ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **ES0905274**	Page	: 1 of 6
Client	: **SANTOS LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR TONY RUTTER	Contact	: Charlie Pierce
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Project	: ----	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 09-APR-2009
Sampler	: KL/HB	Issue Date	: 21-APR-2009
Site	: GUNNEDAH		
		No. of samples received	: 3
Quote number	: EN/039/08	No. of samples analysed	: 3

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

NATA Accredited Laboratory 825

This document is issued in accordance with NATA accreditation requirements.

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Celine Conceicao	Spectroscopist	Inorganics
Hoa Nguyen	Inorganic Chemist	Inorganics
Pabi Subba	Senior Organic Chemist (Semi-Volatile)	Organics
Sarah Millington	Senior Inorganic Chemist	Inorganics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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 insuffient 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 date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for processing purposes. If the sampling time is displayed as 0:00 the information was not provided by client.

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

- **ED041: LOR raised for Turbidimetruc Sulfate for sample ID 'RESERVE PIT" due to matrix interference.**
- **ED093F:: ES0905274-001 and 003 required dilution (X10) prior to digestion due to matrix interference and LOR's have been raised accordingly.**
- **EG020A-T: Natural bottles are used for batch ES0905274-001, 002 and 003.**
- **Sample diluted by ten due to hard to be filted**

Analytical Results

Sub-Matrix: **WATER**

Compound	CAS Number	LOR	Unit	Client sample ID: FLOW PIT	RESERVE PIT	RETURN PIT	----	----
				Client sampling date / time: 07-APR-2009 15:30	07-APR-2009 15:30	07-APR-2009 15:30	----	----
				ES0905274-001	ES0905274-002	ES0905274-003	----	----
EA005: pH								
pH Value	----	0.01	pH Unit	**7.59**	**8.49**	**7.55**	----	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	**19400**	**1840**	**19400**	----	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**670**	**193**	**683**	----	----
Total Alkalinity as CaCO3	----	1	mg/L	**670**	**193**	**683**	----	----
ED041: Sulfate (Turbidimetric) as SO4 2-								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**59**	<10	**55**	----	----
ED045G: Chloride Discrete analyser								
Chloride	16887-00-6	1	mg/L	**4700**	**359**	**4750**	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**79**	**28**	**79**	----	----
Magnesium	7439-95-4	1	mg/L	**57**	**20**	**58**	----	----
Sodium	7440-23-5	1	mg/L	**601**	**69**	**604**	----	----
Potassium	7440-09-7	1	mg/L	**3800**	**283**	**3900**	----	----
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	**0.076**	<0.001	**0.073**	----	----
Beryllium	7440-41-7	0.001	mg/L	**0.005**	<0.001	**0.004**	----	----
Barium	7440-39-3	0.001	mg/L	**4.81**	**0.166**	**4.14**	----	----
Cadmium	7440-43-9	0.0001	mg/L	**0.0010**	<0.0001	**0.0010**	----	----
Chromium	7440-47-3	0.001	mg/L	**0.428**	**0.007**	**0.357**	----	----
Cobalt	7440-48-4	0.001	mg/L	**0.065**	**0.001**	**0.053**	----	----
Copper	7440-50-8	0.001	mg/L	**0.213**	**0.006**	**0.169**	----	----
Lead	7439-92-1	0.001	mg/L	**0.096**	<0.001	**0.085**	----	----
Manganese	7439-96-5	0.001	mg/L	**2.62**	**0.078**	**2.16**	----	----
Nickel	7440-02-0	0.001	mg/L	**0.164**	**0.003**	**0.137**	----	----
Vanadium	7440-62-2	0.01	mg/L	**0.29**	<0.01	**0.28**	----	----
Zinc	7440-66-6	0.005	mg/L	**1.07**	**0.024**	**0.842**	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0010	<0.0001	<0.0010	----	----
EN055: Ionic Balance								
^ Total Anions	----	0.01	meq/L	**147**	**14.0**	**149**	----	----
^ Total Cations	----	0.01	meq/L	----	**13.2**	**135**	----	----
Total Cations	----	0.01	meq/L	**133**	----	----	----	----
^ Ionic Balance	----	0.01	%	----	**2.69**	**4.90**	----	----

Analytical Results

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				Client sampling date / time: 07-APR-2009 15:30	07-APR-2009 15:30	07-APR-2009 15:30	----	----
				ES0905274-001	**ES0905274-002**	**ES0905274-003**	**----**	**----**
EN055: Ionic Balance - Continued								
Ionic Balance	----	0.01	%	**4.95**	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	**260**	<20	**260**	----	----
C10 - C14 Fraction	----	50	µg/L	**2560**	<50	**1950**	----	----
C15 - C28 Fraction	----	100	µg/L	**9500**	<100	**12900**	----	----
C29 - C36 Fraction	----	50	µg/L	**730**	<50	**810**	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**111**	**110**	**109**	----	----
Toluene-D8	2037-26-5	0.1	%	**110**	**99.1**	**102**	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	**111**	**92.1**	**116**	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	80	120
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115