



Environmental Forensics Report of Analysis

Project 20230146

Report #:

1651

Date Issued:

30-May-2023

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Client Project Reference: Menindee Fish Kill - 16 (IMT 3 May 2)

Customer: Department of Planning & Environment

Attention:

[Redacted]

EF Project Contact:

[Redacted]

[Redacted]

[Redacted]

Report Date: 30 May 2023

Project Received: 05 May 2023



The following samples were analysed:

Sample ID	Client ID	Sample Type	Client Sampled Date/Time	Aliquot
232917	E1	Liquid	03/05/2023	
232932	E1	Liquid	03/05/2023	Field Aliquot
232947	E1	Liquid	03/05/2023	Laboratory Aliquot
232918	E2	Liquid	03/05/2023	
232933	E2	Liquid	03/05/2023	Field Aliquot
232948	E2	Liquid	03/05/2023	Laboratory Aliquot
232919	E3	Liquid	03/05/2023	
232934	E3	Liquid	03/05/2023	Field Aliquot
232949	E3	Liquid	03/05/2023	Laboratory Aliquot
232920	E4	Liquid	03/05/2023	
232935	E4	Liquid	03/05/2023	Field Aliquot
232950	E4	Liquid	03/05/2023	Laboratory Aliquot
232921	E5	Liquid	03/05/2023	
232936	E5	Liquid	03/05/2023	Field Aliquot
232951	E5	Liquid	03/05/2023	Laboratory Aliquot
232928	B1	Liquid	03/05/2023	
232943	B1	Liquid	03/05/2023	Field Aliquot
232958	B1	Liquid	03/05/2023	Laboratory Aliquot
232929	B2	Liquid	03/05/2023	
232944	B2	Liquid	03/05/2023	Field Aliquot
232959	B2	Liquid	03/05/2023	Laboratory Aliquot
232930	B3	Liquid	03/05/2023	
232945	B3	Liquid	03/05/2023	Field Aliquot
232960	B3	Liquid	03/05/2023	Laboratory Aliquot
233060	E1 MFK-Z-1_20230503	Liquid	03/05/2023	
233061	E2 MFK-Z-2_20230503	Liquid	03/05/2023	
233062	E3 MFK-Z-3_20230503	Liquid	03/05/2023	
233063	E4 MFK-Z-4_20230503	Liquid	03/05/2023	
233064	E5 MFK-Z-5_20230503	Liquid	03/05/2023	

Tests not covered by NATA accreditation 3040 are denoted with *

Codes: SN = Sample Note
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RC = Project Comment



233065	B1 MFK-Z_20230503	Liquid	03/05/2023
233066	B2 MFK-Z_20230503	Liquid	03/05/2023
233067	B3 MFK-Z_20230503	Liquid	03/05/2023
233433	E1 Filtered 1	Liquid	03/05/2023
233434	E1 Filtered 2	Liquid	03/05/2023
233435	E1 Unfiltered	Liquid	03/05/2023
233436	E2 Filtered 1	Liquid	03/05/2023
233437	E2 Filtered 2	Liquid	03/05/2023
233438	E2 Unfiltered	Liquid	03/05/2023
233439	E3 Filtered 1	Liquid	03/05/2023
233440	E3 Filtered 2	Liquid	03/05/2023
233441	E3 Unfiltered	Liquid	03/05/2023
233442	E4 Filtered 1	Liquid	03/05/2023
233443	E4 Filtered 2	Liquid	03/05/2023
233444	E4 Unfiltered	Liquid	03/05/2023
233445	E5 Filtered 1	Liquid	03/05/2023
233446	E5 Filtered 2	Liquid	03/05/2023
233447	E5 Unfiltered	Liquid	03/05/2023
233448	B1 Filtered 1	Liquid	03/05/2023
233449	B1 Filtered 2	Liquid	03/05/2023
233450	B1 Unfiltered	Liquid	03/05/2023
233451	B2 Filtered 1	Liquid	03/05/2023
233452	B2 Filtered 2	Liquid	03/05/2023
233453	B2 Unfiltered	Liquid	03/05/2023
233454	B3 Filtered 1	Liquid	03/05/2023
233455	B3 Filtered 2	Liquid	03/05/2023
233456	B3 Unfiltered	Liquid	03/05/2023
233533	E5 trip 3 FB - Filtered 1	Liquid	03/05/2023
233534	E5 trip 3 FB - Filtered 2	Liquid	03/05/2023
233535	E5 trip 3 FB - Unfiltered	Liquid	03/05/2023

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Report Notes

- This document has been authorised by the person whose name appears in this report.
- This report shall not be reproduced except in full. Samples analysed as received from the client.
- Results reported as 'less than' (<) indicates a result below the practical quantitation limit for the sample matrix and method used.
- Solid samples are reported on a dry weight basis and biota samples are reported on an as received basis unless specified otherwise.

Project Comments

- Samples 232917, 232918, 232919, 232920, 232921, 232928, 232929, 232930 were sent to ALS Environmental Laboratory (NATA Accreditation no: 825) for the analysis of EP202A: Phenoxycetic Acid Herbicides by LCMS, EP202S: Phenoxycetic Acid Herbicide Surrogate, EP204: Glyphosate and AMPA. This report summarises data from the attached external report: ES2315117, dated 15-May-2023.
- Samples 233060 to 233067 were received outside the method holding time for TSS analysis. Sample 233067 contained very fine particulates, a fraction of which passed through the filter used for analysing total, fixed and volatile suspended solids.
- Samples 233533 to 233535 were sent to ALS Environmental Laboratory (NATA Accreditation no: 825) for the analysis of EK055G: Ammonia as N by Discrete Analyser, EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser, EK061G: Total Kjeldahl Nitrogen By Discrete Analyser, EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser, EK067 G: Total Phosphorus as P by Discrete Analyser, EK071G: Reactive Phosphorus as P by discrete analyser. This report summarises data from the attached external report: ES2316576, dated 24-May-2023.
- Samples 233433 to 233456 were sent to ALS Environmental Laboratory (NATA Accreditation no: 825) for the analysis of EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser, EK061G: Total Kjeldahl Nitrogen By Discrete Analyser, EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser, EK067G: Total Phosphorus as P by Discrete Analyser, EK055G: Ammonia as N by Discrete Analyser, EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser, EK071G: Reactive Phosphorus as P by discrete analyser. This report summarises data from the attached external report: ES2316254, dated 22-May-2023.
- Samples 232932 to 232936 and 232943 to 232945, were sent to Sydney Water Laboratory Services (NATA Accreditation no: 63 and 610) for the analysis of Blue-Green Algal ID and Enumeration. Please see detailed results in the attached Phytoplankton Analysis Report no. 285311 dated 29 May 2023.
- Samples 232947 to 232951 and 232958 to 232960 were sent to Sydney Water Laboratory Services (NATA Accreditation no: 63 and 610) for the analysis of Algal Toxins. Please the attached Analytical Report No: 285311 dated 29 May 2023, which gives Algal Toxins analysis results and the Blue-Green Algal ID and Enumeration summary results.

Analysis Results - External Methods*
Area - EXTERNAL

Analyte	Sample ID	Start Date	Client ID	Sample ID	Start Date	Client ID	Sample ID	Start Date	Client ID	Sample ID	Start Date	Client ID	Sample ID	Start Date	Client ID	Sample ID	Start Date	Client ID	
Algal Enumeration	232932	24/05/2023	E1	232944	232959	9/05/2023	B2	232945	232960	9/05/2023	B3	232943	25/05/2023	B1	232958	9/05/2023	B1		
Algal Identification																			
Algal Toxins																			

Analysis Results - External Methods*
Area - EXTERNAL

Analyte	Sample ID	Start Date	Client ID	Sample ID	Start Date	Client ID	Sample ID	Start Date	Client ID
Algal Enumeration	232944	25/05/2023	B2	232945	25/05/2023	B3	232943	25/05/2023	B1
Algal Identification									
Algal Toxins									

Analysis Results - External Methods*
Area - EXTERNAL

Analyte	Sample ID	Start Date	Client ID	Sample ID	Start Date	Client ID	Sample ID	Start Date	Client ID	Sample ID	Start Date	Client ID	Sample ID	Start Date	Client ID	Sample ID	Start Date	Client ID																				
Ammonia as N	233433	17/05/2023	E1 Filtered 1	233434	17/05/2023	E1 Filtered 2	233435	17/05/2023	E1	233436	17/05/2023	E2 Filtered 1	233437	17/05/2023	E2 Filtered 2	233438	17/05/2023	E2	233439	17/05/2023	E3 Filtered 1	233440	17/05/2023	E3 Filtered 2	233441	17/05/2023	E3	233442	17/05/2023	E4 Filtered 1	233443	17/05/2023	E4 Filtered 2	233444	17/05/2023	E4	Unfiltered	
Nitrite-Nitrate as N																																						
Reactive Phosphorus as P																																						
Total Kjeldahl Nitrogen as N																																						
Total Nitrogen as N																																						
Total Phosphorus as P																																						

Analysis Results - External Methods*
Area - EXTERNAL

Analyte	Sample ID	Start Date	Client ID	Sample ID	Start Date	Client ID	Sample ID	Start Date	Client ID	Sample ID	Start Date	Client ID	Sample ID	Start Date	Client ID	Sample ID	Start Date	Client ID																				
Ammonia as N	233445	17/05/2023	E5 Filtered 1	233446	17/05/2023	E5 Filtered 2	233447	17/05/2023	E5	233448	17/05/2023	B1 Filtered 1	233449	17/05/2023	B1 Filtered 2	233450	17/05/2023	B1	233451	17/05/2023	B2 Filtered 1	233452	17/05/2023	B2 Filtered 2	233453	17/05/2023	B2	233454	17/05/2023	B3 Filtered 1	233455	17/05/2023	B3 Filtered 2	233456	17/05/2023	B3	Unfiltered	
Nitrite-Nitrate as N																																						
Reactive Phosphorus as P																																						
Total Kjeldahl Nitrogen as N																																						
Total Nitrogen as N																																						
Total Phosphorus as P																																						

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Analysis Results - External Methods*

Area - EXTERNAL

Analyte	Sample ID Start Date Client ID	233533 20/05/2023 E5 trip 3 FB - Filtered 1	233534 20/05/2023 E5 trip 3 FB - Filtered 2	233535 20/05/2023 E5 trip 3 FB - Unfiltered
Ammonia as N	mg/L	<0.01		
Nitrite+Nitrate as N	mg/L	<0.01	<0.01	<0.01
Reactive Phosphorus as P	mg/L	<0.01		
Total Kjeldahl Nitrogen as N	mg/L		<0.1	<0.1
Total Nitrogen as N	mg/L		<0.1	<0.1
Total Phosphorus as P	mg/L		0.01	<0.01

Analysis Results - External Methods*

Area - EXTERNAL

Analyte	Sample ID Start Date Client ID	232917 9/05/2023 E1	232918 9/05/2023 E2	232919 9/05/2023 E3	232920 9/05/2023 E4	232921 9/05/2023 E5	232928 9/05/2023 B1	232929 9/05/2023 B2	232930 9/05/2023 B3
2,4,5-T	µg/L	<10	<10	<10	<10	<10	<10	<10	<10
2,4,6-T	µg/L	<10	<10	<10	<10	<10	<10	<10	<10
2,4-D	µg/L	<10	<10	<10	<10	<10	<10	<10	<10
2,4-DB	µg/L	<10	<10	<10	<10	<10	<10	<10	<10
2,4-DP	µg/L	<10	<10	<10	<10	<10	<10	<10	<10
2,6-D	µg/L	<10	<10	<10	<10	<10	<10	<10	<10
4-Chlorophenoxy acetic acid	µg/L	<10	<10	<10	<10	<10	<10	<10	<10
AMPA	µg/L	<10	<10	<10	<10	<10	<10	<10	<10
Clopyralid	µg/L	<10	<10	<10	<10	<10	<10	<10	<10
Dicamba	µg/L	<10	<10	<10	<10	<10	<10	<10	<10
Fluroxypyr	µg/L	<10	<10	<10	<10	<10	<10	<10	<10
Glyphosate	µg/L	<10	<10	<10	<10	<10	<10	<10	<10
MCPA	µg/L	<10	<10	<10	<10	<10	<10	<10	<10
MCPB	µg/L	<10	<10	<10	<10	<10	<10	<10	<10
Mecoprop	µg/L	<10	<10	<10	<10	<10	<10	<10	<10
Picloram	µg/L	<10	<10	<10	<10	<10	<10	<10	<10
Silvex (2,4,5-TP/Fenoprop)	µg/L	<10	<10	<10	<10	<10	<10	<10	<10
Triclopyr	µg/L	<10	<10	<10	<10	<10	<10	<10	<10

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Analysis Results - IGR TSS
Area - INORGANIC

Analyte	Sample ID	Start Date	Client ID	233060	233061	233062	233063	233064	233065	233066	233067
Fixed Suspended Solids		12/05/2023	E1 MFK-Z-1	32	33	37	31	26	13	39	17
Total Suspended Solids		12/05/2023	E2 MFK-Z-2	41	44	52	44	35	22	50	23
Volatile Suspended Solids		12/05/2023	E3 MFK-Z-3	10	11	15	13	9	9	10	6
		12/05/2023	E4 MFK-Z-4								
		12/05/2023	E5 MFK-Z-5								
		12/05/2023	B1 MFK-Z-2								
		12/05/2023	B2 MFK-Z-								
		12/05/2023	B3 MFK-Z-2								

The sample(s) referred to in this report were analysed by the following method(s):

Method code	Method description	Area
External Methods*	External Methods - Analysis completed externally	EXTERNAL
External Methods*	External Methods - Analysis completed externally	EXTERNAL
External Methods*	External Methods - Analysis completed externally	EXTERNAL
IGRTSS	Total Suspended Solids (TSS) (includes Volatile and Fixed Suspended Solids)	INORGANIC

The results in this report were authorised by:

Name	Title	Area
	Senior Scientist	EXTERNAL
	Scientist	INORGANIC

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