CERTIFICATE OF ANALYSIS

Work Order	: **ES2317132**	Page	: 1 of 10
Amendment	: **1**		
Client	: **DEPARTMENT OF PLANNING AND ENVIRONMENT (NSW-DPE)**	Laboratory	: Environmental Division Sydney
Contact	: OEH	Contact	: Customer Services ES
Address	: [redacted] Lidcombe 2141	Address	: [redacted]
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 20230174	Date Samples Received	: 23-May-2023 13:20
Order number	: 4500806025	Date Analysis Commenced	: 23-May-2023
C-O-C number	: ----	Issue Date	: 02-Jun-2023 12:54
Sampler	: ----		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 28		
No. of samples analysed	: 28		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
[redacted]	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
[redacted]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

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

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

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

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

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

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

- EP202: Poor matrix spike recoveries for Picloram and Clopyralid due to matrix effects.
- EP204: Matrix spike could not be recovered due to matrix interferences.
- Amendment (02/06/2023): This report has been amended as a result of misinterpretation of sample identification numbers (IDs) for samples 4. All analysis results are as per the previous report.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	233856	233857	233858	233859	233860
				Sampling date / time	17-May-2023 00:00	17-May-2023 00:00	17-May-2023 00:00	17-May-2023 00:00	17-May-2023 00:00
Compound	CAS Number	LOR	Unit		ES2317132-001	ES2317132-002	ES2317132-003	ES2317132-004	ES2317132-005
					Result	Result	Result	Result	Result
EP202A: Phenoxyacetic Acid Herbicides by LCMS									
4-Chlorophenoxy acetic acid	122-88-3	10	µg/L		<10	<10	<10	<10	<10
2.4-DB	94-82-6	10	µg/L		<10	<10	<10	<10	<10
Dicamba	1918-00-9	10	µg/L		<10	<10	<10	<10	<10
Mecoprop	93-65-2	10	µg/L		<10	<10	<10	<10	<10
MCPA	94-74-6	10	µg/L		<10	<10	<10	<10	<10
2.4-DP	120-36-5	10	µg/L		<10	<10	<10	<10	<10
2.4-D	94-75-7	10	µg/L		<10	<10	<10	<10	<10
Triclopyr	55335-06-3	10	µg/L		<10	<10	<10	<10	<10
Silvex (2.4.5-TP/Fenoprop)	93-72-1	10	µg/L		<10	<10	<10	<10	<10
2.4.5-T	93-76-5	10	µg/L		<10	<10	<10	<10	<10
MCPB	94-81-5	10	µg/L		<10	<10	<10	<10	<10
Picloram	1918-02-1	10	µg/L		<10	<10	<10	<10	<10
Clopyralid	1702-17-6	10	µg/L		<10	<10	<10	<10	<10
Fluroxypyr	69377-81-7	10	µg/L		<10	<10	<10	<10	<10
2.6-D	575-90-6	10	µg/L		<10	<10	<10	<10	<10
2.4.6-T	575-89-3	10	µg/L		<10	<10	<10	<10	<10
EP204: Glyphosate and AMPA									
Glyphosate	1071-83-6	10	µg/L		<10	<10	<10	<10	<10
AMPA	1066-51-9	10	µg/L		<10	<10	<10	<10	<10
EP202S: Phenoxyacetic Acid Herbicide Surrogate									
2.4-Dichlorophenyl Acetic Acid	19719-28-9	10	%		**98.6**	**93.6**	**95.0**	**92.6**	**93.6**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	233861	233862	233944	233945	233946
			Sampling date / time	17-May-2023 00:00	17-May-2023 00:00	17-May-2023 00:00	17-May-2023 00:00	17-May-2023 00:00
Compound	CAS Number	LOR	Unit	ES2317132-006	ES2317132-007	ES2317132-008	ES2317132-009	ES2317132-010
				Result	Result	Result	Result	Result
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	----	----	<0.01	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	----	----	**0.01**	**0.02**	**0.02**
EK061F: Filtered Total Kjeldahl Nitrogen as N (TKN)								
Dissolved TKN as N	----	0.1	mg/L	----	----	----	**0.7**	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	----	----	----	----	**0.6**
EK062F: Filtered Total Nitrogen as N								
^ Filtered Total Nitrogen as N	----	0.1	mg/L	----	----	----	**0.7**	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	----	----	----	----	**0.6**
EK067FG: Filtered Total Phosphorus as P by Discrete Analyser								
Filtered Total Phosphorus as P	----	0.01	mg/L	----	----	----	**0.22**	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	----	----	----	----	**0.30**
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	----	----	**0.29**	----	----
EP202A: Phenoxyacetic Acid Herbicides by LCMS								
4-Chlorophenoxy acetic acid	122-88-3	10	µg/L	<10	<10	----	----	----
2.4-DB	94-82-6	10	µg/L	<10	<10	----	----	----
Dicamba	1918-00-9	10	µg/L	<10	<10	----	----	----
Mecoprop	93-65-2	10	µg/L	<10	<10	----	----	----
MCPA	94-74-6	10	µg/L	<10	<10	----	----	----
2.4-DP	120-36-5	10	µg/L	<10	<10	----	----	----
2.4-D	94-75-7	10	µg/L	<10	<10	----	----	----
Triclopyr	55335-06-3	10	µg/L	<10	<10	----	----	----
Silvex (2.4.5-TP/Fenoprop)	93-72-1	10	µg/L	<10	<10	----	----	----
2.4.5-T	93-76-5	10	µg/L	<10	<10	----	----	----
MCPB	94-81-5	10	µg/L	<10	<10	----	----	----
Picloram	1918-02-1	10	µg/L	<10	<10	----	----	----
Clopyralid	1702-17-6	10	µg/L	<10	<10	----	----	----
Fluroxypyr	69377-81-7	10	µg/L	<10	<10	----	----	----
2.6-D	575-90-6	10	µg/L	<10	<10	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	233861	233862	233944	233945	233946
				Sampling date / time	17-May-2023 00:00	17-May-2023 00:00	17-May-2023 00:00	17-May-2023 00:00	17-May-2023 00:00
Compound	CAS Number	LOR	Unit		ES2317132-006	ES2317132-007	ES2317132-008	ES2317132-009	ES2317132-010
					Result	Result	Result	Result	Result
EP202A: Phenoxyacetic Acid Herbicides by LCMS - Continued									
2.4.6-T	575-89-3	10	µg/L		<10	<10	----	----	----
EP204: Glyphosate and AMPA									
Glyphosate	1071-83-6	10	µg/L		<10	<10	----	----	----
AMPA	1066-51-9	10	µg/L		<10	<10	----	----	----
EP202S: Phenoxyacetic Acid Herbicide Surrogate									
2.4-Dichlorophenyl Acetic Acid	19719-28-9	10	%		**94.8**	**98.7**	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	233947	233948	233949	233950	233951
			Sampling date / time	17-May-2023 00:00	17-May-2023 00:00	17-May-2023 00:00	17-May-2023 00:00	17-May-2023 00:00
Compound	CAS Number	LOR	Unit	ES2317132-011	ES2317132-012	ES2317132-013	ES2317132-014	ES2317132-015
				Result	Result	Result	Result	Result
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**0.12**	----	----	<0.01	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	**0.02**	**0.02**	**0.02**	**0.01**	**0.02**
EK061F: Filtered Total Kjeldahl Nitrogen as N (TKN)								
Dissolved TKN as N	----	0.1	mg/L	----	**1.1**	----	----	**0.8**
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	----	----	**1.3**	----	----
EK062F: Filtered Total Nitrogen as N								
^ **Filtered Total Nitrogen as N**	----	0.1	mg/L	----	**1.1**	----	----	**0.8**
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ **Total Nitrogen as N**	----	0.1	mg/L	----	----	**1.3**	----	----
EK067FG: Filtered Total Phosphorus as P by Discrete Analyser								
Filtered Total Phosphorus as P	----	0.01	mg/L	----	**0.15**	----	----	**0.27**
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	----	----	**0.26**	----	----
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	**0.15**	----	----	**0.30**	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	233952	233953	233954	233955	233956
			Sampling date / time	17-May-2023 00:00	17-May-2023 00:00	17-May-2023 00:00	17-May-2023 00:00	17-May-2023 00:00
Compound	CAS Number	LOR	Unit	ES2317132-016	ES2317132-017	ES2317132-018	ES2317132-019	ES2317132-020
				Result	Result	Result	Result	Result
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	----	0.03	----	----	0.05
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	0.01	<0.01	0.01	0.01	0.03
EK061F: Filtered Total Kjeldahl Nitrogen as N (TKN)								
Dissolved TKN as N	----	0.1	mg/L	----	----	0.7	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.8	----	----	1.2	----
EK062F: Filtered Total Nitrogen as N								
^ Filtered Total Nitrogen as N	----	0.1	mg/L	----	----	0.7	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	0.8	----	----	1.2	----
EK067FG: Filtered Total Phosphorus as P by Discrete Analyser								
Filtered Total Phosphorus as P	----	0.01	mg/L	----	----	0.21	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	0.34	----	----	0.36	----
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	----	0.21	----	----	0.16

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	233957	233958	233959	233960	233961
			Sampling date / time	17-May-2023 00:00	17-May-2023 00:00	17-May-2023 00:00	17-May-2023 00:00	17-May-2023 00:00
Compound	CAS Number	LOR	Unit	ES2317132-021	ES2317132-022	ES2317132-023	ES2317132-024	ES2317132-025
				Result	Result	Result	Result	Result
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	----	----	0.05	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	0.04	0.04	0.04	0.04	0.04
EK061F: Filtered Total Kjeldahl Nitrogen as N (TKN)								
Dissolved TKN as N	----	0.1	mg/L	0.8	----	----	0.8	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	----	1.1	----	----	1.0
EK062F: Filtered Total Nitrogen as N								
^ Filtered Total Nitrogen as N	----	0.1	mg/L	0.8	----	----	0.8	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ Total Nitrogen as N	----	0.1	mg/L	----	1.1	----	----	1.0
EK067FG: Filtered Total Phosphorus as P by Discrete Analyser								
Filtered Total Phosphorus as P	----	0.01	mg/L	0.18	----	----	0.14	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	----	0.24	----	----	0.25
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	----	----	0.15	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	233962	233963	233964	----	----
			Sampling date / time	17-May-2023 00:00	17-May-2023 00:00	17-May-2023 00:00	----	----
Compound	CAS Number	LOR	Unit	ES2317132-026	ES2317132-027	ES2317132-028	--------	--------
				Result	Result	Result	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**0.03**	----	----	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	**0.05**	**0.05**	**0.05**	----	----
EK061F: Filtered Total Kjeldahl Nitrogen as N (TKN)								
Dissolved TKN as N	----	0.1	mg/L	----	**0.9**	----	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	----	----	**1.3**	----	----
EK062F: Filtered Total Nitrogen as N								
^ **Filtered Total Nitrogen as N**	----	0.1	mg/L	----	**1.0**	----	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ **Total Nitrogen as N**	----	0.1	mg/L	----	----	**1.4**	----	----
EK067FG: Filtered Total Phosphorus as P by Discrete Analyser								
Filtered Total Phosphorus as P	----	0.01	mg/L	----	**0.14**	----	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	----	----	**0.24**	----	----
EK071G: Reactive Phosphorus as P by discrete analyser								
Reactive Phosphorus as P	14265-44-2	0.01	mg/L	**0.12**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP202S: Phenoxyacetic Acid Herbicide Surrogate			
2.4-Dichlorophenyl Acetic Acid	19719-28-9	64	140