



# Environmental Forensics Report of Analysis

## Project 20230104

**Report #:** 1595  
**Date Issued:** 06-Apr-2023  
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### Client Project Reference: Menindee Fish Kill 3

Customer: Environmental Protection Agency

Attention: [Redacted]

Report Date: 06 April 2023

Project Received: 30 March 2023

EF Project Contact: [Redacted]  
[Redacted]  
[Redacted]

### The following samples were analysed:

Sample ID	Client ID	Sample Type	Client Sampled Date/Time	Aliquot
232058	DRPW-1	Liquid	30/03/2023 10:40AM	
232066	DRPW-1	Liquid	30/03/2023 10:40AM	Laboratory Aliquot
232059	DRPW-2	Liquid	30/03/2023 10:40AM	
232060	DRPW-3	Liquid	30/03/2023 10:40AM	
232061	DRPW-4	Liquid	30/03/2023 10:40AM	
232062	DRKR-1	Liquid	30/03/2023 12:00PM	
232067	DRKR-1	Liquid	30/03/2023 12:00PM	Laboratory Aliquot
232063	DRKR-2	Liquid	30/03/2023 12:00PM	
232064	DRKR-3	Liquid	30/03/2023 12:00PM	
232065	DRKR-4	Liquid	30/03/2023 12:00PM	

### 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.



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### Project Comments

· Samples 232066, 232067 were sent to Sydney Water Corporation (NATA Accreditation no: 63) for the analysis of MA70CENTI (Algal Cell Count) MA70CENTI (Algal Enumeration) MA70CENTI (Algal Identification). Samples 232058, 232062 were sent to Sydney Water Corporation (NATA Accreditation no: 610) for the analysis of TC0061DWI (ASP DSP Lipophilic Shellfish Toxin) TC0049DWI (Algal Toxins). This report summarises data from the attached external report: 282168, dated 03/04/2023.

· Samples 232061, 232065 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 (NO<sub>x</sub>) by Discrete Analyser, EK061G: Total Kjeldahl Nitrogen By Discrete Analyser, EK062G: Total Nitrogen as N (TKN + NO<sub>x</sub>) 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: ES23107 97, dated 04-Apr-2023.

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Tests not covered by NATA accreditation 3040 are denoted with \*

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Analysis Results - External Methods*		Sample ID	232066	232067
Area - EXTERNAL		Start Date	3/04/2023	3/04/2023
		Client ID	DRPW-1	DRKR-1
Analyte				
Algal Cell Count	-	RC	RC	
Algal Enumeration	-	RC	RC	
Algal Identification	-	RC	RC	

Analysis Results - External Methods*		Sample ID	232061	232065
Area - EXTERNAL		Start Date	31/03/2023	31/03/2023
		Client ID	DRPW-4	DRKR-4
Analyte				
Ammonia as N	mg/L	<0.01	0.06	
Nitrite+Nitrate as N	mg/L	0.81	0.24	
Reactive Phosphorus as P	mg/L	0.22	0.16	
Total Kjeldahl Nitrogen as N	mg/L	2.1	1.9	
Total Nitrogen as N	mg/L	2.9	2.1	
Total Phosphorus as P	mg/L	0.44	0.41	

Analysis Results - External Methods*		Sample ID	232058	232062
Area - EXTERNAL		Start Date	3/04/2023	3/04/2023
		Client ID	DRPW-1	DRKR-1
Analyte				
Algal Toxins	-	RC	RC	
ASP DSP Lipophilic Shellfish Toxin	-	RC	RC	

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**Analysis Results - ICVAASW**  
**Area - INORGANIC**

<i>Sample ID</i>	232060	232064
<i>Start Date</i>	4/04/2023	4/04/2023
<i>Client ID</i>	DRPW-3	DRKR-3

<i>Analyte</i>			
Mercury	µg/L	<0.05	<0.05

**Analysis Results - ICPAES**  
**Area - INORGANIC**

<i>Sample ID</i>	232060	232064
<i>Start Date</i>	30/03/2023	30/03/2023
<i>Client ID</i>	DRPW-3	DRKR-3

<i>Analyte</i>			
Aluminium (Lab. filtered)	mg/L	<0.04	<0.04
Barium (Lab. filtered)	mg/L	0.10	0.10
Boron (Lab. filtered)	mg/L	<0.1	<0.1
Calcium (Lab. filtered)	mg/L	29	29
Iron (Lab. filtered)	mg/L	<0.1	<0.1
Magnesium (Lab. filtered)	mg/L	13	13
Potassium (Lab. filtered)	mg/L	12	11
Sodium (Lab. filtered)	mg/L	37	38
Strontium (Lab. filtered)	mg/L	0.32	0.32
Sulfur (Lab. filtered)	mg/L	3.0	3.1
Titanium (Lab. filtered)	mg/L	<0.01	<0.01

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**Analysis Results - ICPMS**  
**Area - INORGANIC**

Sample ID	232060	232064
Start Date	31/03/2023	31/03/2023
Client ID	DRPW-3	DRKR-3

Analyte			
Antimony (Lab. filtered)	mg/L	<0.0005	<0.0005
Arsenic (Lab. filtered)	mg/L	0.006	0.005
Beryllium (Lab. filtered)	mg/L	<0.0001	<0.0001
Cadmium (Lab. filtered)	mg/L	<0.0001	<0.0001
Chromium (Lab. filtered)	mg/L	<0.001	<0.001
Cobalt (Lab. filtered)	mg/L	0.0002	0.0002
Copper (Lab. filtered)	mg/L	0.0018	0.0019
Lead (Lab. filtered)	mg/L	<0.0001	<0.0001
Lithium (Lab. filtered)	mg/L	0.0018	0.0018
Manganese (Lab. filtered)	mg/L	<0.001	<0.001
Molybdenum (Lab. filtered)	mg/L	0.0005	0.0005
Nickel (Lab. filtered)	mg/L	0.0031	0.0029
Selenium (Lab. filtered)	mg/L	<0.005	<0.005
Silver (Lab. filtered)	mg/L	<0.0001	<0.0001
Thallium (Lab. filtered)	mg/L	<0.0001	<0.0001
Tin (Lab. filtered)	mg/L	<0.0002	<0.0002
Vanadium (Lab. filtered)	mg/L	0.014	0.015
Zinc (Lab. filtered)	mg/L	<0.001	<0.001

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**Analysis Results - ICPAES**

**Area - INORGANIC**

<i>Sample ID</i>	232060	232064
<i>Start Date</i>	30/03/2023	30/03/2023
<i>Client ID</i>	DRPW-3	DRKR-3

**Analyte**

Analyte	Unit	232060	232064
Aluminium (acid extractable)	mg/L	3.3	3.4
Barium (acid extractable)	mg/L	0.13	0.13
Boron (acid extractable)	mg/L	<0.1	<0.1
Calcium (acid extractable)	mg/L	30	29
Iron (acid extractable)	mg/L	3.1	3.2
Magnesium (acid extractable)	mg/L	14	14
Manganese (acid extractable)	mg/L	0.11	0.09
Potassium (acid extractable)	mg/L	13	12
Sodium (acid extractable)	mg/L	38	38
Strontium (acid extractable)	mg/L	0.35	0.34
Sulfur (acid extractable)	mg/L	3.0	3.0
Titanium (acid extractable)	mg/L	0.04	0.05

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**Analysis Results - ICPMS**  
**Area - INORGANIC**

Sample ID	232060	232064
Start Date	31/03/2023	31/03/2023
Client ID	DRPW-3	DRKR-3

Analyte			
Antimony (acid extractable)	mg/L	<0.0005	<0.0005
Arsenic (acid extractable)	mg/L	0.006	0.005
Beryllium (acid extractable)	mg/L	0.0002	0.0002
Cadmium (acid extractable)	mg/L	<0.0001	<0.0001
Chromium (acid extractable)	mg/L	0.004	0.004
Cobalt (acid extractable)	mg/L	0.0019	0.0018
Copper (acid extractable)	mg/L	0.0049	0.0048
Lead (acid extractable)	mg/L	0.0015	0.0016
Lithium (acid extractable)	mg/L	0.0030	0.0030
Molybdenum (acid extractable)	mg/L	0.0014	0.0013
Nickel (acid extractable)	mg/L	0.0065	0.0061
Selenium (acid extractable)	mg/L	<0.005	<0.005
Silver (acid extractable)	mg/L	<0.0001	<0.0001
Thallium (acid extractable)	mg/L	<0.0001	<0.0001
Tin (acid extractable)	mg/L	<0.0002	<0.0002
Vanadium (acid extractable)	mg/L	0.024	0.024
Zinc (acid extractable)	mg/L	0.008	0.008

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Analysis Results - QQPEST

Area - ORGANIC

Analyte	Sample ID	232059	232063
		Start Date	31/03/2023
	Client ID	DRPW-2	DRKR-2
Aldrin	µg/L	<0.3	<0.3
Allethrin	µg/L	<0.5	<0.5
Alpha-Chlordane	µg/L	<0.4	<0.4
alpha-HCH	µg/L	<0.4	<0.4
Ametryn	µg/L	<0.5	<0.5
Atraton	µg/L	<0.5	<0.5
Atrazine	µg/L	<0.5	<0.5
beta-HCH	µg/L	<0.5	<0.5
Bifenthrin	µg/L	<0.5	<0.5
Bioresmethrin	µg/L	<0.3	<0.3
Carbophenothion	µg/L	<0.5	<0.5
Chlorpyrifos	µg/L	<0.4	<0.4
Cis-permethrin	µg/L	<0.3	<0.3
Crotoxyphos	µg/L	<0.5	<0.5
Cyfluthrin	µg/L	<0.5	<0.5
Cypermethrin	µg/L	<0.5	<0.5
delta-HCH	µg/L	<0.5	<0.5
Deltamethrin	µg/L	<0.5	<0.5
Diazinon	µg/L	<0.5	<0.5
Dichlorvos	µg/L	<0.4	<0.4
Dieldrin	µg/L	<0.5	<0.5
Dimethoate	µg/L	<0.5	<0.5
Endosulfan II	µg/L	<1.0	<1.0
Endosulfan I	µg/L	<0.9	<0.9
Endosulfan Sulfate	µg/L	<1.0	<1.0
Endrin Aldehyde	µg/L	<0.5	<0.5
Endrin Ketone	µg/L	<0.5	<0.5
Endrin	µg/L	<0.5	<0.5
Ethion	µg/L	<0.5	<0.5
Fenamiphos	µg/L	<0.5	<0.5
Fenitrothion	µg/L	<0.5	<0.5
Fenthion	µg/L	<0.4	<0.4

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Analysis Results - QQQPEST

Area - ORGANIC

Sample ID	232059	232063
Start Date	31/03/2023	31/03/2023
Client ID	DRPW-2	DRKR-2

Analyte			
Fenvalerate	µg/L	<0.5	<0.5
Gamma-Chlordane	µg/L	<0.4	<0.4
gamma-HCH	µg/L	<0.4	<0.4
Heptachlor Epoxide	µg/L	<0.5	<0.5
Heptachlor	µg/L	<0.4	<0.4
Hexachlorobenzene	µg/L	<0.3	<0.3
Hexazinone	µg/L	<0.5	<0.5
L-cyhalothrin	µg/L	<0.5	<0.5
Malathion	µg/L	<0.5	<0.5
Methidathion	µg/L	<0.5	<0.5
Methyl Azinphos	µg/L	<0.4	<0.4
Methyl Chlorpyrifos	µg/L	<0.4	<0.4
Methyl Parathion	µg/L	<0.5	<0.5
Mevinphos	µg/L	<0.4	<0.4
Oxyfluorfen	µg/L	<0.5	<0.5
Parathion	µg/L	<0.5	<0.5
Phorate	µg/L	<0.4	<0.4
Profenofos	µg/L	<0.5	<0.5
Prometon	µg/L	<0.5	<0.5
Prometryn	µg/L	<0.5	<0.5
Propargite	µg/L	<0.5	<0.5
Propazine	µg/L	<0.5	<0.5
Propetamphos	µg/L	<0.5	<0.5
Simazine	µg/L	<0.5	<0.5
Simetryn	µg/L	<0.5	<0.5
Sulprofos	µg/L	<0.4	<0.4
Tebuconazole	µg/L	<0.5	<0.5
Tebuthiuron	µg/L	<0.5	<0.5
Terbutylazine	µg/L	<0.5	<0.5
Terbutryn	µg/L	<0.5	<0.5
Tetrachlorvinphos	µg/L	<0.5	<0.5
Trans-permethrin	µg/L	<0.7	<0.7

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**Area - ORGANIC**

Sample ID	Client ID	Method	Start Date	Result
232059	DRPW-2	OLSCAN* - LC/MS Scan	31/03/2023	LC/MS scan for approximately 600 pesticides was negative. A list of analysed compounds can be provided on request. Note the list doesn't include glyphosate and quaternary ammonium herbicides (e.g. Paraquat and Diquat).
232063	DRKR-2	OLSCAN* - LC/MS Scan	31/03/2023	LC/MS scan for approximately 600 pesticides was negative. A list of analysed compounds can be provided on request. Note the list doesn't include glyphosate and quaternary ammonium herbicides (e.g. Paraquat and Diquat).

**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
ICVAASW	Mercury by Cold Vapour Atomic Absorption Spectroscopy	INORGANIC
ICPAES	Dissolved element analysis by Inductively Coupled Plasma-Atomic Emission Spectrometry (ICPAES)	INORGANIC
ICPMS	Dissolved Metals by Inductively Coupled Plasma Mass Spectrometry (ICP-MS)	INORGANIC
ICPAES	Acid extractable element analysis by Inductively Coupled Plasma-Atomic Emission Spectrometry (ICPAES)	INORGANIC
ICPMS	Acid extractable Metals by Inductively Coupled Plasma Mass Spectrometry (ICP-MS)	INORGANIC
QQQPEST	Determination of Multiresidue Pesticides by GCMSMS	ORGANIC
OLSCAN*	Qualitative LC/MS scan	ORGANIC

**The results in this report were authorised by:**

Name	Title	Area
	Senior Scientist	EXTERNAL
	Scientist	INORGANIC
	Scientist	ORGANIC