

Appendix 4 - Laboratory analysis reports

Appendix 4 contains the laboratory analysis reports for High Volume Air Sampler PM₁₀ and metals, and dust deposition.

High Volume Air Sampler PM₁₀ and metals

- Certificate of analysis PFK1044 (13 pages)
- Certificate of analysis PFL0375 (12 pages)
- Certificate of analysis PFL1235 (11 pages)
- Certificate of analysis PGA0060 (12 pages)
- Certificate of analysis PGA1005 (11 pages)
- Certificate of analysis PGB0500 (12 pages)
- Certificate of analysis PGB1597 (12 pages)
- Certificate of analysis PGC1007 (12 pages)
- Certificate of analysis PGD0213 (12 pages)
- Certificate of analysis PGD1547 (12 pages)
- Certificate of analysis PGE0148 (12 pages)

Dust deposition

- Certificate of analysis PGA0058 (8 pages)
- Certificate of analysis PGB0072 (8 pages)
- Certificate of analysis PGC0302 (8 pages)
- Certificate of analysis PGD0227 (8 pages)
- Certificate of analysis PGE0191 (8 pages)

Certificate of Analysis PFK1044

Client Details

Client	Department of Water & Environmental Regulation
Contact	
Address	Prime House, 8 Davidson Terrace,, Joondalup, WA, 6027

Sample Details

Your Reference	Pinjarra 2024-25 HVAS - PM10, Metals and Crystalline Silica
Number of Samples	3 HiVol Filter
Date Samples Received	15/11/2024
Date Instructions Received	15/11/2024

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.
Results are reported on a dry weight basis for soils and on an as received basis for other matrices.

Report Details

Date Results Requested by	22/11/2024
Date of Reissue	25/11/2024 - This report supercedes previous report, see amendment history for details

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Authorisation Details

Airborne Dust Approved By	Heram Halim
Results Approved By	Ben Carpenter, Metals Technician Heram Halim, Operations Manager Todd Lee, Group Operations Manager Varsha Ho Wing, Inorganics and Metals Supervisor
Laboratory Manager	Michael Kubiak

Certificate of Analysis PFK1044

Report Amendment History

Revision	Reason for Amendment
R-01	Updated to include Strontium results.

Certificate of Analysis PFK1044

Samples in this Report

Envirolab ID	Sample ID	Matrix	Date Sampled	Date Received
PFK1044-01	DWE210	HiVol Filter	02/11/2024	15/11/2024
PFK1044-02	DWE211	HiVol Filter	08/11/2024	15/11/2024
PFK1044-03	DWE212	HiVol Filter	14/11/2024	15/11/2024

Sample Information

Sample ID	Filter ID	Flow Rate (L/min)	Time Sampled (min)	Air Volume (m3)
DWE210	DWE210	[NA]	[NA]	[NA]
DWE211	DWE211	[NA]	[NA]	[NA]
DWE212	DWE212	[NA]	[NA]	[NA]

Certificate of Analysis PFK1044

Acid Extractable Metals (HiVol Filter)

Envirolab ID Your Reference Date Sampled	Units	PQL	PFK1044-01 DWE210 02/11/2024	PFK1044-02 DWE211 08/11/2024	PFK1044-03 DWE212 14/11/2024
Silver	µg/sample	5.0	<5.0	<5.0	<5.0
Aluminium	µg/sample	5.0	75	220	710
Boron	µg/sample	20	<20	<20	<20
Barium	µg/sample	2.0	<2.0	<2.0	<2.0
Calcium	µg/sample	50	280	200	420
Cadmium	µg/sample	0.50	<0.50	<0.50	<0.50
Cobalt	µg/sample	2.0	<2.0	<2.0	<2.0
Chromium	µg/sample	2.0	10	9.4	9.8
Copper	µg/sample	2.0	<2.0	<2.0	<2.0
Iron	µg/sample	5.0	61	270	1100
Mercury	µg/sample	0.20	<0.20	<0.20	<0.20
Potassium	µg/sample	50	170	94	150
Lithium	µg/sample	2.0	<2.0	<2.0	<2.0
Magnesium	µg/sample	50	320	160	260
Manganese	µg/sample	2.0	<2.0	<2.0	2.4
Molybdenum	µg/sample	5.0	<5.0	<5.0	<5.0
Sodium	µg/sample	100	2500	1300	2100
Nickel	µg/sample	2.0	<2.0	<2.0	<2.0
Phosphorus	µg/sample	20	<20	<20	<20
Lead	µg/sample	5.0	<5.0	<5.0	<5.0
Sulfur	µg/sample	50	320	210	360
Tin	µg/sample	10	<10	<10	<10
Strontium	µg/sample	2.0	2.6	<2.0	2.7
Titanium	µg/sample	2.0	2.3	4.4	24
Vanadium	µg/sample	2.0	<2.0	<2.0	2.9
Zinc	µg/sample	5.0	6.1	<5.0	5.1
Arsenic	µg/sample	2.0	<2.0	<2.0	<2.0
Beryllium	µg/sample	0.20	<0.20	<0.20	<0.20
Gallium*	µg/sample	4.0	<4.0	<4.0	<4.0
Antimony	µg/sample	10	<10	<10	<10
Selenium	µg/sample	4.0	<4.0	<4.0	<4.0
Thorium	µg/sample	4.0	<4.0	<4.0	<4.0
Thallium	µg/sample	4.0	<4.0	<4.0	<4.0
Uranium	µg/sample	4.0	<4.0	<4.0	<4.0

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Quartz/Cristobalite by XRD (HiVol Filter)

Envirolab ID	Units	PQL	PFK1044-01	PFK1044-02	PFK1044-03
Your Reference			DWE210	DWE211	DWE212
Date Sampled			02/11/2024	08/11/2024	14/11/2024
a-Quartz	µg/sample	50	160	530	170

Certificate of Analysis PFK1044

HVAS Dust (HiVol Filter)

Envirolab ID	Units	PQL	PFK1044-01	PFK1044-02	PFK1044-03
Your Reference			DWE210	DWE211	DWE212
Date Sampled			02/11/2024	08/11/2024	14/11/2024
Dust	mg	0.10	18	19	39

Certificate of Analysis PFK1044

Method Summary

Method ID	Methodology Summary
DUST-004 HVAS	Determination of Gravimetric Dust
DUST-005	Respirable Quartz (and/or Cristabolite) determined direct on filter (unless otherwise indicated) by XRD determination. The Quartz exposure standard is 50µg/m3, therefore where sampling follows MDHS 101 guidelines and at least 500L of air is sampled, this is equivalent to a dust weight of 25µg/filter. The estimated measurement uncertainty for the laboratory analysis of Quartz is 30% at 25µg at 95% confidence limit (i.e. statistically the true value lies between 18-32µg / filter (35 65 µg/m3) at 95% confidence). The estimated measurement uncertainty was determined during method validation. NSW Resources Regulator have licenced (MLA0017505) Envirolab/MPL for the Analysis of Inhalable & Respirable Dust and Respirable Crystalline Silica.
METALS-020	Determination of various metals by ICP-OES.
METALS-020/022	Determination of various metals by ICP-OES or ICP-MS.
METALS-021	Determination of Mercury by Cold Vapour AAS.
METALS-022	Determination of various metals by ICP-MS. Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements. Salt forms and/or anion/cation forms (e.g. FeO, PbO, ZnO, BO3) are determined stoichiometrically from the base metal concentration.

Certificate of Analysis PFK1044

Result Definitions

Identifier	Description
NR	Not reported
NEPM	National Environment Protection Measure
NS	Not specified
LCS	Laboratory Control Sample
RPD	Relative Percent Difference
>	Greater than
<	Less than
PQL	Practical Quantitation Limit
INS	Insufficient sample for this test
NA	Test not required
NT	Not tested
DOL	Samples rejected due to particulate overload (air filters only)
RFD	Samples rejected due to filter damage (air filters only)
RUD	Samples rejected due to uneven deposition (air filters only)
##	Indicates a laboratory acceptance criteria outlier, for further details, see Result Comments and/or QC Comments

Quality Control Definitions

Blank

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

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.

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.

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.

Duplicate

This is the complete duplicate analysis of a sample from the process batch. The sample selected should be one where the analyte concentration is easily measurable.

Certificate of Analysis PFK1044

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 and matrix spike recoveries for the batch were within the laboratory acceptance criteria. Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction. Spikes for Physical and Aggregate Tests are not applicable. For VOCs in water samples, three vials are required for duplicate or spike analysis.

General Acceptance Criteria (GAC) - Analyte specific criteria applies for some analytes and is reflected in QC recovery tables.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% - see ELN-P05 QAQC tables for details (available on request); <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase. Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was typically insufficient in order to satisfy laboratory QA/QC protocols.

Miscellaneous Information

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached. We have taken the sampling date as being the date received at the laboratory.

Two significant figures are reported for the majority of tests and with a high degree of confidence, for results <10*PQL, the second significant figure may be in doubt i.e. has a relatively high degree of uncertainty and is provided for information only.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS where sediment/solids are included by default.

Urine Analysis - The BEI values listed are taken from the 2022 edition of *TLVs and BEIs Threshold Limits by ACGIH*.

Air volume measurements are not covered by Envirolab's NATA accreditation.

Data Quality Assessment Summary PFK1044

Client Details

Client	Department of Water & Environmental Regulation
Your Reference	Pinjarra 2024-25 HVAS - PM10, Metals and Crystalline Silica
Date Issued	25/11/2024

Recommended Holding Time Compliance

No recommended holding time exceedances

Quality Control and QC Frequency

QC Type	Compliant	Details
Blank	Yes	No Outliers
LCS	Yes	No Outliers
Duplicates	Yes	No Outliers
Matrix Spike	Yes	No Outliers
Surrogates / Extracted Internal Standards	Yes	No Outliers
QC Frequency	Yes	No Outliers

Surrogates/Extracted Internal Standards, Duplicates and/or Matrix Spikes are not always relevant/applicable to certain analyses and matrices. Therefore, said QC measures are deemed compliant in these situations by default. See Laboratory Acceptance Criteria for more information

Data Quality Assessment Summary PFK1044

Recommended Holding Time Compliance

Analysis	Sample Number(s)	Date Sampled	Date Extracted	Date Analysed	Compliant
Metals OHS HiVol Filter	1	02/11/2024	21/11/2024	21/11/2024	Yes
	2	08/11/2024	21/11/2024	21/11/2024	Yes
	3	14/11/2024	21/11/2024	21/11/2024	Yes
Metals OHS (LL) HiVol Filter	1	02/11/2024	21/11/2024	21/11/2024	Yes
	2	08/11/2024	21/11/2024	21/11/2024	Yes
	3	14/11/2024	21/11/2024	21/11/2024	Yes
Metals OHS-Hg HiVol Filter	1	02/11/2024	21/11/2024	21/11/2024	Yes
	2	08/11/2024	21/11/2024	21/11/2024	Yes
	3	14/11/2024	21/11/2024	21/11/2024	Yes
Quartz by XRD HiVol Filter	1	02/11/2024	20/11/2024	22/11/2024	Yes
	2	08/11/2024	20/11/2024	22/11/2024	Yes
	3	14/11/2024	20/11/2024	22/11/2024	Yes
Gravimetric Dust HiVol Filter	1	02/11/2024	20/11/2024	20/11/2024	Yes
	2	08/11/2024	20/11/2024	20/11/2024	Yes
	3	14/11/2024	20/11/2024	20/11/2024	Yes

Quality Control PFK1044

METALS-021 | Acid Extractable Metals (HiVol Filter) | Batch BFK3779

Analyte	Units	PQL	Blank	DUP1	LCS %
				PFK1044-01	
				Samp QC RPD %	
Mercury	µg/sample	0.20	<0.20	<0.20 <0.20 [NA]	118

METALS-022 | Acid Extractable Metals (HiVol Filter) | Batch BFK3780

Analyte	Units	PQL	Blank	DUP1	LCS %
				PFK1044-01	
				Samp QC RPD %	
Antimony	µg/sample	10	<10	<10 <10 [NA]	95.0
Arsenic	µg/sample	2.0	<2.0	<2.0 <2.0 [NA]	100
Beryllium	µg/sample	0.20	<0.20	<0.20 <0.20 [NA]	89.6
Gallium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]	94.3
Selenium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]	106
Thallium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]	90.1
Thorium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]	71.0
Uranium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]	85.6

METALS-020/022 | Acid Extractable Metals (HiVol Filter) | Batch BFK3781

Analyte	Units	PQL	Blank	DUP1	LCS %
				PFK1044-01	
				Samp QC RPD %	
Aluminium	µg/sample	5.0	<5.0	74.8 72.5 3.17	104
Barium	µg/sample	2.0	<2.0	<2.0 2.00 [NA] [1]	101
Boron	µg/sample	20	<20	<20 <20 [NA]	97.7
Cadmium	µg/sample	0.50	<0.50	<0.50 <0.50 [NA]	90.5
Calcium	µg/sample	50	<50	284 274 3.41	92.9
Chromium	µg/sample	2.0	<2.0	10.3 11.6 11.5	102
Cobalt	µg/sample	2.0	<2.0	<2.0 <2.0 [NA]	91.1
Copper	µg/sample	2.0	<2.0	<2.0 <2.0 [NA]	104
Iron	µg/sample	5.0	<5.0	61.1 58.4 4.66	94.3
Lead	µg/sample	5.0	<5.0	<5.0 <5.0 [NA]	100
Lithium	µg/sample	2.0	<2.0	<2.0 <2.0 [NA]	97.2
Magnesium	µg/sample	50	<50	320 310 3.00	90.8
Manganese	µg/sample	2.0	<2.0	<2.0 <2.0 [NA]	100
Molybdenum	µg/sample	5.0	<5.0	<5.0 <5.0 [NA]	95.8
Nickel	µg/sample	2.0	<2.0	<2.0 <2.0 [NA]	101
Phosphorus	µg/sample	20	<20	<20 <20 [NA]	83.7
Potassium	µg/sample	50	<50	172 163 [NA]	94.7
Silver	µg/sample	5.0	<5.0	<5.0 <5.0 [NA]	106
Sodium	µg/sample	100	<100	2470 2460 0.0649	87.3
Strontium	µg/sample	2.0	<2.0	2.59 2.46 [NA]	93.3
Sulfur	µg/sample	50	<50	316 309 2.26	84.0
Tin	µg/sample	10	<10	<10 <10 [NA]	92.7
Titanium	µg/sample	2.0	<2.0	2.30 2.42 [NA]	94.3
Vanadium	µg/sample	2.0	<2.0	<2.0 <2.0 [NA]	93.9
Zinc	µg/sample	5.0	<5.0	6.13 5.39 [NA]	98.8

DUST-005 | Quartz/Cristobalite by XRD (HiVol Filter) | Batch BFK3488

Analyte	Units	PQL	Blank	DUP1	LCS %
				PFK1044-01	
				Samp QC RPD %	
a-Quartz	µg/sample	50	<12	162 169 [NA]	94.9

Quality Control PFK1044

QC Comments

Identifier	Description
[1]	Duplicate %RPD may be flagged as an outlier to routine laboratory acceptance, however, where one or both results are <10*PQL, the RPD acceptance criteria increases exponentially.

Certificate of Analysis PFL0375

Client Details

Client	Department of Water & Environmental Regulation
Contact	
Address	Prime House, 8 Davidson Terrace,, Joondalup, WA, 6027

Sample Details

Your Reference	Pinjarra 2024-25 HVAS - PM10, Metals and Crystalline Silica
Number of Samples	3 HiVol Filter
Date Samples Received	05/12/2024
Date Instructions Received	05/12/2024

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.
Results are reported on a dry weight basis for soils and on an as received basis for other matrices.

Report Details

Date Results Requested by	12/12/2024
Date of Reissue	03/01/2025 - This report supercedes previous report, see amendment history for details

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Authorisation Details

Airborne Dust Approved By	Thomas Edwards
Results Approved By	Ben Carpenter, Metals Technician Heram Halim, Business Development Manager Michael Mowle, Inorganics Supervisor Thomas Edwards, OHL Supervisor Varsha Ho Wing, Inorganics and Metals Supervisor
Laboratory Manager	Michael Kubiak

Certificate of Analysis PFL0375

Report Amendment History

Revision	Reason for Amendment
R-01	PFL0375-03 (DWE216) Lead result corrected

Certificate of Analysis PFL0375

Samples in this Report

Envirolab ID	Sample ID	Matrix	Date Sampled	Date Received
PFL0375-01	213	HiVol Filter	20/11/2024	05/12/2024
PFL0375-02	215	HiVol Filter	26/11/2024	05/12/2024
PFL0375-03	216	HiVol Filter	02/12/2024	05/12/2024

Sample Information

Sample ID	Filter ID	Flow Rate (L/min)	Time Sampled (min)	Air Volume (m3)
213	DWE213	[NA]	[NA]	[NA]
215	DWE215	[NA]	[NA]	[NA]
216	DWE216	[NA]	[NA]	[NA]

Certificate of Analysis PFL0375

Acid Extractable Metals (HiVol Filter)

Envirolab ID Your Reference Date Sampled	Units	PQL	PFL0375-01 213 20/11/2024	PFL0375-02 215 26/11/2024	PFL0375-03 216 02/12/2024
Silver	µg/sample	5.0	<5.0	<5.0	<5.0
Aluminium	µg/sample	5.0	67	270	64
Boron	µg/sample	20	<20	<20	<20
Barium	µg/sample	2.0	2.0	<2.0	<2.0
Calcium	µg/sample	50	270	280	310
Cadmium	µg/sample	0.50	<0.50	<0.50	<0.50
Cobalt	µg/sample	2.0	<2.0	<2.0	<2.0
Chromium	µg/sample	2.0	8.3	9.2	8.7
Copper	µg/sample	2.0	<2.0	<2.0	<2.0
Iron	µg/sample	5.0	100	330	81
Mercury	µg/sample	0.20	<0.20	<0.20	<0.20
Potassium	µg/sample	50	160	150	160
Lithium	µg/sample	2.0	<2.0	<2.0	<2.0
Magnesium	µg/sample	50	310	410	460
Manganese	µg/sample	2.0	<2.0	<2.0	<2.0
Molybdenum	µg/sample	5.0	<5.0	<5.0	<5.0
Sodium	µg/sample	100	2400	3300	3600
Nickel	µg/sample	2.0	<2.0	<2.0	<2.0
Phosphorus	µg/sample	20	<20	<20	<20
Lead	µg/sample	5.0	<5.0	<5.0	<5.0
Sulfur	µg/sample	50	830	390	450
Tin	µg/sample	10	<10	<10	<10
Strontium	µg/sample	2.0	2.4	2.9	3.1
Titanium	µg/sample	2.0	2.9	4.3	2.0
Vanadium	µg/sample	2.0	<2.0	<2.0	<2.0
Zinc	µg/sample	5.0	<5.0	<5.0	<5.0
Arsenic	µg/sample	2.0	<2.0	<2.0	<2.0
Beryllium	µg/sample	0.20	<0.20	<0.20	<0.20
Gallium*	µg/sample	4.0	<4.0	<4.0	<4.0
Antimony	µg/sample	10	<10	<10	<10
Selenium	µg/sample	4.0	<4.0	<4.0	<4.0
Thorium	µg/sample	4.0	<4.0	<4.0	<4.0
Thallium	µg/sample	4.0	<4.0	<4.0	<4.0
Uranium	µg/sample	4.0	<4.0	<4.0	<4.0

Certificate of Analysis PFL0375

Quartz/Cristobalite by XRD (HiVol Filter)

Envirolab ID	Units	PQL	PFL0375-01	PFL0375-02	PFL0375-03
Your Reference			213	215	216
Date Sampled			20/11/2024	26/11/2024	02/12/2024
a-Quartz	µg/sample	50	94	280	93

Certificate of Analysis PFL0375

HVAS Dust (HiVol Filter)

Envirolab ID	Units	PQL	PFL0375-01	PFL0375-02	PFL0375-03
Your Reference			213	215	216
Date Sampled			20/11/2024	26/11/2024	02/12/2024
Dust	mg	0.10	21	26	25

Certificate of Analysis PFL0375

Method Summary

Method ID	Methodology Summary
DUST-004 HVAS	Determination of Gravimetric Dust
DUST-005	Respirable Quartz (and/or Cristabolite) determined direct on filter (unless otherwise indicated) by XRD determination. The Quartz exposure standard is 50µg/m3, therefore where sampling follows MDHS 101 guidelines and at least 500L of air is sampled, this is equivalent to a dust weight of 25µg/filter. The estimated measurement uncertainty for the laboratory analysis of Quartz is 30% at 25µg at 95% confidence limit (i.e. statistically the true value lies between 18-32µg / filter (35 65 µg/m3) at 95% confidence). The estimated measurement uncertainty was determined during method validation. NSW Resources Regulator have licenced (MLA0017505) Envirolab/MPL for the Analysis of Inhalable & Respirable Dust and Respirable Crystalline Silica.
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Certificate of Analysis PFL0375

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This is the complete duplicate analysis of a sample from the process batch. The sample selected should be one where the analyte concentration is easily measurable.

Certificate of Analysis PFL0375

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 and matrix spike recoveries for the batch were within the laboratory acceptance criteria. Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction. Spikes for Physical and Aggregate Tests are not applicable. For VOCs in water samples, three vials are required for duplicate or spike analysis.

General Acceptance Criteria (GAC) - Analyte specific criteria applies for some analytes and is reflected in QC recovery tables.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% - see ELN-P05 QAQC tables for details (available on request); <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase. Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was typically insufficient in order to satisfy laboratory QA/QC protocols.

Miscellaneous Information

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached. We have taken the sampling date as being the date received at the laboratory.

Two significant figures are reported for the majority of tests and with a high degree of confidence, for results <10*PQL, the second significant figure may be in doubt i.e. has a relatively high degree of uncertainty and is provided for information only.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS where sediment/solids are included by default.

Urine Analysis - The BEI values listed are taken from the 2022 edition of *TLVs and BEIs Threshold Limits by ACGIH*.

Air volume measurements are not covered by Envirolab's NATA accreditation.

Data Quality Assessment Summary PFL0375

Client Details

Client	Department of Water & Environmental Regulation
Your Reference	Pinjarra 2024-25 HVAS - PM10, Metals and Crystalline Silica
Date Issued	03/01/2025

Recommended Holding Time Compliance

Recommended holding time exceedances exist - See detailed list below

Quality Control and QC Frequency

QC Type	Compliant	Details
Blank	Yes	No Outliers
LCS	Yes	No Outliers
Duplicates	Yes	No Outliers
Matrix Spike	Yes	No Outliers
Surrogates / Extracted Internal Standards	Yes	No Outliers
QC Frequency	No	QC Frequency Outliers Exist - See detailed list below

Surrogates/Extracted Internal Standards, Duplicates and/or Matrix Spikes are not always relevant/applicable to certain analyses and matrices. Therefore, said QC measures are deemed compliant in these situations by default. See Laboratory Acceptance Criteria for more information

Data Quality Assessment Summary PFL0375

Recommended Holding Time Compliance

Analysis	Sample Number(s)	Date Sampled	Date Extracted	Date Analysed	Compliant
Metals OHS HiVol Filter	3	02/12/2024	12/12/2024	12/12/2024	Yes
	1	20/11/2024	12/12/2024	12/12/2024	Yes
	2	26/11/2024	12/12/2024	12/12/2024	Yes
Metals OHS (LL) HiVol Filter	3	02/12/2024	12/12/2024	13/12/2024	Yes
	1	20/11/2024	12/12/2024	13/12/2024	Yes
	2	26/11/2024	12/12/2024	13/12/2024	Yes
Metals OHS-Hg HiVol Filter	3	02/12/2024	12/12/2024	12/12/2024	Yes
	1	20/11/2024	12/12/2024	12/12/2024	Yes
	2	26/11/2024	12/12/2024	12/12/2024	Yes
Quartz by XRD HiVol Filter	3	02/12/2024	12/12/2024	13/12/2024	Yes
	1	20/11/2024	12/12/2024	13/12/2024	Yes
	2	26/11/2024	12/12/2024	13/12/2024	Yes
Gravimetric Dust HiVol Filter	3	02/12/2024	12/12/2024	12/12/2024	Yes
	1	20/11/2024	12/12/2024	12/12/2024	No
	2	26/11/2024	12/12/2024	12/12/2024	Yes

Outliers: QC Frequency

METALS-020 | Acid Extractable Metals (HiVol Filter) | Batch BFL2301

Analysis	QC Type	Expected	Reported
Metals OHS	Duplicate	1	0

METALS-020/022 | Acid Extractable Metals (HiVol Filter) | Batch BFL2301

Analysis	QC Type	Expected	Reported
Metals OHS	Duplicate	1	0

METALS-021 | Acid Extractable Metals (HiVol Filter) | Batch BFL2298

Analysis	QC Type	Expected	Reported
Metals OHS-Hg	Duplicate	1	0

METALS-022 | Acid Extractable Metals (HiVol Filter) | Batch BFL2300

Analysis	QC Type	Expected	Reported
Metals OHS (LL)	Duplicate	1	0

Quality Control PFL0375

METALS-021 | Acid Extractable Metals (HiVol Filter) | Batch BFL2298

Analyte	Units	PQL	Blank	LCS %
Mercury	µg/sample	0.20	<0.20	97.6

METALS-022 | Acid Extractable Metals (HiVol Filter) | Batch BFL2300

Analyte	Units	PQL	Blank	LCS %
Antimony	µg/sample	10	<10	109
Arsenic	µg/sample	2.0	<2.0	103
Beryllium	µg/sample	0.20	<0.20	111
Gallium	µg/sample	4.0	<4.0	94.4
Selenium	µg/sample	4.0	<4.0	112
Thallium	µg/sample	4.0	<4.0	90.0
Thorium	µg/sample	4.0	<4.0	72.2
Uranium	µg/sample	4.0	<4.0	88.5

METALS-020/022 | Acid Extractable Metals (HiVol Filter) | Batch BFL2301

Analyte	Units	PQL	Blank	LCS %
Aluminium	µg/sample	5.0	<5.0	103
Barium	µg/sample	2.0	<2.0	113
Boron	µg/sample	20	<20	98.3
Cadmium	µg/sample	0.50	<0.50	98.4
Calcium	µg/sample	50	<50	92.1
Chromium	µg/sample	2.0	<2.0	97.1
Cobalt	µg/sample	2.0	<2.0	98.5
Copper	µg/sample	2.0	<2.0	99.3
Iron	µg/sample	5.0	<5.0	101
Lead	µg/sample	5.0	<5.0	94.6
Lithium	µg/sample	2.0	<2.0	104
Magnesium	µg/sample	50	<50	91.8
Manganese	µg/sample	2.0	<2.0	98.2
Molybdenum	µg/sample	5.0	<5.0	104
Nickel	µg/sample	2.0	<2.0	96.5
Phosphorus	µg/sample	20	<20	97.0
Potassium	µg/sample	50	<50	91.0
Silver	µg/sample	5.0	<5.0	91.9
Sodium	µg/sample	100	<100	88.4
Strontium	µg/sample	2.0	<2.0	98.9
Sulfur	µg/sample	50	<50	89.7
Tin	µg/sample	10	<10	103
Titanium	µg/sample	2.0	<2.0	104
Vanadium	µg/sample	2.0	<2.0	98.5
Zinc	µg/sample	5.0	<5.0	96.4

DUST-005 | Quartz/Cristobalite by XRD (HiVol Filter) | Batch BFL2283

Analyte	Units	PQL	Blank	DUP1 PFL0375-01 Samp QC RPD %	LCS %
a-Quartz	µg/sample	50	<12	93.6 92.6 [NA]	109

Certificate of Analysis PFL1235

Client Details

Client	Department of Water & Environmental Regulation
Contact	
Address	Prime House, 8 Davidson Terrace,, Joondalup, WA, 6027

Sample Details

Your Reference	Pinjarra 2024-25 HVAS - PM10, Metals and Crystalline Silica
Number of Samples	3 HiVol Filter
Date Samples Received	17/12/2024
Date Instructions Received	17/12/2024

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.
Results are reported on a dry weight basis for soils and on an as received basis for other matrices.

Report Details

Date Results Requested by	24/12/2024
Date of Issue	23/12/2024

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Authorisation Details

Airborne Dust Approved By	Thomas Edwards
Results Approved By	Michael Mowle, Inorganics Supervisor Thomas Edwards, OHL Supervisor
Laboratory Manager	Michael Kubiak

Certificate of Analysis PFL1235

Samples in this Report

Envirolab ID	Sample ID	Matrix	Date Sampled	Date Received
PFL1235-01	DWE217	HiVol Filter	08/12/2024	17/12/2024
PFL1235-02	DWE218	HiVol Filter	14/12/2024	17/12/2024
PFL1235-03	DWE219	HiVol Filter	16/12/2024	17/12/2024

Sample Information

Sample ID	Filter ID	Flow Rate (L/min)	Time Sampled (min)	Air Volume (m3)
DWE217	DWE217	[NA]	[NA]	[NA]
DWE218	DWE218	[NA]	[NA]	[NA]
DWE219	DWE219	[NA]	[NA]	[NA]

Certificate of Analysis PFL1235

Acid Extractable Metals (HiVol Filter)

Envirolab ID Your Reference Date Sampled	Units	PQL	PFL1235-01 DWE217 08/12/2024	PFL1235-02 DWE218 14/12/2024	PFL1235-03 DWE219 16/12/2024
Silver	µg/sample	5.0	8.7	10	11
Aluminium	µg/sample	5.0	730	210	12
Boron	µg/sample	20	<20	<20	<20
Barium	µg/sample	2.0	<2.0	<2.0	<2.0
Calcium	µg/sample	50	330	270	<50
Cadmium	µg/sample	0.50	<0.50	<0.50	<0.50
Cobalt	µg/sample	2.0	<2.0	<2.0	<2.0
Chromium	µg/sample	2.0	14	13	6.5
Copper	µg/sample	2.0	<2.0	<2.0	<2.0
Iron	µg/sample	5.0	1200	240	7.8
Mercury	µg/sample	0.20	<0.20	<0.20	<0.20
Potassium	µg/sample	50	170	140	<50
Lithium	µg/sample	2.0	<2.0	<2.0	<2.0
Magnesium	µg/sample	50	310	310	<50
Manganese	µg/sample	2.0	3.0	<2.0	<2.0
Molybdenum	µg/sample	5.0	<5.0	<5.0	<5.0
Sodium	µg/sample	100	2300	2400	<100
Nickel	µg/sample	2.0	<2.0	<2.0	<2.0
Phosphorus	µg/sample	20	<20	<20	<20
Lead	µg/sample	5.0	<5.0	<5.0	<5.0
Sulfur	µg/sample	50	520	880	<50
Tin	µg/sample	10	<10	<10	<10
Strontium	µg/sample	2.0	2.9	2.6	<2.0
Titanium	µg/sample	2.0	26	4.6	<2.0
Vanadium	µg/sample	2.0	3.2	<2.0	<2.0
Zinc	µg/sample	5.0	7.0	<5.0	<5.0
Arsenic	µg/sample	2.0	<2.0	<2.0	<2.0
Beryllium	µg/sample	0.20	<0.20	<0.20	<0.20
Gallium*	µg/sample	4.0	<4.0	<4.0	<4.0
Antimony	µg/sample	10	<10	<10	<10
Selenium	µg/sample	4.0	<4.0	<4.0	<4.0
Thorium	µg/sample	4.0	<4.0	<4.0	<4.0
Thallium	µg/sample	4.0	<4.0	<4.0	<4.0
Uranium	µg/sample	4.0	<4.0	<4.0	<4.0

Certificate of Analysis PFL1235

Quartz/Cristobalite by XRD (HiVol Filter)

Envirolab ID	Units	PQL	PFL1235-01	PFL1235-02	PFL1235-03
Your Reference			DWE217	DWE218	DWE219
Date Sampled			08/12/2024	14/12/2024	16/12/2024
a-Quartz	µg/sample	50	440	180	<50

Certificate of Analysis PFL1235

HVAS Dust (HiVol Filter)

Envirolab ID	Units	PQL	PFL1235-01	PFL1235-02	PFL1235-03
Your Reference			DWE217	DWE218	DWE219
Date Sampled			08/12/2024	14/12/2024	16/12/2024
Dust	mg	0.10	31	20	<0.10

Certificate of Analysis PFL1235

Method Summary

Method ID	Methodology Summary
DUST-004 HVAS	Determination of Gravimetric Dust
DUST-005	Respirable Quartz (and/or Cristabolite) determined direct on filter (unless otherwise indicated) by XRD determination. The Quartz exposure standard is 50µg/m3, therefore where sampling follows MDHS 101 guidelines and at least 500L of air is sampled, this is equivalent to a dust weight of 25µg/filter. The estimated measurement uncertainty for the laboratory analysis of Quartz is 30% at 25µg at 95% confidence limit (i.e. statistically the true value lies between 18-32µg / filter (35 65 µg/m3) at 95% confidence). The estimated measurement uncertainty was determined during method validation. NSW Resources Regulator have licenced (MLA0017505) Envirolab/MPL for the Analysis of Inhalable & Respirable Dust and Respirable Crystalline Silica.
METALS-020	Determination of various metals by ICP-OES.
METALS-020/022	Determination of various metals by ICP-OES or ICP-MS.
METALS-021	Determination of Mercury by Cold Vapour AAS.
METALS-022	Determination of various metals by ICP-MS. Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements. Salt forms and/or anion/cation forms (e.g. FeO, PbO, ZnO, BO3) are determined stoichiometrically from the base metal concentration.

Certificate of Analysis PFL1235

Result Definitions

Identifier	Description
NR	Not reported
NEPM	National Environment Protection Measure
NS	Not specified
LCS	Laboratory Control Sample
RPD	Relative Percent Difference
>	Greater than
<	Less than
PQL	Practical Quantitation Limit
INS	Insufficient sample for this test
NA	Test not required
NT	Not tested
DOL	Samples rejected due to particulate overload (air filters only)
RFD	Samples rejected due to filter damage (air filters only)
RUD	Samples rejected due to uneven deposition (air filters only)
##	Indicates a laboratory acceptance criteria outlier, for further details, see Result Comments and/or QC Comments

Quality Control Definitions

Blank

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

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.

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.

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.

Duplicate

This is the complete duplicate analysis of a sample from the process batch. The sample selected should be one where the analyte concentration is easily measurable.

Certificate of Analysis PFL1235

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 and matrix spike recoveries for the batch were within the laboratory acceptance criteria. Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction. Spikes for Physical and Aggregate Tests are not applicable. For VOCs in water samples, three vials are required for duplicate or spike analysis.

General Acceptance Criteria (GAC) - Analyte specific criteria applies for some analytes and is reflected in QC recovery tables.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% - see ELN-P05 QAQC tables for details (available on request); <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase. Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was typically insufficient in order to satisfy laboratory QA/QC protocols.

Miscellaneous Information

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached. We have taken the sampling date as being the date received at the laboratory.

Two significant figures are reported for the majority of tests and with a high degree of confidence, for results <10*PQL, the second significant figure may be in doubt i.e. has a relatively high degree of uncertainty and is provided for information only.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS where sediment/solids are included by default.

Urine Analysis - The BEI values listed are taken from the 2022 edition of *TLVs and BEIs Threshold Limits by ACGIH*.

Air volume measurements are not covered by Envirolab's NATA accreditation.

Data Quality Assessment Summary PFL1235

Client Details

Client	Department of Water & Environmental Regulation
Your Reference	Pinjarra 2024-25 HVAS - PM10, Metals and Crystalline Silica
Date Issued	23/12/2024

Recommended Holding Time Compliance

No recommended holding time exceedances

Quality Control and QC Frequency

QC Type	Compliant	Details
Blank	Yes	No Outliers
LCS	Yes	No Outliers
Duplicates	Yes	No Outliers
Matrix Spike	Yes	No Outliers
Surrogates / Extracted Internal Standards	Yes	No Outliers
QC Frequency	Yes	No Outliers

Surrogates/Extracted Internal Standards, Duplicates and/or Matrix Spikes are not always relevant/applicable to certain analyses and matrices. Therefore, said QC measures are deemed compliant in these situations by default. See Laboratory Acceptance Criteria for more information

Data Quality Assessment Summary PFL1235

Recommended Holding Time Compliance

Analysis	Sample Number(s)	Date Sampled	Date Extracted	Date Analysed	Compliant
Metals OHS HiVol Filter	1	08/12/2024	20/12/2024	22/12/2024	Yes
	2	14/12/2024	20/12/2024	22/12/2024	Yes
	3	16/12/2024	20/12/2024	22/12/2024	Yes
Metals OHS (LL) HiVol Filter	1	08/12/2024	20/12/2024	22/12/2024	Yes
	2	14/12/2024	20/12/2024	22/12/2024	Yes
	3	16/12/2024	20/12/2024	22/12/2024	Yes
Metals OHS-Hg HiVol Filter	1	08/12/2024	20/12/2024	23/12/2024	Yes
	2	14/12/2024	20/12/2024	23/12/2024	Yes
	3	16/12/2024	20/12/2024	23/12/2024	Yes
Quartz by XRD HiVol Filter	1	08/12/2024	19/12/2024	22/12/2024	Yes
	2	14/12/2024	19/12/2024	22/12/2024	Yes
	3	16/12/2024	19/12/2024	22/12/2024	Yes
Gravimetric Dust HiVol Filter	1	08/12/2024	19/12/2024	19/12/2024	Yes
	2	14/12/2024	19/12/2024	19/12/2024	Yes
	3	16/12/2024	19/12/2024	19/12/2024	Yes

Quality Control PFL1235

METALS-021 | Acid Extractable Metals (HiVol Filter) | Batch BFL3974

Analyte	Units	PQL	Blank	DUP1	LCS %
				PFL1235-01	
				Samp QC RPD %	
Mercury	µg/sample	0.20	<0.20	<0.20 <0.20 [NA]	76.4

METALS-022 | Acid Extractable Metals (HiVol Filter) | Batch BFL3975

Analyte	Units	PQL	Blank	DUP1	LCS %
				PFL1235-01	
				Samp QC RPD %	
Antimony	µg/sample	10	<10	<10 <10 [NA]	103
Arsenic	µg/sample	2.0	<2.0	<2.0 <2.0 [NA]	96.8
Beryllium	µg/sample	0.20	<0.20	<0.20 <0.20 [NA]	96.6
Gallium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]	92.8
Selenium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]	99.4
Thallium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]	83.5
Thorium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]	97.6
Uranium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]	80.6

METALS-020/022 | Acid Extractable Metals (HiVol Filter) | Batch BFL3976

Analyte	Units	PQL	Blank	DUP1	LCS %
				PFL1235-01	
				Samp QC RPD %	
Aluminium	µg/sample	5.0	<5.0	733 760 3.62	94.7
Barium	µg/sample	2.0	<2.0	<2.0 <2.0 [NA]	99.7
Boron	µg/sample	20	<20	<20 <20 [NA]	93.1
Cadmium	µg/sample	0.50	<0.50	<0.50 <0.50 [NA]	94.0
Calcium	µg/sample	50	<50	331 338 2.09	89.7
Chromium	µg/sample	2.0	<2.0	13.8 13.6 1.46	95.0
Cobalt	µg/sample	2.0	<2.0	<2.0 <2.0 [NA]	94.7
Copper	µg/sample	2.0	<2.0	<2.0 <2.0 [NA]	95.8
Iron	µg/sample	5.0	<5.0	1200 1230 2.61	96.3
Lead	µg/sample	5.0	<5.0	<5.0 <5.0 [NA]	95.1
Lithium	µg/sample	2.0	<2.0	<2.0 <2.0 [NA]	98.0
Magnesium	µg/sample	50	<50	306 307 0.333	91.0
Manganese	µg/sample	2.0	<2.0	2.95 2.95 [NA]	95.5
Molybdenum	µg/sample	5.0	<5.0	<5.0 <5.0 [NA]	103
Nickel	µg/sample	2.0	<2.0	<2.0 <2.0 [NA]	96.1
Phosphorus	µg/sample	20	<20	<20 <20 [NA]	88.0
Potassium	µg/sample	50	<50	167 161 [NA]	90.6
Silver	µg/sample	5.0	<5.0	8.65 9.81 [NA]	106
Sodium	µg/sample	100	<100	2320 2320 0.267	87.3
Strontium	µg/sample	2.0	<2.0	2.86 2.85 [NA]	93.0
Sulfur	µg/sample	50	<50	515 512 0.647	88.9
Tin	µg/sample	10	<10	<10 <10 [NA]	98.3
Titanium	µg/sample	2.0	<2.0	25.8 26.6 3.04	98.1
Vanadium	µg/sample	2.0	<2.0	3.18 3.14 [NA]	94.9
Zinc	µg/sample	5.0	<5.0	7.04 5.60 [NA]	95.4

DUST-005 | Quartz/Cristobalite by XRD (HiVol Filter) | Batch BFL3879

Analyte	Units	PQL	Blank	DUP1	LCS %
				PFL1235-01	
				Samp QC RPD %	
a-Quartz	µg/sample	50	<50	442 442 0.0281	92.9

Certificate of Analysis PGA0060

Client Details

Client	Department of Water & Environmental Regulation
Contact	
Address	Prime House, 8 Davidson Terrace,, Joondalup, WA, 6027

Sample Details

Your Reference	Pinjarra 2024-25 HVAS - PM10, Metals and Crystalline Silica
Number of Samples	3 HiVol Filter
Date Samples Received	03/01/2025
Date Instructions Received	03/01/2025

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.
Results are reported on a dry weight basis for soils and on an as received basis for other matrices.

Report Details

Date Results Requested by	13/01/2025
Date of Issue	10/01/2025

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Authorisation Details

Airborne Dust Approved By	Thomas Edwards
Results Approved By	Michael Mowle, Inorganics Supervisor Thomas Edwards, OHL Supervisor Varsha Ho Wing, Inorganics and Metals Supervisor
Laboratory Manager	Michael Kubiak

Certificate of Analysis PGA0060

Samples in this Report

Envirolab ID	Sample ID	Matrix	Date Sampled	Date Received
PGA0060-01	DWE220	HiVol Filter	20/12/2024	03/01/2025
PGA0060-02	DWE221	HiVol Filter	26/12/2024	03/01/2025
PGA0060-03	DWE222	HiVol Filter	01/01/2025	03/01/2025

Sample Information

Sample ID	Filter ID	Flow Rate (L/min)	Time Sampled (min)	Air Volume (m3)
DWE220	DWE220	[NA]	[NA]	[NA]
DWE221	DWE221	[NA]	[NA]	[NA]
DWE222	DWE222	[NA]	[NA]	[NA]

Certificate of Analysis PGA0060

Acid Extractable Metals (HiVol Filter)

Envirolab ID Your Reference Date Sampled	Units	PQL	PGA0060-01 DWE220 20/12/2024	PGA0060-02 DWE221 26/12/2024	PGA0060-03 DWE222 01/01/2025
Silver	µg/sample	5.0	<5.0	<5.0	<5.0
Aluminium	µg/sample	5.0	620	140	1600
Boron	µg/sample	20	<20	<20	<20
Barium	µg/sample	2.0	2.4	2.1	2.7
Calcium	µg/sample	50	450	370	790
Cadmium	µg/sample	0.50	<0.50	<0.50	<0.50
Cobalt	µg/sample	2.0	<2.0	<2.0	<2.0
Chromium	µg/sample	2.0	11	8.8	12
Copper	µg/sample	2.0	3.2	<2.0	2.5
Iron	µg/sample	5.0	780	190	3300
Mercury	µg/sample	0.20	<0.20	<0.20	<0.20
Potassium	µg/sample	50	250	240	240
Lithium	µg/sample	2.0	<2.0	<2.0	<2.0
Magnesium	µg/sample	50	520	590	470
Manganese	µg/sample	2.0	3.9	<2.0	5.0
Molybdenum	µg/sample	5.0	<5.0	<5.0	<5.0
Sodium	µg/sample	100	3700	4400	4400
Nickel	µg/sample	2.0	<2.0	<2.0	<2.0
Phosphorus	µg/sample	20	21	<20	32
Lead	µg/sample	5.0	<5.0	<5.0	<5.0
Sulfur	µg/sample	50	710	590	680
Tin	µg/sample	10	<10	<10	<10
Strontium	µg/sample	2.0	4.2	4.3	5.3
Titanium	µg/sample	2.0	17	5.2	110
Vanadium	µg/sample	2.0	2.1	<2.0	9.5
Zinc	µg/sample	5.0	5.1	11	6.2
Arsenic	µg/sample	2.0	<2.0	<2.0	<2.0
Beryllium	µg/sample	0.20	<0.20	<0.20	<0.20
Gallium*	µg/sample	4.0	<4.0	<4.0	<4.0
Antimony	µg/sample	10	<10	<10	<10
Selenium	µg/sample	4.0	<4.0	<4.0	<4.0
Thorium	µg/sample	4.0	<4.0	<4.0	<4.0
Thallium	µg/sample	4.0	<4.0	<4.0	<4.0
Uranium	µg/sample	4.0	<4.0	<4.0	<4.0

Certificate of Analysis PGA0060

Quartz/Cristobalite by XRD (HiVol Filter)

Envirolab ID	Units	PQL	PGA0060-01	PGA0060-02	PGA0060-03
Your Reference			DWE220	DWE221	DWE222
Date Sampled			20/12/2024	26/12/2024	01/01/2025
a-Quartz	µg/sample	50	590	170	750

Certificate of Analysis PGA0060

HVAS Dust (HiVol Filter)

Envirolab ID	Units	PQL	PGA0060-01	PGA0060-02	PGA0060-03
Your Reference			DWE220	DWE221	DWE222
Date Sampled			20/12/2024	26/12/2024	01/01/2025
Dust	mg	0.10	35	30	52

Certificate of Analysis PGA0060

Method Summary

Method ID	Methodology Summary
DUST-004 HVAS	Determination of Gravimetric Dust
DUST-005	Respirable Quartz (and/or Cristabolite) determined direct on filter (unless otherwise indicated) by XRD determination. The Quartz exposure standard is 50µg/m3, therefore where sampling follows MDHS 101 guidelines and at least 500L of air is sampled, this is equivalent to a dust weight of 25µg/filter. The estimated measurement uncertainty for the laboratory analysis of Quartz is 30% at 25µg at 95% confidence limit (i.e. statistically the true value lies between 18-32µg / filter (35 65 µg/m3) at 95% confidence). The estimated measurement uncertainty was determined during method validation. NSW Resources Regulator have licenced (MLA0017505) Envirolab/MPL for the Analysis of Inhalable & Respirable Dust and Respirable Crystalline Silica.
METALS-020	Determination of various metals by ICP-OES.
METALS-020/022	Determination of various metals by ICP-OES or ICP-MS.
METALS-021	Determination of Mercury by Cold Vapour AAS.
METALS-022	Determination of various metals by ICP-MS.Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements.Salt forms and/or anion/cation forms (e.g. FeO, PbO, ZnO, BO3) are determined stoichiometrically from the base metal concentration.

Certificate of Analysis PGA0060

Result Definitions

Identifier	Description
NR	Not reported
NEPM	National Environment Protection Measure
NS	Not specified
LCS	Laboratory Control Sample
RPD	Relative Percent Difference
>	Greater than
<	Less than
PQL	Practical Quantitation Limit
INS	Insufficient sample for this test
NA	Test not required
NT	Not tested
DOL	Samples rejected due to particulate overload (air filters only)
RFD	Samples rejected due to filter damage (air filters only)
RUD	Samples rejected due to uneven deposition (air filters only)
##	Indicates a laboratory acceptance criteria outlier, for further details, see Result Comments and/or QC Comments

Quality Control Definitions

Blank

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

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.

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.

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.

Duplicate

This is the complete duplicate analysis of a sample from the process batch. The sample selected should be one where the analyte concentration is easily measurable.

Certificate of Analysis PGA0060

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 and matrix spike recoveries for the batch were within the laboratory acceptance criteria. Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction. Spikes for Physical and Aggregate Tests are not applicable. For VOCs in water samples, three vials are required for duplicate or spike analysis.

General Acceptance Criteria (GAC) - Analyte specific criteria applies for some analytes and is reflected in QC recovery tables.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% - see ELN-P05 QAQC tables for details (available on request); <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase. Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was typically insufficient in order to satisfy laboratory QA/QC protocols.

Miscellaneous Information

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached. We have taken the sampling date as being the date received at the laboratory.

Two significant figures are reported for the majority of tests and with a high degree of confidence, for results <10*PQL, the second significant figure may be in doubt i.e. has a relatively high degree of uncertainty and is provided for information only.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS where sediment/solids are included by default.

Urine Analysis - The BEI values listed are taken from the 2022 edition of *TLVs and BEIs Threshold Limits by ACGIH*.

Air volume measurements are not covered by Envirolab's NATA accreditation.

Data Quality Assessment Summary PGA0060

Client Details

Client	Department of Water & Environmental Regulation
Your Reference	Pinjarra 2024-25 HVAS - PM10, Metals and Crystalline Silica
Date Issued	10/01/2025

Recommended Holding Time Compliance

No recommended holding time exceedances

Quality Control and QC Frequency

QC Type	Compliant	Details
Blank	Yes	No Outliers
LCS	Yes	No Outliers
Duplicates	Yes	No Outliers
Matrix Spike	Yes	No Outliers
Surrogates / Extracted Internal Standards	Yes	No Outliers
QC Frequency	Yes	No Outliers

Surrogates/Extracted Internal Standards, Duplicates and/or Matrix Spikes are not always relevant/applicable to certain analyses and matrices. Therefore, said QC measures are deemed compliant in these situations by default. See Laboratory Acceptance Criteria for more information

Data Quality Assessment Summary PGA0060

Recommended Holding Time Compliance

Analysis	Sample Number(s)	Date Sampled	Date Extracted	Date Analysed	Compliant
Metals OHS HiVol Filter	3	01/01/2025	07/01/2025	07/01/2025	Yes
	1	20/12/2024	07/01/2025	07/01/2025	Yes
	2	26/12/2024	07/01/2025	07/01/2025	Yes
Metals OHS (LL) HiVol Filter	3	01/01/2025	07/01/2025	08/01/2025	Yes
	1	20/12/2024	07/01/2025	08/01/2025	Yes
	2	26/12/2024	07/01/2025	08/01/2025	Yes
Metals OHS-Hg HiVol Filter	3	01/01/2025	07/01/2025	10/01/2025	Yes
	1	20/12/2024	07/01/2025	10/01/2025	Yes
	2	26/12/2024	07/01/2025	10/01/2025	Yes
Quartz by XRD HiVol Filter	3	01/01/2025	07/01/2025	07/01/2025	Yes
	1	20/12/2024	07/01/2025	07/01/2025	Yes
	2	26/12/2024	07/01/2025	07/01/2025	Yes
Gravimetric Dust HiVol Filter	3	01/01/2025	06/01/2025	06/01/2025	Yes
	1	20/12/2024	06/01/2025	06/01/2025	Yes
	2	26/12/2024	06/01/2025	06/01/2025	Yes

Quality Control PGA0060

METALS-021 | Acid Extractable Metals (HiVol Filter) | Batch BGA0495

Analyte	Units	PQL	Blank	DUP1	LCS %
				PGA0060-01	
				Samp QC RPD %	
Mercury	µg/sample	0.20	<0.20	<0.20 <0.20 [NA]	99.2

METALS-022 | Acid Extractable Metals (HiVol Filter) | Batch BGA0496

Analyte	Units	PQL	Blank	DUP1	LCS %
				PGA0060-01	
				Samp QC RPD %	
Antimony	µg/sample	10	<10	<10 <10 [NA]	120
Arsenic	µg/sample	2.0	<2.0	<2.0 <2.0 [NA]	103
Beryllium	µg/sample	0.20	<0.20	<0.20 <0.20 [NA]	89.9
Gallium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]	91.6
Selenium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]	118
Thallium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]	92.9
Thorium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]	81.0
Uranium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]	94.0

METALS-020/022 | Acid Extractable Metals (HiVol Filter) | Batch BGA0498

Analyte	Units	PQL	Blank	DUP1	LCS %
				PGA0060-01	
				Samp QC RPD %	
Aluminium	µg/sample	5.0	<5.0	618 615 0.471	95.1
Barium	µg/sample	2.0	<2.0	2.40 2.28 [NA]	96.7
Boron	µg/sample	20	<20	<20 <20 [NA]	96.3
Cadmium	µg/sample	0.50	<0.50	<0.50 <0.50 [NA]	95.1
Calcium	µg/sample	50	<50	446 433 2.85	93.3
Chromium	µg/sample	2.0	<2.0	10.7 11.6 8.16	95.6
Cobalt	µg/sample	2.0	<2.0	<2.0 <2.0 [NA]	94.7
Copper	µg/sample	2.0	<2.0	3.18 3.47 [NA]	97.0
Iron	µg/sample	5.0	<5.0	777 757 2.69	96.4
Lead	µg/sample	5.0	<5.0	<5.0 <5.0 [NA]	97.3
Lithium	µg/sample	2.0	<2.0	<2.0 <2.0 [NA]	97.6
Magnesium	µg/sample	50	<50	518 497 4.02	95.6
Manganese	µg/sample	2.0	<2.0	3.89 3.73 [NA]	96.3
Molybdenum	µg/sample	5.0	<5.0	<5.0 <5.0 [NA]	106
Nickel	µg/sample	2.0	<2.0	<2.0 <2.0 [NA]	95.8
Phosphorus	µg/sample	20	<20	21.1 <20 [NA]	89.7
Potassium	µg/sample	50	<50	247 265 7.08	103
Silver	µg/sample	5.0	<5.0	<5.0 <5.0 [NA]	100
Sodium	µg/sample	100	<100	3700 3550 4.38	87.9
Strontium	µg/sample	2.0	<2.0	4.21 4.02 [NA]	91.7
Sulfur	µg/sample	50	<50	715 688 3.77	96.4
Tin	µg/sample	10	<10	<10 <10 [NA]	97.7
Titanium	µg/sample	2.0	<2.0	16.9 16.8 0.606	102
Vanadium	µg/sample	2.0	<2.0	2.06 <2.0 [NA] [1]	95.5
Zinc	µg/sample	5.0	<5.0	5.07 6.51 [NA]	97.2

DUST-005 | Quartz/Cristobalite by XRD (HiVol Filter) | Batch BGA0519

Analyte	Units	PQL	Blank	DUP1	LCS %
				BGA0519-DUP1#	
				Samp QC RPD %	
a-Quartz	µg/sample	50	<12	1320 1340 2.06	108

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

Quality Control PGA0060

QC Comments

Identifier	Description
[1]	Duplicate %RPD may be flagged as an outlier to routine laboratory acceptance, however, where one or both results are <10*PQL, the RPD acceptance criteria increases exponentially.

Certificate of Analysis PGA1005

Client Details

Client	Department of Water & Environmental Regulation
Contact	
Address	Prime House, 8 Davidson Terrace,, Joondalup, WA, 6027

Sample Details

Your Reference	Pinjarra 2024-25 HVAS - PM10, Metals and Crystalline Silica
Number of Samples	3 HiVol Filter
Date Samples Received	21/01/2025
Date Instructions Received	21/01/2025

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.
Results are reported on a dry weight basis for soils and on an as received basis for other matrices.

Report Details

Date Results Requested by	29/01/2025
Date of Issue	29/01/2025

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Authorisation Details

Airborne Dust Approved By	Thomas Edwards
Results Approved By	Michael Mowle, Inorganics Supervisor Thomas Edwards, OHL Supervisor Varsha Ho Wing, Inorganics and Metals Supervisor
Laboratory Manager	Michael Kubiak

Certificate of Analysis PGA1005

Samples in this Report

Envirolab ID	Sample ID	Matrix	Date Sampled	Date Received
PGA1005-01	223	HiVol Filter	07/01/2025	21/01/2025
PGA1005-02	224	HiVol Filter	13/01/2025	21/01/2025
PGA1005-03	225	HiVol Filter	19/01/2025	21/01/2025

Sample Information

Sample ID	Filter ID	Flow Rate (L/min)	Time Sampled (min)	Air Volume (m3)
223	DWE223	[NA]	[NA]	[NA]
224	DWE224	[NA]	[NA]	[NA]
225	DWE225	[NA]	[NA]	[NA]

Certificate of Analysis PGA1005

Acid Extractable Metals (HiVol Filter)

Envirolab ID Your Reference Date Sampled	Units	PQL	PGA1005-01 223 07/01/2025	PGA1005-02 224 13/01/2025	PGA1005-03 225 19/01/2025
Silver	µg/sample	5.0	15	17	13
Aluminium	µg/sample	5.0	890	260	1200
Boron	µg/sample	20	<20	<20	<20
Barium	µg/sample	2.0	3.6	<2.0	2.4
Calcium	µg/sample	50	750	280	520
Cadmium	µg/sample	0.50	<0.50	<0.50	<0.50
Cobalt	µg/sample	2.0	<2.0	<2.0	<2.0
Chromium	µg/sample	2.0	8.4	12	15
Copper	µg/sample	2.0	3.2	2.6	4.0
Iron	µg/sample	5.0	1000	310	1900
Mercury	µg/sample	0.20	<0.20	<0.20	<0.20
Potassium	µg/sample	50	240	110	230
Lithium	µg/sample	2.0	<2.0	<2.0	<2.0
Magnesium	µg/sample	50	410	200	510
Manganese	µg/sample	2.0	6.3	2.2	4.2
Molybdenum	µg/sample	5.0	<5.0	7.0	<5.0
Sodium	µg/sample	100	2900	1600	4200
Nickel	µg/sample	2.0	<2.0	<2.0	<2.0
Phosphorus	µg/sample	20	34	<20	22
Lead	µg/sample	5.0	<5.0	<5.0	<5.0
Sulfur	µg/sample	50	570	470	710
Tin	µg/sample	10	<10	<10	<10
Strontium	µg/sample	2.0	5.2	<2.0	4.4
Titanium	µg/sample	2.0	20	7.3	53
Vanadium	µg/sample	2.0	2.7	<2.0	5.3
Zinc	µg/sample	5.0	9.0	6.5	6.1
Arsenic	µg/sample	2.0	<2.0	<2.0	<2.0
Beryllium	µg/sample	0.20	<0.20	<0.20	<0.20
Gallium*	µg/sample	4.0	<4.0	<4.0	<4.0
Antimony	µg/sample	10	<10	<10	<10
Selenium	µg/sample	4.0	<4.0	<4.0	<4.0
Thorium	µg/sample	4.0	<4.0	<4.0	<4.0
Thallium	µg/sample	4.0	<4.0	<4.0	<4.0
Uranium	µg/sample	4.0	<4.0	<4.0	<4.0

Certificate of Analysis PGA1005

Quartz/Cristobalite by XRD (HiVol Filter)

Envirolab ID	Units	PQL	PGA1005-01	PGA1005-02	PGA1005-03
Your Reference			223	224	225
Date Sampled			07/01/2025	13/01/2025	19/01/2025
a-Quartz	µg/sample	50	980	370	690

Certificate of Analysis PGA1005

HVAS Dust (HiVol Filter)

Envirolab ID	Units	PQL	PGA1005-01	PGA1005-02	PGA1005-03
Your Reference			223	224	225
Date Sampled			07/01/2025	13/01/2025	19/01/2025
Dust	mg	0.10	38	4.6	39

Certificate of Analysis PGA1005

Method Summary

Method ID	Methodology Summary
DUST-005	Respirable Quartz (and/or Cristabolite) determined direct on filter (unless otherwise indicated) by XRD determination. The Quartz exposure standard is 50µg/m3, therefore where sampling follows MDHS 101 guidelines and at least 500L of air is sampled, this is equivalent to a dust weight of 25µg/filter. The estimated measurement uncertainty for the laboratory analysis of Quartz is 30% at 25µg at 95% confidence limit (i.e. statistically the true value lies between 18-32µg / filter (35 – 65 µg/m3) at 95% confidence). The estimated measurement uncertainty was determined during method validation. NSW Resources Regulator have licenced (MLA0017505) Envirolab/MPL for the Analysis of Inhalable & Respirable Dust and Respirable Crystalline Silica.
INORG-100	Gravimetric determination of Inhalable dust as per AS3640. NSW Resources Regulator have licenced (MLA0017505) Envirolab/MPL for the Analysis of Inhalable & Respirable Dust and Respirable Crystalline Silica.
METALS-020	Determination of various metals by ICP-OES.
METALS-020/022	Determination of various metals by ICP-OES or ICP-MS.
METALS 021	Determination of Mercury by Cold Vapour AAS.
METALS-022	Determination of various metals by ICP-MS.Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements.Salt forms and/or anion/cation forms (e.g. FeO, PbO, ZnO, BO3) are determined stoichiometrically from the base metal concentration.

Certificate of Analysis PGA1005

Result Definitions

Identifier	Description
NR	Not reported
NEPM	National Environment Protection Measure
NS	Not specified
LCS	Laboratory Control Sample
RPD	Relative Percent Difference
>	Greater than
<	Less than
PQL	Practical Quantitation Limit
INS	Insufficient sample for this test
NA	Test not required
NT	Not tested
DOL	Samples rejected due to particulate overload (air filters only)
RFD	Samples rejected due to filter damage (air filters only)
RUD	Samples rejected due to uneven deposition (air filters only)
##	Indicates a laboratory acceptance criteria outlier, for further details, see Result Comments and/or QC Comments

Quality Control Definitions

Blank

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

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.

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.

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.

Duplicate

This is the complete duplicate analysis of a sample from the process batch. The sample selected should be one where the analyte concentration is easily measurable.

Certificate of Analysis PGA1005

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 and matrix spike recoveries for the batch were within the laboratory acceptance criteria. Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction. Spikes for Physical and Aggregate Tests are not applicable. For VOCs in water samples, three vials are required for duplicate or spike analysis.

General Acceptance Criteria (GAC) - Analyte specific criteria applies for some analytes and is reflected in QC recovery tables.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% - see ELN-P05 QAQC tables for details (available on request); <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase. Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was typically insufficient in order to satisfy laboratory QA/QC protocols.

Miscellaneous Information

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached. We have taken the sampling date as being the date received at the laboratory.

Two significant figures are reported for the majority of tests and with a high degree of confidence, for results <10*PQL, the second significant figure may be in doubt i.e. has a relatively high degree of uncertainty and is provided for information only.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS where sediment/solids are included by default.

Urine Analysis - The BEI values listed are taken from the 2022 edition of *TLVs and BEIs Threshold Limits by ACGIH*.

Air volume measurements are not covered by Envirolab's NATA accreditation.

Data Quality Assessment Summary PGA1005

Client Details

Client	Department of Water & Environmental Regulation
Your Reference	Pinjarra 2024-25 HVAS - PM10, Metals and Crystalline Silica
Date Issued	29/01/2025

Recommended Holding Time Compliance

Recommended holding time exceedances exist - See detailed list below

Quality Control and QC Frequency

QC Type	Compliant	Details
Blank	Yes	No Outliers
LCS	Yes	No Outliers
Duplicates	Yes	No Outliers
Matrix Spike	Yes	No Outliers
Surrogates / Extracted Internal Standards	Yes	No Outliers
QC Frequency	No	QC Frequency Outliers Exist - See detailed list below

Surrogates/Extracted Internal Standards, Duplicates and/or Matrix Spikes are not always relevant/applicable to certain analyses and matrices. Therefore, said QC measures are deemed compliant in these situations by default. See Laboratory Acceptance Criteria for more information

Data Quality Assessment Summary PGA1005

Recommended Holding Time Compliance

Analysis	Sample Number(s)	Date Sampled	Date Extracted	Date Analysed	Compliant
Metals OHS HiVol Filter	1	07/01/2025	29/01/2025	29/01/2025	Yes
	2	13/01/2025	29/01/2025	29/01/2025	Yes
	3	19/01/2025	29/01/2025	29/01/2025	Yes
Metals OHS (LL) HiVol Filter	1	07/01/2025	29/01/2025	29/01/2025	Yes
	2	13/01/2025	29/01/2025	29/01/2025	Yes
	3	19/01/2025	29/01/2025	29/01/2025	Yes
Metals OHS-Hg HiVol Filter	1	07/01/2025	29/01/2025	29/01/2025	Yes
	2	13/01/2025	29/01/2025	29/01/2025	Yes
	3	19/01/2025	29/01/2025	29/01/2025	Yes
Quartz by XRD HiVol Filter	1	07/01/2025	28/01/2025	29/01/2025	Yes
	2	13/01/2025	28/01/2025	29/01/2025	Yes
	3	19/01/2025	28/01/2025	29/01/2025	Yes
Gravimetric Dust HiVol Filter	1	07/01/2025	28/01/2025	28/01/2025	No
	2	13/01/2025	28/01/2025	28/01/2025	Yes
	3	19/01/2025	28/01/2025	28/01/2025	Yes

Outliers: QC Frequency

METALS-020 | Acid Extractable Metals (HiVol Filter) | Batch BGA3795

Analysis	QC Type	Expected	Reported
Metals OHS	Duplicate	1	0

METALS-020/022 | Acid Extractable Metals (HiVol Filter) | Batch BGA3795

Analysis	QC Type	Expected	Reported
Metals OHS	Duplicate	1	0

METALS-021 | Acid Extractable Metals (HiVol Filter) | Batch BGA3793

Analysis	QC Type	Expected	Reported
Metals OHS-Hg	Duplicate	1	0

METALS-022 | Acid Extractable Metals (HiVol Filter) | Batch BGA3794

Analysis	QC Type	Expected	Reported
Metals OHS (LL)	Duplicate	1	0

Quality Control PGA1005

METALS-021 | Acid Extractable Metals (HiVol Filter) | Batch BGA3793

Analyte	Units	PQL	Blank	LCS %
Mercury	µg/sample	0.20	<0.20	110

METALS-022 | Acid Extractable Metals (HiVol Filter) | Batch BGA3794

Analyte	Units	PQL	Blank	LCS %
Antimony	µg/sample	10	<10	105
Arsenic	µg/sample	2.0	<2.0	107
Beryllium	µg/sample	0.20	<0.20	101
Gallium	µg/sample	4.0	<4.0	98.5
Selenium	µg/sample	4.0	<4.0	118
Thallium	µg/sample	4.0	<4.0	98.8
Thorium	µg/sample	4.0	<4.0	91.6
Uranium	µg/sample	4.0	<4.0	102

METALS-020/022 | Acid Extractable Metals (HiVol Filter) | Batch BGA3795

Analyte	Units	PQL	Blank	LCS %
Aluminium	µg/sample	5.0	<5.0	103
Barium	µg/sample	2.0	<2.0	111
Boron	µg/sample	20	<20	111
Cadmium	µg/sample	0.50	<0.50	98.7
Calcium	µg/sample	50	<50	109
Chromium	µg/sample	2.0	<2.0	115
Cobalt	µg/sample	2.0	<2.0	98.6
Copper	µg/sample	2.0	<2.0	117
Iron	µg/sample	5.0	<5.0	103
Lead	µg/sample	5.0	<5.0	112
Lithium	µg/sample	2.0	<2.0	109
Magnesium	µg/sample	50	<50	102
Manganese	µg/sample	2.0	<2.0	111
Molybdenum	µg/sample	5.0	<5.0	120
Nickel	µg/sample	2.0	<2.0	113
Phosphorus	µg/sample	20	<20	94.1
Potassium	µg/sample	50	<50	100
Silver	µg/sample	5.0	<5.0	121
Sodium	µg/sample	100	<100	98.8
Strontium	µg/sample	2.0	<2.0	105
Sulfur	µg/sample	50	<50	96.7
Tin	µg/sample	10	<10	112
Titanium	µg/sample	2.0	<2.0	113
Vanadium	µg/sample	2.0	<2.0	100
Zinc	µg/sample	5.0	<5.0	111

DUST-005 | Quartz/Cristobalite by XRD (HiVol Filter) | Batch BGA3621

Analyte	Units	PQL	Blank	DUP1 PGA1005-01 Samp QC RPD %	LCS %
a-Quartz	µg/sample	50	<50	983 955 2.89	93.6

Certificate of Analysis PGB0500

Client Details

Client	Department of Water & Environmental Regulation
Contact	
Address	Prime House, 8 Davidson Terrace,, Joondalup, WA, 6027

Sample Details

Your Reference	Pinjarra 2024-25 HVAS - PM10, Metals and Crystalline Silica
Number of Samples	3 HiVol Filter
Date Samples Received	07/02/2025
Date Instructions Received	07/02/2025

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.
Results are reported on a dry weight basis for soils and on an as received basis for other matrices.

Report Details

Date Results Requested by	14/02/2025
Date of Issue	14/02/2025

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Authorisation Details

Airborne Dust Approved By	Michael Kubiak Shirleen Goh
Results Approved By	Michael Kubiak, Lab Manager Michael Mowle, Inorganics Supervisor Shirleen Goh, OH Lab Analyst
Laboratory Manager	Michael Kubiak

Certificate of Analysis PGB0500

Samples in this Report

Envirolab ID	Sample ID	Matrix	Date Sampled	Date Received
PGB0500-01	226	HiVol Filter	25/01/2025	07/02/2025
PGB0500-02	227	HiVol Filter	31/01/2025	07/02/2025
PGB0500-03	228	HiVol Filter	06/02/2025	07/02/2025

Sample Information

Sample ID	Filter ID	Flow Rate (L/min)	Time Sampled (min)	Air Volume (m3)
226	DWE226	[NA]	[NA]	[NA]
227	DWE227	[NA]	[NA]	[NA]
228	DWE228	[NA]	[NA]	[NA]

Certificate of Analysis PGB0500

Acid Extractable Metals (HiVol Filter)

Envirolab ID Your Reference Date Sampled	Units	PQL	PGB0500-01 226 25/01/2025	PGB0500-02 227 31/01/2025	PGB0500-03 228 06/02/2025
Silver	µg/sample	5.0	<5.0	<5.0	<5.0
Aluminium	µg/sample	5.0	41	430	990
Boron	µg/sample	20	26	<20	<20
Barium	µg/sample	2.0	<2.0	3.6	3.6
Calcium	µg/sample	50	110	830	670
Cadmium	µg/sample	0.50	<0.50	<0.50	<0.50
Cobalt	µg/sample	2.0	<2.0	<2.0	<2.0
Chromium	µg/sample	2.0	8.6	8.2	11
Copper	µg/sample	2.0	<2.0	<2.0	<2.0
Iron	µg/sample	5.0	59	560	1400
Mercury	µg/sample	0.20	<0.20	<0.20	<0.20
Potassium	µg/sample	50	<50	270	310
Lithium	µg/sample	2.0	<2.0	<2.0	<2.0
Magnesium	µg/sample	50	61	700	760
Manganese	µg/sample	2.0	<2.0	4.3	6.9
Molybdenum	µg/sample	5.0	<5.0	<5.0	<5.0
Sodium	µg/sample	100	310	5100	5500
Nickel	µg/sample	2.0	<2.0	3.6	<2.0
Phosphorus	µg/sample	20	<20	28	34
Lead	µg/sample	5.0	<5.0	<5.0	<5.0
Sulfur	µg/sample	50	53	840	860
Tin	µg/sample	10	<10	<10	<10
Strontium	µg/sample	2.0	<2.0	6.3	6.6
Titanium	µg/sample	2.0	2.6	8.5	17
Vanadium	µg/sample	2.0	<2.0	<2.0	3.9
Zinc	µg/sample	5.0	<5.0	7.9	8.3
Arsenic	µg/sample	2.0	<2.0	<2.0	<2.0
Beryllium	µg/sample	0.20	<0.20	<0.20	<0.20
Gallium*	µg/sample	4.0	<4.0	<4.0	<4.0
Antimony	µg/sample	10	<10	<10	<10
Selenium	µg/sample	4.0	<4.0	<4.0	<4.0
Thorium	µg/sample	4.0	<4.0	<4.0	<4.0
Thallium	µg/sample	4.0	<4.0	<4.0	<4.0
Uranium	µg/sample	4.0	<4.0	<4.0	<4.0

Certificate of Analysis PGB0500

Quartz/Cristobalite by XRD (HiVol Filter)

Envirolab ID	Units	PQL	PGB0500-01	PGB0500-02	PGB0500-03
Your Reference			226	227	228
Date Sampled			25/01/2025	31/01/2025	06/02/2025
a-Quartz	µg/sample	50	190	560	860

Certificate of Analysis PGB0500

HVAS Dust (HiVol Filter)

Envirolab ID	Units	PQL	PGB0500-01	PGB0500-02	PGB0500-03
Your Reference			226	227	228
Date Sampled			25/01/2025	31/01/2025	06/02/2025
Dust	mg	0.10	9.7	46	50

Certificate of Analysis PGB0500

Method Summary

Method ID	Methodology Summary
DUST-005	Respirable Quartz (and/or Cristabolite) determined direct on filter (unless otherwise indicated) by XRD determination. The Quartz exposure standard is 50µg/m3, therefore where sampling follows MDHS 101 guidelines and at least 500L of air is sampled, this is equivalent to a dust weight of 25µg/filter. The estimated measurement uncertainty for the laboratory analysis of Quartz is 30% at 25µg at 95% confidence limit (i.e. statistically the true value lies between 18-32µg / filter (35 – 65 µg/m3) at 95% confidence). The estimated measurement uncertainty was determined during method validation. NSW Resources Regulator have licenced (MLA0017505) Envirolab/MPL for the Analysis of Inhalable & Respirable Dust and Respirable Crystalline Silica.
INORG-100	Gravimetric determination of Inhalable dust as per AS3640. NSW Resources Regulator have licenced (MLA0017505) Envirolab/MPL for the Analysis of Inhalable & Respirable Dust and Respirable Crystalline Silica.
METALS-020	Determination of various metals by ICP-OES.
METALS-020/022	Determination of various metals by ICP-OES or ICP-MS.
METALS 021	Determination of Mercury by Cold Vapour AAS.
METALS-022	Determination of various metals by ICP-MS.Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements.Salt forms and/or anion/cation forms (e.g. FeO, PbO, ZnO, BO3) are determined stoichiometrically from the base metal concentration.

Certificate of Analysis PGB0500

Result Definitions

Identifier	Description
NR	Not reported
NEPM	National Environment Protection Measure
NS	Not specified
LCS	Laboratory Control Sample
RPD	Relative Percent Difference
>	Greater than
<	Less than
PQL	Practical Quantitation Limit
INS	Insufficient sample for this test
NA	Test not required
NT	Not tested
DOL	Samples rejected due to particulate overload (air filters only)
RFD	Samples rejected due to filter damage (air filters only)
RUD	Samples rejected due to uneven deposition (air filters only)
##	Indicates a laboratory acceptance criteria outlier, for further details, see Result Comments and/or QC Comments

Quality Control Definitions

Blank

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

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.

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.

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.

Duplicate

This is the complete duplicate analysis of a sample from the process batch. The sample selected should be one where the analyte concentration is easily measurable.

Certificate of Analysis PGB0500

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 and matrix spike recoveries for the batch were within the laboratory acceptance criteria. Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction. Spikes for Physical and Aggregate Tests are not applicable. For VOCs in water samples, three vials are required for duplicate or spike analysis.

General Acceptance Criteria (GAC) - Analyte specific criteria applies for some analytes and is reflected in QC recovery tables.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% - see ELN-P05 QAQC tables for details (available on request); <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase. Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was typically insufficient in order to satisfy laboratory QA/QC protocols.

Miscellaneous Information

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached. We have taken the sampling date as being the date received at the laboratory.

Two significant figures are reported for the majority of tests and with a high degree of confidence, for results <10*PQL, the second significant figure may be in doubt i.e. has a relatively high degree of uncertainty and is provided for information only.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS where sediment/solids are included by default.

Urine Analysis - The BEI values listed are taken from the 2022 edition of *TLVs and BEIs Threshold Limits by ACGIH*.

Air volume measurements are not covered by Envirolab's NATA accreditation.

Data Quality Assessment Summary PGB0500

Client Details

Client	Department of Water & Environmental Regulation
Your Reference	Pinjarra 2024-25 HVAS - PM10, Metals and Crystalline Silica
Date Issued	14/02/2025

Recommended Holding Time Compliance

No recommended holding time exceedances

Quality Control and QC Frequency

QC Type	Compliant	Details
Blank	Yes	No Outliers
LCS	Yes	No Outliers
Duplicates	Yes	No Outliers
Matrix Spike	Yes	No Outliers
Surrogates / Extracted Internal Standards	Yes	No Outliers
QC Frequency	Yes	No Outliers

Surrogates/Extracted Internal Standards, Duplicates and/or Matrix Spikes are not always relevant/applicable to certain analyses and matrices. Therefore, said QC measures are deemed compliant in these situations by default. See Laboratory Acceptance Criteria for more information

Data Quality Assessment Summary PGB0500

Recommended Holding Time Compliance

Analysis	Sample Number(s)	Date Sampled	Date Extracted	Date Analysed	Compliant
Metals OHS HiVol Filter	3	06/02/2025	11/02/2025	12/02/2025	Yes
	1	25/01/2025	11/02/2025	12/02/2025	Yes
	2	31/01/2025	11/02/2025	12/02/2025	Yes
Metals OHS (LL) HiVol Filter	3	06/02/2025	11/02/2025	12/02/2025	Yes
	1	25/01/2025	11/02/2025	12/02/2025	Yes
	2	31/01/2025	11/02/2025	12/02/2025	Yes
Metals OHS-Hg HiVol Filter	3	06/02/2025	11/02/2025	13/02/2025	Yes
	1	25/01/2025	11/02/2025	13/02/2025	Yes
	2	31/01/2025	11/02/2025	13/02/2025	Yes
Quartz by XRD HiVol Filter	3	06/02/2025	10/02/2025	14/02/2025	Yes
	1	25/01/2025	10/02/2025	14/02/2025	Yes
	2	31/01/2025	10/02/2025	14/02/2025	Yes
Gravimetric Dust HiVol Filter	3	06/02/2025	10/02/2025	10/02/2025	Yes
	1	25/01/2025	10/02/2025	10/02/2025	Yes
	2	31/01/2025	10/02/2025	10/02/2025	Yes

Quality Control PGB0500

METALS-021 | Acid Extractable Metals (HiVol Filter) | Batch BGB1694

Analyte	Units	PQL	Blank	DUP1	DUP2	LCS %
				BGB1694-DUP1# Samp QC RPD %	PGB0500-01 Samp QC RPD %	
Mercury	µg/sample	0.20	<0.20	<0.20 <0.20 [NA]	<0.20 <0.20 [NA]	122

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

METALS-022 | Acid Extractable Metals (HiVol Filter) | Batch BGB1695

Analyte	Units	PQL	Blank	DUP1	DUP2	LCS %
				BGB1695-DUP1# Samp QC RPD %	PGB0500-01 Samp QC RPD %	
Antimony	µg/sample	10	<10	<10 <10 [NA]	<10 <10 [NA]	119
Arsenic	µg/sample	2.0	<2.0	<2.0 <2.0 [NA]	<2.0 <2.0 [NA]	106
Beryllium	µg/sample	0.20	<0.20	0.448 0.588 [NA]	<0.20 <0.20 [NA]	104
Gallium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]	<4.0 <4.0 [NA]	103
Selenium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]	<4.0 <4.0 [NA]	115
Thallium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]	<4.0 <4.0 [NA]	103
Thorium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]	<4.0 <4.0 [NA]	97.5
Uranium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]	<4.0 <4.0 [NA]	107

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

METALS-020/022 | Acid Extractable Metals (HiVol Filter) | Batch BGB1696

Analyte	Units	PQL	Blank	DUP1	DUP2	LCS %
				BGB1696-DUP1# Samp QC RPD %	PGB0500-01 Samp QC RPD %	
Aluminium	µg/sample	5.0	<5.0	5860 7440 23.8	41.2 36.4 12.4	102
Barium	µg/sample	2.0	<2.0	2270 2800 20.7	<2.0 <2.0 [NA]	107
Boron	µg/sample	20	<20	13400 15800 16.3	25.6 <20 [NA] [1]	96.8
Cadmium	µg/sample	0.50	<0.50	<0.50 <0.50 [NA]	<0.50 <0.50 [NA]	101
Calcium	µg/sample	50	<50	31900 36100 12.4	110 98.6 [NA]	99.4
Chromium	µg/sample	2.0	<2.0	2.89 3.70 [NA]	8.57 5.40 [NA] [1]	103
Cobalt	µg/sample	2.0	<2.0	<2.0 <2.0 [NA]	<2.0 <2.0 [NA]	101
Copper	µg/sample	2.0	<2.0	10.2 7.22 [NA]	<2.0 <2.0 [NA]	100
Iron	µg/sample	5.0	<5.0	210 256 19.8	59.2 49.8 17.2	107
Lead	µg/sample	5.0	<5.0	<5.0 <5.0 [NA]	<5.0 <5.0 [NA]	99.9
Lithium	µg/sample	2.0	<2.0	9.28 10.9 16.3	<2.0 <2.0 [NA]	108
Magnesium	µg/sample	50	<50	12500 14300 13.3	60.5 <50 [NA] [1]	100
Manganese	µg/sample	2.0	<2.0	17.4 21.1 19.0	<2.0 <2.0 [NA]	101
Molybdenum	µg/sample	5.0	<5.0	<5.0 <5.0 [NA]	<5.0 <5.0 [NA]	109
Nickel	µg/sample	2.0	<2.0	<2.0 <2.0 [NA]	<2.0 <2.0 [NA]	103
Phosphorus	µg/sample	20	<20	48.3 61.4 [NA]	<20 <20 [NA]	98.3
Potassium	µg/sample	50	<50	5880 6260 6.17	<50 <50 [NA]	102
Silver	µg/sample	5.0	<5.0	<5.0 <5.0 [NA]	<5.0 <5.0 [NA]	105
Sodium	µg/sample	100	<100	95100 110000 14.2	307 216 [NA]	95.1
Strontium	µg/sample	2.0	<2.0	75.9 92.8 20.0	<2.0 <2.0 [NA]	100
Sulfur	µg/sample	50	<50	2280 2750 18.6	52.8 <50 [NA] [1]	95.5
Tin	µg/sample	10	<10	<10 <10 [NA]	<10 <10 [NA]	104
Titanium	µg/sample	2.0	<2.0	30.8 35.6 14.3	2.59 2.07 [NA]	103
Vanadium	µg/sample	2.0	<2.0	<2.0 <2.0 [NA]	<2.0 <2.0 [NA]	103
Zinc	µg/sample	5.0	<5.0	1770 2180 20.8	<5.0 <5.0 [NA]	103

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

DUST-005 | Quartz/Cristobalite by XRD (HiVol Filter) | Batch BGB1484

Analyte	Units	PQL	Blank	DUP1	DUP2	LCS %
				BGB1484-DUP1# Samp QC RPD %	BGB1484-DUP2# Samp QC RPD %	
a-Quartz	µg/sample	50	<12	4630 4650 0.442	<50 <50 [NA]	105

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

Quality Control PGB0500

QC Comments

Identifier	Description
[1]	Duplicate %RPD may be flagged as an outlier to routine laboratory acceptance, however, where one or both results are <10*PQL, the RPD acceptance criteria increases exponentially.

Certificate of Analysis PGB1597

Client Details

Client	Department of Water & Environmental Regulation
Contact	
Address	Prime House, 8 Davidson Terrace,, Joondalup, WA, 6027

Sample Details

Your Reference	Pinjarra 2024-25 HVAS - PM10, Metals and Crystalline Silica
Number of Samples	4 HiVol Filter
Date Samples Received	25/02/2025
Date Instructions Received	25/02/2025

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.
Results are reported on a dry weight basis for soils and on an as received basis for other matrices.

Report Details

Date Results Requested by	06/03/2025
Date of Issue	05/03/2025

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Authorisation Details

Airborne Dust Approved By	Shirleen Goh
Results Approved By	Ben Carpenter, Metals Technician Shirleen Goh, OH Lab Analyst Varsha Ho Wing, Inorganics and Metals Supervisor
Laboratory Manager	Michael Kubiak

Certificate of Analysis PGB1597

Samples in this Report

Envirolab ID	Sample ID	Matrix	Date Sampled	Date Received
PGB1597-01	DWE229	HiVol Filter	12/02/2025	25/02/2025
PGB1597-02	DWE230	HiVol Filter	13/02/2025	25/02/2025
PGB1597-03	DWE231	HiVol Filter	18/02/2025	25/02/2025
PGB1597-04	DWE232	HiVol Filter	24/02/2025	25/02/2025

Sample Information

Sample ID	Filter ID	Flow Rate (L/min)	Time Sampled (min)	Air Volume (m3)
DWE229	DWE229	[NA]	[NA]	[NA]
DWE230	DWE230	[NA]	[NA]	[NA]
DWE231	DWE231	[NA]	[NA]	[NA]
DWE232	DWE232	[NA]	[NA]	[NA]

Certificate of Analysis PGB1597

Acid Extractable Metals (HiVol Filter)

Envirolab ID Your Reference Date Sampled	Units	PQL	PGB1597-01 DWE229 12/02/2025	PGB1597-02 DWE230 13/02/2025	PGB1597-03 DWE231 18/02/2025	PGB1597-04 DWE232 24/02/2025
Silver	µg/sample	5.0	6.4	<5.0	<5.0	<5.0
Aluminium	µg/sample	5.0	250	10	650	530
Boron	µg/sample	20	50	<20	<20	<20
Barium	µg/sample	2.0	2.7	<2.0	2.2	3.6
Calcium	µg/sample	50	430	61	390	900
Cadmium	µg/sample	0.50	<0.50	<0.50	<0.50	<0.50
Cobalt	µg/sample	2.0	<2.0	<2.0	<2.0	<2.0
Chromium	µg/sample	2.0	8.8	7.0	7.2	7.0
Copper	µg/sample	2.0	3.0	<2.0	2.4	3.0
Iron	µg/sample	5.0	330	16	1000	640
Mercury	µg/sample	0.20	<0.20	<0.20	<0.20	<0.20
Potassium	µg/sample	50	190	<50	150	270
Lithium	µg/sample	2.0	<2.0	<2.0	<2.0	<2.0
Magnesium	µg/sample	50	430	<50	330	460
Manganese	µg/sample	2.0	2.4	<2.0	3.0	4.1
Molybdenum	µg/sample	5.0	<5.0	<5.0	<5.0	6.1
Sodium	µg/sample	100	3300	<100	2500	3400
Nickel	µg/sample	2.0	<2.0	<2.0	<2.0	<2.0
Phosphorus	µg/sample	20	22	<20	<20	21
Lead	µg/sample	5.0	<5.0	<5.0	<5.0	<5.0
Sulfur	µg/sample	50	500	<50	450	740
Tin	µg/sample	10	<10	<10	<10	<10
Strontium	µg/sample	2.0	3.6	<2.0	2.9	5.3
Titanium	µg/sample	2.0	6.9	<2.0	28	12
Vanadium	µg/sample	2.0	<2.0	<2.0	2.8	<2.0
Zinc	µg/sample	5.0	5.7	<5.0	<5.0	6.3
Arsenic	µg/sample	2.0	<2.0	<2.0	<2.0	<2.0
Beryllium	µg/sample	0.20	<0.20	<0.20	<0.20	<0.20
Gallium*	µg/sample	4.0	<4.0	<4.0	<4.0	<4.0
Antimony	µg/sample	10	<10	<10	<10	<10
Selenium	µg/sample	4.0	<4.0	<4.0	<4.0	<4.0
Thorium	µg/sample	4.0	<4.0	<4.0	<4.0	<4.0
Thallium	µg/sample	4.0	<4.0	<4.0	<4.0	<4.0
Uranium	µg/sample	4.0	<4.0	<4.0	<4.0	<4.0

Certificate of Analysis PGB1597

Quartz/Cristobalite by XRD (HiVol Filter)

Envirolab ID	Units	PQL	PGB1597-01	PGB1597-02	PGB1597-03	PGB1597-04
Your Reference			DWE229	DWE230	DWE231	DWE232
Date Sampled			12/02/2025	13/02/2025	18/02/2025	24/02/2025
a-Quartz	µg/sample	50	670	<50	1000	670

Certificate of Analysis PGB1597

HVAS Dust (HiVol Filter)

Envirolab ID	Units	PQL	PGB1597-01	PGB1597-02	PGB1597-03	PGB1597-04
Your Reference			DWE229	DWE230	DWE231	DWE232
Date Sampled			12/02/2025	13/02/2025	18/02/2025	24/02/2025
Dust	mg	0.10	29	<0.10	32	39

Certificate of Analysis PGB1597

Method Summary

Method ID	Methodology Summary
DUST-005	Respirable Quartz (and/or Cristabolite) determined direct on filter (unless otherwise indicated) by XRD determination. The Quartz exposure standard is 50µg/m3, therefore where sampling follows MDHS 101 guidelines and at least 500L of air is sampled, this is equivalent to a dust weight of 25µg/filter. The estimated measurement uncertainty for the laboratory analysis of Quartz is 30% at 25µg at 95% confidence limit (i.e. statistically the true value lies between 18-32µg / filter (35 – 65 µg/m3) at 95% confidence). The estimated measurement uncertainty was determined during method validation. NSW Resources Regulator have licenced (MLA0017505) Envirolab/MPL for the Analysis of Inhalable & Respirable Dust and Respirable Crystalline Silica.
INORG-100	Gravimetric determination of Inhalable dust as per AS3640. NSW Resources Regulator have licenced (MLA0017505) Envirolab/MPL for the Analysis of Inhalable & Respirable Dust and Respirable Crystalline Silica.
METALS-020	Determination of various metals by ICP-OES. Where salts (oxides, chlorides etc.) are calculated from the element concentration stoichiometrically there is no guarantee that the salt form is completely soluble in the acids used in the preparation.
METALS-020/022	Determination of various metals by ICP-OES or ICP-MS. Where salts (oxides, chlorides etc.) are calculated from the element concentration stoichiometrically there is no guarantee that the salt form is completely soluble in the acids used in the preparation.
METALS-021	Determination of Mercury by Cold Vapour AAS.
METALS-022	Determination of various metals by ICP-MS. Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements. Where salts (oxides, chlorides etc.) are calculated from the element concentration stoichiometrically there is no guarantee that the salt form is completely soluble in the acids used in the preparation.

Certificate of Analysis PGB1597

Result Definitions

Identifier	Description
NR	Not reported
NEPM	National Environment Protection Measure
NS	Not specified
LCS	Laboratory Control Sample
RPD	Relative Percent Difference
>	Greater than
<	Less than
PQL	Practical Quantitation Limit
INS	Insufficient sample for this test
NA	Test not required
NT	Not tested
DOL	Samples rejected due to particulate overload (air filters only)
RFD	Samples rejected due to filter damage (air filters only)
RUD	Samples rejected due to uneven deposition (air filters only)
##	Indicates a laboratory acceptance criteria outlier, for further details, see Result Comments and/or QC Comments

Quality Control Definitions

Blank

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

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.

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.

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.

Duplicate

This is the complete duplicate analysis of a sample from the process batch. The sample selected should be one where the analyte concentration is easily measurable.

Certificate of Analysis PGB1597

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 and matrix spike recoveries for the batch were within the laboratory acceptance criteria. Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction. Spikes for Physical and Aggregate Tests are not applicable. For VOCs in water samples, three vials are required for duplicate or spike analysis.

General Acceptance Criteria (GAC) - Analyte specific criteria applies for some analytes and is reflected in QC recovery tables.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% - see ELN-P05 QAQC tables for details (available on request); <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase. Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was typically insufficient in order to satisfy laboratory QA/QC protocols.

Miscellaneous Information

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached. We have taken the sampling date as being the date received at the laboratory.

Two significant figures are reported for the majority of tests and with a high degree of confidence, for results <10*PQL, the second significant figure may be in doubt i.e. has a relatively high degree of uncertainty and is provided for information only.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS where sediment/solids are included by default.

Urine Analysis - The BEI values listed are taken from the 2022 edition of *TLVs and BEIs Threshold Limits by ACGIH*.

Air volume measurements are not covered by Envirolab's NATA accreditation.

Data Quality Assessment Summary PGB1597

Client Details

Client	Department of Water & Environmental Regulation
Your Reference	Pinjarra 2024-25 HVAS - PM10, Metals and Crystalline Silica
Date Issued	05/03/2025

Recommended Holding Time Compliance

No recommended holding time exceedances

Quality Control and QC Frequency

QC Type	Compliant	Details
Blank	Yes	No Outliers
LCS	Yes	No Outliers
Duplicates	Yes	No Outliers
Matrix Spike	Yes	No Outliers
Surrogates / Extracted Internal Standards	Yes	No Outliers
QC Frequency	Yes	No Outliers

Surrogates/Extracted Internal Standards, Duplicates and/or Matrix Spikes are not always relevant/applicable to certain analyses and matrices. Therefore, said QC measures are deemed compliant in these situations by default. See Laboratory Acceptance Criteria for more information

Data Quality Assessment Summary PGB1597

Recommended Holding Time Compliance

Analysis	Sample Number(s)	Date Sampled	Date Extracted	Date Analysed	Compliant
Metals OHS HiVol Filter	1	12/02/2025	04/03/2025	05/03/2025	Yes
	2	13/02/2025	04/03/2025	05/03/2025	Yes
	3	18/02/2025	04/03/2025	05/03/2025	Yes
	4	24/02/2025	04/03/2025	05/03/2025	Yes
Metals OHS (LL) HiVol Filter	1	12/02/2025	04/03/2025	05/03/2025	Yes
	2	13/02/2025	04/03/2025	05/03/2025	Yes
	3	18/02/2025	04/03/2025	05/03/2025	Yes
	4	24/02/2025	04/03/2025	05/03/2025	Yes
Metals OHS-Hg HiVol Filter	1	12/02/2025	04/03/2025	05/03/2025	Yes
	2	13/02/2025	04/03/2025	05/03/2025	Yes
	3	18/02/2025	04/03/2025	05/03/2025	Yes
	4	24/02/2025	04/03/2025	05/03/2025	Yes
Quartz by XRD HiVol Filter	1	12/02/2025	27/02/2025	05/03/2025	Yes
	2	13/02/2025	27/02/2025	05/03/2025	Yes
	3	18/02/2025	27/02/2025	05/03/2025	Yes
	4	24/02/2025	27/02/2025	05/03/2025	Yes
Gravimetric Dust HiVol Filter	1	12/02/2025	27/02/2025	27/02/2025	Yes
	2	13/02/2025	27/02/2025	27/02/2025	Yes
	3	18/02/2025	27/02/2025	27/02/2025	Yes
	4	24/02/2025	27/02/2025	27/02/2025	Yes

Quality Control PGB1597

METALS-021 | Acid Extractable Metals (HiVol Filter) | Batch BGC0167

Analyte	Units	PQL	Blank	DUP1	DUP2	LCS %
				BGC0167-DUP1# Samp QC RPD %	PGB1597-01 Samp QC RPD %	
Mercury	µg/sample	0.20	<0.20	<0.20 <0.20 [NA]	<0.20 <0.20 [NA]	121

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

METALS-022 | Acid Extractable Metals (HiVol Filter) | Batch BGC0168

Analyte	Units	PQL	Blank	DUP1	DUP2	LCS %
				BGC0168-DUP1# Samp QC RPD %	PGB1597-01 Samp QC RPD %	
Antimony	µg/sample	10	<10	<10 <10 [NA]	<10 <10 [NA]	111
Arsenic	µg/sample	2.0	<2.0	<2.0 <2.0 [NA]	<2.0 <2.0 [NA]	102
Beryllium	µg/sample	0.20	<0.20	0.652 0.852 [NA]	<0.20 <0.20 [NA]	101
Gallium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]	<4.0 <4.0 [NA]	100
Selenium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]	<4.0 <4.0 [NA]	107
Thallium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]	<4.0 <4.0 [NA]	89.0
Thorium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]	<4.0 <4.0 [NA]	94.7
Uranium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]	<4.0 <4.0 [NA]	98.1

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

METALS-020/022 | Acid Extractable Metals (HiVol Filter) | Batch BGC0169

Analyte	Units	PQL	Blank	DUP1	DUP2	LCS %
				BGC0169-DUP1# Samp QC RPD %	PGB1597-01 Samp QC RPD %	
Aluminium	µg/sample	5.0	<5.0	7810 9570 20.2	247 269 8.23	94.6
Barium	µg/sample	2.0	<2.0	2840 3220 12.4	2.68 2.36 [NA]	102
Boron	µg/sample	20	<20	16300 19500 18.0	50.0 <20 [NA] [1]	90.6
Cadmium	µg/sample	0.50	<0.50	<0.50 <0.50 [NA]	<0.50 <0.50 [NA]	90.6
Calcium	µg/sample	50	<50	39000 47300 19.1	428 447 4.39	86.5
Chromium	µg/sample	2.0	<2.0	3.37 3.78 [NA]	8.76 9.38 [NA]	93.6
Cobalt	µg/sample	2.0	<2.0	<2.0 <2.0 [NA]	<2.0 <2.0 [NA]	91.2
Copper	µg/sample	2.0	<2.0	8.54 10.3 [NA]	3.02 3.21 [NA]	95.7
Iron	µg/sample	5.0	<5.0	335 399 17.3	329 353 6.80	94.8
Lead	µg/sample	5.0	<5.0	5.59 5.25 [NA]	<5.0 <5.0 [NA]	92.6
Lithium	µg/sample	2.0	<2.0	10.4 12.7 19.5	<2.0 <2.0 [NA]	96.4
Magnesium	µg/sample	50	<50	14100 17300 20.5	434 452 4.09	89.8
Manganese	µg/sample	2.0	<2.0	23.6 27.8 16.4	2.43 2.65 [NA]	92.3
Molybdenum	µg/sample	5.0	<5.0	<5.0 <5.0 [NA]	<5.0 <5.0 [NA]	101
Nickel	µg/sample	2.0	<2.0	3.13 3.41 [NA]	<2.0 <2.0 [NA]	94.0
Phosphorus	µg/sample	20	<20	78.4 98.4 [NA]	22.2 22.8 [NA]	91.0
Potassium	µg/sample	50	<50	6520 7530 14.3	195 200 [NA]	88.1
Silver	µg/sample	5.0	<5.0	5.07 7.68 [NA]	6.44 5.71 [NA]	108
Sodium	µg/sample	100	<100	113000 135000 17.6	3320 3470 4.43	85.9
Strontium	µg/sample	2.0	<2.0	92.6 110 17.6	3.59 3.81 [NA]	91.6
Sulfur	µg/sample	50	<50	5100 5520 7.95	496 521 4.82	92.5
Tin	µg/sample	10	<10	<10 <10 [NA]	<10 <10 [NA]	97.4
Titanium	µg/sample	2.0	<2.0	50.3 52.9 5.03	6.86 7.33 [NA]	98.6
Vanadium	µg/sample	2.0	<2.0	<2.0 <2.0 [NA]	<2.0 <2.0 [NA]	93.0
Zinc	µg/sample	5.0	<5.0	2120 2400 12.2	5.69 5.72 [NA]	93.6

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

DUST-005 | Quartz/Cristobalite by XRD (HiVol Filter) | Batch BGB4694

Analyte	Units	PQL	Blank	DUP1	LCS %
				PGB1597-01 Samp QC RPD %	
a-Quartz	µg/sample	50	<12	666 688 3.27	107

Quality Control PGB1597

QC Comments

Identifier	Description
[1]	Duplicate %RPD may be flagged as an outlier to routine laboratory acceptance, however, where one or both results are <10*PQL, the RPD acceptance criteria increases exponentially.

Certificate of Analysis PGC1007

Client Details

Client	Department of Water & Environmental Regulation
Contact	
Address	Prime House, 8 Davidson Terrace,, Joondalup, WA, 6027

Sample Details

Your Reference	Pinjarra 2024-25 HVAS - PM10, Metals and Crystalline Silica
Number of Samples	3 HiVol Filter
Date Samples Received	17/03/2025
Date Instructions Received	17/03/2025

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.
Results are reported on a dry weight basis for soils and on an as received basis for other matrices.

Report Details

Date Results Requested by	25/03/2025
Date of Issue	26/03/2025

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Authorisation Details

Airborne Dust Approved By	Shirleen Goh
Results Approved By	Ben Carpenter, Metals Technician Michael Mowle, Development Chemist - Inorganics and Metals Shirleen Goh, OH Lab Analyst Varsha Ho Wing, Inorganics and Metals Supervisor
Laboratory Manager	Michael Kubiak

Certificate of Analysis PGC1007

Samples in this Report

Envirolab ID	Sample ID	Matrix	Date Sampled	Date Received
PGC1007-01	DWE233	HiVol Filter	02/03/2025	17/03/2025
PGC1007-02	DWE234	HiVol Filter	08/03/2025	17/03/2025
PGC1007-03	DWE235	HiVol Filter	14/03/2025	17/03/2025

Sample Information

Sample ID	Filter ID	Flow Rate (L/min)	Time Sampled (min)	Air Volume (m3)
DWE233	DWE233	[NA]	[NA]	[NA]
DWE234	DWE234	[NA]	[NA]	[NA]
DWE235	DWE235	[NA]	[NA]	[NA]

Certificate of Analysis PGC1007

Acid Extractable Metals (HiVol Filter)

Envirolab ID Your Reference Date Sampled	Units	PQL	PGC1007-01 DWE233 02/03/2025	PGC1007-02 DWE234 08/03/2025	PGC1007-03 DWE235 14/03/2025
Silver	µg/sample	5.0	<5.0	<5.0	<5.0
Aluminium	µg/sample	5.0	910	320	63
Boron	µg/sample	20	<20	<20	31
Barium	µg/sample	2.0	<2.0	<2.0	2.0
Calcium	µg/sample	50	480	390	190
Cadmium	µg/sample	0.50	<0.50	<0.50	<0.50
Cobalt	µg/sample	2.0	<2.0	<2.0	<2.0
Chromium	µg/sample	2.0	12	9.8	8.5
Copper	µg/sample	2.0	2.5	<2.0	2.3
Iron	µg/sample	5.0	1500	340	95
Mercury	µg/sample	0.20	<0.20	<0.20	<0.20
Potassium	µg/sample	50	120	230	91
Lithium	µg/sample	2.0	<2.0	<2.0	<2.0
Magnesium	µg/sample	50	200	450	170
Manganese	µg/sample	2.0	3.2	2.2	<2.0
Molybdenum	µg/sample	5.0	<5.0	<5.0	<5.0
Sodium	µg/sample	100	1600	3100	1200
Nickel	µg/sample	2.0	<2.0	<2.0	<2.0
Phosphorus	µg/sample	20	24	<20	<20
Lead	µg/sample	5.0	<5.0	<5.0	<5.0
Sulfur	µg/sample	50	440	680	240
Tin	µg/sample	10	<10	<10	<10
Strontium	µg/sample	2.0	2.7	3.7	<2.0
Titanium	µg/sample	2.0	41	5.6	2.6
Vanadium	µg/sample	2.0	4.1	<2.0	<2.0
Zinc	µg/sample	5.0	5.3	5.8	6.1
Arsenic	µg/sample	2.0	<2.0	<2.0	<2.0
Beryllium	µg/sample	0.20	<0.20	<0.20	<0.20
Gallium*	µg/sample	4.0	<4.0	<4.0	<4.0
Antimony	µg/sample	10	<10	<10	<10
Selenium	µg/sample	4.0	<4.0	<4.0	<4.0
Thorium	µg/sample	4.0	<4.0	<4.0	<4.0
Thallium	µg/sample	4.0	<4.0	<4.0	<4.0
Uranium	µg/sample	4.0	<4.0	<4.0	<4.0

Certificate of Analysis PGC1007

Quartz/Cristobalite by XRD (HiVol Filter)

Envirolab ID	Units	PQL	PGC1007-01	PGC1007-02	PGC1007-03
Your Reference			DWE233	DWE234	DWE235
Date Sampled			02/03/2025	08/03/2025	14/03/2025
a-Quartz	µg/sample	50	890	470	69

Certificate of Analysis PGC1007

HVAS Dust (HiVol Filter)

Envirolab ID	Units	PQL	PGC1007-01	PGC1007-02	PGC1007-03
Your Reference			DWE233	DWE234	DWE235
Date Sampled			02/03/2025	08/03/2025	14/03/2025
Dust	mg	0.10	33	29	11

Certificate of Analysis PGC1007

Method Summary

Method ID	Methodology Summary
DUST-005	Respirable Quartz (and/or Cristabolite) determined direct on filter (unless otherwise indicated) by XRD determination. The Quartz exposure standard is 50µg/m3, therefore where sampling follows MDHS 101 guidelines and at least 500L of air is sampled, this is equivalent to a dust weight of 25µg/filter. The estimated measurement uncertainty for the laboratory analysis of Quartz is 30% at 25µg at 95% confidence limit (i.e. statistically the true value lies between 18-32µg / filter (35 – 65 µg/m3) at 95% confidence). The estimated measurement uncertainty was determined during method validation. NSW Resources Regulator have licenced (MLA0017505) Envirolab/MPL for the Analysis of Inhalable & Respirable Dust and Respirable Crystalline Silica.
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METALS-020	Determination of various metals by ICP-OES. Where salts (oxides, chlorides etc.) are calculated from the element concentration stoichiometrically there is no guarantee that the salt form is completely soluble in the acids used in the preparation.
METALS-020/022	Determination of various metals by ICP-OES or ICP-MS. Where salts (oxides, chlorides etc.) are calculated from the element concentration stoichiometrically there is no guarantee that the salt form is completely soluble in the acids used in the preparation.
METALS-021	Determination of Mercury by Cold Vapour AAS.
METALS-022	Determination of various metals by ICP-MS. Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements. Where salts (oxides, chlorides etc.) are calculated from the element concentration stoichiometrically there is no guarantee that the salt form is completely soluble in the acids used in the preparation.

Certificate of Analysis PGC1007

Result Definitions

Identifier	Description
NR	Not reported
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LCS	Laboratory Control Sample
RPD	Relative Percent Difference
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PQL	Practical Quantitation Limit
INS	Insufficient sample for this test
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RFD	Samples rejected due to filter damage (air filters only)
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Quality Control Definitions

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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.

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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.

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.

Duplicate

This is the complete duplicate analysis of a sample from the process batch. The sample selected should be one where the analyte concentration is easily measurable.

Certificate of Analysis PGC1007

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 and matrix spike recoveries for the batch were within the laboratory acceptance criteria. Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction. Spikes for Physical and Aggregate Tests are not applicable. For VOCs in water samples, three vials are required for duplicate or spike analysis.

General Acceptance Criteria (GAC) - Analyte specific criteria applies for some analytes and is reflected in QC recovery tables.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% - see ELN-P05 QAQC tables for details (available on request); <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase. Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was typically insufficient in order to satisfy laboratory QA/QC protocols.

Miscellaneous Information

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached. We have taken the sampling date as being the date received at the laboratory.

Two significant figures are reported for the majority of tests and with a high degree of confidence, for results <10*PQL, the second significant figure may be in doubt i.e. has a relatively high degree of uncertainty and is provided for information only.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS where sediment/solids are included by default.

Urine Analysis - The BEI values listed are taken from the 2022 edition of *TLVs and BEIs Threshold Limits by ACGIH*.

Air volume measurements are not covered by Envirolab's NATA accreditation.

Data Quality Assessment Summary PGC1007

Client Details

Client	Department of Water & Environmental Regulation
Your Reference	Pinjarra 2024-25 HVAS - PM10, Metals and Crystalline Silica
Date Issued	26/03/2025

Recommended Holding Time Compliance

Recommended holding time exceedances exist - See detailed list below

Quality Control and QC Frequency

QC Type	Compliant	Details
Blank	Yes	No Outliers
LCS	Yes	No Outliers
Duplicates	Yes	No Outliers
Matrix Spike	Yes	No Outliers
Surrogates / Extracted Internal Standards	Yes	No Outliers
QC Frequency	Yes	No Outliers

Surrogates/Extracted Internal Standards, Duplicates and/or Matrix Spikes are not always relevant/applicable to certain analyses and matrices. Therefore, said QC measures are deemed compliant in these situations by default. See Laboratory Acceptance Criteria for more information

Data Quality Assessment Summary PGC1007

Recommended Holding Time Compliance

Analysis	Sample Number(s)	Date Sampled	Date Extracted	Date Analysed	Compliant
Metals OHS HiVol Filter	1	02/03/2025	24/03/2025	26/03/2025	Yes
	2	08/03/2025	24/03/2025	26/03/2025	Yes
	3	14/03/2025	24/03/2025	26/03/2025	Yes
Metals OHS (LL) HiVol Filter	1	02/03/2025	24/03/2025	25/03/2025	Yes
	2	08/03/2025	24/03/2025	25/03/2025	Yes
	3	14/03/2025	24/03/2025	25/03/2025	Yes
Metals OHS-Hg HiVol Filter	1	02/03/2025	24/03/2025	25/03/2025	Yes
	2	08/03/2025	24/03/2025	25/03/2025	Yes
	3	14/03/2025	24/03/2025	25/03/2025	Yes
Quartz by XRD HiVol Filter	1	02/03/2025	21/03/2025	25/03/2025	Yes
	2	08/03/2025	21/03/2025	25/03/2025	Yes
	3	14/03/2025	21/03/2025	25/03/2025	Yes
Gravimetric Dust HiVol Filter	1	02/03/2025	23/03/2025	23/03/2025	No
	2	08/03/2025	23/03/2025	23/03/2025	Yes
	3	14/03/2025	23/03/2025	23/03/2025	Yes

Quality Control PGC1007

METALS-020/022 | Acid Extractable Metals (HiVol Filter) | Batch BGC3787

Analyte	Units	PQL	Blank	DUP1	LCS %
				PGC1007-01	
				Samp QC RPD %	
Aluminium	µg/sample	5.0	<5.0	908 1050 14.1	97.4
Barium	µg/sample	2.0	<2.0	<2.0 2.19 [NA] [1]	99.1
Boron	µg/sample	20	<20	<20 <20 [NA]	99.6
Cadmium	µg/sample	0.50	<0.50	<0.50 <0.50 [NA]	91.4
Calcium	µg/sample	50	<50	481 577 18.3	93.5
Chromium	µg/sample	2.0	<2.0	12.5 14.1 12.5	94.8
Cobalt	µg/sample	2.0	<2.0	<2.0 <2.0 [NA]	91.5
Copper	µg/sample	2.0	<2.0	2.54 3.16 [NA]	96.6
Iron	µg/sample	5.0	<5.0	1520 1720 12.8	92.9
Lead	µg/sample	5.0	<5.0	<5.0 <5.0 [NA]	93.5
Lithium	µg/sample	2.0	<2.0	<2.0 <2.0 [NA]	102
Magnesium	µg/sample	50	<50	197 240 [NA]	97.2
Manganese	µg/sample	2.0	<2.0	3.20 3.87 [NA]	95.8
Molybdenum	µg/sample	5.0	<5.0	<5.0 <5.0 [NA]	101
Nickel	µg/sample	2.0	<2.0	<2.0 <2.0 [NA]	96.8
Phosphorus	µg/sample	20	<20	24.2 27.5 [NA]	88.7
Potassium	µg/sample	50	<50	116 144 [NA]	91.6
Silver	µg/sample	5.0	<5.0	<5.0 <5.0 [NA]	93.0
Sodium	µg/sample	100	<100	1640 1990 19.0	80.4
Strontium	µg/sample	2.0	<2.0	2.65 3.23 [NA]	93.6
Sulfur	µg/sample	50	<50	442 520 16.3	100
Tin	µg/sample	10	<10	<10 <10 [NA]	97.8
Titanium	µg/sample	2.0	<2.0	41.1 47.5 14.4	97.5
Vanadium	µg/sample	2.0	<2.0	4.14 4.77 [NA]	89.9
Zinc	µg/sample	5.0	<5.0	5.28 9.73 [NA] [1]	97.0

METALS-022 | Acid Extractable Metals (HiVol Filter) | Batch BGC3788

Analyte	Units	PQL	Blank	DUP1		LCS %
				PGC1007-01		
				Samp QC RPD %		
Antimony	µg/sample	10	<10	<10 <10 [NA]		120
Arsenic	µg/sample	2.0	<2.0	<2.0 <2.0 [NA]		108
Beryllium	µg/sample	0.20	<0.20	<0.20 <0.20 [NA]		103
Gallium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]		97.0
Selenium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]		122
Thallium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]		82.5
Thorium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]		86.4
Uranium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]		90.6

METALS-021 | Acid Extractable Metals (HiVol Filter) | Batch BGC3789

Analyte	Units	PQL	Blank	DUP1		LCS %
				PGC1007-01		
				Samp QC RPD %		
Mercury	µg/sample	0.20	<0.20	<0.20	<0.20 [NA]	95.2

DUST-005 | Quartz/Cristobalite by XRD (HiVol Filter) | Batch BGC3591

Analyte	Units	PQL	Blank	DUP1		LCS %
				BGC3591-DUP1#		
				Samp QC RPD %		
a-Quartz	µg/sample	50	<12	399 347 13.8		91.4

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

Quality Control PGC1007

QC Comments

Identifier	Description
[1]	Duplicate %RPD may be flagged as an outlier to routine laboratory acceptance, however, where one or both results are <10*PQL, the RPD acceptance criteria increases exponentially.

Certificate of Analysis PGD0213

Client Details

Client	Department of Water & Environmental Regulation
Contact	
Address	Prime House, 8 Davidson Terrace,, Joondalup, WA, 6027

Sample Details

Your Reference	Pinjarra 2024-25 HVAS - PM10, Metals and Crystalline Silica
Number of Samples	3 HiVol Filter
Date Samples Received	02/04/2025
Date Instructions Received	02/04/2025

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.
Results are reported on a dry weight basis for soils and on an as received basis for other matrices.

Report Details

Date Results Requested by	11/04/2025
Date of Issue	11/04/2025

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Authorisation Details

Airborne Dust Approved By	Shirleen Goh
Results Approved By	Shirleen Goh, OH Lab Analyst Varsha Ho Wing, Inorganics and Metals Supervisor
Laboratory Manager	Michael Kubiak

Certificate of Analysis PGD0213

Samples in this Report

Envirolab ID	Sample ID	Matrix	Date Sampled	Date Received
PGD0213-01	DWE236	HiVol Filter	20/03/2025	02/04/2025
PGD0213-02	DWE237	HiVol Filter	26/03/2025	02/04/2025
PGD0213-03	DWE238	HiVol Filter	01/04/2025	02/04/2025

Sample Information

Sample ID	Filter ID	Flow Rate (L/min)	Time Sampled (min)	Air Volume (m3)
DWE236	DWE236	[NA]	[NA]	[NA]
DWE237	DWE237	[NA]	[NA]	[NA]
DWE238	DWE238	[NA]	[NA]	[NA]

Certificate of Analysis PGD0213

Acid Extractable Metals (HiVol Filter)

Envirolab ID Your Reference Date Sampled	Units	PQL	PGD0213-01 DWE236 20/03/2025	PGD0213-02 DWE237 26/03/2025	PGD0213-03 DWE238 01/04/2025
Silver	µg/sample	5.0	<5.0	<5.0	<5.0
Aluminium	µg/sample	5.0	300	710	620
Boron	µg/sample	20	<20	<20	<20
Barium	µg/sample	2.0	<2.0	2.5	4.0
Calcium	µg/sample	50	340	570	600
Cadmium	µg/sample	0.50	<0.50	<0.50	<0.50
Cobalt	µg/sample	2.0	<2.0	<2.0	<2.0
Chromium	µg/sample	2.0	7.2	8.6	8.7
Copper	µg/sample	2.0	<2.0	2.6	2.7
Iron	µg/sample	5.0	360	1100	790
Mercury	µg/sample	0.20	<0.20	<0.20	<0.20
Potassium	µg/sample	50	150	140	180
Lithium	µg/sample	2.0	<2.0	<2.0	<2.0
Magnesium	µg/sample	50	380	290	290
Manganese	µg/sample	2.0	<2.0	4.4	6.2
Molybdenum	µg/sample	5.0	<5.0	<5.0	<5.0
Sodium	µg/sample	100	3000	2400	1600
Nickel	µg/sample	2.0	<2.0	<2.0	<2.0
Phosphorus	µg/sample	20	<20	<20	27
Lead	µg/sample	5.0	<5.0	<5.0	<5.0
Sulfur	µg/sample	50	390	410	480
Tin	µg/sample	10	<10	<10	<10
Strontium	µg/sample	2.0	2.9	3.1	12
Titanium	µg/sample	2.0	5.4	26	10
Vanadium	µg/sample	2.0	<2.0	3.2	<2.0
Zinc	µg/sample	5.0	<5.0	<5.0	8.4
Arsenic	µg/sample	2.0	<2.0	<2.0	<2.0
Beryllium	µg/sample	0.20	<0.20	<0.20	<0.20
Gallium*	µg/sample	4.0	<4.0	<4.0	<4.0
Antimony	µg/sample	10	<10	<10	<10
Selenium	µg/sample	4.0	<4.0	<4.0	<4.0
Thorium	µg/sample	4.0	<4.0	<4.0	<4.0
Thallium	µg/sample	4.0	<4.0	<4.0	<4.0
Uranium	µg/sample	4.0	<4.0	<4.0	<4.0

Certificate of Analysis PGD0213

Quartz/Cristobalite by XRD (HiVol Filter)

Envirolab ID	Units	PQL	PGD0213-01	PGD0213-02	PGD0213-03
Your Reference			DWE236	DWE237	DWE238
Date Sampled			20/03/2025	26/03/2025	01/04/2025
a-Quartz	µg/sample	50	460	690	890

Certificate of Analysis PGD0213

HVAS Dust (HiVol Filter)

Envirolab ID	Units	PQL	PGD0213-01	PGD0213-02	PGD0213-03
Your Reference			DWE236	DWE237	DWE238
Date Sampled			20/03/2025	26/03/2025	01/04/2025
Dust	mg	0.10	27	38	34

Certificate of Analysis PGD0213

Method Summary

Method ID	Methodology Summary
DUST-005	Respirable Quartz (and/or Cristabolite) determined direct on filter (unless otherwise indicated) by XRD determination. The Quartz exposure standard is 50µg/m3, therefore where sampling follows MDHS 101 guidelines and at least 500L of air is sampled, this is equivalent to a dust weight of 25µg/filter. The estimated measurement uncertainty for the laboratory analysis of Quartz is 30% at 25µg at 95% confidence limit (i.e. statistically the true value lies between 18-32µg / filter (35 – 65 µg/m3) at 95% confidence). The estimated measurement uncertainty was determined during method validation. NSW Resources Regulator have licenced (MLA0017505) Envirolab/MPL for the Analysis of Inhalable & Respirable Dust and Respirable Crystalline Silica.
INORG-100	Gravimetric determination of Inhalable dust as per AS3640. NSW Resources Regulator have licenced (MLA0017505) Envirolab/MPL for the Analysis of Inhalable & Respirable Dust and Respirable Crystalline Silica.
METALS-020	Determination of various metals by ICP-OES. Where salts (oxides, chlorides etc.) are calculated from the element concentration stoichiometrically there is no guarantee that the salt form is completely soluble in the acids used in the preparation.
METALS-020/022	Determination of various metals by ICP-OES or ICP-MS. Where salts (oxides, chlorides etc.) are calculated from the element concentration stoichiometrically there is no guarantee that the salt form is completely soluble in the acids used in the preparation.
METALS-021	Determination of Mercury by Cold Vapour AAS.
METALS-022	Determination of various metals by ICP-MS. Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements. Where salts (oxides, chlorides etc.) are calculated from the element concentration stoichiometrically there is no guarantee that the salt form is completely soluble in the acids used in the preparation.

Certificate of Analysis PGD0213

Result Definitions

Identifier	Description
NR	Not reported
NEPM	National Environment Protection Measure
NS	Not specified
LCS	Laboratory Control Sample
RPD	Relative Percent Difference
>	Greater than
<	Less than
PQL	Practical Quantitation Limit
INS	Insufficient sample for this test
NA	Test not required
NT	Not tested
DOL	Samples rejected due to particulate overload (air filters only)
RFD	Samples rejected due to filter damage (air filters only)
RUD	Samples rejected due to uneven deposition (air filters only)
##	Indicates a laboratory acceptance criteria outlier, for further details, see Result Comments and/or QC Comments

Quality Control Definitions

Blank

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

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.

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.

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.

Duplicate

This is the complete duplicate analysis of a sample from the process batch. The sample selected should be one where the analyte concentration is easily measurable.

Certificate of Analysis PGD0213

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 and matrix spike recoveries for the batch were within the laboratory acceptance criteria. Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction. Spikes for Physical and Aggregate Tests are not applicable. For VOCs in water samples, three vials are required for duplicate or spike analysis.

General Acceptance Criteria (GAC) - Analyte specific criteria applies for some analytes and is reflected in QC recovery tables.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% - see ELN-P05 QAQC tables for details (available on request); <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase. Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was typically insufficient in order to satisfy laboratory QA/QC protocols.

Miscellaneous Information

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached. We have taken the sampling date as being the date received at the laboratory.

Two significant figures are reported for the majority of tests and with a high degree of confidence, for results <10*PQL, the second significant figure may be in doubt i.e. has a relatively high degree of uncertainty and is provided for information only.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS where sediment/solids are included by default.

Urine Analysis - The BEI values listed are taken from the 2022 edition of *TLVs and BEIs Threshold Limits by ACGIH*.

Air volume measurements are not covered by Envirolab's NATA accreditation.

Data Quality Assessment Summary PGD0213

Client Details

Client	Department of Water & Environmental Regulation
Your Reference	Pinjarra 2024-25 HVAS - PM10, Metals and Crystalline Silica
Date Issued	11/04/2025

Recommended Holding Time Compliance

No recommended holding time exceedances

Quality Control and QC Frequency

QC Type	Compliant	Details
Blank	Yes	No Outliers
LCS	Yes	No Outliers
Duplicates	Yes	No Outliers
Matrix Spike	Yes	No Outliers
Surrogates / Extracted Internal Standards	Yes	No Outliers
QC Frequency	Yes	No Outliers

Surrogates/Extracted Internal Standards, Duplicates and/or Matrix Spikes are not always relevant/applicable to certain analyses and matrices. Therefore, said QC measures are deemed compliant in these situations by default. See Laboratory Acceptance Criteria for more information

Data Quality Assessment Summary PGD0213

Recommended Holding Time Compliance

Analysis	Sample Number(s)	Date Sampled	Date Extracted	Date Analysed	Compliant
Metals OHS HiVol Filter	3	01/04/2025	08/04/2025	08/04/2025	Yes
	1	20/03/2025	08/04/2025	08/04/2025	Yes
	2	26/03/2025	08/04/2025	08/04/2025	Yes
Metals OHS (LL) HiVol Filter	3	01/04/2025	08/04/2025	08/04/2025	Yes
	1	20/03/2025	08/04/2025	08/04/2025	Yes
	2	26/03/2025	08/04/2025	08/04/2025	Yes
Metals OHS-Hg HiVol Filter	3	01/04/2025	08/04/2025	08/04/2025	Yes
	1	20/03/2025	08/04/2025	08/04/2025	Yes
	2	26/03/2025	08/04/2025	08/04/2025	Yes
Quartz by XRD HiVol Filter	3	01/04/2025	07/04/2025	11/04/2025	Yes
	1	20/03/2025	07/04/2025	11/04/2025	Yes
	2	26/03/2025	07/04/2025	11/04/2025	Yes
Gravimetric Dust HiVol Filter	3	01/04/2025	07/04/2025	07/04/2025	Yes
	1	20/03/2025	07/04/2025	07/04/2025	Yes
	2	26/03/2025	07/04/2025	07/04/2025	Yes

Quality Control PGD0213

METALS-021 | Acid Extractable Metals (HiVol Filter) | Batch BGD1477

Analyte	Units	PQL	Blank	DUP1	DUP2	LCS %
				PGD0213-01	BGD1477-DUP2#	
				Samp QC RPD %	Samp QC RPD %	
Mercury	µg/sample	0.20	<0.20	<0.20 <0.20 [NA]	<0.20 <0.20 [NA]	96.0

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

METALS-022 | Acid Extractable Metals (HiVol Filter) | Batch BGD1478

Analyte	Units	PQL	Blank	DUP1	DUP2	LCS %
				PGD0213-01	BGD1478-DUP2#	
				Samp QC RPD %	Samp QC RPD %	
Antimony	µg/sample	10	<10	<10 <10 [NA]	<10 <10 [NA]	102
Arsenic	µg/sample	2.0	<2.0	<2.0 <2.0 [NA]	<2.0 <2.0 [NA]	108
Beryllium	µg/sample	0.20	<0.20	<0.20 <0.20 [NA]	0.328 0.604 [NA] [1]	113
Gallium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]	<4.0 <4.0 [NA]	102
Selenium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]	<4.0 <4.0 [NA]	116
Thallium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]	<4.0 <4.0 [NA]	98.5
Thorium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]	<4.0 <4.0 [NA]	87.4
Uranium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]	<4.0 <4.0 [NA]	98.7

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

METALS-020/022 | Acid Extractable Metals (HiVol Filter) | Batch BGD1479

Analyte	Units	PQL	Blank	DUP1	DUP2	LCS %
				PGD0213-01	BGD1479-DUP2#	
				Samp QC RPD %	Samp QC RPD %	
Aluminium	µg/sample	5.0	<5.0	300 303 1.12	4220 3830 9.84	98.3
Barium	µg/sample	2.0	<2.0	<2.0 <2.0 [NA]	1610 1330 18.9	101
Boron	µg/sample	20	<20	<20 <20 [NA]	9400 7820 18.4	97.0
Cadmium	µg/sample	0.50	<0.50	<0.50 <0.50 [NA]	<0.50 <0.50 [NA]	97.5
Calcium	µg/sample	50	<50	336 334 0.646	21100 18200 14.5	104
Chromium	µg/sample	2.0	<2.0	7.20 8.93 [NA]	<2.0 <2.0 [NA]	103
Cobalt	µg/sample	2.0	<2.0	<2.0 <2.0 [NA]	<2.0 <2.0 [NA]	99.4
Copper	µg/sample	2.0	<2.0	<2.0 <2.0 [NA]	6.79 5.20 [NA]	103
Iron	µg/sample	5.0	<5.0	362 358 0.944	298 280 6.35	99.4
Lead	µg/sample	5.0	<5.0	<5.0 <5.0 [NA]	<5.0 <5.0 [NA]	100
Lithium	µg/sample	2.0	<2.0	<2.0 <2.0 [NA]	5.83 5.02 [NA]	106
Magnesium	µg/sample	50	<50	375 376 0.325	8300 7230 13.7	101
Manganese	µg/sample	2.0	<2.0	<2.0 <2.0 [NA]	17.9 14.5 20.9	102
Molybdenum	µg/sample	5.0	<5.0	<5.0 <5.0 [NA]	<5.0 <5.0 [NA]	95.2
Nickel	µg/sample	2.0	<2.0	<2.0 <2.0 [NA]	<2.0 <2.0 [NA]	101
Phosphorus	µg/sample	20	<20	<20 <20 [NA]	41.4 33.6 [NA]	90.6
Potassium	µg/sample	50	<50	145 143 [NA]	3960 3140 23.2	98.8
Silver	µg/sample	5.0	<5.0	<5.0 <5.0 [NA]	<5.0 <5.0 [NA]	97.9
Sodium	µg/sample	100	<100	2950 2970 0.776	58800 50300 15.7	97.0
Strontium	µg/sample	2.0	<2.0	2.90 2.90 [NA]	52.0 45.4 13.5	98.5
Sulfur	µg/sample	50	<50	390 383 1.83	2270 1630 33.1	98.4
Tin	µg/sample	10	<10	<10 <10 [NA]	<10 <10 [NA]	93.8
Titanium	µg/sample	2.0	<2.0	5.42 4.98 [NA]	23.9 19.8 18.9	96.1
Vanadium	µg/sample	2.0	<2.0	<2.0 <2.0 [NA]	<2.0 <2.0 [NA]	97.4
Zinc	µg/sample	5.0	<5.0	<5.0 <5.0 [NA]	1260 1060 17.8	100

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

DUST-005 | Quartz/Cristobalite by XRD (HiVol Filter) | Batch BGD1288

Analyte	Units	PQL	Blank	DUP1	LCS %
				PGD0213-01	
				Samp QC RPD %	
a-Quartz	µg/sample	50	<12	464 457 1.57	91.0

Quality Control PGD0213

QC Comments

Identifier	Description
[1]	The laboratory duplicate RPD acceptance criteria has been exceeded. Results are accepted due to the inhomogeneous nature of the sample.

Certificate of Analysis PGD1547

Client Details

Client	Department of Water & Environmental Regulation
Contact	
Address	Prime House, 8 Davidson Terrace,, Joondalup, WA, 6027

Sample Details

Your Reference	Pinjarra 2024-25 HVAS - PM10, Metals and Crystalline Silica
Number of Samples	4 HiVol Filter
Date Samples Received	22/04/2025
Date Instructions Received	22/04/2025

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.
Results are reported on a dry weight basis for soils and on an as received basis for other matrices.

Report Details

Date Results Requested by	02/05/2025
Date of Issue	30/04/2025

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Authorisation Details

Airborne Dust Approved By	Shirleen Goh
Results Approved By	Ben Carpenter, Metals Technician Shirleen Goh, OH Lab Analyst Varsha Ho Wing, Inorganics and Metals Supervisor
Laboratory Manager	Michael Kubiak

Certificate of Analysis PGD1547

Samples in this Report

Envirolab ID	Sample ID	Matrix	Date Sampled	Date Received
PGD1547-01	DWE239	HiVol Filter	07/04/2025	22/04/2025
PGD1547-02	DWE240	HiVol Filter	13/04/2025	22/04/2025
PGD1547-03	DWE241	HiVol Filter	19/04/2025	22/04/2025
PGD1547-04	DWE242	HiVol Filter	22/04/2025	22/04/2025

Sample Information

Sample ID	Filter ID	Flow Rate (L/min)	Time Sampled (min)	Air Volume (m3)
DWE239	DWE239	[NA]	[NA]	[NA]
DWE240	DWE240	[NA]	[NA]	[NA]
DWE241	DWE241	[NA]	[NA]	[NA]
DWE242	DWE242	[NA]	[NA]	[NA]

Certificate of Analysis PGD1547

Acid Extractable Metals (HiVol Filter)

Envirolab ID Your Reference Date Sampled	Units	PQL	PGD1547-01 DWE239 07/04/2025	PGD1547-02 DWE240 13/04/2025	PGD1547-03 DWE241 19/04/2025	PGD1547-04 DWE242 22/04/2025
Silver	µg/sample	5.0	<5.0	<5.0	<5.0	<5.0
Aluminium	µg/sample	5.0	440	380	260	12
Boron	µg/sample	20	31	<20	<20	<20
Barium	µg/sample	2.0	4.0	<2.0	<2.0	<2.0
Calcium	µg/sample	50	360	230	180	55
Cadmium	µg/sample	0.50	<0.50	<0.50	<0.50	<0.50
Cobalt	µg/sample	2.0	<2.0	<2.0	<2.0	<2.0
Chromium	µg/sample	2.0	6.5	7.4	8.5	6.5
Copper	µg/sample	2.0	2.4	<2.0	<2.0	<2.0
Iron	µg/sample	5.0	490	420	320	23
Mercury	µg/sample	0.20	<0.20	<0.20	<0.20	<0.20
Potassium	µg/sample	50	120	120	98	<50
Lithium	µg/sample	2.0	<2.0	<2.0	<2.0	<2.0
Magnesium	µg/sample	50	170	170	170	<50
Manganese	µg/sample	2.0	3.8	2.3	<2.0	<2.0
Molybdenum	µg/sample	5.0	<5.0	<5.0	<5.0	<5.0
Sodium	µg/sample	100	1100	1200	1100	<100
Nickel	µg/sample	2.0	<2.0	<2.0	<2.0	<2.0
Phosphorus	µg/sample	20	22	<20	<20	<20
Lead	µg/sample	5.0	<5.0	<5.0	<5.0	<5.0
Sulfur	µg/sample	50	610	470	250	<50
Tin	µg/sample	10	<10	<10	<10	<10
Strontium	µg/sample	2.0	2.1	<2.0	<2.0	<2.0
Titanium	µg/sample	2.0	9.7	8.6	5.6	<2.0
Vanadium	µg/sample	2.0	<2.0	<2.0	<2.0	<2.0
Zinc	µg/sample	5.0	10	<5.0	<5.0	<5.0
Arsenic	µg/sample	2.0	<2.0	<2.0	<2.0	<2.0
Beryllium	µg/sample	0.20	<0.20	<0.20	<0.20	<0.20
Gallium*	µg/sample	4.0	<4.0	<4.0	<4.0	<4.0
Antimony	µg/sample	10	<10	<10	<10	<10
Selenium	µg/sample	4.0	<4.0	<4.0	<4.0	<4.0
Thorium	µg/sample	4.0	<4.0	<4.0	<4.0	<4.0
Thallium	µg/sample	4.0	<4.0	<4.0	<4.0	<4.0
Uranium	µg/sample	4.0	<4.0	<4.0	<4.0	<4.0

Certificate of Analysis PGD1547

Quartz/Cristobalite by XRD (HiVol Filter)

Envirolab ID	Units	PQL	PGD1547-01	PGD1547-02	PGD1547-03	PGD1547-04
Your Reference			DWE239	DWE240	DWE241	DWE242
Date Sampled			07/04/2025	13/04/2025	19/04/2025	22/04/2025
a-Quartz	µg/sample	50	760	470	400	<50

Certificate of Analysis PGD1547

HVAS Dust (HiVol Filter)

Envirolab ID	Units	PQL	PGD1547-01	PGD1547-02	PGD1547-03	PGD1547-04
Your Reference			DWE239	DWE240	DWE241	DWE242
Date Sampled			07/04/2025	13/04/2025	19/04/2025	22/04/2025
Dust	mg	0.10	25	18	15	<0.10

Certificate of Analysis PGD1547

Method Summary

Method ID	Methodology Summary
DUST-005	Respirable Quartz (and/or Cristabolite) determined direct on filter (unless otherwise indicated) by XRD determination. The Quartz exposure standard is 50µg/m3, therefore where sampling follows MDHS 101 guidelines and at least 500L of air is sampled, this is equivalent to a dust weight of 25µg/filter. The estimated measurement uncertainty for the laboratory analysis of Quartz is 30% at 25µg at 95% confidence limit (i.e. statistically the true value lies between 18-32µg / filter (35 – 65 µg/m3) at 95% confidence). The estimated measurement uncertainty was determined during method validation. NSW Resources Regulator have licenced (MLA0017505) Envirolab/MPL for the Analysis of Inhalable & Respirable Dust and Respirable Crystalline Silica.
INORG-100	Gravimetric determination of Inhalable dust as per AS3640. NSW Resources Regulator have licenced (MLA0017505) Envirolab/MPL for the Analysis of Inhalable & Respirable Dust and Respirable Crystalline Silica.
METALS-020	Determination of various metals by ICP-OES. Where salts (oxides, chlorides etc.) are calculated from the element concentration stoichiometrically there is no guarantee that the salt form is completely soluble in the acids used in the preparation.
METALS-020/022	Determination of various metals by ICP-OES or ICP-MS. Where salts (oxides, chlorides etc.) are calculated from the element concentration stoichiometrically there is no guarantee that the salt form is completely soluble in the acids used in the preparation.
METALS-021	Determination of Mercury by Cold Vapour AAS.
METALS-022	Determination of various metals by ICP-MS. Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements. Where salts (oxides, chlorides etc.) are calculated from the element concentration stoichiometrically there is no guarantee that the salt form is completely soluble in the acids used in the preparation.

Certificate of Analysis PGD1547

Result Definitions

Identifier	Description
NR	Not reported
NEPM	National Environment Protection Measure
NS	Not specified
LCS	Laboratory Control Sample
RPD	Relative Percent Difference
>	Greater than
<	Less than
PQL	Practical Quantitation Limit
INS	Insufficient sample for this test
NA	Test not required
NT	Not tested
DOL	Samples rejected due to particulate overload (air filters only)
RFD	Samples rejected due to filter damage (air filters only)
RUD	Samples rejected due to uneven deposition (air filters only)
##	Indicates a laboratory acceptance criteria outlier, for further details, see Result Comments and/or QC Comments

Quality Control Definitions

Blank

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

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.

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.

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.

Duplicate

This is the complete duplicate analysis of a sample from the process batch. The sample selected should be one where the analyte concentration is easily measurable.

Certificate of Analysis PGD1547

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 and matrix spike recoveries for the batch were within the laboratory acceptance criteria. Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction. Spikes for Physical and Aggregate Tests are not applicable. For VOCs in water samples, three vials are required for duplicate or spike analysis.

General Acceptance Criteria (GAC) - Analyte specific criteria applies for some analytes and is reflected in QC recovery tables.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% - see ELN-P05 QAQC tables for details (available on request); <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase. Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was typically insufficient in order to satisfy laboratory QA/QC protocols.

Miscellaneous Information

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached. We have taken the sampling date as being the date received at the laboratory.

Two significant figures are reported for the majority of tests and with a high degree of confidence, for results <10*PQL, the second significant figure may be in doubt i.e. has a relatively high degree of uncertainty and is provided for information only.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS where sediment/solids are included by default.

Urine Analysis - The BEI values listed are taken from the 2022 edition of *TLVs and BEIs Threshold Limits by ACGIH*.

Air volumes are typically provided by customers (often as flow rate(s) and sampling time(s) and/or simply volume(s) sampled or exposure times (determines 'volume' passive badges are exposed to)). Hence in such circumstances the volume measurement is inevitably not covered by Envirolab's NATA accreditation. An exception may occur where Envirolab Newcastle does the sampling where accreditation exists for certain types of sampling and hence volume determination(s). Note air volumes are often used to determine concentrations for dust and/or analyses on filters, sorbents and in impingers. For canister sampling, the air volume is covered by Envirolab's NATA accreditation.

Data Quality Assessment Summary PGD1547

Client Details

Client	Department of Water & Environmental Regulation
Your Reference	Pinjarra 2024-25 HVAS - PM10, Metals and Crystalline Silica
Date Issued	30/04/2025

Recommended Holding Time Compliance

No recommended holding time exceedances

Quality Control and QC Frequency

QC Type	Compliant	Details
Blank	Yes	No Outliers
LCS	Yes	No Outliers
Duplicates	Yes	No Outliers
Matrix Spike	Yes	No Outliers
Surrogates / Extracted Internal Standards	Yes	No Outliers
QC Frequency	Yes	No Outliers

Surrogates/Extracted Internal Standards, Duplicates and/or Matrix Spikes are not always relevant/applicable to certain analyses and matrices. Therefore, said QC measures are deemed compliant in these situations by default. See Laboratory Acceptance Criteria for more information

Data Quality Assessment Summary PGD1547

Recommended Holding Time Compliance

Analysis	Sample Number(s)	Date Sampled	Date Extracted	Date Analysed	Compliant
Metals OHS HiVol Filter	1	07/04/2025	24/04/2025	28/04/2025	Yes
	2	13/04/2025	24/04/2025	28/04/2025	Yes
	3	19/04/2025	24/04/2025	28/04/2025	Yes
	4	22/04/2025	24/04/2025	28/04/2025	Yes
Metals OHS (LL) HiVol Filter	1	07/04/2025	24/04/2025	30/04/2025	Yes
	2	13/04/2025	24/04/2025	30/04/2025	Yes
	3	19/04/2025	24/04/2025	30/04/2025	Yes
	4	22/04/2025	24/04/2025	30/04/2025	Yes
Metals OHS-Hg HiVol Filter	1	07/04/2025	24/04/2025	24/04/2025	Yes
	2	13/04/2025	24/04/2025	24/04/2025	Yes
	3	19/04/2025	24/04/2025	24/04/2025	Yes
	4	22/04/2025	24/04/2025	24/04/2025	Yes
Quartz by XRD HiVol Filter	1	07/04/2025	23/04/2025	28/04/2025	Yes
	2	13/04/2025	23/04/2025	28/04/2025	Yes
	3	19/04/2025	23/04/2025	28/04/2025	Yes
	4	22/04/2025	23/04/2025	28/04/2025	Yes
Gravimetric Dust HiVol Filter	1	07/04/2025	23/04/2025	23/04/2025	Yes
	2	13/04/2025	23/04/2025	23/04/2025	Yes
	3	19/04/2025	23/04/2025	23/04/2025	Yes
	4	22/04/2025	23/04/2025	23/04/2025	Yes

Quality Control PGD1547

METALS-020/022 | Acid Extractable Metals (HiVol Filter) | Batch BGD4285

Analyte	Units	PQL	Blank	DUP1		LCS %
				PGD1547-01		
				Samp QC RPD %		
Aluminium	µg/sample	5.0	<5.0	437 445 1.80		94.5
Barium	µg/sample	2.0	<2.0	4.01 3.94 [NA]		99.0
Boron	µg/sample	20	<20	30.6 <20 [NA] [1]		94.5
Cadmium	µg/sample	0.50	<0.50	<0.50 <0.50 [NA]		89.1
Calcium	µg/sample	50	<50	364 365 0.258		93.8
Chromium	µg/sample	2.0	<2.0	6.47 7.38 [NA]		95.0
Cobalt	µg/sample	2.0	<2.0	<2.0 <2.0 [NA]		92.4
Copper	µg/sample	2.0	<2.0	2.36 <2.0 [NA] [1]		95.6
Iron	µg/sample	5.0	<5.0	489 510 4.25		90.6
Lead	µg/sample	5.0	<5.0	<5.0 <5.0 [NA]		93.0
Lithium	µg/sample	2.0	<2.0	<2.0 <2.0 [NA]		98.6
Magnesium	µg/sample	50	<50	172 171 [NA]		94.0
Manganese	µg/sample	2.0	<2.0	3.78 3.82 [NA]		97.1
Molybdenum	µg/sample	5.0	<5.0	<5.0 <5.0 [NA]		95.8
Nickel	µg/sample	2.0	<2.0	<2.0 <2.0 [NA]		94.8
Phosphorus	µg/sample	20	<20	22.4 21.8 [NA]		88.4
Potassium	µg/sample	50	<50	121 120 [NA]		99.5
Silver	µg/sample	5.0	<5.0	<5.0 <5.0 [NA]		96.4
Sodium	µg/sample	100	<100	1090 1070 2.09		86.9
Strontium	µg/sample	2.0	<2.0	2.10 2.11 [NA]		92.7
Sulfur	µg/sample	50	<50	614 600 2.33		125
Tin	µg/sample	10	<10	<10 <10 [NA]		94.3
Titanium	µg/sample	2.0	<2.0	9.71 9.98 [NA]		96.6
Vanadium	µg/sample	2.0	<2.0	<2.0 <2.0 [NA]		90.0
Zinc	µg/sample	5.0	<5.0	9.99 9.26 [NA]		93.6

METALS-022 | Acid Extractable Metals (HiVol Filter) | Batch BGD4286

Analyte	Units	PQL	Blank	DUP1		LCS %
				PGD1547-01		
				Samp QC RPD %		
Antimony	µg/sample	10	<10	<10 <10 [NA]		85.6
Arsenic	µg/sample	2.0	<2.0	<2.0 <2.0 [NA]		86.6
Beryllium	µg/sample	0.20	<0.20	<0.20 <0.20 [NA]		77.0
Gallium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]		87.9
Selenium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]		88.2
Thallium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]		78.4
Thorium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]		73.3
Uranium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]		87.4

METALS-021 | Acid Extractable Metals (HiVol Filter) | Batch BGD4287

Analyte	Units	PQL	Blank	DUP1		LCS %
				PGD1547-01		
				Samp QC RPD %		
Mercury	µg/sample	0.20	<0.20	<0.20	<0.20 [NA]	106

DUST-005 | Quartz/Cristobalite by XRD (HiVol Filter) | Batch BGD4155

Analyte	Units	PQL	Blank	DUP1	LCS %
				PGD1547-01	
				Samp QC RPD %	
a-Quartz	µg/sample	50	<12	760 762 0.274	101

Quality Control PGD1547

QC Comments

Identifier	Description
[1]	Duplicate %RPD may be flagged as an outlier to routine laboratory acceptance, however, where one or both results are <10*PQL, the RPD acceptance criteria increases exponentially.

Certificate of Analysis PGE0148

Client Details

Client	Department of Water & Environmental Regulation
Contact	
Address	Prime House, 8 Davidson Terrace,, Joondalup, WA, 6027

Sample Details

Your Reference	Pinjarra 2024-25 HVAS - PM10, Metals and Crystalline Silica
Number of Samples	2 HiVol Filter
Date Samples Received	02/05/2025
Date Instructions Received	02/05/2025

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.
Results are reported on a dry weight basis for soils and on an as received basis for other matrices.

Report Details

Date Results Requested by	12/05/2025
Date of Issue	12/05/2025

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Authorisation Details

Airborne Dust Approved By	Shirleen Goh
Results Approved By	Shirleen Goh, OH Lab Analyst Varsha Ho Wing, Inorganics and Metals Supervisor
Laboratory Manager	Michael Kubiak

Certificate of Analysis PGE0148

Samples in this Report

Envirolab ID	Sample ID	Matrix	Date Sampled	Date Received
PGE0148-01	DWE243	HiVol Filter	25/04/2025	02/05/2025
PGE0148-02	DWE244	HiVol Filter	28/04/2025	02/05/2025

Sample Information

Sample ID	Filter ID	Flow Rate (L/min)	Time Sampled (min)	Air Volume (m3)
DWE243	DWE243	[NA]	[NA]	[NA]
DWE244	DWE244	[NA]	[NA]	[NA]

Certificate of Analysis PGE0148

Acid Extractable Metals (HiVol Filter)

Envirolab ID Your Reference Date Sampled	Units	PQL	PGE0148-01 DWE243 25/04/2025	PGE0148-02 DWE244 28/04/2025
Silver	µg/sample	5.0	<5.0	<5.0
Aluminium	µg/sample	5.0	220	6.2
Boron	µg/sample	20	<20	<20
Barium	µg/sample	2.0	2.1	<2.0
Calcium	µg/sample	50	190	51
Cadmium	µg/sample	0.50	<0.50	<0.50
Cobalt	µg/sample	2.0	<2.0	<2.0
Chromium	µg/sample	2.0	6.7	6.0
Copper	µg/sample	2.0	<2.0	<2.0
Iron	µg/sample	5.0	320	11
Mercury	µg/sample	0.20	<0.20	<0.20
Potassium	µg/sample	50	94	<50
Lithium	µg/sample	2.0	<2.0	<2.0
Magnesium	µg/sample	50	150	<50
Manganese	µg/sample	2.0	2.0	<2.0
Molybdenum	µg/sample	5.0	<5.0	<5.0
Sodium	µg/sample	100	1100	<100
Nickel	µg/sample	2.0	<2.0	<2.0
Phosphorus	µg/sample	20	<20	<20
Lead	µg/sample	5.0	<5.0	<5.0
Sulfur	µg/sample	50	180	<50
Tin	µg/sample	10	<10	<10
Strontium	µg/sample	2.0	<2.0	<2.0
Titanium	µg/sample	2.0	4.2	<2.0
Vanadium	µg/sample	2.0	<2.0	<2.0
Zinc	µg/sample	5.0	<5.0	<5.0
Arsenic	µg/sample	2.0	<2.0	<2.0
Beryllium	µg/sample	0.20	<0.20	<0.20
Gallium*	µg/sample	4.0	<4.0	<4.0
Antimony	µg/sample	10	<10	<10
Selenium	µg/sample	4.0	<4.0	<4.0
Thorium	µg/sample	4.0	<4.0	<4.0
Thallium	µg/sample	4.0	<4.0	<4.0
Uranium	µg/sample	4.0	<4.0	<4.0

Certificate of Analysis PGE0148

Quartz/Cristobalite by XRD (HiVol Filter)

Envirolab ID	Units	PQL	PGE0148-01	PGE0148-02
Your Reference			DWE243	DWE244
Date Sampled			25/04/2025	28/04/2025
a-Quartz	µg/sample	50	330	<50

Certificate of Analysis PGE0148

HVAS Dust (HiVol Filter)

Envirolab ID	Units	PQL	PGE0148-01	PGE0148-02
Your Reference			DWE243	DWE244
Date Sampled			25/04/2025	28/04/2025
Dust	mg	0.10	14	<0.10

Certificate of Analysis PGE0148

Method Summary

Method ID	Methodology Summary
DUST-005	Respirable Quartz (and/or Cristabolite) determined direct on filter (unless otherwise indicated) by XRD determination. The Quartz exposure standard is 50µg/m ³ , therefore where sampling follows MDHS 101 guidelines and at least 500L of air is sampled, this is equivalent to a dust weight of 25µg/filter. The estimated measurement uncertainty for the laboratory analysis of Quartz is 30% at 25µg at 95% confidence limit (i.e. statistically the true value lies between 18-32µg / filter (35 – 65 µg/m ³) at 95% confidence). The estimated measurement uncertainty was determined during method validation. NSW Resources Regulator have licenced (MLA0017505) Envirolab/MPL for the Analysis of Inhalable & Respirable Dust and Respirable Crystalline Silica.
INORG-100	Gravimetric determination of Inhalable dust as per AS3640. NSW Resources Regulator have licenced (MLA0017505) Envirolab/MPL for the Analysis of Inhalable & Respirable Dust and Respirable Crystalline Silica.
METALS-020	Determination of various metals by ICP-OES. Where salts (oxides, chlorides etc.) are calculated from the element concentration stoichiometrically there is no guarantee that the salt form is completely soluble in the acids used in the preparation.
METALS-020/022	Determination of various metals by ICP-OES or ICP-MS. Where salts (oxides, chlorides etc.) are calculated from the element concentration stoichiometrically there is no guarantee that the salt form is completely soluble in the acids used in the preparation.
METALS-021	Determination of Mercury by Cold Vapour AAS.
METALS-022	Determination of various metals by ICP-MS. Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements. Where salts (oxides, chlorides etc.) are calculated from the element concentration stoichiometrically there is no guarantee that the salt form is completely soluble in the acids used in the preparation.

Certificate of Analysis PGE0148

Result Definitions

Identifier	Description
NR	Not reported
NEPM	National Environment Protection Measure
NS	Not specified
LCS	Laboratory Control Sample
RPD	Relative Percent Difference
>	Greater than
<	Less than
PQL	Practical Quantitation Limit
INS	Insufficient sample for this test
NA	Test not required
NT	Not tested
DOL	Samples rejected due to particulate overload (air filters only)
RFD	Samples rejected due to filter damage (air filters only)
RUD	Samples rejected due to uneven deposition (air filters only)
##	Indicates a laboratory acceptance criteria outlier, for further details, see Result Comments and/or QC Comments

Quality Control Definitions

Blank

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

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.

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.

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.

Duplicate

This is the complete duplicate analysis of a sample from the process batch. The sample selected should be one where the analyte concentration is easily measurable.

Certificate of Analysis PGE0148

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 and matrix spike recoveries for the batch were within the laboratory acceptance criteria. Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction. Spikes for Physical and Aggregate Tests are not applicable. For VOCs in water samples, three vials are required for duplicate or spike analysis.

General Acceptance Criteria (GAC) - Analyte specific criteria applies for some analytes and is reflected in QC recovery tables.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% - see ELN-P05 QAQC tables for details (available on request); <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase. Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was typically insufficient in order to satisfy laboratory QA/QC protocols.

Miscellaneous Information

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached. We have taken the sampling date as being the date received at the laboratory.

Two significant figures are reported for the majority of tests and with a high degree of confidence, for results <10*PQL, the second significant figure may be in doubt i.e. has a relatively high degree of uncertainty and is provided for information only.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS where sediment/solids are included by default.

Urine Analysis - The BEI values listed are taken from the 2022 edition of *TLVs and BEIs Threshold Limits by ACGIH*.

Air volumes are typically provided by customers (often as flow rate(s) and sampling time(s) and/or simply volume(s) sampled or exposure times (determines 'volume' passive badges are exposed to)). Hence in such circumstances the volume measurement is inevitably not covered by Envirolab's NATA accreditation. An exception may occur where Envirolab Newcastle does the sampling where accreditation exists for certain types of sampling and hence volume determination(s). Note air volumes are often used to determine concentrations for dust and/or analyses on filters, sorbents and in impingers. For canister sampling, the air volume is covered by Envirolab's NATA accreditation.

Data Quality Assessment Summary PGE0148

Client Details

Client	Department of Water & Environmental Regulation
Your Reference	Pinjarra 2024-25 HVAS - PM10, Metals and Crystalline Silica
Date Issued	12/05/2025

Recommended Holding Time Compliance

No recommended holding time exceedances

Quality Control and QC Frequency

QC Type	Compliant	Details
Blank	Yes	No Outliers
LCS	Yes	No Outliers
Duplicates	Yes	No Outliers
Matrix Spike	Yes	No Outliers
Surrogates / Extracted Internal Standards	Yes	No Outliers
QC Frequency	Yes	No Outliers

Surrogates/Extracted Internal Standards, Duplicates and/or Matrix Spikes are not always relevant/applicable to certain analyses and matrices. Therefore, said QC measures are deemed compliant in these situations by default. See Laboratory Acceptance Criteria for more information

Data Quality Assessment Summary PGE0148

Recommended Holding Time Compliance

Analysis	Sample Number(s)	Date Sampled	Date Extracted	Date Analysed	Compliant
Metals OHS HiVol Filter	1	25/04/2025	07/05/2025	07/05/2025	Yes
	2	28/04/2025	07/05/2025	07/05/2025	Yes
Metals OHS (LL) HiVol Filter	1	25/04/2025	07/05/2025	08/05/2025	Yes
	2	28/04/2025	07/05/2025	08/05/2025	Yes
Metals OHS-Hg HiVol Filter	1	25/04/2025	07/05/2025	09/05/2025	Yes
	2	28/04/2025	07/05/2025	09/05/2025	Yes
Quartz by XRD HiVol Filter	1	25/04/2025	02/05/2025	12/05/2025	Yes
	2	28/04/2025	02/05/2025	12/05/2025	Yes
Gravimetric Dust HiVol Filter	1	25/04/2025	02/05/2025	05/05/2025	Yes
	2	28/04/2025	02/05/2025	05/05/2025	Yes

Quality Control PGE0148

METALS-020/022 | Acid Extractable Metals (HiVol Filter) | Batch BGE1081

Analyte	Units	PQL	Blank	DUP1			DUP2			LCS %
				BGE1081-DUP1#			BGE1081-DUP2#			
				Samp	QC	RPD %	Samp	QC	RPD %	
Aluminium	µg/sample	5.0	<5.0	9840	9880	0.477	91.5	93.6	2.34	89.8
Barium	µg/sample	2.0	<2.0	5530	5350	3.34	2.61	2.33	[NA]	98.6
Boron	µg/sample	20	<20	17400	17300	0.610	42.0	22.4	[NA] [1]	86.6
Cadmium	µg/sample	0.50	<0.50	0.706	0.690	[NA]	<0.50	<0.50	[NA]	92.4
Calcium	µg/sample	50	<50	40200	39800	0.890	298	294	1.61	91.9
Chromium	µg/sample	2.0	<2.0	4.52	4.79	[NA]	7.01	6.36	[NA]	92.1
Cobalt	µg/sample	2.0	<2.0	<2.0	<2.0	[NA]	<2.0	<2.0	[NA]	91.9
Copper	µg/sample	2.0	<2.0	14.0	14.3	2.36	2.95	2.78	[NA]	93.0
Iron	µg/sample	5.0	<5.0	1340	1500	10.8	120	128	6.74	92.5
Lead	µg/sample	5.0	<5.0	6.81	8.39	[NA]	<5.0	<5.0	[NA]	89.3
Lithium	µg/sample	2.0	<2.0	12.1	11.9	1.73	<2.0	<2.0	[NA]	101
Magnesium	µg/sample	50	<50	14600	14300	1.91	133	134	[NA]	92.4
Manganese	µg/sample	2.0	<2.0	34.9	36.3	4.02	<2.0	<2.0	[NA]	91.9
Molybdenum	µg/sample	5.0	<5.0	5.90	<5.0	[NA] [1]	<5.0	<5.0	[NA]	92.0
Nickel	µg/sample	2.0	<2.0	3.03	3.21	[NA]	<2.0	<2.0	[NA]	90.0
Phosphorus	µg/sample	20	<20	104	106	2.40	<20	<20	[NA]	87.6
Potassium	µg/sample	50	<50	7940	7710	3.00	97.0	94.9	[NA]	94.2
Silver	µg/sample	5.0	<5.0	<5.0	<5.0	[NA]	<5.0	<5.0	[NA]	94.4
Sodium	µg/sample	100	<100	116000	114000	2.15	980	987	0.618	85.8
Strontium	µg/sample	2.0	<2.0	135	132	2.27	<2.0	<2.0	[NA]	91.6
Sulfur	µg/sample	50	<50	3740	3480	7.16	181	178	[NA]	93.0
Tin	µg/sample	10	<10	<10	<10	[NA]	<10	<10	[NA]	89.3
Titanium	µg/sample	2.0	<2.0	85.4	94.2	9.76	2.96	2.72	[NA]	90.8
Vanadium	µg/sample	2.0	<2.0	3.25	3.80	[NA]	<2.0	<2.0	[NA]	89.9
Zinc	µg/sample	5.0	<5.0	4190	4040	3.86	6.09	5.67	[NA]	90.3

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

METALS-022 | Acid Extractable Metals (HiVol Filter) | Batch BGE1082

Analyte	Units	PQL	Blank	DUP1		LCS %
				BGE1082-DUP1#		
				Samp	QC RPD %	
Antimony	µg/sample	10	<10	<10 <10 [NA]		103
Arsenic	µg/sample	2.0	<2.0	<2.0 <2.0 [NA]		98.4
Beryllium	µg/sample	0.20	<0.20	<0.20 <0.20 [NA]		91.4
Gallium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]		91.4
Selenium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]		107
Thallium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]		92.2
Thorium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]		92.1
Uranium	µg/sample	4.0	<4.0	<4.0 <4.0 [NA]		97.3

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

METALS-021 | Acid Extractable Metals (HiVol Filter) | Batch BGE1083

Analyte	Units	PQL	Blank	DUP1		LCS %
				BGE1083-DUP1#		
				Samp	QC RPD %	
Mercury	µg/sample	0.20	<0.20	<0.20	<0.20 [NA]	98.8

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

DUST-005 | Quartz/Cristobalite by XRD (HiVol Filter) | Batch BGE0550

Analyte	Units	PQL	Blank	DUP1	DUP2	LCS %
				BGE0550-DUP1#	PGE0148-02	
				Samp QC RPD %	Samp QC RPD %	
a-Quartz	µg/sample	50	<12	204 232 [NA]	<50 <50 [NA]	105

The QC reported was not specifically part of this workorder but formed part of the QC process batch.

Quality Control PGE0148

QC Comments

Identifier	Description
[1]	Duplicate %RPD may be flagged as an outlier to routine laboratory acceptance, however, where one or both results are <10*PQL, the RPD acceptance criteria increases exponentially.

Certificate of Analysis PGA0058

Client Details

Client	Department of Water & Environmental Regulation
Contact	
Address	Prime House, 8 Davidson Terrace,, Joondalup, WA, 6027

Sample Details

Your Reference	24PE627 - DDG Analysis
Number of Samples	2 Dust Gauge
Date Samples Received	03/01/2025
Date Instructions Received	03/01/2025

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.
Results are reported on a dry weight basis for soils and on an as received basis for other matrices.

Report Details

Date Results Requested by	10/01/2025
Date of Issue	16/01/2025

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Authorisation Details

Results Approved By	Lucas Yii, Inorganics Team Leader
Laboratory Manager	Michael Kubiak

Certificate of Analysis PGA0058

Samples in this Report

Envirolab ID	Sample ID	Matrix	Date Sampled	Date Received
PGA0058-01	PJC2	Dust Gauge	02/01/2025	03/01/2025
PGA0058-02	PJB2	Dust Gauge	02/01/2025	03/01/2025

Sample Information

Sample ID	Dust Gauge Start Date	Dust Gauge End Date	Exposure Days
PJC2	03/12/2024	02/01/2025	30
PJB2	03/12/2024	02/01/2025	30

Certificate of Analysis PGA0058

Dust Deposition Gauges (Dust Gauge)

Envirolab ID	Units	PQL	PGA0058-01	PGA0058-02
Your Reference			PJC2	PJB2
Date Sampled			02/01/2025	02/01/2025
Si-Insoluble Solids	g/m2/month	0.10	1.4	0.69
Ss-Soluble Matter	g/m2/month	0.10	0.97	<0.10
St-Total Solids	g/m2/month	0.10	2.4	0.70

Certificate of Analysis PGA0058

Method Summary

Method ID	Methodology Summary
INORG-050	Dust Deposition in accordance with AS3580.10.1 and AS3580.10.2.

Certificate of Analysis PGA0058

Result Definitions

Identifier	Description
NR	Not reported
NEPM	National Environment Protection Measure
NS	Not specified
LCS	Laboratory Control Sample
RPD	Relative Percent Difference
>	Greater than
<	Less than
PQL	Practical Quantitation Limit
INS	Insufficient sample for this test
NA	Test not required
NT	Not tested
DOL	Samples rejected due to particulate overload (air filters only)
RFD	Samples rejected due to filter damage (air filters only)
RUD	Samples rejected due to uneven deposition (air filters only)
##	Indicates a laboratory acceptance criteria outlier, for further details, see Result Comments and/or QC Comments

Quality Control Definitions

Blank

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

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.

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.

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.

Duplicate

This is the complete duplicate analysis of a sample from the process batch. The sample selected should be one where the analyte concentration is easily measurable.

Certificate of Analysis PGA0058

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 and matrix spike recoveries for the batch were within the laboratory acceptance criteria. Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction. Spikes for Physical and Aggregate Tests are not applicable. For VOCs in water samples, three vials are required for duplicate or spike analysis.

General Acceptance Criteria (GAC) - Analyte specific criteria applies for some analytes and is reflected in QC recovery tables.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% - see ELN-P05 QAQC tables for details (available on request); <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase. Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was typically insufficient in order to satisfy laboratory QA/QC protocols.

Miscellaneous Information

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached. We have taken the sampling date as being the date received at the laboratory.

Two significant figures are reported for the majority of tests and with a high degree of confidence, for results <10*PQL, the second significant figure may be in doubt i.e. has a relatively high degree of uncertainty and is provided for information only.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS where sediment/solids are included by default.

Urine Analysis - The BEI values listed are taken from the 2022 edition of *TLVs and BEIs Threshold Limits by ACGIH*.

Air volume measurements are not covered by Envirolab's NATA accreditation.

Data Quality Assessment Summary PGA0058

Client Details

Client	Department of Water & Environmental Regulation
Your Reference	24PE627 - DDG Analysis
Date Issued	16/01/2025

Recommended Holding Time Compliance

No recommended holding time exceedances

Quality Control and QC Frequency

QC Type	Compliant	Details
Blank	Yes	No Outliers
LCS	Yes	No Outliers
Duplicates	Yes	No Outliers
Matrix Spike	Yes	No Outliers
Surrogates / Extracted Internal Standards	Yes	No Outliers
QC Frequency	Yes	No Outliers

Surrogates/Extracted Internal Standards, Duplicates and/or Matrix Spikes are not always relevant/applicable to certain analyses and matrices. Therefore, said QC measures are deemed compliant in these situations by default. See Laboratory Acceptance Criteria for more information

Data Quality Assessment Summary PGA0058

Recommended Holding Time Compliance

Analysis	Sample Number(s)	Date Sampled	Date Extracted	Date Analysed	Compliant
Dust Gauge - 5 Fractions Dust Gauge	1 2	02/01/2025	13/01/2025	16/01/2025	Yes

Certificate of Analysis PGB0072

Client Details

Client	Department of Water & Environmental Regulation
Contact	
Address	Prime House, 8 Davidson Terrace,, Joondalup, WA, 6027

Sample Details

Your Reference	Pinjarra 2024-25PE627v2 DDG Total Solids
Number of Samples	2 Dust Gauge
Date Samples Received	03/02/2025
Date Instructions Received	03/02/2025

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.
Results are reported on a dry weight basis for soils and on an as received basis for other matrices.

Report Details

Date Results Requested by	18/02/2025
Date of Issue	18/02/2025

NATA Accreditation Number 2901. This document shall not be reproduced except in full.

Accredited for compliance with ISO/IEC 17025. Tests not covered by NATA are denoted with *.

Authorisation Details

Results Approved By	Lucas Yii, Inorganics Team Leader
Laboratory Manager	Michael Kubiak

Certificate of Analysis PGB0072

Samples in this Report

Envirolab ID	Sample ID	Matrix	Date Sampled	Date Received
PGB0072-01	PJC3	Dust Gauge	03/02/2025	03/02/2025
PGB0072-02	PJB3	Dust Gauge	03/02/2025	03/02/2025

Sample Information

Sample ID	Dust Gauge Start Date	Dust Gauge End Date	Exposure Days
PJC3	02/01/2025	03/02/2025	32
PJB3	02/01/2025	03/02/2025	33

Certificate of Analysis PGB0072

Dust Deposition Gauges (Dust Gauge)

Envirolab ID	Units	PQL	PGB0072-01	PGB0072-02
Your Reference			PJC3	PJB3
Date Sampled			03/02/2025	03/02/2025
St-Total Solids	g/m2/month	0.10	<0.10	0.15

Certificate of Analysis PGB0072

Method Summary

Method ID	Methodology Summary
INORG-050	Dust Deposition in accordance with AS3580.10.1 and AS3580.10.2.

Certificate of Analysis PGB0072

Result Definitions

Identifier	Description
NR	Not reported
NEPM	National Environment Protection Measure
NS	Not specified
LCS	Laboratory Control Sample
RPD	Relative Percent Difference
>	Greater than
<	Less than
PQL	Practical Quantitation Limit
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Quality Control Definitions

Blank

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

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.

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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.

Duplicate

This is the complete duplicate analysis of a sample from the process batch. The sample selected should be one where the analyte concentration is easily measurable.

Certificate of Analysis PGB0072

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 and matrix spike recoveries for the batch were within the laboratory acceptance criteria. Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction. Spikes for Physical and Aggregate Tests are not applicable. For VOCs in water samples, three vials are required for duplicate or spike analysis.

General Acceptance Criteria (GAC) - Analyte specific criteria applies for some analytes and is reflected in QC recovery tables.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% - see ELN-P05 QAQC tables for details (available on request); <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase. Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

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Miscellaneous Information

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached. We have taken the sampling date as being the date received at the laboratory.

Two significant figures are reported for the majority of tests and with a high degree of confidence, for results <10*PQL, the second significant figure may be in doubt i.e. has a relatively high degree of uncertainty and is provided for information only.

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Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS where sediment/solids are included by default.

Urine Analysis - The BEI values listed are taken from the 2022 edition of *TLVs and BEIs Threshold Limits by ACGIH*.

Air volume measurements are not covered by Envirolab's NATA accreditation.

Data Quality Assessment Summary PGB0072

Client Details

Client	Department of Water & Environmental Regulation
Your Reference	Pinjarra 2024-25PE627v2 DDG Total Solids
Date Issued	18/02/2025

Recommended Holding Time Compliance

No recommended holding time exceedances

Quality Control and QC Frequency

QC Type	Compliant	Details
Blank	Yes	No Outliers
LCS	Yes	No Outliers
Duplicates	Yes	No Outliers
Matrix Spike	Yes	No Outliers
Surrogates / Extracted Internal Standards	Yes	No Outliers
QC Frequency	Yes	No Outliers

Surrogates/Extracted Internal Standards, Duplicates and/or Matrix Spikes are not always relevant/applicable to certain analyses and matrices. Therefore, said QC measures are deemed compliant in these situations by default. See Laboratory Acceptance Criteria for more information

Data Quality Assessment Summary PGB0072

Recommended Holding Time Compliance

Analysis	Sample Number(s)	Date Sampled	Date Extracted	Date Analysed	Compliant
Dust Gauge - Total Solids Dust Gauge	1 2	03/02/2025	10/02/2025	10/02/2025	Yes

Certificate of Analysis PGC0302

Client Details

Client	Department of Water & Environmental Regulation
Contact	
Address	Prime House, 8 Davidson Terrace,, Joondalup, WA, 6027

Sample Details

Your Reference	Pinjarra 2024-25PE627v2 DDG Tota Solids
Number of Samples	2 Dust Gauge
Date Samples Received	05/03/2025
Date Instructions Received	05/03/2025

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.
Results are reported on a dry weight basis for soils and on an as received basis for other matrices.

Report Details

Date Results Requested by	20/03/2025
Date of Issue	20/03/2025

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Accredited for compliance with ISO/IEC 17025. Tests not covered by NATA are denoted with *.

Authorisation Details

Results Approved By	Varsha Ho Wing, Inorganics and Metals Supervisor
Laboratory Manager	Michael Kubiak

Certificate of Analysis PGC0302

Samples in this Report

Envirolab ID	Sample ID	Matrix	Date Sampled	Date Received
PGC0302-01	PJC4	Dust Gauge	04/03/2025	05/03/2025
PGC0302-02	PJB2	Dust Gauge	04/03/2025	05/03/2025

Sample Information

Sample ID	Dust Gauge Start Date	Dust Gauge End Date	Exposure Days
PJC4	03/02/2025	04/03/2025	29
PJB2	03/02/2025	04/03/2025	29

Sample Comments

PJB2	Bottle labelled 'PJB4'
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Certificate of Analysis PGC0302

Dust Deposition Gauges (Dust Gauge)

Envirolab ID	Units	PQL	PGC0302-01	PGC0302-02
Your Reference			PJC4	PJB2
Date Sampled			04/03/2025	04/03/2025
St-Total Solids	g/m2/month	0.10	2.3	1.9

Certificate of Analysis PGC0302

Method Summary

Method ID	Methodology Summary
INORG-050	Dust Deposition in accordance with AS3580.10.1 and AS3580.10.2.

Certificate of Analysis PGC0302

Result Definitions

Identifier	Description
NR	Not reported
NEPM	National Environment Protection Measure
NS	Not specified
LCS	Laboratory Control Sample
RPD	Relative Percent Difference
>	Greater than
<	Less than
PQL	Practical Quantitation Limit
INS	Insufficient sample for this test
NA	Test not required
NT	Not tested
DOL	Samples rejected due to particulate overload (air filters only)
RFD	Samples rejected due to filter damage (air filters only)
RUD	Samples rejected due to uneven deposition (air filters only)
##	Indicates a laboratory acceptance criteria outlier, for further details, see Result Comments and/or QC Comments

Quality Control Definitions

Blank

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

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.

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.

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.

Duplicate

This is the complete duplicate analysis of a sample from the process batch. The sample selected should be one where the analyte concentration is easily measurable.

Certificate of Analysis PGC0302

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 and matrix spike recoveries for the batch were within the laboratory acceptance criteria. Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction. Spikes for Physical and Aggregate Tests are not applicable. For VOCs in water samples, three vials are required for duplicate or spike analysis.

General Acceptance Criteria (GAC) - Analyte specific criteria applies for some analytes and is reflected in QC recovery tables.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% - see ELN-P05 QAQC tables for details (available on request); <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase. Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was typically insufficient in order to satisfy laboratory QA/QC protocols.

Miscellaneous Information

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached. We have taken the sampling date as being the date received at the laboratory.

Two significant figures are reported for the majority of tests and with a high degree of confidence, for results <10*PQL, the second significant figure may be in doubt i.e. has a relatively high degree of uncertainty and is provided for information only.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS where sediment/solids are included by default.

Urine Analysis - The BEI values listed are taken from the 2022 edition of *TLVs and BEIs Threshold Limits by ACGIH*.

Air volume measurements are not covered by Envirolab's NATA accreditation.

Data Quality Assessment Summary PGC0302

Client Details

Client	Department of Water & Environmental Regulation
Your Reference	Pinjarra 2024-25PE627v2 DDG Tota Solids
Date Issued	20/03/2025

Recommended Holding Time Compliance

No recommended holding time exceedances

Quality Control and QC Frequency

QC Type	Compliant	Details
Blank	Yes	No Outliers
LCS	Yes	No Outliers
Duplicates	Yes	No Outliers
Matrix Spike	Yes	No Outliers
Surrogates / Extracted Internal Standards	Yes	No Outliers
QC Frequency	Yes	No Outliers

Surrogates/Extracted Internal Standards, Duplicates and/or Matrix Spikes are not always relevant/applicable to certain analyses and matrices. Therefore, said QC measures are deemed compliant in these situations by default. See Laboratory Acceptance Criteria for more information

Data Quality Assessment Summary PGC0302

Recommended Holding Time Compliance

Analysis	Sample Number(s)	Date Sampled	Date Extracted	Date Analysed	Compliant
Dust Gauge - Total Solids Dust Gauge	1 2	04/03/2025	18/03/2025	19/03/2025	Yes

Certificate of Analysis PGD0227

Client Details

Client	Department of Water & Environmental Regulation
Contact	
Address	Prime House, 8 Davidson Terrace,, Joondalup, WA, 6027

Sample Details

Your Reference	Pinjarra 2024-25 - DDG
Number of Samples	2 Dust Gauge
Date Samples Received	02/04/2025
Date Instructions Received	02/04/2025

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.
Results are reported on a dry weight basis for soils and on an as received basis for other matrices.

Report Details

Date Results Requested by	17/04/2025
Date of Issue	10/04/2025

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Authorisation Details

Results Approved By	Lucas Yii, Inorganics Team Leader
Laboratory Manager	Michael Kubiak

Certificate of Analysis PGD0227

Samples in this Report

Envirolab ID	Sample ID	Matrix	Date Sampled	Date Received
PGD0227-01	PJC5	Dust Gauge	02/04/2025	02/04/2025
PGD0227-02	PJB5	Dust Gauge	02/04/2025	02/04/2025

Sample Information

Sample ID	Dust Gauge Start Date	Dust Gauge End Date	Exposure Days
PJC5	04/03/2025	02/04/2025	29
PJB5	04/03/2025	02/04/2025	29

Certificate of Analysis PGD0227

Dust Deposition Gauges (Dust Gauge)

Envirolab ID	Units	PQL	PGD0227-01	PGD0227-02
Your Reference			PJC5	PJB5
Date Sampled			02/04/2025	02/04/2025
St-Total Solids	g/m2/month	0.10	1.6	3.3

Certificate of Analysis PGD0227

Method Summary

Method ID	Methodology Summary
INORG-050	Dust Deposition in accordance with AS3580.10.1 and AS3580.10.2.

Certificate of Analysis PGD0227

Result Definitions

Identifier	Description
NR	Not reported
NEPM	National Environment Protection Measure
NS	Not specified
LCS	Laboratory Control Sample
RPD	Relative Percent Difference
>	Greater than
<	Less than
PQL	Practical Quantitation Limit
INS	Insufficient sample for this test
NA	Test not required
NT	Not tested
DOL	Samples rejected due to particulate overload (air filters only)
RFD	Samples rejected due to filter damage (air filters only)
RUD	Samples rejected due to uneven deposition (air filters only)
##	Indicates a laboratory acceptance criteria outlier, for further details, see Result Comments and/or QC Comments

Quality Control Definitions

Blank

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

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.

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.

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.

Duplicate

This is the complete duplicate analysis of a sample from the process batch. The sample selected should be one where the analyte concentration is easily measurable.

Certificate of Analysis PGD0227

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 and matrix spike recoveries for the batch were within the laboratory acceptance criteria. Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction. Spikes for Physical and Aggregate Tests are not applicable. For VOCs in water samples, three vials are required for duplicate or spike analysis.

General Acceptance Criteria (GAC) - Analyte specific criteria applies for some analytes and is reflected in QC recovery tables.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% - see ELN-P05 QAQC tables for details (available on request); <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase. Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was typically insufficient in order to satisfy laboratory QA/QC protocols.

Miscellaneous Information

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached. We have taken the sampling date as being the date received at the laboratory.

Two significant figures are reported for the majority of tests and with a high degree of confidence, for results <10*PQL, the second significant figure may be in doubt i.e. has a relatively high degree of uncertainty and is provided for information only.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS where sediment/solids are included by default.

Urine Analysis - The BEI values listed are taken from the 2022 edition of *TLVs and BEIs Threshold Limits by ACGIH*.

Air volume measurements are not covered by Envirolab's NATA accreditation.

Data Quality Assessment Summary PGD0227

Client Details

Client	Department of Water & Environmental Regulation
Your Reference	Pinjarra 2024-25 - DDG
Date Issued	10/04/2025

Recommended Holding Time Compliance

No recommended holding time exceedances

Quality Control and QC Frequency

QC Type	Compliant	Details
Blank	Yes	No Outliers
LCS	Yes	No Outliers
Duplicates	Yes	No Outliers
Matrix Spike	Yes	No Outliers
Surrogates / Extracted Internal Standards	Yes	No Outliers
QC Frequency	Yes	No Outliers

Surrogates/Extracted Internal Standards, Duplicates and/or Matrix Spikes are not always relevant/applicable to certain analyses and matrices. Therefore, said QC measures are deemed compliant in these situations by default. See Laboratory Acceptance Criteria for more information

Data Quality Assessment Summary PGD0227

Recommended Holding Time Compliance

Analysis	Sample Number(s)	Date Sampled	Date Extracted	Date Analysed	Compliant
Dust Gauge - Total Solids Dust Gauge	1 2	02/04/2025	08/04/2025	10/04/2025	Yes

Certificate of Analysis PGE0191

Client Details

Client	Department of Water & Environmental Regulation
Contact	
Address	Prime House, 8 Davidson Terrace,, Joondalup, WA, 6027

Sample Details

Your Reference	Pinjarra 2024-25 - DDG
Number of Samples	2 Dust Gauge
Date Samples Received	02/05/2025
Date Instructions Received	02/05/2025

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.
Results are reported on a dry weight basis for soils and on an as received basis for other matrices.

Report Details

Date Results Requested by	19/05/2025
Date of Issue	16/05/2025

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Authorisation Details

Results Approved By	Michael Mowle, Development Chemist - Inorganics and Metals
Laboratory Manager	Michael Kubiak

Certificate of Analysis PGE0191

Samples in this Report

Envirolab ID	Sample ID	Matrix	Date Sampled	Date Received
PGE0191-01	PJC6	Dust Gauge	01/05/2025	02/05/2025
PGE0191-02	PJB6	Dust Gauge	01/05/2025	02/05/2025

Sample Information

Sample ID	Dust Gauge Start Date	Dust Gauge End Date	Exposure Days
PJC6	02/04/2025	01/05/2025	29
PJB6	02/04/2025	01/05/2025	29

Certificate of Analysis PGE0191

Dust Deposition Gauges (Dust Gauge)

Envirolab ID	Units	PQL	PGE0191-01	PGE0191-02
Your Reference			PJC6	PJB6
Date Sampled			01/05/2025	01/05/2025
St-Total Solids	g/m2/month	0.10	1.7	2.4

Certificate of Analysis PGE0191

Method Summary

Method ID	Methodology Summary
INORG-050	Dust Deposition in accordance with AS3580.10.1 and AS3580.10.2.

Certificate of Analysis PGE0191

Result Definitions

Identifier	Description
NR	Not reported
NEPM	National Environment Protection Measure
NS	Not specified
LCS	Laboratory Control Sample
RPD	Relative Percent Difference
>	Greater than
<	Less than
PQL	Practical Quantitation Limit
INS	Insufficient sample for this test
NA	Test not required
NT	Not tested
DOL	Samples rejected due to particulate overload (air filters only)
RFD	Samples rejected due to filter damage (air filters only)
RUD	Samples rejected due to uneven deposition (air filters only)
##	Indicates a laboratory acceptance criteria outlier, for further details, see Result Comments and/or QC Comments

Quality Control Definitions

Blank

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

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.

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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.

Duplicate

This is the complete duplicate analysis of a sample from the process batch. The sample selected should be one where the analyte concentration is easily measurable.

Certificate of Analysis PGE0191

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 and matrix spike recoveries for the batch were within the laboratory acceptance criteria. Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction. Spikes for Physical and Aggregate Tests are not applicable. For VOCs in water samples, three vials are required for duplicate or spike analysis.

General Acceptance Criteria (GAC) - Analyte specific criteria applies for some analytes and is reflected in QC recovery tables.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% - see ELN-P05 QAQC tables for details (available on request); <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase. Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was typically insufficient in order to satisfy laboratory QA/QC protocols.

Miscellaneous Information

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached. We have taken the sampling date as being the date received at the laboratory.

Two significant figures are reported for the majority of tests and with a high degree of confidence, for results <10*PQL, the second significant figure may be in doubt i.e. has a relatively high degree of uncertainty and is provided for information only.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS where sediment/solids are included by default.

Urine Analysis - The BEI values listed are taken from the 2022 edition of *TLVs and BEIs Threshold Limits by ACGIH*.

Air volumes are typically provided by customers (often as flow rate(s) and sampling time(s) and/or simply volume(s) sampled or exposure times (determines 'volume' passive badges are exposed to)). Hence in such circumstances the volume measurement is inevitably not covered by Envirolab's NATA accreditation. An exception may occur where Envirolab Newcastle does the sampling where accreditation exists for certain types of sampling and hence volume determination(s). Note air volumes are often used to determine concentrations for dust and/or analyses on filters, sorbents and in impingers. For canister sampling, the air volume is covered by Envirolab's NATA accreditation.

Data Quality Assessment Summary PGE0191

Client Details

Client	Department of Water & Environmental Regulation
Your Reference	Pinjarra 2024-25 - DDG
Date Issued	16/05/2025

Recommended Holding Time Compliance

No recommended holding time exceedances

Quality Control and QC Frequency

QC Type	Compliant	Details
Blank	Yes	No Outliers
LCS	Yes	No Outliers
Duplicates	Yes	No Outliers
Matrix Spike	Yes	No Outliers
Surrogates / Extracted Internal Standards	Yes	No Outliers
QC Frequency	Yes	No Outliers

Surrogates/Extracted Internal Standards, Duplicates and/or Matrix Spikes are not always relevant/applicable to certain analyses and matrices. Therefore, said QC measures are deemed compliant in these situations by default. See Laboratory Acceptance Criteria for more information

Data Quality Assessment Summary PGE0191

Recommended Holding Time Compliance

Analysis	Sample Number(s)	Date Sampled	Date Extracted	Date Analysed	Compliant
Dust Gauge - Total Solids Dust Gauge	1 2	01/05/2025	15/05/2025	16/05/2025	Yes