Caley Valley Wetland Monitoring Program

2018-2021

Queensland Government

Prepared by: Science and Technology Division, Department of Environment and Science

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Executive Summary

The Caley Valley is a nationally important wetland and is listed in the Directory of Important Wetlands in Australia. The site contains coastal grass sedge wetland, mangroves, saltmarsh, creeks and channels and a lake. The Caley Valley Wetland complex is a large, relatively intact wetland system, covering an area of about 5154 hectares. Although the wetland has been modified, Caley Valley Wetland provide habitat for large numbers of waterbirds, including threatened and migratory birds, with up to 48,000 waterbirds observed on site during high use times (BAAM 2012). The Caley Valley Wetland is adjacent to the Abbot Point Bulk Coal Terminal (Abbot Point Terminal), which was authorised to temporarily release of water from the coal terminal into the wetland during Tropical Cyclone Debbie in 2017.

This report outlines the monitoring of water and sediment quality undertaken in the Caley Valley Wetland between 2018 and 2021 and presents an assessment of water and sediment quality in the wetland. This study found little evidence of contaminants in the sediments and surface waters of the Caley Valley Wetland, either in an area considered to represent background conditions or an area that is potentially impacted by releases from the Abbot Point Terminal. Sediment samples contained only trace amounts of coal fines; or no coal fines at all.

Overall, exceedances of *in situ* parameters, dissolved metals in surface waters and concentrations of metals in sediments were minor and occurred at both background and potentially impacted areas of the wetland. Elevated levels of nickel in sediment and dissolved copper in surface waters likely represent naturally occurring concentrations in the area.

The results presented in the report do not indicate any issues for management and limited benefit from continuing the Department of Environment and Sciences long-term monitoring program. It is recommended that the long-term monitoring program be discontinued.

Contents

List of tables

List of figures

Introduction

The Caley Valley is a nationally important wetland and is listed in the Directory of Important Wetlands in Australia (DAWE 2022). The wetland is a large, relatively complex, and intact wetland system, covering an area of about 5154 hectares (DAWE 2022), although the wetland has been modified by the construction of two causeways (bund walls) in the 1950s (BMT WBM 2012). The site contains coastal grass sedge wetland, mangroves, saltmarsh, subtidal and intertidal marine and estuarine wetlands, palustrine wetlands, and a lake (DAWE 2022). The wetland is a Matter of State Environmental Significance (MSES), providing habitat for large numbers of waterbirds, including threatened and migratory birds, with up to 48,000 waterbirds observed on site during high use times (BAAM 2012). The coastal grass-sedge wetlands are particularly important habitat for the endangered Australian painted snipe (*Rostratula australis*) with sightings at several locations in the wetland (BAAM 2012). The wetland is located in the dry tropics and is subject to seasonal variations in the extent of freshwater inundation.

The Caley Valley Wetland is adjacent to, and downstream of, the Abbot Point Terminal and was subject to an authorised temporary release of stormwater runoff from the coal terminal during Tropical Cyclone Debbie in 2017. Satellite imagery collected after Tropical Cyclone Debbie appeared to show dark waters downstream of the release point that extended into the wetland. In April 2017 Queensland Government staff undertook a rapid assessment of the wetland and found that although there were indications of recent flooding, there was little visual evidence of coal fines across the whole of the wetland, apart from an area immediately downstream of the licensed discharge point. The Queensland Department of Environment and Science (DES) recommended further monitoring be undertaken by Abbot Point Bulkcoal Pty Ltd, as part of an Environmental Evaluation. In September 2018 DES decided to conduct its own long-term monitoring program in the Caley Valley Wetland (see https://environment.des.qld.gov.au/management/monitoring/locations-of-interest/caley-valley-wetland for more information).

Objectives

The aim of this monitoring program was to investigate the presence of contaminants associated with coal port activities, describe guideline exceedances if present, and to enable the development of a current baseline to assess impacts (if any) from uncontrolled releases from the Abbot Point Terminal in the future. Therefore, sampling was undertaken in an area that would be potentially impacted by releases from the Abbot Point Terminal as well as a comparative area of the wetland.

This report outlines the results of seven rounds of monitoring of water and sediment quality undertaken in the Caley Valley Wetland between October 2018 and June 2021.

Methods

Sampling Sites

The monitoring took place in two separate arms of the north-east section of the Caley Valley Wetland and a site in Saltwater Creek to the south-east of the wetland. The two wetland arms are a part of the Wetland Basin Zone, previously described in detail (BMT WBM 2015).

2018–2019

Two areas for monitoring were established in two separate arms of the wetland (Figure 1). The eastern arm represented an area likely to be directly impacted by a release from the Abbot Point Terminal (licensed release point indicated by "W1 in Figure 1). The western arm represented a control area that was less likely to be directly impacted by a release from the Abbot Point Terminal. In each area, two transects were established, each originating at a location on the eastern bank and radiating westward and south-westward, respectively, with increasing distance from the origin. In the eastern, potentially impacted area, this origin coincided with the licensed release point for the Abbot Point Terminal. There were seven sites in the Potential Impact Area and eight sites in total in the Background Area. Other sites in the Caley Valley included a site at Saltwater Creek to the south of the Abbot Point Terminal, and three sites in the wetland itself (Figure 1). The Saltwater Creek site captures a different hydrological zone of the wetland and the sites near the eastern bund were included to capture conditions further afield from the Background and Potential Impact Areas. Samples at the other sites (CV-BO and CV-EB) were collected opportunistically. Saltwater Creek and areas near the bund wall have been subject to water quality monitoring previously (BMT WBM 2015).

Table 1: Sample sites in the Caley Valley Wetland and types of samples collected (S: Sediment samples, CF: Sediment for coal fines analysis, W: Water samples) in October 2018, January, and March 2019.

Site	October 2018	January 2019	March 2019	Comments
Potential Impact Area				
W1				Release Point
CV-T1-S1	S, CF		S,W, CF	Common start of both transects
CV-T1-S2	S, CF		S, CF	Transect 1, Site 2
CV-T1-S3	S, CF		S, CF	Transect 1, Site 3
CV-T1-S4	S, CF	W	W	Transect 1, Site 4
CV-T2-S2	S, CF		S, CF	Transect 2, Site 2
CV-T2-S3	S, CF		S, CF	Transect 2, Site 3
CV-T2-S4	S, CF			Transect 3, Site 4
Background				
CV-CT1-S1	S, CF		W	Common start of both transects
CV-CT1-S2	S, CF		W	Transect 1, Site 2
CV-CT1-S3	S, CF		W	Transect 1, Site 3
CV-CT1-S4	S, CF	W		Transect 1, Site 4
CV-CT2-S2	S, CF			Transect 2, Site 2
CV-CT2-S3	S, CF			Transect 3, Site 3
CV-CT2-S4	S, CF			Transect 4, Site 4
CV-FW			W	Site in background area of wetland, south of transects
Saltwater Creek				
CV-SWC		W	W	Site in Saltwater Creek
Other areas				
CV-BO		W	W	Wetland site at outflow pipe on southern end of the eastern bund
CV-EB			W	Wetland site at northern end of the eastern bund

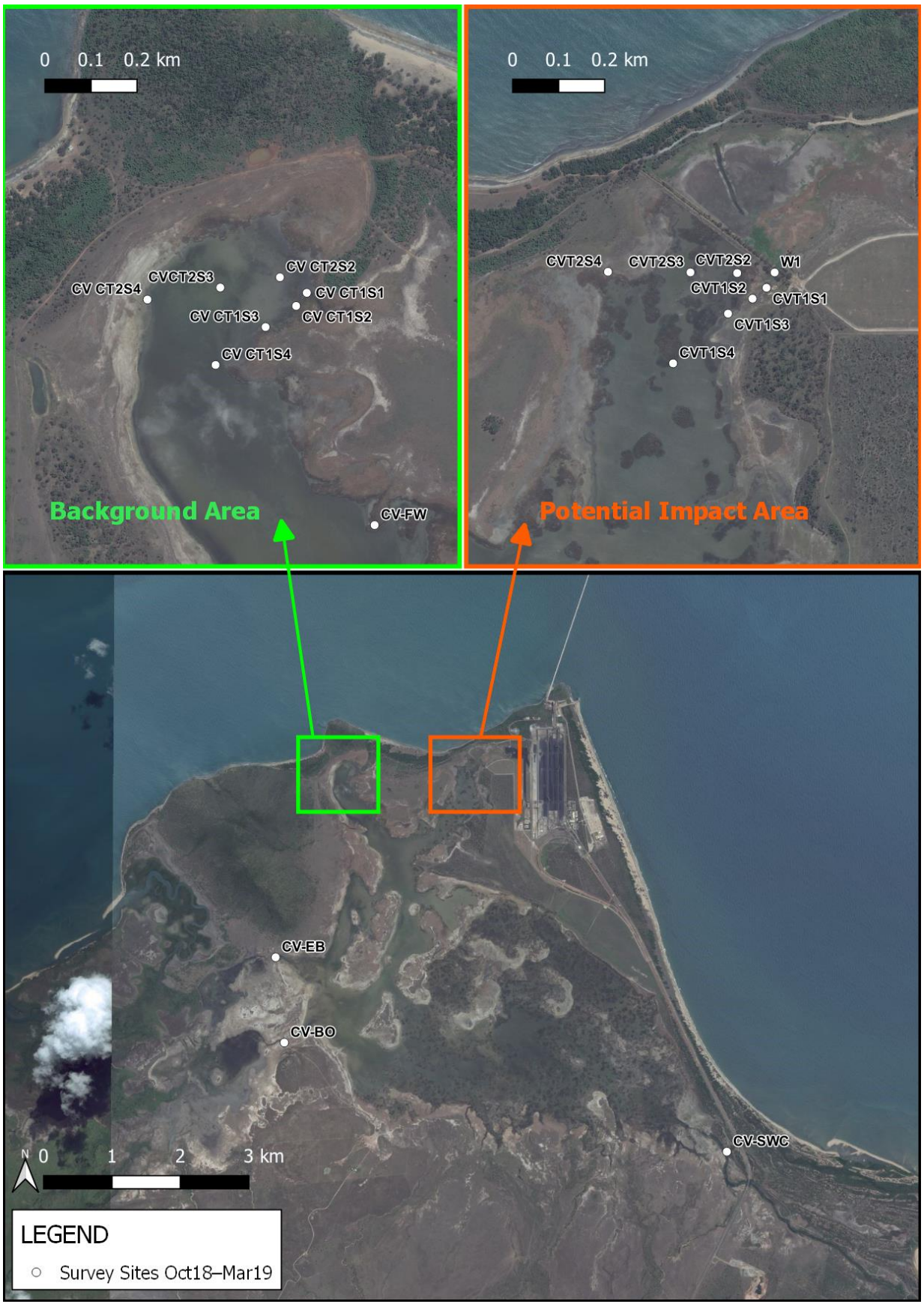

Figure 1: Sample locations at Caley Valley Wetland at Abbot Point between October 2018 and March 2019.

2020–2021

Starting in February 2020, the positions of the monitoring points in both the Potential Impact Area and the Background area were modified from a point-source origin to a 3x3 grid. In the Potential Impact Area, the closest monitoring points were parallel to the rock bund wall on the western boundary of the Abbot Point Terminal (Figure 2). This change in sampling design intends to better accommodate different outflow scenarios, primarily an uncontrolled release over the bund wall, and not only a release from one single point source. Therefore, in each area, up to nine sites were sampled in each monitoring round, in addition to the site at Saltwater Creek.

Table 2: Sample sites in the Caley Valley Wetland and types of samples collected (S: Sediment samples, CF: Sediment for coal fine analysis, W: Water samples) in between February 2020 and June 2021.

Location Site	February 2020	February 2021	March 2021	June 2021	Comments
Potential Impact Area					
CV–AP1	S, CF	W	W	S, CF	Near bund wall
CV–AP2	W, S, CF	W	W	W, S, CF	Near bund wall
CV–AP3	W, S, CF	W	W	W, S, CF	Near bund wall
CV–AP4	S, CF	W	W	CF	~100m from bund wall
CV–AP5	W, S, CF		W	W, S, CF	~100m from bund wall
CV–AP6			W	W, S, CF	~100m from bund wall
CV–AP7	W, S, CF	W	W	W, S, CF	~200m from bund wall
CV–AP8	W, S, CF		W	W, S, CF	~200m from bund wall
CV–AP9			W	W, S, CF	~200m from bund wall
Background Area					
CV–BG1	W, S, CF	W	W	W, S, CF	Background area
CV–BG2	S, CF	W	W	W, S, CF	Background area
CV–BG3	W, S, CF	W	W	W, S, CF	Background area
CV–BG4	S, CF				Background area
CV–BG5	W, S, CF	W	W	W, S, CF	Background area
CV–BG6	W, S, CF	W	W	W, S, CF	Background area
CV–BG7	W, S, CF	W	W	W, S, CF	Background area
CV–BG8					Background area, dry site
CV–BG9	W, S, CF	W	W	W, S, CF	Background area
Saltwater Creek					
CV–SWC		W	W	CF	Site in Saltwater Creek

Figure 2: Sample locations at Caley Valley Wetland at Abbot Point between February 2020 and June 2021.

Timing

The timing of the sampling was intended to cover the drying and wetting cycle of the wetland and the resulting changes in inundation. Where samples were collected in terms of the wet/dry season are presented in Figure 3, with rainfall reflecting seasonal change. The change in the wetland from the dry to the wet season are illustrated by the photos presented in Figure 4. Both pictures were taken facing towards Mount Luce (the range on the right-hand side of the pictures) and Mount Roundback (on the left-hand side of the pictures).

2018–2019

In October 2018, both the potential impact and background areas were completely dry and only sediment samples were taken. In January 2019, the wetland was partially inundated, and water samples were collected where possible. In March 2019, the wetland was completely inundated, and both water and sediment samples were collected. It was not considered safe to sample at all sites in March 2019 because of the potential for crocodiles to be present in the deep water. Sampling between 2018–2019 is summarised in Table 1 and images of the wetlands for each sampling round are presented in Appendix A.

2020

In February 2020, the wetland was partially inundated, and water samples were collected at sites that held water. Samples for analysis of coal fines were taken at suitable sites.

Sampling from 2020 is summarised in Table 2 and images of the wetland is presented in Appendix A.

2021

Three rounds of monitoring were undertaken in 2021, coinciding with the early wet season in February 2021, middle of wet season in March 2021, and the end of the wet season/early dry season in June 2021. Water samples were collected at sites where enough water was present. Sampling in the Potentially Impacted Area in February 2021 was limited because of the crocodile risk. Hence, subsequent sampling in March and June 2021 was conducted using a flat-bottomed punt to overcome this risk. In addition to water samples, sediment samples were collected in June 2021 for analyses of total metals and coal fines.

Sampling from 2021 is summarised in Table 2 and images of the wetlands for each sampling round are presented in Appendix A.

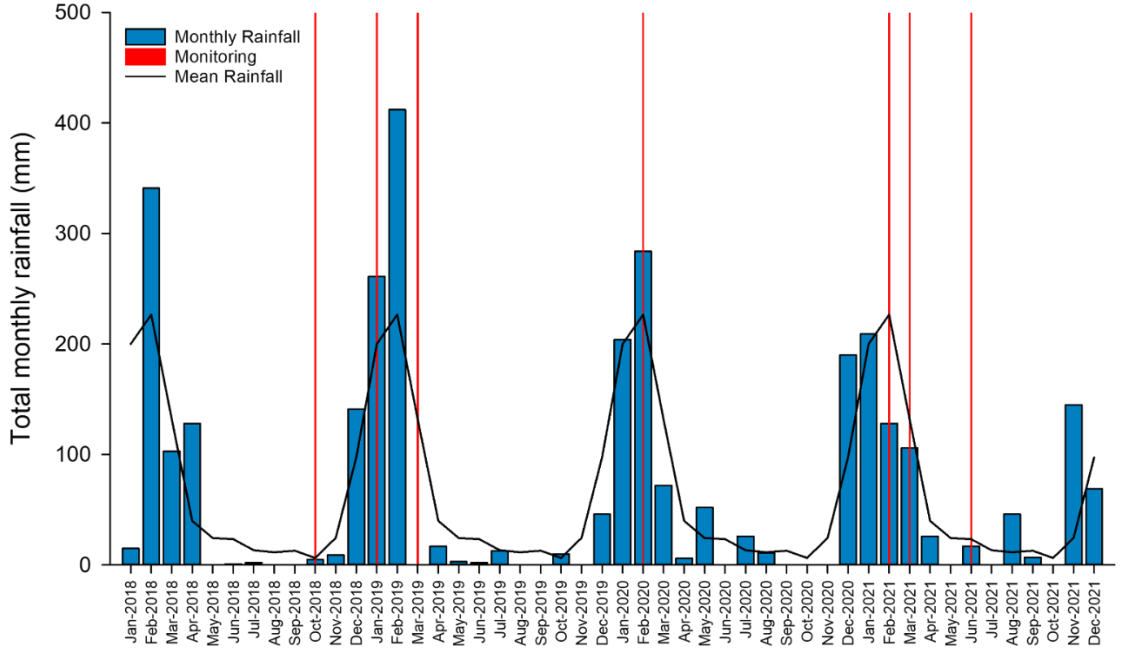

Figure 3: Monthly total rainfall (blue bars) and mean rainfall (black line, data for mean rainfall from 2000–2021) recorded at the Bowen Pump Station (BOM station 33264). Red lines indicate months when monitoring took place.

a)

Dry season October 2018

b)

Wet season March 2021

Figure 4: Sample areas at Caley Valley Wetland in the a) dry and b) wet season.

Water sampling

At each sampling site where water was present, *in situ* water quality data (temperature, pH, dissolved oxygen and

electrical conductivity) were collected using a YSI 556 MPS multi-parameter meter. Water samples were taken for the analysis of metals and metalloids (all monitoring rounds), polycyclic aromatic hydrocarbons (PAH) and BTEX (benzene, toluene, ethylbenzene and xylene) (January 2019–February 2020). Metals, PAHs and BTEX have been associated with particulate coal in the United States (Aherns and Morrisey 2005), and so were analysed for. Sampling for PAH and BTEX ceased after February 2020 as these compounds were never detected. Powder free disposable gloves were used when collecting samples, with a fresh pair being used at each site to prevent cross-contamination of samples. Samples were kept chilled on ice after collection and sent for analysis to Australian Laboratory Services (ALS), a National Association of Testing Authorities (NATA) Australia accredited laboratory.

Sediment sampling

At each sampling site (Table 1, Table 2), composite sediment samples were collected in October 2018, March 2019, February 2020 and June 2021 for the presence of metals. This involved the collection of five random samples from a 5 x 5 m grid. Each sample was approximately 10 x 10 cm in area and 1 cm depth. Samples were composited and a subsample was taken for analysis. Compositing is a standard field sampling practice as sediments can be highly heterogeneous (DES 2018). The use of composite samples is a way of adjusting for variation found in sediment samples. Samples were collected using a stainless-steel trowel and were in a stainless-steel bowl. All equipment was thoroughly cleaned between sites using Decon 90® and rinsed three times with deionised water. Disposable gloves were used when collecting samples, with a fresh pair used at each site. From a subset of composite samples, duplicate samples were obtained by splitting the contents of the bowl into two jars. Samples for the analysis of toxicants were kept chilled on ice after collection and sent to ALS for analysis.

Additional sediment samples were collected and sent to ALS for coal fines analysis to test for coal, a density separation method (float/sink testing) was performed on samples before further drying, crushing and microscopic analysis of the two separate density fractions. Samples were then prepared as per normal petrographic methods by mounting the crushed samples in an acrylic resin and polishing to produce a suitable surface for reflected light microscopy. A point count of each sample was conducted with the material under the crosshairs of the microscope being classified as coal, mineral matter, or organic matter. Five hundred points or a single pass of the entire sample-area were counted on each sample at 500x magnification. Results were expressed as the percentage of coal fines and organic matter on a volume basis (for more information, see Appendix D and DSITI 2017).

Quality Control

Quality control (QC) samples were taken as per the Queensland Monitoring and Sampling Manual (DES 2018). The results of the QAQC samples (Appendix B) collected between 2018 and 2019 passed quality control acceptance criteria and are described in a previous monitoring progress report (DES 2019).

Between 2020 and 2021 Quality control (QC) samples were taken as per the Queensland Monitoring and Sampling Manual (DES 2018), and included sediment sample duplicates, water sample duplicates and field blanks (Appendix B). The results of the QAQC samples were deemed acceptable.

Guidelines

The results of *in situ* and laboratory measurements were compared to the following guidelines:

- Total suspended solids and *in situ* results (temperature, pH, dissolved oxygen and electrical conductivity) from surface water sampling were compared to Queensland Water Quality Guidelines (QWQG) for upper estuarine waters in the Central Coast Regions (EHP 2009).
- Results for toxicants in surface water samples were compared to Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG 2018). Concentrations of toxicants in areas with a salinity of ≤ 2ppt were assessed against guideline values for freshwater systems, whereas those in areas with a salinity > 2ppt were assessed against guideline values for marine systems.
- Guideline values for cadmium, chromium, lead, nickel and zinc were modified (Table 7) according to the water hardness at each site using the method outlined in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG 2018).
- Results of total metals in sediment samples were compared to the ANZG (2018) sediment quality guidelines.

Results and Discussion

Coal Fines in Sediment

2018–2019

Estimates of coal in the sediment in October 2018 and March 2019 showed that the highest percentage of coal (0.6% and 1.8%, respectively) were found at site CV-T1-S2 in the potentially impacted area (Table 3). Overall, the concentrations of coal fines found in the sediment were low, and no coal was measured at the majority of sites.

Table 3: Percentage of coal fines in sediment in the Caley Valley Wetland in October 2018 and March 2019.

Site	Percentage of coal fines in sediment (% mass)[1]	
	October 2018	March 2019
Background Area		
CV-CT1-S1	0	–
CV-CT1-S2	0.2	–
CV-CT1-S3	0	–
CV-CT1-S4	0	–
CV-CT2-S2	0	–
CV-CT2-S3	0	–
CV-CT2-S4	0	–
Potential Impact Area		
CV-T1-S1	0.3	0.2
CV-T1-S2	0.6	1.8
CV-T1-S3	0	0
CV-T1-S4	0	–
CV-T2-S2	0	0
CV-T2-S3	0	0
CV-T2-S4	0.4	–

[1]Relative densities of 1400 kg·m^{-3} for coal and 2600 kg·m^{-3} for minerals (O'Brien 2017 and references therein) were used to calculate the mass abundance of coal and mineral in each sample (using mass = volume X density; where volume is equivalent to projected area basis percentage). Sites not sampled are denoted by '–'.

2020–2021

Estimates of coal in the sediment in February 2020 and June 2021 showed that the highest percentage of coal (0.6%) were found at site CV-BG1 in the control area (Table 4). Overall, the concentration of coal fines found in the sediment were low, and no coal was measured at the majority of sites. There was no apparent trend originating from the release point in terms of coal fines in the sediment samples.

Table 4: Percentage of coal fines in sediment in the Caley Valley Wetland in in February 2020 and June 2021.

Site	Percentage of coal fines in sediment (% mass)[1]	
	February 2020	June 2021
Background Area		
CV-BG1	0.1	0.6
CV-BG2	0	0
CV-BG3	0	0.1
CV-BG4	0.1	–
CV-BG5	0	0.1
CV-BG6	0.1	0
CV-BG7	0	0.1
CV-BG8	–	–
CV-BG9	0	0
Potential Impact Area		
CV–AP1	0.1	0
CV–AP2	0	0
CV–AP3	0	0
CV–AP4	0	0
CV–AP5	0	0
CV–AP6	–	0
CV–AP7	0	0
CV–AP8	0.1	0.1
CV–AP9	–	0.1
Saltwater Creek		
CV-SWC	–	0.1

[1] Relative densities of 1400 $kg \cdot m^{-3}$ for coal and 2600 $kg \cdot m^{-3}$ for minerals (O'Brien 2017 and references therein) were used to calculate the mass abundance of coal and mineral in each sample (using mass = volume X density; where volume is equivalent to projected area basis percentage). Sites not sampled are denoted by '–'.

Water Quality Results

In situ measurements

Between January 2019 and March 2021 (Table 5):

- dissolved oxygen concentrations were above or below the guidelines throughout the wetland and Saltwater Creek, with the exception of site CV–BO in January 2019;
- the measured pH exceeded the QWQG (EHP 2009) in at least one area (background, potential impact or other areas of the wetland) per monitoring round, but only once in the potential impact area (February 2021)
- the measured pH was generally higher in the background area compared to the potential impact area or Saltwater Creek;
- in January 2019, electrical conductivity in all wetland sites was high (21.48 - 60.96 mS/cm), and comparatively low at the site in Saltwater Creek (1.90 mS/cm).
- between March 2019 and June 2021, electrical conductivity ranged from 0.94 mS/cm in Saltwater Creek in February 2021 to 8.56 mS/cm in the background area in June 2021, reflecting seasonal influences (wet/dry).

Dissolved oxygen concentrations have been highly variable in the wetland (BMT WBM 2015; DSITI 2017; GHD 2012), with concentrations of up to 325% saturation being measured in the wetland to the east of the eastern bund (BMT WBM 2015). Large mats of benthic algae and algae covering vegetation were noted at many sites throughout the monitoring period and especially later in the season (March 2019 and March and June 2021), which likely contribute to the high concentrations of oxygen in the waters.

Elevated pH levels have been reported in the wetland previously, with pH exceeding the upper guideline value of pH 8.4 throughout the wetland depending on the time of the year and site (BMT WBM 2015; DSITI 2017; GHD 2012; DES 2019), and a pH of greater than 9 measured historically throughout the wetland and Lake Caley (BMT WBM 2015). In both the background and potential impact sites, elevated pH measurements were associated with elevated dissolved oxygen measurements (Table 5). Therefore, the elevated pH measurements are likely associated with the high plant biomass in the wetland, and the removal of CO_2 or HCO_3^- during photosynthesis (Reid and Mosley 2015), which leads to an increase in pH.

High electrical conductivities indicate high concentrations of ions in the water. The wetland has a well documented variation in salinity levels, ranging from fresh to estuarine and hypersaline (BMT WBM 2015; DES 2019), depending on time of year, accumulated rainfall and intrusion of high tides. Spring high tides were recorded (DTMR 2018, BOM 2022) within a week before the sampling events in January 2019 and June 2021, when the highest conductivities were recorded (Table 5).

Between January 2019 and June 2021, the wetland sites had electrical conductivities that were characterised as freshwater to brackish (between 1.83 and 29.5 mS/cm), with higher conductivities occurring in the dry season or dry wet seasons (January 2019 and June 2021). The site in the southern wetland (CV-BO) had a high electrical conductivity of 60.96 mS/cm. The salinities at the wetland sites were considered typical for the time of year and low rainfall conditions. Saltwater Creek has been described as being of freshwater to brackish character (BMT WBM 2012, 2015; GHD 2012), and the measured salinities between February 2021 (0.94 mS/cm) and January 2019 (1.90 mS/cm) lie well within the historical range for this creek (BMT WBM 2015).

Table 5: *In situ* results from surface water sampling in between January 2019 and June 2021 compared to Queensland Water Quality Guidelines (EHP 2009). Values are medians for each analyte per site and monitoring round when more than one sample was collected. Pink shaded cells indicate reported values that were outside the guideline range. Light blue cells indicate freshwater characteristics and light green cells indicate marine water characteristics.

	Site		Temperature (°C)	pH	Dissolved oxygen (% saturation)	Electrical conductivity (mS/cm)	Salinity* (ppt)
	QWQG Upper Estuarine Central Coast Region			7.0-8.4	70-100		
Monitoring round	**Area**	**n**					
Jan-19	Background	1	33.27	9.18	110	29.50	33.27
	Potential Impact	1	35.82	7.55	106.2	21.48	35.82
	Saltwater Creek	1	25.82	7.49	49	1.90	25.82
	Other (CV–BO)	1	31.44	8.86	97.3	60.96	31.44
Mar-19	Background	4	30.305	9.26	141.2	4.31	2.28
	Potential Impact	6	28.79	7.23	44.2	2.16	1.1
	Saltwater Creek	1	26.81	8.53	66.8	1.05	0.52
	Other	2	29.38	9.885	148.15	2.56	1.32
Feb-20	Background	7	35.06	8.6	101	3.30	1.71
	Potential Impact	5	34.52	7.72	127.6	2.84	1.46
	Saltwater Creek	NA	–	–	–	–	–
Feb-21	Background	7	31.43	10.28	162.1	3.04	1.56
	Potential Impact	5	31.51	9.46	142.6	1.83	0.92
	Saltwater Creek	1	30.1	7.37	69.1	0.94	0.46
Mar-21	Background	9	30.92	9.61	112.9	3.43	1.78
	Potential Impact	7	32.24	8.35	86.9	2.40	1.22
	Saltwater Creek	1	32.27	6.99	115.2	1.61	0.8
Jun-21	Background	5	21.105	8.92	127.3	8.56	4.78
	Potential Impact	7	22.439	8.3	81.8	7.39	4.07
	Saltwater Creek	NA	–	–	–	–	

NA: Site not sampled

* For January 2019, salinity was calculated by using electrical conductivity measured *in situ* in each area and the conversion formula outlined in the Queensland Monitoring and Sampling Manual (DES 2018). For March 2019–June 2021, the median of the measured salinity was used.

Laboratory results of surface water samples

Overall, the water quality samples collected in the Caley Valley Wetland were generally compliant with ANZG (2018) and Queensland Water Quality guidelines (EHP 2009) (Table 6). When the data exceeded the respective guidelines, the exceedances occurred either at both control and impact locations or were relatively minor. Specifically,

- Total suspended solids (TSS) exceeded the Queensland Water Quality guidelines (EHP 2009) in January 2019 and June 2021 at all sites, and in the potential impact area in February 2020. TSS did not exceed the Queensland Water Quality guidelines (EHP 2009) at either background or potential impact area in March 2019, February 2021 and March 2021, even though Saltwater Creek or other wetland sites showed high TSS. TSS levels fluctuate in the Caley Valley Wetland, at both background and potential impact locations. TSS concentrations exceeding the Queensland Water Quality guidelines have previously been recorded in the wetland (BMT WBM 2012; GHD 2012). There were no discharges occurring from the bund wall adjacent to the Abbot Point Terminal at any time during this study, and the results reflect the natural variation in the wetland. TSS is a measure of all solids greater in size than 2 microns and include algae and organic matter as well as suspended sediment. Concentrations of most metals were below guidelines at all sites
- Dissolved copper exceeded the guideline value (1.4 µg/L) at various sites in the wetland over the years, but exceedances were relatively minor, and occurred at both background and potential impact sites, as well as other sites in the wetland. In June 2021, only the potentially impacted sites exceeded the dissolved copper guideline; however, the exceedance was minor (by 0.6 µg/L), and there is no obvious trend or pattern in copper exceedances in the potentially impacted area versus the background or other areas in the wetland.
- Dissolved manganese values exceeded the marine (low reliability) guideline in both the Background and Potential Impact Area, but did not exceed freshwater guideline values in other monitoring rounds. High manganese values in a wetland can be expected as high organic matter and wet-dry cycling promotes manganese accumulation and cycling (La Force et al. 2002).
- Elevated levels of dissolved boron occurred in January 2019, and to a lesser extent in June 2021, at both the background and potential impact sites. These increased levels of dissolved boron are indicative of increased marine water intrusion, which has naturally higher concentrations of boron than freshwater. (ANZG 2021). The data in Table 5 shows near seawater salinity in January 2019 corresponding with the highest boron concentrations. Small increases in salinity in June 2021 correspond with much smaller increases in boron. A spring tide of 3.29 meters at Abbot Point occurred 6 days prior to the June 2021 survey (BOM 2022). In January 2019, boron levels in the surface water samples across the wetland were highest, but the samples also showed high salinity and were characterised as ‘marine’ by the laboratory, hence marine guideline values for water were applied to the January 2019 results. A guideline value for boron in marine water is not defined (ANZ 2021).
- Polycyclic aromatic hydrocarbons (PAH) or BTEX (benzene, toluene, ethylbenzene, and xylene) were all below the LORs in surface water samples (Appendix C).

Table 6: Laboratory results from surface water sampling in between January 2019 and June 2021 compared to Queensland Water Quality Guidelines (EHP 2009) and Australian and New Zealand Guidelines for Fresh and Marine Water Quality, default toxicant guideline values (ANZG 2018). Values are medians for suspended solids and 95th percentiles for other analytes per site and monitoring round. BG = Background Area; PI = Potential Impact Area; SWC = Saltwater Creek; Other = Other wetland areas. Light orange shaded cells indicate exceedances of the relevant guideline. Light green shading of salinity indicates freshwater characteristics, light blue shading indicates marine water characteristics.

	Monitoring round			January 2019				March 2019				February 2020			February 2021			March 2021			June 2021		
	Site			BG**	PI**	SWC*	Other**	BG**	PI*	SWC*	Other*	BG*	PI*	SWC*	BG*	PI*	SWC*	BG*	PI*	SWC*	BG**	PI**	SWC
Analyte	Guideline		LOR	n=1	n=1	n=1	n=1	n=4	n=2	n=1	n=2	n=6	n=5	NA	n=7	n=5	n=1	n=9	n=7	n=1	n=5	n=7	NA
Total Dissolved Solids (mg/L)				19800	14600	806	41800	2690	1570	630	1604	1975	1606	NA	1974	1200	670	2110	1916	936	NA	NA	NA
Total Suspended Solids (TSS) (mg/L)	25[a]		5	38	288***	40	<LOR	6	17	10	54	13	34	NA	10	7	14	8	6	62	88	27	NA
Hardness (mg/L)				3360	3490	185	7600	382	277	175	236	306	252	NA	300	239	160	296	360	173	777	656	NA
Salinity (ppt, *in situ*)				33.27	35.82	25.82	31.44	2.28	1.1	0.52	1.32	1.71	1.46	–	1.56	0.92	0.46	1.78	1.22	0.8	4.78	4.07	
Major Ions (mg/L)																							
Calcium				328	336	28	538	38	35	26	29	40	32	NA	34	32	26	32	41	23	57	58	NA
Chloride				10300	7710	298	23400	1269	685	258	763	885	700	NA	920	479	275	1067	858	439	2828	2350	NA
Fluoride				0.5	0.5	0.2	0.9	0.3	0.3	0.1	0.2	0.4	0.4	NA	0.3	0.4	0.1	0.3	0.52	0.2	NA	NA	NA
Magnesium			1	612	649	28	1520	70	47	25	43	50	42	NA	53	389	23	54	62	28	155	125	NA
Potassium			1	182	197	10	497	24	16	5	17	34	31	NA	27	11	8	22	19	9	44	40	NA
Sodium				5580	5940	167	12900	691	386	132	406	445	352	NA	456	254	143	611	510	247	1428	1237	NA
Sulfate as SO4				461	1150	26	3350	129	162	26	73	128	131	NA	109	182	13	54	198	33	219	153	NA
Dissolved metals and metalloids (µg/L)	fresh[b]	marine[c]																					
Antimony			0.2	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	NA	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.3	0.4	NA
Arsenic	24		0.2	2.8	3.1	2.2	1.5	2.4	1.6	0.7	2.4	15.0	3.7	NA	5.6	4.4	1.5	4.7	6.6	1.4	6.0	7.1	NA
Beryllium			0.1	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	NA	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	NA
Boron	940		5	18600	1280	137	5180	249	18	58	191	321	316	NA	286	170	65	250	225	90	517	464	NA
Cadmium	HMTV		0.05	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	NA	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	NA
Chromium^ (III+VI)	HMTV	27.4	0.2	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.6	0.3	NA	<LOR	<LOR	0.5	<LOR	0.3	0.9	0.3	0.3	NA
Cobalt		1	0.1	<LOR	0.6	1	<LOR	0.5	1.8	0.6	0.4	1.7	1.1	NA	0.6	2.1	0.8	0.4	0.7	0.6	0.9	0.9	NA
Copper	1.4	1.3	0.5	<LOR	<LOR	0.6	2.0	2.0	<LOR	0.5	1.5	2.6	2.0	NA	0.9	0.8	0.6	<LOR	1.7	<LOR	0.5	<LOR	NA
Lead	HMTV	4.4	0.1	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.3	<LOR	NA	<LOR	<LOR	0.1	<LOR	<LOR	<LOR	<LOR	<LOR	NA
Manganese	1900	80[d]	0.5	<LOR	<LOR	286.0	<LOR	49.1	500.0	54.5	4.1	341.3	113.2	NA	164.4	542.6	70.8	1295.3	807.4	44.7	171.4	197.3	NA
Mercury	0.6	0.4	0.1	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	NA	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	NA
Molybdenum			0.1	38.6	27.7	1.6	9.9	5.1	5.6	0.8	3.6	16.1	11.3	NA	6.7	7.6	0.6	4.2	3.2	0.3	9.4	12.5	NA
Nickel	HMTV	70	0.5	1.4	3.5	1.6	0.5	1.9	4.6	1.1	1.0	3.5	3.8	NA	1.1	2.7	1.3	<LOR	1.9	1.0	1.9	2.6	NA
Selenium	11		0.2	2.0	<LOR	<LOR	7.0	0.6	0.4	0.2	0.4	0.2	<LOR	NA	0.3	0.5	0.2	0.4	0.5	0.3	<LOR	0.2	NA
Silver	0.05	1.4	0.1	<LOR	<LOR	<LOR	<LOR	0.2	<LOR	<LOR	<LOR	<LOR	<LOR	NA	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	NA
Tin			0.2	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	1.2	<LOR	NA	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	0.4	<LOR	NA
Zinc	HMTV	15	1	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	3	NA	<LOR	2	<LOR	<LOR	3	<LOR	<LOR	<LOR	NA

a Queensland Water Quality Guidelines (EHP 2009) for Upper Estuarine Central Coast Region
b Australian and New Zealand Guidelines for Fresh and Marine Water Quality, default toxicant guideline values (ANZG 2018). Guideline values for metals and metalloids in freshwater (95% species protection level).
c Australian and New Zealand Guidelines for Fresh and Marine Water Quality, default toxicant guideline values (ANZG 2018). Guideline values for metals and metalloids in marine water (95% species protection level).
d Low or unknown reliability guideline value, only to be used as indicative interim working level (ANZG 2018).
HMTV Hardness Modified Guideline Value – see Table 7
<LOR Result below Limit of Reporting (LOR)
NA Site not sampled
* The sampled water at this site had freshwater characteristics and was analysed by the laboratory using a freshwater matrix. Guideline values for freshwater were used.
** The sampled water at this site had marine water characteristics and was analysed by the laboratory using a marine water matrix. Guideline values for marine water were used.
*** This reading was reported from a very shallow area of the wetland with high macrophyte growth, possibly confounding the TSS result.
^ Laboratory results are for unspeciated chromium

Table 7: Hardness modified guideline values for cadmium, chromium, lead, nickel, and zinc using the method outlined in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG 2018). Hardness modification has only been applied to samples with freshwater characteristics. Hardness modification was calculated on 95th percentiles of hardness for each site and monitoring round.

Monitoring round	Guideline[a]	Jan-19				Mar-19				Feb-20			Feb-21			Mar-21			Jun-21		
Site		BG	PI	SWC	Other	BG	PI	SWC	Other	BG	PI	SWC	BG	PI	SWC	BG	PI	SWC	BG	PI	SWC
Hardness (mg/L)		3360	3490	185	7600	381.8	277.35	175	236	306	251.6	NA	299.5	239.4	160.0	295.8	359.6	173.0	776.6	655.7	NA
Cadmium (µg/L)	0.2	–	–	1.0	–	–	1.4	1.0	1.3	1.6	1.3	NA	1.6	1.3	0.9	1.5	1.8	1.0	–	–	NA
Chromium III (µg/L)	3.3	–	–	14.7	–	–	20.4	14.0	17.9	22.2	18.9	NA	21.8	18.1	13.0	21.6	25.3	13.9	–	–	NA
Lead (µg/L)	3.4	–	–	34.3	–	–	57.3	31.9	46.7	64.9	50.6	NA	63.2	47.5	28.5	62.2	79.7	31.5	–	–	NA
Nickel (µg/L)	11	–	–	110.9	–	–	185.4	103.3	151.0	210.0	163.8	NA	204.4	153.8	92.2	201.2	257.8	101.8	–	–	NA
Zinc (µg/L)	8	–	–	80.6	–	–	134.8	75.1	109.8	152.8	119.1	NA	148.7	111.8	67.0	146.3	187.5	74.0	–	–	NA

a Australian and New Zealand Guidelines for Fresh and Marine Water Quality default toxicant guideline values (ANZG 2018). Guideline values for metals and metalloids in freshwater.
NA Site not sampled
– Site had marine water characteristics, hardness modification not applied

Sediment Quality Results

The analysis of total metals in sediment samples collected between October 2018 and June 2021 (Table 8) showed that all but one analyte (nickel) were lower than sediment quality guidelines (ANZG 2018). In October 2018, the 95th percentile of nickel was above the above the DGV of 21 mg/kg at the potential impact sites as well as the background sites. In March 2019, the 95th percentile of nickel was above the DGV at the potential impact sites (sediment was not sampled at background sites in this monitoring round). In February 2020, the 95th percentile for nickel was above the DGV at the background sites (25 mg/kg) but not at the potentially impacted sites (18 mg/kg). Nickel was below the DGV at all sites in 2021.

The results would indicate that elevated and varying concentrations of nickel are naturally occurring across the Caley Valley Wetland as it was found at both the control and potentially impacted sites over monitoring years.

Table 8: Total metals in sediment samples collected in October 2018, March 2019 and June 2021 compared to the sediment quality guidelines (ANZG 2018). Values are 95th percentiles for each analyte per site and monitoring round. Light orange shading indicates the result is above the default guideline value (DGV). All values are mg/kg.

Monitoring round	Guideline			October 2018		March 2019	February 2020		June 2021		
				BG	PI	PI	BG	PI	BG	PI	SWC
Analyte	DGV	SQG-High	LOR	n=7	n=7	n=5	n=8	n=7	n=8	n=8	n=1
Arsenic	20	70	5	19	13	11	17	9	15	15	<LOR
Barium			10	40	78	62	40	27	30	20	60
Beryllium			1	1	2	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Boron			50	91	67	<LOR	<LOR	<LOR	43	<LOR	<LOR
Cadmium	1.5	10	1	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Chromium	80	370	2	46	37	25	36	24	29	27	15
Cobalt			2	24	42	30	27	15	254	17	8
Copper	65	270	5	29	26	24	23	24	20	21	12
Lead	50	220	5	12	11	8	12	8	8	8	<LOR
Manganese			5	1896	330	279	1017	213	1071	251	88
Mercury	0.15	1	0.1	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Nickel	21	52	2	24	44	29	25	18	18	20	8
Selenium			5	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Vanadium			5	89	51	44	77	43	63	51	41
Zinc	200	410	5	40	132	110	35	60	38	63	12

<LOR Result is below Limit of Reporting (LOR)

Conclusions

This study found little evidence of contaminants in the surface sediments and waters of the Caley Valley Wetland. There is no evidence of contamination from the coal terminal, with very few indicators exceeding guidelines at any site, except due to natural background levels. There was no evidence of any difference in water and sediment quality between the background and potentially impacted area.

Sediment samples collected in October 2018, March 2019, February 2020 and June 2021 showed that most samples contained only trace amounts or no coal fines at all. The highest percentage of coal fines (although still very low) were found in the vicinity of the bund wall in the potentially impacted area in 2019. However, in June 2021, the background area had slightly higher percentage of coal fines in samples compared to the potential impact area (0.6% versus 0.1%, respectively). No obvious trends in percentage of coal fines were observed in either the potential impact or background area between October 2018 and June 2021.

Nickel exceeded sediment guidelines in October 2018, and March 2019 in both control and potentially impacted areas (note: only the potentially impacted area was sampled in March 2019) and only in control area in 2020. As nickel was consistently measured in both the potentially impacted and control areas, it is likely that this element is naturally occurring at elevated levels in the Caley Valley Wetland. *In situ* water quality parameters and TSS measured during the monitoring program exceeded Queensland Water Quality Guidelines for some parameters at sites in the potentially impacted area, the control area, and other sites in the wetland, as well as Saltwater Creek. These exceedances are within historical ranges and are likely reflective of site-specific conditions and seasonal changes in the wetland.

In terms of toxicants, metals in surface water samples collected in the Caley Valley Wetland were generally measured below guidelines (ANZG 2018). Minor exceedances of dissolved copper occurred in the potential impact area, the control area as well as further afield in the wetland. Dissolved manganese exceeded a low-reliability marine guideline in both potential impact and background areas and higher dissolved manganese concentrations are due to natural wetting/drying cycles in the wetland. PAHs or BTEX were not detected in water samples throughout the monitoring program. Increases in dissolved boron concentrations occurred in 2019 and 2021 at both background and potential impact areas and seem to occur when inundation of the wetland with freshwater is at its lowest and the surface water has marine characteristics and tidal influence is more pronounced.

Water and sediment quality results to date show that exceedances of guidelines for several water quality parameters and one sediment quality parameter have occurred; however, these exceedances are not consistent over time and occur in both control and potentially impacted areas and can be influenced by seasonal changes. Although the results were compared to the Queensland Water Quality Guidelines for upper estuaries, the Caley Valley Wetland is a modified estuarine system, and only partially tidally influenced. The default toxicant guideline values (ANZG 2018) for metals and metalloids (95% species protection level) were applied depending on the average salinity in each area and monitoring round. However, owing to the wide variation in environmental conditions (rainfall and water level) in the wetland, the quality of some indicators was highly variable and therefore difficult to characterise. Therefore, locally relevant guidelines should be derived for this system.

The results presented in the report do not indicate any issues for management, and no toxicants of concern were found. There is limited benefit from continuing the Department of Environment and Sciences long-term monitoring program at the present time, and therefore it is recommended that the long-term monitoring program be discontinued.

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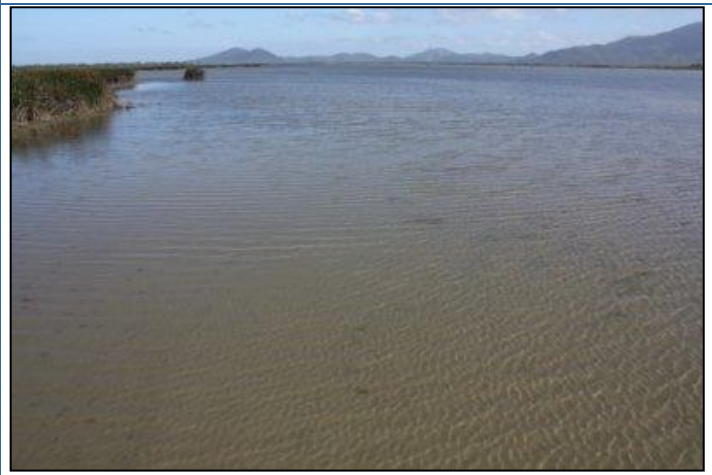
Appendix A: Photos of Background and Potential Impact Areas 2018–2021

Monitoring round	Background area	Potential Impact area
October 2018		
January 2019		

Monitoring round	Background area	Potential Impact area
March 2019		
February 2020		

Monitoring round	Background area	Potential Impact area
February 2021		
March 2021		

Monitoring round	Background area	Potential Impact area
June 2021		

Appendix B: Quality Assurance and Quality Control

Table B-1: Quality Control Samples Collected in 2019, results outlined in DES (2019).

		Sample Description	BLANK	Blank full suite
		Date	06/03/2019	06/03/2019
		Site	CV-BI-0319	CV-BB-0319
Analyte	**Unit**	**LOR**		
Physico-Chemical				
Suspended Solids (SS)	mg/L	5	–	<5
Total Hardness as CaCO3	mg/L	1	–	<1
Total Alkalinity as CaCO3	mg/L	1	–	4
Major Ions				
Calcium	mg/L	1	–	<1
Chloride	mg/L	1	–	<1
Fluoride	mg/L	0.1	–	<0.1
Magnesium	mg/L	1	–	<1
Potassium	mg/L	1	–	<1
Sodium	mg/L	1	–	<1
Sulfate as SO4 - Turbidimetric	mg/L	1	–	<1
Total Anions	meq/L	0.01	–	0.08
Total Cations	meq/L	0.01	–	<0.01
Ionic Balance	%	0.01	–	–
Dissolved Metals and Metalloids				
Antimony	µg/L	0.2	<0.2	<0.2
Arsenic	µg/L	0.2	<0.2	<0.2
Beryllium	µg/L	0.1	<0.1	<0.1
Boron	µg/L	5	8	<5
Cadmium	µg/L	0.05	<0.05	<0.05
Chromium	µg/L	0.2	<0.2	<0.2
Cobalt	µg/L	0.1	<0.1	<0.1
Copper	µg/L	0.5	<0.5	<0.5
Lead	µg/L	0.1	<0.1	<0.1
Manganese	µg/L	0.5	<0.5	<0.5
Mercury	mg/L	0.0001	<0.0001	<0.0001
Molybdenum	µg/L	0.1	<0.1	<0.1
Nickel	µg/L	0.5	<0.5	<0.5
Selenium	µg/L	0.2	<0.2	<0.2
Silver	µg/L	0.1	<0.1	<0.1
Tin	µg/L	0.2	<0.2	<0.2
Zinc	µg/L	1	<1	<1
Total Metals and Metalloids				
Antimony	µg/L	0.2	<0.2	<0.2
Selenium	µg/L	0.2	<0.2	<0.2
Arsenic	µg/L	0.2	<0.2	<0.2
Beryllium	µg/L	0.1	<0.1	<0.1

		Sample Description Date Site	BLANK 06/03/2019 CV-BI-0319	Blank full suite 06/03/2019 CV-BB-0319
Boron	µg/L	5	<5	<5
Cadmium	µg/L	0.05	<0.05	<0.05
Chromium	µg/L	0.2	<0.2	<0.2
Cobalt	µg/L	0.1	<0.1	<0.1
Copper	µg/L	0.5	<0.5	<0.5
Lead	µg/L	0.1	<0.1	<0.1
Manganese	µg/L	0.5	<0.5	<0.5
Mercury	mg/L	0.0001	<0.0001	<0.0001
Molybdenum	µg/L	0.1	<0.1	<0.1
Nickel	µg/L	0.5	0.6	<0.5
Silver	µg/L	0.1	<0.1	<0.1
Tin	µg/L	0.2	<0.2	<0.2
Zinc	µg/L	1	<1	<1

Table B-2: Quality Control Samples Collected in February 2020.

	Unit	Lab Report Number Field ID Date LOR	EB2004433 CV-BG9 13/02/2020 Parent	EB2004433 CV-RG2 13/02/2020 Duplicate	RPD	EB2004433 CV-RG1 12/02/2020 Blank
Analyte						
Total Dissolved Solids (Calc.)	**mg/L**	1	1,950	1,950	0	<1
Inorganics						
Sulfate as SO4 - Turbidimetric (filtered)	**mg/L**	1	125	126	1	<1
Alkalinity (total) as CaCO3	**mg/L**	1	64	58	10	4
Anions Total	**meq/L**	0.01	28.5	28.4	0	0.08
Cations Total	**meq/L**	0.01	26.2	26.1	0	<0.01
Chloride	**mg/L**	1	874	873	0	<1
Fluoride	**mg/L**	0.1	0.4	0.3	29	<0.1
Ionic Balance	**%**	0.01	4.22	4.25	1	–
Sodium (filtered)	**mg/L**	1	443	440	1	<1
Hardness as CaCO3 (filtered)	**mg/L**	1	306	306	0	<1
TSS	**mg/L**	5	<5	7	33	<5
Metals						
Antimony	**ug/L**	0.2	<0.2	<0.2	0	<0.2
Antimony (filtered)	**ug/L**	0.2	<0.2	<0.2	0	<0.2
Arsenic	**ug/L**	0.2	3.7	3.6	3	<0.2
Arsenic (filtered)	**ug/L**	0.2	3	3	0	<0.2
Beryllium	**ug/L**	0.1	<0.1	<0.1	0	<0.1
Beryllium (filtered)	**ug/L**	0.1	<0.1	<0.1	0	<0.1
Boron	**ug/L**	5	326	348	7	<5
Boron (filtered)	**ug/L**	5	279	292	5	<5
Cadmium	**ug/L**	0.05	<0.05	<0.05	0	<0.05
Cadmium (filtered)	**ug/L**	0.05	<0.05	<0.05	0	<0.05
Calcium (filtered)	**ug/L**	1000	40,000	40,000	0	<1,000
Chromium (III+VI)	**ug/L**	0.2	0.2	0.3	40	<0.2
Chromium (III+VI) (filtered)	**ug/L**	0.2	<0.2	<0.2	0	<0.2
Cobalt	**ug/L**	0.1	0.9	0.9	0	<0.1
Cobalt (filtered)	**ug/L**	0.1	0.6	0.7	15	<0.1
Copper	**ug/L**	0.5	2.4	2.5	4	<0.5
Copper (filtered)	**ug/L**	0.5	2.1	2	5	<0.5
Lead	**ug/L**	0.1	<0.1	<0.1	0	<0.1
Lead (filtered)	**ug/L**	0.1	<0.1	<0.1	0	<0.1
Magnesium (filtered)	**ug/L**	1000	50,000	50,000	0	<1,000
Manganese	**ug/L**	0.5	150	146	3	<0.5
Manganese (filtered)	**ug/L**	0.5	123	126	2	<0.5
Mercury	**ug/L**	0.1	<0.1	<0.1	0	<0.1
Mercury (filtered)	**ug/L**	0.1	<0.1	<0.1	0	<0.1
Molybdenum	**ug/L**	0.1	14.7	15.2	3	<0.1
Molybdenum (filtered)	**ug/L**	0.1	13.6	13.7	1	<0.1
Nickel	**ug/L**	0.5	1.9	1.7	11	<0.5
Nickel (filtered)	**ug/L**	0.5	1.5	1.6	6	<0.5
Potassium (filtered)	**ug/L**	1000	33,000	33,000	0	<1,000
Selenium	**ug/L**	0.2	<0.2	<0.2	0	<0.2
Selenium (filtered)	**ug/L**	0.2	<0.2	<0.2	0	<0.2
Silver	**ug/L**	0.1	<0.1	<0.1	0	<0.1
Silver (filtered)	**ug/L**	0.1	<0.1	<0.1	0	<0.1
Tin	**ug/L**	0.2	<0.2	<0.2	0	<0.2
Tin (filtered)	**ug/L**	0.2	<0.2	<0.2	0	<0.2
Zinc	**ug/L**	1	2	<1	67	<1
Zinc (filtered)	**ug/L**	1	<1	<1	0	<1

Table B-3: Quality Control Samples Collected in February 2021.

		Lab Report Number	EB2103109	EB2103109		EB2103109	EB2103109		EB2103109
		Field ID	CVBG6-0221	CVRG6-0221		CVAP4-0221	CVGP4-0221		CVZP4-0221
		Date	2/02/2021	2/02/2021		3/02/2021	3/02/2021		3/02/2021
	Unit	LOR	Parent	Duplicate	RPD	Parent	Duplicate	RPD	Blank
Analyte									
Total Dissolved Solids (Calc.)	**mg/L**	1	1,950	1,960	1	1,200	1,160	3	<1
Inorganics									
Sulfate as SO4 - Turbidimetric (filtered)	**mg/L**	1	105	104	1	173	164	5	<1
Alkalinity (total) as CaCO3	**mg/L**	1	76	77	1	73	84	14	1
Anions Total	**meq/L**	0.01	29.6	29.6	0	18.6	17.8	4	0.02
Cations Total	**meq/L**	0.01	26.4	26.1	1	15.7	15.8	1	<0.01
Chloride	**mg/L**	1	920	917	0	480	451	6	<1
Fluoride	**mg/L**	0.1	0.3	0.3	0	0.3	0.3	0	<0.1
Ionic Balance	**%**	0.01	5.89	6.15	4	8.48	5.91	36	–
Sodium (filtered)	**mg/L**	1	455	452	1	251	256	2	<1
Hardness as CaCO3 (filtered)	**mg/L**	1	296	292	1	225	221	2	<1
TSS	**mg/L**	5	7	9	25	7	8	13	5
Metals									
Antimony	**ug/L**	0.2	<0.2	<0.2	0	<0.2	<0.2	0	<0.2
Antimony (filtered)	**ug/L**	0.2	<0.2	<0.2	0	<0.2	<0.2	0	<0.2
Arsenic	**ug/L**	0.2	3.6	2.9	22	2.9	3.1	7	<0.2
Arsenic (filtered)	**ug/L**	0.2	3.8	3.7	3	3.4	3.3	3	<0.2
Beryllium	**ug/L**	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1
Beryllium (filtered)	**ug/L**	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1
Boron	**ug/L**	5	324	263	21	166	180	8	<5
Boron (filtered)	**ug/L**	5	278	290	4	159	169	6	<5
Cadmium	**ug/L**	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05
Cadmium (filtered)	**ug/L**	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05
Calcium (filtered)	**ug/L**	1000	33,000	33,000	0	29,000	29,000	0	<1,000
Chromium (III+VI)	**ug/L**	0.2	<0.2	<0.2	0	<0.2	<0.2	0	<0.2
Chromium (III+VI) (filtered)	**ug/L**	0.2	<0.2	<0.2	0	<0.2	<0.2	0	<0.2
Cobalt	**ug/L**	0.1	0.4	0.4	0	0.6	0.6	0	<0.1
Cobalt (filtered)	**ug/L**	0.1	0.4	0.4	0	0.6	0.6	0	<0.1
Copper	**ug/L**	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5
Copper (filtered)	**ug/L**	0.5	0.8	0.9	12	<0.5	<0.5	0	<0.5
Lead	**ug/L**	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1
Lead (filtered)	**ug/L**	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1
Magnesium (filtered)	**ug/L**	1000	52,000	51,000	2	37,000	36,000	3	<1,000
Manganese	**ug/L**	0.5	14.3	14	2	129	121	6	<0.5
Manganese (filtered)	**ug/L**	0.5	4.8	5.1	6	137	108	24	<0.5
Mercury	**ug/L**	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1
Mercury (filtered)	**ug/L**	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1
Molybdenum	**ug/L**	0.1	6.6	5.6	16	4	4.8	18	<0.1
Molybdenum (filtered)	**ug/L**	0.1	6.6	6.6	0	3.7	4.7	24	<0.1
Nickel	**ug/L**	0.5	0.9	0.8	12	1.2	1.3	8	<0.5
Nickel (filtered)	**ug/L**	0.5	1	1.1	10	1.3	1.3	0	<0.5
Potassium (filtered)	**ug/L**	1000	25,000	25,000	0	11,000	11,000	0	<1,000
Selenium	**ug/L**	0.2	0.7	0.6	15	0.8	0.7	13	<0.2
Selenium (filtered)	**ug/L**	0.2	0.3	0.3	0	0.5	0.5	0	<0.2
Silver	**ug/L**	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1
Silver (filtered)	**ug/L**	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1
Tin	**ug/L**	0.2	<0.2	<0.2	0	<0.2	<0.2	0	<0.2
Tin (filtered)	**ug/L**	0.2	<0.2	<0.2	0	<0.2	<0.2	0	<0.2
Zinc	**ug/L**	1	<1	2	67	2	1	67	<1
Zinc (filtered)	**ug/L**	1	<1	<1	0	<1	<1	0	<1

Table B-4: Quality Control Samples Collected in March 2021.

		Lab Report Number	EB2108650	EB2108650		EB2108650	EB2108650		EB2108650
		Field ID	CVBG6-0321	CVRG6-0321		CVAP9-0321	CVTP9-0321		CVCB-0321
		Date	23/03/2021	23/03/2021		24/03/2021	24/03/2021		23/03/2021
	Unit	LOR	Parent	Duplicate	RPD	Parent	Duplicate	RPD	Blank
Analyte									
Total Dissolved Solids (Calc.)	**mg/L**	1	2,110	2,120	0	1,420	1,410	1	<1
Inorganics									
Sulfate as SO4 - Turbidimetric (filtered)	**mg/L**	1	54	55	2	106	107	1	<1
Alkalinity (total) as CaCO3	**mg/L**	1	102	104	2	126	126	0	3
Anions Total	**meq/L**	0.01	33.3	33.1	1	23.5	23.6	0	0.06
Cations Total	**meq/L**	0.01	32.7	32.9	1	22.3	22.6	1	<0.01
Chloride	**mg/L**	1	1,070	1,060	1	665	667	0	<1
Fluoride	**mg/L**	0.1	0.2	0.2	0	0.3	0.3	0	<0.1
Ionic Balance	**%**	0.01	0.94	0.34	94	2.49	2.18	13	–
Sodium (filtered)	**mg/L**	1	610	614	1	393	399	2	<1
Hardness as CaCO3 (filtered)	**mg/L**	1	282	282	0	245	242	1	<1
TSS	**mg/L**	5	<5	5	0	<5	5	0	<5
Metals									
Antimony	**ug/L**	0.2	<0.2	<0.2	0	<0.2	<0.2	0	<0.2
Antimony (filtered)	**ug/L**	0.2	<0.2	<0.2	0	<0.2	<0.2	0	<0.2
Arsenic	**ug/L**	0.2	4.8	4.4	9	5.3	5.4	2	<0.2
Arsenic (filtered)	**ug/L**	0.2	4.2	4.3	2	5.3	5.5	4	<0.2
Beryllium	**ug/L**	0.1	<0.1	<0.1	0	<0.1	0.1	0	<0.1
Beryllium (filtered)	**ug/L**	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1
Boron	**ug/L**	5	328	299	9	205	205	0	<5
Boron (filtered)	**ug/L**	5	248	258	4	171	180	5	<5
Cadmium	**ug/L**	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05
Cadmium (filtered)	**ug/L**	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05
Calcium (filtered)	**ug/L**	1000	32,000	32,000	0	32,000	31,000	3	<1,000
Chromium (III+VI)	**ug/L**	0.2	0.2	0.4	67	0.3	0.3	0	<0.2
Chromium (III+VI) (filtered)	**ug/L**	0.2	<0.2	<0.2	0	<0.2	<0.2	0	<0.2
Cobalt	**ug/L**	0.1	0.3	0.3	0	0.5	0.6	18	<0.1
Cobalt (filtered)	**ug/L**	0.1	0.2	0.2	0	0.3	0.3	0	<0.1
Copper	**ug/L**	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5
Copper (filtered)	**ug/L**	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5
Lead	**ug/L**	0.1	<0.1	0.1	0	<0.1	0.1	0	<0.1
Lead (filtered)	**ug/L**	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1
Magnesium (filtered)	**ug/L**	1000	49,000	49,000	0	40,000	40,000	0	<1,000
Manganese	**ug/L**	0.5	32.9	29.5	11	290	285	2	<0.5
Manganese (filtered)	**ug/L**	0.5	17.6	17.4	1	251	268	7	<0.5
Mercury	**ug/L**	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1
Mercury (filtered)	**ug/L**	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1
Molybdenum	**ug/L**	0.1	4.4	4.4	0	2.8	2.8	0	<0.1
Molybdenum (filtered)	**ug/L**	0.1	4.2	4.2	0	2.5	2.6	4	<0.1
Nickel	**ug/L**	0.5	0.6	<0.5	18	1.2	1.2	0	<0.5
Nickel (filtered)	**ug/L**	0.5	0.6	<0.5	18	0.6	0.7	15	<0.5
Potassium (filtered)	**ug/L**	1000	22,000	22,000	0	14,000	14,000	0	<1,000
Selenium	**ug/L**	0.2	0.5	0.4	22	0.2	0.3	40	<0.2
Selenium (filtered)	**ug/L**	0.2	0.4	0.4	0	0.3	0.3	0	<0.2
Silver	**ug/L**	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1
Silver (filtered)	**ug/L**	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1
Tin	**ug/L**	0.2	<0.2	<0.2	0	<0.2	<0.2	0	<0.2
Tin (filtered)	**ug/L**	0.2	<0.2	<0.2	0	<0.2	<0.2	0	<0.2
Zinc	**ug/L**	1	6	2	100	3	3	0	<1
Zinc (filtered)	**ug/L**	1	<1	<1	0	<1	<1	0	<1

Table B-5: Quality Control Samples Collected in June 2021.

		Lab Report Number	ES2121390	ES2121390		ES2121390	ES2121390		ES2121390
		Field ID	CVBG2-0621	CVRG2-0621		CVAP7-0621	CVRP7-0621		CVRP5-0621
		Date	1/06/2021	1/06/2021		2/06/2021	1/06/2021		2/06/2021
	Unit	LOR	Parent	Duplicate	RPD	Parent	Duplicate	RPD	Blank
Analyte									
Total Dissolved Solids (Calc.)	**mg/L**	1	–	–	–	–	–	–	–
Inorganics									
Sulfate as SO4 - Turbidimetric (filtered)	**mg/L**	1	199	200	1	146	146	0	<1
Alkalinity (total) as CaCO3	**mg/L**	1	211	219	4	292	296	1	<1
Anions Total	**meq/L**	0.01	85.1	85.8	1	75.2	74.7	1	<0.01
Cations Total	**meq/L**	0.01	76	76.3	0	66.5	69.2	4	<0.01
Chloride	**mg/L**	1	2,720	2,740	1	2,350	2,330	1	<1
Fluoride	**mg/L**	0.1							
Ionic Balance	**%**	0.01	5.61	5.88	5	6.1	3.82	46	–
Sodium (filtered)	**mg/L**	1	1,380	1,380	0	1,210	1,260	4	<1
Hardness as CaCO3 (filtered)	**mg/L**	1	–	–	–	–	–	–	–
TSS	**mg/L**	5	103	118	14	28	21	29	<5
Metals									
Antimony	**ug/L**	0.2	1.1	0.6	59	0.2	0.2	0	<0.2
Antimony (filtered)	**ug/L**	0.2	0.3	0.3	0	0.3	<0.2	40	<0.2
Arsenic	**ug/L**	0.2	8.1	8.1	0	7.7	7.9	3	<0.2
Arsenic (filtered)	**ug/L**	0.2	4.8	5.2	8	7.1	7.3	3	<0.2
Beryllium	**ug/L**	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1
Beryllium (filtered)	**ug/L**	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1
Boron	**ug/L**	5	452	452	0	417	450	8	30
Boron (filtered)	**ug/L**	5	371	401	8	435	401	8	<5
Cadmium	**ug/L**	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05
Cadmium (filtered)	**ug/L**	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05
Calcium (filtered)	**ug/L**	1000	55,000	56,000	2	56,000	58,000	4	<1,000
Chromium (III+VI)	**ug/L**	0.2	4.7	4.4	7	0.4	0.4	0	<0.2
Chromium (III+VI) (filtered)	**ug/L**	0.2	<0.2	<0.2	0	<0.2	<0.2	0	<0.2
Cobalt	**ug/L**	0.1	3.5	3.5	0	1.1	1.1	0	<0.1
Cobalt (filtered)	**ug/L**	0.1	0.7	0.7	0	0.7	0.8	13	<0.1
Copper	**ug/L**	0.5	3	2.8	7	<0.5	<0.5	0	<0.5
Copper (filtered)	**ug/L**	0.5	<0.5	0.6	18	<0.5	<0.5	0	<0.5
Lead	**ug/L**	0.1	0.9	0.8	12	0.1	0.1	0	<0.1
Lead (filtered)	**ug/L**	0.1	<0.1	0.6	143	<0.1	<0.1	0	<0.1
Magnesium (filtered)	**ug/L**	1000	148,000	150,000	1	123,000	127,000	3	<1,000
Manganese	**ug/L**	0.5	305	308	1	227	221	3	<0.5
Manganese (filtered)	**ug/L**	0.5	99.3	90.9	9	78.4	77.2	2	<0.5
Mercury	**ug/L**	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1
Mercury (filtered)	**ug/L**	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1
Molybdenum	**ug/L**	0.1	10.3	10.3	0	13.6	13.9	2	<0.1
Molybdenum (filtered)	**ug/L**	0.1	8.8	8.9	1	12.2	11.9	2	<0.1
Nickel	**ug/L**	0.5	4.5	4.4	2	2.9	2.9	0	<0.5
Nickel (filtered)	**ug/L**	0.5	1.7	1.7	0	2.5	2.6	4	<0.5
Potassium (filtered)	**ug/L**	1000	43,000	44,000	2	38,000	40,000	5	<1,000
Selenium	**ug/L**	0.2	0.3	0.3	0	0.2	0.2	0	<0.2
Selenium (filtered)	**ug/L**	0.2	<0.2	<0.2	0	<0.2	<0.2	0	<0.2
Silver	**ug/L**	0.1	0.1	<0.1	0	<0.1	<0.1	0	<0.1
Silver (filtered)	**ug/L**	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1
Tin	**ug/L**	0.2	0.2	<0.2	0	<0.2	<0.2	0	<0.2
Tin (filtered)	**ug/L**	0.2	<0.2	<0.2	0	<0.2	<0.2	0	<0.2
Zinc	**ug/L**	1	7	7	0	2	2	0	<1
Zinc (filtered)	**ug/L**	1	<1	3	100	<1	<1	0	<1

Table B-6: Quality Control Samples for sediment collected in February 2020 and June 2021.

		Lab Report Number	EB2004453	EB2004453		ES2121390	ES2121390	
		Field ID	CV-BG2	CV-RG2		CVBG1-0621	CVRG1-0621	
		Date	13/02/2020	2/13/2020		1/06/2021	1/06/2021	
	Unit	LOR	Parent	Duplicate	RPD	Parent	Duplicate	RPD
Analyte								
Moisture Content	**%**	1	47.7	47.9	0	73.7	72.8	1
Total Organic Carbon	**%**	0.2	0.86	1.63	62	–	–	–
Metals								
Arsenic	**mg/kg**	5	16	13	21	8	7	13
Barium	**mg/kg**	10	40	40	0	20	20	0
Beryllium	**mg/kg**	1	<1	<1	0	<1	<1	0
Boron	**mg/kg**	50	<50	<50	0	<50	<50	0
Cadmium	**mg/kg**	1	<1	<1	0	<1	<1	0
Chromium (III+VI)	**mg/kg**	2	35	38	8	19	16	17
Cobalt	**mg/kg**	2	24	23	4	26	23	12
Copper	**mg/kg**	5	22	23	4	15	13	14
Lead	**mg/kg**	5	11	12	9	6	6	0
Manganese	**mg/kg**	5	1050	949	10	441	398	10
Mercury	**mg/kg**	0.1	<0.1	<0.1	0	<0.1	<0.1	0
Nickel	**mg/kg**	2	22	23	4	18	16	12
Selenium	**mg/kg**	5	<5	<5	0	<5	<5	0
Vanadium	**mg/kg**	5	75	74	1	50	44	13
Zinc	**mg/kg**	5	33	35	6	30	26	14
Polynuclear Aromatic Hydrocarbons								
Naphthalene	**mg/kg**	0.5	<0.5	<0.5	0	–	–	–
Acenaphthylene	**mg/kg**	0.5	<0.5	<0.5	0	–	–	–
Acenaphthene	**mg/kg**	0.5	<0.5	<0.5	0	–	–	–
Fluorene	**mg/kg**	0.5	<0.5	<0.5	0	–	–	–
Phenanthrene	**mg/kg**	0.5	<0.5	<0.5	0	–	–	–
Anthracene	**mg/kg**	0.5	<0.5	<0.5	0	–	–	–
Fluoranthene	**mg/kg**	0.5	<0.5	<0.5	0	–	–	–
Pyrene	**mg/kg**	0.5	<0.5	<0.5	0	–	–	–
Benz(a)anthracene	**mg/kg**	0.5	<0.5	<0.5	0	–	–	–
Chrysene	**mg/kg**	0.5	<0.5	<0.5	0	–	–	–
Benzo(b+j)fluoranthene	**mg/kg**	0.5	<0.5	<0.5	0	–	–	–
Benzo(k)fluoranthene	**mg/kg**	0.5	<0.5	<0.5	0	–	–	–
Benzo(a)pyrene	**mg/kg**	0.5	<0.5	<0.5	0	–	–	–
Indeno(1.2.3.cd)pyrene	**mg/kg**	0.5	<0.5	<0.5	0	–	–	–
Dibenz(a.h)anthracene	**mg/kg**	0.5	<0.5	<0.5	0	–	–	–
Benzo(g.h.i)perylene	**mg/kg**	0.5	<0.5	<0.5	0	–	–	–
Sum of polycyclic aromatic hydrocarbons	**mg/kg**	0.5	<0.5	<0.5	0	–	–	–

Appendix C: Laboratory Certificates of Analysis

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB1826430**	Page	: 1 of 9
Client	: **QLD DEPT OF ENVIRONMENT & SCIENCE**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted]	Address	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Project	: Caley Valley	Date Samples Received	: 02-Nov-2018 09:15
Order number	:	Date Analysis Commenced	: 05-Nov-2018
C-O-C number	: ----	Issue Date	: 16-Nov-2018 14:35
Sampler	: [redacted]		
Site	: ----		
Quote number	: [redacted]		
No. of samples received	: 15		
No. of samples analysed	: 15		

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. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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*
[redacted]	2IC Organic Chemist	[redacted]
[redacted]	Asbestos Identifier	[redacted]
[redacted]	Senior Inorganic Chemist	[redacted]
[redacted]	Senior Inorganic Chemist	[redacted]

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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.

- EP075(SIM): High LCS recovery deemed acceptable as all associated analyte results are less than LOR.
- EA153: ALS does not hold NATA accreditation for Laser Particle Sizing.
- EG035T (Total Mercury) Sample EB1826430-002 (CV-T1-S2) shows poor matrix spike recovery due to sample heterogeneity. Confirmed by visual inspection.
- EG005T (Total Metals by ICP-AES): Sample EB1826430 – 010 (CV-CT1-S3) shows poor duplicate results due to sample heterogeneity. Confirmed by visual inspection.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	CV-T1-S1	CV-T1-S2	CV-T1-S3	CV-T1-S4	CV-T2-S2
			Client sampling date / time	31-Oct-2018 10:00	31-Oct-2018 10:20	31-Oct-2018 10:50	31-Oct-2018 11:15	31-Oct-2018 12:40
Compound	CAS Number	LOR	Unit	EB1826430-001	EB1826430-002	EB1826430-003	EB1826430-004	EB1826430-005
				Result	Result	Result	Result	Result
EA010: Conductivity (1:5)								
Electrical Conductivity @ 25°C	----	1	µS/cm	10500	9840	12600	21300	36600
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	11.4	30.1	43.5	25.6	5.8
EA153: Laser Particle Size Analysis of Soils and Solids								
ø +1000µm	----	1	%	-	-	-	-	-
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	9	11	9	13	10
Barium	7440-39-3	10	mg/kg	90	50	20	30	30
Beryllium	7440-41-7	1	mg/kg	2	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg	50	<50	<50	70	<50
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	24	18	24	37	25
Cobalt	7440-48-4	2	mg/kg	52	15	16	16	12
Copper	7440-50-8	5	mg/kg	27	15	17	21	19
Lead	7439-92-1	5	mg/kg	9	12	6	7	8
Manganese	7439-96-5	5	mg/kg	332	131	158	324	216
Nickel	7440-02-0	2	mg/kg	52	18	18	20	16
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	36	29	35	51	36
Zinc	7440-66-6	5	mg/kg	158	47	62	53	67
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CV-T1-S1	CV-T1-S2	CV-T1-S3	CV-T1-S4	CV-T2-S2
				Client sampling date / time	31-Oct-2018 10:00	31-Oct-2018 10:20	31-Oct-2018 10:50	31-Oct-2018 11:15	31-Oct-2018 12:40
Compound	CAS Number	LOR	Unit		EB1826430-001	EB1826430-002	EB1826430-003	EB1826430-004	EB1826430-005
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		**1.2**	**1.2**	**1.2**	**1.2**	**1.2**
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**176**	**126**	**132**	**132**	**123**
2-Chlorophenol-D4	93951-73-6	0.5	%		**155**	**112**	**118**	**116**	**109**
2.4.6-Tribromophenol	118-79-6	0.5	%		**171**	**112**	**106**	**122**	**113**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**143**	**101**	**108**	**106**	**102**
Anthracene-d10	1719-06-8	0.5	%		**138**	**99.1**	**109**	**99.8**	**97.0**
4-Terphenyl-d14	1718-51-0	0.5	%		**141**	**106**	**111**	**99.1**	**98.4**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	CV-T2-S3	CV-T2-S4	CV-CT1-S1	CV-CT1-S2	CV-CT1-S3
			Client sampling date / time	31-Oct-2018 12:30	31-Oct-2018 12:00	31-Oct-2018 13:55	31-Oct-2018 14:10	31-Oct-2018 14:30
Compound	CAS Number	LOR	Unit	EB1826430-006	EB1826430-007	EB1826430-008	EB1826430-009	EB1826430-010
				Result	Result	Result	Result	Result
EA010: Conductivity (1:5)								
Electrical Conductivity @ 25°C	----	1	µS/cm	18100	8720	12700	16800	11600
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	5.7	3.3	4.9	25.1	6.9
EA153: Laser Particle Size Analysis of Soils and Solids								
ø +1000µm	----	1	%	-	-	-	-	-
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	13	<5	12	19	10
Barium	7440-39-3	10	mg/kg	20	20	20	30	20
Beryllium	7440-41-7	1	mg/kg	1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg	60	<50	<50	60	<50
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	37	16	26	46	29
Cobalt	7440-48-4	2	mg/kg	19	8	16	20	14
Copper	7440-50-8	5	mg/kg	24	12	15	30	15
Lead	7439-92-1	5	mg/kg	7	5	7	9	7
Manganese	7439-96-5	5	mg/kg	188	98	601	391	462
Nickel	7440-02-0	2	mg/kg	25	11	14	23	15
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	51	24	51	93	48
Zinc	7440-66-6	5	mg/kg	71	28	25	40	24
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CV-T2-S3	CV-T2-S4	CV-CT1-S1	CV-CT1-S2	CV-CT1-S3
				Client sampling date / time	31-Oct-2018 12:30	31-Oct-2018 12:00	31-Oct-2018 13:55	31-Oct-2018 14:10	31-Oct-2018 14:30
Compound	CAS Number	LOR	Unit		EB1826430-006	EB1826430-007	EB1826430-008	EB1826430-009	EB1826430-010
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		**1.2**	**1.2**	**1.2**	**1.2**	**1.2**
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**127**	**130**	**145**	**140**	**133**
2-Chlorophenol-D4	93951-73-6	0.5	%		**112**	**114**	**128**	**124**	**117**
2.4.6-Tribromophenol	118-79-6	0.5	%		**119**	**116**	**125**	**126**	**109**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**105**	**105**	**119**	**113**	**108**
Anthracene-d10	1719-06-8	0.5	%		**98.4**	**102**	**116**	**108**	**107**
4-Terphenyl-d14	1718-51-0	0.5	%		**99.0**	**103**	**114**	**109**	**104**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	CV-CT1-S4	CV-CT2-S2	CV-CT2-S3	CV-CT2-S4	CV-T3-S1
			Client sampling date / time	31-Oct-2018 14:50	31-Oct-2018 15:50	31-Oct-2018 15:30	31-Oct-2018 15:15	31-Oct-2018 17:00
Compound	CAS Number	LOR	Unit	EB1826430-011	EB1826430-012	EB1826430-013	EB1826430-014	EB1826430-015
				Result	Result	Result	Result	Result
EA010: Conductivity (1:5)								
Electrical Conductivity @ 25°C	----	1	µS/cm	22000	12700	21700	23600	24400
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	8.8	4.9	4.4	2.3	3.0
EA153: Laser Particle Size Analysis of Soils and Solids								
ø +1000µm	----	1	%	-	-	-	-	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	15	18	12	9	7
Barium	7440-39-3	10	mg/kg	40	40	40	20	20
Beryllium	7440-41-7	1	mg/kg	1	1	<1	<1	<1
Boron	7440-42-8	50	mg/kg	100	60	70	60	<50
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	46	46	44	28	20
Cobalt	7440-48-4	2	mg/kg	20	25	23	12	10
Copper	7440-50-8	5	mg/kg	25	23	23	14	11
Lead	7439-92-1	5	mg/kg	11	13	11	7	6
Manganese	7439-96-5	5	mg/kg	1280	2160	725	641	481
Nickel	7440-02-0	2	mg/kg	22	24	23	14	10
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	72	79	71	45	34
Zinc	7440-66-6	5	mg/kg	35	40	35	23	17
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CV-CT1-S4	CV-CT2-S2	CV-CT2-S3	CV-CT2-S4	CV-T3-S1
				Client sampling date / time	31-Oct-2018 14:50	31-Oct-2018 15:50	31-Oct-2018 15:30	31-Oct-2018 15:15	31-Oct-2018 17:00
Compound	CAS Number	LOR	Unit		EB1826430-011	EB1826430-012	EB1826430-013	EB1826430-014	EB1826430-015
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		**1.2**	**1.2**	**1.2**	**1.2**	**1.2**
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**129**	**113**	**106**	**116**	**156**
2-Chlorophenol-D4	93951-73-6	0.5	%		**111**	**114**	**109**	**120**	**156**
2.4.6-Tribromophenol	118-79-6	0.5	%		**107**	**82.9**	**78.6**	**87.0**	**111**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**104**	**117**	**112**	**118**	**153**
Anthracene-d10	1719-06-8	0.5	%		**102**	**128**	**120**	**125**	**157**
4-Terphenyl-d14	1718-51-0	0.5	%		**99.9**	**129**	**122**	**126**	**166**

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	35	155
2-Chlorophenol-D4	93951-73-6	42	153
2.4.6-Tribromophenol	118-79-6	26	157
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	34	157
Anthracene-d10	1719-06-8	37	153
4-Terphenyl-d14	1718-51-0	42	172

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB1901827**	Page	: 1 of 8
Client	: **QLD DEPT OF ENVIRONMENT & SCIENCE**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted]	Address	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Project	: ----	Date Samples Received	: 25-Jan-2019 09:15
Order number	:	Date Analysis Commenced	: 25-Jan-2019
C-O-C number	: ----	Issue Date	: 05-Feb-2019 10:59
Sampler	: [redacted]		
Site	: ----		
Quote number	: [redacted]		
No. of samples received	: 4		
No. of samples analysed	: 4		

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. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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*
[redacted]	Senior Inorganic Chemist	[redacted]
[redacted]	Senior Inorganic Chemist	[redacted]
[redacted]	Senior Organic Chemist	[redacted]
[redacted]	Senior Inorganic Chemist	[redacted]

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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.

- EG093-F (Dissolved Metals in Saline Water by ORC-ICP-MS): High LCS recovery deemed acceptable as all associated analyte results are less than LOR.
- It is recognised that EG093-T (Total Metals in Saline Water by ORC-ICP-MS) is less than EG093-F (Dissolved Metals in Saline Water by ORC-ICP-MS) for some samples. However, the difference is within experimental variation of the methods.
- It is recognised that EG094-T (Total Metals in Fresh Water by ORC-ICP-MS) is less than EG094-F (Dissolved Metals in Fresh Water by ORC-ICP-MS) for sample EB1901827-001(CV-SWC-0119). However, the difference is within experimental variation of the methods.
- Ionic Balance out of acceptable limits for some samples due to analytes not quantified in this report.
- EA016: Calculated TDS is determined from Electrical conductivity using a conversion factor of 0.65.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	CV-SWC-0119	CV-T1S4-0119	CV-B0-0119	CV-CT1S4-0119	----
			Client sampling date / time	23-Jan-2019 00:00	23-Jan-2019 00:00	23-Jan-2019 00:00	23-Jan-2019 00:00	----
Compound	CAS Number	LOR	Unit	EB1901827-001	EB1901827-002	EB1901827-003	EB1901827-004	--------
				Result	Result	Result	Result	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.80	8.66	8.91	9.01	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	1240	22400	64300	30500	----
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	806	14600	41800	19800	----
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	40	288	<5	38	----
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	185	3490	7600	3360	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	14	73	25	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	167	21	36	12	----
Total Alkalinity as CaCO3	----	1	mg/L	167	35	108	37	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	26	1150	3350	461	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	298	7710	23400	10300	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	28	328	538	336	----
Magnesium	7439-95-4	1	mg/L	28	649	1520	612	----
Sodium	7440-23-5	1	mg/L	167	5940	12900	5580	----
Potassium	7440-09-7	1	mg/L	10	197	497	182	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS								
Antimony	7440-36-0	0.5	µg/L	----	<0.5	<0.5	<0.5	----
Arsenic	7440-38-2	0.5	µg/L	----	3.1	1.5	2.8	----
Beryllium	7440-41-7	0.1	µg/L	----	<0.1	<0.1	<0.1	----
Boron	7440-42-8	100	µg/L	----	1280	5180	1860	----
Cadmium	7440-43-9	0.2	µg/L	----	<0.2	<0.2	<0.2	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	CV-SWC-0119	CV-T1S4-0119	CV-B0-0119	CV-CT1S4-0119	----
				Client sampling date / time	23-Jan-2019 00:00	23-Jan-2019 00:00	23-Jan-2019 00:00	23-Jan-2019 00:00	----
Compound	CAS Number	LOR	Unit		EB1901827-001	EB1901827-002	EB1901827-003	EB1901827-004	--------
					Result	Result	Result	Result	----
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS - Continued									
Chromium	7440-47-3	0.5	µg/L	----	<0.5	<0.5	<0.5	----	
Cobalt	7440-48-4	0.2	µg/L	----	**0.6**	<0.2	<0.2	----	
Copper	7440-50-8	1	µg/L	----	<1	**2**	<1	----	
Lead	7439-92-1	0.2	µg/L	----	<0.2	<0.2	<0.2	----	
Manganese	7439-96-5	0.5	µg/L	----	<0.5	<0.5	<0.5	----	
Molybdenum	7439-98-7	0.1	µg/L	----	**27.7**	**9.9**	**38.6**	----	
Nickel	7440-02-0	0.5	µg/L	----	**3.5**	**0.5**	**1.4**	----	
Selenium	7782-49-2	2	µg/L	----	<2	**7**	**2**	----	
Silver	7440-22-4	0.1	µg/L	----	<0.1	<0.1	<0.1	----	
Tin	7440-31-5	5	µg/L	----	<5	<5	<5	----	
Zinc	7440-66-6	5	µg/L	----	<5	<5	<5	----	
EG093T: Total Metals in Saline Water by ORC-ICPMS									
Antimony	7440-36-0	0.5	µg/L	----	<0.5	<0.5	<0.5	----	
Arsenic	7440-38-2	0.5	µg/L	----	**5.3**	**1.6**	**3.8**	----	
Beryllium	7440-41-7	0.1	µg/L	----	<0.1	<0.1	<0.1	----	
Boron	7440-42-8	100	µg/L	----	**1250**	**4780**	**1800**	----	
Cadmium	7440-43-9	0.2	µg/L	----	<0.2	<0.2	<0.2	----	
Chromium	7440-47-3	0.5	µg/L	----	**6.6**	**0.7**	**3.1**	----	
Cobalt	7440-48-4	0.2	µg/L	----	**3.4**	**0.6**	**1.5**	----	
Copper	7440-50-8	1	µg/L	----	**2**	**1**	**1**	----	
Lead	7439-92-1	0.2	µg/L	----	**1.0**	<0.2	**0.5**	----	
Manganese	7439-96-5	0.5	µg/L	----	**143**	**44.3**	**103**	----	
Molybdenum	7439-98-7	0.1	µg/L	----	**25.9**	**10.8**	**36.6**	----	
Nickel	7440-02-0	0.5	µg/L	----	**5.2**	<0.5	**2.0**	----	
Selenium	7782-49-2	2	µg/L	----	**2**	**7**	**3**	----	
Silver	7440-22-4	0.1	µg/L	----	<0.1	<0.1	<0.1	----	
Tin	7440-31-5	5	µg/L	----	<5	<5	**5**	----	
Zinc	7440-66-6	5	µg/L	----	**68**	<5	<5	----	
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS									
Antimony	7440-36-0	0.2	µg/L	<0.2	----	----	----	----	
Selenium	7782-49-2	0.2	µg/L	**0.5**	----	----	----	----	
Arsenic	7440-38-2	0.2	µg/L	**2.2**	----	----	----	----	
Beryllium	7440-41-7	0.1	µg/L	<0.1	----	----	----	----	
Boron	7440-42-8	5	µg/L	**137**	----	----	----	----	

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	CV-SWC-0119	CV-T1S4-0119	CV-B0-0119	CV-CT1S4-0119	----
				Client sampling date / time	23-Jan-2019 00:00	23-Jan-2019 00:00	23-Jan-2019 00:00	23-Jan-2019 00:00	----
Compound	CAS Number	LOR	Unit		EB1901827-001	EB1901827-002	EB1901827-003	EB1901827-004	--------
					Result	Result	Result	Result	----
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS - Continued									
Cadmium	7440-43-9	0.05	µg/L		<0.05	----	----	----	----
Chromium	7440-47-3	0.2	µg/L		<0.2	----	----	----	----
Cobalt	7440-48-4	0.1	µg/L		**1.0**	----	----	----	----
Copper	7440-50-8	0.5	µg/L		**0.6**	----	----	----	----
Lead	7439-92-1	0.1	µg/L		<0.1	----	----	----	----
Manganese	7439-96-5	0.5	µg/L		**286**	----	----	----	----
Molybdenum	7439-98-7	0.1	µg/L		**1.6**	----	----	----	----
Nickel	7440-02-0	0.5	µg/L		**1.6**	----	----	----	----
Silver	7440-22-4	0.1	µg/L		<0.1	----	----	----	----
Tin	7440-31-5	0.2	µg/L		<0.2	----	----	----	----
Zinc	7440-66-6	1	µg/L		<1	----	----	----	----
EG094T: Total metals in Fresh water by ORC-ICPMS									
Antimony	7440-36-0	0.2	µg/L		<0.2	----	----	----	----
Selenium	7782-49-2	0.2	µg/L		**0.4**	----	----	----	----
Arsenic	7440-38-2	0.2	µg/L		**2.5**	----	----	----	----
Beryllium	7440-41-7	0.1	µg/L		**0.1**	----	----	----	----
Boron	7440-42-8	5	µg/L		**150**	----	----	----	----
Cadmium	7440-43-9	0.05	µg/L		<0.05	----	----	----	----
Chromium	7440-47-3	0.2	µg/L		**5.2**	----	----	----	----
Cobalt	7440-48-4	0.1	µg/L		**3.5**	----	----	----	----
Copper	7440-50-8	0.5	µg/L		**3.8**	----	----	----	----
Lead	7439-92-1	0.1	µg/L		**1.4**	----	----	----	----
Manganese	7439-96-5	0.5	µg/L		**702**	----	----	----	----
Molybdenum	7439-98-7	0.1	µg/L		**1.8**	----	----	----	----
Nickel	7440-02-0	0.5	µg/L		**3.5**	----	----	----	----
Silver	7440-22-4	0.1	µg/L		<0.1	----	----	----	----
Tin	7440-31-5	0.2	µg/L		<0.2	----	----	----	----
Zinc	7440-66-6	1	µg/L		**8**	----	----	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.2**	**0.5**	**0.9**	**0.5**	----
EN055: Ionic Balance									
Total Anions	----	0.01	meq/L		**12.3**	**242**	**732**	**301**	----
Total Cations	----	0.01	meq/L		**11.2**	**333**	**726**	**314**	----
Ionic Balance	----	0.01	%		**4.52**	**15.8**	**0.43**	**2.21**	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	CV-SWC-0119	CV-T1S4-0119	CV-B0-0119	CV-CT1S4-0119	----
				Client sampling date / time	23-Jan-2019 00:00	23-Jan-2019 00:00	23-Jan-2019 00:00	23-Jan-2019 00:00	----
Compound	CAS Number	LOR	Unit		EB1901827-001	EB1901827-002	EB1901827-003	EB1901827-004	--------
					Result	Result	Result	Result	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Acenaphthylene	208-96-8	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Acenaphthene	83-32-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Fluorene	86-73-7	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Phenanthrene	85-01-8	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Anthracene	120-12-7	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Fluoranthene	206-44-0	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Pyrene	129-00-0	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Benz(a)anthracene	56-55-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Chrysene	218-01-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	<1	----
Toluene	108-88-3	2	µg/L		<2	<2	<2	<2	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	<2	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	<2	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	<2	----
^ Total Xylenes	----	2	µg/L		<2	<2	<2	<2	----
^ Sum of BTEX	----	1	µg/L		<1	<1	<1	<1	----
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	<5	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%		**29.7**	**32.0**	**35.1**	**26.7**	----
2-Chlorophenol-D4	93951-73-6	1.0	%		**69.2**	**54.5**	**51.8**	**36.3**	----
2.4.6-Tribromophenol	118-79-6	1.0	%		**63.2**	**36.6**	**21.8**	**19.3**	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%		**70.4**	**73.4**	**76.1**	**83.6**	----
Anthracene-d10	1719-06-8	1.0	%		**92.6**	**96.6**	**112**	**92.6**	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	CV-SWC-0119	CV-T1S4-0119	CV-B0-0119	CV-CT1S4-0119	----
				Client sampling date / time	23-Jan-2019 00:00	23-Jan-2019 00:00	23-Jan-2019 00:00	23-Jan-2019 00:00	----
Compound	CAS Number	LOR	Unit		EB1901827-001	EB1901827-002	EB1901827-003	EB1901827-004	--------
					Result	Result	Result	Result	----
EP075(SIM)T: PAH Surrogates - Continued									
4-Terphenyl-d14	1718-51-0	1.0	%		**118**	**120**	**146**	**120**	**----**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**107**	**105**	**104**	**108**	**----**
Toluene-D8	2037-26-5	2	%		**98.9**	**98.7**	**95.1**	**98.4**	**----**
4-Bromofluorobenzene	460-00-4	2	%		**98.8**	**100**	**99.2**	**97.9**	**----**

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	72
2-Chlorophenol-D4	93951-73-6	27	130
2.4.6-Tribromophenol	118-79-6	19	181
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	14	146
Anthracene-d10	1719-06-8	35	137
4-Terphenyl-d14	1718-51-0	36	154
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	66	138
Toluene-D8	2037-26-5	79	120
4-Bromofluorobenzene	460-00-4	74	118

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB1905872**	Page	: 1 of 19
Client	: **QLD DEPT OF ENVIRONMENT & SCIENCE**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted]	Address	: [redacted]
Telephone	: [redacted]	Telephone	: [redacted]
Project	: ----	Date Samples Received	: 08-Mar-2019 09:15
Order number	:	Date Analysis Commenced	: 08-Mar-2019
C-O-C number	: ----	Issue Date	: 15-Mar-2019 08:42
Sampler	: [redacted]		
Site	: ----		
Quote number	: [redacted]		
No. of samples received	: 16		
No. of samples analysed	: 16		

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

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- Analytical Results
- Surrogate Control Limits

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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*
[redacted]	2IC Organic Chemist	[redacted]
[redacted]	Laboratory Coordinator (2IC)	[redacted]
[redacted]	Organic Coordinator	[redacted]
[redacted]	Senior Inorganic Chemist	[redacted]
[redacted]	Senior Inorganic Chemist	[redacted]

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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.

- EG035T (Total Mercury): Sample EB1905872-013 (CV-T1-S2-0319) shows poor matrix spike recovery due to matrix interference. Confirmed by visual inspection.
- EA153: ALS does not hold NATA accreditation for Laser Particle Sizing.
- **Super Trace PAH analysis will be conducted by ALS Environmental, Sydney, NATA accreditation no. 825, Site No. 10911 (Micro site no. 14913).**
- It is recognised that EG094-T (Total Metals in Fresh Water by ORC-ICP-MS) is less than EG094-F (Dissolved Metals in Fresh Water by ORC-ICP-MS) for some samples. However, the difference is within experimental variation of the methods.
- EA016: Calculated TDS is determined from Electrical conductivity using a conversion factor of 0.65.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	CV-T1-S1-0319	CV-T1-S2-0319	CV-T1-S3-0319	CV-T2-S3-0319	CV-T2-S2-0319
			Client sampling date / time	05-Mar-2019 12:40	05-Mar-2019 14:10	05-Mar-2019 14:55	06-Mar-2019 10:40	06-Mar-2019 10:00
Compound	CAS Number	LOR	Unit	EB1905872-012	EB1905872-013	EB1905872-014	EB1905872-015	EB1905872-016
				Result	Result	Result	Result	Result
EA010: Conductivity (1:5)								
Electrical Conductivity @ 25°C	----	1	µS/cm	362	1100	626	584	496
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	46.9	46.8	38.2	47.3	43.7
EA153: Laser Particle Size Analysis of Soils and Solids								
ø +1000µm	----	1	%	4	4	5	13	4
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	6	5	7	12	7
Barium	7440-39-3	10	mg/kg	30	70	10	30	20
Beryllium	7440-41-7	1	mg/kg	1	1	<1	1	<1
Boron	7440-42-8	50	mg/kg	<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	20	18	16	26	21
Cobalt	7440-48-4	2	mg/kg	31	27	9	18	12
Copper	7440-50-8	5	mg/kg	17	25	13	17	18
Lead	7439-92-1	5	mg/kg	8	8	5	8	<5
Manganese	7439-96-5	5	mg/kg	255	285	62	174	88
Nickel	7440-02-0	2	mg/kg	30	25	11	20	16
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	33	34	30	46	36
Zinc	7440-66-6	5	mg/kg	118	80	47	64	65
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP074A: Monocyclic Aromatic Hydrocarbons								
Styrene	100-42-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Isopropylbenzene	98-82-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
n-Propylbenzene	103-65-1	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1.3.5-Trimethylbenzene	108-67-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
sec-Butylbenzene	135-98-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1.2.4-Trimethylbenzene	95-63-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
tert-Butylbenzene	98-06-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
p-Isopropyltoluene	99-87-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
n-Butylbenzene	104-51-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
EP074B: Oxygenated Compounds								
Vinyl Acetate	108-05-4	5	mg/kg	<5	<5	<5	<5	<5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CV-T1-S1-0319	CV-T1-S2-0319	CV-T1-S3-0319	CV-T2-S3-0319	CV-T2-S2-0319
				Client sampling date / time	05-Mar-2019 12:40	05-Mar-2019 14:10	05-Mar-2019 14:55	06-Mar-2019 10:40	06-Mar-2019 10:00
Compound	CAS Number	LOR	Unit		EB1905872-012	EB1905872-013	EB1905872-014	EB1905872-015	EB1905872-016
					Result	Result	Result	Result	Result
EP074B: Oxygenated Compounds - Continued									
2-Butanone (MEK)	78-93-3	5	mg/kg		<5	<5	<5	<5	<5
4-Methyl-2-pentanone (MIBK)	108-10-1	5	mg/kg		<5	<5	<5	<5	<5
2-Hexanone (MBK)	591-78-6	5	mg/kg		<5	<5	<5	<5	<5
EP074C: Sulfonated Compounds									
Carbon disulfide	75-15-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP074D: Fumigants									
2.2-Dichloropropane	594-20-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.2-Dichloropropane	78-87-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
cis-1.3-Dichloropropylene	10061-01-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
trans-1.3-Dichloropropylene	10061-02-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.2-Dibromoethane (EDB)	106-93-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP074E: Halogenated Aliphatic Compounds									
Dichlorodifluoromethane	75-71-8	5	mg/kg		<5	<5	<5	<5	<5
Chloromethane	74-87-3	5	mg/kg		<5	<5	<5	<5	<5
Vinyl chloride	75-01-4	5	mg/kg		<5	<5	<5	<5	<5
Bromomethane	74-83-9	5	mg/kg		<5	<5	<5	<5	<5
Chloroethane	75-00-3	5	mg/kg		<5	<5	<5	<5	<5
Trichlorofluoromethane	75-69-4	5	mg/kg		<5	<5	<5	<5	<5
1.1-Dichloroethene	75-35-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Iodomethane	74-88-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
trans-1.2-Dichloroethene	156-60-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.1-Dichloroethane	75-34-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
cis-1.2-Dichloroethene	156-59-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.1.1-Trichloroethane	71-55-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.1-Dichloropropylene	563-58-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	56-23-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.2-Dichloroethane	107-06-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethene	79-01-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane	74-95-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.1.2-Trichloroethane	79-00-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.3-Dichloropropane	142-28-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethene	127-18-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.1.1.2-Tetrachloroethane	630-20-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
trans-1.4-Dichloro-2-butene	110-57-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CV-T1-S1-0319	CV-T1-S2-0319	CV-T1-S3-0319	CV-T2-S3-0319	CV-T2-S2-0319
				Client sampling date / time	05-Mar-2019 12:40	05-Mar-2019 14:10	05-Mar-2019 14:55	06-Mar-2019 10:40	06-Mar-2019 10:00
Compound	CAS Number	LOR	Unit		EB1905872-012	EB1905872-013	EB1905872-014	EB1905872-015	EB1905872-016
					Result	Result	Result	Result	Result
EP074E: Halogenated Aliphatic Compounds - Continued									
cis-1.4-Dichloro-2-butene	1476-11-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.1.2.2-Tetrachloroethane	79-34-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.2.3-Trichloropropane	96-18-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Pentachloroethane	76-01-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.2-Dibromo-3-chloropropane	96-12-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Hexachlorobutadiene	87-68-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP074F: Halogenated Aromatic Compounds									
Chlorobenzene	108-90-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Bromobenzene	108-86-1	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorotoluene	95-49-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
4-Chlorotoluene	106-43-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.3-Dichlorobenzene	541-73-1	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.4-Dichlorobenzene	106-46-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.2-Dichlorobenzene	95-50-1	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.2.4-Trichlorobenzene	120-82-1	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
1.2.3-Trichlorobenzene	87-61-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP074G: Trihalomethanes									
Chloroform	67-66-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	75-27-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	124-48-1	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform	75-25-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CV-T1-S1-0319	CV-T1-S2-0319	CV-T1-S3-0319	CV-T2-S3-0319	CV-T2-S2-0319
				Client sampling date / time	05-Mar-2019 12:40	05-Mar-2019 14:10	05-Mar-2019 14:55	06-Mar-2019 10:40	06-Mar-2019 10:00
Compound	CAS Number	LOR	Unit		EB1905872-012	EB1905872-013	EB1905872-014	EB1905872-015	EB1905872-016
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg		<50	<50	<50	<50	<50
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ **Sum of BTEX**	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ **Total Xylenes**	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP074S: VOC Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.5	%		**71.3**	**74.3**	**110**	**92.9**	**89.8**
Toluene-D8	2037-26-5	0.5	%		**77.5**	**75.7**	**89.9**	**96.9**	**90.6**
4-Bromofluorobenzene	460-00-4	0.5	%		**87.0**	**85.8**	**99.9**	**108**	**90.7**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**79.5**	**83.4**	**123**	**108**	**103**
Toluene-D8	2037-26-5	0.2	%		**69.8**	**68.3**	**81.0**	**87.4**	**81.7**
4-Bromofluorobenzene	460-00-4	0.2	%		**85.9**	**88.7**	**100**	**111**	**84.8**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	CV-C-C0319	CV-T1-S4-0319	CV-FW-0319	CV-CC1-0319	CV-C-C2-0319
			Client sampling date / time	06-Mar-2019 14:20	06-Mar-2019 09:40	06-Mar-2019 13:50	06-Mar-2019 13:55	06-Mar-2019 13:40
Compound	CAS Number	LOR	Unit	EB1905872-001	EB1905872-002	EB1905872-003	EB1905872-004	EB1905872-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	9.85	7.69	8.13	8.70	8.93
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	4080	2460	2650	4140	4140
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	2650	1600	1720	2690	2690
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	<5	10	90	5	6
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	375	280	292	383	375
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	7	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	48	<1	<1	16	28
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	99	97	48	34
Total Alkalinity as CaCO3	----	1	mg/L	54	99	97	64	62
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	107	131	132	109	110
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	1250	704	766	1270	1260
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	38	33	33	38	38
Magnesium	7439-95-4	1	mg/L	68	48	51	70	68
Sodium	7440-23-5	1	mg/L	686	395	431	692	685
Potassium	7440-09-7	1	mg/L	24	16	17	24	24
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS								
Antimony	7440-36-0	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Selenium	7782-49-2	0.2	µg/L	0.6	0.4	0.4	0.6	0.5
Arsenic	7440-38-2	0.2	µg/L	2.0	1.6	1.8	2.4	2.4
Beryllium	7440-41-7	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Boron	7440-42-8	5	µg/L	220	187	179	237	251

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	CV-C-C0319	CV-T1-S4-0319	CV-FW-0319	CV-CC1-0319	CV-C-C2-0319
				Client sampling date / time	06-Mar-2019 14:20	06-Mar-2019 09:40	06-Mar-2019 13:50	06-Mar-2019 13:55	06-Mar-2019 13:40
Compound	CAS Number	LOR	Unit		EB1905872-001	EB1905872-002	EB1905872-003	EB1905872-004	EB1905872-005
					Result	Result	Result	Result	Result
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS - Continued									
Cadmium	7440-43-9	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
Chromium	7440-47-3	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Cobalt	7440-48-4	0.1	µg/L		**0.3**	**0.6**	**0.5**	**0.4**	**0.4**
Copper	7440-50-8	0.5	µg/L		**2.1**	<0.5	<0.5	<0.5	**0.5**
Lead	7439-92-1	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Manganese	7439-96-5	0.5	µg/L		**4.6**	**119**	**49.3**	**48.2**	**38.7**
Molybdenum	7439-98-7	0.1	µg/L		**4.3**	**5.6**	**5.2**	**4.1**	**4.1**
Nickel	7440-02-0	0.5	µg/L		**0.6**	**2.6**	**2.1**	**0.6**	**0.6**
Silver	7440-22-4	0.1	µg/L		**0.2**	<0.1	**0.2**	<0.1	<0.1
Tin	7440-31-5	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Zinc	7440-66-6	1	µg/L		<1	<1	<1	<1	<1
EG094T: Total metals in Fresh water by ORC-ICPMS									
Antimony	7440-36-0	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Selenium	7782-49-2	0.2	µg/L		**1.0**	**0.5**	**0.6**	**0.9**	**1.0**
Arsenic	7440-38-2	0.2	µg/L		**2.1**	**2.0**	**3.1**	**2.7**	**2.6**
Beryllium	7440-41-7	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Boron	7440-42-8	5	µg/L		**235**	**174**	**180**	**253**	**254**
Cadmium	7440-43-9	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
Chromium	7440-47-3	0.2	µg/L		<0.2	<0.2	**2.1**	<0.2	<0.2
Cobalt	7440-48-4	0.1	µg/L		**0.3**	**0.9**	**2.3**	**0.4**	**0.6**
Copper	7440-50-8	0.5	µg/L		<0.5	**0.6**	**1.8**	<0.5	<0.5
Lead	7439-92-1	0.1	µg/L		<0.1	<0.1	**0.5**	<0.1	<0.1
Manganese	7439-96-5	0.5	µg/L		**14.9**	**201**	**176**	**62.6**	**54.8**
Molybdenum	7439-98-7	0.1	µg/L		**4.5**	**5.5**	**5.4**	**4.2**	**4.4**
Nickel	7440-02-0	0.5	µg/L		<0.5	**2.5**	**3.7**	**0.6**	**0.6**
Silver	7440-22-4	0.1	µg/L		**0.2**	<0.1	<0.1	<0.1	<0.1
Tin	7440-31-5	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Zinc	7440-66-6	1	µg/L		<1	**1**	**9**	<1	<1
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.2**	**0.3**	**0.3**	**0.2**	**0.2**
EN055: Ionic Balance									
Total Anions	----	0.01	meq/L		**38.6**	**24.6**	**26.3**	**39.4**	**39.1**
Total Cations	----	0.01	meq/L		**37.9**	**23.2**	**25.0**	**38.4**	**37.9**
Ionic Balance	----	0.01	%		**0.81**	**2.88**	**2.47**	**1.29**	**1.52**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	CV-C-C0319	CV-T1-S4-0319	CV-FW-0319	CV-CC1-0319	CV-C-C2-0319
				Client sampling date / time	06-Mar-2019 14:20	06-Mar-2019 09:40	06-Mar-2019 13:50	06-Mar-2019 13:55	06-Mar-2019 13:40
Compound	CAS Number	LOR	Unit		EB1905872-001	EB1905872-002	EB1905872-003	EB1905872-004	EB1905872-005
					Result	Result	Result	Result	Result
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L		<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	<2	<2
^ **Total Xylenes**	----	2	µg/L		<2	<2	<2	<2	<2
^ **Sum of BTEX**	----	1	µg/L		<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	<5	<5
EP132B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Acenaphthylene	208-96-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Acenaphthene	83-32-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Fluorene	86-73-7	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Phenanthrene	85-01-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Anthracene	120-12-7	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Fluoranthene	206-44-0	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Pyrene	129-00-0	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Benz(a)anthracene	56-55-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Chrysene	218-01-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Benzo(k)fluoranthene	207-08-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Benzo(a)pyrene	50-32-8	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	<0.005
Indeno(1.2.3.cd)pyrene	193-39-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Dibenz(a.h)anthracene	53-70-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Benzo(g.h.i)perylene	191-24-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
^ **Total PAH**	----	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	<0.005
^ **Benzo(a)pyrene TEQ (zero)**	----	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	<0.005
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**104**	**103**	**99.7**	**102**	**101**
Toluene-D8	2037-26-5	2	%		**90.3**	**96.1**	**94.9**	**92.6**	**96.0**
4-Bromofluorobenzene	460-00-4	2	%		**97.0**	**104**	**99.0**	**103**	**104**
EP132T: Base/Neutral Extractable Surrogates (Low-Level)									
2-Fluorobiphenyl	321-60-8	0.02	%		**108**	**105**	**112**	**111**	**112**
Anthracene-d10	1719-06-8	0.02	%		**109**	**112**	**105**	**98.1**	**114**

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)				Client sample ID	CV-C-C0319	CV-T1-S4-0319	CV-FW-0319	CV-CC1-0319	CV-C-C2-0319
				Client sampling date / time	06-Mar-2019 14:20	06-Mar-2019 09:40	06-Mar-2019 13:50	06-Mar-2019 13:55	06-Mar-2019 13:40
Compound	CAS Number	LOR	Unit		EB1905872-001	EB1905872-002	EB1905872-003	EB1905872-004	EB1905872-005
					Result	Result	Result	Result	Result
EP132T: Base/Neutral Extractable Surrogates (Low-Level) - Continued									
4-Terphenyl-d14	1718-51-0	0.02	%		**116**	**120**	**114**	**117**	**116**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	CV-T1-S1-0319	CV-SW-C-0319	CV-BO-0319	CV-BI-0319	CV-EB-0319
			Client sampling date / time	05-Mar-2019 12:05	05-Mar-2019 08:45	06-Mar-2019 16:00	06-Mar-2019 10:00	06-Mar-2019 15:45
Compound	CAS Number	LOR	Unit	EB1905872-006	EB1905872-007	EB1905872-008	EB1905872-009	EB1905872-010
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.17	7.71	9.69	----	9.63
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	1540	970	2280	----	2480
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	1000	630	1480	----	1610
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	24	10	17	----	91
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	227	175	209	----	237
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	----	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	53	----	61
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	99	103	6	----	9
Total Alkalinity as CaCO3	----	1	mg/L	99	103	59	----	70
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	164	26	66	----	73
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	323	258	711	----	766
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	35	29	21	----	24
Magnesium	7439-95-4	1	mg/L	34	25	38	----	43
Sodium	7440-23-5	1	mg/L	212	132	376	----	408
Potassium	7440-09-7	1	mg/L	10	5	15	----	17
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS								
Antimony	7440-36-0	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Selenium	7782-49-2	0.2	µg/L	0.3	0.2	0.4	<0.2	0.4
Arsenic	7440-38-2	0.2	µg/L	1.4	0.7	2.4	<0.2	2.3
Beryllium	7440-41-7	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Boron	7440-42-8	5	µg/L	116	58	176	8	192

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	CV-T1-S1-0319	CV-SW-C-0319	CV-BO-0319	CV-BI-0319	CV-EB-0319
				Client sampling date / time	05-Mar-2019 12:05	05-Mar-2019 08:45	06-Mar-2019 16:00	06-Mar-2019 10:00	06-Mar-2019 15:45
Compound	CAS Number	LOR	Unit		EB1905872-006	EB1905872-007	EB1905872-008	EB1905872-009	EB1905872-010
					Result	Result	Result	Result	Result
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS - Continued									
Cadmium	7440-43-9	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
Chromium	7440-47-3	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Cobalt	7440-48-4	0.1	µg/L		1.9	0.6	0.4	<0.1	0.3
Copper	7440-50-8	0.5	µg/L		<0.5	0.5	1.4	<0.5	1.5
Lead	7439-92-1	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Manganese	7439-96-5	0.5	µg/L		520	54.5	2.7	<0.5	4.2
Molybdenum	7439-98-7	0.1	µg/L		5.2	0.8	3.1	<0.1	3.6
Nickel	7440-02-0	0.5	µg/L		4.7	1.1	1.0	<0.5	1.0
Silver	7440-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Tin	7440-31-5	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Zinc	7440-66-6	1	µg/L		<1	<1	<1	<1	<1
EG094T: Total metals in Fresh water by ORC-ICPMS									
Antimony	7440-36-0	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Selenium	7782-49-2	0.2	µg/L		0.4	0.2	0.5	<0.2	0.5
Arsenic	7440-38-2	0.2	µg/L		2.2	0.7	2.6	<0.2	2.8
Beryllium	7440-41-7	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Boron	7440-42-8	5	µg/L		129	59	198	<5	213
Cadmium	7440-43-9	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
Chromium	7440-47-3	0.2	µg/L		3.6	<0.2	<0.2	<0.2	1.8
Cobalt	7440-48-4	0.1	µg/L		5.4	0.7	0.7	<0.1	1.4
Copper	7440-50-8	0.5	µg/L		2.2	0.6	2.0	<0.5	2.8
Lead	7439-92-1	0.1	µg/L		0.6	<0.1	0.1	<0.1	0.4
Manganese	7439-96-5	0.5	µg/L		678	110	37.8	<0.5	85.0
Molybdenum	7439-98-7	0.1	µg/L		5.9	0.9	3.4	<0.1	3.6
Nickel	7440-02-0	0.5	µg/L		7.1	1.0	1.3	0.6	2.1
Silver	7440-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Tin	7440-31-5	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Zinc	7440-66-6	1	µg/L		12	<1	<1	<1	2
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		0.3	0.1	0.2	----	0.2
EN055: Ionic Balance									
Total Anions	----	0.01	meq/L		14.5	9.88	22.6	----	24.5
Total Cations	----	0.01	meq/L		14.0	9.37	20.9	----	22.9
Ionic Balance	----	0.01	%		1.69	2.61	3.90	----	3.39

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	CV-T1-S1-0319	CV-SW-C-0319	CV-BO-0319	CV-BI-0319	CV-EB-0319
				Client sampling date / time	05-Mar-2019 12:05	05-Mar-2019 08:45	06-Mar-2019 16:00	06-Mar-2019 10:00	06-Mar-2019 15:45
Compound	CAS Number	LOR	Unit		EB1905872-006	EB1905872-007	EB1905872-008	EB1905872-009	EB1905872-010
					Result	Result	Result	Result	Result
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	----	<1
Toluene	108-88-3	2	µg/L		<2	<2	<2	----	<2
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	----	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	----	<2
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	----	<2
^ Total Xylenes	----	2	µg/L		<2	<2	<2	----	<2
^ Sum of BTEX	----	1	µg/L		<1	<1	<1	----	<1
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	----	<5
EP132B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.02	µg/L		<0.02	<0.02	<0.02	----	<0.02
Acenaphthylene	208-96-8	0.02	µg/L		<0.02	<0.02	<0.02	----	<0.02
Acenaphthene	83-32-9	0.02	µg/L		<0.02	<0.02	<0.02	----	<0.02
Fluorene	86-73-7	0.02	µg/L		<0.02	<0.02	<0.02	----	<0.02
Phenanthrene	85-01-8	0.02	µg/L		<0.02	<0.02	<0.02	----	<0.02
Anthracene	120-12-7	0.02	µg/L		<0.02	<0.02	<0.02	----	<0.02
Fluoranthene	206-44-0	0.02	µg/L		<0.02	<0.02	<0.02	----	<0.02
Pyrene	129-00-0	0.02	µg/L		<0.02	<0.02	<0.02	----	<0.02
Benz(a)anthracene	56-55-3	0.02	µg/L		<0.02	<0.02	<0.02	----	<0.02
Chrysene	218-01-9	0.02	µg/L		<0.02	<0.02	<0.02	----	<0.02
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.02	µg/L		<0.02	<0.02	<0.02	----	<0.02
Benzo(k)fluoranthene	207-08-9	0.02	µg/L		<0.02	<0.02	<0.02	----	<0.02
Benzo(a)pyrene	50-32-8	0.005	µg/L		<0.005	<0.005	<0.005	----	<0.005
Indeno(1.2.3.cd)pyrene	193-39-5	0.02	µg/L		<0.02	<0.02	<0.02	----	<0.02
Dibenz(a.h)anthracene	53-70-3	0.02	µg/L		<0.02	<0.02	<0.02	----	<0.02
Benzo(g.h.i)perylene	191-24-2	0.02	µg/L		<0.02	<0.02	<0.02	----	<0.02
^ Total PAH	----	0.005	µg/L		<0.005	<0.005	<0.005	----	<0.005
^ Benzo(a)pyrene TEQ (zero)	----	0.005	µg/L		<0.005	<0.005	<0.005	----	<0.005
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**101**	**99.4**	**101**	----	**100**
Toluene-D8	2037-26-5	2	%		**92.8**	**94.3**	**94.8**	----	**96.0**
4-Bromofluorobenzene	460-00-4	2	%		**100**	**102**	**103**	----	**101**
EP132T: Base/Neutral Extractable Surrogates (Low-Level)									
2-Fluorobiphenyl	321-60-8	0.02	%		**119**	**109**	**110**	----	**105**
Anthracene-d10	1719-06-8	0.02	%		**114**	**114**	**108**	----	**116**

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)				Client sample ID	CV-T1-S1-0319	CV-SW-C-0319	CV-BO-0319	CV-BI-0319	CV-EB-0319
				Client sampling date / time	05-Mar-2019 12:05	05-Mar-2019 08:45	06-Mar-2019 16:00	06-Mar-2019 10:00	06-Mar-2019 15:45
Compound	CAS Number	LOR	Unit		EB1905872-006	EB1905872-007	EB1905872-008	EB1905872-009	EB1905872-010
					Result	Result	Result	Result	Result
EP132T: Base/Neutral Extractable Surrogates (Low-Level) - Continued									
4-Terphenyl-d14	1718-51-0	0.02	%		**116**	**119**	**115**	**----**	**112**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	CV-BB-0319	----	----	----	----
			Client sampling date / time	06-Mar-2019 16:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EB1905872-011	--------	--------	--------	--------
				Result	----	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**8.12**	----	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	<1	----	----	----	----
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	<1	----	----	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	<5	----	----	----	----
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	<1	----	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**4**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	**4**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	----	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	<1	----	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	<1	----	----	----	----
Magnesium	7439-95-4	1	mg/L	<1	----	----	----	----
Sodium	7440-23-5	1	mg/L	<1	----	----	----	----
Potassium	7440-09-7	1	mg/L	<1	----	----	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS								
Antimony	7440-36-0	0.2	µg/L	<0.2	----	----	----	----
Selenium	7782-49-2	0.2	µg/L	<0.2	----	----	----	----
Arsenic	7440-38-2	0.2	µg/L	<0.2	----	----	----	----
Beryllium	7440-41-7	0.1	µg/L	<0.1	----	----	----	----
Boron	7440-42-8	5	µg/L	<5	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	CV-BB-0319	----	----	----	----
				Client sampling date / time	06-Mar-2019 16:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB1905872-011	--------	--------	--------	--------
					Result	----	----	----	----
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS - Continued									
Cadmium	7440-43-9	0.05	µg/L		<0.05	----	----	----	----
Chromium	7440-47-3	0.2	µg/L		<0.2	----	----	----	----
Cobalt	7440-48-4	0.1	µg/L		<0.1	----	----	----	----
Copper	7440-50-8	0.5	µg/L		<0.5	----	----	----	----
Lead	7439-92-1	0.1	µg/L		<0.1	----	----	----	----
Manganese	7439-96-5	0.5	µg/L		<0.5	----	----	----	----
Molybdenum	7439-98-7	0.1	µg/L		<0.1	----	----	----	----
Nickel	7440-02-0	0.5	µg/L		<0.5	----	----	----	----
Silver	7440-22-4	0.1	µg/L		<0.1	----	----	----	----
Tin	7440-31-5	0.2	µg/L		<0.2	----	----	----	----
Zinc	7440-66-6	1	µg/L		<1	----	----	----	----
EG094T: Total metals in Fresh water by ORC-ICPMS									
Antimony	7440-36-0	0.2	µg/L		<0.2	----	----	----	----
Selenium	7782-49-2	0.2	µg/L		<0.2	----	----	----	----
Arsenic	7440-38-2	0.2	µg/L		<0.2	----	----	----	----
Beryllium	7440-41-7	0.1	µg/L		<0.1	----	----	----	----
Boron	7440-42-8	5	µg/L		<5	----	----	----	----
Cadmium	7440-43-9	0.05	µg/L		<0.05	----	----	----	----
Chromium	7440-47-3	0.2	µg/L		<0.2	----	----	----	----
Cobalt	7440-48-4	0.1	µg/L		<0.1	----	----	----	----
Copper	7440-50-8	0.5	µg/L		<0.5	----	----	----	----
Lead	7439-92-1	0.1	µg/L		<0.1	----	----	----	----
Manganese	7439-96-5	0.5	µg/L		<0.5	----	----	----	----
Molybdenum	7439-98-7	0.1	µg/L		<0.1	----	----	----	----
Nickel	7440-02-0	0.5	µg/L		<0.5	----	----	----	----
Silver	7440-22-4	0.1	µg/L		<0.1	----	----	----	----
Tin	7440-31-5	0.2	µg/L		<0.2	----	----	----	----
Zinc	7440-66-6	1	µg/L		<1	----	----	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		<0.1	----	----	----	----
EN055: Ionic Balance									
Total Anions	----	0.01	meq/L		**0.08**	----	----	----	----
Total Cations	----	0.01	meq/L		<0.01	----	----	----	----
EP080: BTEXN									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	CV-BB-0319	----	----	----	----
				Client sampling date / time	06-Mar-2019 16:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB1905872-011	--------	--------	--------	--------
					Result	----	----	----	----
EP080: BTEXN - Continued									
Benzene	71-43-2	1	µg/L		<1	----	----	----	----
Toluene	108-88-3	2	µg/L		<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	----	----	----	----
^ **Total Xylenes**	----	2	µg/L		<2	----	----	----	----
^ **Sum of BTEX**	----	1	µg/L		<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	----	----	----	----
EP132B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.02	µg/L		<0.02	----	----	----	----
Acenaphthylene	208-96-8	0.02	µg/L		<0.02	----	----	----	----
Acenaphthene	83-32-9	0.02	µg/L		<0.02	----	----	----	----
Fluorene	86-73-7	0.02	µg/L		<0.02	----	----	----	----
Phenanthrene	85-01-8	0.02	µg/L		<0.02	----	----	----	----
Anthracene	120-12-7	0.02	µg/L		<0.02	----	----	----	----
Fluoranthene	206-44-0	0.02	µg/L		<0.02	----	----	----	----
Pyrene	129-00-0	0.02	µg/L		<0.02	----	----	----	----
Benz(a)anthracene	56-55-3	0.02	µg/L		<0.02	----	----	----	----
Chrysene	218-01-9	0.02	µg/L		<0.02	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.02	µg/L		<0.02	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.02	µg/L		<0.02	----	----	----	----
Benzo(a)pyrene	50-32-8	0.005	µg/L		<0.005	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.02	µg/L		<0.02	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.02	µg/L		<0.02	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.02	µg/L		<0.02	----	----	----	----
^ **Total PAH**	----	0.005	µg/L		<0.005	----	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.005	µg/L		<0.005	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**105**	----	----	----	----
Toluene-D8	2037-26-5	2	%		**97.4**	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**103**	----	----	----	----
EP132T: Base/Neutral Extractable Surrogates (Low-Level)									
2-Fluorobiphenyl	321-60-8	0.02	%		**107**	----	----	----	----
Anthracene-d10	1719-06-8	0.02	%		**113**	----	----	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)				Client sample ID	**CV-BB-0319**	**----**	**----**	**----**	**----**
				Client sampling date / time	06-Mar-2019 16:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*		**EB1905872-011**	**--------**	**--------**	**--------**	**--------**
					Result	----	----	----	----
EP132T: Base/Neutral Extractable Surrogates (Low-Level) - Continued									
4-Terphenyl-d14	1718-51-0	0.02	%		**119**	**----**	**----**	**----**	**----**

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP074S: VOC Surrogates			
1.2-Dichloroethane-D4	17060-07-0	53	134
Toluene-D8	2037-26-5	60	131
4-Bromofluorobenzene	460-00-4	59	127
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	53	134
Toluene-D8	2037-26-5	60	131
4-Bromofluorobenzene	460-00-4	59	127

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	66	138
Toluene-D8	2037-26-5	79	120
4-Bromofluorobenzene	460-00-4	74	118
EP132T: Base/Neutral Extractable Surrogates (Low-Level)			
2-Fluorobiphenyl	321-60-8	54	136
Anthracene-d10	1719-06-8	66	134
4-Terphenyl-d14	1718-51-0	63	135

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2004433**	Page	: 1 of 15
Client	: **QLD DEPT OF ENVIRONMENT & SCIENCE**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted]	Address	: [redacted]
Telephone	: [redacted]	Telephone	: [redacted]
Project	: ----	Date Samples Received	: 18-Feb-2020 09:00
Order number	: ----	Date Analysis Commenced	: 18-Feb-2020
C-O-C number	: ----	Issue Date	: 28-Feb-2020 16:51
Sampler	: [redacted]		
Site	: ----		
Quote number	: [redacted]		
No. of samples received	: 13		
No. of samples analysed	: 13		

ilac-MRA NATA
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. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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*
[redacted]	Organic Coordinator	[redacted]
[redacted]	Senior Inorganic Chemist	[redacted]
[redacted]	Senior Inorganic Chemist	[redacted]
[redacted]	2IC Organic Chemist	[redacted]

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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.

- Samples not received in a suitable time frame to conduct the analysis EP132-LL within the recommended holding time.
- **Organics analysis will be conducted by ALS Environmental, Sydney, NATA accreditation no. 825, Site No. 10911 (Micro site no. 14913).**
- It is recognised that EG094-T (Total Metals in Fresh Water by ORC-ICP-MS) is less than EG094-F (Dissolved Metals in Fresh Water by ORC-ICP-MS) for samples CV-BG1 (EB2004433-001) and CV-BG7 (EB2004433-005). However, the difference is within experimental variation of the methods.
- EA016: Calculated TDS is determined from Electrical conductivity using a conversion factor of 0.65.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	CV-BG1	CV-BG3	CV-BG5	CV-BG6	CV-BG7
			Client sampling date / time	11-Feb-2020 10:40	13-Feb-2020 09:45	11-Feb-2020 15:45	13-Feb-2020 00:00	11-Feb-2020 13:25
Compound	CAS Number	LOR	Unit	EB2004433-001	EB2004433-002	EB2004433-003	EB2004433-004	EB2004433-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.63	8.35	8.20	8.55	7.60
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	2520	3020	2690	3040	2080
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	1640	1960	1750	1980	1350
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	68	<5	24	<5	29
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	250	306	268	306	214
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	5	<1	11	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	96	50	78	47	123
Total Alkalinity as CaCO3	----	1	mg/L	96	56	78	58	123
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	94	128	109	128	33
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	735	886	769	880	601
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	31	40	35	40	28
Magnesium	7439-95-4	1	mg/L	42	50	44	50	35
Sodium	7440-23-5	1	mg/L	364	445	390	444	298
Potassium	7440-09-7	1	mg/L	28	34	30	34	17
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG035U: Unfiltered Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS								
Antimony	7440-36-0	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	0.2
Selenium	7782-49-2	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	0.2
Arsenic	7440-38-2	0.2	µg/L	5.5	2.8	4.1	2.8	17.5
Beryllium	7440-41-7	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Boron	7440-42-8	5	µg/L	323	271	315	278	266

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	CV-BG1	CV-BG3	CV-BG5	CV-BG6	CV-BG7
				Client sampling date / time	11-Feb-2020 10:40	13-Feb-2020 09:45	11-Feb-2020 15:45	13-Feb-2020 00:00	11-Feb-2020 13:25
Compound	CAS Number	LOR	Unit		EB2004433-001	EB2004433-002	EB2004433-003	EB2004433-004	EB2004433-005
					Result	Result	Result	Result	Result
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS - Continued									
Cadmium	7440-43-9	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
Chromium	7440-47-3	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	0.7
Cobalt	7440-48-4	0.1	µg/L		1.2	0.4	0.6	0.4	1.9
Copper	7440-50-8	0.5	µg/L		1.5	2.5	2.4	2.6	1.8
Lead	7439-92-1	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	0.4
Manganese	7439-96-5	0.5	µg/L		225	16.7	31.6	16.0	380
Molybdenum	7439-98-7	0.1	µg/L		15.2	14.1	16.4	14.3	8.4
Nickel	7440-02-0	0.5	µg/L		2.6	1.4	2.1	1.3	3.8
Silver	7440-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Tin	7440-31-5	0.2	µg/L		1.6	<0.2	<0.2	<0.2	<0.2
Zinc	7440-66-6	1	µg/L		<1	<1	<1	<1	1
EG094T: Total metals in Fresh water by ORC-ICPMS									
Antimony	7440-36-0	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Selenium	7782-49-2	0.2	µg/L		0.2	<0.2	0.2	<0.2	0.3
Arsenic	7440-38-2	0.2	µg/L		7.1	3.0	5.0	3.2	19.8
Beryllium	7440-41-7	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Boron	7440-42-8	5	µg/L		353	336	358	318	299
Cadmium	7440-43-9	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
Chromium	7440-47-3	0.2	µg/L		2.3	<0.2	1.8	0.4	2.1
Cobalt	7440-48-4	0.1	µg/L		2.0	0.5	1.5	0.8	2.6
Copper	7440-50-8	0.5	µg/L		3.4	3.1	3.3	2.9	2.4
Lead	7439-92-1	0.1	µg/L		0.6	<0.1	0.3	0.1	0.9
Manganese	7439-96-5	0.5	µg/L		234	31.4	80.0	39.2	394
Molybdenum	7439-98-7	0.1	µg/L		15.7	16.3	18.1	15.3	9.3
Nickel	7440-02-0	0.5	µg/L		3.5	1.6	3.0	3.0	4.6
Silver	7440-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Tin	7440-31-5	0.2	µg/L		0.5	<0.2	<0.2	0.5	<0.2
Zinc	7440-66-6	1	µg/L		4	6	2	<1	4
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		0.4	0.4	0.4	0.4	0.4
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		24.6	28.8	25.5	28.6	20.1
ø Total Cations	----	0.01	meq/L		21.6	26.3	23.1	26.3	17.7
ø Ionic Balance	----	0.01	%		6.62	4.43	4.98	4.28	6.42

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	CV-BG1	CV-BG3	CV-BG5	CV-BG6	CV-BG7
				Client sampling date / time	11-Feb-2020 10:40	13-Feb-2020 09:45	11-Feb-2020 15:45	13-Feb-2020 00:00	11-Feb-2020 13:25
Compound	CAS Number	LOR	Unit		EB2004433-001	EB2004433-002	EB2004433-003	EB2004433-004	EB2004433-005
					Result	Result	Result	Result	Result
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L		<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	<2	<2
^ Total Xylenes	----	2	µg/L		<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L		<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	<5	<5
EP132B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Acenaphthylene	208-96-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Acenaphthene	83-32-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Fluorene	86-73-7	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Phenanthrene	85-01-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Anthracene	120-12-7	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Fluoranthene	206-44-0	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Pyrene	129-00-0	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Benz(a)anthracene	56-55-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Chrysene	218-01-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Benzo(k)fluoranthene	207-08-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Benzo(a)pyrene	50-32-8	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	<0.005
Indeno(1.2.3.cd)pyrene	193-39-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Dibenz(a.h)anthracene	53-70-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Benzo(g.h.i)perylene	191-24-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
^ Total PAH	----	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	<0.005
^ Benzo(a)pyrene TEQ (zero)	----	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	<0.005
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**101**	**100**	**105**	**102**	**103**
Toluene-D8	2037-26-5	2	%		**100**	**97.0**	**98.6**	**99.3**	**98.1**
4-Bromofluorobenzene	460-00-4	2	%		**107**	**92.4**	**96.6**	**95.5**	**93.6**
EP132T: Base/Neutral Extractable Surrogates (Low-Level)									
2-Fluorobiphenyl	321-60-8	0.02	%		**113**	**109**	**111**	**110**	**102**
Anthracene-d10	1719-06-8	0.02	%		**113**	**109**	**109**	**108**	**101**

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)				Client sample ID	CV-BG1	CV-BG3	CV-BG5	CV-BG6	CV-BG7
				Client sampling date / time	11-Feb-2020 10:40	13-Feb-2020 09:45	11-Feb-2020 15:45	13-Feb-2020 00:00	11-Feb-2020 13:25
Compound	CAS Number	LOR	Unit		EB2004433-001	EB2004433-002	EB2004433-003	EB2004433-004	EB2004433-005
					Result	Result	Result	Result	Result
EP132T: Base/Neutral Extractable Surrogates (Low-Level) - Continued									
4-Terphenyl-d14	1718-51-0	0.02	%		**110**	**118**	**111**	**116**	**110**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	CV-BG9	CV-RG1	CV-RG2	CV-AP2	CV-AP3
			Client sampling date / time	13-Feb-2020 11:30	12-Feb-2020 09:50	13-Feb-2020 08:30	12-Feb-2020 15:00	12-Feb-2020 16:00
Compound	CAS Number	LOR	Unit	EB2004433-006	EB2004433-007	EB2004433-008	EB2004433-009	EB2004433-010
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	8.22	6.07	8.13	7.64	7.86
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	3000	<1	3000	2370	2480
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	1950	<1	1950	1540	1610
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	<5	<5	7	43	34
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	306	<1	306	240	246
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	64	4	58	49	47
Total Alkalinity as CaCO3	----	1	mg/L	64	4	58	49	47
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	125	<1	126	124	130
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	874	<1	873	676	700
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	40	<1	40	30	31
Magnesium	7439-95-4	1	mg/L	50	<1	50	40	41
Sodium	7440-23-5	1	mg/L	443	<1	440	340	353
Potassium	7440-09-7	1	mg/L	33	<1	33	30	31
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG035U: Unfiltered Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS								
Antimony	7440-36-0	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Selenium	7782-49-2	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Arsenic	7440-38-2	0.2	µg/L	3.0	<0.2	3.0	3.7	3.5
Beryllium	7440-41-7	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Boron	7440-42-8	5	µg/L	279	<5	292	316	300

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	CV-BG9	CV-RG1	CV-RG2	CV-AP2	CV-AP3
				Client sampling date / time	13-Feb-2020 11:30	12-Feb-2020 09:50	13-Feb-2020 08:30	12-Feb-2020 15:00	12-Feb-2020 16:00
Compound	CAS Number	LOR	Unit		EB2004433-006	EB2004433-007	EB2004433-008	EB2004433-009	EB2004433-010
					Result	Result	Result	Result	Result
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS - Continued									
Cadmium	7440-43-9	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
Chromium	7440-47-3	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Cobalt	7440-48-4	0.1	µg/L		**0.6**	<0.1	**0.7**	**0.7**	**0.7**
Copper	7440-50-8	0.5	µg/L		**2.1**	<0.5	**2.0**	**1.5**	**2.0**
Lead	7439-92-1	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Manganese	7439-96-5	0.5	µg/L		**123**	<0.5	**126**	**40.3**	**44.6**
Molybdenum	7439-98-7	0.1	µg/L		**13.6**	<0.1	**13.7**	**11.3**	**11.2**
Nickel	7440-02-0	0.5	µg/L		**1.5**	<0.5	**1.6**	**3.5**	**3.5**
Silver	7440-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Tin	7440-31-5	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Zinc	7440-66-6	1	µg/L		<1	<1	<1	<1	<1
EG094T: Total metals in Fresh water by ORC-ICPMS									
Antimony	7440-36-0	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Selenium	7782-49-2	0.2	µg/L		<0.2	<0.2	<0.2	**0.2**	<0.2
Arsenic	7440-38-2	0.2	µg/L		**3.7**	<0.2	**3.6**	**5.2**	**4.4**
Beryllium	7440-41-7	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Boron	7440-42-8	5	µg/L		**326**	<5	**348**	**340**	**339**
Cadmium	7440-43-9	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
Chromium	7440-47-3	0.2	µg/L		**0.2**	<0.2	**0.3**	**2.2**	**1.8**
Cobalt	7440-48-4	0.1	µg/L		**0.9**	<0.1	**0.9**	**1.8**	**1.5**
Copper	7440-50-8	0.5	µg/L		**2.4**	<0.5	**2.5**	**2.9**	**2.6**
Lead	7439-92-1	0.1	µg/L		<0.1	<0.1	<0.1	**0.6**	**0.3**
Manganese	7439-96-5	0.5	µg/L		**150**	<0.5	**146**	**65.0**	**85.6**
Molybdenum	7439-98-7	0.1	µg/L		**14.7**	<0.1	**15.2**	**12.7**	**12.5**
Nickel	7440-02-0	0.5	µg/L		**1.9**	<0.5	**1.7**	**5.1**	**4.8**
Silver	7440-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Tin	7440-31-5	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Zinc	7440-66-6	1	µg/L		**2**	<1	<1	**8**	**6**
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.4**	<0.1	**0.3**	**0.4**	**0.4**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**28.5**	**0.08**	**28.4**	**22.6**	**23.4**
ø Total Cations	----	0.01	meq/L		**26.2**	<0.01	**26.1**	**20.3**	**21.1**
ø Ionic Balance	----	0.01	%		**4.22**	**----**	**4.25**	**5.32**	**5.22**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	CV-BG9	CV-RG1	CV-RG2	CV-AP2	CV-AP3
				Client sampling date / time	13-Feb-2020 11:30	12-Feb-2020 09:50	13-Feb-2020 08:30	12-Feb-2020 15:00	12-Feb-2020 16:00
Compound	CAS Number	LOR	Unit		EB2004433-006	EB2004433-007	EB2004433-008	EB2004433-009	EB2004433-010
					Result	Result	Result	Result	Result
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	<1	<1
Toluene	108-88-3	2	µg/L		<2	<2	<2	<2	<2
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	<2	<2
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	<2	<2
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	<2	<2
^ Total Xylenes	----	2	µg/L		<2	<2	<2	<2	<2
^ Sum of BTEX	----	1	µg/L		<1	<1	<1	<1	<1
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	<5	<5
EP132B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Acenaphthylene	208-96-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Acenaphthene	83-32-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Fluorene	86-73-7	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Phenanthrene	85-01-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Anthracene	120-12-7	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Fluoranthene	206-44-0	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Pyrene	129-00-0	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Benz(a)anthracene	56-55-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Chrysene	218-01-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Benzo(k)fluoranthene	207-08-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Benzo(a)pyrene	50-32-8	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	<0.005
Indeno(1.2.3.cd)pyrene	193-39-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Dibenz(a.h)anthracene	53-70-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Benzo(g.h.i)perylene	191-24-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
^ Total PAH	----	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	<0.005
^ Benzo(a)pyrene TEQ (zero)	----	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	<0.005
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**101**	**103**	**101**	**107**	**101**
Toluene-D8	2037-26-5	2	%		**95.8**	**100**	**99.2**	**98.3**	**97.2**
4-Bromofluorobenzene	460-00-4	2	%		**88.4**	**98.3**	**90.8**	**97.5**	**92.8**
EP132T: Base/Neutral Extractable Surrogates (Low-Level)									
2-Fluorobiphenyl	321-60-8	0.02	%		**110**	**112**	**99.9**	**99.8**	**103**
Anthracene-d10	1719-06-8	0.02	%		**113**	**110**	**104**	**104**	**109**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	CV-BG9	CV-RG1	CV-RG2	CV-AP2	CV-AP3
				Client sampling date / time	13-Feb-2020 11:30	12-Feb-2020 09:50	13-Feb-2020 08:30	12-Feb-2020 15:00	12-Feb-2020 16:00
Compound	CAS Number	LOR	Unit		EB2004433-006	EB2004433-007	EB2004433-008	EB2004433-009	EB2004433-010
					Result	Result	Result	Result	Result
EP132T: Base/Neutral Extractable Surrogates (Low-Level) - Continued									
4-Terphenyl-d14	1718-51-0	0.02	%		**116**	**110**	**119**	**116**	**119**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	CV-AP5	CV-AP7	CV-AP8	----	----
			Client sampling date / time	12-Feb-2020 12:00	12-Feb-2020 09:00	12-Feb-2020 17:18	----	----
Compound	CAS Number	LOR	Unit	EB2004433-011	EB2004433-012	EB2004433-013	--------	--------
				Result	Result	Result	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**7.65**	**7.47**	**7.50**	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**2440**	**2300**	**2440**	----	----
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	**1590**	**1500**	**1590**	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	**18**	**14**	**40**	----	----
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	**246**	**236**	**253**	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**49**	**49**	**50**	----	----
Total Alkalinity as CaCO3	----	1	mg/L	**49**	**49**	**50**	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**131**	**123**	**131**	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**696**	**656**	**698**	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**31**	**30**	**32**	----	----
Magnesium	7439-95-4	1	mg/L	**41**	**39**	**42**	----	----
Sodium	7440-23-5	1	mg/L	**348**	**326**	**346**	----	----
Potassium	7440-09-7	1	mg/L	**31**	**29**	**31**	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	----	----
EG035U: Unfiltered Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	----	----
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS								
Antimony	7440-36-0	0.2	µg/L	<0.2	<0.2	<0.2	----	----
Selenium	7782-49-2	0.2	µg/L	<0.2	<0.2	<0.2	----	----
Arsenic	7440-38-2	0.2	µg/L	**3.4**	**3.5**	**3.4**	----	----
Beryllium	7440-41-7	0.1	µg/L	<0.1	<0.1	<0.1	----	----
Boron	7440-42-8	5	µg/L	**307**	**284**	**314**	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	CV-AP5	CV-AP7	CV-AP8	----	----
				Client sampling date / time	12-Feb-2020 12:00	12-Feb-2020 09:00	12-Feb-2020 17:18	----	----
Compound	CAS Number	LOR	Unit		EB2004433-011	EB2004433-012	EB2004433-013	--------	--------
					Result	Result	Result	----	----
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS - Continued									
Cadmium	7440-43-9	0.05	µg/L		<0.05	<0.05	<0.05	----	----
Chromium	7440-47-3	0.2	µg/L		**0.3**	<0.2	<0.2	----	----
Cobalt	7440-48-4	0.1	µg/L		**0.9**	**1.2**	**0.7**	----	----
Copper	7440-50-8	0.5	µg/L		**2.0**	**1.4**	**1.8**	----	----
Lead	7439-92-1	0.1	µg/L		<0.1	<0.1	<0.1	----	----
Manganese	7439-96-5	0.5	µg/L		**81.8**	**121**	**72.6**	----	----
Molybdenum	7439-98-7	0.1	µg/L		**11.3**	**10.7**	**11.1**	----	----
Nickel	7440-02-0	0.5	µg/L		**3.9**	**3.5**	**3.3**	----	----
Silver	7440-22-4	0.1	µg/L		<0.1	<0.1	<0.1	----	----
Tin	7440-31-5	0.2	µg/L		<0.2	<0.2	<0.2	----	----
Zinc	7440-66-6	1	µg/L		**4**	<1	**1**	----	----
EG094T: Total metals in Fresh water by ORC-ICPMS									
Antimony	7440-36-0	0.2	µg/L		<0.2	<0.2	<0.2	----	----
Selenium	7782-49-2	0.2	µg/L		<0.2	<0.2	**0.2**	----	----
Arsenic	7440-38-2	0.2	µg/L		**4.3**	**4.6**	**4.8**	----	----
Beryllium	7440-41-7	0.1	µg/L		<0.1	<0.1	<0.1	----	----
Boron	7440-42-8	5	µg/L		**351**	**336**	**352**	----	----
Cadmium	7440-43-9	0.05	µg/L		<0.05	<0.05	<0.05	----	----
Chromium	7440-47-3	0.2	µg/L		**1.3**	**1.6**	**2.8**	----	----
Cobalt	7440-48-4	0.1	µg/L		**1.5**	**2.0**	**2.1**	----	----
Copper	7440-50-8	0.5	µg/L		**2.4**	**2.2**	**3.4**	----	----
Lead	7439-92-1	0.1	µg/L		**0.2**	**0.4**	**0.7**	----	----
Manganese	7439-96-5	0.5	µg/L		**108**	**150**	**116**	----	----
Molybdenum	7439-98-7	0.1	µg/L		**12.6**	**12.0**	**12.5**	----	----
Nickel	7440-02-0	0.5	µg/L		**4.5**	**5.0**	**5.2**	----	----
Silver	7440-22-4	0.1	µg/L		<0.1	<0.1	<0.1	----	----
Tin	7440-31-5	0.2	µg/L		<0.2	<0.2	<0.2	----	----
Zinc	7440-66-6	1	µg/L		**7**	**4**	**11**	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.3**	**0.3**	**0.4**	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**23.3**	**22.0**	**23.4**	----	----
ø Total Cations	----	0.01	meq/L		**20.8**	**19.6**	**20.9**	----	----
ø Ionic Balance	----	0.01	%		**5.63**	**5.80**	**5.69**	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	CV-AP5	CV-AP7	CV-AP8	----	----
				Client sampling date / time	12-Feb-2020 12:00	12-Feb-2020 09:00	12-Feb-2020 17:18	----	----
Compound	CAS Number	LOR	Unit		EB2004433-011	EB2004433-012	EB2004433-013	--------	--------
					Result	Result	Result	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	<1	<1	----	----
Toluene	108-88-3	2	µg/L		<2	<2	<2	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	<2	<2	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	----	----
^ **Total Xylenes**	----	2	µg/L		<2	<2	<2	----	----
^ **Sum of BTEX**	----	1	µg/L		<1	<1	<1	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	<5	----	----
EP132B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Acenaphthylene	208-96-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Acenaphthene	83-32-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Fluorene	86-73-7	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Phenanthrene	85-01-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Anthracene	120-12-7	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Fluoranthene	206-44-0	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Pyrene	129-00-0	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Benz(a)anthracene	56-55-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Chrysene	218-01-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Benzo(k)fluoranthene	207-08-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Benzo(a)pyrene	50-32-8	0.005	µg/L		<0.005	<0.005	<0.005	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Dibenz(a.h)anthracene	53-70-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Benzo(g.h.i)perylene	191-24-2	0.02	µg/L		<0.02	<0.02	<0.02	----	----
^ **Total PAH**	----	0.005	µg/L		<0.005	<0.005	<0.005	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.005	µg/L		<0.005	<0.005	<0.005	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**105**	**108**	**106**	----	----
Toluene-D8	2037-26-5	2	%		**98.9**	**96.4**	**97.1**	----	----
4-Bromofluorobenzene	460-00-4	2	%		**96.3**	**91.2**	**92.0**	----	----
EP132T: Base/Neutral Extractable Surrogates (Low-Level)									
2-Fluorobiphenyl	321-60-8	0.02	%		**98.6**	**100**	**103**	----	----
Anthracene-d10	1719-06-8	0.02	%		**109**	**103**	**110**	----	----

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)				Client sample ID	**CV-AP5**	**CV-AP7**	**CV-AP8**	**----**	**----**
				Client sampling date / time	12-Feb-2020 12:00	12-Feb-2020 09:00	12-Feb-2020 17:18	----	----
Compound	*CAS Number*	*LOR*	*Unit*		**EB2004433-011**	**EB2004433-012**	**EB2004433-013**	**--------**	**--------**
					Result	Result	Result	----	----
EP132T: Base/Neutral Extractable Surrogates (Low-Level) - Continued									
4-Terphenyl-d14	1718-51-0	0.02	%		**118**	**112**	**107**	**----**	**----**

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	66	138
Toluene-D8	2037-26-5	79	120
4-Bromofluorobenzene	460-00-4	74	118
EP132T: Base/Neutral Extractable Surrogates (Low-Level)			
2-Fluorobiphenyl	321-60-8	54	136
Anthracene-d10	1719-06-8	66	134
4-Terphenyl-d14	1718-51-0	63	135

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2004453**	Page	: 1 of 11
Client	: **QLD DEPT OF ENVIRONMENT & SCIENCE**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted]	Address	: [redacted]
Telephone	: [redacted]	Telephone	: [redacted]
Project	: ----	Date Samples Received	: 18-Feb-2020 09:00
Order number	: ----	Date Analysis Commenced	: 19-Feb-2020
C-O-C number	: ----	Issue Date	: 27-Feb-2020 15:42
Sampler	: [redacted]		
Site	: ----		
Quote number	: [redacted]		
No. of samples received	: 16		
No. of samples analysed	: 16		

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. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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*
[redacted]	Team Leader - Asbestos	[redacted]
[redacted]	Senior Inorganic Chemist	[redacted]
[redacted]	Senior Inorganic Chemist	[redacted]
[redacted]	2IC Organic Chemist	[redacted]

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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.

- EA153: ALS does not hold NATA accreditation for Laser Particle Sizing.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- Particle Sizing analysis will be conducted by ALS Newcastle, NATA accreditation no. 825, site no 1656.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CV-BG1	CV-BG2	CV-BG3	CV-BG4	CV-BG5
				Client sampling date / time	11-Feb-2020 10:40	13-Feb-2020 10:00	13-Feb-2020 09:45	11-Feb-2020 12:00	11-Feb-2020 15:45
Compound	CAS Number	LOR	Unit		EB2004453-001	EB2004453-002	EB2004453-003	EB2004453-004	EB2004453-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		45.8	47.7	45.0	25.2	46.3
EA153: Laser Particle Size Analysis of Soils and Solids									
ø +1000µm	----	1	%		See Attached	See Attached	See Attached	See Attached	See Attached
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		6	16	14	<5	13
Barium	7440-39-3	10	mg/kg		20	40	40	<10	40
Beryllium	7440-41-7	1	mg/kg		<1	<1	<1	<1	1
Boron	7440-42-8	50	mg/kg		<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		20	35	36	4	34
Cobalt	7440-48-4	2	mg/kg		19	24	25	<2	28
Copper	7440-50-8	5	mg/kg		20	22	22	<5	20
Lead	7439-92-1	5	mg/kg		8	11	11	<5	11
Manganese	7439-96-5	5	mg/kg		420	1050	895	33	955
Nickel	7440-02-0	2	mg/kg		18	22	24	2	25
Selenium	7782-49-2	5	mg/kg		<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		50	75	78	10	74
Zinc	7440-66-6	5	mg/kg		33	33	34	<5	36
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP003: Total Organic Carbon (TOC) in Soil									
Total Organic Carbon	----	0.02	%		2.97	0.86	0.74	0.74	0.62
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CV-BG1	CV-BG2	CV-BG3	CV-BG4	CV-BG5
				Client sampling date / time	11-Feb-2020 10:40	13-Feb-2020 10:00	13-Feb-2020 09:45	11-Feb-2020 12:00	11-Feb-2020 15:45
Compound	CAS Number	LOR	Unit		EB2004453-001	EB2004453-002	EB2004453-003	EB2004453-004	EB2004453-005
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		**1.2**	**1.2**	**1.2**	**1.2**	**1.2**
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**85.3**	**91.8**	**89.0**	**90.4**	**91.6**
2-Chlorophenol-D4	93951-73-6	0.5	%		**87.6**	**93.6**	**90.1**	**88.9**	**92.8**
2.4.6-Tribromophenol	118-79-6	0.5	%		**71.7**	**75.3**	**71.1**	**73.8**	**73.6**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**100**	**106**	**103**	**103**	**104**
Anthracene-d10	1719-06-8	0.5	%		**96.8**	**104**	**102**	**99.8**	**102**
4-Terphenyl-d14	1718-51-0	0.5	%		**89.5**	**98.1**	**95.0**	**93.6**	**96.0**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	CV-BG6	CV-BG7	CV-BG9	CV-RG2	CV-AP1
			Client sampling date / time	13-Feb-2020 12:00	11-Feb-2020 13:25	13-Feb-2020 11:30	13-Feb-2020 08:30	13-Feb-2020 14:40
Compound	CAS Number	LOR	Unit	EB2004453-006	EB2004453-007	EB2004453-008	EB2004453-009	EB2004453-010
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**42.1**	**30.6**	**47.5**	**47.9**	**31.2**
EA153: Laser Particle Size Analysis of Soils and Solids								
ø +1000µm	----	1	%	**See Attached**	**See Attached**	**See Attached**	**See Attached**	**See Attached**
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**17**	<5	**11**	**13**	**9**
Barium	7440-39-3	10	mg/kg	**40**	<10	**40**	**40**	**20**
Beryllium	7440-41-7	1	mg/kg	<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg	<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	**35**	**8**	**36**	**38**	**16**
Cobalt	7440-48-4	2	mg/kg	**26**	**5**	**23**	**23**	**16**
Copper	7440-50-8	5	mg/kg	**22**	**7**	**23**	**23**	**11**
Lead	7439-92-1	5	mg/kg	**12**	<5	**11**	**12**	**6**
Manganese	7439-96-5	5	mg/kg	**918**	**86**	**892**	**949**	**243**
Nickel	7440-02-0	2	mg/kg	**23**	**6**	**22**	**23**	**18**
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	**73**	**14**	**70**	**74**	**33**
Zinc	7440-66-6	5	mg/kg	**32**	**16**	**33**	**35**	**59**
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	**0.97**	**1.49**	**1.67**	**1.63**	**1.88**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CV-BG6	CV-BG7	CV-BG9	CV-RG2	CV-AP1
				Client sampling date / time	13-Feb-2020 12:00	11-Feb-2020 13:25	13-Feb-2020 11:30	13-Feb-2020 08:30	13-Feb-2020 14:40
Compound	CAS Number	LOR	Unit		EB2004453-006	EB2004453-007	EB2004453-008	EB2004453-009	EB2004453-010
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		**1.2**	**1.2**	**1.2**	**1.2**	**1.2**
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**87.8**	**90.2**	**89.0**	**92.9**	**88.1**
2-Chlorophenol-D4	93951-73-6	0.5	%		**86.2**	**89.2**	**88.1**	**91.5**	**87.6**
2.4.6-Tribromophenol	118-79-6	0.5	%		**70.0**	**74.9**	**70.2**	**76.2**	**72.6**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**101**	**98.8**	**93.8**	**99.6**	**97.5**
Anthracene-d10	1719-06-8	0.5	%		**100**	**98.4**	**99.0**	**106**	**96.4**
4-Terphenyl-d14	1718-51-0	0.5	%		**94.4**	**93.1**	**91.9**	**98.0**	**91.3**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	CV-AP2	CV-AP3	CV-AP4	CV-AP5	CV-AP7
			Client sampling date / time	12-Feb-2020 15:00	12-Feb-2020 16:00	12-Feb-2020 11:00	12-Feb-2020 12:00	12-Feb-2020 09:00
Compound	CAS Number	LOR	Unit	EB2004453-011	EB2004453-012	EB2004453-013	EB2004453-014	EB2004453-015
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	34.0	39.2	39.8	30.0	32.6
EA153: Laser Particle Size Analysis of Soils and Solids								
ø +1000µm	----	1	%	See Attached	See Attached	See Attached	See Attached	See Attached
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	7	8	<5	7	<5
Barium	7440-39-3	10	mg/kg	10	20	20	20	<10
Beryllium	7440-41-7	1	mg/kg	<1	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg	<50	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	15	20	12	16	12
Cobalt	7440-48-4	2	mg/kg	7	10	14	8	10
Copper	7440-50-8	5	mg/kg	14	18	12	15	10
Lead	7439-92-1	5	mg/kg	5	6	6	7	<5
Manganese	7439-96-5	5	mg/kg	52	93	142	78	99
Nickel	7440-02-0	2	mg/kg	9	14	16	11	12
Selenium	7782-49-2	5	mg/kg	<5	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg	32	39	22	32	20
Zinc	7440-66-6	5	mg/kg	39	46	61	51	32
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	1.28	1.85	4.02	1.15	1.25
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CV-AP2	CV-AP3	CV-AP4	CV-AP5	CV-AP7
				Client sampling date / time	12-Feb-2020 15:00	12-Feb-2020 16:00	12-Feb-2020 11:00	12-Feb-2020 12:00	12-Feb-2020 09:00
Compound	CAS Number	LOR	Unit		EB2004453-011	EB2004453-012	EB2004453-013	EB2004453-014	EB2004453-015
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		**1.2**	**1.2**	**1.2**	**1.2**	**1.2**
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**88.9**	**93.0**	**89.6**	**91.5**	**91.7**
2-Chlorophenol-D4	93951-73-6	0.5	%		**88.4**	**92.6**	**91.1**	**91.9**	**90.0**
2.4.6-Tribromophenol	118-79-6	0.5	%		**72.6**	**72.2**	**77.6**	**74.0**	**76.9**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**97.4**	**100**	**97.0**	**95.6**	**93.3**
Anthracene-d10	1719-06-8	0.5	%		**99.6**	**99.1**	**97.6**	**97.6**	**102**
4-Terphenyl-d14	1718-51-0	0.5	%		**91.6**	**94.4**	**92.4**	**90.4**	**94.1**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	CV-AP8	----	----	----	----
			Client sampling date / time	12-Feb-2020 16:00	----	----	----	----
Compound	CAS Number	LOR	Unit	EB2004453-016	--------	--------	--------	--------
				Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**44.9**	----	----	----	----
EA153: Laser Particle Size Analysis of Soils and Solids								
ø +1000µm	----	1	%	**See Attached**	----	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**7**	----	----	----	----
Barium	7440-39-3	10	mg/kg	**30**	----	----	----	----
Beryllium	7440-41-7	1	mg/kg	**1**	----	----	----	----
Boron	7440-42-8	50	mg/kg	<50	----	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg	**25**	----	----	----	----
Cobalt	7440-48-4	2	mg/kg	**10**	----	----	----	----
Copper	7440-50-8	5	mg/kg	**26**	----	----	----	----
Lead	7439-92-1	5	mg/kg	**8**	----	----	----	----
Manganese	7439-96-5	5	mg/kg	**88**	----	----	----	----
Nickel	7440-02-0	2	mg/kg	**17**	----	----	----	----
Selenium	7782-49-2	5	mg/kg	<5	----	----	----	----
Vanadium	7440-62-2	5	mg/kg	**45**	----	----	----	----
Zinc	7440-66-6	5	mg/kg	**57**	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	----	----	----
EP003: Total Organic Carbon (TOC) in Soil								
Total Organic Carbon	----	0.02	%	**4.31**	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	CV-AP8	----	----	----	----
				Client sampling date / time	12-Feb-2020 16:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2004453-016	--------	--------	--------	--------
					Result	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	----	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg		<0.5	----	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg		<0.5	----	----	----	----
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg		**0.6**	----	----	----	----
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg		**1.2**	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**79.6**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		**82.8**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		**89.1**	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**93.0**	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%		**95.3**	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		**96.2**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	35	154
2-Chlorophenol-D4	93951-73-6	42	153
2.4.6-Tribromophenol	118-79-6	26	157
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	34	156
Anthracene-d10	1719-06-8	37	153
4-Terphenyl-d14	1718-51-0	42	172

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2103109**	Page	: 1 of 11
Amendment	: **1**		
Client	: **QLD DEPT OF ENVIRONMENT & SCIENCE**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted]	Address	: [redacted]
Telephone	: [redacted]	Telephone	: [redacted]
Project	: CV Monitoring	Date Samples Received	: 05-Feb-2021 09:00
Order number	: ----	Date Analysis Commenced	: 05-Feb-2021
C-O-C number	: ----	Issue Date	: 15-Feb-2021 10:16
Sampler	: [redacted]		
Site	: ----		
Quote number	: [redacted]		
No. of samples received	: 16		
No. of samples analysed	: 16		

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.

Signatories	*Position*	*Accreditation Category*
[redacted]	Senior Inorganic Chemist	[redacted]
[redacted]	Senior Inorganic Chemist	[redacted]

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.

- Amendment (15/02/2021): This report has been amended to allow the distribution of an Electronic Data Deliverable (EDD) not previously provided. All analysis results are as per the previous report.
- It is recognised that EG094-T (Total Metals in Fresh Water by ORC-ICP-MS) is less than EG094-F (Dissolved Metals in Fresh Water by ORC-ICP-MS) for some samples. However, the difference is within experimental variation of the methods.
- EA016: Calculated TDS is determined from Electrical conductivity using a conversion factor of 0.65.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	CVAP1-0221	CVAP2-0221	CVAP3-0221	CVAP4-0221	CVGP4-0221
			Sampling date / time	03-Feb-2021 10:15	03-Feb-2021 09:00	03-Feb-2021 09:45	03-Feb-2021 11:30	03-Feb-2021 12:30
Compound	CAS Number	LOR	Unit	EB2103109-001	EB2103109-002	EB2103109-003	EB2103109-004	EB2103109-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.40	8.94	9.37	9.13	7.90
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	1850	1820	1840	1850	1790
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	1200	1180	1200	1200	1160
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	8	6	8	7	8
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	243	223	221	225	221
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	16	30	26	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	95	48	33	47	84
Total Alkalinity as CaCO3	----	1	mg/L	95	65	63	73	84
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	175	180	175	173	164
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	463	468	477	480	451
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	33	30	29	29	29
Magnesium	7439-95-4	1	mg/L	39	36	36	37	36
Sodium	7440-23-5	1	mg/L	252	248	255	251	256
Potassium	7440-09-7	1	mg/L	11	11	11	11	11
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS								
Antimony	7440-36-0	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Selenium	7782-49-2	0.2	µg/L	0.5	0.5	0.5	0.5	0.5
Arsenic	7440-38-2	0.2	µg/L	4.6	3.2	3.2	3.4	3.3
Beryllium	7440-41-7	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Boron	7440-42-8	5	µg/L	154	170	168	159	169

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	CVAP1-0221	CVAP2-0221	CVAP3-0221	CVAP4-0221	CVGP4-0221
				Sampling date / time	03-Feb-2021 10:15	03-Feb-2021 09:00	03-Feb-2021 09:45	03-Feb-2021 11:30	03-Feb-2021 12:30
Compound	CAS Number	LOR	Unit		EB2103109-001	EB2103109-002	EB2103109-003	EB2103109-004	EB2103109-005
					Result	Result	Result	Result	Result
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS - Continued									
Cadmium	7440-43-9	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
Chromium	7440-47-3	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Cobalt	7440-48-4	0.1	µg/L		**2.4**	**0.8**	**0.7**	**0.6**	**0.6**
Copper	7440-50-8	0.5	µg/L		**0.8**	**0.8**	**0.8**	<0.5	<0.5
Lead	7439-92-1	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Manganese	7439-96-5	0.5	µg/L		**644**	**15.2**	**6.9**	**137**	**108**
Molybdenum	7439-98-7	0.1	µg/L		**5.3**	**7.7**	**7.0**	**3.7**	**4.7**
Nickel	7440-02-0	0.5	µg/L		**2.9**	**2.1**	**1.8**	**1.3**	**1.3**
Silver	7440-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Tin	7440-31-5	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Zinc	7440-66-6	1	µg/L		**1**	**2**	**2**	<1	<1
EG094T: Total metals in Fresh water by ORC-ICPMS									
Antimony	7440-36-0	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Selenium	7782-49-2	0.2	µg/L		**0.7**	**0.7**	**0.7**	**0.8**	**0.7**
Arsenic	7440-38-2	0.2	µg/L		**4.4**	**2.9**	**2.8**	**2.9**	**3.1**
Beryllium	7440-41-7	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Boron	7440-42-8	5	µg/L		**156**	**171**	**174**	**166**	**180**
Cadmium	7440-43-9	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
Chromium	7440-47-3	0.2	µg/L		<0.2	**0.3**	<0.2	<0.2	<0.2
Cobalt	7440-48-4	0.1	µg/L		**2.5**	**0.8**	**0.8**	**0.6**	**0.6**
Copper	7440-50-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Lead	7439-92-1	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Manganese	7439-96-5	0.5	µg/L		**687**	**30.4**	**18.7**	**129**	**121**
Molybdenum	7439-98-7	0.1	µg/L		**4.6**	**7.1**	**6.7**	**4.0**	**4.8**
Nickel	7440-02-0	0.5	µg/L		**2.5**	**1.8**	**1.8**	**1.2**	**1.3**
Silver	7440-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Tin	7440-31-5	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Zinc	7440-66-6	1	µg/L		**2**	**2**	**4**	**2**	**1**
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.4**	**0.4**	**0.3**	**0.3**	**0.3**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**18.6**	**18.2**	**18.4**	**18.6**	**17.8**
ø Total Cations	----	0.01	meq/L		**16.1**	**15.5**	**15.8**	**15.7**	**15.8**
ø Ionic Balance	----	0.01	%		**7.21**	**8.05**	**7.54**	**8.48**	**5.91**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	CVZP4-0221	CVAP7-0221	SWC-0221	CVBG1-0221	CVBG2-0221
			Sampling date / time	03-Feb-2021 12:15	03-Feb-2021 14:00	03-Feb-2021 16:30	02-Feb-2021 09:30	02-Feb-2021 10:15
Compound	CAS Number	LOR	Unit	EB2103109-006	EB2103109-007	EB2103109-008	EB2103109-009	EB2103109-010
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	6.24	9.66	7.56	7.91	9.61
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1820	1030	3040	2910
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	<1	1180	670	1980	1890
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	5	<5	14	16	9
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	<1	219	160	296	282
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	40	<1	<1	41
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	1	17	91	91	27
Total Alkalinity as CaCO3	----	1	mg/L	1	56	91	91	68
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	182	13	94	106
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	<1	471	275	918	890
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	<1	30	26	31	32
Magnesium	7439-95-4	1	mg/L	<1	35	23	53	49
Sodium	7440-23-5	1	mg/L	<1	251	143	456	436
Potassium	7440-09-7	1	mg/L	<1	10	8	26	24
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS								
Antimony	7440-36-0	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Selenium	7782-49-2	0.2	µg/L	<0.2	0.5	0.2	0.3	0.3
Arsenic	7440-38-2	0.2	µg/L	<0.2	2.7	1.5	5.6	3.6
Beryllium	7440-41-7	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Boron	7440-42-8	5	µg/L	<5	168	65	270	261

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	CVZP4-0221	CVAP7-0221	SWC-0221	CVBG1-0221	CVBG2-0221
				Sampling date / time	03-Feb-2021 12:15	03-Feb-2021 14:00	03-Feb-2021 16:30	02-Feb-2021 09:30	02-Feb-2021 10:15
Compound	CAS Number	LOR	Unit		EB2103109-006	EB2103109-007	EB2103109-008	EB2103109-009	EB2103109-010
					Result	Result	Result	Result	Result
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS - Continued									
Cadmium	7440-43-9	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
Chromium	7440-47-3	0.2	µg/L		<0.2	<0.2	**0.5**	<0.2	<0.2
Cobalt	7440-48-4	0.1	µg/L		<0.1	**0.6**	**0.8**	**0.6**	**0.4**
Copper	7440-50-8	0.5	µg/L		<0.5	<0.5	**0.6**	**0.5**	**0.9**
Lead	7439-92-1	0.1	µg/L		<0.1	<0.1	**0.1**	**0.1**	<0.1
Manganese	7439-96-5	0.5	µg/L		<0.5	**12.4**	**70.8**	**174**	**3.1**
Molybdenum	7439-98-7	0.1	µg/L		<0.1	**6.4**	**0.6**	**5.8**	**6.6**
Nickel	7440-02-0	0.5	µg/L		<0.5	**1.6**	**1.3**	**1.0**	**1.0**
Silver	7440-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Tin	7440-31-5	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Zinc	7440-66-6	1	µg/L		<1	<1	<1	<1	<1
EG094T: Total metals in Fresh water by ORC-ICPMS									
Antimony	7440-36-0	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Selenium	7782-49-2	0.2	µg/L		<0.2	**0.6**	**0.3**	**0.6**	**0.6**
Arsenic	7440-38-2	0.2	µg/L		<0.2	**2.4**	**1.3**	**5.8**	**3.4**
Beryllium	7440-41-7	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Boron	7440-42-8	5	µg/L		<5	**168**	**75**	**315**	**303**
Cadmium	7440-43-9	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
Chromium	7440-47-3	0.2	µg/L		<0.2	<0.2	**0.5**	<0.2	<0.2
Cobalt	7440-48-4	0.1	µg/L		<0.1	**0.6**	**0.8**	**0.8**	**0.4**
Copper	7440-50-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	**0.6**
Lead	7439-92-1	0.1	µg/L		<0.1	<0.1	<0.1	**0.1**	<0.1
Manganese	7439-96-5	0.5	µg/L		<0.5	**24.2**	**72.2**	**231**	**8.6**
Molybdenum	7439-98-7	0.1	µg/L		<0.1	**5.8**	**0.6**	**5.8**	**6.7**
Nickel	7440-02-0	0.5	µg/L		<0.5	**1.5**	**1.2**	**1.1**	**1.0**
Silver	7440-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Tin	7440-31-5	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Zinc	7440-66-6	1	µg/L		<1	**1**	**2**	**3**	**1**
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		<0.1	**0.3**	**0.1**	**0.3**	**0.3**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**0.02**	**18.2**	**9.85**	**29.7**	**28.7**
ø Total Cations	----	0.01	meq/L		<0.01	**15.6**	**9.62**	**26.4**	**25.2**
ø Ionic Balance	----	0.01	%		**----**	**7.83**	**1.19**	**5.82**	**6.43**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	CVBG3-0221	CVBG5-0221	CVBG6-0221	CVBG7-0221	CVBG9-0221
			Sampling date / time	02-Feb-2021 12:15	02-Feb-2021 13:15	02-Feb-2021 12:45	02-Feb-2021 15:45	02-Feb-2021 15:00
Compound	CAS Number	LOR	Unit	EB2103109-011	EB2103109-012	EB2103109-013	EB2103109-014	EB2103109-015
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	9.89	9.48	9.92	7.77	9.75
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	3020	3020	3000	2960	3010
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	1960	1960	1950	1920	1960
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	10	11	7	8	20
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	291	294	296	301	294
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	57	47	67	<1	60
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	10	35	9	115	18
Total Alkalinity as CaCO3	----	1	mg/L	67	82	76	115	77
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	110	101	105	74	103
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	916	919	920	901	919
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	34	32	33	33	32
Magnesium	7439-95-4	1	mg/L	50	52	52	53	52
Sodium	7440-23-5	1	mg/L	449	454	455	444	450
Potassium	7440-09-7	1	mg/L	24	25	25	27	25
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS								
Antimony	7440-36-0	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Selenium	7782-49-2	0.2	µg/L	0.3	0.3	0.3	0.3	0.3
Arsenic	7440-38-2	0.2	µg/L	2.7	4.9	3.8	5.6	4.6
Beryllium	7440-41-7	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Boron	7440-42-8	5	µg/L	261	278	278	270	289

Analytical Results

Sub-Matrix: **WATER**
(Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	CVBG3-0221	CVBG5-0221	CVBG6-0221	CVBG7-0221	CVBG9-0221
				Sampling date / time	02-Feb-2021 12:15	02-Feb-2021 13:15	02-Feb-2021 12:45	02-Feb-2021 15:45	02-Feb-2021 15:00
					EB2103109-011	EB2103109-012	EB2103109-013	EB2103109-014	EB2103109-015
					Result	Result	Result	Result	Result
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS - Continued									
Cadmium	7440-43-9	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
Chromium	7440-47-3	0.2	µg/L		<0.2	<0.2	<0.2	**0.2**	<0.2
Cobalt	7440-48-4	0.1	µg/L		**0.3**	**0.4**	**0.4**	**0.6**	**0.4**
Copper	7440-50-8	0.5	µg/L		**0.9**	**0.7**	**0.8**	<0.5	**0.8**
Lead	7439-92-1	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Manganese	7439-96-5	0.5	µg/L		**0.9**	**23.6**	**4.8**	**142**	**8.0**
Molybdenum	7439-98-7	0.1	µg/L		**6.8**	**6.3**	**6.6**	**2.2**	**6.4**
Nickel	7440-02-0	0.5	µg/L		**1.1**	**1.0**	**1.0**	**0.9**	**1.1**
Silver	7440-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Tin	7440-31-5	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Zinc	7440-66-6	1	µg/L		<1	<1	<1	**1**	<1
EG094T: Total metals in Fresh water by ORC-ICPMS									
Antimony	7440-36-0	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Selenium	7782-49-2	0.2	µg/L		**0.7**	**0.6**	**0.7**	**0.6**	**0.7**
Arsenic	7440-38-2	0.2	µg/L		**2.7**	**4.7**	**3.6**	**5.0**	**4.0**
Beryllium	7440-41-7	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Boron	7440-42-8	5	µg/L		**288**	**313**	**324**	**294**	**288**
Cadmium	7440-43-9	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
Chromium	7440-47-3	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	**0.3**
Cobalt	7440-48-4	0.1	µg/L		**0.4**	**0.6**	**0.4**	**0.6**	**0.6**
Copper	7440-50-8	0.5	µg/L		**0.6**	<0.5	<0.5	<0.5	**0.7**
Lead	7439-92-1	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Manganese	7439-96-5	0.5	µg/L		**7.3**	**45.9**	**14.3**	**140**	**52.8**
Molybdenum	7439-98-7	0.1	µg/L		**6.2**	**6.4**	**6.6**	**2.3**	**6.1**
Nickel	7440-02-0	0.5	µg/L		**1.0**	**1.1**	**0.9**	**0.8**	**1.2**
Silver	7440-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Tin	7440-31-5	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Zinc	7440-66-6	1	µg/L		<1	**1**	<1	**2**	**1**
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.3**	**0.3**	**0.3**	**0.3**	**0.3**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**29.5**	**29.7**	**29.6**	**29.2**	**29.6**
ø Total Cations	----	0.01	meq/L		**26.0**	**26.3**	**26.4**	**26.0**	**26.1**
ø Ionic Balance	----	0.01	%		**6.34**	**6.08**	**5.89**	**5.87**	**6.31**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	CVRG6-0221	----	----	----	----
			Sampling date / time	02-Feb-2021 13:45	----	----	----	----
Compound	CAS Number	LOR	Unit	EB2103109-016	--------	--------	--------	--------
				Result	----	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**9.90**	----	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**3010**	----	----	----	----
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	**1960**	----	----	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	**9**	----	----	----	----
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	**292**	----	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	**72**	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**5**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	**77**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**104**	----	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**917**	----	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**33**	----	----	----	----
Magnesium	7439-95-4	1	mg/L	**51**	----	----	----	----
Sodium	7440-23-5	1	mg/L	**452**	----	----	----	----
Potassium	7440-09-7	1	mg/L	**25**	----	----	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS								
Antimony	7440-36-0	0.2	µg/L	<0.2	----	----	----	----
Selenium	7782-49-2	0.2	µg/L	**0.3**	----	----	----	----
Arsenic	7440-38-2	0.2	µg/L	**3.7**	----	----	----	----
Beryllium	7440-41-7	0.1	µg/L	<0.1	----	----	----	----
Boron	7440-42-8	5	µg/L	**290**	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	CVRG6-0221	----	----	----	----
				Sampling date / time	02-Feb-2021 13:45	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2103109-016	--------	--------	--------	--------
					Result	----	----	----	----
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS - Continued									
Cadmium	7440-43-9	0.05	µg/L		<0.05	----	----	----	----
Chromium	7440-47-3	0.2	µg/L		<0.2	----	----	----	----
Cobalt	7440-48-4	0.1	µg/L		**0.4**	----	----	----	----
Copper	7440-50-8	0.5	µg/L		**0.9**	----	----	----	----
Lead	7439-92-1	0.1	µg/L		<0.1	----	----	----	----
Manganese	7439-96-5	0.5	µg/L		**5.1**	----	----	----	----
Molybdenum	7439-98-7	0.1	µg/L		**6.6**	----	----	----	----
Nickel	7440-02-0	0.5	µg/L		**1.1**	----	----	----	----
Silver	7440-22-4	0.1	µg/L		<0.1	----	----	----	----
Tin	7440-31-5	0.2	µg/L		<0.2	----	----	----	----
Zinc	7440-66-6	1	µg/L		<1	----	----	----	----
EG094T: Total metals in Fresh water by ORC-ICPMS									
Antimony	7440-36-0	0.2	µg/L		<0.2	----	----	----	----
Selenium	7782-49-2	0.2	µg/L		**0.6**	----	----	----	----
Arsenic	7440-38-2	0.2	µg/L		**2.9**	----	----	----	----
Beryllium	7440-41-7	0.1	µg/L		<0.1	----	----	----	----
Boron	7440-42-8	5	µg/L		**263**	----	----	----	----
Cadmium	7440-43-9	0.05	µg/L		<0.05	----	----	----	----
Chromium	7440-47-3	0.2	µg/L		<0.2	----	----	----	----
Cobalt	7440-48-4	0.1	µg/L		**0.4**	----	----	----	----
Copper	7440-50-8	0.5	µg/L		<0.5	----	----	----	----
Lead	7439-92-1	0.1	µg/L		<0.1	----	----	----	----
Manganese	7439-96-5	0.5	µg/L		**14.0**	----	----	----	----
Molybdenum	7439-98-7	0.1	µg/L		**5.6**	----	----	----	----
Nickel	7440-02-0	0.5	µg/L		**0.8**	----	----	----	----
Silver	7440-22-4	0.1	µg/L		<0.1	----	----	----	----
Tin	7440-31-5	0.2	µg/L		<0.2	----	----	----	----
Zinc	7440-66-6	1	µg/L		**2**	----	----	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.3**	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**29.6**	----	----	----	----
ø Total Cations	----	0.01	meq/L		**26.1**	----	----	----	----
ø Ionic Balance	----	0.01	%		**6.15**	----	----	----	----

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2108650**	Page	: 1 of 11
Amendment	: **2**		
Client	: **QLD DEPT OF ENVIRONMENT & SCIENCE**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted]	Address	: [redacted]
Telephone	: [redacted]	Telephone	: [redacted]
Project	: CV Monitoring	Date Samples Received	: 30-Mar-2021 15:53
Order number	: ----	Date Analysis Commenced	: 31-Mar-2021
C-O-C number	: ----	Issue Date	: 15-Apr-2021 15:57
Sampler	: [redacted]		
Site	: ----		
Quote number	: [redacted]		
No. of samples received	: 20		
No. of samples analysed	: 20		

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.

Signatories	*Position*	*Accreditation Category*
[redacted]	Senior Inorganic Chemist	[redacted]
[redacted]	Senior Inorganic Chemist	[redacted]

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.

- Amendment (08/04/2021): This report has been amended to allow the distribution of an Electronic Data Deliverable (EDD) not previously provided. All analysis results are as per the previous report.
- It is recognised that EG020-T (Total Metals by ICP-MS) is less than EG020-F (Dissolved Metals by ICP-MS) for some samples. However, the difference is within experimental variation of the methods.
- Amendment (12/04/2021): This report has been amended following changes to sample CVCB-0321 (EB2108650 – 019) EG094-F (Dissolved Metals in Fresh Water by ORC-ICP-MS) Zn results. All details are recorded in client query 21BNCC147 and the quality system is being utilised to resolve this issue under corrective action 21BNC1055.
- EA016: Calculated TDS is determined from Electrical conductivity using a conversion factor of 0.65.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	CVAP1-0321	CVAP2-0321	CVAP3-0321	CVAP4-0321	CVAP5-0321
			Sampling date / time	24-Mar-2021 15:00	24-Mar-2021 12:45	24-Mar-2021 12:00	24-Mar-2021 13:45	24-Mar-2021 11:15
Compound	CAS Number	LOR	Unit	EB2108650-001	EB2108650-002	EB2108650-003	EB2108650-004	EB2108650-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.68	8.62	7.56	9.28	8.57
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	3380	2290	2160	2220	2210
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	2200	1490	1400	1440	1440
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	23	17	10	<5	50
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	406	290	266	242	219
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	34	<1	104	29
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	222	138	164	23	86
Total Alkalinity as CaCO3	----	1	mg/L	222	172	164	127	116
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	236	141	117	114	111
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	964	666	637	676	684
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	44	37	34	31	30
Magnesium	7439-95-4	1	mg/L	72	48	44	40	35
Sodium	7440-23-5	1	mg/L	578	400	372	392	394
Potassium	7440-09-7	1	mg/L	22	14	14	14	14
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS								
Antimony	7440-36-0	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Selenium	7782-49-2	0.2	µg/L	0.5	0.4	0.3	0.3	0.3
Arsenic	7440-38-2	0.2	µg/L	4.8	5.8	6.2	4.9	4.8
Beryllium	7440-41-7	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Boron	7440-42-8	5	µg/L	250	188	171	149	140

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	CVAP1-0321	CVAP2-0321	CVAP3-0321	CVAP4-0321	CVAP5-0321
				Sampling date / time	24-Mar-2021 15:00	24-Mar-2021 12:45	24-Mar-2021 12:00	24-Mar-2021 13:45	24-Mar-2021 11:15
Compound	CAS Number	LOR	Unit		EB2108650-001	EB2108650-002	EB2108650-003	EB2108650-004	EB2108650-005
					Result	Result	Result	Result	Result
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS - Continued									
Cadmium	7440-43-9	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
Chromium	7440-47-3	0.2	µg/L		<0.2	<0.2	<0.2	**0.2**	**0.4**
Cobalt	7440-48-4	0.1	µg/L		**0.6**	**0.4**	**0.7**	**0.4**	**0.3**
Copper	7440-50-8	0.5	µg/L		<0.5	<0.5	<0.5	**2.6**	<0.5
Lead	7439-92-1	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Manganese	7439-96-5	0.5	µg/L		**166**	**30.5**	**643**	**320**	**21.5**
Molybdenum	7439-98-7	0.1	µg/L		**1.1**	**2.4**	**2.3**	**2.0**	**3.2**
Nickel	7440-02-0	0.5	µg/L		**1.4**	**1.0**	**0.8**	**1.4**	**2.3**
Silver	7440-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Tin	7440-31-5	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Zinc	7440-66-6	1	µg/L		<1	<1	**3**	**2**	<1
EG094T: Total metals in Fresh water by ORC-ICPMS									
Antimony	7440-36-0	0.2	µg/L		**0.2**	<0.2	<0.2	<0.2	<0.2
Selenium	7782-49-2	0.2	µg/L		**0.5**	**0.4**	**0.3**	**0.3**	**0.4**
Arsenic	7440-38-2	0.2	µg/L		**5.2**	**8.0**	**7.7**	**5.4**	**6.7**
Beryllium	7440-41-7	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Boron	7440-42-8	5	µg/L		**364**	**273**	**237**	**190**	**199**
Cadmium	7440-43-9	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
Chromium	7440-47-3	0.2	µg/L		**3.3**	**0.5**	**0.6**	**0.4**	**0.5**
Cobalt	7440-48-4	0.1	µg/L		**1.0**	**0.6**	**1.0**	**0.5**	**0.8**
Copper	7440-50-8	0.5	µg/L		**0.5**	<0.5	<0.5	<0.5	**0.5**
Lead	7439-92-1	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	**0.2**
Manganese	7439-96-5	0.5	µg/L		**260**	**260**	**854**	**404**	**132**
Molybdenum	7439-98-7	0.1	µg/L		**3.9**	**2.8**	**2.7**	**2.1**	**3.8**
Nickel	7440-02-0	0.5	µg/L		**14.1**	**2.5**	**2.8**	**1.6**	**1.8**
Silver	7440-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Tin	7440-31-5	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Zinc	7440-66-6	1	µg/L		**2**	**6**	**8**	**3**	**6**
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.6**	**0.4**	**0.3**	**0.3**	**0.3**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**36.5**	**25.2**	**23.7**	**24.0**	**23.9**
ø Total Cations	----	0.01	meq/L		**33.8**	**23.6**	**21.8**	**22.2**	**21.9**
ø Ionic Balance	----	0.01	%		**3.86**	**3.30**	**4.01**	**3.75**	**4.48**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	CVAP6-0321	CVAP7-0321	CVAP8-0321	CVAP9-0321	CVTP9-0321
			Sampling date / time	24-Mar-2021 10:30	24-Mar-2021 14:00	24-Mar-2021 09:00	24-Mar-2021 09:45	24-Mar-2021 10:00
Compound	CAS Number	LOR	Unit	EB2108650-006	EB2108650-007	EB2108650-008	EB2108650-009	EB2108650-010
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.65	8.75	7.22	7.47	7.50
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	2070	2260	2240	2180	2170
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	1340	1470	1460	1420	1410
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	<5	<5	6	<5	5
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	258	240	245	245	242
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	40	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	149	75	108	126	126
Total Alkalinity as CaCO3	----	1	mg/L	149	115	108	126	126
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	114	118	113	106	107
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	612	698	697	665	667
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	34	32	32	32	31
Magnesium	7439-95-4	1	mg/L	42	39	40	40	40
Sodium	7440-23-5	1	mg/L	368	409	404	393	399
Potassium	7440-09-7	1	mg/L	14	14	14	14	14
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS								
Antimony	7440-36-0	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Selenium	7782-49-2	0.2	µg/L	0.2	0.3	0.3	0.3	0.3
Arsenic	7440-38-2	0.2	µg/L	6.8	4.5	4.9	5.3	5.5
Beryllium	7440-41-7	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Boron	7440-42-8	5	µg/L	159	146	175	171	180

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	CVAP6-0321	CVAP7-0321	CVAP8-0321	CVAP9-0321	CVTP9-0321
				Sampling date / time	24-Mar-2021 10:30	24-Mar-2021 14:00	24-Mar-2021 09:00	24-Mar-2021 09:45	24-Mar-2021 10:00
Compound	CAS Number	LOR	Unit		EB2108650-006	EB2108650-007	EB2108650-008	EB2108650-009	EB2108650-010
					Result	Result	Result	Result	Result
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS - Continued									
Cadmium	7440-43-9	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
Chromium	7440-47-3	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Cobalt	7440-48-4	0.1	µg/L		**0.5**	**0.2**	**0.3**	**0.3**	**0.3**
Copper	7440-50-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Lead	7439-92-1	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Manganese	7439-96-5	0.5	µg/L		**917**	**17.2**	**259**	**251**	**268**
Molybdenum	7439-98-7	0.1	µg/L		**2.3**	**3.1**	**3.1**	**2.5**	**2.6**
Nickel	7440-02-0	0.5	µg/L		**0.6**	**1.0**	**0.6**	**0.6**	**0.7**
Silver	7440-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Tin	7440-31-5	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Zinc	7440-66-6	1	µg/L		<1	<1	**1**	<1	<1
EG094T: Total metals in Fresh water by ORC-ICPMS									
Antimony	7440-36-0	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Selenium	7782-49-2	0.2	µg/L		**0.3**	**0.3**	**0.3**	**0.2**	**0.3**
Arsenic	7440-38-2	0.2	µg/L		**7.1**	**6.9**	**5.2**	**5.3**	**5.4**
Beryllium	7440-41-7	0.1	µg/L		<0.1	**2.7**	<0.1	<0.1	**0.1**
Boron	7440-42-8	5	µg/L		**208**	**188**	**217**	**205**	**205**
Cadmium	7440-43-9	0.05	µg/L		<0.05	**0.68**	<0.05	<0.05	<0.05
Chromium	7440-47-3	0.2	µg/L		**0.3**	**2.3**	**0.8**	**0.3**	**0.3**
Cobalt	7440-48-4	0.1	µg/L		**0.6**	**3.4**	**0.5**	**0.5**	**0.6**
Copper	7440-50-8	0.5	µg/L		<0.5	**2.9**	<0.5	<0.5	<0.5
Lead	7439-92-1	0.1	µg/L		<0.1	**2.3**	<0.1	<0.1	**0.1**
Manganese	7439-96-5	0.5	µg/L		**1060**	**34.5**	**269**	**290**	**285**
Molybdenum	7439-98-7	0.1	µg/L		**2.8**	**3.3**	**3.8**	**2.8**	**2.8**
Nickel	7440-02-0	0.5	µg/L		**2.0**	**3.8**	**3.2**	**1.2**	**1.2**
Silver	7440-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Tin	7440-31-5	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Zinc	7440-66-6	1	µg/L		**2**	**4**	**2**	**3**	**3**
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.3**	**0.3**	**0.3**	**0.3**	**0.3**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**22.6**	**24.4**	**24.2**	**23.5**	**23.6**
ø Total Cations	----	0.01	meq/L		**21.5**	**23.0**	**22.8**	**22.3**	**22.6**
ø Ionic Balance	----	0.01	%		**2.48**	**3.14**	**2.88**	**2.49**	**2.18**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	CVBG1-0321	CVBG2-0321	CVBG3-0321	CVBG5-0321	CVBG6-0321
			Sampling date / time	23-Mar-2021 09:10	23-Mar-2021 10:15	23-Mar-2021 12:15	23-Mar-2021 11:15	23-Mar-2021 12:45
Compound	CAS Number	LOR	Unit	EB2108650-011	EB2108650-012	EB2108650-013	EB2108650-014	EB2108650-015
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.38	9.26	9.71	8.87	9.42
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	2970	3180	3150	3230	3250
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	1930	2070	2050	2100	2110
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	8	<5	<5	44	<5
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	293	297	272	271	282
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	44	<1	4
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	109	63	47	98
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	172	29	<1	49	<1
Total Alkalinity as CaCO3	----	1	mg/L	172	138	108	96	102
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	20	36	42	54	54
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	955	1020	1040	1060	1070
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	30	30	30	31	32
Magnesium	7439-95-4	1	mg/L	53	54	48	47	49
Sodium	7440-23-5	1	mg/L	537	594	582	602	610
Potassium	7440-09-7	1	mg/L	19	22	22	22	22
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS								
Antimony	7440-36-0	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Selenium	7782-49-2	0.2	µg/L	0.3	0.4	0.4	0.3	0.4
Arsenic	7440-38-2	0.2	µg/L	4.2	4.9	3.6	4.2	4.2
Beryllium	7440-41-7	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Boron	7440-42-8	5	µg/L	243	227	246	240	248

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	CVBG1-0321	CVBG2-0321	CVBG3-0321	CVBG5-0321	CVBG6-0321
				Sampling date / time	23-Mar-2021 09:10	23-Mar-2021 10:15	23-Mar-2021 12:15	23-Mar-2021 11:15	23-Mar-2021 12:45
Compound	CAS Number	LOR	Unit		EB2108650-011	EB2108650-012	EB2108650-013	EB2108650-014	EB2108650-015
					Result	Result	Result	Result	Result
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS - Continued									
Cadmium	7440-43-9	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
Chromium	7440-47-3	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Cobalt	7440-48-4	0.1	µg/L		**0.5**	**0.1**	**0.1**	**0.2**	**0.2**
Copper	7440-50-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Lead	7439-92-1	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Manganese	7439-96-5	0.5	µg/L		**1760**	**97.7**	**2.8**	**211**	**17.6**
Molybdenum	7439-98-7	0.1	µg/L		**0.9**	**2.4**	**3.0**	**4.0**	**4.2**
Nickel	7440-02-0	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	**0.6**
Silver	7440-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Tin	7440-31-5	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Zinc	7440-66-6	1	µg/L		<1	<1	<1	<1	<1
EG094T: Total metals in Fresh water by ORC-ICPMS									
Antimony	7440-36-0	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Selenium	7782-49-2	0.2	µg/L		**0.4**	**0.4**	**0.4**	**0.5**	**0.5**
Arsenic	7440-38-2	0.2	µg/L		**4.8**	**5.1**	**4.2**	**5.1**	**4.8**
Beryllium	7440-41-7	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Boron	7440-42-8	5	µg/L		**334**	**297**	**332**	**333**	**328**
Cadmium	7440-43-9	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
Chromium	7440-47-3	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	**0.2**
Cobalt	7440-48-4	0.1	µg/L		**0.8**	**0.2**	**0.3**	**0.4**	**0.3**
Copper	7440-50-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Lead	7439-92-1	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Manganese	7439-96-5	0.5	µg/L		**2150**	**148**	**24.5**	**518**	**32.9**
Molybdenum	7439-98-7	0.1	µg/L		**1.1**	**2.8**	**3.3**	**4.3**	**4.4**
Nickel	7440-02-0	0.5	µg/L		**0.6**	<0.5	<0.5	**0.6**	**0.6**
Silver	7440-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Tin	7440-31-5	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Zinc	7440-66-6	1	µg/L		**1**	**2**	**2**	**3**	**6**
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.3**	**0.3**	**0.2**	**0.2**	**0.2**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**30.8**	**32.3**	**32.4**	**32.9**	**33.3**
ø Total Cations	----	0.01	meq/L		**29.7**	**32.3**	**31.3**	**32.2**	**32.7**
ø Ionic Balance	----	0.01	%		**1.80**	**0.10**	**1.64**	**1.20**	**0.94**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	CVBG7-0321	CVBG9-0321	CVRG6-0321	CVCB-0321	CVSWC-0321
			Sampling date / time	23-Mar-2021 15:00	23-Mar-2021 13:45	23-Mar-2021 13:00	23-Mar-2021 12:00	23-Mar-2021 16:30
Compound	CAS Number	LOR	Unit	EB2108650-016	EB2108650-017	EB2108650-018	EB2108650-019	EB2108650-020
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	8.33	9.51	9.43	7.96	7.10
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	3120	3240	3270	<1	1440
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	2030	2110	2120	<1	936
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	8	14	5	<5	62
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	277	278	282	<1	173
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	23	10	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	13	78	94	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	122	<1	<1	3	121
Total Alkalinity as CaCO3	----	1	mg/L	135	101	104	3	121
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	24	54	55	<1	33
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	1030	1050	1060	<1	439
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	27	32	32	<1	23
Magnesium	7439-95-4	1	mg/L	51	48	49	<1	28
Sodium	7440-23-5	1	mg/L	589	612	614	<1	247
Potassium	7440-09-7	1	mg/L	20	22	22	<1	9
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS								
Antimony	7440-36-0	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Selenium	7782-49-2	0.2	µg/L	0.4	0.4	0.4	<0.2	0.3
Arsenic	7440-38-2	0.2	µg/L	3.3	4.1	4.3	<0.2	1.4
Beryllium	7440-41-7	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Boron	7440-42-8	5	µg/L	226	251	258	<5	90

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	CVBG7-0321	CVBG9-0321	CVRG6-0321	CVCB-0321	CVSWC-0321
				Sampling date / time	23-Mar-2021 15:00	23-Mar-2021 13:45	23-Mar-2021 13:00	23-Mar-2021 12:00	23-Mar-2021 16:30
Compound	CAS Number	LOR	Unit		EB2108650-016	EB2108650-017	EB2108650-018	EB2108650-019	EB2108650-020
					Result	Result	Result	Result	Result
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS - Continued									
Cadmium	7440-43-9	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
Chromium	7440-47-3	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	**0.9**
Cobalt	7440-48-4	0.1	µg/L		**0.2**	**0.2**	**0.2**	<0.1	**0.6**
Copper	7440-50-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Lead	7439-92-1	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Manganese	7439-96-5	0.5	µg/L		**93.2**	**6.1**	**17.4**	<0.5	**44.7**
Molybdenum	7439-98-7	0.1	µg/L		**0.9**	**4.2**	**4.2**	<0.1	**0.3**
Nickel	7440-02-0	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	**1.0**
Silver	7440-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Tin	7440-31-5	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Zinc	7440-66-6	1	µg/L		<1	<1	<1	<1	<1
EG094T: Total metals in Fresh water by ORC-ICPMS									
Antimony	7440-36-0	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Selenium	7782-49-2	0.2	µg/L		**0.4**	**0.4**	**0.4**	<0.2	**0.5**
Arsenic	7440-38-2	0.2	µg/L		**3.7**	**4.4**	**4.4**	<0.2	**2.3**
Beryllium	7440-41-7	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Boron	7440-42-8	5	µg/L		**315**	**321**	**299**	<5	**107**
Cadmium	7440-43-9	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
Chromium	7440-47-3	0.2	µg/L		**0.3**	<0.2	**0.4**	<0.2	**4.0**
Cobalt	7440-48-4	0.1	µg/L		**0.4**	**0.3**	**0.3**	<0.1	**2.5**
Copper	7440-50-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	**3.2**
Lead	7439-92-1	0.1	µg/L		<0.1	<0.1	**0.1**	<0.1	**0.4**
Manganese	7439-96-5	0.5	µg/L		**122**	**19.1**	**29.5**	<0.5	**160**
Molybdenum	7439-98-7	0.1	µg/L		**1.0**	**4.4**	**4.4**	<0.1	**0.5**
Nickel	7440-02-0	0.5	µg/L		**0.5**	<0.5	<0.5	<0.5	**2.9**
Silver	7440-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Tin	7440-31-5	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Zinc	7440-66-6	1	µg/L		**2**	<1	**2**	<1	**4**
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.3**	**0.2**	**0.2**	<0.1	**0.2**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**32.2**	**32.8**	**33.1**	**0.06**	**15.5**
ø Total Cations	----	0.01	meq/L		**31.7**	**32.7**	**32.9**	<0.01	**14.4**
ø Ionic Balance	----	0.01	%		**0.90**	**0.05**	**0.34**	**----**	**3.55**

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2103109**	Page	: 1 of 11
Amendment	: **1**		
Client	: **QLD DEPT OF ENVIRONMENT & SCIENCE**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted]	Address	: [redacted]
Telephone	: [redacted]	Telephone	: [redacted]
Project	: CV Monitoring	Date Samples Received	: 05-Feb-2021 09:00
Order number	: ----	Date Analysis Commenced	: 05-Feb-2021
C-O-C number	: ----	Issue Date	: 15-Feb-2021 10:16
Sampler	: [redacted]		
Site	: ----		
Quote number	: [redacted]		
No. of samples received	: 16		
No. of samples analysed	: 16		

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.

Signatories	*Position*	*Accreditation Category*
[redacted]	Senior Inorganic Chemist	[redacted]
[redacted]	Senior Inorganic Chemist	[redacted]

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.

- Amendment (15/02/2021): This report has been amended to allow the distribution of an Electronic Data Deliverable (EDD) not previously provided. All analysis results are as per the previous report.
- It is recognised that EG094-T (Total Metals in Fresh Water by ORC-ICP-MS) is less than EG094-F (Dissolved Metals in Fresh Water by ORC-ICP-MS) for some samples. However, the difference is within experimental variation of the methods.
- EA016: Calculated TDS is determined from Electrical conductivity using a conversion factor of 0.65.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	CVAP1-0221	CVAP2-0221	CVAP3-0221	CVAP4-0221	CVGP4-0221
			Sampling date / time	03-Feb-2021 10:15	03-Feb-2021 09:00	03-Feb-2021 09:45	03-Feb-2021 11:30	03-Feb-2021 12:30
Compound	CAS Number	LOR	Unit	EB2103109-001	EB2103109-002	EB2103109-003	EB2103109-004	EB2103109-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.40	8.94	9.37	9.13	7.90
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	1850	1820	1840	1850	1790
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	1200	1180	1200	1200	1160
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	8	6	8	7	8
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	243	223	221	225	221
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	16	30	26	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	95	48	33	47	84
Total Alkalinity as CaCO3	----	1	mg/L	95	65	63	73	84
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	175	180	175	173	164
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	463	468	477	480	451
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	33	30	29	29	29
Magnesium	7439-95-4	1	mg/L	39	36	36	37	36
Sodium	7440-23-5	1	mg/L	252	248	255	251	256
Potassium	7440-09-7	1	mg/L	11	11	11	11	11
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS								
Antimony	7440-36-0	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Selenium	7782-49-2	0.2	µg/L	0.5	0.5	0.5	0.5	0.5
Arsenic	7440-38-2	0.2	µg/L	4.6	3.2	3.2	3.4	3.3
Beryllium	7440-41-7	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Boron	7440-42-8	5	µg/L	154	170	168	159	169

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	CVAP1-0221	CVAP2-0221	CVAP3-0221	CVAP4-0221	CVGP4-0221
				Sampling date / time	03-Feb-2021 10:15	03-Feb-2021 09:00	03-Feb-2021 09:45	03-Feb-2021 11:30	03-Feb-2021 12:30
Compound	CAS Number	LOR	Unit		EB2103109-001	EB2103109-002	EB2103109-003	EB2103109-004	EB2103109-005
					Result	Result	Result	Result	Result
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS - Continued									
Cadmium	7440-43-9	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
Chromium	7440-47-3	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Cobalt	7440-48-4	0.1	µg/L		**2.4**	**0.8**	**0.7**	**0.6**	**0.6**
Copper	7440-50-8	0.5	µg/L		**0.8**	**0.8**	**0.8**	<0.5	<0.5
Lead	7439-92-1	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Manganese	7439-96-5	0.5	µg/L		**644**	**15.2**	**6.9**	**137**	**108**
Molybdenum	7439-98-7	0.1	µg/L		**5.3**	**7.7**	**7.0**	**3.7**	**4.7**
Nickel	7440-02-0	0.5	µg/L		**2.9**	**2.1**	**1.8**	**1.3**	**1.3**
Silver	7440-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Tin	7440-31-5	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Zinc	7440-66-6	1	µg/L		**1**	**2**	**2**	<1	<1
EG094T: Total metals in Fresh water by ORC-ICPMS									
Antimony	7440-36-0	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Selenium	7782-49-2	0.2	µg/L		**0.7**	**0.7**	**0.7**	**0.8**	**0.7**
Arsenic	7440-38-2	0.2	µg/L		**4.4**	**2.9**	**2.8**	**2.9**	**3.1**
Beryllium	7440-41-7	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Boron	7440-42-8	5	µg/L		**156**	**171**	**174**	**166**	**180**
Cadmium	7440-43-9	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
Chromium	7440-47-3	0.2	µg/L		<0.2	**0.3**	<0.2	<0.2	<0.2
Cobalt	7440-48-4	0.1	µg/L		**2.5**	**0.8**	**0.8**	**0.6**	**0.6**
Copper	7440-50-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Lead	7439-92-1	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Manganese	7439-96-5	0.5	µg/L		**687**	**30.4**	**18.7**	**129**	**121**
Molybdenum	7439-98-7	0.1	µg/L		**4.6**	**7.1**	**6.7**	**4.0**	**4.8**
Nickel	7440-02-0	0.5	µg/L		**2.5**	**1.8**	**1.8**	**1.2**	**1.3**
Silver	7440-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Tin	7440-31-5	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Zinc	7440-66-6	1	µg/L		**2**	**2**	**4**	**2**	**1**
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.4**	**0.4**	**0.3**	**0.3**	**0.3**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**18.6**	**18.2**	**18.4**	**18.6**	**17.8**
ø Total Cations	----	0.01	meq/L		**16.1**	**15.5**	**15.8**	**15.7**	**15.8**
ø Ionic Balance	----	0.01	%		**7.21**	**8.05**	**7.54**	**8.48**	**5.91**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	CVZP4-0221	CVAP7-0221	SWC-0221	CVBG1-0221	CVBG2-0221
			Sampling date / time	03-Feb-2021 12:15	03-Feb-2021 14:00	03-Feb-2021 16:30	02-Feb-2021 09:30	02-Feb-2021 10:15
Compound	CAS Number	LOR	Unit	EB2103109-006	EB2103109-007	EB2103109-008	EB2103109-009	EB2103109-010
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	6.24	9.66	7.56	7.91	9.61
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	<1	1820	1030	3040	2910
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	<1	1180	670	1980	1890
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	5	<5	14	16	9
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	<1	219	160	296	282
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	40	<1	<1	41
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	1	17	91	91	27
Total Alkalinity as CaCO3	----	1	mg/L	1	56	91	91	68
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	182	13	94	106
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	<1	471	275	918	890
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	<1	30	26	31	32
Magnesium	7439-95-4	1	mg/L	<1	35	23	53	49
Sodium	7440-23-5	1	mg/L	<1	251	143	456	436
Potassium	7440-09-7	1	mg/L	<1	10	8	26	24
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS								
Antimony	7440-36-0	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Selenium	7782-49-2	0.2	µg/L	<0.2	0.5	0.2	0.3	0.3
Arsenic	7440-38-2	0.2	µg/L	<0.2	2.7	1.5	5.6	3.6
Beryllium	7440-41-7	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Boron	7440-42-8	5	µg/L	<5	168	65	270	261

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	CVZP4-0221	CVAP7-0221	SWC-0221	CVBG1-0221	CVBG2-0221
				Sampling date / time	03-Feb-2021 12:15	03-Feb-2021 14:00	03-Feb-2021 16:30	02-Feb-2021 09:30	02-Feb-2021 10:15
Compound	CAS Number	LOR	Unit		EB2103109-006	EB2103109-007	EB2103109-008	EB2103109-009	EB2103109-010
					Result	Result	Result	Result	Result
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS - Continued									
Cadmium	7440-43-9	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
Chromium	7440-47-3	0.2	µg/L		<0.2	<0.2	**0.5**	<0.2	<0.2
Cobalt	7440-48-4	0.1	µg/L		<0.1	**0.6**	**0.8**	**0.6**	**0.4**
Copper	7440-50-8	0.5	µg/L		<0.5	<0.5	**0.6**	**0.5**	**0.9**
Lead	7439-92-1	0.1	µg/L		<0.1	<0.1	**0.1**	**0.1**	<0.1
Manganese	7439-96-5	0.5	µg/L		<0.5	**12.4**	**70.8**	**174**	**3.1**
Molybdenum	7439-98-7	0.1	µg/L		<0.1	**6.4**	**0.6**	**5.8**	**6.6**
Nickel	7440-02-0	0.5	µg/L		<0.5	**1.6**	**1.3**	**1.0**	**1.0**
Silver	7440-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Tin	7440-31-5	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Zinc	7440-66-6	1	µg/L		<1	<1	<1	<1	<1
EG094T: Total metals in Fresh water by ORC-ICPMS									
Antimony	7440-36-0	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Selenium	7782-49-2	0.2	µg/L		<0.2	**0.6**	**0.3**	**0.6**	**0.6**
Arsenic	7440-38-2	0.2	µg/L		<0.2	**2.4**	**1.3**	**5.8**	**3.4**
Beryllium	7440-41-7	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Boron	7440-42-8	5	µg/L		<5	**168**	**75**	**315**	**303**
Cadmium	7440-43-9	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
Chromium	7440-47-3	0.2	µg/L		<0.2	<0.2	**0.5**	<0.2	<0.2
Cobalt	7440-48-4	0.1	µg/L		<0.1	**0.6**	**0.8**	**0.8**	**0.4**
Copper	7440-50-8	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	**0.6**
Lead	7439-92-1	0.1	µg/L		<0.1	<0.1	<0.1	**0.1**	<0.1
Manganese	7439-96-5	0.5	µg/L		<0.5	**24.2**	**72.2**	**231**	**8.6**
Molybdenum	7439-98-7	0.1	µg/L		<0.1	**5.8**	**0.6**	**5.8**	**6.7**
Nickel	7440-02-0	0.5	µg/L		<0.5	**1.5**	**1.2**	**1.1**	**1.0**
Silver	7440-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Tin	7440-31-5	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Zinc	7440-66-6	1	µg/L		<1	**1**	**2**	**3**	**1**
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		<0.1	**0.3**	**0.1**	**0.3**	**0.3**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**0.02**	**18.2**	**9.85**	**29.7**	**28.7**
ø Total Cations	----	0.01	meq/L		<0.01	**15.6**	**9.62**	**26.4**	**25.2**
ø Ionic Balance	----	0.01	%		**----**	**7.83**	**1.19**	**5.82**	**6.43**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	CVBG3-0221	CVBG5-0221	CVBG6-0221	CVBG7-0221	CVBG9-0221
			Sampling date / time	02-Feb-2021 12:15	02-Feb-2021 13:15	02-Feb-2021 12:45	02-Feb-2021 15:45	02-Feb-2021 15:00
Compound	CAS Number	LOR	Unit	EB2103109-011	EB2103109-012	EB2103109-013	EB2103109-014	EB2103109-015
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	9.89	9.48	9.92	7.77	9.75
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	3020	3020	3000	2960	3010
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	1960	1960	1950	1920	1960
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	10	11	7	8	20
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	291	294	296	301	294
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	57	47	67	<1	60
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	10	35	9	115	18
Total Alkalinity as CaCO3	----	1	mg/L	67	82	76	115	77
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	110	101	105	74	103
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	916	919	920	901	919
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	34	32	33	33	32
Magnesium	7439-95-4	1	mg/L	50	52	52	53	52
Sodium	7440-23-5	1	mg/L	449	454	455	444	450
Potassium	7440-09-7	1	mg/L	24	25	25	27	25
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS								
Antimony	7440-36-0	0.2	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Selenium	7782-49-2	0.2	µg/L	0.3	0.3	0.3	0.3	0.3
Arsenic	7440-38-2	0.2	µg/L	2.7	4.9	3.8	5.6	4.6
Beryllium	7440-41-7	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Boron	7440-42-8	5	µg/L	261	278	278	270	289

Analytical Results

Sub-Matrix: **WATER**
(Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	CVBG3-0221	CVBG5-0221	CVBG6-0221	CVBG7-0221	CVBG9-0221
				Sampling date / time	02-Feb-2021 12:15	02-Feb-2021 13:15	02-Feb-2021 12:45	02-Feb-2021 15:45	02-Feb-2021 15:00
					EB2103109-011	EB2103109-012	EB2103109-013	EB2103109-014	EB2103109-015
					Result	Result	Result	Result	Result
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS - Continued									
Cadmium	7440-43-9	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
Chromium	7440-47-3	0.2	µg/L		<0.2	<0.2	<0.2	**0.2**	<0.2
Cobalt	7440-48-4	0.1	µg/L		**0.3**	**0.4**	**0.4**	**0.6**	**0.4**
Copper	7440-50-8	0.5	µg/L		**0.9**	**0.7**	**0.8**	<0.5	**0.8**
Lead	7439-92-1	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Manganese	7439-96-5	0.5	µg/L		**0.9**	**23.6**	**4.8**	**142**	**8.0**
Molybdenum	7439-98-7	0.1	µg/L		**6.8**	**6.3**	**6.6**	**2.2**	**6.4**
Nickel	7440-02-0	0.5	µg/L		**1.1**	**1.0**	**1.0**	**0.9**	**1.1**
Silver	7440-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Tin	7440-31-5	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Zinc	7440-66-6	1	µg/L		<1	<1	<1	**1**	<1
EG094T: Total metals in Fresh water by ORC-ICPMS									
Antimony	7440-36-0	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Selenium	7782-49-2	0.2	µg/L		**0.7**	**0.6**	**0.7**	**0.6**	**0.7**
Arsenic	7440-38-2	0.2	µg/L		**2.7**	**4.7**	**3.6**	**5.0**	**4.0**
Beryllium	7440-41-7	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Boron	7440-42-8	5	µg/L		**288**	**313**	**324**	**294**	**288**
Cadmium	7440-43-9	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
Chromium	7440-47-3	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	**0.3**
Cobalt	7440-48-4	0.1	µg/L		**0.4**	**0.6**	**0.4**	**0.6**	**0.6**
Copper	7440-50-8	0.5	µg/L		**0.6**	<0.5	<0.5	<0.5	**0.7**
Lead	7439-92-1	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Manganese	7439-96-5	0.5	µg/L		**7.3**	**45.9**	**14.3**	**140**	**52.8**
Molybdenum	7439-98-7	0.1	µg/L		**6.2**	**6.4**	**6.6**	**2.3**	**6.1**
Nickel	7440-02-0	0.5	µg/L		**1.0**	**1.1**	**0.9**	**0.8**	**1.2**
Silver	7440-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Tin	7440-31-5	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Zinc	7440-66-6	1	µg/L		<1	**1**	<1	**2**	**1**
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.3**	**0.3**	**0.3**	**0.3**	**0.3**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**29.5**	**29.7**	**29.6**	**29.2**	**29.6**
ø Total Cations	----	0.01	meq/L		**26.0**	**26.3**	**26.4**	**26.0**	**26.1**
ø Ionic Balance	----	0.01	%		**6.34**	**6.08**	**5.89**	**5.87**	**6.31**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	CVRG6-0221	----	----	----	----
			Sampling date / time	02-Feb-2021 13:45	----	----	----	----
Compound	CAS Number	LOR	Unit	EB2103109-016	--------	--------	--------	--------
				Result	----	----	----	----
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	**9.90**	----	----	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**3010**	----	----	----	----
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	**1960**	----	----	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	**9**	----	----	----	----
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	**292**	----	----	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	**72**	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**5**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L	**77**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**104**	----	----	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**917**	----	----	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**33**	----	----	----	----
Magnesium	7439-95-4	1	mg/L	**51**	----	----	----	----
Sodium	7440-23-5	1	mg/L	**452**	----	----	----	----
Potassium	7440-09-7	1	mg/L	**25**	----	----	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	----	----	----	----
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS								
Antimony	7440-36-0	0.2	µg/L	<0.2	----	----	----	----
Selenium	7782-49-2	0.2	µg/L	**0.3**	----	----	----	----
Arsenic	7440-38-2	0.2	µg/L	**3.7**	----	----	----	----
Beryllium	7440-41-7	0.1	µg/L	<0.1	----	----	----	----
Boron	7440-42-8	5	µg/L	**290**	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	CVRG6-0221	----	----	----	----
				Sampling date / time	02-Feb-2021 13:45	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2103109-016	--------	--------	--------	--------
					Result	----	----	----	----
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS - Continued									
Cadmium	7440-43-9	0.05	µg/L		<0.05	----	----	----	----
Chromium	7440-47-3	0.2	µg/L		<0.2	----	----	----	----
Cobalt	7440-48-4	0.1	µg/L		**0.4**	----	----	----	----
Copper	7440-50-8	0.5	µg/L		**0.9**	----	----	----	----
Lead	7439-92-1	0.1	µg/L		<0.1	----	----	----	----
Manganese	7439-96-5	0.5	µg/L		**5.1**	----	----	----	----
Molybdenum	7439-98-7	0.1	µg/L		**6.6**	----	----	----	----
Nickel	7440-02-0	0.5	µg/L		**1.1**	----	----	----	----
Silver	7440-22-4	0.1	µg/L		<0.1	----	----	----	----
Tin	7440-31-5	0.2	µg/L		<0.2	----	----	----	----
Zinc	7440-66-6	1	µg/L		<1	----	----	----	----
EG094T: Total metals in Fresh water by ORC-ICPMS									
Antimony	7440-36-0	0.2	µg/L		<0.2	----	----	----	----
Selenium	7782-49-2	0.2	µg/L		**0.6**	----	----	----	----
Arsenic	7440-38-2	0.2	µg/L		**2.9**	----	----	----	----
Beryllium	7440-41-7	0.1	µg/L		<0.1	----	----	----	----
Boron	7440-42-8	5	µg/L		**263**	----	----	----	----
Cadmium	7440-43-9	0.05	µg/L		<0.05	----	----	----	----
Chromium	7440-47-3	0.2	µg/L		<0.2	----	----	----	----
Cobalt	7440-48-4	0.1	µg/L		**0.4**	----	----	----	----
Copper	7440-50-8	0.5	µg/L		<0.5	----	----	----	----
Lead	7439-92-1	0.1	µg/L		<0.1	----	----	----	----
Manganese	7439-96-5	0.5	µg/L		**14.0**	----	----	----	----
Molybdenum	7439-98-7	0.1	µg/L		**5.6**	----	----	----	----
Nickel	7440-02-0	0.5	µg/L		**0.8**	----	----	----	----
Silver	7440-22-4	0.1	µg/L		<0.1	----	----	----	----
Tin	7440-31-5	0.2	µg/L		<0.2	----	----	----	----
Zinc	7440-66-6	1	µg/L		**2**	----	----	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		**0.3**	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**29.6**	----	----	----	----
ø Total Cations	----	0.01	meq/L		**26.1**	----	----	----	----
ø Ionic Balance	----	0.01	%		**6.15**	----	----	----	----

Appendix D: Coal Fines Analysis

Microscopic Analysis

[redacted]/DES SEDIMENT SAMPLES

Report Number: 45014092

July 5, 2021

Australian Laboratory Services Pty Ltd
[redacted]

Contents

1. Introduction

ALS Energy – Coal Technology were contacted to conduct an analysis of some sediment samples to determine the amount of coal contained in each sample. 17 samples were received. The samples were prepared by float/sink at a density of S1.0/F2.0 (as per AS4156.1) to concentrate the coal portion of the sample. Maceral analysis (AS2856.2) was conducted on the 17 samples at the ALS Coal Petrography and Imaging Centre at [redacted].

The 17 samples were:

1. CV-BG1
2. CV-BG2
3. CV-BG3
4. CV-BG5
5. CV-BG6
6. CV-BG7
7. CV-BG9
8. CV-AP1
9. CV-AP2
10. CV-AP3
11. CV-AP5
12. CV-AP6
13. CV-AP7
14. CV-AP8
15. CV-AP9
16. CV-RG1
17. CV-SWC

2. Procedure

After receipt of sample from the Department of Environment and Science, the samples were prepped by removing excess water by filtration (where required), then air drying the samples. Float/sink testing was conducted with the masses for three density fractions (Float 1.0, Sink 1.0 – Float 2.0 and Sink 2.0) being recorded (see Appendix A) and a petrography sample being prepared from the S1.0 - F2.0 fraction.

Samples were then prepared as per normal petrographic samples by mounting the crushed samples in an acrylic resin, which is polished via a multistage polishing procedure on a Struers Tegra polishing system to produce a suitable surface for reflected light microscopy.

A maceral count of each sample was conducted with the material under the crosshairs of the microscope being classified as per AS2856.2 (see Appendix B for Maceral Reports). 500 points were counted, where possible, on each sample at 500x magnification.

3. Results

The results of the point count on the sediment samples are outlined in the following table:

Sample	S1.0-F2.0 Mass (g)	Coal (% vol) in S1.0-F2.0	Coal (g)	Coal (% mass)
CV-BG1	69.2	3.4	1.7	0.6
CV-BG2	1.3	15.4	0.1	0.0
CV-BG3	0.4	67.2	0.2	0.1
CV-BG5	0.6	77.3	0.4	0.1
CV-BG6	0.1	19.3	0.0	0.0
CV-BG7	67.1	0.8	0.3	0.1
CV-BG9	0.2	4.6	0.0	0.0
CV-AP1	1.3	15.3	0.2	0.0
CV-AP2	0.7	34	0.2	0.0
CV-AP3	0.1	41.3	0.0	0.0
CV-AP5	0.6	38.2	0.0	0.0
CV-AP6	0.1	61.3	0.0	0.0
CV-AP7	0.4	32.5	0.0	0.0
CV-AP8	8.2	3.9	0.3	0.1
CV-AP9	1.2	55.5	0.5	0.1
CV-RG1	63.5	2.2	1.0	0.4
CV-SWC	129.3	0.8	0.6	0.1

The samples were predominantly made up of a mixture of mineral matter and non-coal organic material. To calculate the mass of coal in each fraction, the coal is assumed to have a relative density of 1.4 whilst the mineral matter is assume to have a relative density of 2.6.

4. Appendix A

4.1 Float Sink Results (AS4156.1)

Sample	Fraction	Mass (g)
CV-BG1	F1	2.0
	S1 F2	69.2
	S2	231.2
CV-BG2	F1	0.0
	S1 F2	1.3
	S2	487.3
CV-BG3	F1	0.0
	S1 F2	0.4
	S2	259.5
CV-BG5	F1	0.0
	S1 F2	0.6
	S2	449.4
CV-BG6	F1	0.0
	S1 F2	0.1
	S2	337.0
CV-BG7	F1	0.9
	S1 F2	67.1
	S2	554.4

CV-BG9	F1	0.0
	S1 F2	0.2
	S2	256.1
CV-AP1	F1	0.1
	S1 F2	1.3
	S2	844.5
CV-AP2	F1	0.0
	S1 F2	0.7
	S2	580.9
CV-AP3	F1	0.0
	S1 F2	0.1
	S2	382.3
CV-AP5	F1	0.1
	S1 F2	0.6
	S2	622.5
CV-AP6	F1	0.0
	S1 F2	0.1
	S2	430.2
CV-AP7	F1	0.0
	S1 F2	0.4
	S2	256.3

CV-AP8	F1	0.0
	S1 F2	8.2
	S2	443.7
CV-AP9	F1	0.0
	S1 F2	1.2
	S2	368.1
CV-RG1	F1	1.8
	S1 F2	63.5
	S2	174
CV-SWC	F1	2.3
	S1 F2	129.3
	S2	345.4

5. Appendix B

Report Number: 45014092
Petrography Number: 1137Q
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45014092-C1 DES CV-BG1 S1 F2 FS-10 TQ21002950V043

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	3.4	7.5	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	**2.0**	**4.4**
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	**1.4**	**3.1**
			Gelovitrinite	Corpogellinite	0.0	0.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	0.0	0.0		Sporinite	0.0	0.0
				Cutinite	0.0	0.0
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	0.0	0.0
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	0.0	0.0	Telo-inertinite	Fusinite	0.0	0.0
				Semifusinite	0.0	0.0
				Natural Coke	0.0	0.0
			Detro-inertinite	Inertodetrinite	0.0	0.0
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
Organic Matter	42.3	92.6				
MINERAL	54.3					

Prepared and measured in accordance with Australian Standards AS 2856.1, AS 2856.2.
Date: 30/06/2021 Observations: 501
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

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1 of 1

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Report Number: 45014092
Petrography Number: 1153Q
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45014092-C1 DES CV-BG2 S1 F2 FS-10 TQ21002950G046

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	11.5	25.2	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	10.8	23.6
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	0.7	1.6
			Gelovitrinite	Corpogellinite	0.0	0.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	3.2	7.1		Sporinite	0.0	0.0
				Cutinite	0.0	0.0
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	3.2	7.1
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	0.7	1.6	Telo-inertinite	Fusinite	0.0	0.0
				Semifusinite	0.7	1.6
				Natural Coke	0.0	0.0
			Detro-inertinite	Inertodetrinite	0.0	0.0
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
Organic Matter	30.1	66.1				
MINERAL	54.5					

Prepared and measured in accordance with Australian Standards AS 2856.1, AS 2856.2.
Date 5/07/2021 Observations: 279
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

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Report Number: 45014092
Petrography Number: 1154Q
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45014092-C1 DES CV-BG3 S1 F2 FS-10 TQ21002950G049

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	56.9	75.8	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	51.1	68.0
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	5.8	7.8
			Gelovitrinite	Corpogellinite	0.0	0.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	6.6	8.7		Sporinite	1.5	1.9
				Cutinite	0.0	0.0
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	5.1	6.8
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	4.4	5.8	Telo-inertinite	Fusinite	0.0	0.0
				Semifusinite	1.5	1.9
				Natural Coke	0.7	1.0
			Detro-inertinite	Inertodetrinite	2.2	2.9
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
Organic Matter	7.3	9.7				
MINERAL	24.8					

Prepared and measured in accordance with Australian Standards AS 2856.1; AS 2856.2
Date: 5/07/2021 Observations: 137
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

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1 of 1

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Report Number: 45014092
Petrography Number: 1155Q
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45014092-C1 DES CV-8G5 S1 F2 FS-10 TQ21002950G052

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	51.7	60.4	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	45.2	52.8
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	6.5	7.6
			Gelovitrinite	Corpogellinite	0.0	0.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	8.4	9.8		Sporinite	3.0	3.5
				Cutinite	1.2	1.4
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	4.2	4.9
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	17.2	20.1	Telo-inertinite	Fusinite	0.6	0.7
				Semifusinite	9.5	11.1
				Natural Coke	0.0	0.0
			Detro-inertinite	Inertodetrinite	7.1	8.3
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
Organic Matter	8.3	9.7				
MINERAL	14.3					

Prepared and measured in accordance with Australian Standards AS 2856.1; AS 2856.2.
Date: 5/07/2021 Observations: 168
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

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1 of 1

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Report Number: 45014092
Petrography Number: 1156Q
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45014092-C1 DES CV-BG6 S1 F2 FS-10 TQ21002950G055

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	14.0	33.3	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	14.0	33.3
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	0.0	0.0
			Gelovitrinite	Corpogellinite	0.0	0.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	1.8	4.2		Sporinite	0.0	0.0
				Cutinite	0.0	0.0
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	1.8	4.2
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	3.5	8.3	Telo-inertinite	Fusinite	0.0	0.0
				Semifusinite	0.0	0.0
				Natural Coke	0.0	0.0
			Detro-inertinite	Inertodetrinite	3.5	8.3
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
Organic Matter	22.8	54.2				
MINERAL	57.9					

Prepared and measured in accordance with Australian Standards AS 2856.1, AS 2856.2.
Date 5/07/2021 Observations: 57
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

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1 of 1

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Report Number: 45014092
Petrography Number: 1140Q
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45014092-C1 DES CV-BG7 S1 F2 FS-10 TQ21002950V058

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	0.8	3.6	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	0.8	3.6
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	0.0	0.0
			Gelovitrinite	Corpogellinite	0.0	0.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	0.0	0.0		Sporinite	0.0	0.0
				Cutinite	0.0	0.0
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	0.0	0.0
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	0.0	0.0	Telo-inertinite	Fusinite	0.0	0.0
				Semifusinite	0.0	0.0
				Natural Coke	0.0	0.0
			Detro-inertinite	Inertodetrinite	0.0	0.0
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
Organic Matter	21.5	96.4				
MINERAL	77.7					

Prepared and measured in accordance with Australian Standards AS 2856.1, AS 2856.2.
Date: 1/07/2021 Observations: 503
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

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1 of 1

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Report Number: 45014092
Petrography Number: 1157Q
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45014092-C1 DES CV-BG9 S1 F2 FS-10 TQ21002950G061

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	3.2	7.9	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	2.4	5.9
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	0.8	2.0
			Gelovitrinite	Corpogellinite	0.0	0.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	0.2	0.5		Sporinite	0.0	0.0
				Cutinite	0.2	0.5
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	0.0	0.0
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	1.2	2.9	Telo-inertinite	Fusinite	0.0	0.0
				Semifusinite	1.0	2.4
				Natural Coke	0.2	0.5
			Detro-inertinite	Inertodetrinite	0.0	0.0
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
Organic Matter	36.8	88.8				
MINERAL	58.5					

Prepared and measured in accordance with Australian Standards AS 2856.1; AS 2856.2
Date: 5/07/2021 Observations: 494
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

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1 of 1

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Report Number: 45014092
Petrography Number: 1146Q
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45014092-C1 DES CV-AP1 S1 F2 FS-10 TQ21002950G019

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	14.5	19.4	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	12.1	16.2
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	2.4	3.2
			Gelovitrinite	Corpogellinite	0.0	0.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	0.0	0.0		Sporinite	0.0	0.0
				Cutinite	0.0	0.0
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	0.0	0.0
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	1.2	1.5	Telo-inertinite	Fusinite	0.4	0.5
				Semifusinite	0.4	0.5
				Natural Coke	0.4	0.5
			Detro-inertinite	Inertodetrinite	0.0	0.0
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
Organic Matter	58.9	78.9				
MINERAL	25.4					

Prepared and measured in accordance with Australian Standards AS 2856.1; AS 2856.2.
Date: 2/07/2021 Observations: 248
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

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1 of 1

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Report Number: 45014092
Petrography Number: 1147Q
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45014092-C1 DES CV-AP2 S1 F2 FS-10 TQ21002950G022

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	27.1	41.9	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	23.8	36.7
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	3.3	5.2
			Gelovitrinite	Corpogellinite	0.0	0.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	1.0	1.5		Sporinite	0.0	0.0
				Cutinite	0.0	0.0
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	1.0	1.5
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	6.7	10.2	Telo-inertinite	Fusinite	0.4	0.6
				Semifusinite	2.9	4.5
				Natural Coke	0.8	1.2
			Detro-inertinite	Inertodetrinite	2.6	3.9
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
Organic Matter	30.1	46.4				
MINERAL	35.2					

Prepared and measured in accordance with Australian Standards AS 2856.1, AS 2856.2.
Date: 5/07/2021 Observations: 500
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

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1 of 1

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Report Number: 45014092
Petrography Number: 1148Q
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45014092-C1 DES CV-AP3 S1 F2 FS-10 TQ21002950G025

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	32.7	52.8	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	29.3	47.2
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	3.4	5.6
			Gelovitrinite	Corpogellinite	0.0	0.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	5.2	8.3		Sporinite	0.0	0.0
				Cutinite	0.0	0.0
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	5.2	8.3
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	5.1	8.4	Telo-inertinite	Fusinite	0.0	0.0
				Semifusinite	1.7	2.8
				Natural Coke	1.7	2.8
			Detro-inertinite	Inertodetrinite	1.7	2.8
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
Organic Matter	19.0	30.6				
MINERAL	37.9					

Prepared and measured in accordance with Australian Standards AS 2856.1; AS 2856.2.
Date 5/07/2021 Observations: 58
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

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1 of 1

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Report Number: 45014092
Petrography Number: 1149Q
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45014092-C1 DES CV-AP5 S1 F2 FS-10 TQ21002950G028

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	35.0	43.5	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	28.5	35.4
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	6.5	8.1
			Gelovitrinite	Corpogellinite	0.0	0.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	0.8	1.0		Sporinite	0.0	0.0
				Cutinite	0.0	0.0
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	0.8	1.0
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	3.2	4.0	Telo-inertinite	Fusinite	0.0	0.0
				Semifusinite	0.0	0.0
				Natural Coke	0.8	1.0
			Detro-inertinite	Inertodetrinite	2.4	3.0
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
Organic Matter	41.5	51.5				
MINERAL	19.5					

Prepared and measured in accordance with Australian Standards AS 2856.1, AS 2856.2.
Date: 2/07/2021 Observations: 123
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

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1 of 1

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Report Number: 45014092
Petrography Number: 1150Q
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45014092-C1 DES CV-AP6 S1 F2 FS-10 TQ21002950G031

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	49.3	70.3	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	46.3	66.0
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	3.0	4.3
			Gelovitrinite	Corpogellinite	0.0	0.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	6.0	8.5		Sporinite	0.0	0.0
				Cutinite	0.0	0.0
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	6.0	8.5
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	6.0	8.5	Telo-inertinite	Fusinite	0.0	0.0
				Semifusinite	4.5	6.4
				Natural Coke	0.0	0.0
			Detro-inertinite	Inertodetrinite	1.5	2.1
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
Organic Matter	9.0	12.8				
MINERAL	29.9					

Prepared and measured in accordance with Australian Standards AS 2856.1 / AS 2856.2.
Date: 2/07/2021 Observations: 67
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

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1 of 1

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Report Number: 45014092
Petrography Number: 1151Q
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45014092-C1 DES CV-AP7 S1 F2 FS-10 TQ21002950G034

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	25.5	47.0	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	14.1	26.0
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	10.3	19.0
			Gelovitrinite	Corpogellinite	1.1	2.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	0.5	1.0		Sporinite	0.5	1.0
				Cutinite	0.0	0.0
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	0.0	0.0
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	6.5	12.0	Telo-inertinite	Fusinite	0.0	0.0
				Semifusinite	2.7	5.0
				Natural Coke	0.0	0.0
			Detro-inertinite	Inertodetrinite	3.8	7.0
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
Organic Matter	21.7	40.0				
MINERAL	45.7					

Prepared and measured in accordance with Australian Standards AS 2856.1, AS 2856.2
Date: 5/07/2021 Observations: 184
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

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1 of 1

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Report Number: 45014092
Petrography Number: 1136Q
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45014092-C1 DES CV-AP8 S1 F2 FS-10 TQ21002950V037

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	3.9	5.2	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	3.5	4.7
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	0.4	0.5
			Gelovitrinite	Corpogellinite	0.0	0.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	0.0	0.0		Sporinite	0.0	0.0
				Cutinite	0.0	0.0
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	0.0	0.0
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	0.0	0.0	Telo-inertinite	Fusinite	0.0	0.0
				Semifusinite	0.0	0.0
				Natural Coke	0.0	0.0
			Detro-inertinite	Inertodetrinite	0.0	0.0
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
Organic Matter	71.1	94.8				
MINERAL	25.0					

Prepared and measured in accordance with Australian Standards AS 2856.1, AS 2856.2.
Date: 29/06/2021 Observations: 508
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

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1 of 1

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Report Number: 45014092
Petrography Number: 1152Q
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45014092-C1 DES CV-AP9 S1 F2 FS-10 TQ21002950G040

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	49.8	76.2	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	39.4	60.3
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	10.4	15.9
			Gelovitrinite	Corpogellinite	0.0	0.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	3.1	4.7		Sporinite	2.4	3.6
				Cutinite	0.5	0.7
				Resinite	0.2	0.4
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	0.0	0.0
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	3.3	5.1	Telo-inertinite	Fusinite	0.0	0.0
				Semifusinite	0.7	1.1
				Natural Coke	0.7	1.1
			Detro-inertinite	Inertodetrinite	1.9	2.9
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
Organic Matter	9.2	14.1				
MINERAL	34.7					

Prepared and measured in accordance with Australian Standards AS 2856.1; AS 2856.2.
Date: 5/07/2021 Observations: 424
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

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1 of 1

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Report Number: 45014092
Petrography Number: 1138Q
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45014092-C1 DES CV-RG1 S1 F2 FS-10 TQ21002950V064

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	2.2	5.9	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	1.6	4.3
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	0.6	1.6
			Gelovitrinite	Corpogellinite	0.0	0.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	0.0	0.0		Sporinite	0.0	0.0
				Cutinite	0.0	0.0
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	0.0	0.0
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	0.0	0.0	Telo-inertinite	Fusinite	0.0	0.0
				Semifusinite	0.0	0.0
				Natural Coke	0.0	0.0
			Detro-inertinite	Inertodetrinite	0.0	0.0
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
Organic Matter	34.9	94.1				
MINERAL	63.0					

Prepared and measured in accordance with Australian Standards AS 2856.1; AS 2856.2.
Date: 1/07/2021 Observations: 505
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

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1 of 1

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Report Number: 45014092
Petrography Number: 1139Q
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45014092-C1 DES CV-SWC S1 F2 FS-10 TQ21002950V067

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	0.8	3.9	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	0.8	3.9
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	0.0	0.0
			Gelovitrinite	Corpogellinite	0.0	0.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	0.0	0.0		Sporinite	0.0	0.0
				Cutinite	0.0	0.0
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	0.0	0.0
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
Natural Coke	0.8	3.9	Telo-inertinite	Fusinite	0.0	0.0
				Semifusinite	0.0	0.0
				Natural Coke	0.8	3.9
			Detro-inertinite	Inertodetrinite	0.0	0.0
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
Organic Matter	18.7	92.2				
MINERAL	79.8					

Prepared and measured in accordance with Australian Standards AS 2856.1; AS 2856.2.
Date: 1/07/2021 Observations: 509
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

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1 of 1

[redacted]

Microscopic Analysis

[redacted] DES SEDIMENT SAMPLES

December 21, 2018

Australian Laboratory Services Pty Ltd
[redacted]

Contents

1. Introduction

ALS Energy – Coal Technology were contacted to conduct an analysis of some sediment samples to determine the amount of coal contained in each sample. Fourteen samples were received. The samples were prepared by float/sink at a density of S1.0/F2.0 (as per AS4156.1) to concentrate the coal portion of the sample. Maceral analysis (AS2856.2) was conducted on the eight samples at the ALS Coal Petrography and Imaging Centre at [redacted]

The eight samples were:

1. CV-T1-S1-1218
2. CV-T1-S2-1218
3. CV-T1-S3-1218
4. CV-T1-S4-1218
5. CV-T2-S2-1218
6. CV-T2-S3-1218
7. CV-T2-S4-1218
8. CV-CT1-S1-1218
9. CV-CT1-S2-1218
10. CV-CT1-S3-1218
11. CV-CT1-S4-1218
12. CV-CT2-S2-1218
13. CV-CT2-S3-1218
14. CV-CT2-S4-1218

2. Procedure

After receipt of sample from the Department of Environment and Science, the samples were prepped by removing excess water by filtration (where required), then air drying the samples. Float/sink testing was conducted, with the masses for three density fractions (Float 1.0, Sink 1.0 – Float 2.0 and Sink 2.0) being recorded (see Appendix A) and a petrography sample being prepared from the S1.0 - F2.0 fraction.

Samples were then prepared as per normal petrographic samples by mounting the crushed samples in an acrylic resin, which is polished via a multistage polishing procedure on a Struers Tegra polishing system to produce a suitable surface for reflected light microscopy.

A maceral count of each sample was conducted with the material under the crosshairs of the microscope being classified as per AS2856.2 (see Appendix B for Maceral Reports. 500 points were counted on each sample at 500x magnification.

3. Results

The results of the point count are outlined in the following table:

Sample	S1.0-F2.0 Mass (g)	Coal (% vol) in S1.0-F2.0	Coal (g)	Coal (% mass)
CV-T1-S1-1218	23.3	5.4	0.8	0.3
CV-T1-S2-1218	22.3	6.1	0.9	0.6
CV-T1-S3-1218	3.7	3.8	0.1	0.0
CV-T1-S4-1218	2	3	0.0	0.0
CV-T2-S2-1218	1.3	2	0.0	0.0
CV-T2-S3-1218	10.1	0.8	0.1	0.0
CV-T2-S4-1218	67.4	6.1	2.4	0.4
CV-CT1-S1-1218	1.1	6.7	0.1	0.0
CV-CT1-S2-1218	17.9	2.6	0.3	0.2
CV-CT1-S3-1218	0.1	1.8	0.0	0.0
CV-CT1-S4-1218	0	0	0.0	0.0
CV-CT2-S2-1218	0	0	0.0	0.0
CV-CT2-S3-1218	0	0	0.0	0.0
CV-CT2-S4-1218	5.9	1.4	0.0	0.0

The samples were predominantly made up of a mixture of mineral matter and non-coal organic material. To calculate the mass of coal in each fraction, the coal is assumed to have a relative density of 1.4 whilst the mineral matter is assume to have a relative density of 2.6.

4. Appendix A

4.1 Float Sink Results (AS4156.1)

Sample	Fraction	Mass (g)
CV-T1-S1	F1	4.3
	S1 F2	23.3
	S2	232.8
CV-T1-S2	F1	12.8
	S1 F2	22.3
	S2	121.2
CV-T1-S3	F1	14.5
	S1 F2	3.7
	S2	524.8
CV-T1-S4	F1	2.9
	S1 F2	2
	S2	360.2
CV-T2-S2	F1	12.5
	S1 F2	1.3
	S2	90.1
CV-T2-S3	F1	3
	S1 F2	10.1
	S2	314.9

CV-T2-S4	F1	9.6
	S1 F2	67.4
	S2	513.5
CV-CT1-S1	F1	0.1
	S1 F2	1.1
	S2	382.7
CV-CT1-S2	F1	7.3
	S1 F2	17.9
	S2	136.4
CV-CT1-S3	F1	0
	S1 F2	0.1
	S2	396.2
CV-CT1-S4	F1	0
	S1 F2	0
	S2	373.5
CV-CT2-S2	F1	0
	S1 F2	0
	S2	662.2
CV-CT2-S3	F1	0
	S1 F2	0
	S2	736.7

CV-CT2-S4	F1	0
	S1 F2	5.9
	S2	623.2

5. Appendix B

Report Number: 45012946
Petrography Number: 3013N
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45012946 CV-CT1-S2 S1 F2 DES Nov Enviro TQ18011488V040

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	1.4	7.0	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	1.2	6.0
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	0.2	1.0
			Gelovitrinite	Corpogellinite	0.0	0.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	0.6	3.0		Sporinite	0.4	2.0
				Cutinite	0.0	0.0
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	0.2	1.0
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	0.6	3.0	Telo-inertinite	Fusinite	0.0	0.0
				Semifusinite	0.6	3.0
				Funginite	0.0	0.0
			Detro-inertinite	Inertodetrinite	0.0	0.0
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
ORGANIC MATTER	17.3	87.0				
MINERAL	80.1					

Prepared and measured in accordance with Australian Standards AS 2856.1; AS 2856.2.
Date: 19/12/2018 Observations: 303
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

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1 of 1

[redacted]

Report Number: 45012946
Petrography Number: 3012N
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45012946 CV-CT1-S1 S1 F2 DES Nov Enviro TQ18011488V037

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	5.5	11.7	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	5.1	10.9
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	0.4	0.8
			Gelovitrinite	Corpogellinite	0.0	0.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	0.4	0.8		Sporinite	0.2	0.4
				Cutinite	0.0	0.0
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	0.2	0.4
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	0.8	1.7	Telo-inertinite	Fusinite	0.0	0.0
				Semifusinite	0.6	1.3
				Funginite	0.0	0.0
			Detro-inertinite	Inertodetrinite	0.2	0.4
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
ORGANIC MATTER	40.5	85.8				
MINERAL	52.8					

Prepared and measured in accordance with Australian Standards AS 2856.1; AS 2856.2.
Date: 20/12/2018 Observations: 306
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

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1 of 1

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Report Number: 45012946
Petrography Number: 3014N
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45012946 CV-CT1-S3 S1 F2 DES Nov Enviro TQ18011488V043

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	1.0	7.9	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	0.8	6.3
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	0.2	1.6
			Gelovitrinite	Corpogellinite	0.0	0.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	0.0	0.0		Sporinite	0.0	0.0
				Cutinite	0.0	0.0
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	0.0	0.0
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	0.8	6.3	Telo-inertinite	Fusinite	0.0	0.0
				Semifusinite	0.8	6.3
				Funginite	0.0	0.0
			Detro-inertinite	Inertodetrinite	0.0	0.0
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
ORGANIC MATTER	10.8	85.7				
MINERAL	87.5					

Prepared and measured in accordance with Australian Standards AS 2856.1; AS 2856.2.
Date: 20/12/2018 Observations: 302
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

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1 of 1

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Report Number: 45012946
Petrography Number: 3015N
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45012946 CV-CT2-S4 S1 F2 DES Nov Enviro TQ18011488V055

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	1.2	8.4	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	0.8	5.6
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	0.4	2.8
			Gelovitrinite	Corpogellinite	0.0	0.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	0.0	0.0		Sporinite	0.0	0.0
				Cutinite	0.0	0.0
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	0.0	0.0
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	0.2	1.4	Telo-inertinite	Fusinite	0.0	0.0
				Semifusinite	0.2	1.4
				Funginite	0.0	0.0
			Detro-inertinite	Inertodetrinite	0.0	0.0
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
NATURAL COKE	12.6	90.3				
MINERAL	86.0					

Prepared and measured in accordance with Australian Standards AS 2856.1; AS 2856.2.
Date: 19/12/2018 Observations: 315
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

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1 of 1

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Report Number: 45012946
Petrography Number: 3005N
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45012946 CV-T1-S1 S1 F2 DES Nov Enviro TQ18011488V016

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	3.8	11.8	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	3.0	9.3
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	0.8	2.5
			Gelovitrinite	Corpogellinite	0.0	0.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	0.2	0.6		Sporinite	0.2	0.6
				Cutinite	0.0	0.0
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	0.0	0.0
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	1.4	4.4	Telo-inertinite	Fusinite	0.0	0.0
				Semifusinite	0.8	2.5
				Funginite	0.0	0.0
			Detro-inertinite	Inertodetrinite	0.6	1.9
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
ORGANIC MATTER	26.9	83.3				
MINERAL	67.7					

Prepared and measured in accordance with Australian Standards AS 2856.1; AS 2856.2.
Date: 18/12/2018 Observations: 302
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

[redacted]

1 of 1

[redacted]

Report Number: 45012946
Petrography Number: 3006N
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45012946 CV-T1-S2 S1 F2 DES Nov Enviro TQ18011488V019

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	4.5	16.7	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	3.9	14.5
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	0.6	2.2
			Gelovitrinite	Corpogellinite	0.0	0.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	0.2	0.7		Sporinite	0.2	0.7
				Cutinite	0.0	0.0
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	0.0	0.0
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	1.4	5.0	Telo-inertinite	Fusinite	0.2	0.7
				Semifusinite	1.0	3.6
				Funginite	0.0	0.0
			Detro-inertinite	Inertodetrinite	0.2	0.7
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
ORGANIC MATTER	21.0	77.5				
MINERAL	72.9					

Prepared and measured in accordance with Australian Standards AS 2856.1; AS 2856.2.
Date: 18/12/2018 Observations: 310
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

[redacted]

1 of 1

[redacted]

Report Number: 45012946
Petrography Number: 3007N
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45012946 CV-T1-S3 S1 F2 DES Nov Enviro TQ18011488V022

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	1.8	11.8	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	1.6	10.5
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	0.2	1.3
			Gelovitrinite	Corpogellinite	0.0	0.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	0.2	1.3		Sporinite	0.2	1.3
				Cutinite	0.0	0.0
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	0.0	0.0
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	1.8	11.8	Telo-inertinite	Fusinite	0.6	3.9
				Semifusinite	1.0	6.6
				Funginite	0.0	0.0
			Detro-inertinite	Inertodetrinite	0.2	1.3
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
ORGANIC MATTER	11.3	75.0				
MINERAL	85.0					

Prepared and measured in accordance with Australian Standards AS 2856.1; AS 2856.2.
Date: 19/12/2018 Observations: 305
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

[redacted]

1 of 1

[redacted]

Report Number: 45012946
Petrography Number: 3008N
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45012946 CV-T1-S4 S1 F2 DES Nov Enviro TQ18011488V025

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	2.8	24.6	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	2.8	24.6
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	0.0	0.0
			Gelovitrinite	Corpogellinite	0.0	0.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	0.0	0.0		Sporinite	0.0	0.0
				Cutinite	0.0	0.0
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	0.0	0.0
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	0.2	1.8	Telo-inertinite	Fusinite	0.2	1.8
				Semifusinite	0.0	0.0
				Funginite	0.0	0.0
			Detro-inertinite	Inertodetrinite	0.0	0.0
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
ORGANIC MATTER	8.3	73.7				
MINERAL	88.8					

Prepared and measured in accordance with Australian Standards AS 2856.1; AS 2856.2.
Date: 19/12/2018 Observations: 308
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

[redacted]

[redacted]

Report Number: 45012946
Petrography Number: 3009N
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45012946 CV-T2-S2 S1 F2 DES Nov Enviro TQ18011488V028

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	1.2	6.0	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	1.0	5.0
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	0.2	1.0
			Gelovitrinite	Corpogellinite	0.0	0.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	0.0	0.0		Sporinite	0.0	0.0
				Cutinite	0.0	0.0
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	0.0	0.0
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	0.8	4.0	Telo-inertinite	Fusinite	0.0	0.0
				Semifusinite	0.4	2.0
				Funginite	0.0	0.0
			Detro-inertinite	Inertodetrinite	0.4	2.0
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
ORGANIC MATTER	17.8	90.0				
MINERAL	80.2					

Prepared and measured in accordance with Australian Standards AS 2856.1; AS 2856.2.
Date: 20/12/2018 Observations: 306
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

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1 of 1

[redacted]

Report Number: 45012946
Petrography Number: 3010N
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45012946 CV-T2-S3 S1 F2 DES Nov Enviro TQ18011488V031

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	0.4	1.8	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	0.4	1.8
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	0.0	0.0
			Gelovitrinite	Corpogellinite	0.0	0.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	0.4	1.8		Sporinite	0.4	1.8
				Cutinite	0.0	0.0
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	0.0	0.0
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	0.0	0.0	Telo-inertinite	Fusinite	0.0	0.0
				Semifusinite	0.0	0.0
				Funginite	0.0	0.0
			Detro-inertinite	Inertodetrinite	0.0	0.0
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
ORGANIC MATTER	20.7	96.4				
MINERAL	78.6					

Prepared and measured in accordance with Australian Standards AS 2856.1; AS 2856.2.
Date: 19/12/2018 Observations: 313
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

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1 of 1

[redacted]

Report Number: 45012946
Petrography Number: 3011N
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45012946 CV-T2-S4 S1 F2 DES Nov Enviro TQ18011488V034

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	3.1	21.0	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	2.9	19.7
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	0.2	1.3
			Gelovitrinite	Corpogellinite	0.0	0.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	0.4	2.6		Sporinite	0.4	2.6
				Cutinite	0.0	0.0
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	0.0	0.0
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	2.6	17.1	Telo-inertinite	Fusinite	0.0	0.0
				Semifusinite	1.2	7.9
				Funginite	0.0	0.0
			Detro-inertinite	Inertodetrinite	1.4	9.2
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
ORGANIC MATTER	8.8	59.2				
MINERAL	85.1					

Prepared and measured in accordance with Australian Standards AS 2856.1; AS 2856.2.
Date: 19/12/2018 Observations: 311
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

[redacted]

[redacted]

Microscopic Analysis

[redacted]/DES SEDIMENT SAMPLES

March 14, 2019

Australian Laboratory Services Pty Ltd
[redacted]

Contents

1. Introduction

ALS Energy – Coal Technology were contacted by [redacted] from the Department of Science, Information Technology and Innovation [redacted] lysis of environmental samples to determine if there is any coal present. Microscopic analysis was conducted on the samples at the ALS Coal Petrography and Imaging Centre at [redacted]. The samples received for analysis were the following:

CV-TIS4-0119

CV-CT154

2. Procedure

After receipt, samples were dried overnight in an oven to remove excess water. The samples were prepared by crushing any oversize material down to a 1mm top size using a mortar and pestle to limit over-crushing.

Samples were then prepared as per normal petrographic samples by mounting the crushed samples in an acrylic resin, which is polished via a multistage polishing procedure on a Struers Tegra polishing system to produce a suitable surface for reflected light microscopy.

A point count of each sample was conducted with the material under the crosshairs of the microscope being classified as coal, mineral matter or organic matter. 500 points or a single pass of the entire area of the block were counted on the sample at 500x magnification. Some example images are included below.

Figure 1: (CV-TIS4-0119), Coal dust particles, with the darker grey Vitrinite and lighter grey/white of Inertinite; 50x objective, oil immersion, reflected white light.

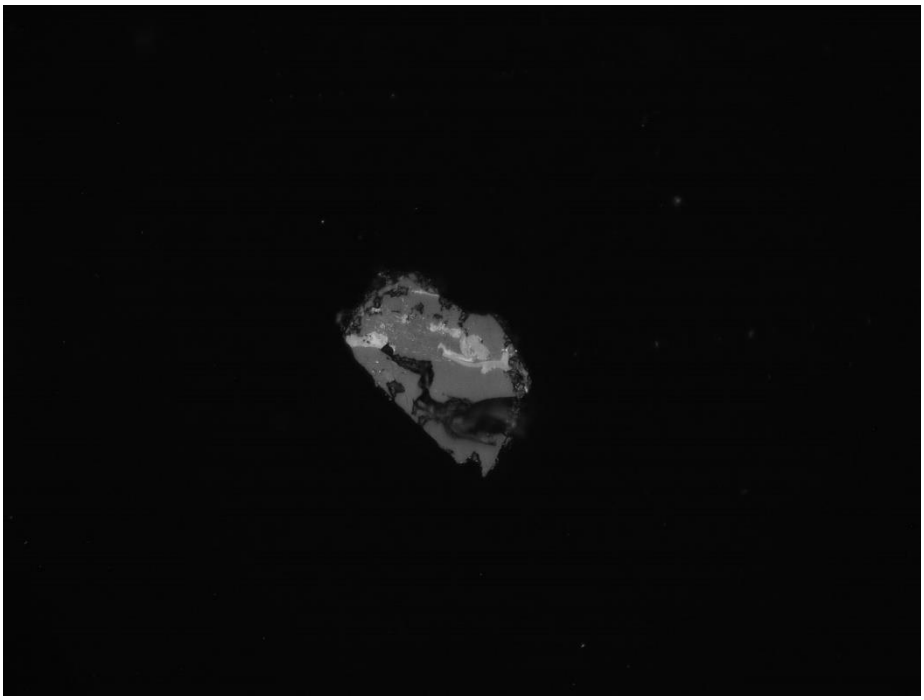

Figure 2: (CV-TIS4-0119), Coal dust particle; 50x objective, oil immersion, reflected white light.

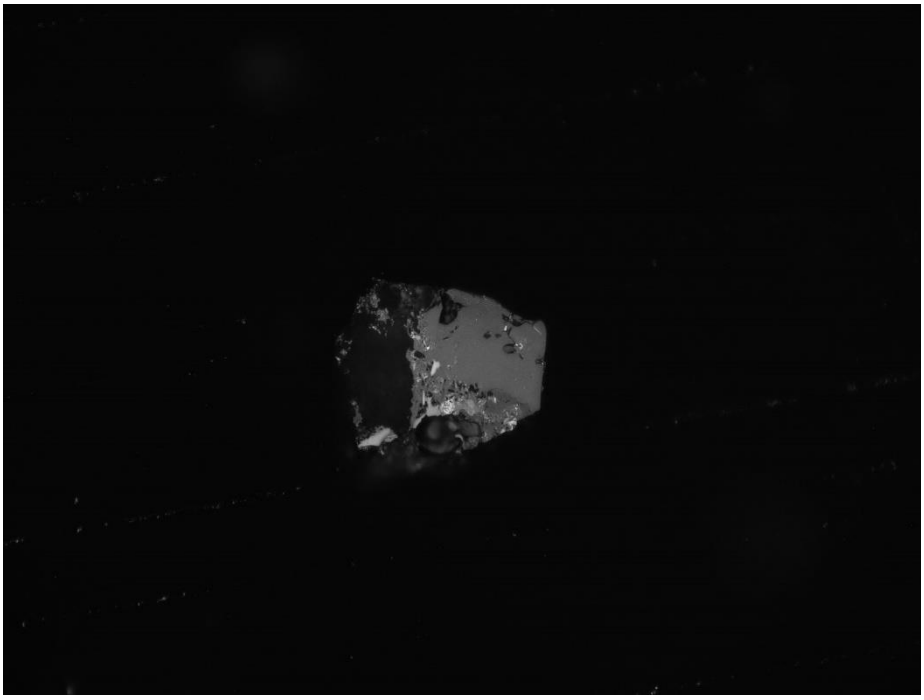

Figure 3: (CV-TIS4-0119), Coal dust particle with imbedded mineral matter; 50x objective, oil immersion, reflected white light.

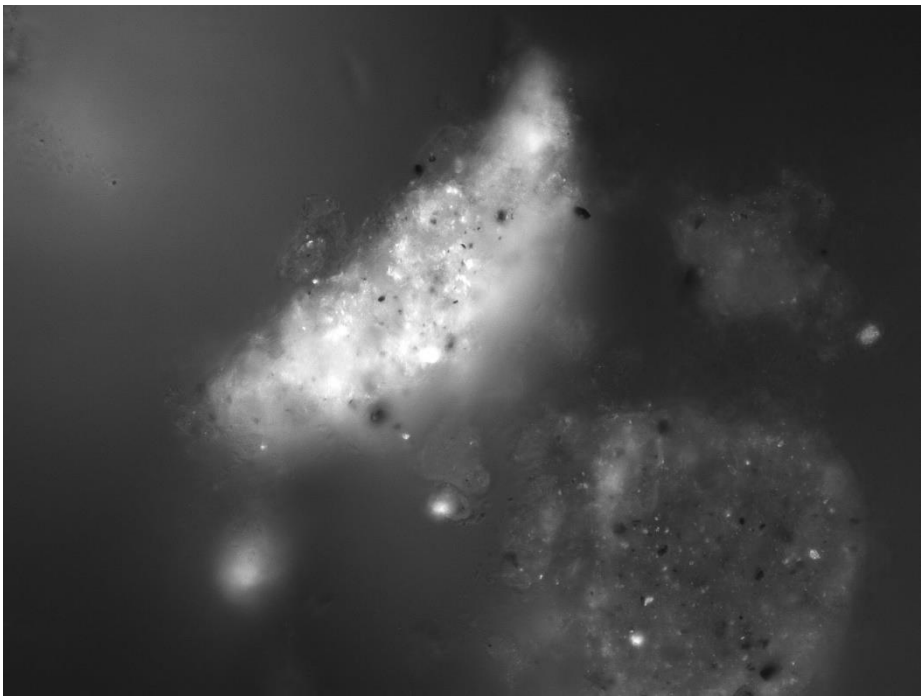

Figure 4: (CV-CT154), Mineral Matter; 50x objective, oil immersion, reflected white light.

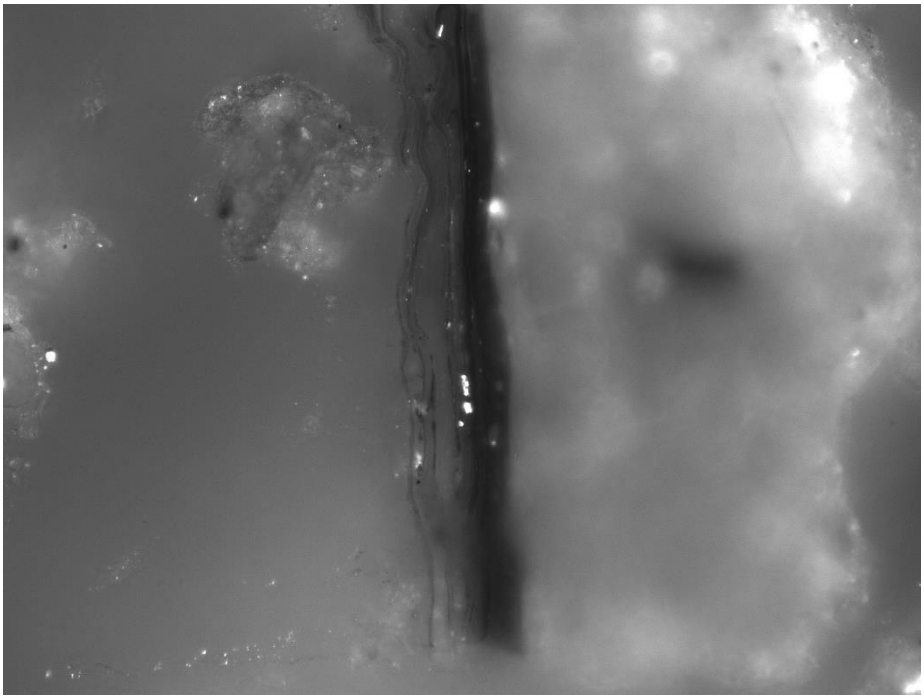

Figure 5: (CV-CT154), Organic Matter (middle) and Mineral (right); 50x objective; oil immersion, reflected white light.

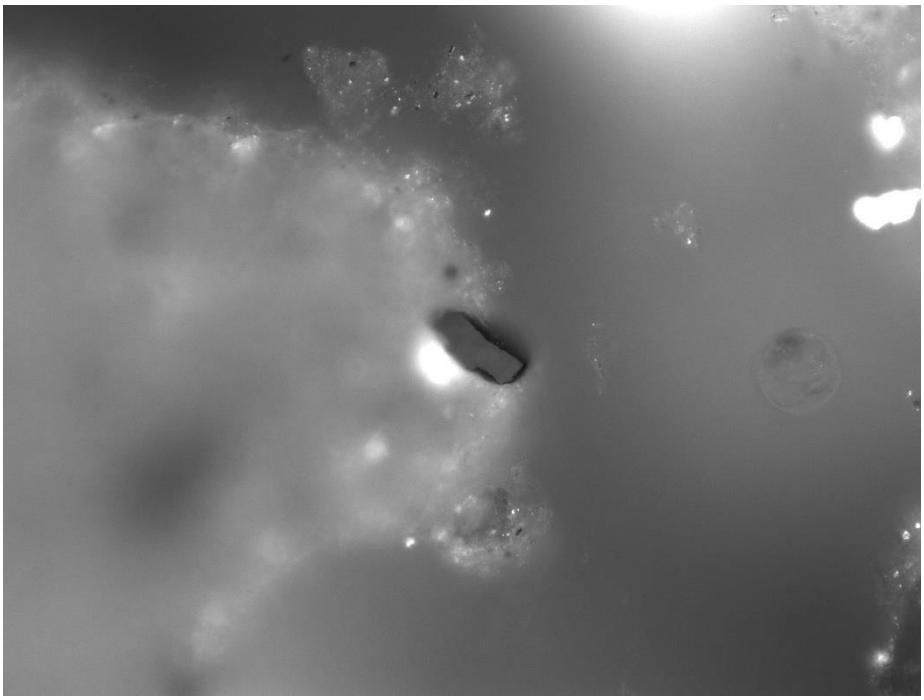

Figure 6: (CV-CT154), Mineral (left) Small coal particle (middle); 50x objective, oil immersion, reflected white light.

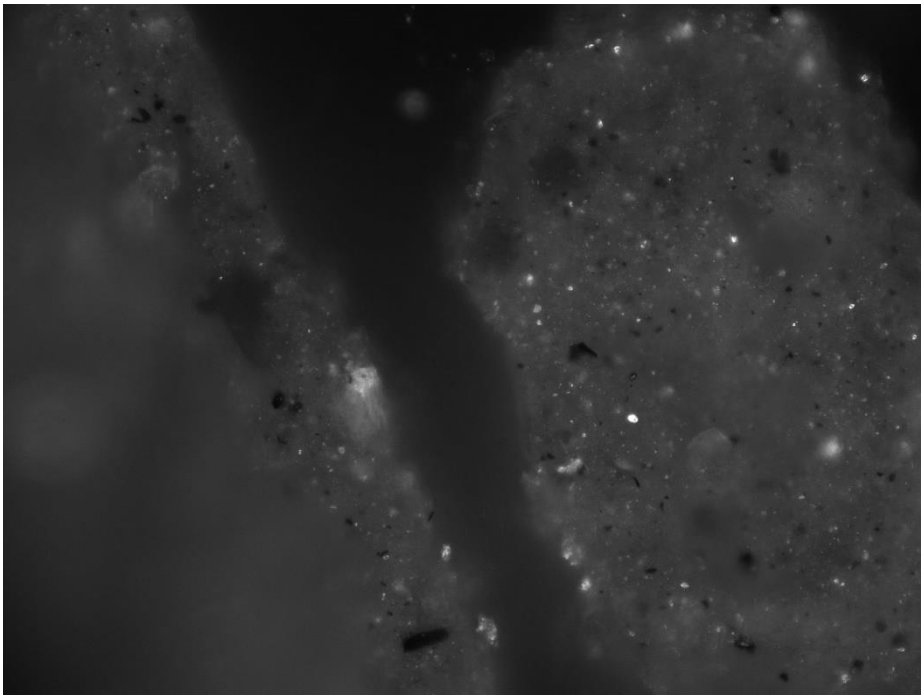

Figure 7: (CV-CT154), Mineral Matter; 50x objective; oil immersion, reflected white light.

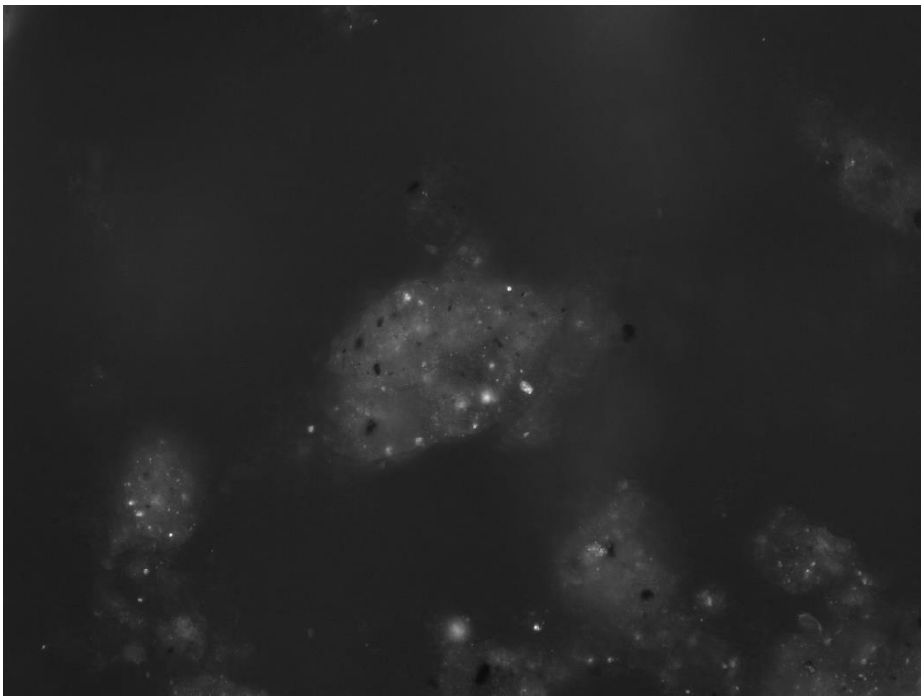

Figure 8: (CV-CT154), Mineral Matter; 50x objective, oil immersion, reflected white light.

3. Results

The results of the point count are outlined in the following table:

Sample	Coal (%)	Mineral (%)	Organic (%)
CV-TIS4-0119	89.7	10.1	0.3
CV-CT154	0.2	99.8	0

In CV-TIS4-0119, it was comprised of mostly coal particles and mineral matter. Consisting around 89.7% coal and 10.1% Mineral Matter, with a negligible quantity of 0.3% organic matter. In CV-CT154, however, it consisted of mostly mineral matter at around 99.8% mineral matter with minute quantities of coal and organic matter present.

Microscopic Analysis

[redacted]/DES SEDIMENT SAMPLES

Report Number: 45013494

May 20, 2020

Australian Laboratory Services Pty Ltd
[redacted]

Contents

1. Introduction

ALS Energy – Coal Technology were contacted to conduct an analysis of some sediment samples to determine the amount of coal contained in each sample. 16 samples were received. The samples were prepared by float/sink at a density of S1.0/F2.0 (as per AS4156.1) to concentrate the coal portion of the sample. Maceral analysis (AS2856.2) was conducted on the 16 samples at the ALS Coal Petrography and Imaging Centre at [redacted].

The 16 samples were:

1. CV-BG1
2. CV-BG2
3. CV-BG3
4. CV-BG4
5. CV-BG5
6. CV-BG6
7. CV-BG7
8. CV-BG9
9. CV-RG2
10. CV-AP1
11. CV-AP2
12. CV-AP3
13. CV-AP4
14. CV-AP5
15. CV-AP7
16. CV-AP8

2. Procedure

After receipt of sample from the Department of Environment and Science, the samples were prepped by removing excess water by filtration (where required), then air drying the samples. Float/sink testing was conducted (on the five sediment samples), with the masses for three density fractions (Float 1.0, Sink 1.0 – Float 2.0 and Sink 2.0) being recorded (see Appendix A) and a petrography sample being prepared from the S1.0 - F2.0 fraction.

Samples were then prepared as per normal petrographic samples by mounting the crushed samples in an acrylic resin, which is polished via a multistage polishing procedure on a Struers Tegra polishing system to produce a suitable surface for reflected light microscopy.

A maceral count of each sample was conducted with the material under the crosshairs of the microscope being classified as per AS2856.2 (see Appendix B for Maceral Reports. 500 points were counted on each sample at 500x magnification.

3. Results

The results of the point count on the sediment samples are outlined in the following table:

Sample	S1.0-F2.0 Mass (g)	Coal (% vol) in S1.0-F2.0	Coal (g)	Coal (% mass)
CV-BG1	49.4	0.8	0.3	0.1
CV-BG2	3.4	0.4	0.0	0.0
CV-BG3	1.3	5	0.0	0.0
CV-BG4	59.4	1.4	0.6	0.1
CV-BG5	0.2	22.9	0.0	0.0
CV-BG6	0.6	76.5	0.4	0.1
CV-BG7	79.4	0.2	0.1	0.0
CV-BG9	3.1	1	0.0	0.0
CV-RG2	2.5	3.3	0.1	0.0
CV-AP1	19.2	2	0.2	0.1
CV-AP2	11.1	0.2	0.0	0.0
CV-AP3	1.1	2.8	0.0	0.0
CV-AP4	103.3	7	0.0	0.0
CV-AP5	2.1	4.6	0.1	0.0
CV-AP7	6.1	2.8	0.1	0.0
CV-AP8	33.6	2	0.5	0.1

The samples were predominantly made up of a mixture of mineral matter and non-coal organic material. To calculate the mass of coal in each fraction, the coal is assumed to have a relative density of 1.4 whilst the mineral matter is assume to have a relative density of 2.6.

4. Appendix A

4.1 Float Sink Results (AS4156.1)

Sample	Fraction	Mass (g)
CV-BG1	F1	4.7
	S1 F2	49.4
	S2	338.1
CV-BG2	F1	0.0
	S1 F2	3.4
	S2	286.2
CV-BG3	F1	0.0
	S1 F2	1.3
	S2	257.9
CV-BG4	F1	6.2
	S1 F2	59.4
	S2	599.3
CV-BG5	F1	0.0
	S1 F2	0.2
	S2	411.1
CV-BG6	F1	0.0
	S1 F2	0.6
	S2	306.8

CV-BG7	F1	2.3
	S1 F2	79.4
	S2	463
CV-BG9	F1	0.1
	S1 F2	3.1
	S2	360.4
CV-RG2	F1	0.0
	S1 F2	2.5
	S2	278.1
CV-AP1	F1	1.2
	S1 F2	19.2
	S2	397.6
CV-AP2	F1	0.4
	S1 F2	11.1
	S2	589.2
CV-AP3	F1	0.0
	S1 F2	1.1
	S2	267.2
CV-AP4	F1	3.0
	S1 F2	103.3
	S2	574.2

CV-AP5	F1	0.0
	S1 F2	2.1
	S2	723.6
CV-AP7	F1	0.7
	S1 F2	6.1
	S2	532.4
CV-AP9	F1	1.4
	S1 F2	33.6
	S2	399.9

5. Appendix B

Report Number: 45013494
Petrography Number: 732P
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45013494-C1 DES - Feb '20 CV Enviro, CV-BG1 S1 F2 TQ20001412V018

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	0.8	2.4	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	**0.8**	**2.4**
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	**0.0**	**0.0**
			Gelovitrinite	Corpogellinite	0.0	0.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	0.0	0.0		Sporinite	0.0	0.0
				Cutinite	0.0	0.0
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	0.0	0.0
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	0.0	0.0	Telo-inertinite	Fusinite	0.0	0.0
				Semifusinite	0.0	0.0
				Funginite	0.0	0.0
			Detro-inertinite	Inertodetrinite	0.0	0.0
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
ORGANIC MATTER	32.7	97.6				
MINERAL	66.5					

Prepared and measured in accordance with Australian Standards AS 2856.1; AS 2856.2.
Date: 5/05/2020 Observations: 304
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

[redacted]

1 of 1

[redacted]

Report Number: 45013494
Petrography Number: 733P
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45013494-C2 DES - Feb '20 CV Enviro, CV-BG2 S1 F2 TQ20001412V021

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	0.4	4.0	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	0.4	4.0
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	0.0	0.0
			Gelovitrinite	Corpogellinite	0.0	0.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	0.0	0.0		Sporinite	0.0	0.0
				Cutinite	0.0	0.0
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	0.0	0.0
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	0.0	0.0	Telo-inertinite	Fusinite	0.0	0.0
				Semifusinite	0.0	0.0
				Natural Coke	0.0	0.0
			Detro-inertinite	Inertodetrinite	0.0	0.0
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
ORGANIC MATTER	9.5	96.0				
MINERAL	90.1					

Prepared and measured in accordance with Australian Standards AS 2856.1; AS 2856.2.
Date: 5/05/2020 Observations: 304
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

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1 of 1

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Report Number: 45013494
Petrography Number: 734P
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45013494-C3 DES - Feb '20 CV Enviro, CV-BG3 S1 F2 TQ20001412V024

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	3.6	42.9	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	**3.6**	**42.9**
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	**0.0**	**0.0**
			Gelovitrinite	Corpogellinite	0.0	0.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	0.6	7.1		Sporinite	0.6	7.1
				Cutinite	0.0	0.0
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	0.0	0.0
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	0.8	9.5	Telo-inertinite	Fusinite	0.0	0.0
				Semifusinite	0.8	9.5
				Natural Coke	0.0	0.0
			Detro-inertinite	Inertodetrinite	0.0	0.0
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
ORGANIC MATTER	3.4	40.5				
MINERAL	91.7					

Prepared and measured in accordance with Australian Standards AS 2856.1; AS 2856.2.
Date: 5/05/2020 Observations: 304
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

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1 of 1

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Report Number: 45013494
Petrography Number: 735P
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45013494-C4 DES - Feb '20 CV Enviro, CV-BG4 S1 F2 TQ20001412V027

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	1.2	2.7	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	1.2	2.7
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	0.0	0.0
			Gelovitrinite	Corpogellinite	0.0	0.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	0.0	0.0		Sporinite	0.0	0.0
				Cutinite	0.0	0.0
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	0.0	0.0
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	0.2	0.5	Telo-inertinite	Fusinite	0.0	0.0
				Semifusinite	0.0	0.0
				Funginite	0.2	0.5
			Detro-inertinite	Inertodetrinite	0.0	0.0
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
ORGANIC MATTER	42.2	96.8				
MINERAL	56.4					

Prepared and measured in accordance with Australian Standards AS 2856.1; AS 2856.2.
Date: 5/05/2020 Observations: 307
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

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1 of 1

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Report Number: 45013494
Petrography Number: 736P
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45013494-C5 DES - Feb '20 CV Enviro, CV-BG5 S1 F2 TQ20001412V030

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	11.9	27.4	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	**11.5**	**26.5**
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	**0.4**	**0.9**
			Gelovitrinite	Corpogellinite	0.0	0.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	1.4	3.2		Sporinite	0.2	0.5
				Cutinite	0.0	0.0
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	1.2	2.7
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	9.6	21.9	Telo-inertinite	Fusinite	0.0	0.0
				Semifusinite	5.0	11.4
				Natural Coke	4.4	10.0
			Detro-inertinite	Inertodetrinite	0.2	0.5
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
ORGANIC MATTER	20.7	47.5				
MINERAL	56.5					

Prepared and measured in accordance with Australian Standards AS 2856.1; AS 2856.2.
Date: 6/05/2020 Observations: 303
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

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Report Number: 45013494
Petrography Number: 737P
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45013494-C6 DES - Feb '20 CV Enviro, CV-BG6 S1 F2 TQ20001412V033

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	76.5	94.4	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	**76.5**	**94.4**
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	**0.0**	**0.0**
			Gelovitrinite	Corpogellinite	0.0	0.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	0.0	0.0		Sporinite	0.0	0.0
				Cutinite	0.0	0.0
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	0.0	0.0
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	0.0	0.0	Telo-inertinite	Fusinite	0.0	0.0
				Semifusinite	0.0	0.0
				Funginite	0.0	0.0
			Detro-inertinite	Inertodetrinite	0.0	0.0
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
ORGANIC MATTER	4.5	5.6				
MINERAL	19.0					

Prepared and measured in accordance with Australian Standards AS 2856.1; AS 2856.2.
Date: 7/05/2020 Observations: 500
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

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1 of 1

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Report Number: 45013494
Petrography Number: 738P
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45013494-C7 DES - Feb '20 CV Enviro, CV-BG7 S1 F2 TQ20001412V036

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	0.2	0.8	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	0.2	0.8
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	0.0	0.0
			Gelovitrinite	Corpogellinite	0.0	0.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	0.0	0.0		Sporinite	0.0	0.0
				Cutinite	0.0	0.0
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	0.0	0.0
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	0.0	0.0	Telo-inertinite	Fusinite	0.0	0.0
				Semifusinite	0.0	0.0
				Funginite	0.0	0.0
			Detro-inertinite	Inertodetrinite	0.0	0.0
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
ORGANIC MATTER	23.4	99.2				
MINERAL	76.4					

Prepared and measured in accordance with Australian Standards AS 2856.1; AS 2856.2.
Date: 8/05/2020 Observations: 308
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

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Report Number: 45013494
Petrography Number: 739P
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45013494-C8 DES - Feb '20 CV Enviro, CV-BG9 S1 F2 TQ20001412V039

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	1.0	3.6	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	1.0	3.6
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	0.0	0.0
			Gelovitrinite	Corpogellinite	0.0	0.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	0.0	0.0		Sporinite	0.0	0.0
				Cutinite	0.0	0.0
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	0.0	0.0
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	0.0	0.0	Telo-inertinite	Fusinite	0.0	0.0
				Semifusinite	0.0	0.0
				Natural Coke	0.0	0.0
			Detro-inertinite	Inertodetrinite	0.0	0.0
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
ORGANIC MATTER	26.1	96.4				
MINERAL	72.9					

Prepared and measured in accordance with Australian Standards AS 2856.1; AS 2856.2.
Date: 11/05/2020 Observations: 310
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

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1 of 1

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Report Number: 45013494
Petrography Number: 740P
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45013494-C9 DES - Feb '20 CV Enviro, CV-RG2 S1 F2 TQ20001412V042

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	3.1	9.6	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	**3.1**	**9.6**
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	**0.0**	**0.0**
			Gelovitrinite	Corpogellinite	0.0	0.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	0.2	0.6		Sporinite	0.0	0.0
				Cutinite	0.0	0.0
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	0.2	0.6
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	0.0	0.0	Telo-inertinite	Fusinite	0.0	0.0
				Semifusinite	0.0	0.0
				Natural Coke	0.0	0.0
			Detro-inertinite	Inertodetrinite	0.0	0.0
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
ORGANIC MATTER	29.3	89.8				
MINERAL	67.4					

Prepared and measured in accordance with Australian Standards AS 2856.1; AS 2856.2.
Date: 11/05/2020 Observations: 309
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

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Report Number: 45013494
Petrography Number: 741P
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45013494-C10 DES - Feb '20 CV Enviro, CV-AP1 S1 F2 TQ20001412V045

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	1.4	5.4	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	1.0	3.8
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	0.2	0.8
			Gelovitrinite	Corpogellinite	0.2	0.8
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	0.0	0.0		Sporinite	0.0	0.0
				Cutinite	0.0	0.0
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	0.0	0.0
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	0.6	2.3	Telo-inertinite	Fusinite	0.0	0.0
				Semifusinite	0.4	1.5
				Natural Coke	0.2	0.8
			Detro-inertinite	Inertodetrinite	0.0	0.0
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
ORGANIC MATTER	24.5	92.5				
MINERAL	73.5					

Prepared and measured in accordance with Australian Standards AS 2856.1; AS 2856.2.
Date: 11/05/2020 Observations: 502
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

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Report Number: 45013494
Petrography Number: 742P
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45013494-C11 DES - Feb '20 CV Enviro, CV-AP2 S1 F2 TQ20001412V048

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	0.2	1.6	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	0.2	1.6
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	0.0	0.0
			Gelovitrinite	Corpogellinite	0.0	0.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	0.0	0.0		Sporinite	0.0	0.0
				Cutinite	0.0	0.0
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	0.0	0.0
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	0.0	0.0	Telo-inertinite	Fusinite	0.0	0.0
				Semifusinite	0.0	0.0
				Natural Coke	0.0	0.0
			Detro-inertinite	Inertodetrinite	0.0	0.0
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
ORGANIC MATTER	12.2	98.4				
MINERAL	87.6					

Prepared and measured in accordance with Australian Standards AS 2856.1; AS 2856.2.
Date: 12/05/2020 Observations: 300
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

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Report Number: 45013494
Petrography Number: 743P
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45013494-C12 DES - Feb '20 CV Enviro, CV-AP3 S1 F2 TQ20001412V051

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	1.6	5.2	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	1.6	5.2
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	0.0	0.0
			Gelovitrinite	Corpogellinite	0.0	0.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	0.0	0.0		Sporinite	0.0	0.0
				Cutinite	0.0	0.0
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	0.0	0.0
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	1.2	3.9	Telo-inertinite	Fusinite	0.0	0.0
				Semifusinite	1.2	3.9
				Natural Coke	0.0	0.0
			Detro-inertinite	Inertodetrinite	0.0	0.0
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
ORGANIC MATTER	27.7	90.8				
MINERAL	69.5					

Prepared and measured in accordance with Australian Standards AS 2856.1; AS 2856.2.
Date: 12/05/2020 Observations: 302
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

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Report Number: 45013494
Petrography Number: 744P
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45013494-C13 DES - Feb '20 CV Enviro, CV-AP4 S1 F2 TQ20001412V054

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	4.2	15.1	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	**4.2**	**15.1**
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	**0.0**	**0.0**
			Gelovitrinite	Corpogellinite	0.0	0.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	0.0	0.0		Sporinite	0.0	0.0
				Cutinite	0.0	0.0
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	0.0	0.0
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	2.8	10.1	Telo-inertinite	Fusinite	0.0	0.0
				Semifusinite	2.6	9.4
				Natural Coke	0.0	0.0
			Detro-inertinite	Inertodetrinite	0.2	0.7
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
ORGANIC MATTER	20.8	74.8				
MINERAL	72.2					

Prepared and measured in accordance with Australian Standards AS 2856.1; AS 2856.2.
Date: 13/03/2020 Observations: 300
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

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Report Number: 45013494
Petrography Number: 745P
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45013494-C14 DES - Feb '20 CV Enviro, CV-AP5 S1 F2 TQ20001412V057

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	2.8	21.9	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	**2.8**	**21.9**
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	**0.0**	**0.0**
			Gelovitrinite	Corpogellinite	0.0	0.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	0.0	0.0		Sporinite	0.0	0.0
				Cutinite	0.0	0.0
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	0.0	0.0
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	1.8	14.1	Telo-inertinite	Fusinite	0.0	0.0
				Semifusinite	1.8	14.1
				Natural Coke	0.0	0.0
			Detro-inertinite	Inertodetrinite	0.0	0.0
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
ORGANIC MATTER	8.2	64.1				
MINERAL	87.3					

Prepared and measured in accordance with Australian Standards AS 2856.1; AS 2856.2.
Date: 15/05/2020 Observations: 302
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

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1 of 1

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Report Number: 45013494
Petrography Number: 746P
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45013494-C15 DES - Feb '20 CV Enviro, CV-AP7 S1 F2 TQ20001412V060

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	1.4	3.6	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	1.4	3.6
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	0.0	0.0
			Gelovitrinite	Corpogellinite	0.0	0.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	0.0	0.0		Sporinite	0.0	0.0
				Cutinite	0.0	0.0
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	0.0	0.0
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	1.4	3.5	Telo-inertinite	Fusinite	0.8	2.0
				Semifusinite	0.4	1.0
				Natural Coke	0.2	0.5
			Detro-inertinite	Inertodetrinite	0.0	0.0
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
ORGANIC MATTER	36.0	92.9				
MINERAL	61.2					

Prepared and measured in accordance with Australian Standards AS 2856.1; AS 2856.2.
Date: 18/05/2020 Observations: 308
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

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1 of 1

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Report Number: 45013494
Petrography Number: 747P
Client: ACIRL CASH SALE

MACERAL ANALYSIS

Sample Details: 45013494-C16 DES - Feb '20 CV Enviro, CV-AP8 S1 F2 TQ20001412V063

GROUP	VOLUME (%)	VOLUME (% mineral free)	SUBGROUP	MACERAL	VOLUME (%)	VOLUME (% mineral free)
VITRINITE	1.8	4.8	Telovitrinite	Textinite	0.0	0.0
				Texto-ulminite	0.0	0.0
				Eu-ulminite	0.0	0.0
				Telocollinite	0.6	1.6
			Detrovitrinite	Attrinite	0.0	0.0
				Densinite	0.0	0.0
				Desmocollinite	1.2	3.2
			Gelovitrinite	Corpogellinite	0.0	0.0
				Porigelinite	0.0	0.0
				Eugelinite	0.0	0.0
LIPTINITE	0.0	0.0		Sporinite	0.0	0.0
				Cutinite	0.0	0.0
				Resinite	0.0	0.0
				Liptodetrinite	0.0	0.0
				Alginite	0.0	0.0
				Suberinite	0.0	0.0
				Fluorinite	0.0	0.0
				Exsudatinite	0.0	0.0
				Bituminite	0.0	0.0
INERTINITE	0.2	0.5	Telo-inertinite	Fusinite	0.0	0.0
				Semifusinite	0.2	0.5
				Natural Coke	0.0	0.0
			Detro-inertinite	Inertodetrinite	0.0	0.0
				Micrinite	0.0	0.0
			Gelo-inertinite	Macrinite	0.0	0.0
ORGANIC MATTER	35.5	94.7				
MINERAL	62.5					

Prepared and measured in accordance with Australian Standards AS 2856.1; AS 2856.2.
Date: 18/03/2020 Observations: 302
Analysis performed on As Received sample
This data has not been artificially rounded to avoid misleading presentation of results.

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