

CLIENT DETAILS

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Project **Wathagar Discharge Event Monitoring**
Order Number **(Not specified)**
Samples **1**

LABORATORY DETAILS

Manager **Jeremy Truong**
Laboratory **SGS Brisbane Environmental**
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SGS Reference **BE008741 R0**
Report Number **0000028203**
Date Reported **14 Apr 2014**
Date Received **02 Apr 2014**

COMMENTS

Accredited for compliance with ISO/IEC 17025. NATA accredited laboratory 2562(20707/1706).

OP: Some OP LCS recoveries were reported below acceptance criteria. No significant levels of these analytes were detected.

OCOP: At least 2 of the 3 surrogates passes acceptance criteria.

Nitrate/Nitrite/NOx/TN/TKN and TP subcontracted to SGS Sydney, Unit 16 33 Maddox St Alexandria NSW 2015, NATA Accreditation Number: 2562, Site Number: 4354, SE126515 R0

SIGNATORIES



Jeremy Truong
Business Manager



Leanne Orsmond
Inorganics Supervisor



Michael Morrison
Senior Organic Chemist

Parameter	Units	LOR	Levee
pH in water Method: AN101			

Sample Number BE008741.001
 Sample Matrix Water
 Sample Date 31/3/14 8:00
 Sample Name W Site 13
 Regulator NW

pH**	pH Units	0.1	7.0
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Conductivity and TDS by Calculation - Water Method: AN106

Conductivity @ 25 C	µS/cm	5	49
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Total and Volatile Suspended Solids (TSS / VSS) Method: AN114

Total Suspended Solids Dried at 103-105°C	mg/L	1	57
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TKN Kjeldahl Digestion by Discrete Analyser Method: AN281/AN292

Total Kjeldahl Nitrogen	mg/L	0.05	0.69
Total Nitrogen (calc)	mg/L	0.05	0.65

Total Phosphorus by Kjeldahl Digestion DA in Water Method: AN279/AN293

Total Phosphorus (Kjeldahl Digestion)	mg/L	0.02	0.38
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OC Pesticides in Water Method: AN400/AN420

Alpha BHC	µg/L	0.1	<0.1
Hexachlorobenzene (HCB)	µg/L	0.1	<0.1
Beta BHC	µg/L	0.1	<0.1
Lindane (gamma BHC)	µg/L	0.1	<0.1
Delta BHC	µg/L	0.1	<0.1
Heptachlor	µg/L	0.1	<0.1
Aldrin	µg/L	0.1	<0.1
Heptachlor epoxide	µg/L	0.1	<0.1
Isodrin	µg/L	0.1	<0.1
Gamma Chlordane	µg/L	0.1	<0.1
Alpha Chlordane	µg/L	0.1	<0.1
Alpha Endosulfan	µg/L	0.1	<0.1
p,p'-DDE	µg/L	0.1	<0.1
Dieldrin	µg/L	0.1	<0.1
Endrin	µg/L	0.1	<0.1
Beta Endosulfan	µg/L	0.1	<0.1
p,p'-DDD	µg/L	0.1	<0.1
Endosulfan sulphate	µg/L	0.1	<0.1
p,p'-DDT	µg/L	0.1	<0.1
Endrin ketone	µg/L	0.1	<0.1
Methoxychlor	µg/L	0.1	<0.1
Mirex	µg/L	0.1	<0.1



ANALYTICAL REPORT

BE008741 R0

Sample Number	BE008741.001
Sample Matrix	Water
Sample Date	31/3/14 8:00
Sample Name	W Site 13
Regulator Name	Levee

Parameter Units LOR

OC Pesticides in Water Method: AN400/AN420 (continued)

Surrogates

d14-p-terphenyl (Surrogate)	%	-	120
2-fluorobiphenyl (Surrogate)	%	-	110
d5-nitrobenzene (Surrogate)	%	-	110

OP Pesticides in Water Method: AN400/AN420

Dichlorvos	µg/L	1	<1
Dimethoate	µg/L	1	<1
Diazinon (Dimpylate)	µg/L	0.5	<0.5
Fenitrothion	µg/L	0.2	<0.2
Malathion	µg/L	0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	µg/L	0.2	<0.2
Parathion-ethyl (Parathion)	µg/L	0.2	<0.2
Bromophos Ethyl	µg/L	0.2	<0.2
Methidathion	µg/L	0.5	<0.5
Ethion	µg/L	0.2	<0.2
Azinphos-methyl	µg/L	0.2	<0.2

Surrogates

d14-p-terphenyl (Surrogate)	%	-	120
d5-nitrobenzene (Surrogate)	%	-	110
2-fluorobiphenyl (Surrogate)	%	-	110

Other SVOC Analytes in Water Method: AN420

OPs

Carbophenothion	µg/L	0.5	<0.5
Chlorpyrifos-methyl	µg/L	0.5	<0.5
Dichlorofenthion	µg/L	0.5	<0.5
Dioxathion	µg/L	2	<2
Famphur (Famophos)	µg/L	0.5	<0.5
Fonophos	µg/L	0.5	<0.5
Terbufos	µg/L	0.5	<0.5



ANALYTICAL REPORT

BE008741 R0

Sample Number	BE008741.001
Sample Matrix	Water
Sample Date	31/3/14 8:00
Sample Name	W Site 13
Regulator	NW Levee

Parameter	Units	LOR	Levee
Other SVOC Analytes in Water Method: AN420 (continued)			
other SVOCs			
Thionazin	µg/L	1	<1

MB blank results are compared to the Limit of Reporting

LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared to the amount of analyte spiked into the sample.

DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula: *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA', the results are less than the LOR and thus the RPD is not applicable.

Conductivity and TDS by Calculation - Water Method: ME-(AU)-[ENV]JAN106

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Conductivity @ 25 C	LB013765	µS/cm	5	<5	0 - 14%	99 - 100%

OC Pesticides in Water Method: ME-(AU)-[ENV]JAN400/AN420

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Alpha BHC	LB013730	µg/L	0.1	NVL	
Hexachlorobenzene (HCB)	LB013730	µg/L	0.1	NVL	
Beta BHC	LB013730	µg/L	0.1	NVL	
Lindane (gamma BHC)	LB013730	µg/L	0.1	<0.1	116%
Delta BHC	LB013730	µg/L	0.1	<0.1	
Heptachlor	LB013730	µg/L	0.1	<0.1	98%
Aldrin	LB013730	µg/L	0.1	<0.1	113%
Heptachlor epoxide	LB013730	µg/L	0.1	<0.1	
Isodrin	LB013730	µg/L	0.1	<0.1	114%
Gamma Chlordane	LB013730	µg/L	0.1	<0.1	111%
Alpha Chlordane	LB013730	µg/L	0.1	<0.1	
Alpha Endosulfan	LB013730	µg/L	0.1	<0.1	
p,p'-DDE	LB013730	µg/L	0.1	<0.1	NA
Dieldrin	LB013730	µg/L	0.1	<0.1	118%
Endrin	LB013730	µg/L	0.1	<0.1	115%
Beta Endosulfan	LB013730	µg/L	0.1	<0.1	
p,p'-DDD	LB013730	µg/L	0.1	<0.1	
Endosulfan sulphate	LB013730	µg/L	0.1	<0.1	
p,p'-DDT	LB013730	µg/L	0.1	<0.1	
Endrin ketone	LB013730	µg/L	0.1	<0.1	
Methoxychlor	LB013730	µg/L	0.1	<0.1	
Mirex	LB013730	µg/L	0.1	<0.1	106%

Surrogates

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
d14-p-terphenyl (Surrogate)	LB013730	%	-	550%	130%
2-fluorobiphenyl (Surrogate)	LB013730	%	-	100%	130%
d5-nitrobenzene (Surrogate)	LB013730	%	-	500%	140%

MB blank results are compared to the Limit of Reporting

LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared to the amount of analyte spiked into the sample.

DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula: *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA', the results are less than the LOR and thus the RPD is not applicable.

OP Pesticides in Water Method: ME-(AU)-[ENV]AN400/AN420

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Dichlorvos	LB013730	µg/L	1	<1	NA
Dimethoate	LB013730	µg/L	1	<1	NA
Diazinon (Dimpylale)	LB013730	µg/L	0.5	<0.5	50%
Fenitrothion	LB013730	µg/L	0.2	<0.2	
Malathion	LB013730	µg/L	0.2	<0.2	
Chlorpyrifos (Chlorpyrifos Ethyl)	LB013730	µg/L	0.2	<0.2	106%
Parathion-ethyl (Parathion)	LB013730	µg/L	0.2	<0.2	91%
Bromophos Ethyl	LB013730	µg/L	0.2	<0.2	
Methidathion	LB013730	µg/L	0.5	<0.5	90%
Ethion	LB013730	µg/L	0.2	<0.2	
Azinphos-methyl	LB013730	µg/L	0.2	<0.2	

Surrogates

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
d14-p-terphenyl (Surrogate)	LB013730	%	-	110%	130%
d5-nitrobenzene (Surrogate)	LB013730	%	-	100%	130%
2-fluorobiphenyl (Surrogate)	LB013730	%	-	100%	140%

Other SVOC Analytes in Water Method: ME-(AU)-[ENV]AN420

OPs

Parameter	QC Reference	Units	LOR	MB
Carbophenothion	LB013730	µg/L	0.5	<0.5
Chlorpyrifos-methyl	LB013730	µg/L	0.5	<0.5
Dichlofenthion	LB013730	µg/L	0.5	<0.5
Dioxathion	LB013730	µg/L	2	<2
Famphur (Famophos)	LB013730	µg/L	0.5	<0.5
Fonophos	LB013730	µg/L	0.5	<0.5
Terbufos	LB013730	µg/L	0.5	<0.5

other SVOCs

Parameter	QC Reference	Units	LOR	MB
Thionazin	LB013730	µg/L	1	<1

MB blank results are compared to the Limit of Reporting

LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared to the amount of analyte spiked into the sample.

DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula: *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA', the results are less than the LOR and thus the RPD is not applicable.

pH in water Method: ME-(AU)-[ENV]AN101

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
pH**	L8013765	pH Units	0.1	5.5 - 5.7	0%	101%

Total and Volatile Suspended Solids (TSS / VSS) Method: ME-(AU)-[ENV]AN114

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Total Suspended Solids Dried at 103-105°C	L8013844	mg/L	1	<1	0 - 9%	90 - 97%

METHOD

METHODOLOGY SUMMARY

- AN083 Separatory funnels are used for aqueous samples and extracted by transferring an appropriate volume (mass) of liquid into a separatory funnel and adding 3 serial aliquots of dichloromethane. Samples receive a single extraction at pH 7 to recover base / neutral analytes and two extractions at pH < 2 to recover acidic analytes. QC samples are prepared by spiking organic free water with target analytes and extracting as per samples.
- AN101 pH in Soil Sludge Sediment and Water: pH is measured electrometrically using a combination electrode (glass plus reference electrode) and is calibrated against 3 buffers purchased commercially. For soils, an extract with water is made at a ratio of 1:5 and the pH determined and reported on the extract. Reference APHA 4500-H+.
- AN106 Conductivity and TDS by Calculation: Conductivity is measured by meter with temperature compensation and is calibrated against a standard solution of potassium chloride. Conductivity is generally reported as $\mu\text{mhos/cm}$ or $\mu\text{S/cm @ 25}^\circ\text{C}$. For soils, an extract with water is made at a ratio of 1:5 and the EC determined and reported on the extract, or calculated back to the as-received sample. Total Dissolved Salts can be estimated from conductivity using a conversion factor, which for natural waters, is in the range 0.55 to 0.75. SGS use 0.6. Reference APHA 2520 B.
- AN114 Total Suspended and Volatile Suspended Solids: The sample is homogenised by shaking and a known volume is filtered through a pre-weighed GF/C filter paper and washed well with deionised water. The filter paper is dried and reweighed. The TSS is the residue retained by the filter per unit volume of sample. Reference APHA 2540 D, Internal Reference AN114
- AN245 Anions by Ion Chromatography: A water sample is injected into an eluent stream that passes through the ion chromatographic system where the anions of interest ie Br, Cl, NO₂, NO₃ and SO₄ are separated on their relative affinities for the active sites on the column packing material. Changes to the conductivity and the UV-visible absorbance of the eluent enable identification and quantitation of the anions based on their retention time and peak height or area. APHA 4110 B
- AN277/WC250.312 Nitrite ions, when reacted with a reagent containing sulphanilamide and N-(1-naphthyl)-ethylenediamine dihydrochloride produce a highly coloured azo dye that is measured photometrically at 540nm.
- AN279/AN293 The sample is digested with Sulphuric acid, K₂SO₄ and CuSO₄. All forms of phosphorus are converted into orthophosphate. The digest is cooled and placed on the discrete analyser for colorimetric analysis.
- AN281 An unfiltered water or soil sample is first digested in a block digester with sulphuric acid, K₂SO₄ and CuSO₄. The ammonia produced following digestion is then measured colourimetrically using the Aquakem 250 Discrete Analyser. A portion of the digested sample is buffered to an alkaline pH, and interfering cations are complexed. The ammonia then reacts with salicylate and hypochlorite to give a blue colour whose absorbance is measured at 660nm and compared with calibration standards. This is proportional to the concentration of Total Kjeldahl Nitrogen in the original sample.
- AN400 OC and OP Pesticides by GC-ECD: The determination of organochlorine (OC) and organophosphorus (OP) pesticides and polychlorinated biphenyls (PCBs) in soils, sludges and groundwater. (Based on USEPA methods 3510, 3550, 8140 and 8080.)
- AN420 SVOC Compounds: Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
- AN420 SVOC Compounds: Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).

FOOTNOTES

IS	Insufficient sample for analysis.	LOR	Limit of Reporting
LNR	Sample listed, but not received.	↑↓	Raised or Lowered Limit of Reporting
*	This analysis is not covered by the scope of accreditation.	QFH	QC result is above the upper tolerance
**	Indicative data, theoretical holding time exceeded.	QFL	QC result is below the lower tolerance
^	Performed by outside laboratory.	-	The sample was not analysed for this analyte
		NVL	Not Validated

Samples analysed as received.
Solid samples expressed on a dry weight basis.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here:
<http://www.sgs.com.au/pv.sgsv3/~media/Local/Australia/Documents/Technical%20Documents/MP-AU-ENV-QU-022%20QA%20QC%20Plan.pdf>

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Order
Project Wathagar Discharge Event Monitoring

Sample Name BE008741.001
Description W Site 13 Regulator NW Levee
Sample Date 31/3/2014 8:00

Job Number	Method Name	Analyte Name	Units	Reporting Limit	Result
BE008741	pH in water	pH**	pH Units	0.1	7.0
BE008741	Conductivity and TDS by Calcul	Conductivity @ 25 C	µS/cm	5	49
BE008741	Total and Volatile Suspended S	Total Suspended So	mg/L	1	57
BE008741	TKN Kjeldahl Digestion by Discr	Total Kjeldahl Nitrogi	mg/L	0.05	0.89
BE008741	TKN Kjeldahl Digestion by Discr	Total Nitrogen (calc)	mg/L	0.05	0.95
BE008741	Total Phosphorus by Kjeldahl Di	Total Phosphorus (K	mg/L	0.02	0.38
BE008741	OC Pesticides in Water	Alpha BHC	µg/L	0.1 <0.1	
BE008741	OC Pesticides in Water	Hexachlorobenzene	µg/L	0.1 <0.1	
BE008741	OC Pesticides in Water	Beta BHC	µg/L	0.1 <0.1	
BE008741	OC Pesticides in Water	Lindane (gamma BH	µg/L	0.1 <0.1	
BE008741	OC Pesticides in Water	Delta BHC	µg/L	0.1 <0.1	
BE008741	OC Pesticides in Water	Heptachlor	µg/L	0.1 <0.1	
BE008741	OC Pesticides in Water	Aldrin	µg/L	0.1 <0.1	
BE008741	OC Pesticides in Water	Heptachlor epoxide	µg/L	0.1 <0.1	
BE008741	OC Pesticides in Water	Isodrin	µg/L	0.1 <0.1	
BE008741	OC Pesticides in Water	Gamma Chlordane	µg/L	0.1 <0.1	
BE008741	OC Pesticides in Water	Alpha Chlordane	µg/L	0.1 <0.1	
BE008741	OC Pesticides in Water	Alpha Endosulfan	µg/L	0.1 <0.1	
BE008741	OC Pesticides in Water	p,p'-DDE	µg/L	0.1 <0.1	
BE008741	OC Pesticides in Water	Dieldrin	µg/L	0.1 <0.1	
BE008741	OC Pesticides in Water	Endrin	µg/L	0.1 <0.1	
BE008741	OC Pesticides in Water	Beta Endosulfan	µg/L	0.1 <0.1	
BE008741	OC Pesticides in Water	p,p'-DDD	µg/L	0.1 <0.1	
BE008741	OC Pesticides in Water	Endosulfan sulphate	µg/L	0.1 <0.1	
BE008741	OC Pesticides in Water	p,p'-DDT	µg/L	0.1 <0.1	
BE008741	OC Pesticides in Water	Endrin ketone	µg/L	0.1 <0.1	
BE008741	OC Pesticides in Water	Methoxychlor	µg/L	0.1 <0.1	
BE008741	OC Pesticides in Water	Mirex	µg/L	0.1 <0.1	
BE008741	OC Pesticides in Water	d14-p-terphenyl (Sur %		0	120
BE008741	OC Pesticides in Water	2-fluorobiphenyl (Sui %		0	110
BE008741	OC Pesticides in Water	d5-nitrobenzene (Su %		0	110
BE008741	OP Pesticides in Water	Dichlorvos	µg/L	1 <1	
BE008741	OP Pesticides in Water	Dimethoate	µg/L	1 <1	
BE008741	OP Pesticides in Water	Diazinon (Dimpylate)	µg/L	0.5 <0.5	
BE008741	OP Pesticides in Water	Fenitrothion	µg/L	0.2 <0.2	
BE008741	OP Pesticides in Water	Malathion	µg/L	0.2 <0.2	
BE008741	OP Pesticides in Water	Chlorpyrifos (Chlorp)	µg/L	0.2 <0.2	
BE008741	OP Pesticides in Water	Parathion-ethyl (Par	µg/L	0.2 <0.2	
BE008741	OP Pesticides in Water	Bromophos Ethyl	µg/L	0.2 <0.2	
BE008741	OP Pesticides in Water	Methidathion	µg/L	0.5 <0.5	
BE008741	OP Pesticides in Water	Ethion	µg/L	0.2 <0.2	
BE008741	OP Pesticides in Water	Azinphos-methyl	µg/L	0.2 <0.2	
BE008741	OP Pesticides in Water	d14-p-terphenyl (Sur %		0	120
BE008741	OP Pesticides in Water	d5-nitrobenzene (Su %		0	110
BE008741	OP Pesticides in Water	2-fluorobiphenyl (Sui %		0	110
BE008741	Other SVOC Analytes in Water	Carbophenothion	µg/L	0.5 <0.5	
BE008741	Other SVOC Analytes in Water	Chlorpyrifos-methyl	µg/L	0.5 <0.5	
BE008741	Other SVOC Analytes in Water	Dichlofenthion	µg/L	0.5 <0.5	
BE008741	Other SVOC Analytes in Water	Dioxathion	µg/L	2 <2	
BE008741	Other SVOC Analytes in Water	Famphur (Famophos	µg/L	0.5 <0.5	
BE008741	Other SVOC Analytes in Water	Fonophos	µg/L	0.5 <0.5	
BE008741	Other SVOC Analytes in Water	Terbufos	µg/L	0.5 <0.5	
BE008741	Other SVOC Analytes in Water	Thionazin	µg/L	1 <1	