WILLIAMTOWN TO CAMPVALE HYDROLOGY

18 AUGUST 2016

Prepared by Dr Brendan Berghout, Senior Water Resource Engineer, Hunter Water

1 BACKGROUND

Campvale Canal was constructed in the early 1900s to provide drainage of Campvale Swamp and thereby allow the area to be used for agricultural production. Campvale Canal originally drained into Grahamstown Moor where it joined with Grahamstown Drain and ultimately drained to Windeyers Creek and the Hunter River at Raymond Terrace.

Grahamstown Dam was constructed in the late 1950s by building dam walls around the edge of Grahamstown Moor, thereby creating a large and relatively shallow water storage. Grahamstown Dam is now the largest dam operated by Hunter Water and is central to the lower Hunter water supply scheme. It provides a large storage buffer that ensures supply during drought, and sufficient treatment capacity to meet peaks in customer demand each summer. Grahamstown Dam has a storage capacity of around 183,000 megalitres (ML), and can supply water into the reticulation network at a rate of up to 270 ML/day.

The construction of Grahamstown Dam effectively blocked the original outlet of Campvale Canal, necessitating the construction of a new pumping station. This pumping station operates automatically to control the water level in Campvale Canal. All water that flows along Campvale Canal to the pumping station is pumped into Grahamstown Dam. The pumping station has a capacity of 455 ML/day. Land-use within the catchment of Campvale Canal has gradually changed with time, and now consists of a mixture of urban and rural areas.

The purpose of this report is to document the scientific understanding of the interactions between groundwater and surface water from the Tomago Sandbeds, and Campvale Canal. It follows after recent low level (trace) detections of perfluorooctane sulphonic acid (PFOS) in the water at Campvale Pumping Station, and also in the groundwater catchment of the canal. Significant levels of perfluoroalkyl and polyfluoroalkly substances (PFAS), including PFOS, are known to have entered the groundwater under the Williamtown RAAF Base, largely due to historic firefighting and fire training activities on the site.

2 HYDROGEOLOGY OF THE TOMAGO SANDBEDS

Hydrogeology describes the interaction between the hydrological inputs to an aquifer and its geology, which fundamentally drive the way that water flows through the aquifer under different climatic conditions. Important elements of the hydrogeology include the process of rainfall becoming recharge, evaporation from the aquifer, transpiration by trees, surface water interactions where surface water enters or exits the aquifer, the operation of borelines, the spatial geometry of the aquifer, the type of material that makes up the aquifer, and any boundary constraints, such as salt water boundaries.

Hunter Water has a thorough understanding of the hydrogeology of the Tomago Sandbeds. This understanding is based on numerous studies and comprehensive datasets. The datasets include water level information that Hunter Water has been collecting since the 1970s, and hundreds of individual borelogs, dating back to the 1940s, that describe the vertical geology at each site that has been drilled.

Hunter Water has participated in a number of research projects by the University of Newcastle, as well as other research agencies, investigating various aspects of the Tomago Sandbeds. This research includes a large body of work that characterised the process by which rainfall on the sandbeds becomes recharged or, in other words, characterising what proportion of rainfall

actually makes it to the watertable under a wide range of groundwater levels and climatic conditions.

The underlying datasets and research work has been used by Hunter Water, supported by industry specialists, to develop numerical models of the Tomago Sandbeds. These models have reached a high level of maturity, with the current Hunter Water model representing a 3rd generation of model improvements. Significant improvements have been made to the models over time as the capability to simulate important aspects of the hydrogeology have improved. After the first model was developed (GHD, 1995), the two most significant improvements came with the improved characterisation of recharge (Crosbie, 2003), and the inclusion of surface drainage features, such as Campvale Drain, in the hydrogeological model (Barnett, 2006).

The current Hunter Water model was provided to the Department of Defence, and has been further improved for the purpose of characterising contamination movement under RAAF Williamtown (HydroSimulations, 2016).

The numerical models allow investigation of water flow patterns for the historic climate sequence since contamination first started entering the aquifer at RAAF Williamtown.

3 CONTAMINANT TRANSPORT

The primary driver of contaminant movement in the Tomago Sandbdes is groundwater movement. Groundwater movement through an aquifer carries contaminants through advective and dispersive processes. Advection refers to contamination being carried in the direction of groundwater flow, and dispersion refers to the spreading out of contamination as it travels down gradient. Dispersion is largely the result to the tortuous path that water must take to flow through an aquifer due to having to flow around the sand grains in the aquifer and any heterogeneity (variability) in the hydraulic parameters of the aquifer.

A secondary driver is chemical diffusion. Chemical diffusion is a much slower process, and relates to the concentration gradient of the contamination. Diffusion is thereby an important consideration with respect to smoothing out the concentration gradient at the boundary of plumes, but is not significant in terms of the underlying direction of migration compared with the processes of advection and dispersion.

The assessment of contaminant transport therefore relies heavily on an understanding of the underlying hydrogeology. Contamination will fundamentally follow the groundwater flow direction and spread slightly.

4 GROUNDWATER FLOW BETWEEN WILLIAMTOWN AND CAMPVALE

The direction of groundwater flow is governed by the slope of the watertable. Groundwater will always flow in the direction of steepest slope, and the rate of flow is a function of the slope and the permeability of the aquifer.

Hunter Water has been collecting groundwater level data between Campvale and Williamtown for 40 years, and is therefore able to plot the shape of the groundwater surface for a wide range of climatic conditions. All of these plots indicate that the groundwater in the contamination zone under RAAF Williamtown is always flowing in a southly direction. There are no instances when water flows north from Williamtown towards Campvale Canal. The locations where Hunter Water monitors groundwater level are provided in Appendix A.

Figure 1 shows the watertable in February 1981, which is an example of the watertable situation under dry conditions. February 1981 marked the end of the worst drought on record for Hunter Water. Figure 2 shows the watertable in January 1999, which is an example of a wet situation. There are many similarly wet situations available in the dataset.

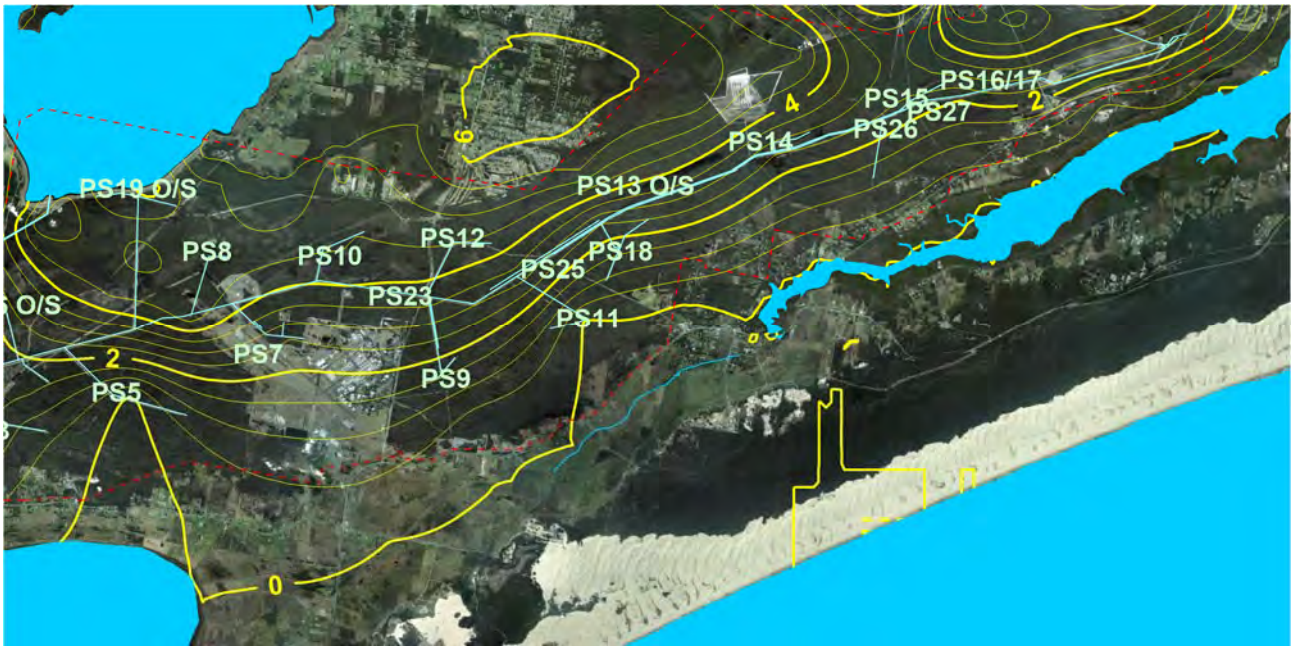

Figure 1 Groundwater elevation in February 1981 (dry condition) in metres above sea level

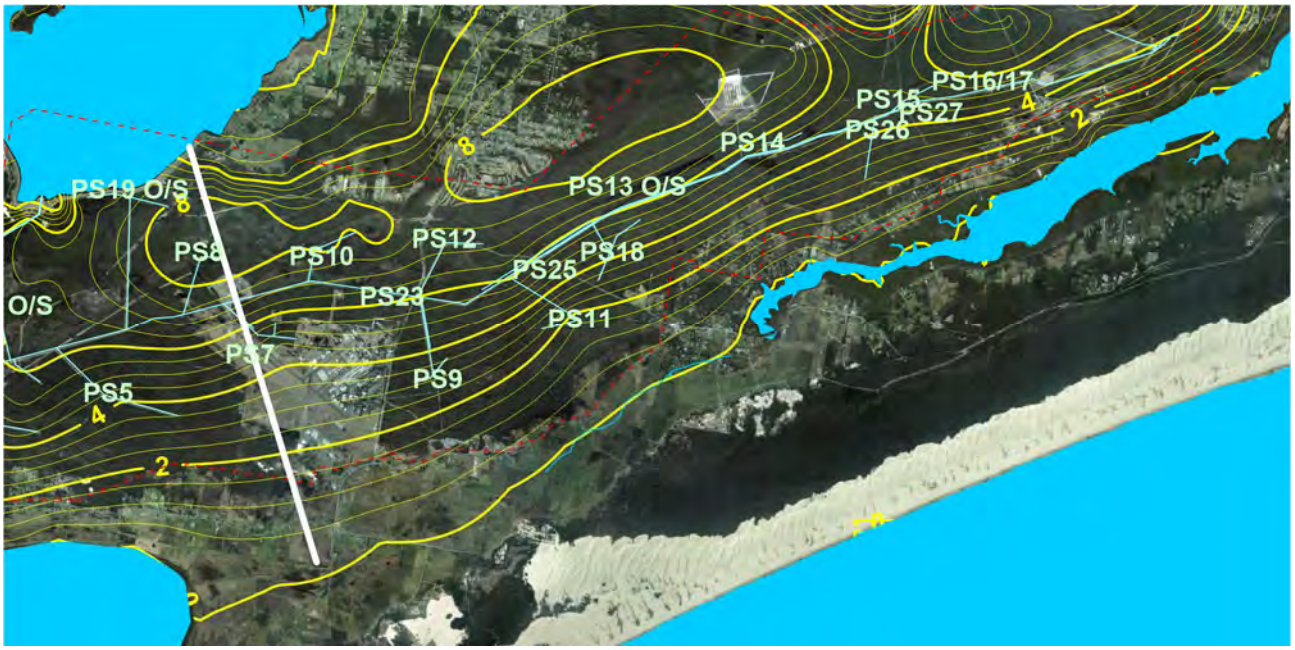

Figure 2 Groundwater elevation in January 1999 (wet condition) in metres above sea level

The previous two figures show the watertable plotted as contours and can be interpreted in a similar way as reading a topographic map. The watertable profile between Campvale and Williamtown is also presented as a cross section along the white line that is shown in Figure 2 is the wet and dry cross sections are shown in Figure 3 and Figure 4.

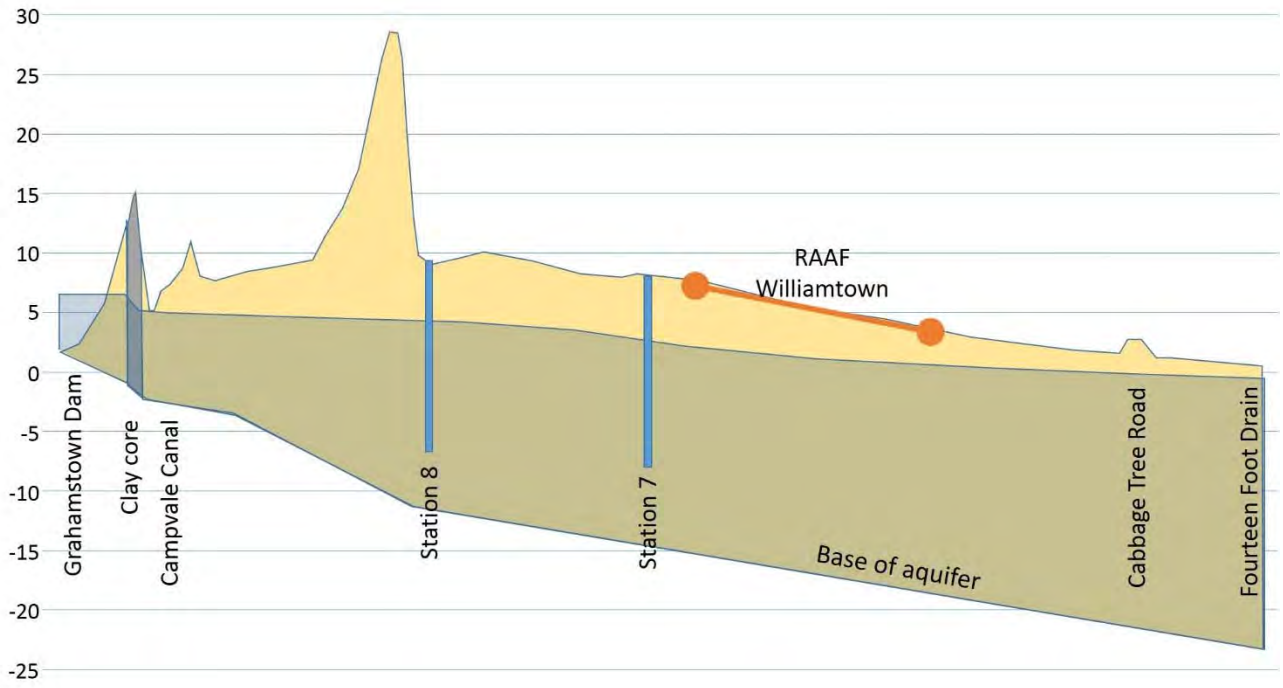

Figure 3 Water table and aquifer cross section between Grahamstown Dam (near Campvale Pumping Station) and Fourteen Foot Drain south of RAAF Williamtown in February 1981 (dry condition). All levels are presented relative to sea level.

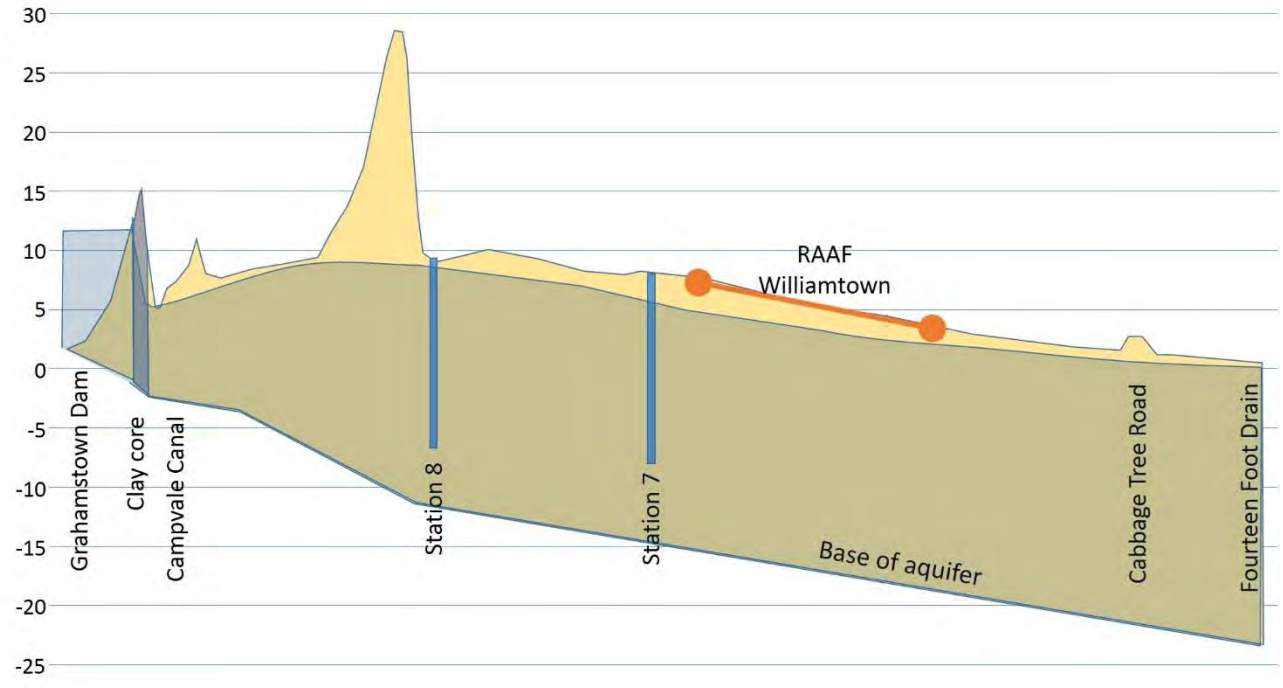

Figure 4 Watertable and aquifer cross section between Grahamstown Dam and Fourteen Foot Drain January 1999 (wet condition).

It is clear from Figure 1 through to Figure 4 that the groundwater flow direction under RAAF Williamtown consistently takes contamination in a southerly direction under dry and wet conditions. Under dry conditions groundwater flows in a southerly direction all the way from Campvale Canal towards RAAF Williamtown, and under wet conditions a watertable divide forms between Campvale Canal and Station 8. The exact location of the divide is thereby a function of climatic conditions, but it never moves as far south as RAAF Williamtown.

Groundwater flow cannot take contamination from under RAAF Williamtown towards Campvale Canal.

5 SURFACE WATER FLOW BETWEEN WILLIAMTOWN AND CAMPVALE

The direction of surface water flow is governed entirely by the shape of the ground surface topography, and taking into account any drainage structures that may have been installed.

Given the relatively flat topography, there are many areas of Tomago where water will pool under wet conditions. These pools will fill up to the point that the pool spills, which occurs at the lowest elevation location around the rim of the pool.

The surface topography between Campvale Canal and RAAF Williamtown is provided in Figure 5. This figure is based on the latest airborne laser scanning survey of the area, which is the most accurate survey method currently available. Colours have been selected for the figure that show a gradation of elevation between sea level (pale blue) and 20 m above sea level (white). Locations that have an elevation that is greater than 20 m above sea level are shown as white.

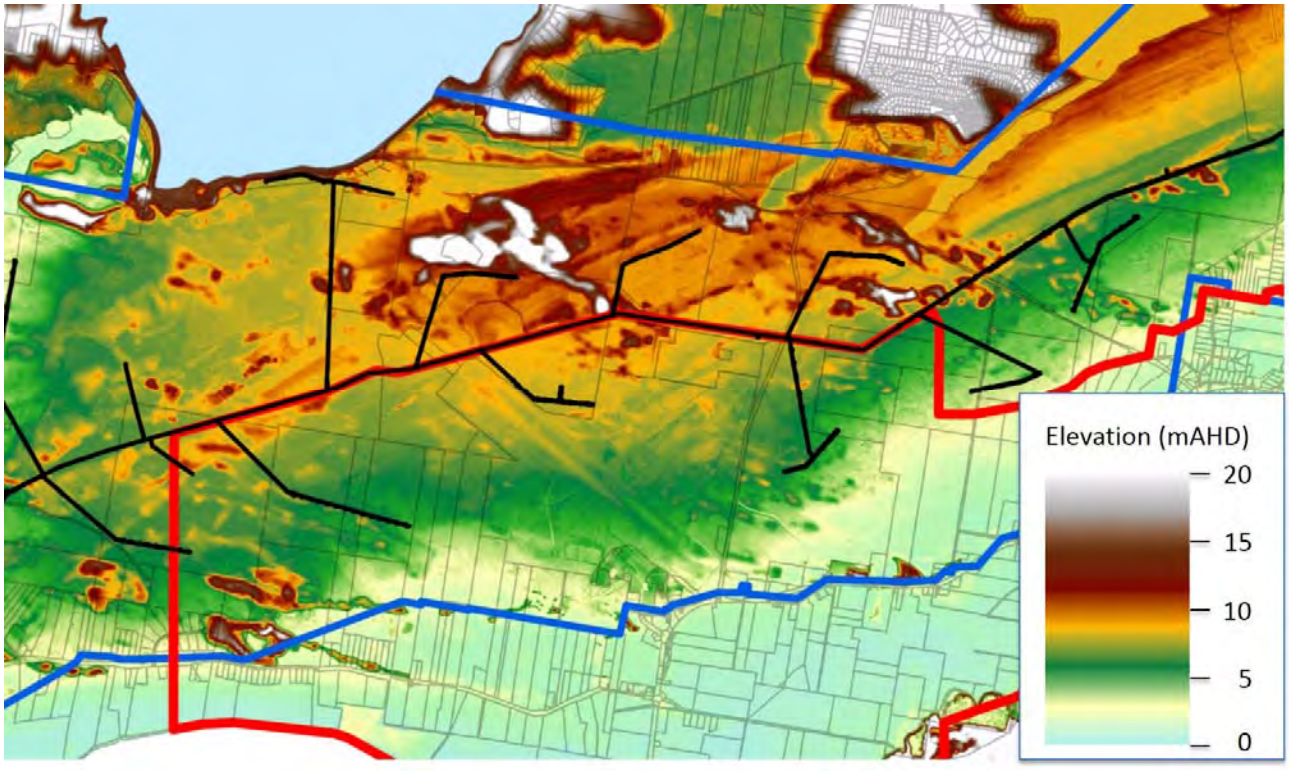

Figure 5 Surface topography between Campvale Drain and RAAF Williamtown

It is clear from Figure 5 that surface water on the RAAF Base cannot not flow north to Campvale Canal because there is a hill between the two areas that is higher than the Williamtown site and southward flow routes.

6 WATER QUALITY OBSERVATIONS BETWEEN RAAF WILLIAMTOWN AND CAMPVALE

If contamination is travelling north from RAAF Williamtown towards Campvale Canal, there should be a contamination plume extending north from the source sites.

None of the groundwater samples that have been taken north of RAAF Williamtown give any indication of a plume that is migrating to the north. These groundwater samples include results collected by AECOM (AECOM (for Department of Defence), 2016) that are presented in Figure F49 of that report and samples collected by Hunter Water at groundwater extraction stations.

The relevant parts of Figure F49 (AECOM (for Department of Defence), 2016) are reproduced in Figure 6 to show the relative location of AECOM sampling results and the location of Hunter Water borelines, north of RAAF Williamtown. A square dot indicates the location of a groundwater sample and the colour green indicates that the PFOS result is below the limit of reporting.

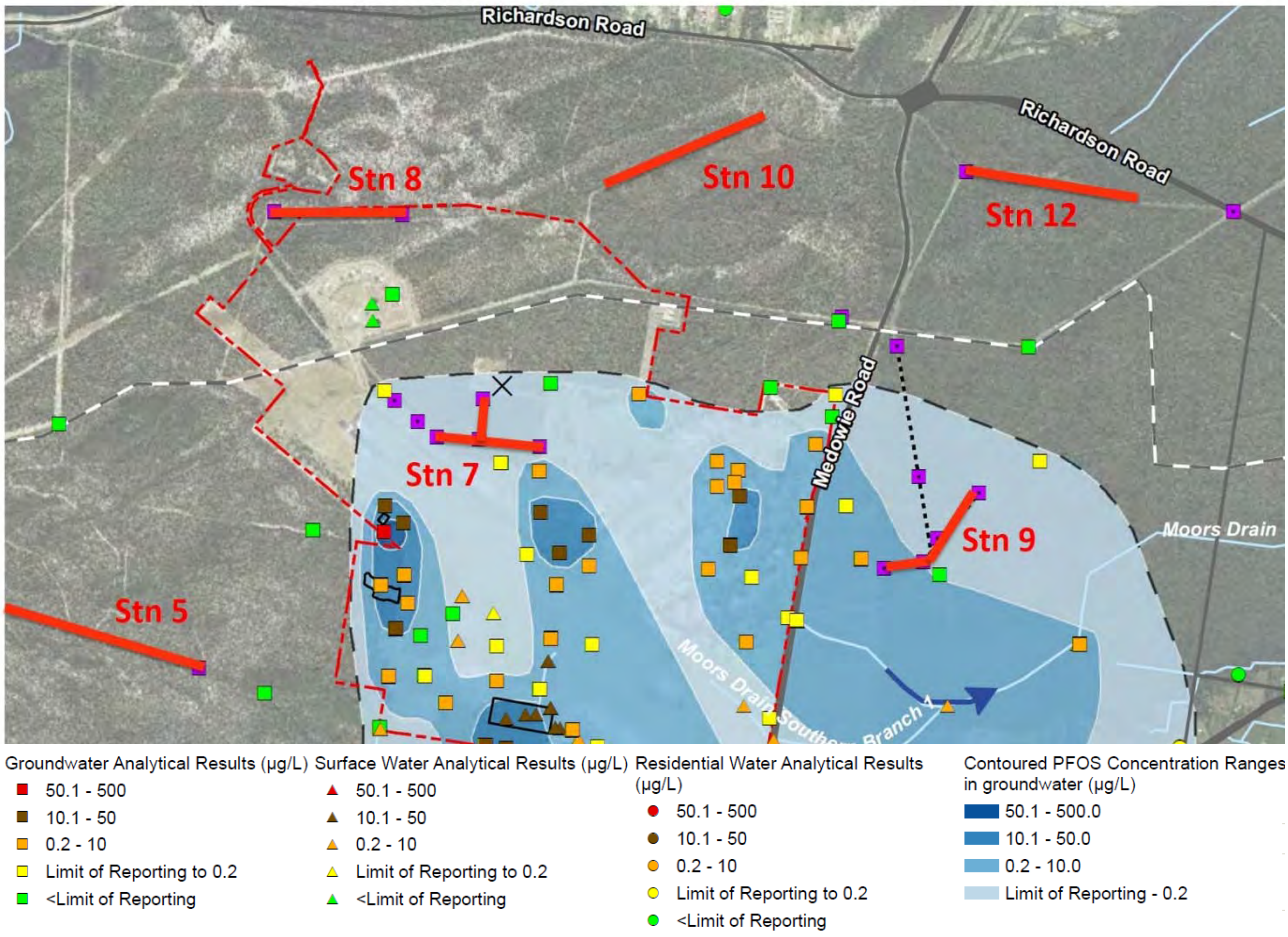

Figure 6 Extract from Figure F49 (AECOM (for Department of Defence), 2016) showing PFOS results and the illustrated groundwater extent in the area of interest, with the location of Hunter Water borelines highlighted in red

Analytical results from sampling at Hunter Water bores are summarised in Table 1, with full results in Appendix B

Table 1 Summary of PFOS and PFOA sampling from Hunter Water borelines (Refer to Appendix B for laboratory reports)

Site Name	Sample Id	Date Sampled	PFOS (ug/L)	PFOA (ug/L)
Tomago Station 9-PS	H0922133	9-Oct-09	0.03	<0.02
Tomago Bore 1	H1215694	22-May-12	<0.02	<0.02
Tomago Bore 2	H1215695	22-May-12	<0.02	<0.02
Tomago Bore 3	H1215696	22-May-12	<0.02	<0.02
Tomago Bore 4	H1215697	22-May-12	<0.02	<0.02
Tomago Bore 5	H1215698	22-May-12	<0.02	<0.02
Tomago Bore 7	H1215699	22-May-12	<0.02	<0.02
Tomago Bore 8	H1215700	22-May-12	<0.02	<0.02
Tomago Bore 9	H1215701	22-May-12	<0.02	<0.02
Tomago Bore 10	H1215702	22-May-12	<0.02	<0.02
Tomago Bore 11	H1215703	22-May-12	<0.02	<0.02
Tomago Bore 12	H1215704	22-May-12	<0.02	<0.02
Tomago Bore 14	H1215705	22-May-12	<0.02	<0.02
Tomago Bore 16	H1215707	22-May-12	<0.02	<0.02
Tomago Bore 17	H1215708	22-May-12	<0.02	<0.02
Tomago Bore 18	H1215709	22-May-12	<0.02	<0.02
Tomago Bore 20	H1215710	22-May-12	<0.02	<0.02
Tomago Bore 21	H1215711	22-May-12	<0.02	<0.02
Tomago Bore 22	H1215712	22-May-12	<0.02	<0.02
Tomago Bore 24	H1215713	22-May-12	<0.02	<0.02
Tomago Bore 25	H1215714	22-May-12	<0.02	<0.02
Tomago Bore 26	H1215715	22-May-12	<0.02	<0.02
Tomago Bore 27	H1215715	22-May-12	<0.02	<0.02
Tomago - Raw Water	H1317890	20-Aug-13	<0.02	<0.02
Tomago Bore 3	H1322582	27-Aug-13	<0.02	<0.02
Tomago Bore 4	H1322583	27-Aug-13	<0.02	<0.02
Tomago Bore 5	H1322584	27-Aug-13	<0.02	<0.02
Tomago Bore 21	H1322586	27-Aug-13	<0.02	<0.02
Tomago Bore 25B	H1322588	27-Aug-13	<0.02	<0.02
Tomago Bore 14	H1322585	27-Aug-13	<0.02	<0.02
Tomago Bore 24	H1322587	27-Aug-13	<0.02	<0.02
Tomago Bore 27	H1322590	27-Aug-13	<0.02	<0.02
Tomago Bore 26	H1322589	27-Aug-13	<0.02	<0.02
Tomago Bore 7	H1322774	29-Aug-13	<0.02	<0.02
Tomago Station 7 (Hydrant)	H1513815	22-May-15	<0.02	<0.02
Tomago Station 9 Hydrant	H1513817	22-May-15	0.17	<0.02
Tomago - Raw Water	H1513560	27-May-15	<0.02	<0.02
Tomago - Raw Water	H1513566	22-Jun-15	<0.02	<0.02
Tomago Station 8	H1516484	24-Jun-15	<0.02	<0.02
Tomago Station 5 (Hydrant)	H1516483	24-Jun-15	<0.02	<0.02
Tomago Station 11 (Hydrant)	H1516875	1-Jul-15	<0.02	<0.02
Tomago - Raw Water	H1518869	23-Jul-15	<0.02	<0.02
Tomago Station 14	H1519693	29-Jul-15	<0.02	<0.02
Tomago Station 15	H1519694	29-Jul-15	<0.02	<0.02
Tomago Station 3 (Hydrant)	H1519689	29-Jul-15	<0.02	<0.02
Tomago Station 5 (Hydrant)	H1519690	29-Jul-15	<0.02	<0.02
Tomago Station 21	H1519695	29-Jul-15	<0.02	<0.02
Tomago Station 24	H1519696	29-Jul-15	<0.02	<0.02
Tomago Station 25A	H1519697	29-Jul-15	<0.02	<0.02
Tomago Station 25B	H1519698	29-Jul-15	<0.02	<0.02
Tomago Station 27	H1519699	29-Jul-15	<0.02	<0.02
Tomago Station 11 (Hydrant)	H1519691	29-Jul-15	<0.02	<0.02
Tomago Station 12 (Hydrant)	H1519692	29-Jul-15	<0.02	<0.02
Tomago Station 22	H1520201	5-Aug-15	<0.02	<0.02
Tomago - Raw Water	H1519724	17-Aug-15	<0.02	<0.02
Tomago Station 8	H1522586	28-Aug-15	<0.02	<0.02
Tomago Station 5 (Hydrant)	H1522584	28-Aug-15	<0.02	<0.02
Tomago Station 11 (Hydrant)	H1522588	28-Aug-15	<0.02	<0.02
Tomago Station 8	H1522740	2-Sep-15	<0.02	<0.02
Tomago Station 11 (Hydrant)	H1522741	2-Sep-15	<0.02	<0.02
Tomago - Raw Water	H1522426	7-Sep-15	<0.02	<0.02
Tomago Station 8	H1525217	25-Sep-15	<0.02	<0.02
Tomago Station 5 (Hydrant)	H1525215	25-Sep-15	<0.02	<0.02
Tomago Station 7 (Hydrant)	H1525216	25-Sep-15	<0.02	<0.02
Tomago Station 9 Hydrant	H1525218	25-Sep-15	0.17	<0.02
Tomago Station 11 (Hydrant)	H1525219	25-Sep-15	<0.02	<0.02
Tomago Station 5 Bore 14	H1525220	25-Sep-15	<0.02	<0.02

As shown in Figure 6 the contaminant plume passes through bore station 9 and this is confirmed with the testing results in Table 1. It should be noted that borestations 5, 7 and 9 have been embargoed for water supply purposes.

The water quality data clearly supports the hydrogeological interpretation that contamination originating from RAAF Williamtown is moving in a southerly direction.

7 PFAS DETECTIONS IN CAMPVALE CANAL

Hunter Water has been sampling for PFAS in the water extracted from Grahamstown Dam since October 2015, and Campvale Canal since March 2016. These results (summarised in Table 2) indicate that while trace quantities of PFAS are regularly present in Campvale Canal, the concentration is well below guideline levels for safe drinking water.

The Campvale catchment includes a mix of residential and rural land use. It contributes between 5% to 10% of the inflow into Grahamstown Dam. Based on land use in the catchment and evidence from the literature, including the widespread use of PFAS in a broad range of applications (e.g. Dickenson & Higgins (2016), Xiao et al (2011), Nguyen (2011)), it is considered that the most likely source of PFAS in Campvale Canal is urban runoff. The concentrations of PFAS detected in Campvale Canal are not considered a significant risk to drinking water quality. Hunter Water will continue to monitor the water quality of Campvale Canal.

Regular testing of Grahamstown Dam shows that water supplied to customers is safe to drink. None of the samples from Grahamstown Dam have returned a positive detection. The samples have been taken from the raw water extracted from the dam for treatment at Grahamstown Water Treatment Plant.

The sampling locations used to test water from Campvale Canal and Grahamstown Dam are long term operational monitoring points used to assess raw water quality. Decades of historical water quality monitoring of these sites demonstrates that they are representative locations for chemical assessment of raw waters.

Into the future it is expected that trace levels of PFAS will be detected in drinking water supplies as demonstrated in the literature (Thompson et al (2011), Water Research Foundation (2016)). Concentrations of PFAS below guidelines values for drinking water are safe for consumption.

Table 2 Summary of PFOS and PFOA results from Campvale Canal. (Refer to Appendix B for laboratory reports)

Site Name	Sample Id	Date/Time Sampled	PFOA (ug/L)	PFOS (ug/L)
Campvale PS Inlet R9	H1603646	22/03/2016	<0.01	<0.01
Campvale PS Inlet R9	H1605501	5/04/2016	<0.01	<0.01
Campvale PS Inlet R9	H1605910	12/04/2016	<0.01	<0.01
Campvale PS Inlet R9	H1606633	26/04/2016	<0.01	<0.01
Campvale PS Inlet R9	H1607409	3/05/2016	<0.01	<0.01
Campvale PS Inlet R9	H1608064	10/05/2016	<0.01	<0.01
Campvale PS Inlet R9	H1608990	17/05/2016	<0.01	<0.01
Campvale PS Inlet R9	H1609495	24/05/2016	<0.01	<0.01
Campvale PS Inlet R9	H1610149	31/05/2016	<0.01	<0.01
Campvale PS Inlet R9	H1610885	7/06/2016	<0.01	<0.01
Campvale PS Inlet R9	H1611492	14/06/2016	<0.01	<0.01
Campvale PS Inlet R9	H1611840	22/06/2016	<0.01	<0.01
Campvale PS Inlet R9	H1612149	28/06/2016	<0.002	0.002
Campvale PS Inlet R9	H1613032	5/07/2016	<0.002	<0.002
Campvale PS Inlet R9	H1613423	12/07/2016	<0.002	<0.002
Campvale PS Inlet R9	H1613759	19/07/2016	<0.002	0.004
Campvale PS Inlet R9	H1614082	26/07/2016	<0.002	<0.002
Campvale PS Inlet R9	H1614856	2/08/2016	<0.002	0.002
G/Town Raw Water (Inlet Pit)	H1522123	12-Oct-15	<0.2	<0.2
G/Town Raw Water (Inlet Pit)	H1524003	2-Nov-15	<0.01	<0.01
G/Town Raw Water (Inlet Pit)	H1527731	14-Dec-15	<0.01	<0.01
G/Town Raw Water (Inlet Pit)	H1529634	4-Jan-16	<0.01	<0.01
G/Town Raw Water (Inlet Pit)	H1532874	8-Feb-16	<0.01	<0.01
G/Town Raw Water (Inlet Pit)	H1601836	7-Mar-16	<0.01	<0.01
G/Town Raw Water (Inlet Pit)	H1605358	4-Apr-16	<0.01	<0.01
G/Town Raw Water (Inlet Pit)	H1607240	2-May-16	<0.01	<0.01
G/Town Raw Water (Inlet Pit)	H1611374	14-Jun-16	<0.01	<0.01
G/Town Raw Water (Inlet Pit)	H1613289	12-Jul-16	<0.002	<0.002

8 CONCLUSION

A range of evidence including hydrogeological data, water quality monitoring and numerical modelling has been used to develop a comprehensive understanding of the hydrogeology of the Tomago Sandbeds, focussing on the area between RAAF Williamtown and Campvale Canal.

Based on multiple lines of evidence it is concluded that contamination from RAAF Williamtown cannot travel north via the groundwater system due to the hydrogeological setting and cannot travel north as surface water due to the topographic barriers.

The detections of PFAS at Campvale Canal at low concentrations is not unexpected given the land use in the catchment and the well documented widespread use of PFAS in many common applications. The concentrations of PFAS detected at Campvale do not pose a risk to drinking water quality.

REFERENCES

Aecom (for Department of Defence) 2016. Stage 2B Environmental Investigation Report RAAF Base Williamtown.

Barnett, B. S. 2006. Tomago Sands groundwater model.

Crosbie, R. S. 2003. The regional scaling of groundwater recharge.

Dickenson E.R.V and Higgins C (2016). Treatment Mitigation Strategies for Poly- and Perfluoroalkyl Substances. Water Research Foundation. USA

GHD 1995. Tomago and North Stockton sandbeds hydrogeological assessment

Hydrosimulations 2016. RAAF Williamtown Groundwater Modelling.

Nguyen T.V., Reinhard M, Gin Y.H.K (2011). Occurrence and source characterization of perfluorochemicals in an urban watershed in Chemosphere 82: 1277- 1285

Thompson, J, Eaglesham, G & Mueller, J 2011a Concentrations of PFOS, PFOA and other perfluorinated alkyl acids in Australian drinking water. Chemosphere, 83:1320-1326

Xiao, F., Simcik, M., Gulliver, J.S. (2011). Perfluoroalkyl acids in urban stormwater runoff: Influence of land use in Water Research 46: 6601-6608

APPENDIX A – MAP SHOWING THE LOCATIONS OF HUNTER WATER'S GROUNDWATER LEVEL MONITORING POINTS

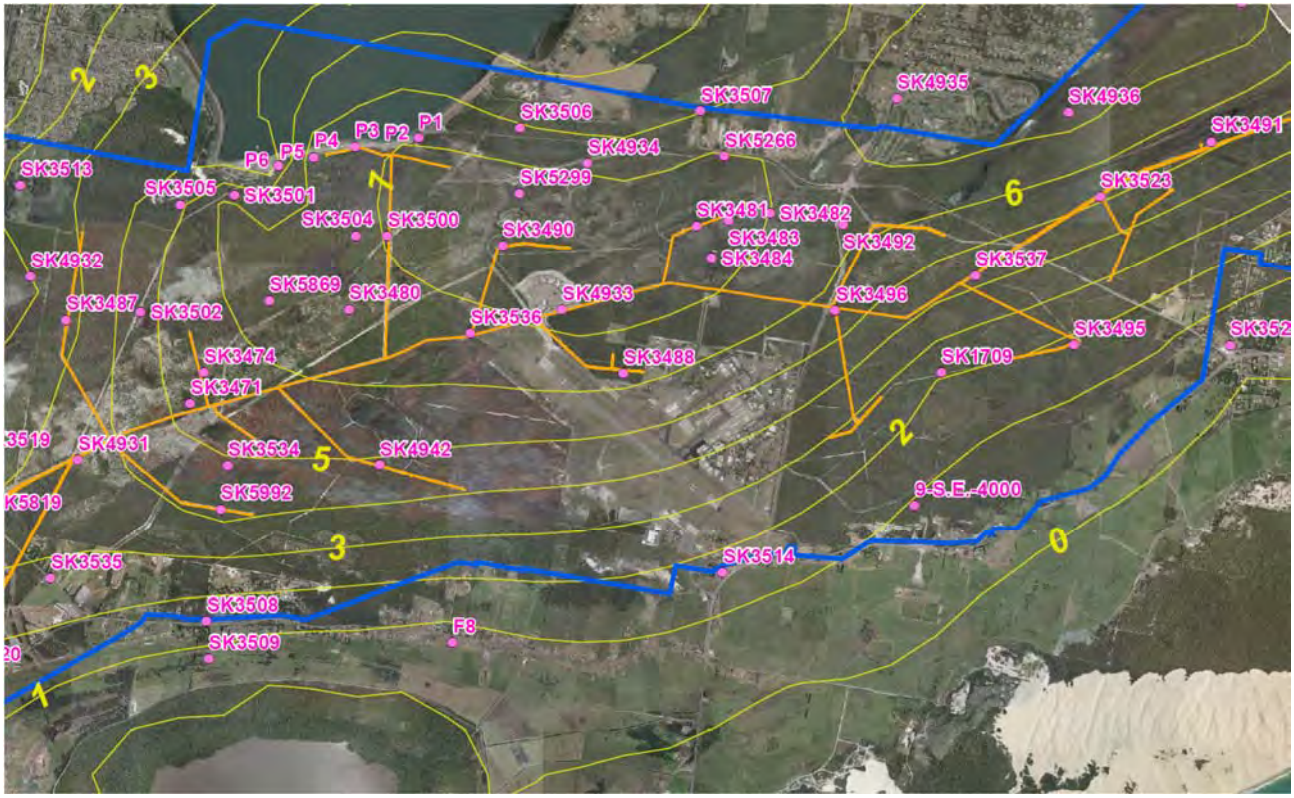

Figure 7 Map of Hunter Water groundwater level monitoring network

APPENDIX B – PFAS LABORATORY REPORTS

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **ES0915208**	Page	: 1 of 4
Client	: **HUNTER WATER AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MS KIM TOMLINSON	Contact	: Charlie Pierce
Address	: PO BOX 5007 23 Rosegum Place Warabrook NSW 2304 HUNTER REGIONAL MC AUSTRALIA 2310	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: tomlinsonk@labs.hwa.com.au	E-mail	: charlie.pierce@alsenviro.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: 2009 Blanket Quote	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: LABS9652		
C-O-C number	: ----	Date Samples Received	: 09-OCT-2009
Sampler	: ----	Issue Date	: 16-OCT-2009
Site	: ----		
		No. of samples received	: 1
Quote number	: SY/158/09	No. of samples analysed	: 1

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Phalak Inthaksone	Organics Co-ordinator	Organics

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 insuffient 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 date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for processing purposes. If the sampling time is displayed as 0:00 the information was not provided by client.

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

- **EP231: PFOA and PFOS results are reported as an aggregate of linear and branched isomers.**

Analytical Results

Sub-Matrix: **WATER**

			Client sample ID	**H0922133 TOMAGO STATION 9-PS**	----	----	----	----
			Client sampling date / time	[09-OCT-2009]	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES0915208-001**	**----**	**----**	**----**	**----**
EP231: Perfluorooctyl Acids and Sulfonates.								
PFOS	1769-23-1	0.02	µg/L	**0.03**	----	----	----	----
PFOA	335-67-1	0.02	µg/L	<0.02	----	----	----	----
6:2 Fluorotelomer Sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L	<0.1	----	----	----	----

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **ES1212889**	Page	: 1 of 7
Client	: **HUNTER WATER AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MS KIM SMITH	Contact	: Client Services
Address	: PO BOX 5007 23 Rosegum Place Warabrook NSW 2304 HUNTER REGIONAL MC AUSTRALIA 2310	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kim.smith@hwa.com.au	E-mail	: sydney@alsglobal.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: ----	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: LABS 10204		
C-O-C number	: ----	Date Samples Received	: 24-MAY-2012
Sampler	: ----	Issue Date	: 31-MAY-2012
Site	: ----		
		No. of samples received	: 23
Quote number	: SY/344/10	No. of samples analysed	: 23

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Hoa Nguyen	Inorganic Chemist	Sydney Inorganics
Phalak Inthaksone	Laboratory Manager - Organics	Sydney Organics

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.

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

- **EP231: PFOA & PFOS results are reported as an aggregate of linear and branched isomers.**
- **MBAS is calculated as LAS, molecular weight 342.**

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: H1215694 TOMAGO BORE 1	H1215695 TOMAGO BORE 2	H1215696 TOMAGO BORE 3	H1215697 TOMAGO BORE 4	H1215698 TOMAGO BORE 5
Client sampling date / time				22-MAY-2012 15:00	22-MAY-2012 15:00	22-MAY-2012 15:00	22-MAY-2012 15:00	22-MAY-2012 15:00
				ES1212889-001	ES1212889-002	ES1212889-003	ES1212889-004	ES1212889-005
EP231: Perfluorooctyl Acids and Sulfonates.								
PFOS	1763-23-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
PFOA	335-67-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
6:2 Fluorotelomer Sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: H1215699 TOMAGO BORE 7	H1215700 TOMAGO BORE 8	H1215701 TOMAGO BORE 9	H1215702 TOMAGO BORE 10	H1215703 TOMAGO BORE 11
			Client sampling date / time	22-MAY-2012 15:00	22-MAY-2012 15:00	22-MAY-2012 15:00	22-MAY-2012 15:00	22-MAY-2012 15:00
				ES1212889-006	ES1212889-007	ES1212889-008	ES1212889-009	ES1212889-010
EP231: Perfluorooctyl Acids and Sulfonates.								
PFOS	1763-23-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
PFOA	335-67-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
6:2 Fluorotelomer Sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: H1215704 TOMAGO BORE 12	H1215705 TOMAGO BORE 14	H1215707 TOMAGO BORE 16	H1215708 TOMAGO BORE 17	H1215709 TOMAGO BORE 18
Client sampling date / time				22-MAY-2012 15:00	22-MAY-2012 15:00	22-MAY-2012 15:00	22-MAY-2012 15:00	22-MAY-2012 15:00
				ES1212889-011	ES1212889-012	ES1212889-013	ES1212889-014	ES1212889-015
EP231: Perfluorooctyl Acids and Sulfonates.								
PFOS	1763-23-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
PFOA	335-67-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
6:2 Fluorotelomer Sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: H1215710 TOMAGO BORE 20	H1215711 TOMAGO BORE 21	H1215712 TOMAGO BORE 22	H1215713 TOMAGO BORE 24	H1215714 TOMAGO BORE 25
Client sampling date / time				22-MAY-2012 15:00	22-MAY-2012 15:00	22-MAY-2012 15:00	22-MAY-2012 15:00	22-MAY-2012 15:00
				ES1212889-016	ES1212889-017	ES1212889-018	ES1212889-019	ES1212889-020
EP231: Perfluorooctyl Acids and Sulfonates.								
PFOS	1763-23-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
PFOA	335-67-1	0.02	µg/L	<0.02	<0.02	<0.02	<0.02	<0.02
6:2 Fluorotelomer Sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID	H1215715 TOMAGO BORE 26	H1215716 TOMAGO BORE 27	[redacted]	----	----
				Client sampling date / time	22-MAY-2012 15:00	22-MAY-2012 15:00	[redacted]	----	----
					ES1212889-021	ES1212889-022	[redacted]	----	----
EP050: Anionic Surfactants as MBAS									
Anionic Surfactants as MBAS	----	0.1	mg/L		----	----	[redacted]	----	----
EP231: Perfluorooctyl Acids and Sulfonates.									
PFOS	1763-23-1	0.02	µg/L		<0.02	<0.02	----	----	----
PFOA	335-67-1	0.02	µg/L		<0.02	<0.02	----	----	----
6:2 Fluorotelomer Sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L		<0.1	<0.1	----	----	----

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1318491**	Page	: 1 of 3
Amendment	: **1**		
Client	: **HUNTER WATER**	Laboratory	: Environmental Division Sydney
Contact	: MS KIM SMITH	Contact	: Client Services
Address	: PO BOX 317 23 Rosegum Place Warabrook NSW 2304 HUNTER REGIONAL MC AUSTRALIA 2310	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kim.smith@alsglobal.com	E-mail	: sydney@alsglobal.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Order number	: LABS 11101		
C-O-C number	: ----	Date Samples Received	: 20-AUG-2013
Sampler	: ----	Issue Date	: 15-AUG-2016
Site	: ----		
		No. of samples received	: 1
Quote number	: SY/443/13	No. of samples analysed	: 1

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Phalak Inthakesone	Laboratory Manager - Organics	Sydney Organics

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

- **EP231: PFOA & PFOS results are reported as an aggregate of linear and branched isomers.**
- **This report has been amended as a result of misinterpretation of sample identification numbers (IDs). All analysis results are as per the previous report**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	H1317890 TOMAGO RAW WATER	----	----	----	----
				Client sampling date / time	[20-AUG-2013]	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1318491-001	----	----	----	----
EP231: Perfluorinated Compounds									
PFOS	1763-23-1	0.02	µg/L		<0.02	----	----	----	----
PFOA	335-67-1	0.02	µg/L		<0.02	----	----	----	----
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L		<0.1	----	----	----	----

CERTIFICATE OF ANALYSIS

Work Order	: **ES1319007**	Page	: 1 of 4
Amendment	: **1**		
Client	: **HUNTER WATER**	Laboratory	: Environmental Division Sydney
Contact	: MS KIM SMITH	Contact	: Client Services
Address	: PO BOX 317 23 Rosegum Place Warabrook NSW 2304 HUNTER REGIONAL MC AUSTRALIA 2310	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kim.smith@alsglobal.com	E-mail	: sydney@alsglobal.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Order number	: LABS 11101		
C-O-C number	: ----	Date Samples Received	: 28-AUG-2013
Sampler	: ----	Issue Date	: 15-AUG-2016
Site	: ----		
		No. of samples received	: 9
Quote number	: SY/443/13	No. of samples analysed	: 9

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Lana Nguyen	Senior LCMS Chemist	Sydney Organics

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

- **EP231: PFOA & PFOS results are reported as an aggregate of linear and branched isomers.**
- **This report has been amended as a result of misinterpretation of sample identification numbers (IDs). All analysis results are as per the previous report**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Client sample ID	H1322582 TOMAGO BORE 3	H1322583 TOMAGO BORE 4	H1322584 TOMAGO BORE 5	H1322585 TOMAGO BORE 14	H1322586 TOMAGO BORE 21
				Client sampling date / time	27-AUG-2013 15:00	27-AUG-2013 15:00	27-AUG-2013 15:00	27-AUG-2013 15:00	27-AUG-2013 15:00
					ES1319007-001	ES1319007-002	ES1319007-003	ES1319007-004	ES1319007-005
EP231: Perfluorinated Compounds									
PFOS	1763-23-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
PFOA	335-67-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	H1322587 TOMAGO BORE 24	H1322588 TOMAGO BORE 25B	H1322589 TOMAGO BORE 26	H1322590 TOMAGO BORE 27	----
				Client sampling date / time	27-AUG-2013 15:00	27-AUG-2013 15:00	27-AUG-2013 15:00	27-AUG-2013 15:00	----
Compound	CAS Number	LOR	Unit		ES1319007-006	ES1319007-007	ES1319007-008	ES1319007-009	----
EP231: Perfluorinated Compounds									
PFOS	1763-23-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
PFOA	335-67-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	----

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1319109**	Page	: 1 of 3
Amendment	: **1**		
Client	: **HUNTER WATER**	Laboratory	: Environmental Division Sydney
Contact	: MS KIM SMITH	Contact	: Client Services
Address	: PO BOX 317 23 Rosegum Place Warabrook NSW 2304 HUNTER REGIONAL MC AUSTRALIA 2310	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kim.smith@alsglobal.com	E-mail	: sydney@alsglobal.com
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Order number	: LABS 11101		
C-O-C number	: ----	Date Samples Received	: 30-AUG-2013
Sampler	: ----	Issue Date	: 15-AUG-2016
Site	: ----		
		No. of samples received	: 1
Quote number	: SY/443/13	No. of samples analysed	: 1

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Lana Nguyen	Senior LCMS Chemist	Sydney Organics

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

- **EP231: PFOA & PFOS results are reported as an aggregate of linear and branched isomers.**
- **This report has been amended as a result of misinterpretation of sample identification numbers (IDs). All analysis results are as per the previous report**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	H1322774 TOMAGO BORE 7	----	----	----	----
				Client sampling date / time	29-AUG-2013 15:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1319109-001	----	----	----	----
EP231: Perfluorinated Compounds									
PFOS	1763-23-1	0.02	µg/L		<0.02	----	----	----	----
PFOA	335-67-1	0.02	µg/L		<0.02	----	----	----	----
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L		<0.1	----	----	----	----

CERTIFICATE OF ANALYSIS

Work Order	: **ES1522525**	Page	: 1 of 2
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MS KIM SMITH	Contact	:
Address	: PO BOX 317 23 ROSEGUM PLACE WARRABROOK NSW 2304 HUNTER REGIONAL MC AUSTRALIA 2310	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kim.smith@alsglobal.com	E-mail	:
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: SPECIALIST TESTS	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 22-May-2015 14:45
C-O-C number	: ----	Date Analysis Commenced	: 28-May-2015
Sampler	: ----	Issue Date	: 29-May-2015 13:00
Site	: ----		
		No. of samples received	: 2
Quote number	: ----	No. of samples analysed	: 2

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Lana Nguyen	Senior LCMS Chemist	Sydney Organics

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.

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.

- PFOS and PFOA results are reported as an aggregate of linear and branched isomers.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**H1513815 TOMAGO STATION 7 HYDRANT**	**H1513817 TOMAGO STATION 9 HYDRANT**	**----**	**----**	**----**
			Client sampling date / time	[22-May-2015]	[22-May-2015]	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1522525-001**	**ES1522525-002**	**--------**	**--------**	**--------**
				Result	Result	Result	Result	Result
EP231: Perfluorinated Compounds								
PFOS	1763-23-1	0.02	µg/L	<0.02	**0.17**	**----**	**----**	**----**
PFOA	335-67-1	0.02	µg/L	<0.02	<0.02	**----**	**----**	**----**
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L	<0.1	<0.1	**----**	**----**	**----**
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L	<0.1	<0.1	**----**	**----**	**----**

CERTIFICATE OF ANALYSIS

Work Order	: **ES1522794**	Page	: 1 of 2
Amendment	: **1**		
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MS KIM SMITH	Contact	:
Address	: 5/585 Maitland Road MAYFIELD NSW, AUSTRALIA 2304	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kim.smith@alsglobal.com	E-mail	:
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: SPECIALIST TESTS	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 27-May-2015 15:10
C-O-C number	: ----	Date Analysis Commenced	: 29-May-2015
Sampler	: ----	Issue Date	: 25-Jun-2015 15:10
Site	: ----		
		No. of samples received	: 2
Quote number	: ----	No. of samples analysed	: 2

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Alex Rossi	Organic Chemist	Sydney Organics
Andrew Epps	Senior Inorganic Chemist	WB Water Lab Brisbane

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.

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.

- This report has been amended following changes to the analytical data reported. This is a no-error ammendment due to client request for results to be changed.
- PFOS and PFOA results are reported as an aggregate of linear and branched isomers.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**H1513558 TOMAGO RAW WATER**	**H1513560 TOMAGO RAW WATER**	**----**	**----**	**----**
			Client sampling date / time	[27-May-2015]	[27-May-2015]	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1522794-001**	**ES1522794-002**	**--------**	**--------**	**--------**
				Result	Result	Result	Result	Result
ED009: Anions								
Iodide	20461-54-5	0.01	mg/L	**0.013**	**----**	**----**	**----**	**----**
EP231: Perfluorinated Compounds								
PFOS	1763-23-1	0.02	µg/L	**----**	<0.02	**----**	**----**	**----**
PFOA	335-67-1	0.02	µg/L	**----**	<0.02	**----**	**----**	**----**
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L	**----**	<0.1	**----**	**----**	**----**
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L	**----**	<0.1	**----**	**----**	**----**

CERTIFICATE OF ANALYSIS

Work Order	: **ES1524551**	Page	: 1 of 2
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MS KIM SMITH	Contact	:
Address	: 5/585 Maitland Road MAYFIELD NSW, AUSTRALIA 2304	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kim.smith@alsglobal.com	E-mail	:
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: SPECIALIST TESTS	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 23-Jun-2015 13:54
C-O-C number	: ----	Date Analysis Commenced	: 25-Jun-2015
Sampler	: ----	Issue Date	: 29-Jun-2015 11:23
Site	: ----		
		No. of samples received	: 4
Quote number	: ----	No. of samples analysed	: 4

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Phalak Inthakesone	Laboratory Manager - Organics	Sydney Organics

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.

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.

- PFOS and PFOA results are reported as an aggregate of linear and branched isomers.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**H1513566 TOMAGO RAW**	**H1515312 PATERSON RIVER GOSTWYCK**	**H1511336 DUNGOG TW RAW**	**H1511338 DUNGOG CWT**	**----**
			Client sampling date / time	[22-Jun-2015]	[23-Jun-2015]	[23-Jun-2015]	[23-Jun-2015]	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1524551-001**	**ES1524551-002**	**ES1524551-003**	**ES1524551-004**	**--------**
				Result	Result	Result	Result	Result
ED009: Anions								
Iodide	20461-54-5	0.01	mg/L	**----**	<0.010	<0.010	<0.010	**----**
EP231: Perfluorinated Compounds								
PFOS	1763-23-1	0.02	µg/L	<0.02	**----**	**----**	**----**	**----**
PFOA	335-67-1	0.02	µg/L	<0.02	**----**	**----**	**----**	**----**
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L	<0.1	**----**	**----**	**----**	**----**
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L	<0.1	**----**	**----**	**----**	**----**

CERTIFICATE OF ANALYSIS

Work Order	: **ES1524674**	Page	: 1 of 2
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MS KIM SMITH	Contact	:
Address	: 5/585 Maitland Road MAYFIELD NSW, AUSTRALIA 2304	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kim.smith@alsglobal.com	E-mail	:
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: SPECIALIST TESTS	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 24-Jun-2015 14:55
C-O-C number	: ----	Date Analysis Commenced	: 26-Jun-2015
Sampler	: ----	Issue Date	: 01-Jul-2015 11:51
Site	: ----		
		No. of samples received	: 3
Quote number	: ----	No. of samples analysed	: 3

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Alex Rossi	Organic Chemist	Sydney Organics
Ankit Joshi	Inorganic Chemist	Sydney Inorganics

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.

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.

- Gross Alpha and Beta Activity analyses are performed by ALS Fyshwick (NATA Accreditation number 992).
- PFOS and PFOA results are reported as an aggregate of linear and branched isomers.

Analytical Results

Sub-Matrix: **SLUDGE** (Matrix: **WATER**)			Client sample ID	**H1511590 CESSNOCK HEATER DIGESTER**	**H1516483 TOMAGO STATION 5 (HYDRANT)**	**H1516484 TOMAGO STATION 8**	**----**	**----**
			Client sampling date / time	[24-Jun-2015]	[24-Jun-2015]	[24-Jun-2015]	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1524674-001**	**ES1524674-002**	**ES1524674-003**	**--------**	**--------**
				Result	Result	Result	Result	Result
EP045: Volatile Acids as CH3COOH								
Volatile Acids as Acetic Acid	----	5	mg/L	**123**	**----**	**----**	**----**	**----**
EP231: Perfluorinated Compounds								
PFOS	1763-23-1	0.02	µg/L	**----**	<0.02	<0.02	**----**	**----**
PFOA	335-67-1	0.02	µg/L	**----**	<0.02	<0.02	**----**	**----**
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L	**----**	<0.1	<0.1	**----**	**----**
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L	**----**	<0.1	<0.1	**----**	**----**

CERTIFICATE OF ANALYSIS

Work Order	: **ES1525154**	Page	: 1 of 2
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MS KIM SMITH	Contact	:
Address	: 5/585 Maitland Road MAYFIELD NSW, AUSTRALIA 2304	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kim.smith@alsglobal.com	E-mail	:
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: SPECIALIST TESTS	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 01-Jul-2015 13:47
C-O-C number	: ----	Date Analysis Commenced	: 03-Jul-2015
Sampler	: ----	Issue Date	: 08-Jul-2015 17:16
Site	: ----		
		No. of samples received	: 3
Quote number	: ----	No. of samples analysed	: 3

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Alex Rossi	Organic Chemist	Sydney Organics
Ankit Joshi	Inorganic Chemist	Sydney Inorganics

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.

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.

- PFOS and PFOA results are reported as an aggregate of linear and branched isomers.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**H1511719 DUNGOG PRIMARY 1 DIGESTER**	**H1514818 CESSNOCK HEATER DIGESTER**	**H1516875 TOMAGO STATION 11 (HYDRANT)**	**----**	**----**
			Client sampling date / time	[30-Jun-2015]	[01-Jul-2015]	[01-Jul-2015]	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1525154-001**	**ES1525154-002**	**ES1525154-003**	**--------**	**--------**
				Result	Result	Result	Result	Result
EP045: Volatile Acids as CH3COOH								
Volatile Acids as Acetic Acid	----	5	mg/L	**257**	**110**	**----**	**----**	**----**
EP231: Perfluorinated Compounds								
PFOS	1763-23-1	0.02	µg/L	**----**	**----**	<0.02	**----**	**----**
PFOA	335-67-1	0.02	µg/L	**----**	**----**	<0.02	**----**	**----**
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L	**----**	**----**	<0.1	**----**	**----**
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L	**----**	**----**	<0.1	**----**	**----**

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1526706**	Page	: 1 of 2
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MS KIM SMITH	Contact	:
Address	: 5/585 Maitland Road MAYFIELD NSW, AUSTRALIA 2304	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kim.smith@alsglobal.com	E-mail	:
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: SPECIALIST TESTS	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 23-Jul-2015 11:16
C-O-C number	: ----	Date Analysis Commenced	: 24-Jul-2015
Sampler	: ----	Issue Date	: 27-Jul-2015 12:51
Site	: ----		
		No. of samples received	: 1
Quote number	: ----	No. of samples analysed	: 1

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Lana Nguyen	Senior LCMS Chemist	Sydney Organics

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.

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.

- PFOS and PFOA results are reported as an aggregate of linear and branched isomers.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**H1518869 TOMAGO RAW WATER**	----	----	----	----
			Client sampling date / time	[23-Jul-2015]	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1526706-001**	--------	--------	--------	--------
				Result	Result	Result	Result	Result
EP231: Perfluorinated Compounds								
PFOS	1763-23-1	0.02	µg/L	<0.02	----	----	----	----
PFOA	335-67-1	0.02	µg/L	<0.02	----	----	----	----
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L	<0.1	----	----	----	----
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L	<0.1	----	----	----	----

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1527148**	Page	: 1 of 8
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MS KIM SMITH	Contact	:
Address	: PO BOX 317 23 ROSEGUM PLACE WARRABROOK NSW 2304 HUNTER REGIONAL MC AUSTRALIA 2310	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kim.smith@alsglobal.com	E-mail	:
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: SPECIALIST TESTS	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 29-Jul-2015 13:00
C-O-C number	: ----	Date Analysis Commenced	: 31-Jul-2015
Sampler	: KIM SMITH	Issue Date	: 06-Aug-2015 16:11
Site	: ----		
		No. of samples received	: 14
Quote number	: ----	No. of samples analysed	: 14

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Phalak Inthakesone	Laboratory Manager - Organics	Sydney Organics

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.

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.

- PFOS and PFOA results are reported as an aggregate of linear and branched isomers.

Analytical Results

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

Compound	CAS Number	LOR	Unit	Client sample ID	H1519619 COOLING TOWER	H1519621 CLARENCE RAW TOWER	H1519622 CLARENCE SUBNATANT (TREATED WATER)	H1519689 TOMAGO STATION 3 (HYDRANT)	H1519690 TOMAGO STATION 5 (HYDRANT)
				Client sampling date / time	[28-Jul-2015]	[23-Jul-2015]	[23-Jul-2015]	[29-Jul-2015]	[29-Jul-2015]
					ES1527148-001	ES1527148-002	ES1527148-003	ES1527148-004	ES1527148-005
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS									
Cadmium	7440-43-9	0.0001	mg/L		----	**0.0002**	<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									
Aluminium	7429-90-5	5	µg/L		----	<5	**10**	----	----
Arsenic	7440-38-2	0.2	µg/L		----	<0.2	<0.2	----	----
Barium	7440-39-3	0.2	µg/L		----	**26.4**	**20.4**	----	----
Beryllium	7440-41-7	0.2	µg/L		----	**0.3**	<0.2	----	----
Boron	7440-42-8	1	µg/L		----	**8**	**7**	----	----
Cadmium	7440-43-9	0.2	µg/L		----	**0.27**	<0.20	----	----
Chromium	7440-47-3	0.2	µg/L		----	**0.3**	<0.2	----	----
Cobalt	7440-48-4	0.2	µg/L		----	**280**	**3.8**	----	----
Copper	7440-50-8	0.2	µg/L		----	**1.8**	<0.2	----	----
Iron	7439-89-6	5	µg/L		----	**12**	<5	----	----
Lead	7439-92-1	0.2	µg/L		----	<0.2	<0.2	----	----
Manganese	7439-96-5	0.2	µg/L		----	**2050**	**28.9**	----	----
Molybdenum	7439-98-7	0.2	µg/L		----	<0.2	<0.2	----	----
Nickel	7440-02-0	0.2	µg/L		----	**722**	**17.6**	----	----
Selenium	7782-49-2	0.2	µg/L		----	**0.2**	<0.2	----	----
Silver	7440-22-4	0.01	µg/L		----	<0.01	----	----	----
Silver	7440-22-4	1	µg/L		----	<1.0	----	----	----
Strontium	7440-24-6	0.2	µg/L		----	**63**	**61**	----	----
Vanadium	7440-62-2	0.2	µg/L		----	<0.2	<0.2	----	----
Zinc	7440-66-6	1	µg/L		----	**985**	**4**	----	----
EG094T: Total metals in Fresh water by ORC-ICPMS									
Arsenic	7440-38-2	0.2	µg/L		<0.2	----	----	**1.9**	**5.3**
Cadmium	7440-43-9	0.2	µg/L		<0.20	----	----	----	----
Chromium	7440-47-3	0.2	µg/L		<0.2	----	----	----	----
Copper	7440-50-8	0.2	µg/L		**1.3**	----	----	----	----
Iron	7439-89-6	5	µg/L		----	----	----	**5500**	**7220**
Lead	7439-92-1	0.2	µg/L		**1.0**	----	----	----	----
Manganese	7439-96-5	0.2	µg/L		<0.2	----	----	**25.6**	**28.2**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Client sample ID	H1519619 COOLING TOWER	H1519621 CLARENCE RAW TOWER	H1519622 CLARENCE SUBNATANT (TREATED WATER)	H1519689 TOMAGO STATION 3 (HYDRANT)	H1519690 TOMAGO STATION 5 (HYDRANT)
				Client sampling date / time	[28-Jul-2015]	[23-Jul-2015]	[23-Jul-2015]	[29-Jul-2015]	[29-Jul-2015]
					ES1527148-001	ES1527148-002	ES1527148-003	ES1527148-004	ES1527148-005
					Result	Result	Result	Result	Result
EG094T: Total metals in Fresh water by ORC-ICPMS - Continued									
Selenium	7782-49-2	0.2	µg/L		<0.2	----	----	----	----
Nickel	7440-02-0	0.2	µg/L		<0.2	----	----	----	----
Silver	7440-22-4	1	µg/L		<1.0	----	----	----	----
Zinc	7440-66-6	1	µg/L		**5**	----	----	----	----
EP231: Perfluorinated Compounds									
PFOS	1763-23-1	0.02	µg/L		----	----	----	<0.02	<0.02
PFOA	335-67-1	0.02	µg/L		----	----	----	<0.02	<0.02
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L		----	----	----	<0.1	<0.1
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L		----	----	----	<0.1	<0.1

Analytical Results

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

Compound	CAS Number	LOR	Unit	Client sample ID	H1519691 TOMAGO STATION 11 (HYDRANT)	H1519692 TOMAGO STATION 12 (HYDRANT)	H1519693 TOMAGO STATION 14	H1519694 TOMAGO STATION 15	H1519695 TOMAGO STATION 21
				Client sampling date / time	[29-Jul-2015]	[29-Jul-2015]	[29-Jul-2015]	[29-Jul-2015]	[29-Jul-2015]
					ES1527148-006	ES1527148-007	ES1527148-008	ES1527148-009	ES1527148-010
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS									
Cadmium	7440-43-9	0.0001	mg/L		----	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		----	----	----	----	----
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS									
Aluminium	7429-90-5	5	µg/L		----	----	----	----	----
Arsenic	7440-38-2	0.2	µg/L		----	----	----	----	----
Barium	7440-39-3	0.2	µg/L		----	----	----	----	----
Beryllium	7440-41-7	0.2	µg/L		----	----	----	----	----
Boron	7440-42-8	1	µg/L		----	----	----	----	----
Cadmium	7440-43-9	0.2	µg/L		----	----	----	----	----
Chromium	7440-47-3	0.2	µg/L		----	----	----	----	----
Cobalt	7440-48-4	0.2	µg/L		----	----	----	----	----
Copper	7440-50-8	0.2	µg/L		----	----	----	----	----
Iron	7439-89-6	5	µg/L		----	----	----	----	----
Lead	7439-92-1	0.2	µg/L		----	----	----	----	----
Manganese	7439-96-5	0.2	µg/L		----	----	----	----	----
Molybdenum	7439-98-7	0.2	µg/L		----	----	----	----	----
Nickel	7440-02-0	0.2	µg/L		----	----	----	----	----
Selenium	7782-49-2	0.2	µg/L		----	----	----	----	----
Silver	7440-22-4	0.01	µg/L		----	----	----	----	----
Silver	7440-22-4	1	µg/L		----	----	----	----	----
Strontium	7440-24-6	0.2	µg/L		----	----	----	----	----
Vanadium	7440-62-2	0.2	µg/L		----	----	----	----	----
Zinc	7440-66-6	1	µg/L		----	----	----	----	----
EG094T: Total metals in Fresh water by ORC-ICPMS									
Arsenic	7440-38-2	0.2	µg/L		**0.7**	**2.1**	**2.0**	**3.2**	**1.2**
Cadmium	7440-43-9	0.2	µg/L		----	----	----	----	----
Chromium	7440-47-3	0.2	µg/L		----	----	----	----	----
Copper	7440-50-8	0.2	µg/L		----	----	----	----	----
Iron	7439-89-6	5	µg/L		**2310**	**2620**	**1880**	**1070**	**1000**
Lead	7439-92-1	0.2	µg/L		----	----	----	----	----
Manganese	7439-96-5	0.2	µg/L		**12.0**	**7.1**	**8.1**	**10.2**	**95.8**
Selenium	7782-49-2	0.2	µg/L		----	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	H1519691 TOMAGO STATION 11 (HYDRANT)	H1519692 TOMAGO STATION 12 (HYDRANT)	H1519693 TOMAGO STATION 14	H1519694 TOMAGO STATION 15	H1519695 TOMAGO STATION 21
				Client sampling date / time	[29-Jul-2015]	[29-Jul-2015]	[29-Jul-2015]	[29-Jul-2015]	[29-Jul-2015]
Compound	CAS Number	LOR	Unit		ES1527148-006	ES1527148-007	ES1527148-008	ES1527148-009	ES1527148-010
					Result	Result	Result	Result	Result
EG094T: Total metals in Fresh water by ORC-ICPMS - Continued									
Nickel	7440-02-0	0.2	µg/L		----	----	----	----	----
Silver	7440-22-4	1	µg/L		----	----	----	----	----
Zinc	7440-66-6	1	µg/L		----	----	----	----	----
EP231: Perfluorinated Compounds									
PFOS	1763-23-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
PFOA	335-67-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1

Analytical Results

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

Compound	CAS Number	LOR	Unit	Client sample ID	H1519696 TOMAGO STATION 24	H1519697 TOMAGO STATION 25A	H1519698 TOMAGO STATION 25B	H1519699 TOMAGO STATION 27	----
				Client sampling date / time	[29-Jul-2015]	[29-Jul-2015]	[29-Jul-2015]	[29-Jul-2015]	----
					ES1527148-011	ES1527148-012	ES1527148-013	ES1527148-014	--------
					Result	Result	Result	Result	Result
EG020F: Dissolved Metals by ICP-MS									
Cadmium	7440-43-9	0.0001	mg/L		----	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		----	----	----	----	----
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS									
Aluminium	7429-90-5	5	µg/L		----	----	----	----	----
Arsenic	7440-38-2	0.2	µg/L		----	----	----	----	----
Barium	7440-39-3	0.2	µg/L		----	----	----	----	----
Beryllium	7440-41-7	0.2	µg/L		----	----	----	----	----
Boron	7440-42-8	1	µg/L		----	----	----	----	----
Cadmium	7440-43-9	0.2	µg/L		----	----	----	----	----
Chromium	7440-47-3	0.2	µg/L		----	----	----	----	----
Cobalt	7440-48-4	0.2	µg/L		----	----	----	----	----
Copper	7440-50-8	0.2	µg/L		----	----	----	----	----
Iron	7439-89-6	5	µg/L		----	----	----	----	----
Lead	7439-92-1	0.2	µg/L		----	----	----	----	----
Manganese	7439-96-5	0.2	µg/L		----	----	----	----	----
Molybdenum	7439-98-7	0.2	µg/L		----	----	----	----	----
Nickel	7440-02-0	0.2	µg/L		----	----	----	----	----
Selenium	7782-49-2	0.2	µg/L		----	----	----	----	----
Silver	7440-22-4	0.01	µg/L		----	----	----	----	----
Silver	7440-22-4	1	µg/L		----	----	----	----	----
Strontium	7440-24-6	0.2	µg/L		----	----	----	----	----
Vanadium	7440-62-2	0.2	µg/L		----	----	----	----	----
Zinc	7440-66-6	1	µg/L		----	----	----	----	----
EG094T: Total metals in Fresh water by ORC-ICPMS									
Arsenic	7440-38-2	0.2	µg/L		**0.2**	**0.7**	**0.9**	**1.9**	----
Cadmium	7440-43-9	0.2	µg/L		----	----	----	----	----
Chromium	7440-47-3	0.2	µg/L		----	----	----	----	----
Copper	7440-50-8	0.2	µg/L		----	----	----	----	----
Iron	7439-89-6	5	µg/L		**877**	**5850**	**2310**	**1800**	----
Lead	7439-92-1	0.2	µg/L		----	----	----	----	----
Manganese	7439-96-5	0.2	µg/L		**48.7**	**22.9**	**17.8**	**8.7**	----
Selenium	7782-49-2	0.2	µg/L		----	----	----	----	----

Analytical Results

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

Compound	CAS Number	LOR	Unit	Client sample ID	H1519696 TOMAGO STATION 24	H1519697 TOMAGO STATION 25A	H1519698 TOMAGO STATION 25B	H1519699 TOMAGO STATION 27	----
				Client sampling date / time	[29-Jul-2015]	[29-Jul-2015]	[29-Jul-2015]	[29-Jul-2015]	----
					ES1527148-011	ES1527148-012	ES1527148-013	ES1527148-014	--------
					Result	Result	Result	Result	Result
EG094T: Total metals in Fresh water by ORC-ICPMS - Continued									
Nickel	7440-02-0	0.2	µg/L		----	----	----	----	----
Silver	7440-22-4	1	µg/L		----	----	----	----	----
Zinc	7440-66-6	1	µg/L		----	----	----	----	----
EP231: Perfluorinated Compounds									
PFOS	1763-23-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
PFOA	335-67-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	----
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	----

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1527682**	Page	: 1 of 2
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MS KIM SMITH	Contact	:
Address	: 5/585 Maitland Road MAYFIELD NSW, AUSTRALIA 2304	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kim.smith@alsglobal.com	E-mail	:
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: SPECIALIST TESTS	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 05-Aug-2015 15:18
C-O-C number	: ----	Date Analysis Commenced	: 07-Aug-2015
Sampler	: ----	Issue Date	: 12-Aug-2015 11:16
Site	: ----		
		No. of samples received	: 4
Quote number	: ----	No. of samples analysed	: 4

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Lana Nguyen	Senior LCMS Chemist	Sydney Organics

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.

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.

- PFOS and PFOA results are reported as an aggregate of linear and branched isomers.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**H1516126 DUNGOG PRIMARY 1 DIGESTER**	**H1516127 DUNGOG SEC 2 DIGESTER**	**H1516300 CESSNOCK HEATER DIGESTER**	**H1520201 TOMAGO STATION 22**	**----**
			Client sampling date / time	[04-Aug-2015]	[04-Aug-2015]	[05-Aug-2015]	[05-Aug-2015]	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1527682-001**	**ES1527682-002**	**ES1527682-003**	**ES1527682-004**	**--------**
				Result	Result	Result	Result	Result
EP045: Volatile Acids as CH3COOH								
Volatile Acids as Acetic Acid	----	5	mg/L	**2220**	**96**	**110**	**----**	**----**
EP231: Perfluorinated Compounds								
PFOS	1763-23-1	0.02	µg/L	**----**	**----**	**----**	<0.02	**----**
PFOA	335-67-1	0.02	µg/L	**----**	**----**	**----**	<0.02	**----**
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L	**----**	**----**	**----**	<0.1	**----**
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L	**----**	**----**	**----**	<0.1	**----**

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1528513**	Page	: 1 of 2
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MS KIM SMITH	Contact	:
Address	: 5/585 Maitland Road MAYFIELD NSW, AUSTRALIA 2304	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kim.smith@alsglobal.com	E-mail	:
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: SPECIALIST TESTS	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 17-Aug-2015 14:30
C-O-C number	: ----	Date Analysis Commenced	: 18-Aug-2015
Sampler	: ----	Issue Date	: 19-Aug-2015 16:10
Site	: ----		
		No. of samples received	: 1
Quote number	: ----	No. of samples analysed	: 1

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Lana Nguyen	Senior LCMS Chemist	Sydney Organics

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.

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.

- PFOS and PFOA results are reported as an aggregate of linear and branched isomers.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**H1519724 TOMAGO RAW WATER**	----	----	----	----
			Client sampling date / time	[17-Aug-2015]	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1528513-001**	--------	--------	--------	--------
				Result	Result	Result	Result	Result
EP231: Perfluorinated Compounds								
PFOS	1763-23-1	0.02	µg/L	<0.02	----	----	----	----
PFOA	335-67-1	0.02	µg/L	<0.02	----	----	----	----
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L	<0.1	----	----	----	----
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L	<0.1	----	----	----	----

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1529582**	Page	: 1 of 2
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MS KIM SMITH	Contact	:
Address	: 5/585 Maitland Road MAYFIELD NSW, AUSTRALIA 2304	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kim.smith@alsglobal.com	E-mail	:
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: SPECIALIST TESTS	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 28-Aug-2015 12:07
C-O-C number	: ----	Date Analysis Commenced	: 31-Aug-2015
Sampler	: ----	Issue Date	: 03-Sep-2015 18:23
Site	: ----		
		No. of samples received	: 3
Quote number	: ----	No. of samples analysed	: 3

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Lana Nguyen	Senior LCMS Chemist	Sydney Organics
Phalak Inthakesone	Laboratory Manager - Organics	Sydney Organics

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.

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.

- PFOS and PFOA results are reported as an aggregate of linear and branched isomers.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**H1522584 TOMAGO STATION 5 (HYDRANT)**	**H1522586 TOMAGO STATION 8**	**H1522588 TOMAGO STATION 11 (HYDRANT)**	**----**	**----**
			Client sampling date / time	[28-Aug-2015]	[28-Aug-2015]	[28-Aug-2015]	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1529582-001**	**ES1529582-002**	**ES1529582-003**	**--------**	**--------**
				Result	Result	Result	Result	Result
EP231: Perfluorinated Compounds								
PFOS	1763-23-1	0.02	µg/L	<0.02	<0.02	<0.02	**----**	**----**
PFOA	335-67-1	0.02	µg/L	<0.02	<0.02	<0.02	**----**	**----**
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L	<0.1	<0.1	<0.1	**----**	**----**
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L	<0.1	<0.1	<0.1	**----**	**----**

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1530138**	Page	: 1 of 5
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MS KIM SMITH	Contact	:
Address	: 5/585 Maitland Road MAYFIELD NSW, AUSTRALIA 2304	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kim.smith@alsglobal.com	E-mail	:
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: SPECIALIST TESTS	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 03-Sep-2015 15:10
C-O-C number	: ----	Date Analysis Commenced	: 04-Sep-2015
Sampler	: ----	Issue Date	: 09-Sep-2015 10:38
Site	: ----		
		No. of samples received	: 11
Quote number	: ----	No. of samples analysed	: 11

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Lana Nguyen	Senior LCMS Chemist	Sydney Organics

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.

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.

- EG035: Poor matrix spike recovery was obtained for Mercury on sample ES1530107 # 2 due to high matrix interference. Confirmed by re-analysis.
- PFOS and PFOA results are reported as an aggregate of linear and branched isomers.

Analytical Results

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

Compound	CAS Number	LOR	Unit	Client sample ID	H1521255 TRANSPACIFIC KOORAGANG	H1522740 TOMAGO STATION 8	H1522741 TOMAGO STATION 11 (HYDRANT)	H1519112 ANNA BAY-B4	H1519114 ANNA BAY-B6
				Client sampling date / time	[02-Sep-2015]	[02-Sep-2015]	[02-Sep-2015]	[03-Sep-2015]	[03-Sep-2015]
					ES1530138-001	ES1530138-002	ES1530138-003	ES1530138-004	ES1530138-005
					Result	Result	Result	Result	Result
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	----	----	----	----
EG094T: Total metals in Fresh water by ORC-ICPMS									
Aluminium	7429-90-5	5	µg/L		----	----	----	**57**	**47**
Arsenic	7440-38-2	0.2	µg/L		**4.8**	----	----	----	----
Iron	7439-89-6	5	µg/L		**911**	----	----	**14**	<5
Manganese	7439-96-5	0.2	µg/L		----	----	----	<0.2	<0.2
Nickel	7440-02-0	0.2	µg/L		**10.2**	----	----	----	----
Zinc	7440-66-6	1	µg/L		**17**	----	----	----	----
EP231: Perfluorinated Compounds									
PFOS	1763-23-1	0.02	µg/L		----	<0.02	<0.02	----	----
PFOA	335-67-1	0.02	µg/L		----	<0.02	<0.02	----	----
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L		----	<0.1	<0.1	----	----
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L		----	<0.1	<0.1	----	----

Analytical Results

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

				Client sample ID	H1519115 ANNA BAY-B7	H1519116 ANNA BAY-B8	H1519119 ANNA BAY-B2	H1519120 ANNA BAY-B3	H1522769 6 WICKHAM RD, NEW LAMBTON (FRONT)
				Client sampling date / time	[03-Sep-2015]	[03-Sep-2015]	[03-Sep-2015]	[03-Sep-2015]	[03-Sep-2015]
Compound	CAS Number	LOR	Unit		ES1530138-006	ES1530138-007	ES1530138-008	ES1530138-009	ES1530138-010
					Result	Result	Result	Result	Result
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		----	----	----	----	----
EG094T: Total metals in Fresh water by ORC-ICPMS									
Aluminium	7429-90-5	5	µg/L		**86**	**62**	**65**	**71**	----
Arsenic	7440-38-2	0.2	µg/L		----	----	----	----	----
Iron	7439-89-6	5	µg/L		**28**	**46**	**10**	<5	**47**
Manganese	7439-96-5	0.2	µg/L		**4.8**	**0.9**	<0.2	<0.2	**10.7**
Nickel	7440-02-0	0.2	µg/L		----	----	----	----	----
Zinc	7440-66-6	1	µg/L		----	----	----	----	----
EP231: Perfluorinated Compounds									
PFOS	1763-23-1	0.02	µg/L		----	----	----	----	----
PFOA	335-67-1	0.02	µg/L		----	----	----	----	----
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L		----	----	----	----	----
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L		----	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	H1522771 8 WICKHAM RD, NEW LAMBTON (FRONT)	----	----	----	----
				Client sampling date / time	[03-Sep-2015]	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1530138-011	--------	--------	--------	--------
					Result	Result	Result	Result	Result
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		----	----	----	----	----
EG094T: Total metals in Fresh water by ORC-ICPMS									
Aluminium	7429-90-5	5	µg/L		----	----	----	----	----
Arsenic	7440-38-2	0.2	µg/L		----	----	----	----	----
Iron	7439-89-6	5	µg/L		**47**	----	----	----	----
Manganese	7439-96-5	0.2	µg/L		**10.7**	----	----	----	----
Nickel	7440-02-0	0.2	µg/L		----	----	----	----	----
Zinc	7440-66-6	1	µg/L		----	----	----	----	----
EP231: Perfluorinated Compounds									
PFOS	1763-23-1	0.02	µg/L		----	----	----	----	----
PFOA	335-67-1	0.02	µg/L		----	----	----	----	----
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L		----	----	----	----	----
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L		----	----	----	----	----

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1530535**	Page	: 1 of 6
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MS KIM SMITH	Contact	:
Address	: 5/585 Maitland Road MAYFIELD NSW, AUSTRALIA 2304	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kim.smith@alsglobal.com	E-mail	:
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: SPECIALIST TESTS	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 08-Sep-2015 15:44
C-O-C number	: ----	Date Analysis Commenced	: 09-Sep-2015
Sampler	: ----	Issue Date	: 11-Sep-2015 11:13
Site	: ----		
		No. of samples received	: 19
Quote number	: ----	No. of samples analysed	: 19

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Phalak Inthakesone	Laboratory Manager - Organics	Sydney Organics

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.

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.

- PFOS and PFOA results are reported as an aggregate of linear and branched isomers.

Analytical Results

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

Compound	CAS Number	LOR	Unit	Client sample ID	H1519224 54 WARRWN ST SEAHAM	H1519225 RAY/TERRACE 44 WILLIAM ST	H1519238 MAITLAND 262 HIGH ST	H1519239 EAST MAITLAND 118 VICTORIA ST	H1519240 THORNTON 4 BUNBURY ST
				Client sampling date / time	[08-Sep-2015]	[08-Sep-2015]	[08-Sep-2015]	[08-Sep-2015]	[08-Sep-2015]
					ES1530535-001	ES1530535-002	ES1530535-003	ES1530535-004	ES1530535-005
					Result	Result	Result	Result	Result
ED093T: Total Major Cations									
Calcium	7440-70-2	0.1	mg/L		----	----	----	----	----
Magnesium	7439-95-4	0.1	mg/L		----	----	----	----	----
Potassium	7440-09-7	0.1	mg/L		----	----	----	----	----
Sodium	7440-23-5	0.1	mg/L		----	----	----	----	----
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS									
Aluminium	7429-90-5	5	µg/L		----	----	----	----	**26**
EG094T: Total metals in Fresh water by ORC-ICPMS									
Aluminium	7429-90-5	5	µg/L		----	----	----	----	----
Copper	7440-50-8	0.2	µg/L		----	----	----	----	----
Iron	7439-89-6	5	µg/L		----	----	----	----	----
Manganese	7439-96-5	0.2	µg/L		----	----	----	----	----
EG094U: Unfiltered Metals in Fresh Water by ORC-ICPMS									
Aluminium	7429-90-5	5	µg/L		----	----	----	----	**39**
Arsenic	7440-38-2	0.2	µg/L		----	----	----	----	----
Copper	7440-50-8	0.2	µg/L		----	----	----	----	**1.8**
Iron	7439-89-6	5	µg/L		**17**	**46**	**23**	**10**	**72**
Lead	7439-92-1	0.2	µg/L		----	----	----	----	**0.3**
Manganese	7439-96-5	0.2	µg/L		**2.0**	**12.4**	**3.6**	**1.6**	**4.2**
Zinc	7440-66-6	1	µg/L		----	----	----	----	**1**
EP231: Perfluorinated Compounds									
PFOS	1763-23-1	0.02	µg/L		----	----	----	----	----
PFOA	335-67-1	0.02	µg/L		----	----	----	----	----
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L		----	----	----	----	----
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L		----	----	----	----	----

Analytical Results

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

Compound	CAS Number	LOR	Unit	Client sample ID	H1519241 KURRI 91 MAITLAND ST	H1519242 BELLBIRD 23 FISHER ST	H1519243 PELAW MAIN 43 EVATT ST	H1519223 90 FOSTERTON ST DUNGOG	H1519284 KIWS-INLET WATER
				Client sampling date / time	[08-Sep-2015]	[08-Sep-2015]	[08-Sep-2015]	[08-Sep-2015]	[08-Sep-2015]
					ES1530535-006	ES1530535-007	ES1530535-008	ES1530535-009	ES1530535-010
					Result	Result	Result	Result	Result
ED093T: Total Major Cations									
Calcium	7440-70-2	0.1	mg/L		----	----	----	----	**34.1**
Magnesium	7439-95-4	0.1	mg/L		----	----	----	----	**9.0**
Potassium	7440-09-7	0.1	mg/L		----	----	----	----	----
Sodium	7440-23-5	0.1	mg/L		----	----	----	----	----
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS									
Aluminium	7429-90-5	5	µg/L		----	**28**	----	----	----
EG094T: Total metals in Fresh water by ORC-ICPMS									
Aluminium	7429-90-5	5	µg/L		----	----	----	----	**23**
Copper	7440-50-8	0.2	µg/L		----	----	----	----	**0.8**
Iron	7439-89-6	5	µg/L		----	----	----	----	**148**
Manganese	7439-96-5	0.2	µg/L		----	----	----	----	----
EG094U: Unfiltered Metals in Fresh Water by ORC-ICPMS									
Aluminium	7429-90-5	5	µg/L		----	**34**	----	----	----
Arsenic	7440-38-2	0.2	µg/L		----	----	----	----	----
Copper	7440-50-8	0.2	µg/L		----	----	----	----	----
Iron	7439-89-6	5	µg/L		**27**	**12**	**14**	**11**	----
Lead	7439-92-1	0.2	µg/L		----	----	----	----	----
Manganese	7439-96-5	0.2	µg/L		**4.7**	**1.5**	**2.4**	**1.4**	----
Zinc	7440-66-6	1	µg/L		----	----	----	----	----
EP231: Perfluorinated Compounds									
PFOS	1763-23-1	0.02	µg/L		----	----	----	----	----
PFOA	335-67-1	0.02	µg/L		----	----	----	----	----
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L		----	----	----	----	----
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L		----	----	----	----	----

Analytical Results

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

				Client sample ID	H1519285 KIWS-TREATED WATER	H1519261 W/RIVER BOAGS HILL INLET	H1519265 CAMPVALE PS INLET R9	H1519226 PATERSON RIVER	H1519227 ALLYN RIVER
				Client sampling date / time	[08-Sep-2015]	[08-Sep-2015]	[08-Sep-2015]	[08-Sep-2015]	[08-Sep-2015]
Compound	CAS Number	LOR	Unit		ES1530535-011	ES1530535-012	ES1530535-013	ES1530535-014	ES1530535-015
					Result	Result	Result	Result	Result
ED093T: Total Major Cations									
Calcium	7440-70-2	0.1	mg/L		**0.2**	**13.4**	**7.5**	**16.0**	**17.0**
Magnesium	7439-95-4	0.1	mg/L		<0.1	**8.0**	**6.7**	----	----
Potassium	7440-09-7	0.1	mg/L		**0.6**	**2.3**	----	----	----
Sodium	7440-23-5	0.1	mg/L		**10.1**	**31.1**	----	----	----
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS									
Aluminium	7429-90-5	5	µg/L		----	----	----	----	----
EG094T: Total metals in Fresh water by ORC-ICPMS									
Aluminium	7429-90-5	5	µg/L		----	**611**	**883**	----	----
Copper	7440-50-8	0.2	µg/L		----	----	----	----	----
Iron	7439-89-6	5	µg/L		----	**1000**	**2020**	----	----
Manganese	7439-96-5	0.2	µg/L		----	**28.7**	**42.2**	----	----
EG094U: Unfiltered Metals in Fresh Water by ORC-ICPMS									
Aluminium	7429-90-5	5	µg/L		<5	----	----	----	----
Arsenic	7440-38-2	0.2	µg/L		<0.2	----	----	----	----
Copper	7440-50-8	0.2	µg/L		<0.2	----	----	----	----
Iron	7439-89-6	5	µg/L		<5	----	----	----	----
Lead	7439-92-1	0.2	µg/L		----	----	----	----	----
Manganese	7439-96-5	0.2	µg/L		----	----	----	----	----
Zinc	7440-66-6	1	µg/L		<1	----	----	----	----
EP231: Perfluorinated Compounds									
PFOS	1763-23-1	0.02	µg/L		----	----	----	----	----
PFOA	335-67-1	0.02	µg/L		----	----	----	----	----
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L		----	----	----	----	----
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L		----	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	H1519212 CHICHESTER DAM SCREENS	H1519213 DUNGOG TW RAW	H1519215 DUNGOG CWT	H1522426 TOMAGO-RAW WATER	----
				Client sampling date / time	[08-Sep-2015]	[08-Sep-2015]	[08-Sep-2015]	[08-Sep-2015]	----
Compound	CAS Number	LOR	Unit		ES1530535-016	ES1530535-017	ES1530535-018	ES1530535-019	--------
					Result	Result	Result	Result	Result
ED093T: Total Major Cations									
Calcium	7440-70-2	0.1	mg/L		4.0	3.9	15.7	----	----
Magnesium	7439-95-4	0.1	mg/L		1.5	1.4	1.5	----	----
Potassium	7440-09-7	0.1	mg/L		----	----	----	----	----
Sodium	7440-23-5	0.1	mg/L		----	----	----	----	----
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS									
Aluminium	7429-90-5	5	µg/L		----	----	----	----	----
EG094T: Total metals in Fresh water by ORC-ICPMS									
Aluminium	7429-90-5	5	µg/L		----	----	----	----	----
Copper	7440-50-8	0.2	µg/L		----	----	----	----	----
Iron	7439-89-6	5	µg/L		----	----	----	----	----
Manganese	7439-96-5	0.2	µg/L		----	----	----	----	----
EG094U: Unfiltered Metals in Fresh Water by ORC-ICPMS									
Aluminium	7429-90-5	5	µg/L		----	----	----	----	----
Arsenic	7440-38-2	0.2	µg/L		----	----	----	----	----
Copper	7440-50-8	0.2	µg/L		----	----	----	----	----
Iron	7439-89-6	5	µg/L		----	----	----	----	----
Lead	7439-92-1	0.2	µg/L		----	----	----	----	----
Manganese	7439-96-5	0.2	µg/L		----	----	----	----	----
Zinc	7440-66-6	1	µg/L		----	----	----	----	----
EP231: Perfluorinated Compounds									
PFOS	1763-23-1	0.02	µg/L		----	----	----	<0.02	----
PFOA	335-67-1	0.02	µg/L		----	----	----	<0.02	----
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L		----	----	----	<0.1	----
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L		----	----	----	<0.1	----

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1532192**	Page	: 1 of 4
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MS KIM SMITH	Contact	:
Address	: 5/585 Maitland Road MAYFIELD NSW, AUSTRALIA 2304	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kim.smith@alsglobal.com	E-mail	:
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: SPECIALIST TESTS	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 25-Sep-2015 13:02
C-O-C number	: ----	Date Analysis Commenced	: 26-Sep-2015
Sampler	: ----	Issue Date	: 02-Oct-2015 13:00
Site	: ----		
		No. of samples received	: 6
Quote number	: ----	No. of samples analysed	: 6

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Lana Nguyen	Senior LCMS Chemist	Sydney Organics

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.

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.

- PFOS and PFOA results are reported as an aggregate of linear and branched isomers.

Analytical Results

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

				Client sample ID	H1525215 TOMAGO STATION 5 (HYDRANT)	H1525216 TOMAGO STATION 7 (HYDRANT)	H1525217 TOMAGO STATION 8	H1525218 TOMAGO STATION 9 HYDRANT	H1525219 TOMAGO STATION 11 (HYDRANT)
				Client sampling date / time	[25-Sep-2015]	[25-Sep-2015]	[25-Sep-2015]	[25-Sep-2015]	[25-Sep-2015]
Compound	*CAS Number*	*LOR*	*Unit*		**ES1532192-001**	**ES1532192-002**	**ES1532192-003**	**ES1532192-004**	**ES1532192-005**
					Result	Result	Result	Result	Result
EP231: Perfluorinated Compounds									
PFOS	1763-23-1	0.02	µg/L		<0.02	<0.02	<0.02	**0.17**	<0.02
PFOA	335-67-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)				Client sample ID	**H1525220 TOMAGO STATION 5 BORE 14**	**----**	**----**	**----**	**----**
				Client sampling date / time	[25-Sep-2015]	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*		**ES1532192-006**	**--------**	**--------**	**--------**	**--------**
					Result	Result	Result	Result	Result
EP231: Perfluorinated Compounds									
PFOS	1763-23-1	0.02	µg/L		<0.02	**----**	**----**	**----**	**----**
PFOA	335-67-1	0.02	µg/L		<0.02	**----**	**----**	**----**	**----**
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L		<0.1	**----**	**----**	**----**	**----**
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L		<0.1	**----**	**----**	**----**	**----**

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1533421**	Page	: 1 of 4
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MS KIM SMITH	Contact	:
Address	: 5/585 Maitland Road MAYFIELD NSW, AUSTRALIA 2304	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kim.smith@alsglobal.com	E-mail	:
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: SPECIALIST TESTS	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 13-Oct-2015 15:25
C-O-C number	: ----	Date Analysis Commenced	: 14-Oct-2015
Sampler	: ----	Issue Date	: 19-Oct-2015 16:34
Site	: ----		
		No. of samples received	: 7
Quote number	: ----	No. of samples analysed	: 7

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Phalak Inthakesone	Laboratory Manager - Organics	Sydney Organics

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.

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.

- PFOS and PFOA results are reported as an aggregate of linear and branched isomers.

Analytical Results

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

				Client sample ID	H1522138 ANNA BAY TW RAW	H1522143 LTP TW RAW WATER	H1522145 NELSON BAY TW RAW WATER	H1522123 G/TOWN RAW WATER (INLET PIT)	H1522212 DUNGOG TW RAW
				Client sampling date / time	[12-Oct-2015]	[12-Oct-2015]	[12-Oct-2015]	[13-Oct-2015]	[13-Oct-2015]
Compound	CAS Number	LOR	Unit		ES1533421-001	ES1533421-002	ES1533421-003	ES1533421-004	ES1533421-005
					Result	Result	Result	Result	Result
EP231: Perfluorinated Compounds									
PFOS	1763-23-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
PFOA	335-67-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	H1522221 PATERSON RIVER	H1522222 ALLYN RIVER	----	----	----
				Client sampling date / time	[13-Oct-2015]	[13-Oct-2015]	----	----	----
Compound	CAS Number	LOR	Unit		ES1533421-006	ES1533421-007	--------	--------	--------
					Result	Result	Result	Result	Result
EP231: Perfluorinated Compounds									
PFOS	1763-23-1	0.02	µg/L		<0.02	<0.02	----	----	----
PFOA	335-67-1	0.02	µg/L		<0.02	<0.02	----	----	----
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L		<0.1	<0.1	----	----	----
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L		<0.1	<0.1	----	----	----

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1535108**	Page	: 1 of 4
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MS KIM SMITH	Contact	:
Address	: 5/585 Maitland Road MAYFIELD NSW, AUSTRALIA 2304	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kim.smith@alsglobal.com	E-mail	:
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: SPECIALIST TESTS	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 02-Nov-2015 15:10
C-O-C number	: ----	Date Analysis Commenced	: 03-Nov-2015
Sampler	: ----	Issue Date	: 09-Nov-2015 14:51
Site	: ----		
		No. of samples received	: 6
Quote number	: ----	No. of samples analysed	: 6

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Phalak Inthakesone	Laboratory Manager - Organics	Sydney Organics

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.

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.

- PFOS and PFOA results are reported as an aggregate of linear and branched isomers.

Analytical Results

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

Compound	CAS Number	LOR	Unit	Client sample ID	H1524025 ANNA BAY TW RAW	H1524026 ANNA BAY CWT OUT	H1524030 LTP TW RAW WATER	H1524031 LTP FINAL TAP OUTSIDE	H1524032 NELSON BAY TW RAW WATER
				Client sampling date / time	[02-Nov-2015]	[02-Nov-2015]	[02-Nov-2015]	[02-Nov-2015]	[02-Nov-2015]
					ES1535108-001	ES1535108-002	ES1535108-003	ES1535108-004	ES1535108-005
					Result	Result	Result	Result	Result
ED009: Anions									
Iodide	20461-54-5	0.01	mg/L		<0.010	<0.010	<0.010	**0.011**	<0.010
EP231: Perfluorinated Compounds									
PFOS	1763-23-1	0.01	µg/L		<0.01	----	<0.01	----	<0.01
PFOA	335-67-1	0.01	µg/L		<0.01	----	<0.01	----	<0.01
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L		<0.1	----	<0.1	----	<0.1
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L		<0.1	----	<0.1	----	<0.1

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	H1524033 NELSON BAY LARGE CWT	----	----	----	----
				Client sampling date / time	[02-Nov-2015]	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1535108-006	--------	--------	--------	--------
					Result	Result	Result	Result	Result
ED009: Anions									
Iodide	20461-54-5	0.01	mg/L		<0.010	----	----	----	----
EP231: Perfluorinated Compounds									
PFOS	1763-23-1	0.01	µg/L		----	----	----	----	----
PFOA	335-67-1	0.01	µg/L		----	----	----	----	----
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L		----	----	----	----	----
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L		----	----	----	----	----

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1535290**	Page	: 1 of 2
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MS KIM SMITH	Contact	:
Address	: 5/585 Maitland Road MAYFIELD NSW, AUSTRALIA 2304	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kim.smith@alsglobal.com	E-mail	:
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: SPECIALIST TESTS	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: ----	Date Samples Received	: 04-Nov-2015 10:50
C-O-C number	: ----	Date Analysis Commenced	: 05-Nov-2015
Sampler	: ----	Issue Date	: 10-Nov-2015 17:11
Site	: ----		
		No. of samples received	: 2
Quote number	: ----	No. of samples analysed	: 2

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics
Phalak Inthakesone	Laboratory Manager - Organics	Sydney Organics

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.

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.

- ED009-X: Spike for fluoride failed due to matrix interference.
- PFOS and PFOA results are reported as an aggregate of linear and branched isomers.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**H1524003 G/TOWN RAW WATER (INLET PIT)**	**H1524007 G/TOWN CWT**	**----**	**----**	**----**
			Client sampling date / time	[02-Nov-2015]	[02-Nov-2015]	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1535290-001**	**ES1535290-002**	**--------**	**--------**	**--------**
				Result	Result	Result	Result	Result
ED009: Anions								
Iodide	20461-54-5	0.01	mg/L	<0.010	<0.010	**----**	**----**	**----**
EP231: Perfluorinated Compounds								
PFOS	1763-23-1	0.01	µg/L	<0.01	**----**	**----**	**----**	**----**
PFOA	335-67-1	0.01	µg/L	<0.01	**----**	**----**	**----**	**----**
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L	<0.1	**----**	**----**	**----**	**----**
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L	<0.1	**----**	**----**	**----**	**----**

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1536067**	Page	: 1 of 2
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MS KIM SMITH	Contact	:
Address	: 5/585 Maitland Road MAYFIELD NSW, AUSTRALIA 2304	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kim.smith@alsglobal.com	E-mail	:
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: SPECIALIST TESTS	QC Level	: NEPM 2013 B3 & ALS QC Standard
Order number	: ----	Date Samples Received	: 12-Nov-2015 13:45
C-O-C number	: ----	Date Analysis Commenced	: 13-Nov-2015
Sampler	: ----	Issue Date	: 19-Nov-2015 12:47
Site	: ----		
		No. of samples received	: 5
Quote number	: ----	No. of samples analysed	: 5

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Phalak Inthakesone	Laboratory Manager - Organics	Sydney Organics

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.

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.

- EP231: Positive results reported have been confirmed by repeat analysis.
- PFOS and PFOA results are reported as an aggregate of linear and branched isomers.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)				Client sample ID	H1529566 TOMAGO STATION 9 BORE 1	H1529567 TOMAGO STATION 9 BORE 15	H1529568 TOMAGO STATION 9 BORE 30	H1529569 TOMAGO STATION 9 BORE 45	H1529570 TOMAGO STATION 9 BORE 60
				Client sampling date / time	[12-Nov-2015]	[12-Nov-2015]	[12-Nov-2015]	[12-Nov-2015]	[12-Nov-2015]
Compound	*CAS Number*	*LOR*	*Unit*		**ES1536067-001**	**ES1536067-002**	**ES1536067-003**	**ES1536067-004**	**ES1536067-005**
					Result	Result	Result	Result	Result
EP231: Perfluorinated Compounds									
PFOS	1763-23-1	0.01	µg/L		**0.04**	**0.02**	**0.07**	<0.01	<0.01
PFOA	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1538868**	Page	: 1 of 2
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MS KIM SMITH	Contact	:
Address	: 5/585 Maitland Road MAYFIELD NSW, AUSTRALIA 2304	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kim.smith@alsglobal.com	E-mail	:
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: SPECIALIST TESTS	QC Level	: NEPM 2013 B3 & ALS QC Standard
Order number	: ----	Date Samples Received	: 15-Dec-2015 15:48
C-O-C number	: ----	Date Analysis Commenced	: 16-Dec-2015
Sampler	: ----	Issue Date	: 18-Dec-2015 16:41
Site	: ----		
		No. of samples received	: 4
Quote number	: ----	No. of samples analysed	: 4

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Gaston Allende	R&D Chemist	Sydney Organics, Smithfield, NSW

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.

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.

- PFOS and PFOA results are reported as an aggregate of linear and branched isomers.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**H1527731 G/TOWN RAW WATER (INLET PIT)**	**H1527745 ANNA BAY TW RAW**	**H1527750 LTP TW RAW WATER**	**H1527752 NELSON BAY TW RAW WATER**	**----**
			Client sampling date / time	[14-Dec-2015]	[15-Dec-2015]	[15-Dec-2015]	[15-Dec-2015]	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1538868-001**	**ES1538868-002**	**ES1538868-003**	**ES1538868-004**	**--------**
				Result	Result	Result	Result	Result
EP231: Perfluorinated Compounds								
PFOS	1763-23-1	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	**----**
PFOA	335-67-1	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	**----**
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	**----**
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	**----**

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1600128**	Page	: 1 of 2
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MS KIM SMITH	Contact	:
Address	: PO BOX 317 23 ROSEGUM PLACE WARRABROOK NSW 2304 HUNTER REGIONAL MC AUSTRALIA 2310	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kim.smith@alsglobal.com	E-mail	:
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: SPECIALIST TESTS	QC Level	: NEPM 2013 B3 & ALS QC Standard
Order number	: ----	Date Samples Received	: 05-Jan-2016 15:36
C-O-C number	: ----	Date Analysis Commenced	: 07-Jan-2016
Sampler	: ----	Issue Date	: 12-Jan-2016 16:59
Site	: ----		
		No. of samples received	: 4
Quote number	: ----	No. of samples analysed	: 4

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Gaston Allende	R&D Chemist	Sydney Organics, Smithfield, NSW

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.

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.

- PFOS and PFOA results are reported as an aggregate of linear and branched isomers.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**H1529956 Dungog TW Raw**	**H1531039 Paterson River**	**H1529634 G/Town Raw Water Inlet Pit**	**H1530938 Chichester Dam Screens**	**----**
			Client sampling date / time	[05-Jan-2016]	[05-Jan-2016]	[05-Jan-2016]	[05-Jan-2016]	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1600128-001**	**ES1600128-002**	**ES1600128-003**	**ES1600128-004**	**--------**
				Result	Result	Result	Result	Result
EP231: Perfluorinated Compounds								
PFOS	1763-23-1	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	**----**
PFOA	335-67-1	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	**----**
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	**----**
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	**----**

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1600294**	Page	: 1 of 2
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MS KIM SMITH	Contact	:
Address	: PO BOX 317 23 ROSEGUM PLACE WARRABROOK NSW 2304 HUNTER REGIONAL MC AUSTRALIA 2310	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kim.smith@alsglobal.com	E-mail	:
Telephone	: ----	Telephone	: +61-2-8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: SPECIALIST TESTS	QC Level	: NEPM 2013 B3 & ALS QC Standard
Order number	: ----	Date Samples Received	: 07-Jan-2016 13:50
C-O-C number	: ----	Date Analysis Commenced	: 08-Jan-2016
Sampler	: ----	Issue Date	: 11-Jan-2016 13:08
Site	: ----		
		No. of samples received	: 3
Quote number	: ----	No. of samples analysed	: 3

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Gaston Allende	R&D Chemist	Sydney Organics, Smithfield, NSW

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.

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.

- PFOS and PFOA results are reported as an aggregate of linear and branched isomers.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**H1530944 Anna Bay TW Raw**	**H1530945 LTP TW Raw Water**	**H1530946 Nelson Bay TW Raw Water**	**----**	**----**
			Client sampling date / time	[06-Jan-2016]	[06-Jan-2016]	[06-Jan-2016]	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**ES1600294-001**	**ES1600294-002**	**ES1600294-003**	**--------**	**--------**
				Result	Result	Result	Result	Result
EP231: Perfluorinated Compounds								
PFOS	1763-23-1	0.01	µg/L	<0.01	<0.01	<0.01	**----**	**----**
PFOA	335-67-1	0.01	µg/L	<0.01	<0.01	<0.01	**----**	**----**
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L	<0.1	<0.1	<0.1	**----**	**----**
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L	<0.1	<0.1	<0.1	**----**	**----**

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **WN1600338**	Page	: 1 of 2
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: ALS Water - Newcastle
Contact	: MS KIM SMITH	Contact	: Andrea Swan
Address	: 5/585 Maitland Road MAYFIELD NSW, AUSTRALIA 2304	Address	: 5/585 Maitland Road Newcastle West NSW Australia 2304
E-mail	: kim.smith@alsglobal.com	E-mail	: Andrea.Swan@ALSGlobal.com
Telephone	: ----	Telephone	: +61 2 4014 2500
Facsimile	: ----	Facsimile	: +61 2 4967 7382
Project	: Hunter Water	QC Level	: NEPM 2013 B3 & ALS QC Standard
Order number	: ----	Date Samples Received	: 08-Feb-2016 13:49
C-O-C number	: ----	Date Analysis Commenced	: 09-Feb-2016
Sampler	: ----	Issue Date	: 15-Feb-2016 15:48
Site	: ----		
		No. of samples received	: 4
Quote number	: ----	No. of samples analysed	: 4

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Lana Nguyen	Senior LCMS Chemist	Sydney Organics, Smithfield, NSW

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.

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.

- PFOS and PFOA results are reported as an aggregate of linear and branched isomers.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)				Client sample ID	**H1532874 G/Town Raw Water (Inlet Pit)**	**H1532894 LTP TW Raw Water**	**H1532889 Anna Bay TW Raw**	**H1532896 Nelson Bay TW Raw Water**	**----**
				Client sampling date / time	[08-Feb-2016]	[08-Feb-2016]	[08-Feb-2016]	[08-Feb-2016]	----
Compound	*CAS Number*	*LOR*	*Unit*		**WN1600338-001**	**WN1600338-002**	**WN1600338-003**	**WN1600338-004**	**--------**
					Result	Result	Result	Result	Result
EP231: Perfluorinated Compounds									
PFOS	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**----**
PFOA	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**----**
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	**----**
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	**----**

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **WN1600689**	Page	: 1 of 2
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: ALS Water - Newcastle
Contact	: MS KIM SMITH	Contact	: Andrea Swan
Address	: 5/585 Maitland Road MAYFIELD NSW, AUSTRALIA 2304	Address	: 5/585 Maitland Road Newcastle West NSW Australia 2304
E-mail	: kim.smith@alsglobal.com	E-mail	: Andrea.Swan@ALSGlobal.com
Telephone	: ----	Telephone	: +61 2 4014 2500
Facsimile	: ----	Facsimile	: +61 2 4967 7382
Project	: Hunter Water	QC Level	: NEPM 2013 B3 & ALS QC Standard
Order number	: ----	Date Samples Received	: 07-Mar-2016 16:09
C-O-C number	: ----	Date Analysis Commenced	: 11-Mar-2016
Sampler	: ----	Issue Date	: 14-Mar-2016 15:15
Site	: ----		
		No. of samples received	: 4
Quote number	: ----	No. of samples analysed	: 4

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Lana Nguyen	Senior LCMS Chemist	Sydney Organics, Smithfield, NSW

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.

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.

- PFOS and PFOA results are reported as an aggregate of linear and branched isomers.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**H1601836 G/Town Raw Water (Inlet Pit)**	**H1601863 LTP TW Raw Water**	**H1601865 Nelson Bay TW Raw Water**	**H1601858 Anna Bay TW Raw Water**	**----**
			Client sampling date / time	[07-Mar-2016]	[07-Mar-2016]	[07-Mar-2016]	[07-Mar-2016]	----
Compound	*CAS Number*	*LOR*	*Unit*	**WN1600689-001**	**WN1600689-002**	**WN1600689-003**	**WN1600689-004**	**--------**
				Result	Result	Result	Result	Result
EP231: Perfluorinated Compounds								
PFOS	1763-23-1	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	**----**
PFOA	335-67-1	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	**----**
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	**----**
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	**----**
EP231S: PFC Surrogate								
13C4-PFOS	----	0.01	%	**104**	**106**	**129**	**124**	**----**

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **WN1600859**	Page	: 1 of 6
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: ALS Water - Newcastle
Contact	: MS KIM SMITH	Contact	: Andrea Swan
Address	: 5/585 Maitland Road MAYFIELD NSW, AUSTRALIA 2304	Address	: 5/585 Maitland Road Newcastle West NSW Australia 2304
Telephone	: ----	Telephone	: +61 2 4014 2500
Project	: Hunter Water	Date Samples Received	: 16-Mar-2016 14:02
Order number	: ----	Date Analysis Commenced	: 18-Mar-2016
C-O-C number	: ----	Issue Date	: 23-Mar-2016 09:08
Sampler	: ----		
Site	: ----		
Quote number	: ----		
No. of samples received	: 11		
No. of samples analysed	: 11		

NATA Accredited Laboratory 825
Accredited for compliance with
ISO/IEC 17025.

NATA
WORLD RECOGNISED ACCREDITATION

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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*
Lana Nguyen	Senior LCMS Chemist	Sydney Organics, Smithfield, NSW

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.

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.

- PFOS and PFOA results are reported as an aggregate of linear and branched isomers.

Analytical Results

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

				Client sample ID	H1602756 Allyn River	H1603036 Ray/Terrace Raw	H1603403 Morpeth Raw	H1603412 Morpeth Disinfected Effluent	H1603439 Kurri Kurri Disinfected Effluent
				Client sampling date / time	[16-Mar-2016]	[16-Mar-2016]	[16-Mar-2016]	[16-Mar-2016]	[16-Mar-2016]
Compound	CAS Number	LOR	Unit		WN1600859-001	WN1600859-002	WN1600859-003	WN1600859-004	WN1600859-005
					Result	Result	Result	Result	Result
EP231: Perfluorinated Compounds									
PFOS	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
PFOA	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
EP231S: PFC Surrogate									
13C4-PFOS	----	0.01	%		**91.0**	**91.0**	**105**	**106**	**109**

Analytical Results

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

				Client sample ID	H1603457 Shortland Raw	H1603466 Shortland Effluent Dump Station	H1608314 Farley Raw	H1608315 Farley Disinfected Effluent	H1608406 South East Campvale Swamp
				Client sampling date / time	[16-Mar-2016]	[16-Mar-2016]	[16-Mar-2016]	[16-Mar-2016]	[16-Mar-2016]
Compound	*CAS Number*	*LOR*	*Unit*		**WN1600859-006**	**WN1600859-007**	**WN1600859-008**	**WN1600859-009**	**WN1600859-010**
					Result	Result	Result	Result	Result
EP231: Perfluorinated Compounds									
PFOS	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	**0.25**	<0.01
PFOA	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
EP231S: PFC Surrogate									
13C4-PFOS	----	0.01	%		**89.0**	**89.0**	**86.0**	**112**	**82.0**

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**H1603007 Ray/Terrace Disinfected Effluent**	**----**	**----**	**----**	**----**
			Client sampling date / time	[16-Mar-2016]	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**WN1600859-011**	**--------**	**--------**	**--------**	**--------**
				Result	Result	Result	Result	Result
EP231: Perfluorinated Compounds								
PFOS	1763-23-1	0.01	µg/L	<0.01	**----**	**----**	**----**	**----**
PFOA	335-67-1	0.01	µg/L	<0.01	**----**	**----**	**----**	**----**
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L	<0.1	**----**	**----**	**----**	**----**
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L	<0.1	**----**	**----**	**----**	**----**
EP231S: PFC Surrogate								
13C4-PFOS	----	0.01	%	**86.0**	**----**	**----**	**----**	**----**

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFC Surrogate			
13C4-PFOS	----	70	130

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **WN1600919**	Page	: 1 of 3
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: ALS Water - Newcastle
Contact	: MS KIM SMITH	Contact	: Andrea Swan
Address	: 5/585 Maitland Road MAYFIELD NSW, AUSTRALIA 2304	Address	: 5/585 Maitland Road Newcastle West NSW Australia 2304
Telephone	: ----	Telephone	: +61 2 4014 2500
Project	: Hunter Water	Date Samples Received	: 22-Mar-2016 15:32
Order number	: ----	Date Analysis Commenced	: 24-Mar-2016
C-O-C number	: ----	Issue Date	: 30-Mar-2016 14:53
Sampler	: ----		
Site	: ----		
Quote number	: ----		
No. of samples received	: 3		
No. of samples analysed	: 3		

NATA Accredited Laboratory 825
Accredited for compliance with
ISO/IEC 17025.

NATA
WORLD RECOGNISED ACCREDITATION

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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*
Lana Nguyen	Senior LCMS Chemist	Sydney Organics, Smithfield, NSW

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.

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.

- PFOS and PFOA results are reported as an aggregate of linear and branched isomers.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)				Client sample ID	**H1603615 Paterson River**	**H1603616 Allyn River**	**H1603646 Campvale PS Inlet R9**	**----**	**----**
				Client sampling date / time	[22-Mar-2016]	[22-Mar-2016]	[22-Mar-2016]	----	----
Compound	*CAS Number*	*LOR*	*Unit*		**WN1600919-001**	**WN1600919-002**	**WN1600919-003**	**--------**	**--------**
					Result	Result	Result	Result	Result
EP231: Perfluorinated Compounds									
PFOS	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	**----**	**----**
PFOA	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	**----**	**----**
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L		<0.1	<0.1	<0.1	**----**	**----**
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L		<0.1	<0.1	<0.1	**----**	**----**
EP231S: PFC Surrogate									
13C4-PFOS	----	0.01	%		**120**	**100**	**101**	**----**	**----**

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFC Surrogate			
13C4-PFOS	----	70	130

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **WN1600941**	Page	: 1 of 3
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: ALS Water - Newcastle
Contact	: MS KIM SMITH	Contact	: Andrea Swan
Address	: 5/585 Maitland Road MAYFIELD NSW, AUSTRALIA 2304	Address	: 5/585 Maitland Road Newcastle West NSW Australia 2304
Telephone	: ----	Telephone	: +61 2 4014 2500
Project	: Hunter Water	Date Samples Received	: 29-Mar-2016 11:14
Order number	: ----	Date Analysis Commenced	: 30-Mar-2016
C-O-C number	: ----	Issue Date	: 05-Apr-2016 16:25
Sampler	: ----		
Site	: ----		
Quote number	: ----		
No. of samples received	: 3		
No. of samples analysed	: 3		

NATA Accredited Laboratory 825
Accredited for compliance with
ISO/IEC 17025.

NATA
WORLD RECOGNISED ACCREDITATION

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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*
Lana Nguyen	Senior LCMS Chemist	Sydney Organics, Smithfield, NSW

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.

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.

- PFOS and PFOA results are reported as an aggregate of linear and branched isomers.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)				Client sample ID	**H1603916 Paterson River**	**H1603917 Allyn River**	**H1603977 Campvale PS Inlet R9**	**----**	**----**
				Client sampling date / time	[29-Mar-2016]	[29-Mar-2016]	[29-Mar-2016]	----	----
Compound	*CAS Number*	*LOR*	*Unit*		**WN1600941-001**	**WN1600941-002**	**WN1600941-003**	**--------**	**--------**
					Result	Result	Result	Result	Result
EP231: Perfluorinated Compounds									
PFOS	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	**----**	**----**
PFOA	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	**----**	**----**
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L		<0.1	<0.1	<0.1	**----**	**----**
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L		<0.1	<0.1	<0.1	**----**	**----**
EP231S: PFC Surrogate									
13C4-PFOS	----	0.01	%		**104**	**92.4**	**107**	**----**	**----**

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFC Surrogate			
13C4-PFOS	----	70	130

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **WN1601003**	Page	: 1 of 3
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: ALS Water - Newcastle
Contact	: MS KIM SMITH	Contact	: Andrea Swan
Address	: 5/585 Maitland Road MAYFIELD NSW, AUSTRALIA 2304	Address	: 5/585 Maitland Road Newcastle West NSW Australia 2304
Telephone	: ----	Telephone	: +61 2 4014 2500
Project	: Hunter Water	Date Samples Received	: 04-Apr-2016 13:01
Order number	: ----	Date Analysis Commenced	: 06-Apr-2016
C-O-C number	: ----	Issue Date	: 11-Apr-2016 17:17
Sampler	: ----		
Site	: ----		
Quote number	: ----		
No. of samples received	: 3		
No. of samples analysed	: 3		

NATA Accredited Laboratory 825
Accredited for compliance with
ISO/IEC 17025.

NATA
WORLD RECOGNISED ACCREDITATION

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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*
Alex Rossi	Organic Chemist	Sydney Organics, Smithfield, NSW

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.

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.

- PFOS and PFOA results are reported as an aggregate of linear and branched isomers.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**H1605383 LTP TW Raw Water**	**H1605378 Anna Bay TW Raw**	**H1605358 G/Town Raw Water Inlet Pit**	**----**	**----**
			Client sampling date / time	[04-Apr-2016]	[04-Apr-2016]	[04-Apr-2016]	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**WN1601003-001**	**WN1601003-002**	**WN1601003-003**	**--------**	**--------**
				Result	Result	Result	Result	Result
EP231: Perfluorinated Compounds								
PFOS	1763-23-1	0.01	µg/L	<0.01	<0.01	<0.01	**----**	**----**
PFOA	335-67-1	0.01	µg/L	<0.01	<0.01	<0.01	**----**	**----**
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L	<0.1	<0.1	<0.1	**----**	**----**
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L	<0.1	<0.1	<0.1	**----**	**----**
EP231S: PFC Surrogate								
13C4-PFOS	----	0.01	%	**118**	**122**	**108**	**----**	**----**

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFC Surrogate			
13C4-PFOS	----	70	130

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **WN1601060**	Page	: 1 of 3
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: ALS Water - Newcastle
Contact	: MS KIM SMITH	Contact	: Andrea Swan
Address	: 5/585 Maitland Road MAYFIELD NSW, AUSTRALIA 2304	Address	: 5/585 Maitland Road Newcastle West NSW Australia 2304
Telephone	: ----	Telephone	: +61 2 4014 2500
Project	: Hunter Water	Date Samples Received	: 05-Apr-2016 10:47
Order number	: ----	Date Analysis Commenced	: 06-Apr-2016
C-O-C number	: ----	Issue Date	: 12-Apr-2016 12:04
Sampler	: ----		
Site	: ----		
Quote number	: ----		
No. of samples received	: 3		
No. of samples analysed	: 3		

NATA Accredited Laboratory 825
Accredited for compliance with
ISO/IEC 17025.

NATA
WORLD RECOGNISED ACCREDITATION

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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*
Alex Rossi	Organic Chemist	Sydney Organics, Smithfield, NSW

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.

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.

- PFOS and PFOA results are reported as an aggregate of linear and branched isomers.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)				Client sample ID	**H1605501 Campvale PS Inlet R9**	**H1605455 Dungog TW Raw**	**H1605466 Allyn River**	**----**	**----**
				Client sampling date / time	[05-Apr-2016]	[05-Apr-2016]	[05-Apr-2016]	----	----
Compound	*CAS Number*	*LOR*	*Unit*		**WN1601060-001**	**WN1601060-002**	**WN1601060-003**	**--------**	**--------**
					Result	Result	Result	Result	Result
EP231: Perfluorinated Compounds									
PFOS	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	**----**	**----**
PFOA	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	**----**	**----**
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L		<0.1	<0.1	<0.1	**----**	**----**
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L		<0.1	<0.1	<0.1	**----**	**----**
EP231S: PFC Surrogate									
13C4-PFOS	----	0.01	%		**129**	**86.2**	**85.6**	**----**	**----**

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFC Surrogate			
13C4-PFOS	----	70	130

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **WN1601089**	Page	: 1 of 3
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: ALS Water - Newcastle
Contact	: MS KIM SMITH	Contact	: Andrea Swan
Address	: 5/585 Maitland Road MAYFIELD NSW, AUSTRALIA 2304	Address	: 5/585 Maitland Road Newcastle West NSW Australia 2304
Telephone	: ----	Telephone	: +61 2 4014 2500
Project	: Hunter Water	Date Samples Received	: 12-Apr-2016 15:12
Order number	: ----	Date Analysis Commenced	: 14-Apr-2016
C-O-C number	: ----	Issue Date	: 15-Apr-2016 17:05
Sampler	: ----		
Site	: ----		
Quote number	: ----		
No. of samples received	: 3		
No. of samples analysed	: 3		

NATA Accredited Laboratory 825
Accredited for compliance with
ISO/IEC 17025.

NATA
WORLD RECOGNISED ACCREDITATION

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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*
Lana Nguyen	Senior LCMS Chemist	Sydney Organics, Smithfield, NSW

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.

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.

- PFOS and PFOA results are reported as an aggregate of linear and branched isomers.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**H1605910 Campvale PS Inlet R9**	**H1605859 Paterson River**	**H1605860 Allyn River**	**----**	**----**
			Client sampling date / time	[12-Apr-2016]	[12-Apr-2016]	[12-Apr-2016]	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**WN1601089-001**	**WN1601089-002**	**WN1601089-003**	**--------**	**--------**
				Result	Result	Result	Result	Result
EP231: Perfluorinated Compounds								
PFOS	1763-23-1	0.01	µg/L	<0.01	<0.01	<0.01	**----**	**----**
PFOA	335-67-1	0.01	µg/L	<0.01	<0.01	<0.01	**----**	**----**
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L	<0.1	<0.1	<0.1	**----**	**----**
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L	<0.1	<0.1	<0.1	**----**	**----**
EP231S: PFC Surrogate								
13C4-PFOS	----	0.01	%	**112**	**110**	**108**	**----**	**----**

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFC Surrogate			
13C4-PFOS	----	70	130

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **WN1601282**	Page	: 1 of 3
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: ALS Water - Newcastle
Contact	: MS KIM SMITH	Contact	: Andrea Swan
Address	: 5/585 Maitland Road MAYFIELD NSW, AUSTRALIA 2304	Address	: 5/585 Maitland Road Newcastle West NSW Australia 2304
Telephone	: ----	Telephone	: +61 2 4014 2500
Project	: SPECIALIST TESTS	Date Samples Received	: 26-Apr-2016 16:11
Order number	: ----	Date Analysis Commenced	: 27-Apr-2016
C-O-C number	: ----	Issue Date	: 02-May-2016 15:43
Sampler	: ----		
Site	: ----		
Quote number	: ----		
No. of samples received	: 3		
No. of samples analysed	: 3		

NATA Accredited Laboratory 825
Accredited for compliance with
ISO/IEC 17025.

NATA
WORLD RECOGNISED ACCREDITATION

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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*
Lana Nguyen	Senior LCMS Chemist	Sydney Organics, Smithfield, NSW

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.

- PFOS and PFOA results are reported as an aggregate of linear and branched isomers.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**H1606571 Paterson River**	**H1606572 Allyn River**	**H1606633 Campvale PS Inlet**	**----**	**----**
			Client sampling date / time	[26-Apr-2016]	[26-Apr-2016]	[26-Apr-2016]	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**WN1601282-001**	**WN1601282-002**	**WN1601282-003**	**--------**	**--------**
				Result	Result	Result	----	----
EP231: Perfluorinated Compounds								
PFOS	1763-23-1	0.01	µg/L	<0.01	<0.01	<0.01	**----**	**----**
PFOA	335-67-1	0.01	µg/L	<0.01	<0.01	<0.01	**----**	**----**
6:2 Fluorotelomer sulfonate (6:2 FtS)	27619-97-2	0.1	µg/L	<0.1	<0.1	<0.1	**----**	**----**
8:2 Fluorotelomer sulfonate	39108-34-4	0.1	µg/L	<0.1	<0.1	<0.1	**----**	**----**
EP231S: PFC Surrogate								
13C4-PFOS	----	0.01	%	**102**	**105**	**113**	**----**	**----**

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFC Surrogate			
13C4-PFOS	----	70	130

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **WN1601368**	Page	: 1 of 3
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: ALS Water - Newcastle
Contact	: MS KIM SMITH	Contact	: Andrea Swan
Address	: 5/585 Maitland Road MAYFIELD NSW, AUSTRALIA 2304	Address	: 5/585 Maitland Road Newcastle West NSW Australia 2304
Telephone	: ----	Telephone	: +61 2 4014 2500
Project	: Hunter Water	Date Samples Received	: 02-May-2016 16:13
Order number	: ----	Date Analysis Commenced	: 03-May-2016
C-O-C number	: ----	Issue Date	: 05-May-2016 08:54
Sampler	: ----		
Site	: ----		
Quote number	: ----		
No. of samples received	: 4		
No. of samples analysed	: 4		

NATA Accredited Laboratory 825
Accredited for compliance with
ISO/IEC 17025.

NATA
WORLD RECOGNISED ACCREDITATION

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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*
Lana Nguyen	Senior LCMS Chemist	Sydney Organics, Smithfield, NSW

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.

- PFOS and PFOA results are reported as an aggregate of linear and branched isomers.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)				Client sample ID	**H1612377 Newcastle Airport**	**H1607269 LTP TW Raw Water**	**H1607264 Anna Bay TW Raw**	**H1607240 G/Town Raw Water Inlet Pit**	**----**
				Client sampling date / time	[02-May-2016]	[02-May-2016]	[02-May-2016]	[02-May-2016]	----
Compound	*CAS Number*	*LOR*	*Unit*		**WN1601368-001**	**WN1601368-002**	**WN1601368-003**	**WN1601368-004**	**--------**
					Result	Result	Result	Result	----
EP231: Perfluorinated Compounds									
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.33**	<0.01	<0.01	<0.01	**----**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**----**
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	**----**
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	**----**
EP231S: PFC Surrogate									
13C4-PFOS	----	0.01	%		**115**	**117**	**116**	**112**	**----**

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFC Surrogate			
13C4-PFOS	----	70	130

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **WN1601389**	Page	: 1 of 3
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: ALS Water - Newcastle
Contact	: MS KIM SMITH	Contact	: Andrea Swan
Address	: 5/585 Maitland Road MAYFIELD NSW, AUSTRALIA 2304	Address	: 5/585 Maitland Road Newcastle West NSW Australia 2304
Telephone	: ----	Telephone	: +61 2 4014 2500
Project	: Hunter Water	Date Samples Received	: 03-May-2016 16:18
Order number	: ----	Date Analysis Commenced	: 04-May-2016
C-O-C number	: ----	Issue Date	: 09-May-2016 15:45
Sampler	: ----		
Site	: ----		
Quote number	: ----		
No. of samples received	: 4		
No. of samples analysed	: 4		

NATA Accredited Laboratory 825
Accredited for compliance with
ISO/IEC 17025.

NATA
WORLD RECOGNISED ACCREDITATION

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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*
Lana Nguyen	Senior LCMS Chemist	Sydney Organics, Smithfield, NSW

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.

- PFOS and PFOA results are reported as an aggregate of linear and branched isomers.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)				---- **Campvale PS Inlet R9**	---- **Allyn River**	---- **Paterson River**	---- **Dungog TW Raw**	----
			Client sampling date / time	[03-May-2016]	[03-May-2016]	[03-May-2016]	[03-May-2016]	----
Compound	*CAS Number*	*LOR*	*Unit*	**WN1601389-001**	**WN1601389-002**	**WN1601389-003**	**WN1601389-004**	--------
				Result	Result	Result	Result	----
EP231: Perfluorinated Compounds								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	----
EP231S: PFC Surrogate								
13C4-PFOS	----	0.01	%	**98.6**	**97.1**	**104**	**98.0**	----

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFC Surrogate			
13C4-PFOS	----	70	130

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **WN1601457**	Page	: 1 of 3
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: ALS Water - Newcastle
Contact	: MS KIM SMITH	Contact	: Andrea Swan
Address	: 5/585 Maitland Road MAYFIELD NSW, AUSTRALIA 2304	Address	: 5/585 Maitland Road Newcastle West NSW Australia 2304
Telephone	: ----	Telephone	: +61 2 4014 2500
Project	: SPECIALIST TESTS	Date Samples Received	: 10-May-2016 16:30
Order number	: ----	Date Analysis Commenced	: 11-May-2016
C-O-C number	: ----	Issue Date	: 16-May-2016 09:26
Sampler	: ----		
Site	: ----		
Quote number	: ----		
No. of samples received	: 4		
No. of samples analysed	: 4		

NATA Accredited Laboratory 825
Accredited for compliance with
ISO/IEC 17025.

NATA
WORLD RECOGNISED ACCREDITATION

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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*
Lana Nguyen	Senior LCMS Chemist	Sydney Organics, Smithfield, NSW

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.

- PFOS and PFOA results are reported as an aggregate of linear and branched isomers.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)				Client sample ID	**H1608010 Paterson River**	**H1608011 Allyn River**	**H1608064 Campvale PS Inlet R9**	**H1612523 Newcastle Airport**	**----**
				Client sampling date / time	[10-May-2016]	[10-May-2016]	[10-May-2016]	[10-May-2016]	----
Compound	*CAS Number*	*LOR*	*Unit*		**WN1601457-001**	**WN1601457-002**	**WN1601457-003**	**WN1601457-004**	**--------**
					Result	Result	Result	Result	----
EP231: Perfluorinated Compounds									
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**----**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**----**
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	**----**
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	**----**
EP231S: PFC Surrogate									
13C4-PFOS	----	0.01	%		**93.1**	**101**	**98.2**	**99.5**	**----**

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFC Surrogate			
13C4-PFOS	----	70	130

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **WN1601520**	Page	: 1 of 6
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: ALS Water - Newcastle
Contact	: MS KIM SMITH	Contact	: Andrea Swan
Address	: 5/585 Maitland Road MAYFIELD NSW, AUSTRALIA 2304	Address	: 5/585 Maitland Road Newcastle West NSW Australia 2304
Telephone	: ----	Telephone	: +61 2 4014 2500
Project	: SPECIALIST TESTS	Date Samples Received	: 17-May-2016 15:51
Order number	: ----	Date Analysis Commenced	: 18-May-2016
C-O-C number	: ----	Issue Date	: 24-May-2016 15:30
Sampler	: ----		
Site	: ----		
Quote number	: ----		
No. of samples received	: 11		
No. of samples analysed	: 11		

NATA Accredited Laboratory 825
Accredited for compliance with
ISO/IEC 17025.

NATA
WORLD RECOGNISED ACCREDITATION

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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*
Alex Rossi	Organic Chemist	Sydney Organics, Smithfield, NSW

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.

- PFOS and PFOA results are reported as an aggregate of linear and branched isomers.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)				Client sample ID	H1612679 Farley Disinfected Effluent	H1612681 Wallis CCreek 100m Upstream	H1612682 Wallis Creek @ Ross Lane	H1612685 Fishery Creek Upstream	H1612678 Farley Raw
				Client sampling date / time	[17-May-2016]	[17-May-2016]	[17-May-2016]	[17-May-2016]	[17-May-2016]
Compound	*CAS Number*	*LOR*	*Unit*		**WN1601520-001**	**WN1601520-002**	**WN1601520-003**	**WN1601520-004**	**WN1601520-005**
					Result	Result	Result	Result	Result
EP231: Perfluorinated Compounds									
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.10**	**0.07**	**0.05**	<0.01	**0.14**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.02**	**0.02**	<0.01	<0.01	<0.01
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
EP231S: PFC Surrogate									
13C4-PFOS	----	0.01	%		**74.0**	**82.0**	**72.0**	**81.0**	**76.0**

Analytical Results

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

				Client sample ID	H1612680 Fishery Creek @ Park Street	H1612677 Farley A/Tank	H1612684 Fishery Creek Downstream	H1608990 Campvale PS Inlet R9	H1612683 Wallis Creek Upstream of Floodgates
				Client sampling date / time	[17-May-2016]	[17-May-2016]	[17-May-2016]	[17-May-2016]	[17-May-2016]
Compound	CAS Number	LOR	Unit		WN1601520-006	WN1601520-007	WN1601520-008	WN1601520-009	WN1601520-010
					Result	Result	Result	Result	Result
EP231: Perfluorinated Compounds									
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.04**	**0.06**	**0.08**	<0.01	**0.04**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.03**	**0.03**	**0.02**	<0.01	**0.02**
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
EP231S: PFC Surrogate									
13C4-PFOS	----	0.01	%		**74.0**	**74.0**	**77.7**	**72.0**	**74.0**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	H1612705 Newcastle Airport	----	----	----	----
				Client sampling date / time	[17-May-2016]	----	----	----	----
Compound	CAS Number	LOR	Unit		WN1601520-011	--------	--------	--------	--------
					Result	----	----	----	----
EP231: Perfluorinated Compounds									
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.08**	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.1	µg/L		<0.1	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.1	µg/L		<0.1	----	----	----	----
EP231S: PFC Surrogate									
13C4-PFOS	----	0.01	%		**72.0**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFC Surrogate			
13C4-PFOS	----	70	130

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **WN1601687**	Page	: 1 of 3
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: ALS Water - Newcastle
Contact	: MS KIM SMITH	Contact	:
Address	: 5/585 Maitland Road MAYFIELD NSW, AUSTRALIA 2304	Address	: 5/585 Maitland Road Newcastle West NSW Australia 2304
Telephone	: ----	Telephone	: +61 2 4014 2500
Project	: SPECIALIST TESTS	Date Samples Received	: 31-May-2016 15:54
Order number	: ----	Date Analysis Commenced	: 01-Jun-2016
C-O-C number	: ----	Issue Date	: 02-Jun-2016 15:57
Sampler	: ----		
Site	: ----		
Quote number	: ----		
No. of samples received	: 1		
No. of samples analysed	: 1		

NATA Accredited Laboratory 825
Accredited for compliance with
ISO/IEC 17025.

NATA
WORLD RECOGNISED ACCREDITATION

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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*
Lana Nguyen	Senior LCMS Chemist	Sydney Organics, Smithfield, NSW

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.

- PFOS and PFOA results are reported as an aggregate of linear and branched isomers.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**----** **Campvale PS Inlet R9**	**----**	**----**	**----**	**----**
			Client sampling date / time	[31-May-2016]	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**WN1601687-001**	**--------**	**--------**	**--------**	**--------**
				Result	----	----	----	----
EP231: Perfluorinated Compounds								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	**----**	**----**	**----**	**----**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	**----**	**----**	**----**	**----**
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.1	µg/L	<0.1	**----**	**----**	**----**	**----**
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.1	µg/L	<0.1	**----**	**----**	**----**	**----**
EP231S: PFC Surrogate								
13C4-PFOS	----	0.01	%	**110**	**----**	**----**	**----**	**----**

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFC Surrogate			
13C4-PFOS	----	70	130

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **WN1601768**	Page	: 1 of 3
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: ALS Water - Newcastle
Contact	: MS KIM SMITH	Contact	:
Address	: 5/585 Maitland Road MAYFIELD NSW, AUSTRALIA 2304	Address	: 5/585 Maitland Road Newcastle West NSW Australia 2304
Telephone	: ----	Telephone	: +61 2 4014 2500
Project	: Hunter Water	Date Samples Received	: 07-Jun-2016 14:43
Order number	: ----	Date Analysis Commenced	: 08-Jun-2016
C-O-C number	: ----	Issue Date	: 09-Jun-2016 13:55
Sampler	: ----		
Site	: ----		
Quote number	: ----		
No. of samples received	: 5		
No. of samples analysed	: 5		

NATA Accredited Laboratory 825
Accredited for compliance with
ISO/IEC 17025.

NATA
WORLD RECOGNISED ACCREDITATION

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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*
Alex Rossi	Organic Chemist	Sydney Organics, Smithfield, NSW

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.

- PFOS and PFOA results are reported as an aggregate of linear and branched isomers.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)				Client sample ID	**H1614432 Wallis Creek 100m Upstream**	**H1614442 Wallis Creek @ Ross Lane**	**H1614433 Wallis Creek Upstream of Floodgates**	**H1614434 Fishery Creek @ Park St**	**H1610885 Campvale PS Inlet R9**
				Client sampling date / time	[07-Jun-2016]	[07-Jun-2016]	[07-Jun-2016]	[07-Jun-2016]	[07-Jun-2016]
Compound	*CAS Number*	*LOR*	*Unit*		**WN1601768-001**	**WN1601768-002**	**WN1601768-003**	**WN1601768-004**	**WN1601768-005**
					Result	Result	Result	Result	Result
EP231: Perfluorinated Compounds									
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	**0.05**	**0.05**	**0.06**	<0.01
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
EP231S: PFC Surrogate									
13C4-PFOS	----	0.01	%		**102**	**116**	**102**	**102**	**110**

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFC Surrogate			
13C4-PFOS	----	70	130

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **WN1601839**	Page	: 1 of 5
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: ALS Water - Newcastle
Contact	: MS KIM SMITH	Contact	:
Address	: 5/585 Maitland Road MAYFIELD NSW, AUSTRALIA 2304	Address	: 5/585 Maitland Road Newcastle West NSW Australia 2304
Telephone	: ----	Telephone	: +61 2 4014 2500
Project	: Hunter Water	Date Samples Received	: 14-Jun-2016 15:31
Order number	: ----	Date Analysis Commenced	: 15-Jun-2016
C-O-C number	: ----	Issue Date	: 17-Jun-2016 13:20
Sampler	: ----		
Site	: ----		
Quote number	: ----		
No. of samples received	: 7		
No. of samples analysed	: 7		

NATA Accredited Laboratory 825
Accredited for compliance with
ISO/IEC 17025.

NATA
WORLD RECOGNISED ACCREDITATION

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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*
Alex Rossi	Organic Chemist	Sydney Organics, Smithfield, NSW

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.

- PFOS and PFOA results are reported as an aggregate of linear and branched isomers.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	H1611492 Campvale PS Inlet R9	H1611374 G/Town Raw Water Inlet Pit	H1611388 Anna Bay TW Raw	H1611391 LTP TW Raw Water	H1611420 Dungog TW Raw
			Client sampling date / time	[14-Jun-2016]	[14-Jun-2016]	[14-Jun-2016]	[14-Jun-2016]	[14-Jun-2016]
Compound	CAS Number	LOR	Unit	WN1601839-001	WN1601839-002	WN1601839-003	WN1601839-004	WN1601839-005
				Result	Result	Result	Result	Result
EP231: Perfluorinated Compounds								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.1	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
EP231S: PFC Surrogate								
13C4-PFOS	----	0.01	%	**94.3**	**91.9**	**92.1**	**90.4**	**85.7**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	H1611430 Paterson River	H1611431 Allyn River	----	----	----
			Client sampling date / time	[14-Jun-2016]	[14-Jun-2016]	----	----	----
Compound	CAS Number	LOR	Unit	WN1601839-006	WN1601839-007	--------	--------	--------
				Result	Result	----	----	----
EP231: Perfluorinated Compounds								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.1	µg/L	<0.1	<0.1	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.1	µg/L	<0.1	<0.1	----	----	----
EP231S: PFC Surrogate								
13C4-PFOS	----	0.01	%	**83.9**	**113**	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFC Surrogate			
13C4-PFOS	----	70	130

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **WN1601971**	Page	: 1 of 3
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: ALS Water - Newcastle
Contact	: MS KIM SMITH	Contact	:
Address	: 5/585 Maitland Road MAYFIELD NSW, AUSTRALIA 2304	Address	: 5/585 Maitland Road Newcastle West NSW Australia 2304
Telephone	: ----	Telephone	: +61 2 4014 2500
Project	: Hunter Water	Date Samples Received	: 23-Jun-2016 12:07
Order number	: ----	Date Analysis Commenced	: 24-Jun-2016
C-O-C number	: ----	Issue Date	: 30-Jun-2016 16:01
Sampler	: ----		
Site	: ----		
Quote number	: ----		
No. of samples received	: 1		
No. of samples analysed	: 1		

NATA Accredited Laboratory 825
Accredited for compliance with
ISO/IEC 17025.

NATA
WORLD RECOGNISED ACCREDITATION

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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*
Lana Nguyen	Senior LCMS Chemist	Sydney Organics, Smithfield, NSW

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.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**H1611840 Campvale PS Inlet R9**	----	----	----	----
			Client sampling date / time	22-Jun-2016 07:20	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**WN1601971-001**	--------	--------	--------	--------
				Result	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	----	----	----	----
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.02	%	**85.0**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	130

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **WN1602042**	Page	: 1 of 3
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: ALS Water - Newcastle
Contact	: MS KIM SMITH	Contact	:
Address	: 5/585 Maitland Road MAYFIELD NSW, AUSTRALIA 2304	Address	: 5/585 Maitland Road Newcastle West NSW Australia 2304
Telephone	: ----	Telephone	: +61 2 4014 2500
Project	: Hunter Water	Date Samples Received	: 29-Jun-2016 08:39
Order number	: ----	Date Analysis Commenced	: 30-Jun-2016
C-O-C number	: ----	Issue Date	: 05-Jul-2016 15:17
Sampler	: ----		
Site	: ----		
Quote number	: ----		
No. of samples received	: 1		
No. of samples analysed	: 1		

NATA Accredited Laboratory 825
Accredited for compliance with
ISO/IEC 17025.

NATA
WORLD RECOGNISED ACCREDITATION

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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*
Lana Nguyen	Senior LCMS Chemist	Sydney Organics, Smithfield, NSW

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.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**H1612149 Campvale PS Inlet R9**	----	----	----	----
			Client sampling date / time	[28-Jun-2016]	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**WN1602042-001**	--------	--------	--------	--------
				Result	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L	**0.003**	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L	**0.002**	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L	<0.002	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L	<0.002	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L	<0.002	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L	<0.005	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L	<0.005	----	----	----	----
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.002	%	**80.0**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	70	120

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **WN1602113**	Page	: 1 of 3
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: ALS Water - Newcastle
Contact	: MS KIM SMITH	Contact	:
Address	: 5/585 Maitland Road MAYFIELD NSW, AUSTRALIA 2304	Address	: 5/585 Maitland Road Newcastle West NSW Australia 2304
Telephone	: ----	Telephone	: +61 2 4014 2500
Project	: Hunter Water	Date Samples Received	: 05-Jul-2016 13:01
Order number	: ----	Date Analysis Commenced	: 06-Jul-2016
C-O-C number	: ----	Issue Date	: 08-Jul-2016 14:46
Sampler	: ----		
Site	: ----		
Quote number	: ----		
No. of samples received	: 4		
No. of samples analysed	: 4		

NATA Accredited Laboratory 825
Accredited for compliance with
ISO/IEC 17025.

NATA
WORLD RECOGNISED ACCREDITATION

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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*
Alex Rossi	Organic Chemist	Sydney Organics, Smithfield, NSW

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.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**H1616735 Newcastle Airport**	**H1613032 Campvale PS Inlet R9**	**H1612976 Allyn River**	**H1612975 Paterson River**	**----**
			Client sampling date / time	[05-Jul-2016]	[05-Jul-2016]	[05-Jul-2016]	[05-Jul-2016]	----
Compound	*CAS Number*	*LOR*	*Unit*	**WN1602113-001**	**WN1602113-002**	**WN1602113-003**	**WN1602113-004**	**--------**
				Result	Result	Result	Result	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L	**0.046**	**0.004**	<0.002	<0.002	**----**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L	**0.264**	<0.002	<0.002	<0.002	**----**
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L	<0.002	<0.002	<0.002	<0.002	**----**
Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L	**0.005**	<0.002	<0.002	<0.002	**----**
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L	<0.002	<0.002	<0.002	<0.002	**----**
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L	<0.005	<0.005	<0.005	<0.005	**----**
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L	<0.005	<0.005	<0.005	<0.005	**----**
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.002	%	**82.6**	**85.3**	**94.4**	**90.3**	**----**

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	70	120

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **WN1602194**	Page	: 1 of 3
Amendment	: **1**		
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: ALS Water - Newcastle
Contact	: MS KIM SMITH	Contact	:
Address	: 5/585 Maitland Road MAYFIELD NSW, AUSTRALIA 2304	Address	: 5/585 Maitland Road Newcastle West NSW Australia 2304
Telephone	: ----	Telephone	: +61 2 4014 2500
Project	: SPECIALIST TESTS	Date Samples Received	: 11-Jul-2016 16:22
Order number	: ----	Date Analysis Commenced	: 12-Jul-2016
C-O-C number	: ----	Issue Date	: 18-Jul-2016 12:34
Sampler	: ----		
Site	: ----		
Quote number	: ----		
No. of samples received	: 3		
No. of samples analysed	: 3		

NATA Accredited Laboratory 825
Accredited for compliance with
ISO/IEC 17025.

NATA
WORLD RECOGNISED ACCREDITATION

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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*
Alex Rossi	Organic Chemist	Sydney Organics, Smithfield, NSW

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.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			*Client sample ID*	**H1616745 H K Powder Coating**	**H1613306 LTP TW Raw Water**	**H1613303 Anna Bay TW Raw**	**----**	**----**
			Client sampling date / time	[11-Jul-2016]	[11-Jul-2016]	[11-Jul-2016]	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**WN1602194-001**	**WN1602194-002**	**WN1602194-003**	**--------**	**--------**
				Result	Result	Result	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L	<0.002	<0.002	<0.002	**----**	**----**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L	**0.004**	<0.002	<0.002	**----**	**----**
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L	<0.002	<0.002	<0.002	**----**	**----**
Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L	<0.002	<0.002	<0.002	**----**	**----**
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L	<0.002	<0.002	<0.002	**----**	**----**
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L	**0.011**	<0.005	**0.008**	**----**	**----**
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L	<0.005	<0.005	<0.005	**----**	**----**
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.002	%	**90.7**	**101**	**89.5**	**----**	**----**

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	70	120

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **WN1602214**	Page	: 1 of 3
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: ALS Water - Newcastle
Contact	: Mr Greg Towers	Contact	:
Address	: 5/585 Maitland Road MAYFIELD NSW, AUSTRALIA 2304	Address	: 5/585 Maitland Road Newcastle West NSW Australia 2304
Telephone	: ----	Telephone	: +61 2 4014 2500
Project	: SPECIALIST TESTS	Date Samples Received	: 12-Jul-2016 16:30
Order number	: ----	Date Analysis Commenced	: 13-Jul-2016
C-O-C number	: ----	Issue Date	: 19-Jul-2016 12:55
Sampler	: ----		
Site	: ----		
Quote number	: ----		
No. of samples received	: 3		
No. of samples analysed	: 3		

NATA Accredited Laboratory 825
Accredited for compliance with
ISO/IEC 17025.

NATA
WORLD RECOGNISED ACCREDITATION

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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*
Alex Rossi	Organic Chemist	Sydney Organics, Smithfield, NSW

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.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**H1613289 G/Town Raw Water (Inlet Pit)**	**H1613297 Dungog TW Raw**	**H1613423 Campvale PS Inlet R9**	**----**	**----**
			Client sampling date / time	[12-Jul-2016]	[12-Jul-2016]	[12-Jul-2016]	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**WN1602214-001**	**WN1602214-002**	**WN1602214-003**	**--------**	**--------**
				Result	Result	Result	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L	<0.002	<0.002	<0.002	**----**	**----**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L	<0.002	<0.002	<0.002	**----**	**----**
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L	<0.002	<0.002	<0.002	**----**	**----**
Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L	<0.002	<0.002	<0.002	**----**	**----**
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L	<0.002	<0.002	<0.002	**----**	**----**
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L	<0.005	<0.005	<0.005	**----**	**----**
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L	<0.005	<0.005	<0.005	**----**	**----**
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.002	%	**110**	**95.3**	**111**	**----**	**----**
13C4-PFOS	----	0.02	%	**----**	**106**	**----**	**----**	**----**

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	70	120

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **WN1602296**	Page	: 1 of 3
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: ALS Water - Newcastle
Contact	: MR NEIL MARTIN	Contact	:
Address	: 5/585 Maitland Road MAYFIELD NSW, AUSTRALIA 2304	Address	: 5/585 Maitland Road Newcastle West NSW Australia 2304
Telephone	: ----	Telephone	: +61 2 4014 2500
Project	: Hunter Water	Date Samples Received	: 19-Jul-2016 15:02
Order number	: ----	Date Analysis Commenced	: 20-Jul-2016
C-O-C number	: ----	Issue Date	: 25-Jul-2016 11:04
Sampler	: ----		
Site	: ----		
Quote number	: ----		
No. of samples received	: 1		
No. of samples analysed	: 1		

NATA Accredited Laboratory 825
Accredited for compliance with
ISO/IEC 17025.

NATA
WORLD RECOGNISED ACCREDITATION

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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*
Alex Rossi	Organic Chemist	Sydney Organics, Smithfield, NSW

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.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**H1613759 Campvale PS Inlet R9**	----	----	----	----
			Client sampling date / time	[19-Jul-2016]	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**WN1602296-001**	--------	--------	--------	--------
				Result	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L	<0.002	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L	**0.004**	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L	<0.002	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L	<0.002	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L	<0.002	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L	<0.005	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L	<0.005	----	----	----	----
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.002	%	**91.1**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	70	120

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **WN1602371**	Page	: 1 of 3
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: ALS Water - Newcastle
Contact	: MR NEIL MARTIN	Contact	:
Address	: 5/585 Maitland Road MAYFIELD NSW, AUSTRALIA 2304	Address	: 5/585 Maitland Road Newcastle West NSW Australia 2304
Telephone	: ----	Telephone	: +61 2 4014 2500
Project	: Hunter Water	Date Samples Received	: 26-Jul-2016 13:27
Order number	: ----	Date Analysis Commenced	: 28-Jul-2016
C-O-C number	: ----	Issue Date	: 02-Aug-2016 15:11
Sampler	: ----		
Site	: ----		
Quote number	: ----		
No. of samples received	: 1		
No. of samples analysed	: 1		

NATA Accredited Laboratory 825
Accredited for compliance with
ISO/IEC 17025.

NATA
WORLD RECOGNISED ACCREDITATION

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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*
Alex Rossi	Organic Chemist	Sydney Organics, Smithfield, NSW

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.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**H1614082 Campvale PS Inlet R9**	----	----	----	----
			Client sampling date / time	[26-Jul-2016]	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**WN1602371-001**	--------	--------	--------	--------
				Result	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L	<0.002	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L	<0.002	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L	<0.002	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L	<0.002	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L	<0.002	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L	<0.005	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L	<0.005	----	----	----	----
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.002	%	**107**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	70	120

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **WN1602460**	Page	: 1 of 3
Client	: **AUSTRALIAN LABORATORY SERVICES PTY LTD**	Laboratory	: ALS Water - Newcastle
Contact	: MR NEIL MARTIN	Contact	:
Address	: 5/585 Maitland Road MAYFIELD NSW, AUSTRALIA 2304	Address	: 5/585 Maitland Road Newcastle West NSW Australia 2304
Telephone	: ----	Telephone	: +61 2 4014 2500
Project	: Hunter Water	Date Samples Received	: 02-Aug-2016 14:26
Order number	: ----	Date Analysis Commenced	: 03-Aug-2016
C-O-C number	: ----	Issue Date	: 05-Aug-2016 11:47
Sampler	: ----		
Site	: ----		
Quote number	: ----		
No. of samples received	: 3		
No. of samples analysed	: 3		

NATA Accredited Laboratory 825
Accredited for compliance with
ISO/IEC 17025.

NATA
WORLD RECOGNISED ACCREDITATION

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

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*
Alex Rossi	Organic Chemist	Sydney Organics, Smithfield, NSW

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.

Analytical Results

Sub-Matrix: **WATER** (Matrix: **WATER**)			Client sample ID	**H1614856 Campvale PS Inlet R9**	**H1614805 Paterson River**	**H1614806 Allyn River**	**----**	**----**
			Client sampling date / time	[02-Aug-2016]	[02-Aug-2016]	[02-Aug-2016]	----	----
Compound	*CAS Number*	*LOR*	*Unit*	**WN1602460-001**	**WN1602460-002**	**WN1602460-003**	**--------**	**--------**
				Result	Result	Result	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L	**0.003**	<0.002	<0.002	**----**	**----**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L	**0.002**	<0.002	<0.002	**----**	**----**
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L	<0.002	<0.002	<0.002	**----**	**----**
Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L	<0.002	<0.002	<0.002	**----**	**----**
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L	<0.002	<0.002	<0.002	**----**	**----**
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L	<0.005	<0.005	<0.005	**----**	**----**
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L	<0.005	<0.005	<0.005	**----**	**----**
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.002	%	**95.2**	**102**	**106**	**----**	**----**

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	70	120