL82	EPL83
Your Reference	--	--	Site 2	Site 1	Site 5	Blank	Site 4
Location	--	--	1/10/2011	1/10/2011	1/10/2011		2/10/2011
Date Sampled							
Dust	mg/filter	0.1	49	54	28	5.6	110
Dust in Air	µg/m ³	0.1	29	35	18	[NA]	74
Iron	µg/filter	5	1,900	910	460	320	1,600
Iron in Air	µg/m ³	0.005	1.1	0.59	0.30	[NA]	1.0
Nickel	µg/filter	2	9	5	4	<2	7
Nickel in Air	µg/m ³	0.002	0.006	0.003	0.002	[NA]	0.004
Lead	µg/filter	5	<5	<5	<5	<5	<5
Lead in Air	µg/m ³	0.005	<0.005	<0.005	<0.005	[NA]	<0.005
Lithium	µg/filter	2	<2	<2	<2	<2	<2
Lithium in Air	µg/m ³	0.001	<0.001	<0.001	<0.001	[NA]	<0.001
Sulfur	µg/filter	50	3,900	5,000	5,800	4,800	5,200
Sulfur in Air	µg/m ³	0.02	2.3	3.3	3.8	[NA]	3.4
Zinc	µg/filter	5	130	134	142	144	161
Zinc in Air	µg/m ³	0.002	0.080	0.090	0.090	[NA]	0.10

Metals in High Volume Filters	UNITS	PQL	115416-37	115416-38	115416-39	115416-40	115416-41
Our Reference:	--	--	EPL84	EPL85	EPL86	EPL87	EPL88
Your Reference	--	--	Site 3	Site 2	Site 1	Site 5	Blank
Location	--	--	2/10/2011	2/10/2011	2/10/2011	2/10/2011	
Date Sampled							
Dust	mg/filter	0.1	190	210	220	180	6.5
Dust in Air	µg/m ³	0.1	120	120	140	120	[NA]
Iron	µg/filter	5	1,900	2,400	1,700	480	200
Iron in Air	µg/m ³	0.005	1.3	1.5	1.1	0.31	[NA]
Nickel	µg/filter	2	6	14	9	4	3
Nickel in Air	µg/m ³	0.002	0.004	0.008	0.006	0.002	[NA]
Lead	µg/filter	5	<5	<5	<5	<5	<5
Lead in Air	µg/m ³	0.005	<0.005	<0.005	<0.005	<0.005	[NA]
Lithium	µg/filter	2	<2	<2	<2	<2	<2
Lithium in Air	µg/m ³	0.001	<0.001	<0.001	<0.001	<0.001	[NA]
Sulfur	µg/filter	50	3,100	4,400	3,900	2,500	590
Sulfur in Air	µg/m ³	0.02	2.0	2.7	2.6	1.6	[NA]
Zinc	µg/filter	5	162	193	151	142	72
Zinc in Air	µg/m ³	0.002	0.11	0.12	0.10	0.090	[NA]

Client Reference: Dust Analysis

Metals in High Volume Filters	UNITS	PQL	115416-42	115416-43	115416-44	115416-45	115416-46
Our Reference:	--	--	EPL89	EPL90	EPL91	EPL92	EPL93
Your Reference	--	--	Site 4	Site 3	Site 2	Site 1	Site 5
Location	--	--	3/10/2011	3/10/2011	3/10/2011	3/10/2011	3/10/2011
Date Sampled							
Dust	mg/filter	0.1	120	120	130	140	100
Dust in Air	µg/m ³	0.1	77	74	76	86	65
Iron	µg/filter	5	480	420	1,700	770	480
Iron in Air	µg/m ³	0.005	0.31	0.26	1.0	0.49	0.30
Nickel	µg/filter	2	3	2	7	4	3
Nickel in Air	µg/m ³	0.002	<0.002	<0.002	0.004	0.002	<0.002
Lead	µg/filter	5	<5	<5	<5	<5	<5
Lead in Air	µg/m ³	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Lithium	µg/filter	2	<2	<2	<2	<2	<2
Lithium in Air	µg/m ³	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulfur	µg/filter	50	2,700	2,400	3,200	4,300	3,000
Sulfur in Air	µg/m ³	0.02	1.7	1.5	1.9	2.7	1.9
Zinc	µg/filter	5	152	132	98	95	153
Zinc in Air	µg/m ³	0.002	0.10	0.080	0.060	0.060	0.10

Metals in High Volume Filters	UNITS	PQL	115416-47	115416-48
Our Reference:	--	--	EPL94	Blank Lot
Your Reference	--	--	Blank	T03776
Location	--	--		
Date Sampled				
Dust	mg/filter	0.1	5.1	[NA]
Iron	µg/filter	5	280	290
Nickel	µg/filter	2	2	2
Lead	µg/filter	5	<5	<5
Lithium	µg/filter	2	<2	<2
Sulfur	µg/filter	50	1,400	1,400
Zinc	µg/filter	5	124	140

Client Reference: Dust Analysis

MethodID	Methodology Summary
DUST-004	Airborne samples analysed according to AS 2985 for Respirable Dust or AS 3640 for Inhalable Dust . Sample results based on volume data supplied by client. Samples tested as received, *accreditation does not cover sampling.
METALS-020	Metals in soil and water by ICP-OES.

Report Comments:

INS: Insufficient sample for this test; NT: Not tested; PQL: Practical Quantitation Limit; <: Less than; >: Greater than
RPD: Relative Percent Difference; NA: Test not required; LCS: Laboratory Control Sample; NR: Not requested
NS: Not specified; NEPM: National Environmental Protection Measure
DOL: Sample rejected due to particulate overload

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD a matrix spike recoveries for the sample batch were within laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spike and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and Speciated Phenols is acceptable.

Surrogates: 60-140% is acceptable for general organics and 10-140% for SVOC and Speciated Phenols.