

Department of Jobs, Precincts and Regions

KANGAROO FLAT DUST MONITORING REPORT Q1 2022

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Contents

Executive Summary.....	4
1 Introduction.....	6
2 Background	6
2.1 Scope and Objective.....	6
2.2 Regulatory Environment	7
2.3 What is Dust.....	8
3 Measurement of Dust.....	9
3.1 Site Locations.....	9
3.2 Deposited Matter	11
3.3 Metals/Metalloids Monitoring in Dust.....	12
3.4 Ash Content.....	12
3.5 Dust Monitoring Standards.....	13
3.6 Dust Monitoring Program	13
4 Dust Deposition Results.....	14
4.1 Kangaroo Flat Mine – Q1 2022	14
4.1.1 Deposition of Total Insoluble Matter	14
4.1.2 Mineral Content in Dust.....	15
4.1.3 Metals/Metalloids in Dust	16
4.2 Quality Assurance and Quality Control	18
5 Summary of Results	19
6 Further Considerations	19
7 References	20
8 Tables.....	21
9 Supplementary Data.....	24
9.1 Arsenic	24
9.2 Barium	26
9.3 Manganese.....	28
9.4 Trend Graphs	30
Appendix A – Supplementary Information	34
Appendix B – Laboratory Reports	37

Table of Figures

Figure 1 - Kangaroo Flat - Monitoring Locations	9
Figure 2 - Kangaroo Flat - Control Site Location KF5 (BG)	10
Figure 3 - Kangaroo Flat - Control Site Gauge KF5 (BG)	10
Figure 4 - Kangaroo Flat - Dust Deposition Gauge KF1 (W)	12
Figure 5 - Kangaroo Flat - Total Insoluble Matter (TIM) - Q1 2022	14
Figure 6 - Kangaroo Flat - Total Ash Content - Q1 2022	15
Figure 7 - Kangaroo Flat - Ash Content/TIM Ratio - Q1 2022	15
Figure 8 - Kangaroo Flat - Total Arsenic/Total Solids - Q1 2022	16
Figure 9 - Kangaroo Flat - Arsenic in Soluble Fraction - Q1 2022	24
Figure 10 - Kangaroo Flat - Arsenic in Insoluble Fraction - Q1 2022	24
Figure 11 - Kangaroo Flat - Arsenic in Soluble Fraction - 2021-2022	25
Figure 12 - Kangaroo Flat - Arsenic in Insoluble Fraction - 2021-2022	25
Figure 13 - Kangaroo Flat - Barium in Soluble Fraction - Q1 2022	26
Figure 14 - Kangaroo Flat - Barium in Insoluble Fraction - Q1 2022	26
Figure 15 - Kangaroo Flat - Barium in Soluble Fraction - 2021-2022	27
Figure 16 - Kangaroo Flat - Barium in Insoluble Fraction - 2021-2022	27
Figure 17 - Kangaroo Flat - Manganese in Soluble Fraction - Q1 2022	28
Figure 18 - Kangaroo Flat - Manganese in Insoluble Fraction - Q1 2022	28
Figure 19 - Kangaroo Flat - Manganese in Soluble Fraction - 2021-2022	29
Figure 20 - Kangaroo Flat - Manganese in Insoluble Fraction - 2021-2022	29
Figure 21 - Kangaroo Flat - Total Insoluble Matter (TIM) - 2021-2022	30
Figure 22 - Kangaroo Flat - Total Ash Content - 2021-2022	31
Figure 23 - Kangaroo Flat - Ash Content/TIM Ratio - 2021-2022	32
Figure 24 - Kangaroo Flat - Total Arsenic/Total Solids - 2021-2022	33

Table of Tables

Table 1 - Kangaroo Flat - Dust Deposition Data	21
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Executive Summary

ALS was engaged by the Department of Jobs, Precincts and Regions (DJPR) to undertake dust monitoring at the former Kangaroo Flat Mine from the start of January 2021. This report provides results and analysis of data collected from sampling in Q1 2022 for the Kangaroo Flat Mine site.

In April 2021, Earth Resources Regulation (ERR) inherited the responsibility for care and maintenance and rehabilitation of the former Bendigo Gold Mine sites, as its operator, Kralcopic Pty Ltd went into liquidation. Prior to inheriting this responsibility, ERR engaged ALS to undertake depositional dust monitoring at the former Bendigo Mine sites, i.e. Kangaroo Flat and Woodvale, to proactively address ongoing community concerns relating to dust.

This report analyses the data gathered in Q1 2022 for the Kangaroo Flat Mine site by comparing the levels to accepted standards (where available) and previous dust monitoring results. The results of dust monitoring in the first half of 2021 were published in a report by CDM Smith. During Q3 and Q4, ALS completed the collection of samples/monitoring, analysis of lab results (Springvale ALS Laboratory - NATA accredited) and drafted the dust monitoring reports.

The Kangaroo Flat Mine site (including dust monitoring sites) is located approximately 4 km south from the centre of Bendigo. The Kangaroo Flat Mine site includes:

- fine tailings dam currently covered in dust suppression polymer
- coarse tailings dam which has been covered with waste rock
- two water dams which capture rainwater
- various other smaller ponds for stormwater management.

This site is currently under care and maintenance. To keep dust levels down, ERR is applying a range of dust control measures at the site, including applying water and dust suppression polymer and ensuring vegetation cover. Daily inspections during business days are carried out to make sure that dust levels are kept minimised.

To maintain continuity and comparability of data, monitoring was undertaken at the same locations, and a similar methodology and analysis process was followed in this report as done before.

The original scope of dust monitoring at Kangaroo Flat was to operate and maintain four depositional dust gauges. ERR has since asked ALS to add a further monitoring site for the purpose gathering background data. Data from this control site will be used for comparative background analysis.

The purpose of dust monitoring is to check that dust issues are being minimised and managed effectively including testing the effectiveness of dust control measures. Another objective of the dust monitoring program at Kangaroo Flat is to gather baseline data ahead of rehabilitation works. These results will inform decision making on dust control measures required during site rehabilitation, to ensure works meet air quality standards (where available).

The results for Q1 2022 were consistent to previous results recorded by ALS and published in the CDM Smith Report for the first half of 2021, ALS Reports for Q3 and Q4 2021.

As done previously in the CDM Smith Report, the following questions are answered for Q1 2022:

- *Did the dust deposition rates recorded in Q1 2022, exceed the adopted dust deposition criteria of 4 g/m²/month, measured as Total Insoluble Matter (TIM)?*

In Q1 2022, there was no instance where the dust level exceeded over the 4 g/m²/month criteria at any of the monitoring sites.

- *Are dust deposition rates recorded in Q1 2022, comparable to available historic results in this area?*

Overall results for Q1 2022 were comparable to previous results (Kralcopic Report in 2018, CDM Smith Report for the first half of 2021, ALS Reports for Q3 and Q4 of 2021).

- *Are arsenic concentrations recorded in deposited dust in Q1 2022, comparable to available historic results in this area?*

Although there were higher readings for arsenic in the soluble fraction, when these readings were used to calculate the total arsenic concentration, the results were 96.6 mg/kg for KF1 in Jan-22 and 35.8 mg/kg for KF2 in Feb-22 which were both below the 100 mg/kg assessment level from the Contaminated Sites Guideline. These results however are higher than the background levels which is why it is important for the dust suppression polymer cover to be maintained at the fine tailings dam.

Barium and manganese were generally within the historical ranges previously recorded, with results being comparable and at times lower than 2021 results.

Continued monitoring at the newly introduced background monitoring location KF5 (BG) will provide additional data to which the source data can be compared to, in future reports. Furthermore, ERR has confirmed that the focus here is to keep the dust levels minimised, which is why the fines tailings dam has been fully covered with dust suppression polymer.

1 Introduction

ALS was engaged by the Department of Jobs, Precincts and Regions (DJPR) to undertake dust monitoring at the former Kangaroo Flat Mine site from the start of January 2021. This report provides results and analysis of data collected from sampling in Q1 2022. ALS undertook the field component of maintaining dust gauges and replacing sample containers, as well as laboratory analysis of samples collected. Samples were collected on a routine monthly basis from locations specified by DJPR. These locations are displayed in [Section 3.1](#), [Figure 1](#) and [Figure 2](#) of this report.

2 Background

In April 2021, ERR inherited the responsibility for care and maintenance and rehabilitation of the former Bendigo Gold Mine sites, as its operator, Kralcopic Pty Ltd went into liquidation. Prior to inheriting this responsibility, ERR engaged ALS to undertake depositional dust monitoring at the former Bendigo Mine sites, i.e. Kangaroo Flat and Woodvale, to proactively address ongoing community concerns relating to dust. This report analyses the data gathered in Q1 2022 for the Kangaroo Flat site by comparing the levels to accepted standards (where available) and previous dust monitoring results published in:

- ALS report for Q4 2021;
- ALS report for Q3 2021;
- CDM Smith report for the first half of 2021; and
- Kralcopic report for Q4 2018.

The reports listed above are referenced in this document. To maintain continuity and comparability of results, this document has been prepared in a similar format to the CDM Smith report.

The Kangaroo Flat Mine is located to the east of Kangaroo Flat, approximately 4 km south from the centre of Bendigo. The site includes decommissioned mine tunnels and shafts as well as processing plants and tailings dams. The site is currently in care and maintenance. To keep dust levels down, ERR is applying a range of dust control measures at the former the Kangaroo Flat Mine site, including applying water and dust suppression polymer and ensuring vegetation cover. Daily inspections carried out during business days ensure dust levels are minimised.

To maintain continuity and comparability of data, monitoring was undertaken at the same locations as done previously, and similar methodology and analysis used. This report builds on the previous results and provides baseline information to potentially inform decisions around some aspects of rehabilitation.

2.1 Scope and Objective

The scope of dust monitoring at Kangaroo Flat is to operate and maintain five depositional dust gauges.

All depositional dust gauges except for the background gauge KF5 (BG) are located at their historic locations with the following naming conventions since the dates specified below:

- KF1 (W) Jan 2021
- KF2 (E) Jan 2021
- KF3 (N) Jan 2021
- KF4 (S) Jan 2021
- KF5 (BG) Sep 2021

Laboratory analysis requirements were provided by DJPR and were in line with historical requirements during the previous monitoring program to maintain continuity and comparability of results.

The purpose of dust monitoring is to check that dust issues are being minimised and managed effectively including testing the effectiveness of dust control measures. Another objective of the dust monitoring program at Kangaroo Flat is to gather baseline data ahead of rehabilitation works. These results will inform decision making on dust control measures required during site rehabilitation to ensure works meet air quality standards (where available).

As done previously, the following considerations were included in the assessment of Q1 2022 data:

- *Did the dust deposition rates recorded in Q1 2022, exceed the adopted dust deposition criteria of 4 g/m²/month, measured as Total Insoluble Matter (TIM)?*
- *Are dust deposition rates recorded in Q1 2022, comparable to available historic results in this area?*
- *Are arsenic concentrations recorded in deposited dust in Q1 2022, comparable to available historic results in this area?*

2.2 Regulatory Environment

The Environment Protection Authority (EPA) has overarching responsibility for the air quality in Victoria. The EPA administers the *Environment Protection Act 2017* and the *Environment Protection Regulations 2021* under which Environmental Reference Standards (ERS) and Guidelines are provided.

The purpose of the ERS is to support the protection of human health and the environment from pollution and waste by providing benchmarks to assess and report on environmental conditions in the whole or any part of Victoria.

The ERS seeks to achieve this purpose by:

- (a) identifying environmental values to be achieved or maintained in the whole or any part of Victoria; and
- (b) specifying indicators and objectives to be used to measure, determine or assess whether those environmental values are being achieved, maintained or threatened.

The ERS provides guidance, objectives and levels on values where the environment may be impacted and incorporates the Ambient Air Quality National Environment Protection Measure (NEPM AAQ).

The main guidance document used for the purpose of this report is EPA Publication 1191 – Protocol for Environmental Management – Mining and Extractive Industries (Mining PEM). The criteria in this guidance used for this report has been carried over to the EPA’s latest Guideline for Assessing and Minimising Air Pollution in Victoria, Publication 1961, February 2022.

Under the new EPA legislation, duty holders have responsibility under the general environmental duty to apply controls to eliminate or minimise risks to human health and the environment. This means that the primary focus is on applying effective elimination, minimisation and control measures. Monitoring is for the purpose of determining the effectiveness of control measures.

2.3 What is Dust

Dust is not typically classified according to its composition, but instead on its particle size, as follows:

- Deposited matter - any particles that fall out of suspension in the atmosphere.
- Total Suspended Particles (TSP) - particles suspended or entrained in the air. Typically, this is particles of 30 μm (0.03 mm) equivalent aerodynamic diameter or less. Larger particles tend not to become suspended.
- PM_{10} - particles 10 μm equivalent aerodynamic diameter or less.
- $\text{PM}_{2.5}$ - particles 2.5 μm equivalent aerodynamic diameter or less.

Dust particle size is an important consideration influencing dispersion and transport in the atmosphere and potential effects on human health. Human activities (e.g. energy use, transport, industrial activities etc) can affect the air quality, in particular airborne dust.

Potential sources of dust are:

- natural sources such as dust storms, agricultural dust, bushfires, vegetation, pollen and fungi; and
- anthropogenic sources such as mines sites, industry, roads and vehicles, construction sites, domestic and diffuse sources (CDM Smith, 2021).

3 Measurement of Dust

3.1 Site Locations

Locations of depositional dust gauges around the Kangaroo Flat Mine are presented in [Figure 1](#).

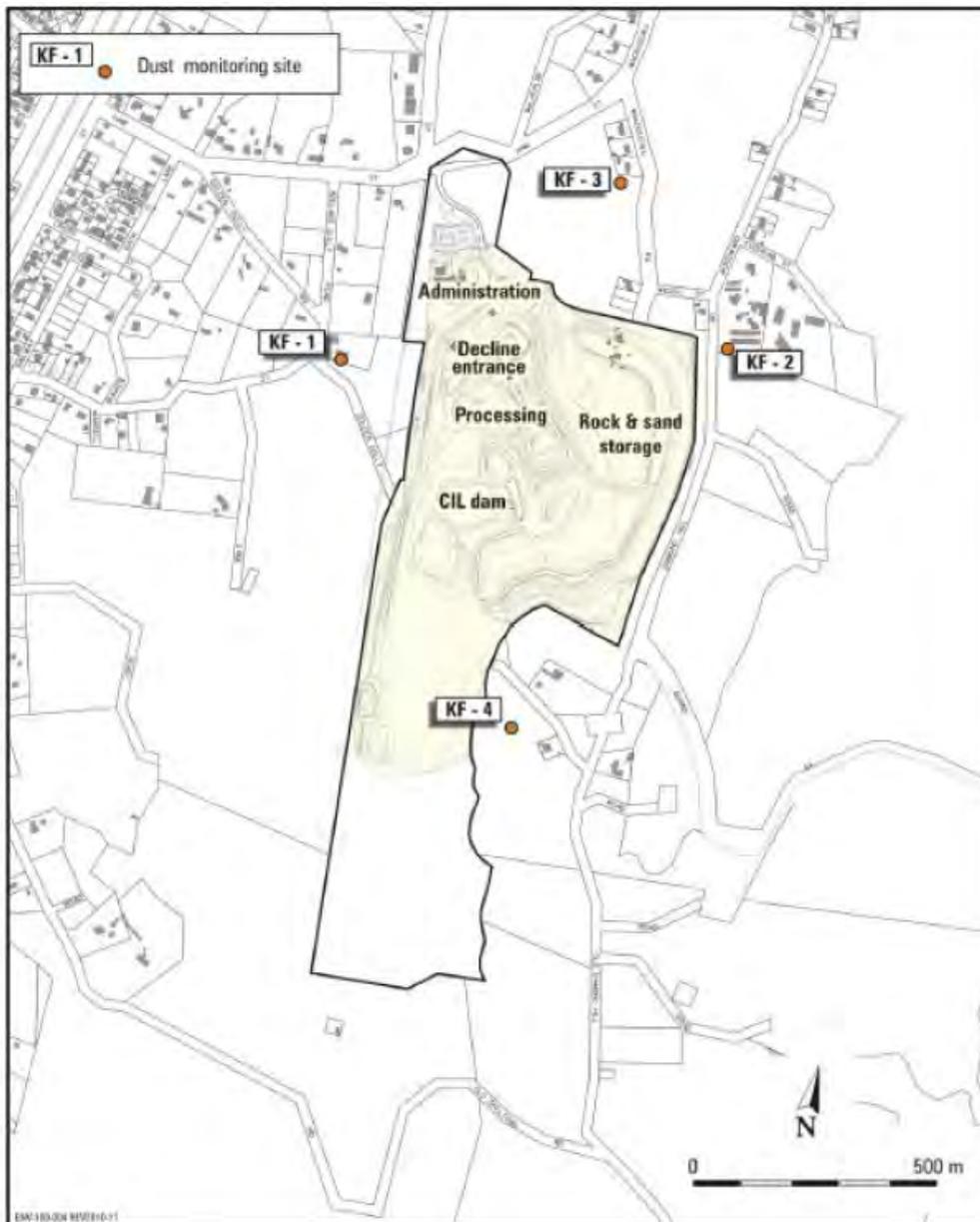


Figure 1 - Kangaroo Flat - Monitoring Locations

Samples were collected in accordance with the Standard AS/NZS 3580.10.1 - Methods for sampling and analysis of ambient air – Determination of particulate matter – Deposited matter – Gravimetric method and ALS Dust Sampling and Depositional Dust Gauge Work Procedure MAT-MAP1000 (See Appendix A – Supplementary Information).

ALS Laboratory in Springvale analysed the samples for the following:

- Total deposited matter
- Total ash content
- Metals/metalloids, in the soluble, insoluble and ash content fraction of dust.

3.2 Deposited Matter

The Standard (AS/NZS 3580.10.1:2016) sets out a method (used in this report) for sampling particulate matter that is deposited from the atmosphere. This Standard also sets out procedures for the gravimetric (i.e. by weighing) determination of the mass deposition rate of insoluble/soluble solids, ash/combustible matter, and total solids from ambient air.

The method provides an estimate of the mean surface concentration of deposited matter settling from the air over a sampling period, typically of one month. Particulate matter deposition rates of 0.1 g/m²/month and above may be determined using a monthly sampling period. The sample obtained by the sampling procedure specified may be subjected to physical or chemical analysis.

Over a given sampling period, particles that settle from the ambient air are collected in a vessel and retained together with any rainwater. The sample is passed through a sieve to remove any extraneous matter (e.g. leaves, insects), and the sieved sample containing the deposited matter is transferred to a filtration apparatus. The insoluble and soluble materials are separated by filtration, and the mass of the dried insoluble solids is gravimetrically determined.

The ash and combustible matter content are determined by loss on ignition of the insoluble solids. Soluble solids are determined from the filtrate. The total solids are obtained by the addition of the insoluble solids and the soluble solids. The mass deposition rate of deposited matter is then calculated from the mass of solids obtained, the funnel cross-sectional area and the exposure period. (AS/NZS 3580.10.1:2016)



Figure 4 - Kangaroo Flat - Dust Deposition Gauge KF1 (W)

3.3 Metals/Metalloids Monitoring in Dust

The inclusion of the analysis of metals/metalloids in the dust samples assist in identifying possible sources of contamination if present.

Analysis for insoluble matter, soluble matter and ash content was undertaken for the following:

- Arsenic
- Barium
- Manganese

It is understood that there are no specific threshold values for metals and metalloids in deposited dust either in the former Mining Licence or within the ERS. (CDM Smith, 2021)

3.4 Ash Content

Ash Content is the remaining material after the sample has been combusted in the laboratory. Ash content provides an indication of the mineral content (or soil dust) of the sample. The mineral content may be attributable to onsite contributions, but may also be attributed to other sources such as agriculture, unsealed roads, etc.

3.5 Dust Monitoring Standards

Results were compared against relevant dust deposition rate criteria described by EPA Publication 1191 (2007), as shown below which has been adopted in EPA Publication 1961 (2022):

Averaging period	Maximum increase above background (2g/m ² /month) in deposited dust level	Maximum total deposited dust level
Annual	2g/m ² /month	4g/m ² /month

The following points apply to the criteria:

- Results of monitoring should not exceed 4 g/m²/month (no more than 2 g/m²/month above background) as a monthly average.
- The 2 g/m²/month criteria are used when baseline data on deposited dust levels exist, while the 4 g/m²/month criteria is used when no baseline data exists.
- The criteria refer to all sources of deposited matter (including sources from mines, agriculture, unsealed roads, etc) and cumulative impacts.
- The criteria states that in some cases, a mine may increase deposited dust levels by up to 2 g/m²/month. However, the total deposited dust level (including sources from mines, agriculture, unsealed roads, etc) must not exceed 4 g/m²/month.

Deposited matter (dust) can be used as an indicator of the effectiveness of site management practices and the potential for offsite nuisance (fugitive dust). Deposited dust monitoring, when conducted over a set time period, is useful for examining trends and evaluating deviation from long term trends with respect to site activities.

3.6 Dust Monitoring Program

The current method of undertaking depositional dust monitoring is considered sufficient as the site is in care and maintenance i.e. no new pollution is being introduced to the site from industry. There is a considerable body of knowledge about the contamination level at the site, so all that is required at this stage is to determine whether this contamination is becoming air borne and becoming a problem to the nearby landholders. Depositional dust monitoring provides a range of useful information to be able to understand what's happening at this site and its surrounds.

Depositional dust monitoring can provide the following invaluable information:

- test the effectiveness of dust minimisation, control and management measures
- identify key problematic sources, or groups of sources on larger more complex sites
- identify where dust sensitivities may occur
- characterise temporal or spatial trends
- metallic/metalloid concentrations useful for considering impacts on nearby community.

4 Dust Deposition Results

4.1 Kangaroo Flat Mine – Q1 2022

Dust deposition analysis results are presented in [Table 1](#) and laboratory results reports are attached in [Appendix B](#), all at the end of this document.

Where results were reported as “less than” (<) a specified number (laboratory reporting limit) the number reported was adopted for use in the graphical displays. This approach adopts a conservative value for the number being reported.

4.1.1 Deposition of Total Insoluble Matter

Total Insoluble Matter (TIM) met the criteria of less than 4 g/m²/month on 15 of 15 measurements during Q1 2022. See [Figure 5](#) below.

Throughout Q1 results, none of the readings exceeded the background plus 2 g/m²/month criteria. These readings verify the monitored sites are within the requirements for Mining PEM criteria.

Dust deposition rate at site KF5 (BG) was the highest value for the period during March 2022 recording a result of 2.4 g/m²/month. When the data from all source monitoring sites were averaged for Q1 2022, an average of 1.3 g/m²/month was recorded. This value is below the inferred background level suggested within the Mining PEM. Both exceedance criteria (4 g/m²/month and background plus 2 g/m²/month) have been considered when reviewing data sets. ALS found no exceedances were recorded during Q1, 2022.

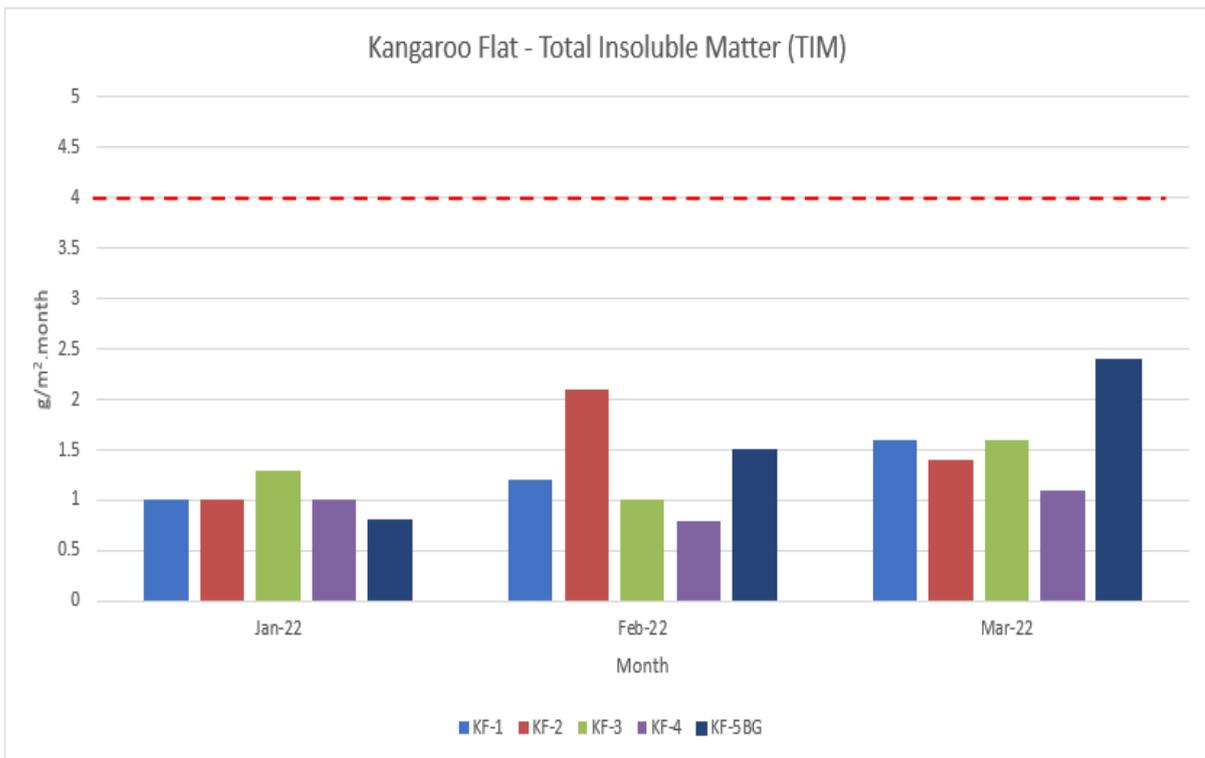


Figure 5 - Kangaroo Flat - Total Insoluble Matter (TIM) - Q1 2022
Red dotted line is the criteria used for the purpose of this report.

4.1.2 Mineral Content in Dust

The fraction of dust measured as ash content is displayed below in Figure 6. The values recorded during Q1 were generally 0.2 g/m²/month or less. Slightly elevated readings at KF2 (E) (0.3 g/m²/month), KF4 (N) (0.4 g/m²/month) during January and KF3 (S) (0.3 g/m²/month) in February were recorded with these values at or below historical values.

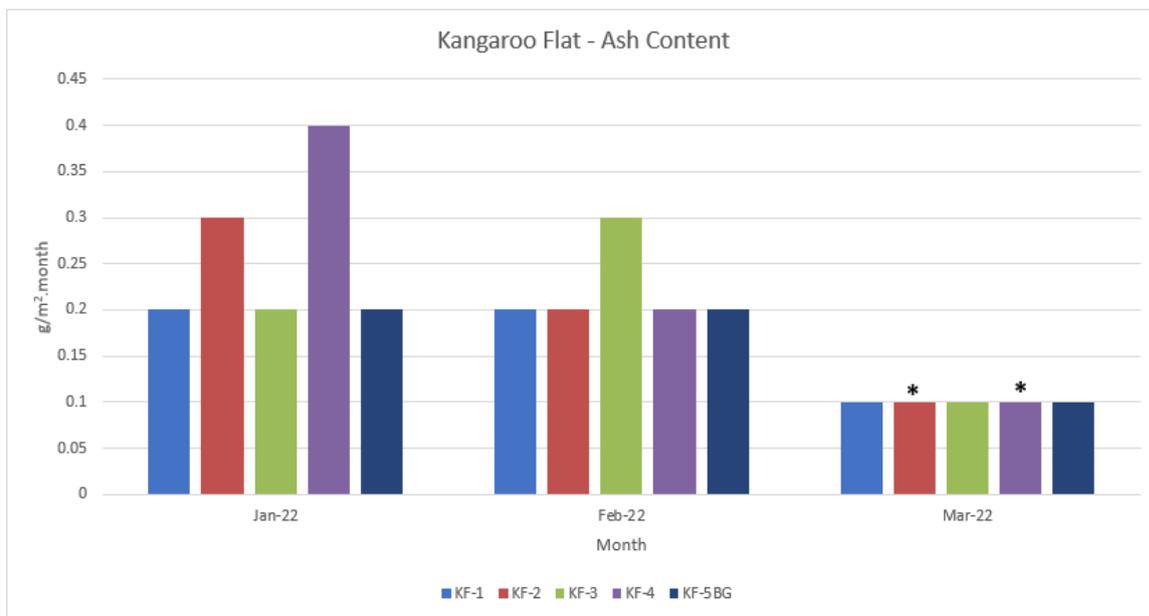


Figure 6 - Kangaroo Flat - Total Ash Content - Q1 2022

An asterisk (*) has been placed over the samples which recorded as less than (<) the value x displayed on the graph.

To gain a general understanding of what proportion of the sample is ash content i.e. mineral dust, the ratio of total ash content and TIM has been plotted in Figure 7.

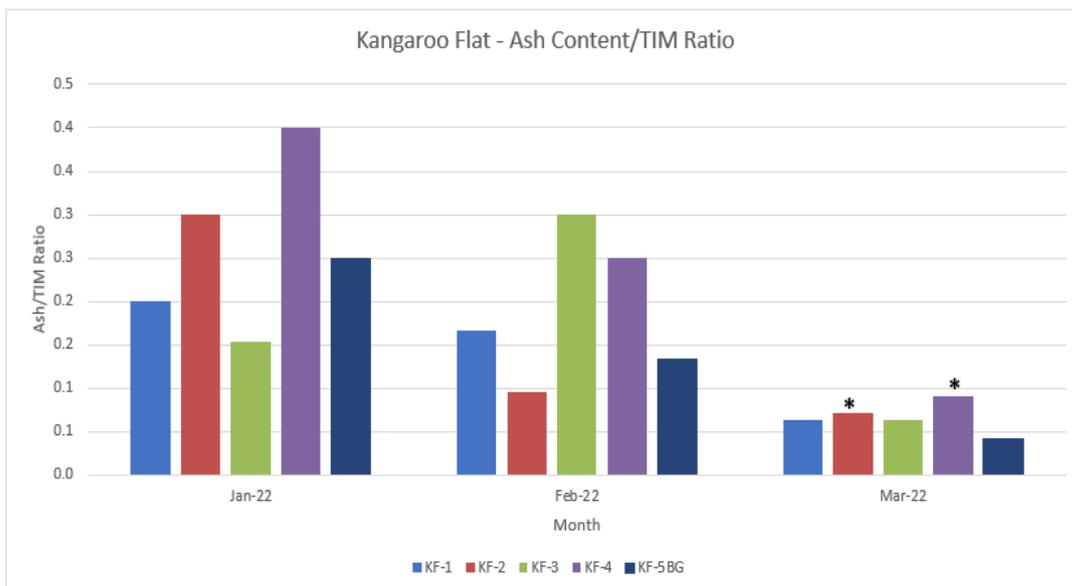


Figure 7 - Kangaroo Flat - Ash Content/TIM Ratio - Q1 2022

An asterisk (*) has been placed over the samples which recorded as less than (<) the value x displayed on the graph.

Figure 7 shows that ash content in the samples throughout Q1 2022 were generally low, with higher readings at KF4 (S) and KF2 (E) for January 2021 and KF3 (N) in February 2022. This shows that quite a proportion of the samples consisted of leafy biological content as opposed to mineral dust content. This is typical for areas where there are reasonable levels of vegetation in its surrounds.

Figure 23 in Section 9.4 shows that this explanation holds true for a greater part of the samples with a few exceptions recorded in wetter periods seen in June, July and September 2021 where the mineral dust content has dominated the sample.

4.1.3 Metals/Metalloids in Dust

Graphical presentations of soluble and insoluble metals (arsenic, barium and manganese) are provided in Section 9 of this report. Majority of arsenic, barium and manganese concentrations for Q1 2022 were consistent with previously recorded historical data sets. Historical data sets from 2021 have been reported and results were within historical ranges.

In the Q1 2022 results, ALS identified higher readings at KF1 in January 2022, KF2 in February 2022 for Arsenic. ALS field staff observed no major changes onsite that could have contributed to the higher results. Results also indicated a rise in the soluble fraction of barium in Jan-22 and Mar-22 for KF4 (S). Barium concentration thresholds are a couple of orders of magnitude higher than arsenic concentration thresholds in the Contaminated Sites Guidelines, so this is not a major concern.

To provide an understanding of total arsenic concentrations measured in dust relative to concentrations measured in soils within the region, total arsenic concentration has been displayed below in Figure 8 in mg/kg. This is calculated by adding soluble and insoluble components of arsenic in $\mu\text{g}/\text{m}^2/\text{month}$ and dividing by the total solids $\text{g}/\text{m}^2/\text{month}$.

This ratio is being plotted because this provides a figure which could be compared to the figures quoted in the guideline, Contaminated Sites Management Series – Assessment Levels for Soil, Sediment and Water. The assessment level for soil for arsenic is 100 mg/kg for standard residential areas in this guideline.

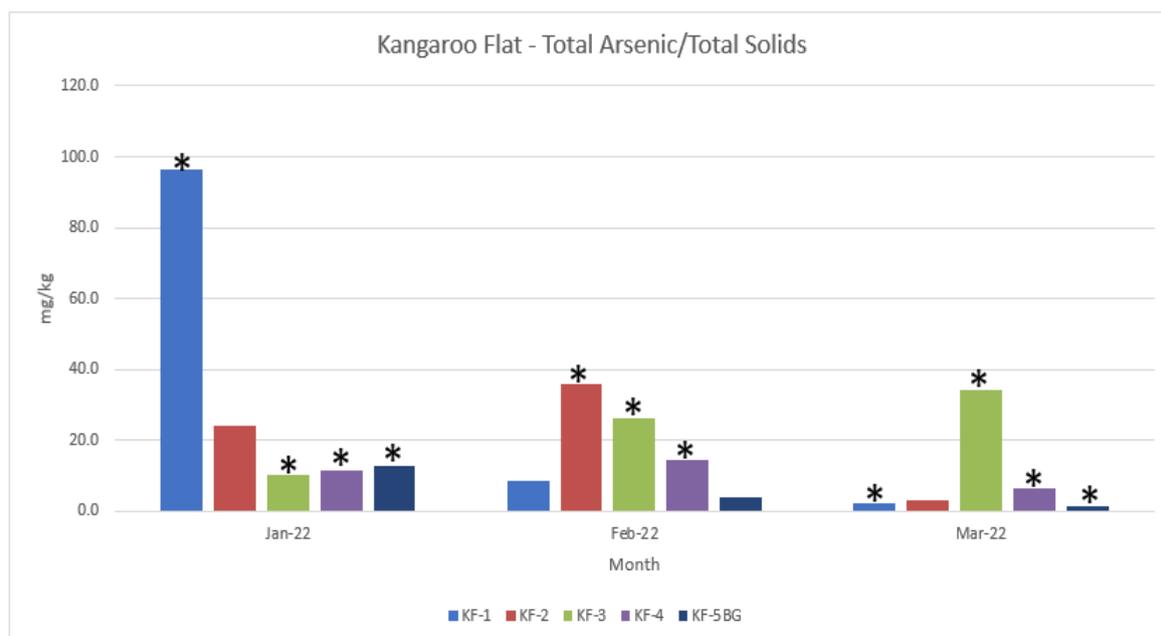


Figure 8 - Kangaroo Flat - Total Arsenic/Total Solids - Q1 2022
 An asterisk (*) has been placed over the samples which recorded as less than (<) the value x displayed on the graph.

Total arsenic concentrations for Q1 ranged from 1.3 to 96.6 mg/kg with a mean of 22.8 mg/kg across all source monitoring sites. This is well below the 100 mg/kg assessment level mentioned above and comparable to Q3 (20.9 mg/kg) and Q4 (26.4 mg/kg) mean total arsenic concentrations.

Overall, concentrations recorded for Q1 remained consistent with previous historical readings during 2021. See [Figure 24](#) in [Section 9.4](#).

There is no definitive pattern across the monitoring sites to indicate that the arsenic concentrations are from a single source. Highest concentrations through the period were observed at KF1 (W) (mean 35.8 mg/kg) and KF3 (N) (mean 23.6 mg/kg). These figures are still below the 100 mg/kg assessment level in the Contaminated Sites Guideline.

4.2 Quality Assurance and Quality Control

Field sampling and analysis was undertaken in accordance with the following Standards:

- Australian Standard AS/NZS 3580.10.1 (2016), Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter – Deposited Matter – Gravimetric Method. **(AS/NZS 3580.10.1)**
- Australian Standard AS/NZS 3580.10.2 (2013), Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter – Impinged Matter – Gravimetric Method. **(AS/NZS 3580.10.2)**

Sampling methodology and locations are consistent with sampling previously undertaken to maintain continuity and comparability of results.

ALS Environmental Laboratory has NATA accreditation for the following Ambient Air Parameters:

ISO/IEC 17025 (2017)				
Environment				
SERVICE	PRODUCT	DETERMINANT	TECHNIQUE	PROCEDURE
Analysis for physical and chemical characteristics	Air - Ambient	Particulate matter	Gravimetric	AS 3580.10.2 and in-house EA1201, EA1251, EA1391, EA1411 and EA1421
		Deposited matter	Gravimetric	AS 3580.10.1 and in-house EA120-142

The NATA accreditation process involves confirming that the relevant Australian Standards are being followed in the company procedures. ALS has followed the relevant Australian Standards in sample gathering, analysis and reporting of results which is satisfactory. Nevertheless ALS is reviewing any gaps in their accreditation and will be rectifying these gaps in due course.

Internal laboratory quality control measures note the following:

- No Method Blank value outliers occurred.
- No laboratory control outliers occurred.
- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) results reported.
- No laboratory duplicate results reported.
- No holding time outliers occurred.
- No quality control sample frequency outliers occurred (based on NEPM 2013 B3 quality control specification).

5 Summary of Results

Results are discussed in detail throughout the relevant sections in this report. In summary, the overall results for Q1 2022 were comparable to previous results or less than what was observed in 2021.

The key findings for Q1 2022 are as follows:

- There were no exceedances of the 4 g/m²/month (or the background plus 2 g/m²/month) criteria at depositional gauges monitoring the Kangaroo Flat mine in Q1 2022.
- Although there were higher readings for arsenic in the soluble fraction, when these readings were used to calculate the total arsenic concentration, the results were 96.6 mg/kg for KF1 in Jan-22 and 35.8 mg/kg for KF2 in Feb-22 which were both below the 100 mg/kg assessment level from the Contaminated Sites Guideline. These results however are higher than the background levels which is why it is important for the dust suppression polymer cover to be maintained at the fine tailings dam.
- Barium and manganese were generally within the historical ranges previously recorded, with results being comparable and at times lower than 2021 results.

6 Further Considerations

ERR has advised that they will continue to monitor the site for dust levels and ensure that a range of dust control measures are applied during this care and maintenance phase of the rehabilitation project to minimise dust nuisance. ERR will be endeavouring to make continuous improvements to dust suppression and monitoring from the findings of the dust monitoring work.

7 References

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- ALS Hydrographics Pty Ltd (2021), Kangaroo Flat Dust Monitoring Q4 2021 Report. **(ALS Report)**
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- CDM Smith (2021), Kangaroo Flat Mine - Dust Monitoring Report - January to June 2021. **(CDM Smith Report)**
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- National Environment Protection Council (1998), National Environment Protection (Ambient Air Quality) Measure, July 2018. **(NEPM AAQ)**
- Victorian Government (2001), Statement of Environment Protection Policy (Air Quality Management), Victorian Government Gazette, No S 240, 21 December 2001. **(SEPP AQM)**
- Victorian Government (2016), State Environment Protection Policy (Ambient Air Quality), Original Policy including Two Variations, Victorian Gazette Nos S19, S240 and G30, published on 9 February 1999, 21 December 2001 and 28 July 2016, respectively. **(SEPP AAQ)**
- Victorian Government (2021), Environment Reference Standard, under the *Environment Protection Act 2017*, Victorian Government Gazette, No. S 245, 26 May 2021. **(ERS)**
- EPA NSW Publication, Approved Methods for the Modelling and Assessment of Air Pollutants in NSW, (2017)

8 Tables

Table 1 - Kangaroo Flat - Dust Deposition Data

					Barium	Magnese	Arsenic	Total Solids	Total Solids (mg)	Total Insoluble Matter	Total Insoluble Matter (mg)	Total Soluble Matter	Total Soluble Matter (mg)	Combustible Matter	Combustible Matter (mg)	Ash Content	Ash Content (mg)
					ug/m2 month	ug/m2 month	ug/m2 month	g/m2 month	mg	g/m2 month	mg	g/m2 month	mg	g/m2 month	mg	g/m2 month	mg
EQL									1	0.1	1	0.1	1	0.1	1	0.1	1
Description	Location	Quarter	Month	Lab Report Number													
KF1 (Insoluble)	KF1	Q1 2022	Jan-22	EM2201387	74.7	100	22.5										
			Feb-22	EM2203816	70.2	128	12										
			Mar-22	EM2206291	87.1	89.2	9.51										
KF1 (Soluble)	KF1	Q4 2021	Jan-22	EM2201387	157	410	219										
			Feb-22	EM2203816	148	258	10.57										
			Mar-22	EM2206291	143	318	0.05										
KF1 (Ash)	KF1	Q4 2021	Jan-22	EM2201387	74.7	47.9	22.5										
			Feb-22	EM2203816	70.2	94.1	8.77										
			Mar-22	EM2206291	87.1	58.7	9.51										
KF1	KF1	Q4 2021	Jan-22	EM2201387				2.5	46	1	18	1.5	28	0.8	15	0.2	3
			Feb-22	EM2203816				2.7	43	1.2	19	1.5	24	1	16	0.2	3
			Mar-22	EM2206291				4	75	1.6	30	2.4	45	1.5	28	0.1	2
KF2 (Insoluble)	KF2	Q4 2021	Jan-22	EM2201387	110	101	17.3										
			Feb-22	EM2203816	82.5	101	32.1										
			Mar-22	EM2206291	62	53.3	5.34										
KF2 (Soluble)	KF2	Q4 2021	Jan-22	EM2201387	141	364	23.6										
			Feb-22	EM2203816	126	604	165										
			Mar-22	EM2206291	151	259	1.99										
KF2 (Ash)	KF2	Q4 2021	Jan-22	EM2201387	110	60.2	15.1										
			Feb-22	EM2203816	82.5	101	32.1										
			Mar-22	EM2206291	62	49.8	4.02										
KF2	KF2	Q4 2021	Jan-22	EM2201387				1.7	31	1	18	0.7	13	0.7	12	0.3	6
			Feb-22	EM2203816				5.5	91	2.1	34	3.4	57	1.9	31	0.2	3
			Mar-22	EM2206291				2.3	43	1.4	27	0.9	16	1.3	25	0.1	2

					Barium	Manganese	Arsenic	Total Solids	Total Solids (mg)	Total Insoluble Matter	Total Insoluble Matter (mg)	Total Soluble Matter	Total Soluble Matter (mg)	Combustible Matter	Combustible Matter (mg)	Ash Content	Ash Content (mg)
					ug/m2 month	ug/m2 month	ug/m2 month	g/m2 month	mg	g/m2 month	mg	g/m2 month	mg	g/m2 month	mg	g/m2 month	mg
EQL									1	0.1	1	0.1	1	0.1	1	0.1	1
Description	Location	Quarter	Month	Lab Report Number													
KF3 (Insoluble)	KF3	Q4 2021	Jan-22	EM2201387	104	95	16.7										
			Feb-22	EM2203816	97.7	138	38.1										
			Mar-22	EM2206291	115	99.9	85.8										
KF3 (Soluble)	KF3	Q4 2021	Jan-22	EM2201387	180	460	58.9										
			Feb-22	EM2203816	55.3	196	22.5										
			Mar-22	EM2206291	94.4	250	20.3										
KF3 (Ash)	KF3	Q4 2021	Jan-22	EM2201387	104	73.8	16.7										
			Feb-22	EM2203816	97.7	105	38.1										
			Mar-22	EM2206291	115	83.2	85.8										
KF3	KF3	Q4 2021	Jan-22	EM2201387				7.3	136	1.3	24	6	112	1.1	21	0.2	3
			Feb-22	EM2203816				2.3	37	1	16	1.3	21	0.7	11	0.3	5
			Mar-22	EM2206291				3.1	59	1.6	30	1.5	29	1.5	28	0.1	2
KF4 (Insoluble)	KF4	Q4 2021	Jan-22	EM2201387	117	113	10.7										
			Feb-22	EM2203816	82.8	74.7	20.4										
			Mar-22	EM2206291	111	103	12.5										
KF4 (Soluble)	KF4	Q4 2021	Jan-22	EM2201387	522	436	16.1										
			Feb-22	EM2203816	215	285	15.4										
			Mar-22	EM2206291	449	279	0.05										
KF4 (Ash)	KF4	Q4 2021	Jan-22	EM2201387	117	74.3	10.7										
			Feb-22	EM2203816	82.8	60.3	20.4										
			Mar-22	EM2206291	68.7	43.3	4.89										
KF4	KF4	Q4 2021	Jan-22	EM2201387				2.3	43	1	19	1.3	24	0.6	12	0.4	7
			Feb-22	EM2203816				2.5	42	0.8	13	1.7	29	0.6	9	0.2	4
			Mar-22	EM2206291				2	37	1.1	21	0.9	16	1	20	0.1	2

					Barium	Manganese	Arsenic	Total Solids	Total Solids (mg)	Total Insoluble Matter	Total Insoluble Matter (mg)	Total Soluble Matter	Total Soluble Matter (mg)	Combustible Matter	Combustible Matter (mg)	Ash Content	Ash Content (mg)
					ug/m2 month	ug/m2 month	ug/m2 month	g/m2 month	mg	g/m2 month	mg	g/m2 month	mg	g/m2 month	mg	g/m2 month	mg
EQL									1	0.1	1	0.1	1	0.1	1	0.1	1
Description	Location	Quarter	Month	Lab Report Number													
KF5BG (Insoluble)	KF5BG	Q4 2021	Jan-22	EM2201387	91.4	80.4	6.1										
			Feb-22	EM2203816	76.2	143	5.02										
			Mar-22	EM2206291	85.7	136	6.07										
KF5BG (Soluble)	KF5BG	Q4 2021	Jan-22	EM2201387	144	463	12.7										
			Feb-22	EM2203816	76.2	137	5.17										
			Mar-22	EM2206291	95.9	300	0.05										
KF5BG (Ash)	KF5BG	Q4 2021	Jan-22	EM2201387	91.4	59.5	6.1										
			Feb-22	EM2203816	76.2	108	4.85										
			Mar-22	EM2206291	85.7	100	5.32										
KF5BG	KF5BG	Q4 2021	Jan-22	EM2201387				1.5	29	0.8	16	0.7	13	0.6	12	0.2	4
			Feb-22	EM2203816				2.7	45	1.5	25	1.2	20	1.3	22	0.2	3
			Mar-22	EM2206291				4	77	2.4	46	1.6	31	2.3	43	0.1	3

9 Supplementary Data

Graphs for Metals/Metalloids in Insoluble and Soluble Fractions including trends are presented below.

9.1 Arsenic

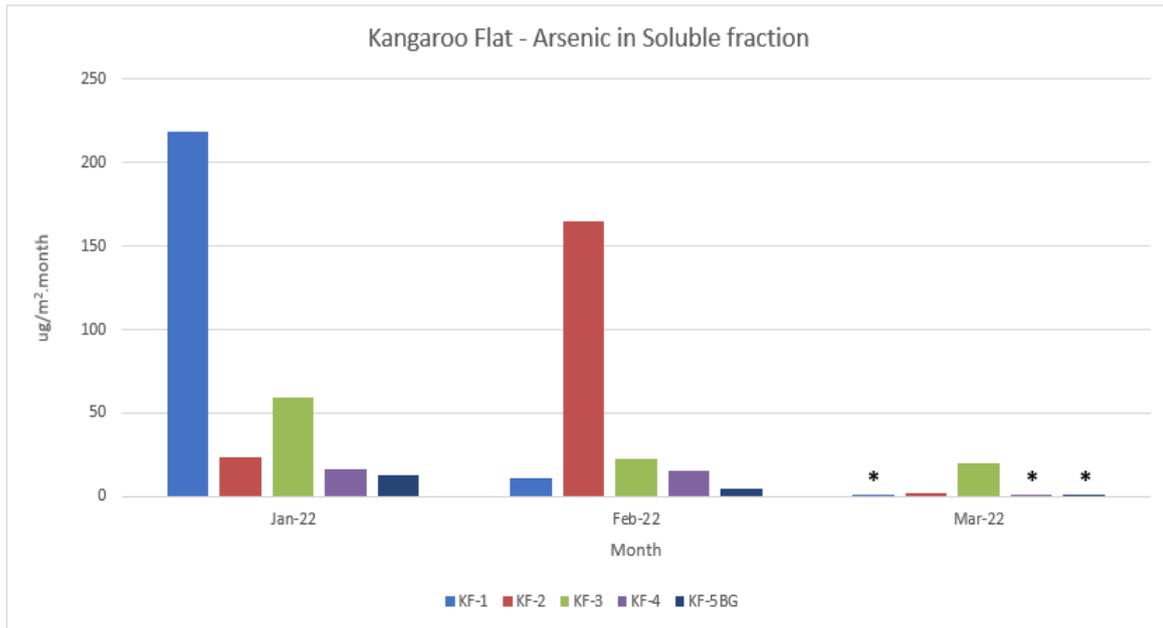


Figure 9 - Kangaroo Flat - Arsenic in Soluble Fraction - Q1 2022

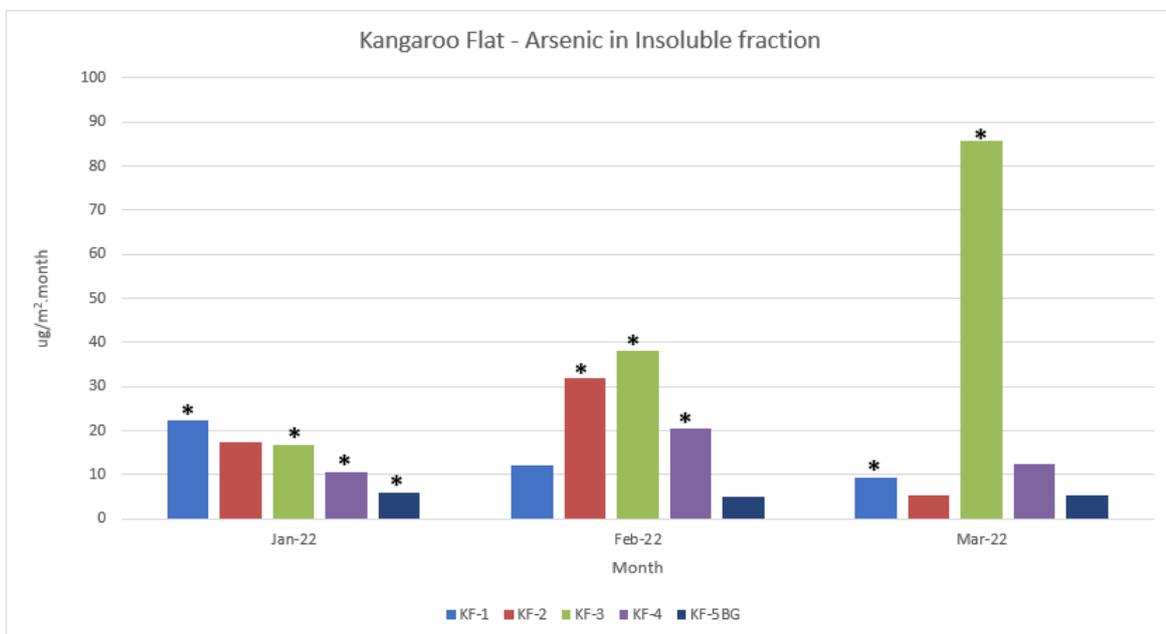


Figure 10 - Kangaroo Flat - Arsenic in Insoluble Fraction - Q1 2022

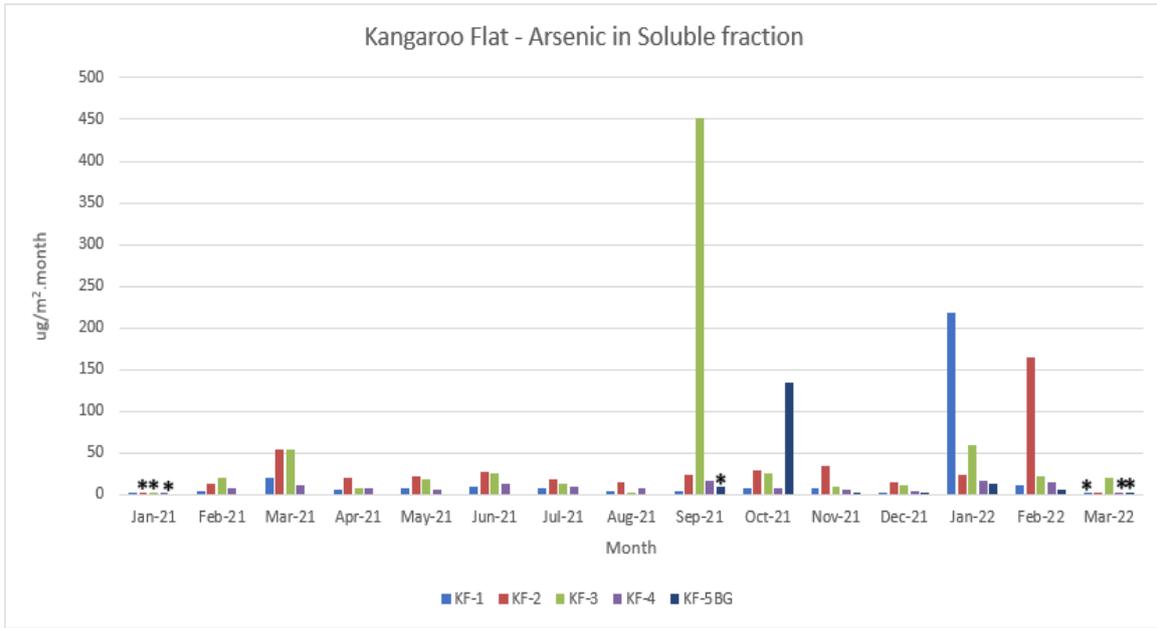


Figure 11 - Kangaroo Flat - Arsenic in Soluble Fraction - 2021-2022
 An asterisk (*) has been placed over the samples which recorded as less than (<) the value x displayed on the graph.

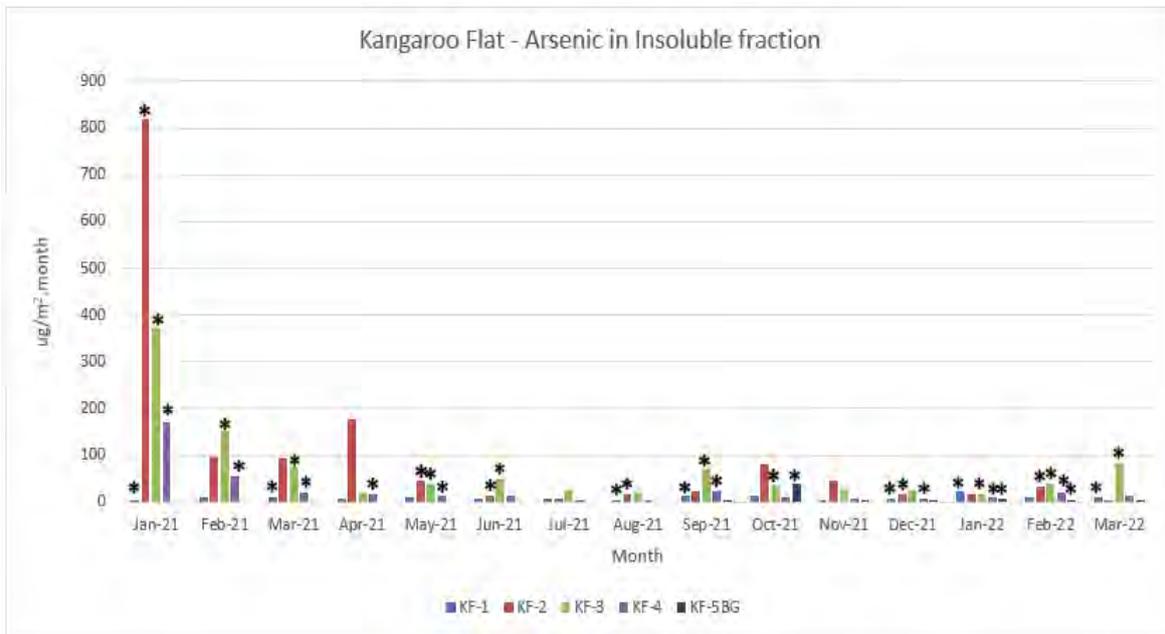


Figure 12 - Kangaroo Flat - Arsenic in Insoluble Fraction - 2021-2022
 An asterisk (*) has been placed over the samples which recorded as less than (<) the value x displayed on the graph.

9.2 Barium

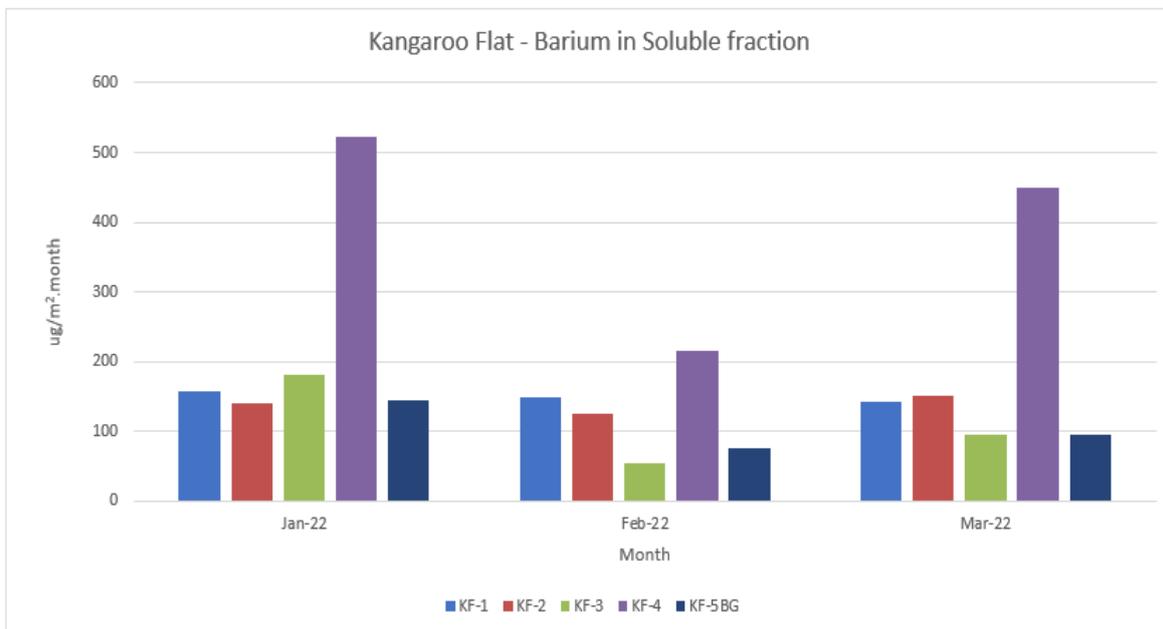


Figure 13 - Kangaroo Flat - Barium in Soluble Fraction - Q1 2022

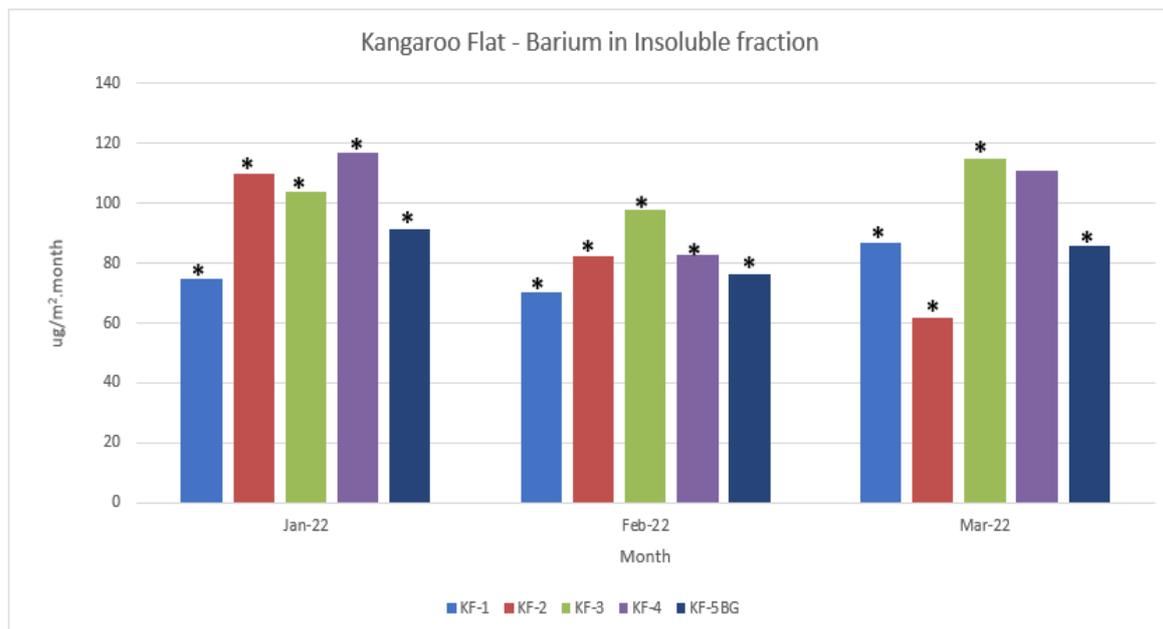


Figure 14 - Kangaroo Flat - Barium in Insoluble Fraction - Q1 2022

An asterisk (*) has been placed over the samples which recorded as less than (<) the value x displayed on the graph.

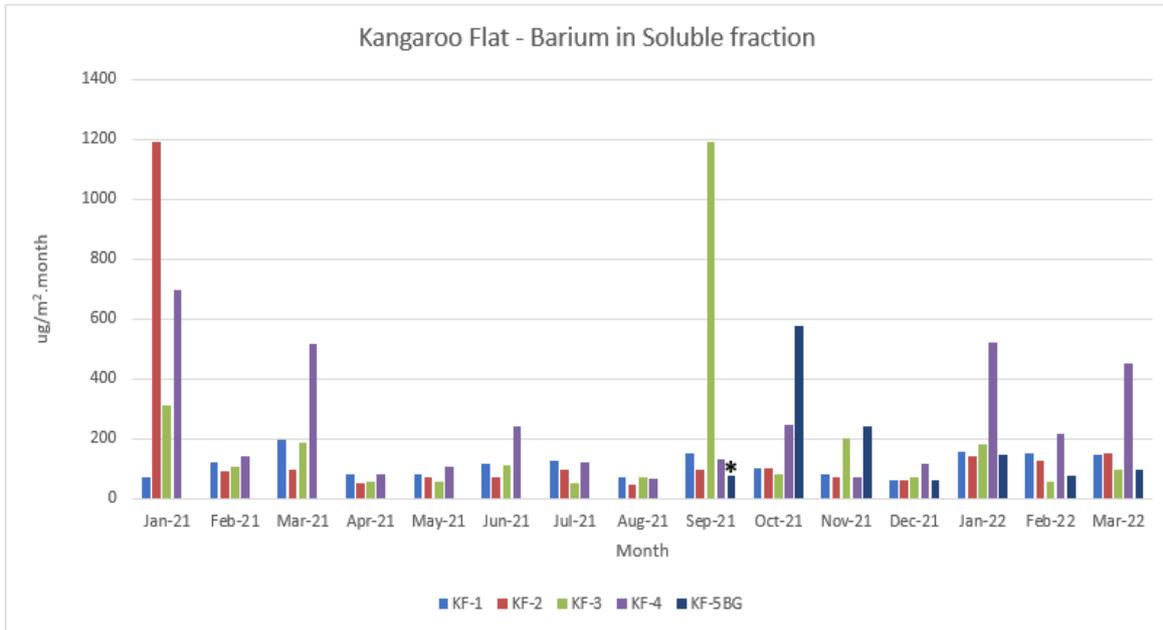


Figure 15 - Kangaroo Flat - Barium in Soluble Fraction - 2021-2022

An asterisk (*) has been placed over the samples which recorded as less than (<) the value x displayed on the graph.

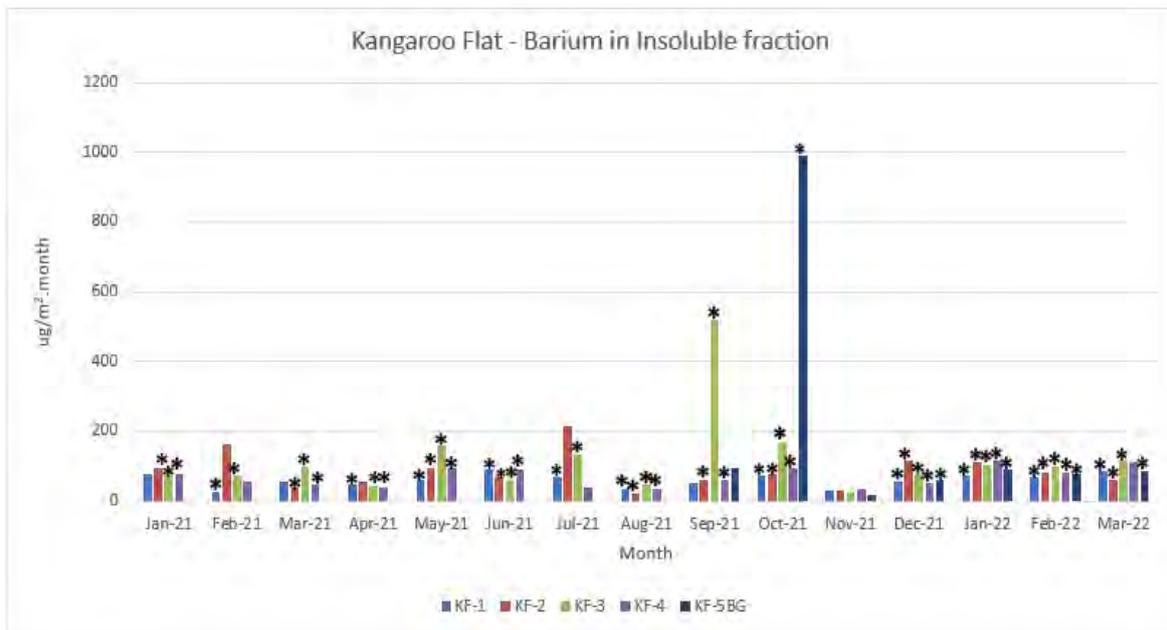


Figure 16 - Kangaroo Flat - Barium in Insoluble Fraction - 2021-2022

An asterisk (*) has been placed over the samples which recorded as less than (<) the value x displayed on the graph.

9.3 Manganese

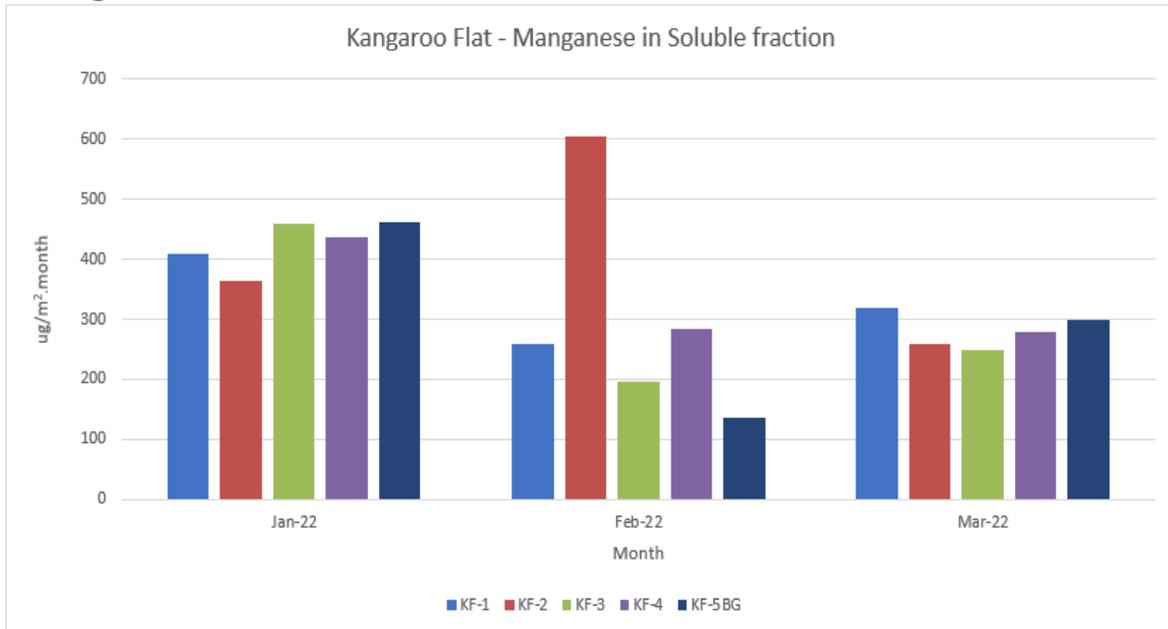


Figure 17 - Kangaroo Flat - Manganese in Soluble Fraction - Q1 2022

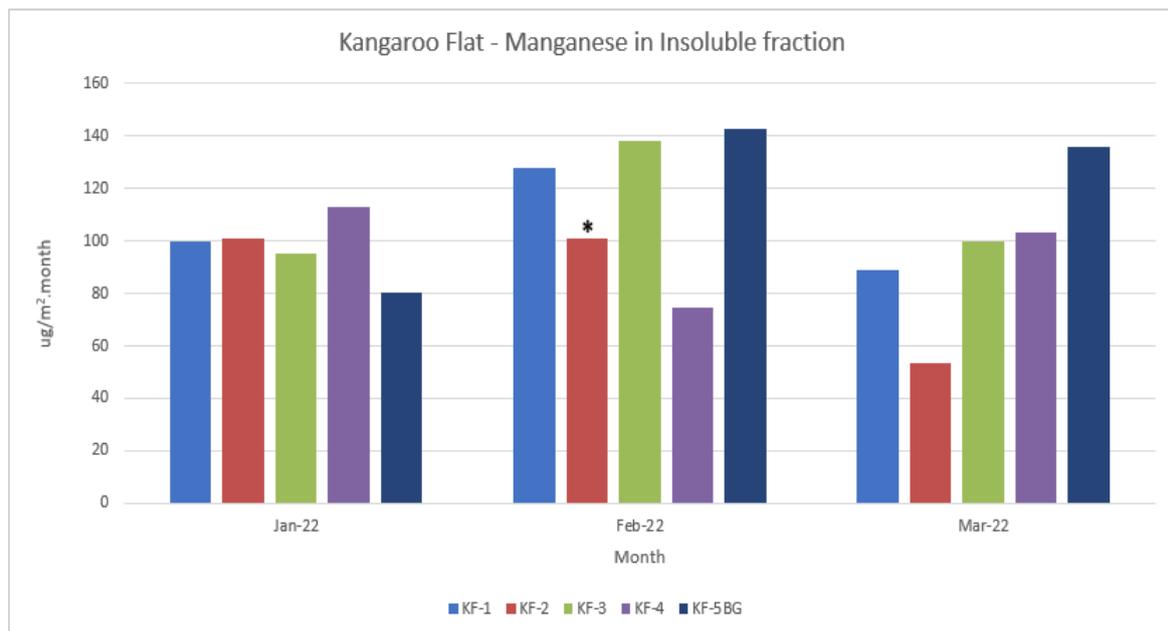


Figure 18 - Kangaroo Flat - Manganese in Insoluble Fraction - Q1 2022

An asterisk (*) has been placed over the samples which recorded as less than (<) the value x displayed on the graph.

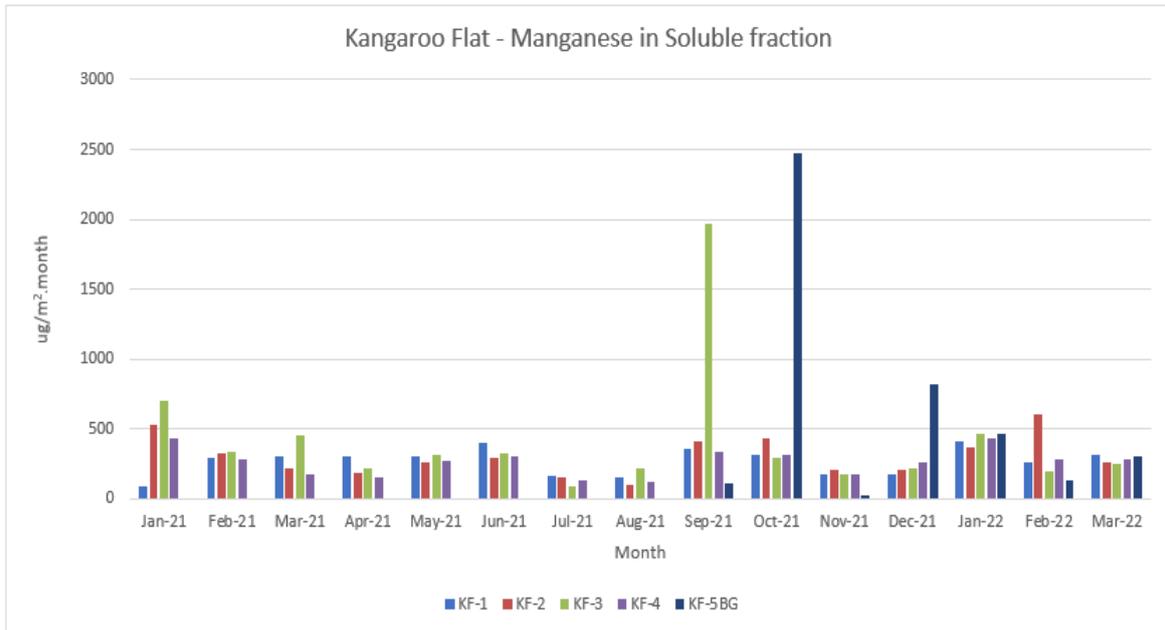


Figure 19 - Kangaroo Flat - Manganese in Soluble Fraction - 2021-2022

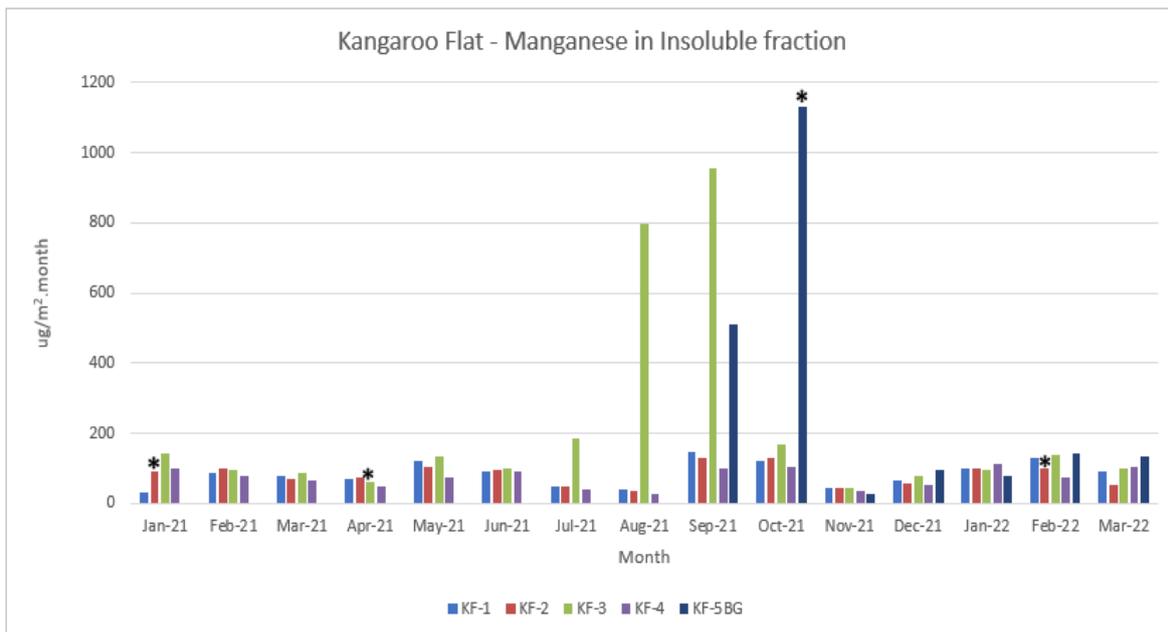


Figure 20 - Kangaroo Flat - Manganese in Insoluble Fraction - 2021-2022
 An asterisk (*) has been placed over the samples which recorded as less than (<) the value x displayed on the graph.

9.4 Trend Graphs

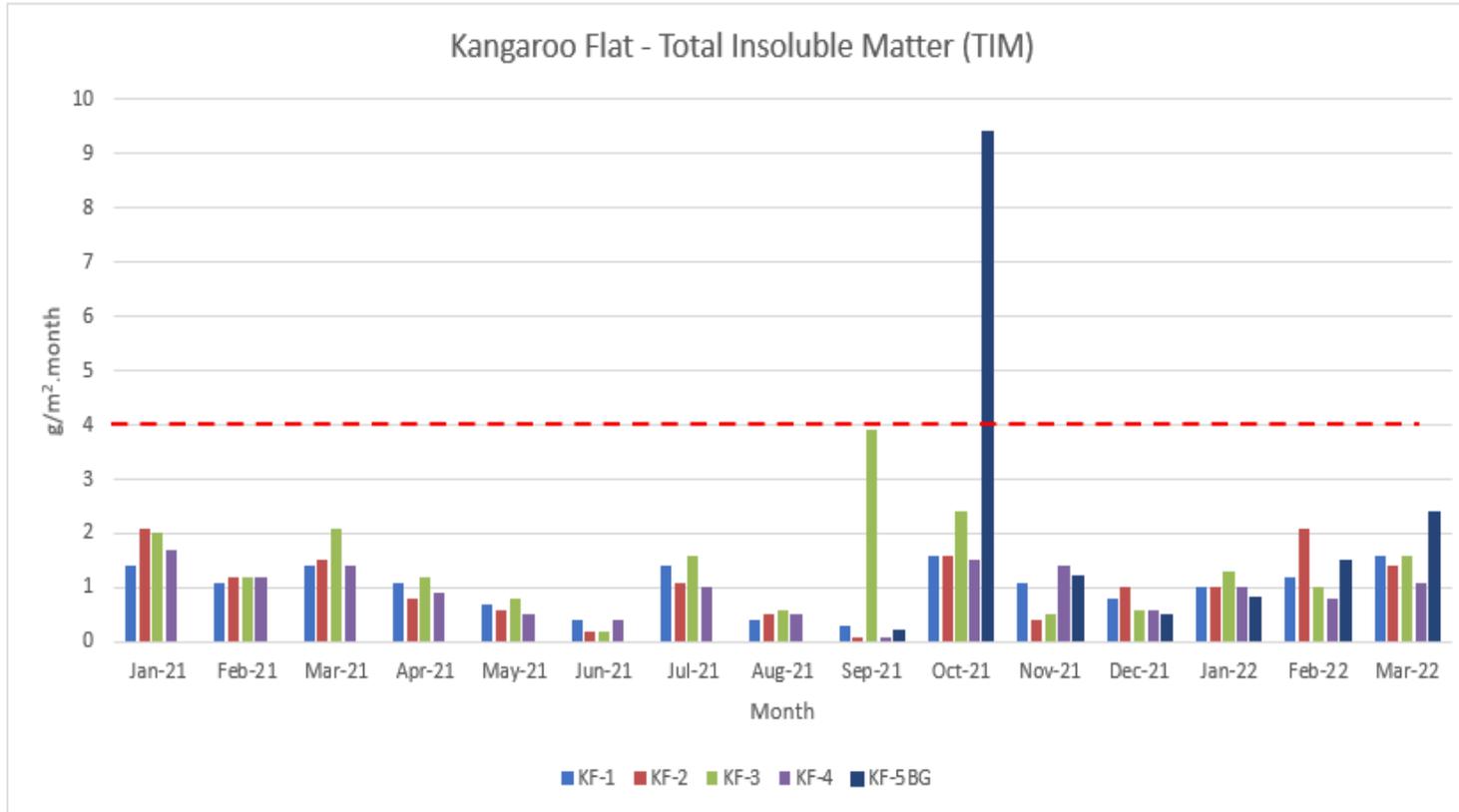


Figure 21 - Kangaroo Flat - Total Insoluble Matter (TIM) – 2021-2022

Figure 21 shows TIM from throughout 2021 and no exceedances in the first quarter of 2022. The chart shows no exceedances of the recommended criteria level occurred during this period with values being recorded generally similar for Q1 2022 as with other quarters in 2021. Overall, average value of TIM for Q1 at the source is aligned with the rest of the year's data with the average being at 1.3 g/m²/month.

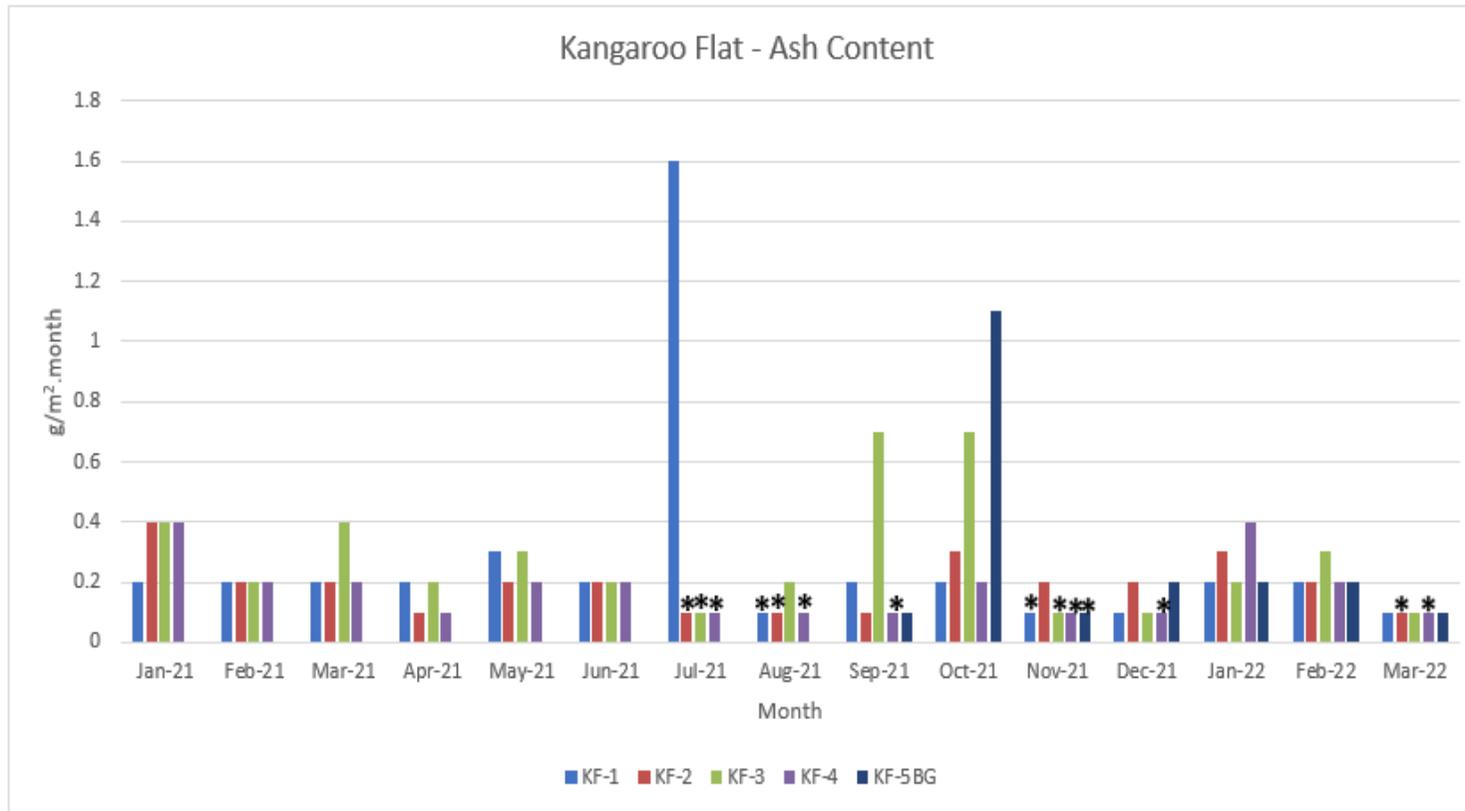


Figure 22 - Kangaroo Flat - Total Ash Content - 2021-2022
 An asterisk (*) has been placed over the samples which recorded as less than (<) the value x displayed on the graph.

Figure 22 provides graphical summary of total ash content throughout 2021 and the first quarter of 2022. As can be seen from this graph, most of the data for Q1 2022 was below 0.3 g/m²/month with only KF4 (N) recording a higher figure of 0.4 g/m²/month. All total ash content levels recorded for Q1 2022 were within acceptable levels and comparable to recorded values throughout 2021.

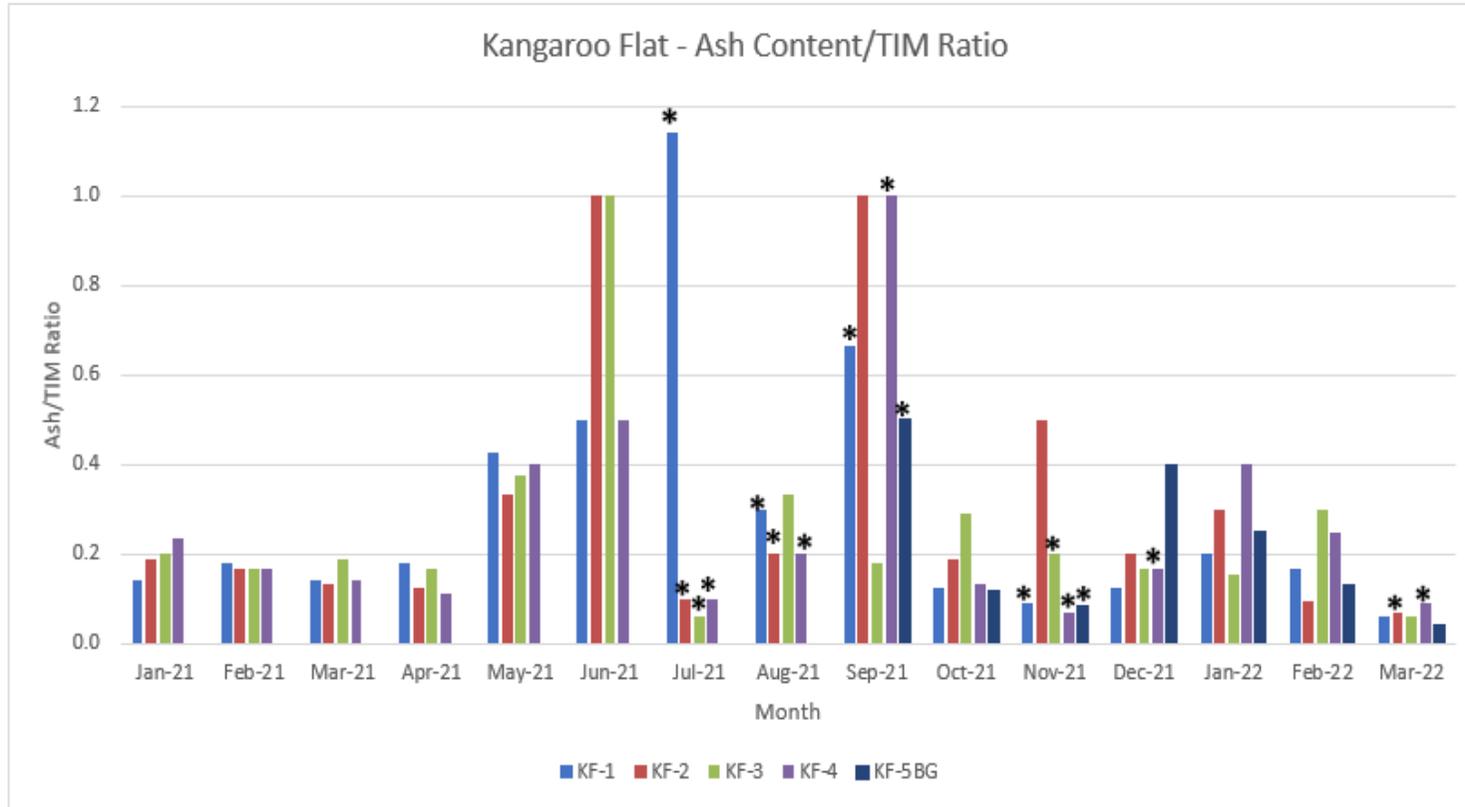


Figure 23 - Kangaroo Flat - Ash Content/TIM Ratio - 2021-2022
 An asterisk (*) has been placed over the samples which recorded as less than (<) the value x displayed on the graph.

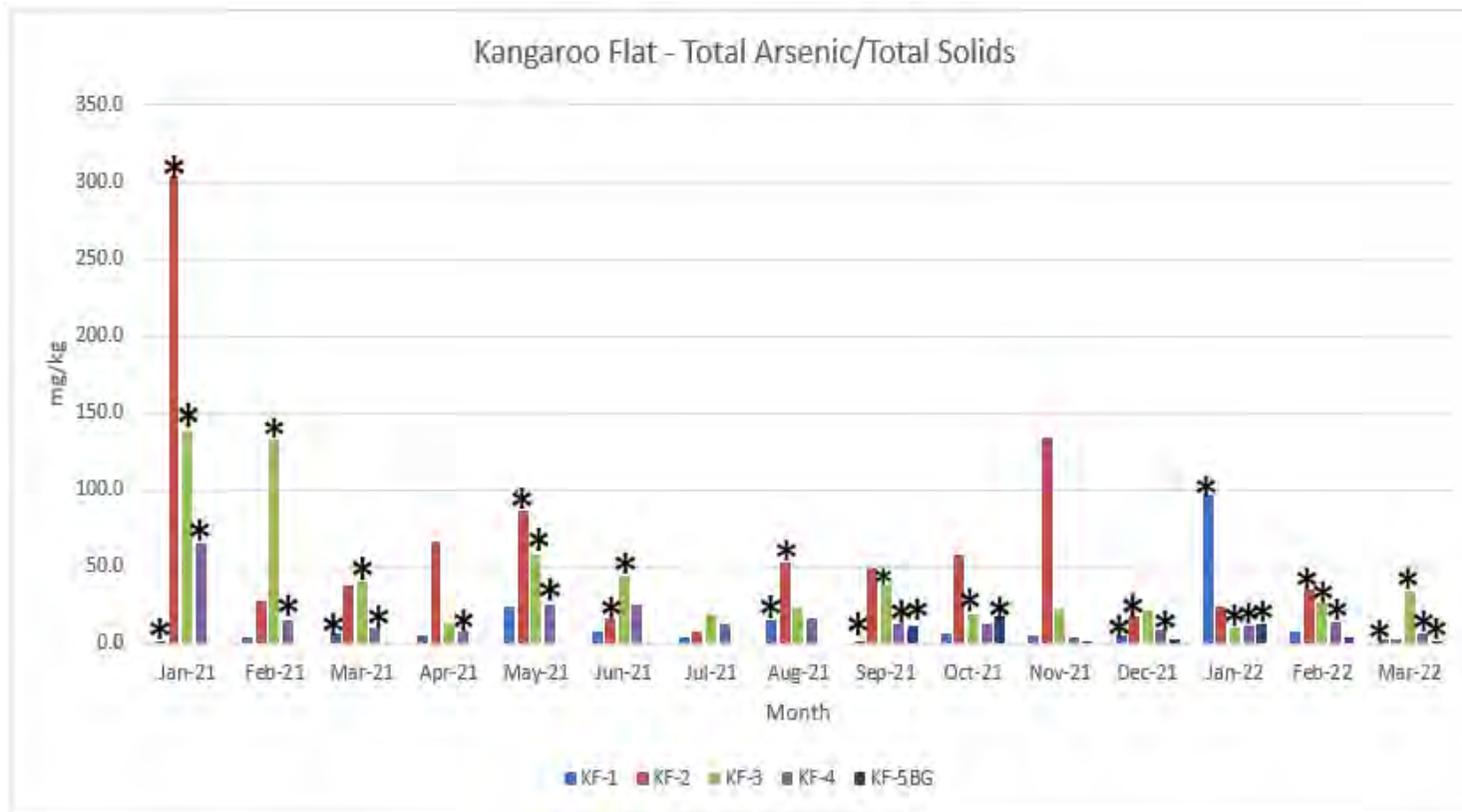


Figure 24 - Kangaroo Flat - Total Arsenic/Total Solids - 2021-2022
 An asterisk (*) has been placed over the samples which recorded as less than (<) the value x displayed on the graph.

By comparing the graphs in Figure 23 and Figure 24 above, it can be concluded that these results for Q1 2022 are trending in line with previous results. Results recorded for Q1 2022 were overall similar to the values recorded in 2021.

Appendix A - Supplementary Information



Dust Sampling – Depositional Dust Gauge Work Procedure

1 Scope

Depositional Dust Gauges are used to collect samples of ambient airborne dust particles. The information is often used to monitor the levels of dust generated by industry activities. Monitoring stations are usually located near lease boundaries, at neighbouring receptor sites (neighbouring properties) or to specifically determine the airborne dust associated with a particular activity (eg. stockpiles). The samples are collected monthly and analysed.

2 Definitions

Dust Gauges	Comprises of a 150 mm diameter soda glass funnel with side angles of 60 degrees. The funnel is supported firmly in the neck of a wide mouth glass bottle. The funnel and bottle are positioned on a fixed stand with the top of the funnel being approximately 2 m above ground. Siting of gauges is as per AS 2922-1987.
Copper Sulfate	(CuSO ₄ .5H ₂ O) – 10ml of CuSO ₄ solution (7.8 g/L copper sulphate pentahydrate in de-ionised water matrix) placed into each of the sample collection flasks prior to placement in the field to inhibit algal growth.
Bottle Exchange	The sample collection period is not to exceed 30 day +/-2 days.

3 References

- AS / NZS 2922:1987 Ambient Air – Guide for the Siting of Sampling Units
- AS / NZS 3580.10.1:2003 Methods for Sampling and Analysis of Ambient Air – Determination of Particulate Matter – Deposited Matter – Gravimetric Method
- MAT-MAP3001 – ALS WRG Queensland Safety Management Plan

4 Procedure

4.1 Location of Depositional Dust Gauges

Depositional Dust Gauges should be located and installed as per AS / NZS 2922:1987.

4.2 Bottle Collection & Deployment

Depositional dust gauges should be collected and deployed as outlined below:

- Upon arrival at each site review any safety considerations such as JSA or "Take 5's" based on site requirements.
- Remove the bottle and funnel from the stand being careful not to spill any of the liquid from the bottle.
- Rinse any deposited matter from the walls of the funnel into the bottle with distilled water and record the required observations on the appropriate Dust Field Forms.
- Remove the funnel and stopper from the bottle and affix the cap to the bottle.
- Record on the field sheet the site number (and bottle number) that has been removed and the time and date of removal.
- Clean the funnel of any residual grease or matter and inspect the stopper for damage or wear.
- Select a new bottle for the site (recording the bottle number if required), remove the cap and insert the funnel.
- Replace the bottle into stand and secure.



4.3 Sample Submission and Laboratory Testing

Submit the sampled deposit flask to a selected analytical laboratory for analysis to AS 3580.10.1 – 1991 as follows:

- Determination of Total Solids
- Insoluble Solids
- Soluble Solids
- Ash and Combustible Matter

Generally the receiving laboratory should report specified particulate parameters in grams/m²/month. Results should be reported to at least 1 decimal place. If required, the volume of liquid contained in each deposit flask should be recorded to give an indication of the rainfall for the exposure period.

The receiving laboratory must hold current NATA accreditation to perform and report the results of these analytical procedures.

5 Equipment

The following items of equipment are required to undertake the servicing of the sites:

- Suitably prepared exchange deposit flasks
- Wash bottle of distilled or de-ionised water
- Narrow bottle brush
- Clean rag or paper towel
- Permanent marker pen
- Insect spray

6 Recording of Results

Field observations shall be recorded on the Field Sheet Form.

Any uncharacteristic weather observations that are observed shall be entered onto the Field Sheet Form. These include any wet weather observations that are outside of what would be expected for the time of year that may impact on samples taken. These can include but are not limited to: Very strong winds, very high temperatures, heavy recent rainfall, very cold temperatures, hail, snow etc.

Appendix B - Laboratory Reports

CERTIFICATE OF ANALYSIS

Work Order : **EM2201387**
Client : **ALS WATER AND HYDROGRAPHICS PTY LTD**
Contact : **ROHAN OLIVER**
Address : **94 KERANG-KOONDROOK ROAD**
 KERANG 3579
Telephone : **—**
Project : **MV214940**
Order number : **—**
C-O-C number : **—**
Sampler : **ROHAN OLIVER**
Site : **—**
Quote number : **ME/968/20**
No. of samples received : **36**
No. of samples analysed : **36**

Page : **1 of 10**
Laboratory : **Environmental Division Melbourne**
Contact : **Customer Services EM**
Address : **4 Westall Rd Springvale VIC Australia 3171**
Telephone : **+61-3-8549 9600**
Date Samples Received : **02-Feb-2022 11:22**
Date Analysis Commenced : **03-Feb-2022**
Issue Date : **11-Feb-2022 12:49**



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Nikki Stepniewski	Senior Inorganic Instrument Chemist	Melbourne Inorganics, Springvale, VIC



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- ALS is not NATA accredited for the analysis of metals in dust deposition gauge.
- Analysis as per AS3580.10.1-2016. Samples passed through a 1mm sieve prior to analysis. NATA accreditation does not apply for results reported in g/m².mth as sampling data was provided by the client.
- Sampling period: 30/12/2021 - 31/01/2022
- Sample exposure period is within the typical exposure period of 30+/-2 days as per AS3580.10.1
- For dust analysis, the Limit of Reporting (LOR) referenced in the reports for deposited matter parameters represents the reporting increment rather than reporting limit.



Analytical Results

Sub-Matrix: DUST (Matrix: AIR)				Sample ID	WVDD01	WVDD02	WVDD03	WVDD04	WVDD05
Sampling date / time					31-Jan-2022 09:35	31-Jan-2022 09:45	31-Jan-2022 09:55	31-Jan-2022 10:10	31-Jan-2022 10:20
Compound	CAS Number	LOR	Unit	EM2201387-001	EM2201387-002	EM2201387-003	EM2201387-004	EM2201387-005	
				Result	Result	Result	Result	Result	
EA120: Ash Content									
Ash Content	---	0.1	g/m ² .month	1.2	0.7	0.5	0.2	0.2	
Ash Content (mg)	---	2	mg	22	14	9	5	5	
EA125: Combustible Matter									
Combustible Matter	---	0.1	g/m ² .month	1.0	5.5	1.5	0.8	0.9	
Combustible Matter (mg)	---	2	mg	20	102	28	16	18	
EA139: Total Soluble Matter									
Total Soluble Matter	---	0.1	g/m ² .month	1.4	5.0	0.3	1.6	2.4	
Total Soluble Matter (mg)	---	2	mg	27	94	6	31	45	
EA141: Total Insoluble Matter									
Total Insoluble Matter	---	0.1	g/m ² .month	2.2	6.2	2.0	1.1	1.2	
Total Insoluble Matter (mg)	---	2	mg	42	116	37	21	23	
EA142: Total Solids									
Total Solids	---	0.1	g/m ² .month	3.6	11.2	2.3	2.7	3.6	
Total Solids (mg)	---	2	mg	69	210	43	52	68	
EG020T: Total Metals by ICP-MS									
Ø Arsenic	7440-38-2	0.05	µg/m ² .month	<11.7	9.04	7.98	3.66	2.68	
Ø Barium	7440-39-3	0.05	µg/m ² .month	<626	<376	<236	<62.6	<72.4	
Ø Manganese	7439-96-5	0.05	µg/m ² .month	219	351	122	33.8	44.3	



Analytical Results

Sub-Matrix: DUST (Matrix: AIR)				Sample ID	WVDD06	WVDD07BG	KF1	KF2	KF3
Sampling date / time					31-Jan-2022 09:25	31-Jan-2022 08:50	31-Jan-2022 11:45	31-Jan-2022 11:30	31-Jan-2022 11:35
Compound	CAS Number	LOR	Unit	EM2201387-006	EM2201387-007	EM2201387-008	EM2201387-009	EM2201387-010	
				Result	Result	Result	Result	Result	
EA120: Ash Content									
Ash Content	---	0.1	g/m ² .month	0.5	0.4	0.2	0.3	0.2	
Ash Content (mg)	---	2	mg	10	8	3	6	3	
EA125: Combustible Matter									
Combustible Matter	---	0.1	g/m ² .month	1.1	0.9	0.8	0.7	1.1	
Combustible Matter (mg)	---	2	mg	21	19	15	12	21	
EA139: Total Soluble Matter									
Total Soluble Matter	---	0.1	g/m ² .month	1.5	3.6	1.5	0.7	6.0	
Total Soluble Matter (mg)	---	2	mg	28	69	28	13	112	
EA141: Total Insoluble Matter									
Total Insoluble Matter	---	0.1	g/m ² .month	1.6	1.4	1.0	1.0	1.3	
Total Insoluble Matter (mg)	---	2	mg	31	27	18	18	24	
EA142: Total Solids									
Total Solids	---	0.1	g/m ² .month	3.1	5.0	2.5	1.7	7.3	
Total Solids (mg)	---	2	mg	59	96	46	31	136	
EG020T: Total Metals by ICP-MS									
⊖ Arsenic	7440-38-2	0.05	µg/m ² .month	<7.50	5.04	<22.5	15.1	<16.7	
⊖ Barium	7440-39-3	0.05	µg/m ² .month	<382	<174	<74.7	<110	<104	
⊖ Manganese	7439-96-5	0.05	µg/m ² .month	127	149	47.9	60.2	73.8	



Analytical Results

Sub-Matrix: DUST (Matrix: AIR)				Sample ID	KF4	KF5BG	WVDD01 Soluble metals	WVDD02 Soluble metals	WVDD03 Soluble metals
Sampling date / time				31-Jan-2022 11:20	31-Jan-2022 11:10	31-Jan-2022 09:35	31-Jan-2022 09:45	31-Jan-2022 09:55	
Compound	CAS Number	LOR	Unit	EM2201387-011	EM2201387-012	EM2201387-013	EM2201387-014	EM2201387-015	
				Result	Result	Result	Result	Result	
EA120: Ash Content									
Ash Content	---	0.1	g/m ² .month	0.4	0.2	---	---	---	
Ash Content (mg)	---	2	mg	7	4	---	---	---	
EA125: Combustible Matter									
Combustible Matter	---	0.1	g/m ² .month	0.6	0.6	---	---	---	
Combustible Matter (mg)	---	2	mg	12	12	---	---	---	
EA139: Total Soluble Matter									
Total Soluble Matter	---	0.1	g/m ² .month	1.3	0.7	---	---	---	
Total Soluble Matter (mg)	---	2	mg	24	13	---	---	---	
EA141: Total Insoluble Matter									
Total Insoluble Matter	---	0.1	g/m ² .month	1.0	0.8	---	---	---	
Total Insoluble Matter (mg)	---	2	mg	19	16	---	---	---	
EA142: Total Solids									
Total Solids	---	0.1	g/m ² .month	2.3	1.5	---	---	---	
Total Solids (mg)	---	2	mg	43	29	---	---	---	
EG020T: Total Metals by ICP-MS									
⌀ Arsenic	7440-38-2	0.05	µg/m ² .month	<10.7	<6.10	7.00	48.9	19.5	
⌀ Barium	7440-39-3	0.05	µg/m ² .month	<117	<91.4	294	452	510	
⌀ Manganese	7439-96-5	0.05	µg/m ² .month	74.3	59.5	586	1330	871	



Analytical Results

Sub-Matrix: DUST (Matrix: AIR)				Sample ID	WVDD04 Soluble metals	WVDD05 Soluble metals	WVDD06 Soluble metals	WVDD07BG Soluble metals	KF1 Soluble metals
Sampling date / time				31-Jan-2022 10:10	31-Jan-2022 10:20	31-Jan-2022 09:25	31-Jan-2022 08:50	31-Jan-2022 11:45	
Compound	CAS Number	LOR	Unit	EM2201387-016	EM2201387-017	EM2201387-018	EM2201387-019	EM2201387-020	
				Result	Result	Result	Result	Result	
EG020T: Total Metals by ICP-MS									
o Arsenic	7440-38-2	0.05	µg/m ³ .month	23.9	51.7	23.8	7.81	219	
o Barium	7440-39-3	0.05	µg/m ³ .month	151	161	996	209	157	
o Manganese	7439-96-5	0.05	µg/m ³ .month	384	529	988	706	410	



Analytical Results

Sub-Matrix: **DUST**
 (Matrix: **AIR**)

Sample ID

				KF2	KF3	KF4	KF5BG	WVDD01
				Soluble metals	Soluble metals	Soluble metals	Soluble metals	Insoluble metals
Sampling date / time				31-Jan-2022 11:30	31-Jan-2022 11:35	31-Jan-2022 11:20	31-Jan-2022 11:10	31-Jan-2022 09:35
Compound	CAS Number	LOR	Unit	EM2201387-021	EM2201387-022	EM2201387-023	EM2201387-024	EM2201387-025
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
∅ Arsenic	7440-38-2	0.05	µg/m ³ .month	23.6	58.9	16.1	12.7	<11.7
∅ Barium	7440-39-3	0.05	µg/m ³ .month	141	180	522	144	<626
∅ Manganese	7439-96-5	0.05	µg/m ³ .month	364	460	436	463	211



Analytical Results

Sub-Matrix: DUST
 (Matrix: AIR)

Sample ID

				WVDD02	WVDD03	WVDD04	WVDD05	WVDD06
				Insoluble metals				
				31-Jan-2022 09:45	31-Jan-2022 09:55	31-Jan-2022 10:10	31-Jan-2022 10:20	31-Jan-2022 09:25
Compound	CAS Number	LOR	Unit	EM2201387-026	EM2201387-027	EM2201387-028	EM2201387-029	EM2201387-030
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
⊖ Arsenic	7440-38-2	0.05	µg/m ² .month	9.11	10.6	8.31	5.11	<7.50
⊖ Barium	7440-39-3	0.05	µg/m ² .month	<376	<238	<62.6	<72.4	<382
⊖ Manganese	7439-96-5	0.05	µg/m ² .month	360	160	68.4	78.2	139



Analytical Results

Sub-Matrix: DUST
 (Matrix: AIR)

				Sample ID	WVDD07BG	KF1	KF2	KF3	KF4
					Insoluble metals				
				Sampling date / time	31-Jan-2022 08:50	31-Jan-2022 11:45	31-Jan-2022 11:30	31-Jan-2022 11:35	31-Jan-2022 11:20
Compound	CAS Number	LOR	Unit		EM2201387-031	EM2201387-032	EM2201387-033	EM2201387-034	EM2201387-035
					Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS									
⊖ Arsenic	7440-38-2	0.05	µg/m ² .month		5.03	<22.5	17.3	<16.7	<10.7
⊖ Barium	7440-39-3	0.05	µg/m ² .month		<174	<74.7	<110	<104	<117
⊖ Manganese	7439-96-5	0.05	µg/m ² .month		191	100	101	95.0	113



Analytical Results

Sub-Matrix: DUST (Matrix: AIR)				Sample ID				
				KF5BG	---	---	---	---
				Insoluble metals	---	---	---	---
				Sampling date / time	31-Jan-2022 11:10	---	---	---
Compound	CAS Number	LOR	Unit	EM2201387-036	---	---	---	---
				Result	---	---	---	---
EG020T: Total Metals by ICP-MS								
⌀ Arsenic	7440-38-2	0.05	µg/m ² .month	<6.10	---	---	---	---
⌀ Barium	7440-39-3	0.05	µg/m ² .month	<91.4	---	---	---	---
⌀ Manganese	7439-96-5	0.05	µg/m ² .month	80.4	---	---	---	---



QUALITY CONTROL REPORT

Work Order : EM2201387

Client : ALS WATER AND HYDROGRAPHICS PTY LTD

Contact : ROHAN OLIVER

Address : 94 KERANG-KOONDROOK ROAD
KERANG 3579

Telephone : —

Project : MV214940

Order number : —

C-O-C number : —

Sampler : ROHAN OLIVER

Site : —

Quote number : ME/968/20

No. of samples received : 36

No. of samples analysed : 36

Page : 1 of 3

Laboratory : Environmental Division Melbourne

Contact : Customer Services EM

Address : 4 Westall Rd Springvale VIC Australia 3171

Telephone : +61-3-8549 9600

Date Samples Received : 02-Feb-2022

Date Analysis Commenced : 03-Feb-2022

Issue Date : 11-Feb-2022



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Nikki Stepniewski	Senior Inorganic Instrument Chemist	Melbourne Inorganics, Springvale, VIC



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :
Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
= Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

- **No Laboratory Duplicate (DUP) Results are required to be reported.**



Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: AIR				Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report			
Method: Compound	CAS Number	LOR	Unit		Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
EA139: Total Soluble Matter (QCLot: 4152219)								
EA139: Total Soluble Matter	---	0.1	g/m ² .month	<0.1	1.66 g/m ² .month	126	70.0	130
EA139: Total Soluble Matter (mg)	---	2	mg	<2	29.3 mg	119	70.0	130
EA141: Total Insoluble Matter (QCLot: 4152220)								
EA141: Total Insoluble Matter	---	0.1	g/m ² .month	<0.1	5.66 g/m ² .month	104	66.8	134
EA141: Total Insoluble Matter (mg)	---	2	mg	<2	100 mg	98.0	67.5	125
EA142: Total Solids (QCLot: 4152221)								
EA142: Total Solids	---	0.1	g/m ² .month	<0.1	---	---	---	---
EA142: Total Solids (mg)	---	2	mg	<2	129.3 mg	103	68.4	126
EG020T: Total Metals by ICP-MS (QCLot: 4164868)								
EG020TUG: Arsenic	7440-38-2	0.05	µg	<0.050	---	---	---	---
EG020TUG: Barium	7440-39-3	0.05	µg	<0.050	---	---	---	---
EG020TUG: Manganese	7439-96-5	0.05	µg	<0.050	---	---	---	---
EG020T: Total Metals by ICP-MS (QCLot: 4164869)								
EG020TUG: Arsenic	7440-38-2	0.05	µg	<0.050	---	---	---	---
EG020TUG: Barium	7440-39-3	0.05	µg	<0.050	---	---	---	---
EG020TUG: Manganese	7439-96-5	0.05	µg	<0.050	---	---	---	---

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.



QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EM2201387	Page	: 1 of 5
Client	: ALS WATER AND HYDROGRAPHICS PTY LTD	Laboratory	: Environmental Division Melbourne
Contact	: ROHAN OLIVER	Telephone	: +61-3-8549 9600
Project	: MV214940	Date Samples Received	: 02-Feb-2022
Site	: —	Issue Date	: 11-Feb-2022
Sampler	: ROHAN OLIVER	No. of samples received	: 36
Order number	: —	No. of samples analysed	: 36

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- NO Method Blank value outliers occur.
- NO Duplicate outliers occur.
- NO Laboratory Control outliers occur.
- NO Matrix Spike outliers occur.
- For all regular sample matrices, NO surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

- NO Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- NO Quality Control Sample Frequency Outliers exist.



Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: AIR

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA120: Ash Content							
Dust Gauge (Bottle) - Benzalkonium Chloride Algaeicide (EA120)							
WVDD01, WVDD02, WVDD03, WVDD04, WVDD05, WVDD06, WVDD07BG, KF1, KF2, KF3, KF4, KF5BG	31-Jan-2022	---	---	---	03-Feb-2022	30-Jul-2022	✓
EA125: Combustible Matter							
Dust Gauge (Bottle) - Benzalkonium Chloride Algaeicide (EA125)							
WVDD01, WVDD02, WVDD03, WVDD04, WVDD05, WVDD06, WVDD07BG, KF1, KF2, KF3, KF4, KF5BG	31-Jan-2022	---	---	---	03-Feb-2022	30-Jul-2022	✓
EA139: Total Soluble Matter							
Dust Gauge (Bottle) - Benzalkonium Chloride Algaeicide (EA139)							
WVDD01, WVDD02, WVDD03, WVDD04, WVDD05, WVDD06, WVDD07BG, KF1, KF2, KF3, KF4, KF5BG	31-Jan-2022	---	---	---	03-Feb-2022	30-Jul-2022	✓
EA141: Total Insoluble Matter							
Dust Gauge (Bottle) - Benzalkonium Chloride Algaeicide (EA141)							
WVDD01, WVDD02, WVDD03, WVDD04, WVDD05, WVDD06, WVDD07BG, KF1, KF2, KF3, KF4, KF5BG	31-Jan-2022	---	---	---	03-Feb-2022	30-Jul-2022	✓



Matrix: AIR Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EA142: Total Solids								
Dust Gauge (Bottle) - Benzalkonium Chloride Algaecide (EA142)								
WVDD01, WVDD03, WVDD05, WVDD07BG, KF2, KF4,	WVDD02, WVDD04, WVDD06, KF1, KF3, KF5BG	31-Jan-2022	---	---	---	03-Feb-2022	30-Jul-2022	✓
EG020T: Total Metals by ICP-MS								
Dust Residue (EG020TUG)								
WVDD01, WVDD03, WVDD05, WVDD07BG, KF2, KF4, WVDD01 - Soluble metals, WVDD03 - Soluble metals, WVDD05 - Soluble metals, WVDD07BG - Soluble metals, KF2 - Soluble metals, KF4 - Soluble metals, WVDD01 - Insoluble metals, WVDD03 - Insoluble metals, WVDD05 - Insoluble metals, WVDD07BG - Insoluble metals, KF2 - Insoluble metals, KF4 - Insoluble metals,	WVDD02, WVDD04, WVDD06, KF1, KF3, KF5BG, WVDD02 - Soluble metals, WVDD04 - Soluble metals, WVDD06 - Soluble metals, KF1 - Soluble metals, KF3 - Soluble metals, KF5BG - Soluble metals, WVDD02 - Insoluble metals, WVDD04 - Insoluble metals, WVDD06 - Insoluble metals, KF1 - Insoluble metals, KF3 - Insoluble metals, KF5BG - Insoluble metals	31-Jan-2022	---	---	---	10-Feb-2022	30-Jul-2022	✓



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: AIR

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
<i>Analytical Methods</i>							
Laboratory Control Samples (LCS)							
Total Insoluble Matter (TIM)	EA141	1	12	8.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Solids (TS)	EA142	1	12	8.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Soluble Matter (SM)	EA139	1	12	8.33	4.76	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Total Insoluble Matter (TIM)	EA141	1	12	8.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals - ICP-MS (mass/filter)	EG020TUG	2	36	5.56	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Solids (TS)	EA142	1	12	8.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Soluble Matter (SM)	EA139	1	12	8.33	4.76	✔	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Ash Content (AC)	EA120	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Ash content in deposited dust.
Combustible Matter (CM)	EA125	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Combustible Matter in deposited dust.
Total Soluble Matter (SM)	EA139	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Soluble Solids in deposited dust.
Total Insoluble Matter (TIM)	EA141	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Total Insoluble solids in deposited dust.
Total Solids (TS)	EA142	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Total Solids in deposited dust.
Total Metals - ICP-MS (mass/filter)	* FGD20011G	AIR	In house: Referenced to APHA 3125; USEPA SW846, 6020 (ICPMS) Metals in Dust residue are quantified by ICPMS and reported as ug of the TIM.



CERTIFICATE OF ANALYSIS

Work Order : EM2203816
Client : ALS WATER AND HYDROGRAPHICS PTY LTD
Contact : ROHAN OLIVER
Address : 94 KERANG-KOONDROOK ROAD
 KERANG 3579
Telephone : —
Project : MV214940
Order number : —
C-O-C number : —
Sampler : R. Oliver
Site : —
Quote number : ME/968/20
No. of samples received : 36
No. of samples analysed : 36

Page : 1 of 10
Laboratory : Environmental Division Melbourne
Contact : Customer Services EM
Address : 4 Westall Rd Springvale VIC Australia 3171
Telephone : +61-3-8549 9600
Date Samples Received : 02-Mar-2022 10:30
Date Analysis Commenced : 08-Mar-2022
Issue Date : 11-Mar-2022 17:50



Accreditation No. 825
 Accredited for compliance with
 ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

- ALS is not NATA accredited for the analysis of metals in dust deposition gauge.
- Analysis as per AS3580.10.1-2016. Samples passed through a 1mm sieve prior to analysis. NATA accreditation does not apply for results reported in g/m².mth as sampling data was provided by the client.
- Sample exposure period is within the typical exposure period of 30+/-2 days as per AS3580.10.1
- For dust analysis, the Limit of Reporting (LOR) referenced in the reports for deposited matter parameters represents the reporting increment rather than reporting limit.



Analytical Results

Sub-Matrix: DUST (Matrix: AIR)				Sample ID	WVDD01	WVDD02	WVDD03	WVDD04	WVDD05
				Sampling date / time	28-Feb-2022 09:50	28-Feb-2022 10:00	28-Feb-2022 10:15	28-Feb-2022 10:30	28-Feb-2022 10:45
Compound	GAS Number	LOR	Unit		EM2203816-001	EM2203816-002	EM2203816-003	EM2203816-004	EM2203816-005
					Result	Result	Result	Result	Result
EA120: Ash Content									
Ash Content	---	0.1	g/m ² .month		0.2	0.2	0.2	0.2	0.2
Ash Content (mg)	---	2	mg		3	2	4	3	3
EA125: Combustible Matter									
Combustible Matter	---	0.1	g/m ² .month		2.1	1.6	1.2	0.1	0.2
Combustible Matter (mg)	---	2	mg		35	28	19	2	3
EA139: Total Soluble Matter									
Total Soluble Matter	---	0.1	g/m ² .month		8.6	1.5	0.6	0.6	2.7
Total Soluble Matter (mg)	---	2	mg		141	25	11	10	44
EA141: Total Insoluble Matter									
Total Insoluble Matter	---	0.1	g/m ² .month		2.3	1.8	1.4	0.3	0.4
Total Insoluble Matter (mg)	---	2	mg		38	30	23	5	6
EA142: Total Solids									
Total Solids	---	0.1	g/m ² .month		10.9	3.3	2.0	0.9	3.1
Total Solids (mg)	---	2	mg		179	55	34	15	50
EG020T: Total Metals by ICP-MS									
Ø Arsenic	7440-38-2	0.05	µg/m ² .month		<4.93	2.68	4.39	<4.54	<4.09
Ø Barium	7440-39-3	0.05	µg/m ² .month		789	<67.2	<113	<52.4	<81.4
Ø Manganese	7439-96-5	0.05	µg/m ² .month		<124	46.6	61.1	47.2	<78.1



Analytical Results

Sub-Matrix: DUST (Matrix: AIR)				Sample ID	WVDD06	WVDD07BG	KF1	KF2	KF3
Sampling date / time					28-Feb-2022 09:30	28-Feb-2022 09:05	28-Feb-2022 12:35	28-Feb-2022 12:20	28-Feb-2022 12:30
Compound	CAS Number	LOR	Unit	EM2203816-006	EM2203816-007	EM2203816-008	EM2203816-009	EM2203816-010	
				Result	Result	Result	Result	Result	
EA120: Ash Content									
Ash Content	---	0.1	g/m ² .month	0.3	0.2	0.2	0.2	0.3	
Ash Content (mg)	---	2	mg	5	3	3	3	5	
EA125: Combustible Matter									
Combustible Matter	---	0.1	g/m ² .month	1.6	0.3	1.0	1.9	0.7	
Combustible Matter (mg)	---	2	mg	27	5	16	31	11	
EA139: Total Soluble Matter									
Total Soluble Matter	---	0.1	g/m ² .month	5.7	0.7	1.5	3.4	1.3	
Total Soluble Matter (mg)	---	2	mg	94	11	24	57	21	
EA141: Total Insoluble Matter									
Total Insoluble Matter	---	0.1	g/m ² .month	1.9	0.5	1.2	2.1	1.0	
Total Insoluble Matter (mg)	---	2	mg	32	8	19	34	16	
EA142: Total Solids									
Total Solids	---	0.1	g/m ² .month	7.6	1.2	2.7	5.5	2.3	
Total Solids (mg)	---	2	mg	126	19	43	91	37	
EG020T: Total Metals by ICP-MS									
Ø Arsenic	7440-38-2	0.05	µg/m ² .month	<6.69	<2.77	8.77	<32.1	<38.1	
Ø Barium	7440-39-3	0.05	µg/m ² .month	<202	<75.8	<70.2	<82.5	<97.7	
Ø Manganese	7439-96-5	0.05	µg/m ² .month	<237	56.9	94.1	<101	105	



Analytical Results

Sub-Matrix: DUST (Matrix: AIR)		Sample ID		KF4	KF5BG	WVDD01	WVDD02	WVDD03
		Sampling date / time		28-Feb-2022 12:15	28-Feb-2022 12:00	28-Feb-2022 09:50	28-Feb-2022 10:00	28-Feb-2022 10:15
Compound	CAS Number	LOR	Unit	EM2203816-011	EM2203816-012	EM2203816-013	EM2203816-014	EM2203816-015
				Result	Result	Result	Result	Result
EA120: Ash Content								
Ash Content	---	0.1	g/m ² .month	0.2	0.2	---	---	---
Ash Content (mg)	---	2	mg	4	3	---	---	---
EA125: Combustible Matter								
Combustible Matter	---	0.1	g/m ² .month	0.6	1.3	---	---	---
Combustible Matter (mg)	---	2	mg	9	22	---	---	---
EA139: Total Soluble Matter								
Total Soluble Matter	---	0.1	g/m ² .month	1.7	1.2	---	---	---
Total Soluble Matter (mg)	---	2	mg	29	20	---	---	---
EA141: Total Insoluble Matter								
Total Insoluble Matter	---	0.1	g/m ² .month	0.8	1.5	---	---	---
Total Insoluble Matter (mg)	---	2	mg	13	25	---	---	---
EA142: Total Solids								
Total Solids	---	0.1	g/m ² .month	2.5	2.7	---	---	---
Total Solids (mg)	---	2	mg	42	45	---	---	---
EG020T: Total Metals by ICP-MS								
Ø Arsenic	7440-38-2	0.05	µg/m ² .month	<20.4	4.85	25.7	8.36	13.9
Ø Barium	7440-39-3	0.05	µg/m ² .month	<82.8	<76.2	700	140	191
Ø Manganese	7439-96-5	0.05	µg/m ² .month	60.3	108	1040	261	326



Analytical Results

Sub-Matrix: DUST (Matrix: AIR)				Sample ID	WVDD04 Soluble metals	WVDD05 Soluble metals	WVDD06 Soluble metals	WVDD07BG Soluble metals	KF1 Soluble metals
Sampling date / time					28-Feb-2022 10:30	28-Feb-2022 10:45	28-Feb-2022 09:30	28-Feb-2022 09:05	28-Feb-2022 12:35
Compound	CAS Number	LOR	Unit		EM2203816-016	EM2203816-017	EM2203816-018	EM2203816-019	EM2203816-020
					Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS									
⊖ Arsenic	7440-38-2	0.05	µg/m ² .month		8.52	22.6	26.7	3.93	10.57
⊖ Barium	7440-39-3	0.05	µg/m ² .month		72.1	125	419	106	148
⊖ Manganese	7439-96-5	0.05	µg/m ² .month		143	531	1580	304	258



Analytical Results

Sub-Matrix: DUST (Matrix: AIR)				Sample ID	KF2 Soluble metals	KF3 Soluble metals	KF4 Soluble metals	KF5BG Soluble metals	WVDD01 Insoluble metals
Sampling date / time				28-Feb-2022 12:20	28-Feb-2022 12:30	28-Feb-2022 12:15	28-Feb-2022 12:00	28-Feb-2022 09:50	
Compound	CAS Number	LOR	Unit	EM2203816-021	EM2203816-022	EM2203816-023	EM2203816-024	EM2203816-025	
				Result	Result	Result	Result	Result	
EG020T: Total Metals by ICP-MS									
Ø Arsenic	7440-38-2	0.05	µg/m ² .month	165	22.5	15.4	5.17	<4.93	
Ø Barium	7440-39-3	0.05	µg/m ² .month	126	55.3	215	76.2	1010	
Ø Manganese	7439-96-5	0.05	µg/m ² .month	604	196	285	137	<124	



Analytical Results

Sub-Matrix: DUST (Matrix: AIR)				Sample ID	WVDD02 Insoluble metals	WVDD03 Insoluble metals	WVDD04 Insoluble metals	WVDD05 Insoluble metals	WVDD06 Insoluble metals
				Sampling date / time	28-Feb-2022 10:00	28-Feb-2022 10:15	28-Feb-2022 10:30	28-Feb-2022 10:45	28-Feb-2022 09:30
Compound	CAS Number	LOR	Unit		EM2203816-026	EM2203816-027	EM2203816-028	EM2203816-029	EM2203816-030
					Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS									
⌀ Arsenic	7440-38-2	0.05	µg/m ² .month		3.31	4.61	<4.54	<4.09	<6.69
⌀ Barium	7440-39-3	0.05	µg/m ² .month		<67.2	<113	<52.4	<81.4	<202
⌀ Manganese	7439-96-5	0.05	µg/m ² .month		68.7	84.7	51.9	<78.1	<237



Analytical Results

Sub-Matrix: DUST
 (Matrix: AIR)

Sample ID

				WDD07BG	KF1	KF2	KF3	KF4
				Insoluble metals				
				28-Feb-2022 09:05	28-Feb-2022 12:35	28-Feb-2022 12:20	28-Feb-2022 12:30	28-Feb-2022 12:15
Compound	CAS Number	LOR	Unit	EM2203816-031	EM2203816-032	EM2203816-033	EM2203816-034	EM2203816-035
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
⊖ Arsenic	7440-38-2	0.05	µg/m ² .month	<2.77	12.0	<32.1	<38.1	<20.4
⊖ Barium	7440-39-3	0.05	µg/m ² .month	<75.8	<70.2	<82.5	<97.7	<82.8
⊖ Manganese	7439-96-5	0.05	µg/m ² .month	68.8	128	<101	138	74.7



Analytical Results

Sub-Matrix: DUST (Matrix: AIR)				Sample ID	KF5BG	---	---	---	---
				Insoluble metals	---	---	---	---	---
				Sampling date / time	28-Feb-2022 12:00	---	---	---	---
Compound	CAS Number	LOR	Unit	EM2203816-036	---	---	---	---	---
				Result	---	---	---	---	---
EG020T: Total Metals by ICP-MS									
⊖ Arsenic	7440-38-2	0.05	µg/m ² .month	5.02	---	---	---	---	---
⊖ Barium	7440-39-3	0.05	µg/m ² .month	<76.2	---	---	---	---	---
⊖ Manganese	7439-96-5	0.05	µg/m ² .month	143	---	---	---	---	---



QUALITY CONTROL REPORT

Work Order : **EM2203816**

Client : **ALS WATER AND HYDROGRAPHICS PTY LTD**

Contact : **ROHAN OLIVER**

Address : **94 KERANG-KOONDROOK ROAD
KERANG 3579**

Telephone : **---**

Project : **MV214940**

Order number : **---**

C-O-C number : **---**

Sampler : **R. Oliver**

Site : **---**

Quote number : **ME/968/20**

No. of samples received : **36**

No. of samples analysed : **36**

Page : **1 of 3**

Laboratory : **Environmental Division Melbourne**

Contact : **Customer Services EM**

Address : **4 Westall Rd Springvale VIC Australia 3171**

Telephone : **+61-3-8549 9600**

Date Samples Received : **02-Mar-2022**

Date Analysis Commenced : **08-Mar-2022**

Issue Date : **11-Mar-2022**



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Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key :
Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
= Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

- **No Laboratory Duplicate (DUP) Results are required to be reported.**



Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: AIR

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
				Result	Spike Concentration	Spike Recovery (%)	Acceptable Limits (%)	
						LCS	Low	High
EA139: Total Soluble Matter (QCLot: 4214173)								
EA139: Total Soluble Matter	---	0.1	g/m ² .month	<0.1	1.66 g/m ² .month	108	70.0	130
EA139: Total Soluble Matter (mg)	---	2	mg	<2	29.3 mg	113	70.0	130
EA141: Total Insoluble Matter (QCLot: 4214174)								
EA141: Total Insoluble Matter	---	0.1	g/m ² .month	<0.1	5.66 g/m ² .month	95.4	66.8	134
EA141: Total Insoluble Matter (mg)	---	2	mg	<2	100 mg	98.0	67.5	125
EA142: Total Solids (QCLot: 4214175)								
EA142: Total Solids	---	0.1	g/m ² .month	<0.1	---	---	---	---
EA142: Total Solids (mg)	---	2	mg	<2	129.3 mg	101	68.4	126
EG020T: Total Metals by ICP-MS (QCLot: 4219421)								
EG020TUG: Arsenic	7440-38-2	0.05	µg	<0.050	---	---	---	---
EG020TUG: Barium	7440-39-3	0.05	µg	<0.050	---	---	---	---
EG020TUG: Manganese	7439-96-5	0.05	µg	<0.050	---	---	---	---
EG020T: Total Metals by ICP-MS (QCLot: 4219422)								
EG020TUG: Arsenic	7440-38-2	0.05	µg	<0.050	---	---	---	---
EG020TUG: Barium	7440-39-3	0.05	µg	<0.050	---	---	---	---
EG020TUG: Manganese	7439-96-5	0.05	µg	<0.050	---	---	---	---
EG020T: Total Metals by ICP-MS (QCLot: 4219423)								
EG020TUG: Arsenic	7440-38-2	0.05	µg	<0.050	---	---	---	---
EG020TUG: Barium	7440-39-3	0.05	µg	<0.050	---	---	---	---
EG020TUG: Manganese	7439-96-5	0.05	µg	<0.050	---	---	---	---

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.



QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EM2203816	Page	: 1 of 5
Client	: ALS WATER AND HYDROGRAPHICS PTY LTD	Laboratory	: Environmental Division Melbourne
Contact	: ROHAN OLIVER	Telephone	: +61-3-8549 9600
Project	: MV214940	Date Samples Received	: 02-Mar-2022
Site	: —	Issue Date	: 11-Mar-2022
Sampler	: R. Oliver	No. of samples received	: 36
Order number	: —	No. of samples analysed	: 36

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- NO Method Blank value outliers occur.
- NO Duplicate outliers occur.
- NO Laboratory Control outliers occur.
- NO Matrix Spike outliers occur.
- For all regular sample matrices, NO surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

- NO Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- NO Quality Control Sample Frequency Outliers exist.



Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: AIR

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA120: Ash Content							
Dust Gauge (Bottle) - Benzalkonium Chloride Algaeicide (EA120) WVDD01, WVDD02, WVDD03, WVDD04, WVDD05, WVDD06, WVDD07BG, KF1, KF2, KF3, KF4, KF5BG	28-Feb-2022	---	---	---	08-Mar-2022	27-Aug-2022	✓
EA125: Combustible Matter							
Dust Gauge (Bottle) - Benzalkonium Chloride Algaeicide (EA125) WVDD01, WVDD02, WVDD03, WVDD04, WVDD05, WVDD06, WVDD07BG, KF1, KF2, KF3, KF4, KF5BG	28-Feb-2022	---	---	---	08-Mar-2022	27-Aug-2022	✓
EA139: Total Soluble Matter							
Dust Gauge (Bottle) - Benzalkonium Chloride Algaeicide (EA139) WVDD01, WVDD02, WVDD03, WVDD04, WVDD05, WVDD06, WVDD07BG, KF1, KF2, KF3, KF4, KF5BG	28-Feb-2022	---	---	---	08-Mar-2022	27-Aug-2022	✓
EA141: Total Insoluble Matter							
Dust Gauge (Bottle) - Benzalkonium Chloride Algaeicide (EA141) WVDD01, WVDD02, WVDD03, WVDD04, WVDD05, WVDD06, WVDD07BG, KF1, KF2, KF3, KF4, KF5BG	28-Feb-2022	---	---	---	08-Mar-2022	27-Aug-2022	✓



Matrix: AIR Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EA142: Total Solids								
Dust Gauge (Bottle) - Benzalkonium Chloride Algaecide (EA142)								
WVDD01, WVDD03, WVDD05, WVDD07BG, KF2, KF4,	WVDD02, WVDD04, WVDD06, KF1, KF3, KF5BG	28-Feb-2022	---	---	---	08-Mar-2022	27-Aug-2022	✓
EG020T: Total Metals by ICP-MS								
Dust Residue (EG020TUG)								
WVDD01, WVDD03, WVDD05, WVDD07BG, KF2, KF4, WVDD01 - Soluble metals, WVDD03 - Soluble metals, WVDD05 - Soluble metals, WVDD07BG - Soluble metals, KF2 - Soluble metals, KF4 - Soluble metals, WVDD01 - Insoluble metals, WVDD03 - Insoluble metals, WVDD05 - Insoluble metals, WVDD07BG - Insoluble metals, KF2 - Insoluble metals, KF4 - Insoluble metals,	WVDD02, WVDD04, WVDD06, KF1, KF3, KF5BG, WVDD02 - Soluble metals, WVDD04 - Soluble metals, WVDD06 - Soluble metals, KF1 - Soluble metals, KF3 - Soluble metals, KF5BG - Soluble metals, WVDD02 - Insoluble metals, WVDD04 - Insoluble metals, WVDD06 - Insoluble metals, KF1 - Insoluble metals, KF3 - Insoluble metals, KF5BG - Insoluble metals	28-Feb-2022	---	---	---	10-Mar-2022	27-Aug-2022	✓



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **AIR**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Laboratory Control Samples (LCS)							
Total Insoluble Matter (TIM)	EA141	1	12	8.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Solids (TS)	EA142	1	12	8.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Soluble Matter (SM)	EA139	1	12	8.33	4.76	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Total Insoluble Matter (TIM)	EA141	1	12	8.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals - ICP-MS (mass/filter)	EG020TUG	3	44	6.82	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Solids (TS)	EA142	1	12	8.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Soluble Matter (SM)	EA139	1	12	8.33	4.76	✔	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Ash Content (AC)	EA120	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Ash content in deposited dust.
Combustible Matter (CM)	EA125	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Combustible Matter in deposited dust.
Total Soluble Matter (SM)	EA139	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Soluble Solids in deposited dust.
Total Insoluble Matter (TIM)	EA141	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Total Insoluble solids in deposited dust.
Total Solids (TS)	EA142	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Total Solids in deposited dust.
Total Metals - ICP-MS (mass/filter)	* EGN20TLIG	AIR	In house: Referenced to APHA 3125; USEPA SW846, 6020 (ICPMS) Metals in Dust residue are quantified by ICPMS and reported as ug of the TIM.

CERTIFICATE OF ANALYSIS

Work Order : **EM2206291**
Client : **ALS WATER AND HYDROGRAPHICS PTY LTD**
Contact : **ROHAN OLIVER**
Address : **94 KERANG-KOONDROOK ROAD**
KERANG 3579
Telephone : **—**
Project : **MV214940**
Order number : **—**
C-O-C number : **—**
Sampler : **ROHAN OLIVER**
Site : **—**
Quote number : **ME/**
No. of samples received : **84**
No. of samples analysed : **84**

Page : **1 of 19**
Laboratory : **Environmental Division Melbourne**
Contact : **Bronwyn Sheen**
Address : **4 Westall Rd Springvale VIC Australia 3171**
Telephone : **+6138549 9600**
Date Samples Received : **05-Apr-2022 10:30**
Date Analysis Commenced : **21-Apr-2022**
Issue Date : **28-Apr-2022 17:59**



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This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Jarwis Nheu	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- ALS is not NATA accredited for the analysis of metals in dust deposition gauge.
- Analysis as per AS3580.10.1-2016. Samples passed through a 1mm sieve prior to analysis. NATA accreditation does not apply for results reported in g/m².mth as sampling data was provided by the client.
- EA120+EA125+EA139+EA141+EA142: EM2206291 #1-#12: Analysis as per AS3580.10.1-2016. Samples passed through a 1mm sieve prior to analysis. NATA accreditation does not apply for results reported in g/m².mth as sampling data was provided by the client.
- **Sampling period 28/2/22 - 1/4/22**
- EA120I+EA125I+EA139I+EA141I+EA142I: EM2206291 #13-#28: Directional dust analysis as per AS3580.10.2-2013. Samples passed through a 1mm sieve prior to analysis. NATA accreditation does not apply for results reported in g/m².mth as sampling data was provided by the client.
- EA120+EA125+EA139+EA141+EA142: EM2206291 #1-#12: Sample exposure period is within the typical exposure period of 30+/-2 days as per AS3580.10.1
- EA120I+EA125I+EA139I+EA141I+EA142I: EM2206291 #13-#18, #20-#26, #28: Sample container was received with no liquid. 100ml of DI water was used to dissolve contents, perform analysis and for calculation of results.
- EA120I+EA125I+EA139I+EA141I+EA142I: EM2206291 #13-#28: Sample exposure period is within the typical exposure period of 30+/-2 days as per AS3580.10.2
- Directional dust analysis as per AS3580.10.2-2013. Samples passed through a 1mm sieve prior to analysis. NATA accreditation does not apply for results reported in g/m².mth as sampling data was provided by the client.
- For dust analysis, the Limit of Reporting (LOR) referenced in the reports for deposited matter parameters represents the reporting increment rather than reporting limit.



Analytical Results

Sub-Matrix: DUST (Matrix: AIR)				Sample ID	WVDD01	WVDD02	WVDD03	WVDD04	WVDD05
Sampling date / time					01-Apr-2022 10:50	01-Apr-2022 09:50	01-Apr-2022 10:30	01-Apr-2022 10:10	01-Apr-2022 10:00
Compound	CAS Number	LOR	Unit	EM2206291-001	EM2206291-002	EM2206291-003	EM2206291-004	EM2206291-005	
				Result	Result	Result	Result	Result	
EA120: Ash Content									
Ash Content	---	0.1	g/m ² .month	0.6	0.5	0.4	0.2	0.2	
Ash Content (mg)	---	2	mg	11	10	8	3	4	
EA125: Combustible Matter									
Combustible Matter	---	0.1	g/m ² .month	3.3	6.8	2.6	1.6	1.6	
Combustible Matter (mg)	---	2	mg	63	127	49	30	30	
EA139: Total Soluble Matter									
Total Soluble Matter	---	0.1	g/m ² .month	4.1	6.0	2.7	1.4	1.6	
Total Soluble Matter (mg)	---	2	mg	77	113	50	26	30	
EA141: Total Insoluble Matter									
Total Insoluble Matter	---	0.1	g/m ² .month	3.9	7.3	3.0	1.8	1.8	
Total Insoluble Matter (mg)	---	2	mg	74	137	57	33	34	
EA142: Total Solids									
Total Solids	---	0.1	g/m ² .month	8.0	13.3	5.7	3.2	3.4	
Total Solids (mg)	---	2	mg	151	250	107	59	64	
EG020T: Total Metals by ICP-MS									
⊖ Arsenic	7440-38-2	0.05	µg/m ² /month	<16.5	<9.48	8.24	<7.03	<3.99	
⊖ Barium	7440-39-3	0.05	µg/m ² /month	<265	<419	<255	<115	<107	
⊖ Manganese	7439-96-5	0.05	µg/m ² /month	180	<345	148	83.4	72.5	



Analytical Results

Sub-Matrix: DUST (Matrix: AIR)		Sample ID		WVDD06	WVDD07BG	KF1	KF2	KF3
Sampling date / time		01-Apr-2022 09:30		01-Apr-2022 09:00	01-Apr-2022 13:20	01-Apr-2022 01:05	01-Apr-2022 13:10	
Compound	GAS Number	LOR	Unit	EM2206291-006	EM2206291-007	EM2206291-008	EM2206291-009	EM2206291-010
				Result	Result	Result	Result	Result
EA120: Ash Content								
Ash Content	---	0.1	g/m ² .month	0.4	0.2	0.1	<0.1	0.1
Ash Content (mg)	---	2	mg	7	4	2	<2	2
EA125: Combustible Matter								
Combustible Matter	---	0.1	g/m ² .month	2.0	1.5	1.5	1.3	1.5
Combustible Matter (mg)	---	2	mg	39	28	28	25	28
EA139: Total Soluble Matter								
Total Soluble Matter	---	0.1	g/m ² .month	3.2	1.4	2.4	0.9	1.5
Total Soluble Matter (mg)	---	2	mg	61	27	45	16	29
EA141: Total Insoluble Matter								
Total Insoluble Matter	---	0.1	g/m ² .month	2.4	1.7	1.6	1.4	1.6
Total Insoluble Matter (mg)	---	2	mg	46	32	30	27	30
EA142: Total Solids								
Total Solids	---	0.1	g/m ² .month	5.6	3.1	4.0	2.3	3.1
Total Solids (mg)	---	2	mg	107	59	75	43	59
EG020T: Total Metals by ICP-MS								
⊖ Arsenic	7440-38-2	0.05	µg/m ² /month	9.97	<2.82	<9.51	4.02	<85.8
⊖ Barium	7440-39-3	0.05	µg/m ² /month	<267	<69.3	<87.1	<62.0	<115
⊖ Manganese	7439-96-5	0.05	µg/m ² /month	125	63.9	58.7	49.8	83.2



Analytical Results

Sub-Matrix: DUST (Matrix: AIR)				Sample ID	KF4	KF5BG	WVDG03N	WVDG03E	WVDG03S
Sampling date / time				01-Apr-2022 13:00	01-Apr-2022 12:50	01-Apr-2022 10:30	01-Apr-2022 10:30	01-Apr-2022 10:30	
Compound	GAS Number	LOR	Unit	EM2206291-011	EM2206291-012	EM2206291-013	EM2206291-014	EM2206291-015	
				Result	Result	Result	Result	Result	
EA120: Ash Content									
Ash Content	---	0.1	g/m ² .month	<0.1	0.1	---	---	---	
Ash Content (mg)	---	2	mg	<2	3	---	---	---	
EA120: Ash Content									
Ash Content	---	0.1	g/m ² .month	---	---	<0.1	<0.1	0.3	
Ash Content (mg)	---	2	mg	---	---	<2	<2	5	
EA125: Combustible Matter									
Combustible Matter	---	0.1	g/m ² .month	1.0	2.3	---	---	---	
Combustible Matter (mg)	---	2	mg	20	43	---	---	---	
EA125: Combustible Matter									
Combustible Matter	---	0.1	g/m ² .month	---	---	1.9	2.2	2.1	
Combustible Matter (mg)	---	2	mg	---	---	30	36	34	
EA139: Total Soluble Matter									
Total Soluble Matter (mg)	---	2	mg	---	---	12	6	10	
Total Soluble Matter	---	0.1	g/m ² .month	0.9	1.6	---	---	---	
Total Soluble Matter (mg)	---	2	mg	16	31	---	---	---	
EA139: Total Soluble Matter									
Total Soluble Matter	---	0.1	g/m ² .month	---	---	0.8	0.3	0.6	
EA141: Total Insoluble Matter									
Total Insoluble Matter	---	0.1	g/m ² .month	1.1	2.4	---	---	---	
Total Insoluble Matter (mg)	---	2	mg	---	---	31	37	39	
Total Insoluble Matter (mg)	---	2	mg	21	46	---	---	---	
EA141: Total Insoluble Matter									
Total Insoluble Matter	---	0.1	g/m ² .month	---	---	1.9	2.3	2.4	
EA142: Total Solids									
Total Solids	---	0.1	g/m ² .month	2.0	4.0	---	---	---	
Total Solids (mg)	---	2	mg	---	---	43	43	49	
Total Solids (mg)	---	2	mg	37	77	---	---	---	
EA142: Total Solids									
Total Solids	---	0.1	g/m ² .month	---	---	2.7	2.6	3.0	
EG020T: Total Metals by ICP-MS									
⊕ Arsenic	7440-38-2	0.05	µg/m ² /month	4.89	5.32	0.54	0.55	4.33	
⊕ Barium	7440-39-3	0.05	µg/m ² /month	68.7	<85.7	538	72.5	<105	
⊕ Manganese	7439-96-5	0.05	µg/m ² /month	43.3	100	15.0	14.4	51.7	



Analytical Results

Sub-Matrix: DUST (Matrix: AIR)				Sample ID	WVDG03W	WVDG04N	WVDG04E	WVDG04S	WVDG04W
Sampling date / time				01-Apr-2022 10:30	01-Apr-2022 10:10	01-Apr-2022 10:10	01-Apr-2022 10:10	01-Apr-2022 10:10	
Compound	CAS Number	LOR	Unit	EM2206291-016	EM2206291-017	EM2206291-018	EM2206291-019	EM2206291-020	
				Result	Result	Result	Result	Result	
EA120I: Ash Content									
Ash Content	---	0.1	g/m ² .month	<0.1	<0.1	0.3	0.9	<0.1	
Ash Content (mg)	---	2	mg	<2	<2	4	15	<2	
EA125I: Combustible Matter									
Combustible Matter	---	0.1	g/m ² .month	0.9	1.2	1.6	2.9	1.6	
Combustible Matter (mg)	---	2	mg	15	20	27	47	27	
EA139I: Total Soluble Matter									
Total Soluble Matter (mg)	---	2	mg	14	4	5	21	6	
EA139I: Total Soluble Matter									
Total Soluble Matter	---	0.1	g/m ² .month	0.9	0.2	0.3	1.3	0.4	
EA141I: Total Insoluble Matter									
Total Insoluble Matter (mg)	---	2	mg	15	20	31	62	28	
EA141I: Total Insoluble Matter									
Total Insoluble Matter	---	0.1	g/m ² .month	0.9	1.2	1.9	3.8	1.7	
EA142I: Total Solids									
Total Solids (mg)	---	2	mg	29	24	36	83	34	
EA142I: Total Solids									
Total Solids	---	0.1	g/m ² .month	1.8	1.4	2.2	5.1	2.1	
EG020T: Total Metals by ICP-MS									
∅ Arsenic	7440-38-2	0.05	µg/m ² /month	0.21	<0.07	<3.91	<13.9	<3.29	
∅ Barium	7440-39-3	0.05	µg/m ² /month	17.2	<18.0	<194	<608	45.5	
∅ Manganese	7439-96-5	0.05	µg/m ² /month	10.8	6.90	<78.0	197	33.5	



Analytical Results

Sub-Matrix: DUST
 (Matrix: AIR)

Sample ID

				WVDG05N	WVDG05E	WVDG05S	WVDG05W	WVDG06N
		Sampling date / time		01-Apr-2022 10:00	01-Apr-2022 10:00	01-Apr-2022 10:00	01-Apr-2022 10:50	01-Apr-2022 00:00
Compound	CAS Number	LOR	Unit	EM2206291-021	EM2206291-022	EM2206291-023	EM2206291-024	EM2206291-025
				Result	Result	Result	Result	Result
EA120I: Ash Content								
Ash Content	---	0.1	g/m ² .month	0.6	0.1	<0.1	<0.1	<0.1
Ash Content (mg)	---	2	mg	10	2	<2	<2	<2
EA125I: Combustible Matter								
Combustible Matter	---	0.1	g/m ² .month	4.1	2.2	1.9	1.8	2.1
Combustible Matter (mg)	---	2	mg	66	35	31	29	33
EA139: Total Soluble Matter								
Total Soluble Matter (mg)	---	2	mg	10	3	3	5	4
EA139I: Total Soluble Matter								
Total Soluble Matter	---	0.1	g/m ² .month	0.6	0.2	0.2	0.3	0.2
EA141: Total Insoluble Matter								
Total Insoluble Matter (mg)	---	2	mg	76	37	31	30	34
EA141I: Total Insoluble Matter								
Total Insoluble Matter	---	0.1	g/m ² .month	4.7	2.3	1.9	1.8	2.1
EA142: Total Solids								
Total Solids (mg)	---	2	mg	86	40	34	35	38
EA142I: Total Solids								
Total Solids	---	0.1	g/m ² .month	5.3	2.5	2.1	2.1	2.3
EG020T: Total Metals by ICP-MS								
⊖ Arsenic	7440-38-2	0.05	µg/m ² /month	6.21	0.40	0.52	0.85	1.44
⊖ Barium	7440-39-3	0.05	µg/m ² /month	<257	13.7	<41.1	11.8	<40.6
⊖ Manganese	7439-96-5	0.05	µg/m ² /month	73.2	10.8	15.4	8.05	72.7



Analytical Results

Sub-Matrix: DUST (Matrix: AIR)				Sample ID	WVDG06E	WVDG06S	WVDG06W	WVDD01 Soluble metals	WVDD02 Soluble metals
Sampling date / time				01-Apr-2022 00:00	01-Apr-2022 00:00	01-Apr-2022 00:00	01-Apr-2022 00:00	01-Apr-2022 09:50	
Compound	CAS Number	LOR	Unit	EM2206291-026	EM2206291-027	EM2206291-028	EM2206291-029	EM2206291-030	
				Result	Result	Result	Result	Result	
EA120I: Ash Content									
Ash Content	---	0.1	g/m ² .month	<0.1	1.4	0.1	---	---	
Ash Content (mg)	---	2	mg	<2	23	<2	---	---	
EA125I: Combustible Matter									
Combustible Matter	---	0.1	g/m ² .month	1.4	3.3	0.9	---	---	
Combustible Matter (mg)	---	2	mg	24	54	14	---	---	
EA139: Total Soluble Matter									
Total Soluble Matter (mg)	---	2	mg	8	18	11	---	---	
EA139I: Total Soluble Matter									
Total Soluble Matter	---	0.1	g/m ² .month	0.5	1.1	0.7	---	---	
EA141: Total Insoluble Matter									
Total Insoluble Matter (mg)	---	2	mg	25	77	16	---	---	
EA141I: Total Insoluble Matter									
Total Insoluble Matter	---	0.1	g/m ² .month	1.5	4.7	1.0	---	---	
EA142: Total Solids									
Total Solids (mg)	---	2	mg	33	95	27	---	---	
EA142I: Total Solids									
Total Solids	---	0.1	g/m ² .month	2.0	5.8	1.7	---	---	
EG020T: Total Metals by ICP-MS									
⊖ Arsenic	7440-38-2	0.05	µg/m ² /month	<0.25	<25.3	<1.69	14.6	17.0	
⊖ Barium	7440-39-3	0.05	µg/m ² /month	<20.1	<428	<48.4	369	269	
⊖ Manganese	7439-96-5	0.05	µg/m ² /month	<24.5	<962	<65.9	913	813	



Analytical Results

Sub-Matrix: DUST
 (Matrix: AIR)

Sample ID

				WVDD03	WVDD04	WVDD05	WVDD06	WVDD07BG
				Soluble metals				
				01-Apr-2022 10:30	01-Apr-2022 10:10	01-Apr-2022 10:00	01-Apr-2022 09:30	01-Apr-2022 09:00
Compound	CAS Number	LOR	Unit	EM2206291-031	EM2206291-032	EM2206291-033	EM2206291-034	EM2206291-035
Sampling date / time				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
⌀ Arsenic	7440-38-2	0.05	µg/m2/month	<0.05	<0.05	1.43	27.9	8.28
⌀ Barium	7440-39-3	0.05	µg/m2/month	481	138	155	1060	235
⌀ Manganese	7439-96-5	0.05	µg/m2/month	842	416	548	880	430



Analytical Results

Sub-Matrix: **DUST**
 (Matrix: **AIR**)

Sample ID

				KF1	KF2	KF3	KF4	KF5BG
				Soluble metals				
				01-Apr-2022 13:20	01-Apr-2022 13:05	01-Apr-2022 13:10	01-Apr-2022 13:00	01-Apr-2022 12:50
Compound	CAS Number	LOR	Unit	EM2206291-036	EM2206291-037	EM2206291-038	EM2206291-039	EM2206291-040
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
⌀ Arsenic	7440-38-2	0.05	µg/m2/month	<0.05	1.99	20.3	<0.05	<0.05
⌀ Barium	7440-39-3	0.05	µg/m2/month	143	151	94.4	449	95.9
⌀ Manganese	7439-96-5	0.05	µg/m2/month	318	259	250	279	300



Analytical Results

Sub-Matrix: DUST (Matrix: AIR)				Sample ID	WVDG03N Soluble metals	WVDG03E Soluble metals	WVDG03S Soluble metals	WVDG03W Soluble metals	WVDG04N Soluble metals
				Sampling date / time	01-Apr-2022 10:30	01-Apr-2022 10:30	01-Apr-2022 10:30	01-Apr-2022 10:30	01-Apr-2022 10:10
Compound	CAS Number	LOR	Unit	EM2206291-041	EM2206291-042	EM2206291-043	EM2206291-044	EM2206291-045	EM2206291-045
				Result	Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS									
ø Arsenic	7440-38-2	0.05	µg/m2/month	0.92	0.61	6.72	0.97	<0.05	
ø Barium	7440-39-3	0.05	µg/m2/month	230	39.1	39.1	27.0	20.1	
ø Manganese	7439-96-5	0.05	µg/m2/month	66.7	28.5	74.7	51.0	22.9	



Analytical Results

Sub-Matrix: **DUST**
 (Matrix: **AIR**)

Sample ID

				WVDG04E	WVDG04S	WVDG04W	WVDG05N	WVDG05E
				Soluble metals				
				01-Apr-2022 10:10	01-Apr-2022 10:10	01-Apr-2022 10:10	01-Apr-2022 10:00	01-Apr-2022 10:00
Compound	CAS Number	LOR	Unit	EM2206291-046	EM2206291-047	EM2206291-048	EM2206291-049	EM2206291-050
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
⌀ Arsenic	7440-38-2	0.05	µg/m2/month	0.34	7.30	0.21	1.01	<0.05
⌀ Barium	7440-39-3	0.05	µg/m2/month	36.6	181	47.2	34.9	25.7
⌀ Manganese	7439-96-5	0.05	µg/m2/month	34.7	235	41.9	36.5	24.3



Analytical Results

Sub-Matrix: **DUST**
 (Matrix: **AIR**)

Sample ID

				WVDG05S Soluble metals	WVDG05W Soluble metals	WVDG06N Soluble metals	WVDG06E Soluble metals	WVDG06S Soluble metals
Sampling date / time				01-Apr-2022 10:00	01-Apr-2022 10:00	01-Apr-2022 09:30	01-Apr-2022 09:30	01-Apr-2022 09:30
Compound	CAS Number	LOR	Unit	EM2206291-051	EM2206291-052	EM2206291-053	EM2206291-054	EM2206291-055
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
⊖ Arsenic	7440-38-2	0.05	µg/m ² /month	<0.05	0.29	1.09	4.19	15.0
⊖ Barium	7440-39-3	0.05	µg/m ² /month	19.6	20.3	24.4	22.9	71.8
⊖ Manganese	7439-96-5	0.05	µg/m ² /month	24.6	37.8	51.6	68.9	520



Analytical Results

Sub-Matrix: **DUST**
 (Matrix: **AIR**)

Sample ID

				WVDG06W Soluble metals	WVDD01 Insoluble metals	WVDD02 Insoluble metals	WVDD03 Insoluble metals	WVDD04 Insoluble metals
Sampling date / time				01-Apr-2022 09:30	01-Apr-2022 10:50	01-Apr-2022 09:50	01-Apr-2022 10:30	01-Apr-2022 10:10
Compound	CAS Number	LOR	Unit	EM2206291-056	EM2206291-057	EM2206291-058	EM2206291-059	EM2206291-060
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ø Arsenic	7440-38-2	0.05	µg/m2/month	4.04	<16.5	<9.48	8.83	<7.03
ø Barium	7440-39-3	0.05	µg/m2/month	29.0	<265	<419	<255	<115
ø Manganese	7439-96-5	0.05	µg/m2/month	111	212	<345	174	95.4



Analytical Results

Sub-Matrix: DUST
 (Matrix: AIR)

Sample ID

				WVDD05	WVDD06	WVDD07BG	KF1	KF2
				Insoluble metals				
Sampling date / time				01-Apr-2022 10:00	01-Apr-2022 09:30	01-Apr-2022 09:00	01-Apr-2022 13:20	01-Apr-2022 13:05
Compound	CAS Number	LOR	Unit	EM2206291-061	EM2206291-062	EM2206291-063	EM2206291-064	EM2206291-065
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
o Arsenic	7440-38-2	0.05	µg/m2/month	<3.99	12.4	<2.82	<9.51	5.34
o Barium	7440-39-3	0.05	µg/m2/month	<107	<267	<69.3	<87.1	<62.0
o Manganese	7439-96-5	0.05	µg/m2/month	114	209	83.0	89.2	53.3



Analytical Results

Sub-Matrix: DUST (Matrix: AIR)				Sample ID	KF3 Insoluble metals	KF4 Insoluble metals	KF5BG Insoluble metals	WVDG03N Insoluble metals	WVDG03E Insoluble metals
Sampling date / time					01-Apr-2022 13:10	01-Apr-2022 13:00	01-Apr-2022 12:50	01-Apr-2022 10:30	01-Apr-2022 00:00
Compound	GAS Number	LOR	Unit	EM2206291-066	EM2206291-067	EM2206291-068	EM2206291-069	EM2206291-070	
				Result	Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS									
⌀ Arsenic	7440-38-2	0.05	µg/m2/month	<85.8	12.5	6.07	1.47	3.15	
⌀ Barium	7440-39-3	0.05	µg/m2/month	<115	111	<85.7	1340	336	
⌀ Manganese	7439-96-5	0.05	µg/m2/month	99.9	103	136	30.8	40.8	



Analytical Results

Sub-Matrix: DUST
 (Matrix: AIR)

Sample ID

				WVDG03S	WVDG03W	WVDG04N	WVDG04E	WVDG04S
				Insoluble metals				
				01-Apr-2022 00:00	01-Apr-2022 00:00	01-Apr-2022 10:10	01-Apr-2022 10:10	01-Apr-2022 10:10
Compound	CAS Number	LOR	Unit	EM2206291-071	EM2206291-072	EM2206291-073	EM2206291-074	EM2206291-075
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
⌀ Arsenic	7440-38-2	0.05	µg/m2/month	5.63	1.22	<0.07	<3.91	<13.9
⌀ Barium	7440-39-3	0.05	µg/m2/month	<105	21.9	<18.0	<194	<608
⌀ Manganese	7439-96-5	0.05	µg/m2/month	64.5	20.4	8.76	<78.0	197



Analytical Results

Sub-Matrix: DUST
 (Matrix: AIR)

Sample ID

				WVDG04W	WVDG05N	WVDG05E	WVDG05S	WVDG05W
				Insoluble metals				
				01-Apr-2022 10:10	01-Apr-2022 10:00	01-Apr-2022 10:00	01-Apr-2022 10:00	01-Apr-2022 10:00
Compound	CAS Number	LOR	Unit	EM2206291-076	EM2206291-077	EM2206291-078	EM2206291-079	EM2206291-080
				Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS								
ø Arsenic	7440-38-2	0.05	µg/m2/month	<3.29	7.93	1.18	0.92	1.09
ø Barium	7440-39-3	0.05	µg/m2/month	49.9	<257	25.6	<41.1	21.2
ø Manganese	7439-96-5	0.05	µg/m2/month	39.8	78.4	21.5	22.4	22.4



Analytical Results

Sub-Matrix: DUST (Matrix: AIR)				Sample ID	WVDG06N Insoluble metals	WVDG06E Insoluble metals	WVDG06S Insoluble metals	WVDG06W Insoluble metals	---
Sampling date / time				01-Apr-2022 09:30	01-Apr-2022 09:30	01-Apr-2022 09:30	01-Apr-2022 09:30	01-Apr-2022 09:30	---
Compound	CAS Number	LOR	Unit	EM2206291-081	EM2206291-082	EM2206291-083	EM2206291-084	---	---
				Result	Result	Result	Result	---	---
EG020T: Total Metals by ICP-MS									
⊖ Arsenic	7440-38-2	0.05	µg/m2/month	2.64	<0.25	<25.3	<1.69	---	---
⊖ Barium	7440-39-3	0.05	µg/m2/month	<40.6	<20.1	<428	<48.4	---	---
⊖ Manganese	7439-96-5	0.05	µg/m2/month	110	<24.5	<962	<65.9	---	---



QUALITY CONTROL REPORT

Work Order : EM2206291

Client : ALS WATER AND HYDROGRAPHICS PTY LTD

Contact : ROHAN OLIVER

Address : 94 KERANG-KOONDROOK ROAD
KERANG 3579

Telephone : —

Project : MV214940

Order number : —

C-O-C number : —

Sampler : ROHAN OLIVER

Site : —

Quote number : ME/

No. of samples received : 84

No. of samples analysed : 84

Page : 1 of 4

Laboratory : Environmental Division Melbourne

Contact : Bronwyn Sheen

Address : 4 Westall Rd Springvale VIC Australia 3171

Telephone : +6138549 9600

Date Samples Received : 05-Apr-2022

Date Analysis Commenced : 21-Apr-2022

Issue Date : 28-Apr-2022



Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	Position	Accreditation Category
Jarwis Nheu	Senior Inorganic Chemist	Melbourne Inorganics, Springvale, VIC



General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

- **No Laboratory Duplicate (DUP) Results are required to be reported.**



Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: AIR				Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report			
Method: Compound	CAS Number	LOR	Unit		Spike Concentration	Spike Recovery (%)		Acceptable Limits (%)
				LCS		Low	High	
EA139: Total Soluble Matter (QCLot: 4297109)								
EA139: Total Soluble Matter	---	0.1	g/m ² .month	<0.1	1.66 g/m ² .month	102	70.0	130
EA139: Total Soluble Matter (mg)	---	2	mg	<2	29.3 mg	88.7	70.0	130
EA141: Total Insoluble Matter (QCLot: 4297108)								
EA141: Total Insoluble Matter	---	0.1	g/m ² .month	<0.1	5.66 g/m ² .month	110	70.0	130
EA141: Total Insoluble Matter (mg)	---	2	mg	<2	100 mg	98.0	70.0	130
EA142: Total Solids (QCLot: 4297107)								
EA142: Total Solids	---	0.1	g/m ² .month	<0.1	7.32 g/m ² .month	108	70.0	130
EA142: Total Solids (mg)	---	2	mg	<2	129.3 mg	95.9	70.0	130
EA139: Total Soluble Matter (QCLot: 4297105)								
EA139: Total Soluble Matter	---	0.1	g/m ² .month	<0.1	1.66 g/m ² .month	108	70.0	130
EA139: Total Soluble Matter (mg)	---	2	mg	<2	29.3 mg	113	70.0	130
EA141: Total Insoluble Matter (QCLot: 4297106)								
EA141: Total Insoluble Matter	---	0.1	g/m ² .month	<0.1	5.66 g/m ² .month	95.4	66.8	134
EA141: Total Insoluble Matter (mg)	---	2	mg	<2	100 mg	99.0	67.5	125
EA142: Total Solids (QCLot: 4297104)								
EA142: Total Solids	---	0.1	g/m ² .month	<0.1	---	---	---	---
EA142: Total Solids (mg)	---	2	mg	<2	129.3 mg	102	68.4	126
EG020T: Total Metals by ICP-MS (QCLot: 4306296)								
EG020TUG: Arsenic	7440-38-2	0.05	µg	<0.050	---	---	---	---
EG020TUG: Barium	7440-39-3	0.05	µg	<0.050	---	---	---	---
EG020TUG: Manganese	7439-96-5	0.05	µg	<0.050	---	---	---	---
EG020T: Total Metals by ICP-MS (QCLot: 4306297)								
EG020TUG: Arsenic	7440-38-2	0.05	µg	<0.050	---	---	---	---
EG020TUG: Barium	7440-39-3	0.05	µg	<0.050	---	---	---	---
EG020TUG: Manganese	7439-96-5	0.05	µg	<0.050	---	---	---	---
EG020T: Total Metals by ICP-MS (QCLot: 4306298)								
EG020TUG: Arsenic	7440-38-2	0.05	µg	<0.050	---	---	---	---
EG020TUG: Barium	7440-39-3	0.05	µg	<0.050	---	---	---	---
EG020TUG: Manganese	7439-96-5	0.05	µg	<0.050	---	---	---	---
EG020T: Total Metals by ICP-MS (QCLot: 4306299)								
EG020TUG: Arsenic	7440-38-2	0.05	µg	<0.050	---	---	---	---
EG020TUG: Barium	7440-39-3	0.05	µg	<0.050	---	---	---	---
EG020TUG: Manganese	7439-96-5	0.05	µg	<0.050	---	---	---	---



Sub-Matrix: AIR				Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report			
Method: Compound	CAS Number	LOR	Unit		Spike Concentration	Spike Recovery (%) LCS	Acceptable Limits (%) Low High	
EG020T: Total Metals by ICP-MS (QCLot: 4306300)								
EG020TUG: Arsenic	7440-38-2	0.05	µg	<0.050	---	---	---	---
EG020TUG: Barium	7440-39-3	0.05	µg	<0.050	---	---	---	---
EG020TUG: Manganese	7439-96-5	0.05	µg	<0.050	---	---	---	---

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

- No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EM2206291	Page	: 1 of 10
Client	: ALS WATER AND HYDROGRAPHICS PTY LTD	Laboratory	: Environmental Division Melbourne
Contact	: ROHAN OLIVER	Telephone	: +6138549 9600
Project	: MV214940	Date Samples Received	: 05-Apr-2022
Site	: ---	Issue Date	: 28-Apr-2022
Sampler	: ROHAN OLIVER	No. of samples received	: 84
Order number	: ---	No. of samples analysed	: 84

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- NO Method Blank value outliers occur.
- NO Duplicate outliers occur.
- NO Laboratory Control outliers occur.
- NO Matrix Spike outliers occur.
- For all regular sample matrices, NO surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

- NO Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- NO Quality Control Sample Frequency Outliers exist.



Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: AIR

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA120: Ash Content							
Directional Dust Gauge - Plastic - Benzalkonium Chloride Algaecide (EA120) WVDD01, WVDD02, WVDD03, WVDD04	01-Apr-2022	---	---	---	21-Apr-2022	01-May-2022	✓
Directional Dust Gauge - Unpreserved (EA120) WVDD05, WVDD06, WVDD07BG, KF1, KF2, KF3, KF4, KF5BG	01-Apr-2022	---	---	---	21-Apr-2022	01-May-2022	✓
EA120I: Ash Content							
Directional Dust Gauge - Plastic - Benzalkonium Chloride Algaecide (EA120I) WVDG03N, WVDG03E, WVDG03S, WVDG03W, WVDG04N, WVDG04E, WVDG04S, WVDG04W, WVDG05N, WVDG05E, WVDG05S, WVDG05W, WVDG06N, WVDG06E, WVDG06S, WVDG06W	01-Apr-2022	---	---	---	21-Apr-2022	01-May-2022	✓
EA125: Combustible Matter							
Directional Dust Gauge - Plastic - Benzalkonium Chloride Algaecide (EA125) WVDD01, WVDD02, WVDD03, WVDD04	01-Apr-2022	---	---	---	21-Apr-2022	01-May-2022	✓
Directional Dust Gauge - Unpreserved (EA125) WVDD05, WVDD06, WVDD07BG, KF1, KF2, KF3, KF4, KF5BG	01-Apr-2022	---	---	---	21-Apr-2022	01-May-2022	✓



Matrix: AIR Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA125: Combustible Matter							
Directional Dust Gauge - Plastic - Benzalkonium Chloride Algaeide (EA125I)							
WVDG03N, WVDG03S, WVDG04N, WVDG04S, WVDG05N, WVDG05S, WVDG06N, WVDG06S,	WVDG03E, WVDG03W, WVDG04E, WVDG04W, WVDG05E, WVDG05W, WVDG06E, WVDG06W	01-Apr-2022	---	---	---	21-Apr-2022	01-May-2022 ✓
EA139: Total Soluble Matter							
Directional Dust Gauge - Plastic - Benzalkonium Chloride Algaeide (EA139I)							
WVDD01, WVDG03N, WVDG03S, WVDG04N, WVDG04S, WVDG05N, WVDG05S, WVDG06N, WVDG06S,	WVDD02, WVDG03E, WVDG03W, WVDG04E, WVDG04W, WVDG05E, WVDG05W, WVDG06E, WVDG06W	01-Apr-2022	---	---	---	21-Apr-2022	01-May-2022 ✓
Directional Dust Gauge - Unpreserved (EA139)							
WVDD05, WVDD07BG, KF2, KF4,	WVDD06, KF1, KF3, KF5BG	01-Apr-2022	---	---	---	21-Apr-2022	01-May-2022 ✓
EA139I: Total Soluble Matter							
Directional Dust Gauge - Plastic - Benzalkonium Chloride Algaeide (EA139I)							
WVDG03N, WVDG03S, WVDG04N, WVDG04S, WVDG05N, WVDG05S, WVDG06N, WVDG06S,	WVDG03E, WVDG03W, WVDG04E, WVDG04W, WVDG05E, WVDG05W, WVDG06E, WVDG06W	01-Apr-2022	---	---	---	21-Apr-2022	01-May-2022 ✓



Matrix: AIR

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA141: Total Insoluble Matter							
Directional Dust Gauge - Plastic - Benzalkonium Chloride Algaecide (EA141) W/DD01, W/DD02, W/DD03, W/DD04, W/DG03N, W/DG03E, W/DG03S, W/DG03W, W/DG04N, W/DG04E, W/DG04S, W/DG04W, W/DG05N, W/DG05E, W/DG05S, W/DG05W, W/DG06N, W/DG06E, W/DG06S, W/DG06W	01-Apr-2022	---	---	---	21-Apr-2022	01-May-2022	✓
Directional Dust Gauge - Unpreserved (EA141) W/DD05, W/DD06, W/DD07BG, KF1, KF2, KF3, KF4, KF5BG	01-Apr-2022	---	---	---	21-Apr-2022	01-May-2022	✓
EA141: Total Insoluble Matter							
Directional Dust Gauge - Plastic - Benzalkonium Chloride Algaecide (EA141) W/DG03N, W/DG03E, W/DG03S, W/DG03W, W/DG04N, W/DG04E, W/DG04S, W/DG04W, W/DG05N, W/DG05E, W/DG05S, W/DG05W, W/DG06N, W/DG06E, W/DG06S, W/DG06W	01-Apr-2022	---	---	---	21-Apr-2022	01-May-2022	✓



Matrix: AIR

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA142: Total Solids							
Directional Dust Gauge - Plastic - Benzalkonium Chloride Algacide (EA142)							
WVDD01, WVDD02, WVDD03, WVDD04, WVDG03N, WVDG03E, WVDG03S, WVDG03W, WVDG04N, WVDG04E, WVDG04S, WVDG04W, WVDG05N, WVDG05E, WVDG05S, WVDG05W, WVDG06N, WVDG06E, WVDG06S, WVDG06W	01-Apr-2022	---	---	---	21-Apr-2022	01-May-2022	✓
Directional Dust Gauge - Unpreserved (EA142)							
WVDD05, WVDD06, WVDD07BG, KF1, KF2, KF3, KF4, KF5BG	01-Apr-2022	---	---	---	21-Apr-2022	01-May-2022	✓
EA142: Total Solids							
Directional Dust Gauge - Plastic - Benzalkonium Chloride Algacide (EA142)							
WVDG03N, WVDG03E, WVDG03S, WVDG03W, WVDG04N, WVDG04E, WVDG04S, WVDG04W, WVDG05N, WVDG05E, WVDG05S, WVDG05W, WVDG06N, WVDG06E, WVDG06S, WVDG06W	01-Apr-2022	---	---	---	21-Apr-2022	01-May-2022	✓

Page : 6 of 10
 Work Order : EM2206291
 Client : ALS WATER AND HYDROGRAPHICS PTY LTD
 Project : MV214940



Matrix: AIR Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
Container / Client Sample ID(s)							
EG020T: Total Metals by ICP-MS							
Dust Residue (EG020TUG)							



Matrix: AIR

Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis			
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EG020T: Total Metals by ICP-MS - Continued								
W/DD01, W/DD03, W/DD05, W/DD07BG, KF2, KF4, W/DG03N, W/DG03S, W/DG04N, W/DG04S, W/DG05N, W/DG05S, W/DG06N, W/DG06S, KF1 - Soluble metals, W/DD01 - Soluble metals, W/DD03 - Soluble metals, W/DD05 - Soluble metals, W/DD07BG - Soluble metals, KF4 - Soluble metals, W/DG03N - Soluble metals, W/DG03S - Soluble metals, W/DG04N - Soluble metals, W/DG04S - Soluble metals, W/DG05N - Soluble metals, W/DG05S - Soluble metals, W/DG06N - Soluble metals, W/DG06S - Soluble metals, W/DD01 - Insoluble metals, W/DD03 - Insoluble metals, W/DD05 - Insoluble metals, W/DD07BG - Insoluble metals, KF2 - Insoluble metals, KF4 - Insoluble metals, W/DG03N - Insoluble metals, W/DG03S - Insoluble metals, W/DG04N - Insoluble metals, W/DG04S - Insoluble metals, W/DG05N - Insoluble metals, W/DG05S - Insoluble metals, W/DG06N - Insoluble metals,	W/DD02, W/DD04, W/DD06, KF1, KF3, KF5BG, W/DG03E, W/DG03W, W/DG04E, W/DG04W, W/DG05E, W/DG05W, W/DG06E, W/DG06W, W/DD02 - Soluble metals, W/DD04 - Soluble metals, W/DD06 - Soluble metals, KF2 - Soluble metals, KF3 - Soluble metals, KF5BG - Soluble metals, W/DG03E - Soluble metals, W/DG03W - Soluble metals, W/DG04E - Soluble metals, W/DG04W - Soluble metals, W/DG05E - Soluble metals, W/DG05W - Soluble metals, W/DG06E - Soluble metals, W/DG06W - Soluble metals, W/DD02 - Insoluble metals, W/DD04 - Insoluble metals, W/DD06 - Insoluble metals, KF1 - Insoluble metals, KF3 - Insoluble metals, KF5BG - Insoluble metals, W/DG03E - Insoluble metals, W/DG03W - Insoluble metals, W/DG04E - Insoluble metals, W/DG04W - Insoluble metals, W/DG05E - Insoluble metals, W/DG05W - Insoluble metals, W/DG06E - Insoluble metals,	01-Apr-2022	---	---	---	27-Apr-2022	28-Sep-2022	✓

Page : 8 of 10
 Work Order : EM2206291
 Client : ALS WATER AND HYDROGRAPHICS PTY LTD
 Project : MV214940



Matrix: AIR Evaluation: * = Holding time breach ; ✓ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
<i>Container / Client Sample ID(s)</i>							
EG020T: Total Metals by ICP-MS - Continued							
WVDG06S - Insoluble metals,	WVDG06W - Insoluble metals						



Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: AIR

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type	Method	Count		Rate (%)			Quality Control Specification
		QC	Regular	Actual	Expected	Evaluation	
Analytical Methods							
Laboratory Control Samples (LCS)							
Total Insoluble Matter (TIM)	EA141	1	12	8.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Insoluble Matter (TIM)	EA141I	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Solids (TS)	EA142	1	12	8.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Solids (TS)	EA142I	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Soluble Matter (SM)	EA139	1	12	8.33	4.76	✔	NEPM 2013 B3 & ALS QC Standard
Total Soluble Matter (SM)	EA139I	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Total Insoluble Matter (TIM)	EA141	1	12	8.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Insoluble Matter (TIM)	EA141I	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Metals - ICP-MS (mass/filter)	EG020TUG	5	84	5.95	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Solids (TS)	EA142	1	12	8.33	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Solids (TS)	EA142I	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard
Total Soluble Matter (SM)	EA139	1	12	8.33	4.76	✔	NEPM 2013 B3 & ALS QC Standard
Total Soluble Matter (SM)	EA139I	1	16	6.25	5.00	✔	NEPM 2013 B3 & ALS QC Standard



Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Ash Content (AC)	EA120	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Ash content in deposited dust.
Ash Content (AC)	EA120I	AIR	In house: Referenced to AS 3580.10.2. A gravimetric procedure reporting Ash content in deposited dust.
Combustible Matter (CM)	EA125	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Combustible Matter in deposited dust.
Combustible Matter (CM)	EA125I	AIR	In house: Referenced to AS 3580.10.2. A gravimetric procedure reporting Combustible Matter in deposited dust.
Total Soluble Matter (SM)	EA139	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Soluble Solids in deposited dust.
Total Soluble Matter (SM)	EA139I	AIR	In house: Referenced to AS 3580.10.2. A gravimetric procedure reporting Soluble Solids in deposited dust.
Total Insoluble Matter (TIM)	EA141	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Total Insoluble solids in deposited dust.
Total Insoluble Matter (TIM)	EA141I	AIR	In house: Referenced to AS 3580.10.2. A gravimetric procedure reporting Total Insoluble solids in deposited dust.
Total Solids (TS)	EA142	AIR	In house: Referenced to AS 3580.10.1. A gravimetric procedure reporting Total Solids in deposited dust.
Total Solids (TS)	EA142I	AIR	In house: Referenced to AS 3580.10.2. A gravimetric procedure reporting Total Solids in deposited dust.
Total Metals - ICP-MS (mass/filter)	* FGD2011G	AIR	In house: Referenced to APHA 3125; USEPA SW846, 6020 (ICPMS) Metals in Dust residue are quantified by ICPMS and reported as ug of the TIM.