

CLIENT DETAILS

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Project **Yarraman Gin Discharge**
 Order Number **TBA**
 Samples **3**

LABORATORY DETAILS

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SGS Reference **ME319266 R0**
 Date Received **09 Mar 2021**
 Date Reported

COMMENTS

This is an interim report. Final QC checks are yet to be completed.

BOD5, COD, TKN & TP analysis subcontracted to SGS Sydney, Unit 16 33 Maddox St Alexandria NSW 2015, NATA Accreditation Number: 2562, Site Number: 4354, <ENTER REPORT NUMBER>.

SIGNATORIES



Christopher BENNETT
 Laboratory Technician



Ryan ZHANG
 Inorganics Team Leader



Vanessa PALAMARA
 Senior Chemist

Parameter	Units	LOR	ME319266.001	ME319266.002	ME319266.003
Sample Number			ME319266.001	ME319266.002	ME319266.003
Sample Matrix			Water	Water	Water
Sample Date			25/2/21 16:00	25/2/21 16:00	25/2/21 16:00
Sample Name			Point20	Point21	Point25

pH in water Method: AN101 Tested: 12/3/2021

Parameter	Units	LOR	ME319266.001	ME319266.002	ME319266.003
pH**	pH Units	0.1	-	-	7.4

Total and Volatile Suspended Solids (TSS / VSS) Method: AN114 Tested: 15/3/2021

Parameter	Units	LOR	ME319266.001	ME319266.002	ME319266.003
Total Suspended Solids Dried at 103-105°C	mg/L	5	94	63	25

Nitrate Nitrogen and Nitrite Nitrogen (NOx) by FIA Method: MA-1127-04 Tested: 12/3/2021

Parameter	Units	LOR	ME319266.001	ME319266.002	ME319266.003
Nitrate/Nitrite Nitrogen, NOx as N	mg/L	0.01	<0.01	<0.01	<0.01

TKN Kjeldahl Digestion by Discrete Analyser Method: AN292 Tested: -

Parameter	Units	LOR	ME319266.001	ME319266.002	ME319266.003
Total Kjeldahl Nitrogen	mg/L	0.05	NVL	NVL	NVL
Total Nitrogen (calc)	mg/L	0.05	NVL	NVL	NVL

Total Phosphorus by Kjeldahl Digestion DA in Water Method: AN279/AN293(Sydney only) Tested: -

Parameter	Units	LOR	ME319266.001	ME319266.002	ME319266.003
Total Phosphorus (Kjeldahl Digestion) as P	mg/L	0.02	NVL	NVL	NVL

CBOD5 Method: AN183 Tested: -

Parameter	Units	LOR	ME319266.001	ME319266.002	ME319266.003
Biochemical Oxygen Demand (CBOD5)	mg/L	5	-	-	NVL

Parameter	Units	LOR	Sample Number	ME319266.001	ME319266.002	ME319266.003
			Sample Matrix	Water	Water	Water
			Sample Date	25/2/21 16:00	25/2/21 16:00	25/2/21 16:00
			Sample Name	Point20	Point21	Point25

COD in Water Method: AN179/AN181 Tested: -

Parameter	Units	LOR	ME319266.001	ME319266.002	ME319266.003
Chemical Oxygen Demand	mg/L	10	-	-	NVL

SVOC Compounds in Waters by GC-QQQ Method: MA8270 Tested: 11/3/2021

Parameter	Units	LOR	ME319266.001	ME319266.002	ME319266.003
4,4-DDD	µg/L	1	<1	<1	<1
4,4-DDE	µg/L	1	<1	<1	<1
4,4-DDT	µg/L	1	<1	<1	<1
o,p-DDT	µg/L	1	<1	<1	<1
Aldrin	µg/L	1	<1	<1	<1
alpha-BHC	µg/L	1	<1	<1	<1
alpha-Chlordane	µg/L	1	<1	<1	<1
beta-BHC	µg/L	1	<1	<1	<1
Chlorpyrifos	µg/L	1	<1	<1	<1
delta-BHC	µg/L	1	<1	<1	<1
Dieldrin	µg/L	1	<1	<1	<1
Dimethoate	µg/L	1	<1	<1	<1
Endosulfan 1	µg/L	1	<1	<1	<1
Endosulfan 2	µg/L	1	<1	<1	<1
Endosulfan Sulphate	µg/L	1	<1	<1	<1
Endrin	µg/L	1	<1	<1	<1
Endrin Aldehyde	µg/L	1	<1	<1	<1
Endrin ketone	µg/L	1	<1	<1	<1
gamma-BHC	µg/L	1	<1	<1	<1
gamma-Chlordane	µg/L	1	<1	<1	<1
Heptachlor	µg/L	1	<1	<1	<1
Heptachlor Epoxide	µg/L	1	<1	<1	<1
Hexachlorobenzene	µg/L	1	<1	<1	<1
Isodrin	µg/L	1	<1	<1	<1
Methoxychlor	µg/L	1	<1	<1	<1
Mirex	µg/L	1	<1	<1	<1
2-fluorobiphenyl (Surrogate)	%	-	85	94	70

Combined SVOC Pesticides in Water Method: MA 8270 Tested: 11/3/2021

Parameter	Units	LOR	ME319266.001	ME319266.002	ME319266.003
Dichlorvos	µg/L	1	<1	<1	<1
Diazinon*	µg/L	1	<1	<1	<1
Fenitrothion	µg/L	1	<1	<1	<1
Malathion	µg/L	1	<1	<1	<1
Parathion	µg/L	1	<1	<1	<1
Bromophos ethyl*	µg/L	1	<1	<1	<1
Methidathion	µg/L	1	<1	<1	<1
Ethion	µg/L	1	<1	<1	<1
Azinphos-methyl	µg/L	1	<1	<1	<1

Surrogates

Parameter	Units	LOR	ME319266.001	ME319266.002	ME319266.003
d14-p-terphenyl (Surrogate)	%	-	-	-	-

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 the 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.

Combined SVOC Pesticides in Water Method: MA 8270

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Dichlorvos	LB039698	µg/L	1	<1	123%
Diazinon	LB039698	µg/L	1	<1	NA
Fenitrothion	LB039698	µg/L	1	<1	NA
Malathion	LB039698	µg/L	1	<1	NA
Parathion	LB039698	µg/L	1	<1	NA
Bromophos ethyl	LB039698	µg/L	1	<1	NA
Methidathion	LB039698	µg/L	1	<1	NA
Ethion	LB039698	µg/L	1	<1	NA
Azinphos-methyl	LB039698	µg/L	1	<1	NA

Nitrate Nitrogen and Nitrite Nitrogen (NOx) by FIA Method: MA-1127-04

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery	MSD %RPD
Nitrate/Nitrite Nitrogen, NOx as N	LB039724	mg/L	0.01	<0.01	1%	NA	NA	NA

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

Parameter	QC Reference	Units	LOR	DUP %RPD
pH**	LB039739	pH Units	0.1	0 - 1%

SVOC Compounds in Waters by GC-QQ Method: MA8270

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
4,4-DDD	LB039698	µg/L	1	<1	NA
4,4-DDE	LB039698	µg/L	1	<1	NA
4,4-DDT	LB039698	µg/L	1	<1	NA
o,p-DDT	LB039698	µg/L	1	<1	NA
Aldrin	LB039698	µg/L	1	<1	76%
alpha-BHC	LB039698	µg/L	1	<1	NA
alpha-Chlordane	LB039698	µg/L	1	<1	NA
beta-BHC	LB039698	µg/L	1	<1	NA
Chlorpyrifos	LB039698	µg/L	1	<1	NA
delta-BHC	LB039698	µg/L	1	<1	NA
Dieldrin	LB039698	µg/L	1	<1	69%
Dimethoate	LB039698	µg/L	1	<1	NA
Endosulfan 1	LB039698	µg/L	1	<1	NA
Endosulfan 2	LB039698	µg/L	1	<1	NA
Endosulfan Sulphate	LB039698	µg/L	1	<1	NA
Endrin	LB039698	µg/L	1	<1	89%
Endrin Aldehyde	LB039698	µg/L	1	<1	NA
Endrin ketone	LB039698	µg/L	1	<1	NA
gamma-BHC	LB039698	µg/L	1	<1	74%
gamma-Chlordane	LB039698	µg/L	1	<1	NA
Heptachlor	LB039698	µg/L	1	<1	64%
Heptachlor Epoxide	LB039698	µg/L	1	<1	NA
Hexachlorobenzene	LB039698	µg/L	1	<1	NA
Isodrin	LB039698	µg/L	1	<1	NA
Methoxychlor	LB039698	µg/L	1	<1	NA
Mirex	LB039698	µg/L	1	<1	NA
2-fluorobiphenyl (Surrogate)	LB039698	%	-	87%	70%

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 the 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.

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	LB039753	mg/L	5	<5	11%	109%

METHOD

METHODOLOGY SUMMARY

AN101	<p>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+.</p>
AN114	<p>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</p>
AN181	<p>Analysis of COD by Semi Closed Reflux: The sample is refluxed with strong acid and a known excess of oxidant. After digestion the unreduced oxidant is back titrated to determine the amount of oxidant consumed. The chemically oxidised matter is calculated in terms of oxygen equivalents. Reference APHA 5220 B.</p>
AN183	<p>BOD: Serial dilutions of the sample are firstly combined with various reagents to aid bacterial growth and the sample is incubated for 5 days at 20°C. The difference between the initial and final oxygen contents of the sample is the amount of oxygen consumed by the bacteria. This is related to the organic loading of the sample therefore cBOD is the measure of the digestibility or bioavailability of organic matter in the sample. Reference APHA 5210 B. Internal Reference AN183</p>
AN279/AN293(Sydney)	<p>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.</p>
AN281	<p>An unfiltered water or soil sample is first digested in a block digester with sulfuric 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.</p>
MA1127-04	<p>Determination of nitrate/nitrite by Flow Injection Analysis (FIA). The method is based on reactions that are specific for the nitrite (NO₂⁻) ion. Nitrate is quantitatively reduced to nitrite by passage of the sample through a copperised cadmium column. The nitrite (reduced nitrate plus original nitrite) is then determined by diazotisation with sulphanilamide under acidic conditions to form a diazonium ion. The diazonium ion is then coupled with N-(1-naphthyl)ethylenediamine dihydrochloride. The resulting pink dye absorbs at 540 nm. Nitrate concentrations are obtained by subtracting nitrite values, which have been previously analysed</p>
MA8270	<p>This method covers analytical procedures for the analysis of semi-volatile organic compounds (SVOC) including most neutral, acidic, and basic organic compounds based on the USEPA method 8270D. Samples are extracted into a solvent appropriate to the matrix and analysed using a gas chromatograph – triple quadrupole (GC–QQQ).</p>
MS-EN-MA8270 Pest	<p>This method covers analytical procedures for the analysis of semi-volatile organic compounds (SVOC pesticides) including most neutral, acidic, and basic organic compounds based on the USEPA method 8270D. Samples are extracted into a solvent appropriate to the matrix and analysed using a gas chromatograph – triple quadrupole (GC–QQQ).</p>

FOOTNOTES

IS	Insufficient sample for analysis.	LOR	Limit of Reporting
LNR	Sample listed, but not received.	↑↓	Raised or Lowered Limit of Reporting
*	NATA accreditation does not cover the performance of this service.	QFH	QC result is above the upper tolerance
**	Indicative data, theoretical holding time exceeded.	QFL	QC result is below the lower tolerance
***	Indicates that both * and ** apply.	-	The sample was not analysed for this analyte
		NVL	Not Validated

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calculated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the "Total" LOR will be the sum of those two LORs.

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

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.

Note that in terms of units of radioactivity:

- a. 1 Bq is equivalent to 27 pCi
- b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au/en-gb/environment-health-and-safety.

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