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REPORT
on
GEOCHEMICAL ASSESSMENT

PROPOSED TRINITY POINT MARINA
MORISSET PARK
LAKE MACQUARIE

Prepared for

JOHNSON PROPERTY GROUP PTY LTD

Project 39823B

DECEMBER 2007

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Project No: 39823B

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6 December 2007

REPORT ON
GEOCHEMICAL ASSESSMENT
PROPOSED TRINITY POINT MARINA
MORISSET PARK, LAKE MACQUARIE

1. INTRODUCTION

This report presents the results of geochemical testing of lake bed sediment and lake waters in the vicinity of the proposed Trinity Point Marina and Tourist Development. The project is to be constructed at 49 Lakeview Road, Morisset Park, (Lot 31, Part Lot 32 and Part Lot 33, DP 1117408). The work was carried out for Johnson Property Group (JPG), in consultation with the client's marina design consultant, Worley Parsons Pty Ltd (WP) incorporating Patterson Britton & Partners Pty Ltd.

The purpose of the investigation was to collect samples of lake bed sediment and undertake geochemical testing so that the results could be compared to the sediment quality guidelines from the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (Ref 1). Samples of lake water were also tested to provide background data for future reference.

The scope of work includes presentation of the factual data in this report with the results of testing to be used by others to assess the impact of proposed construction activities within the project area.

For the purpose of the investigation, the client supplied concept plans of the proposed development, along with site survey plans. The concept plan used in the preparation of this report is the Site Plan by HBO + EMTB Architects Pty Ltd (Ref No 202669, SK000, Issue I dated 29 October 2007). The site survey plan was prepared by Surdevel Pty Ltd, (Ref 1320, dated 30 November 2006). A hydrographic survey of the proposed marina area had been undertaken by another consultant, however the contours were provided to Douglas Partners Pty Ltd (DP) on a plan by Patterson Britton & Partners (Ref 6759.10-GA, dated 17 September 2007).

2. PROPOSED DEVELOPMENT

The Trinity Point Marina and Tourist Development comprises a number of components including the Marina, Marina Village and clusters of multi-storey accommodation buildings (Blocks A to G).

The Marina development will include an approximately 300 berth marina, along with an associated breakwater, boat maintenance facilities (travel lift, hardstand and workshop). Other related commercial infrastructure such as café, restaurant and function facilities are proposed for the Marina Village, however these are not covered in this report.

Immediately south of the Marina Village will be several clusters of multi storey buildings, up to six stories in height. These are likewise not covered in this report.

This report only covers geochemical testing of lake bed sediment and lake water undertaken in the off-shore portions of the proposed marina development.

3. SITE DESCRIPTION AND REGIONAL GEOLOGY

The proposed Trinity Point development is located to the north of, and on, Bluff Point on the Morisset Peninsula of the western shores of Lake Macquarie. The property is described as 49 Lakeview Road, Morisset Park (Lot 31, Part Lot 32 and Part Lot 33, DP 1117408), but the project area also includes adjoining portions of Lake Macquarie, where the marina is proposed.

The portion of the project area which is the subject of this report is the off-shore area, north-east of the northern part of the property, and is herein referred to as the 'site'. A plan showing the approximate location of the site is shown on Drawing 1, attached.

Reference to the hydrographic survey contours indicate that water depths of up to about 5.8 m can be expected within the proposed marina area. Lake Macquarie is a coastal lake, and hence is tidal.

The following photographs show the general site area at the time of the sampling.

Photo 1– view of proposed Marina area

Photo 2 – drill rig set up on modular barge, in proposed marina area

4. FIELD WORK

4.1 Methods

A systematic sampling procedure was conducted, with the coordinates of proposed sample locations provided by WP. The field work was undertaken on 25 September 2007 and included the collection of 15 samples (SS1 to SS15) of lake bed sediment from within the project area. The approximate sample locations are shown on Drawing 2, attached.

The sediment samples were collected by professional divers as arranged by WP and the client. The dive boat was equipped with a GPS, and the locations were set out using the provided MGA coordinates.

The divers were provided with stainless steel sampling equipment, and two environmental engineers from DP were on hand to recover the samples from the divers. In addition to collecting

the samples, the engineers made a visual classification of each sample, the results of which are presented on the attached Sample Record Sheet.

Samples of lake water were collected by DP at 15 locations, corresponding to the position of each sediment sample location, and hence assigned sample numbers SS1 to SS15.

Two of the samples of lake water were submitted for geochemical analysis to provide background water quality data.

In addition to the sediment sampling, over-water drilling was also undertaken for other components of the project, the results of which are presented separately. However several sediment samples collected as part of the over-water drilling programme were submitted for geotechnical laboratory testing to supplement the data collected during the sediment sampling, and are presented herein.

All sampling data was recorded on DP chain of custody sheets, and the general sampling procedure comprised:

- decontamination of all sampling equipment using a 3% solution of phosphate free detergent (Decon 90) and tap water prior to collecting each sample;
- the use of disposable gloves for each sampling event.
- transfer of soil samples into laboratory-prepared glass jars, and capping immediately;
- collection of replicate samples for QA/QC purposes;
- collection of replicate soil samples in zip-lock plastic bags at each depth for PID screening;
- collection of water samples in laboratory-prepared plastic bottles, and capping immediately;
- labelling of sample containers with individual and unique identification, including project number, sample location and sample depth; and
- placement of the sample jars and replicate sample bags into a cooled, insulated and sealed container for transport to the laboratory;
- inclusion of a laboratory provided trip blank soil sample in the transported sample batch, to assess cross-contamination between samples during transport;

- use of chain of custody (C-O-C) documentation ensuring that sample tracking and custody could be cross-checked at any point in the transfer of samples from the field to the laboratory.

Copies of completed sample record sheets and COC documentation are attached.

Replicate samples for each sample were screened for the presence of volatile organic compounds (VOCs), using a Microtip HL-2000 photo-ionisation detector (PID) with a 10.6 eV lamp, calibrated to 100 ppm Isobutylene. The PID is capable of detecting over 300 VOCs. The results of the PID testing are presented on the attached Sample Record Sheet.

The work was undertaken in accordance with the DP quality system and procedures for geochemical sampling as presented in the company's field procedures manual. A list of the procedures used and other information on quality assurance and quality control, including analysis of replicate samples, is attached.

The approximate locations of each sample are shown on Drawing 2, attached. Each sediment sample was given the prefix 'SS'. A visual identification was made of each sample, the results of which are presented in the attached Sample Record Sheet. The attached general notes, which explain the descriptive terms and classifications methods used, should be read in conjunction with this report.

4.2 Data Quality Objectives (DQOs)

Table 1 summarises data quality objectives (DQOs) and the procedures designed to enable achievement of the DQOs.

Table 1 – Data Quality Objectives

DQO	Achievement Evaluation Procedure
Documentation completeness	Completion of field sample record sheet and laboratory chain of custody documentation.
Data comparability	Use of NATA certified laboratory, use of consistent sampling technique.
Precision and accuracy for sampling and analysis	Achievement of 50% RPD for replicate analysis, acceptable levels for laboratory QC criteria.

5. FIELD AND LABORATORY TESTING PROGRAMME

Field testing of lake waters was undertaken by an environmental engineer from DP, using Troll 9500 multi-parameter water quality meter to measure pH, EC, Red-ox Potential, Dissolved Oxygen (DO) and turbidity (NTU) of the lake water at each of the 15 sediment sample locations.

Laboratory testing was undertaken by SGS Environmental Services Pty Ltd (SGS), a laboratory registered with the National Association of Testing Authorities, Australia (NATA). Some tests were subcontracted by SGS to the National Measurement Institute (NMI), formerly the government analytical laboratories.

A total of 17 soil samples (one from each of the 15 sediment sample locations plus one QA/QC sample, and one trip blank) were selected to provide a preliminary assessment of lake bed sediment conditions. The purpose of the testing was to compare the geochemistry of the lake bed sediments in the project area to the Sediment Quality Guidelines (Ref 1).

The selected sediment samples were analysed for the following potential contaminants:

- Polycyclic Aromatic Hydrocarbons (PAH):
- Organochlorine Pesticides (OCP's);
- Organophosphorus Pesticides (OPP's);
- Polychlorinated Biphenyls (PCB);
- Metals: Arsenic (As); Antimony (Sb); Cadmium (Cd); Chromium (Cr); Copper (Cu); Lead (Pb); Nickel (Ni); Silver (Ag); Selenium (Se); Zinc (Zn); and Mercury (Hg);

- Tributyltin (TBT);
- Total Organic Carbon (TOC);

Quality Control/Quality Assurance (QA/QC) testing comprised one soil replicate (sample QA1), and one trip blank (TB1) the results of which are attached.

Two samples of lake water were tested for the following:

- Metals: Arsenic (As); Antimony (Sb); Barium (Ba); Beryllium (Be); Boron (B); Cadmium (Cd); Chromium (Cr); Copper (Cu); Cobalt (Co); Lead (Pb); Manganese (Mn); Molybdenum (Mo); Nickel (Ni); Selenium (Se); Zinc (Zn); and Mercury (Hg);
- Nitrite, Nitrate, Chloride, Sulphate;
- Total Phosphorous; Total Nitrogen.

In addition, two samples of lake bed sediment, collected during the over water drilling, were submitted to DP's laboratory for particle size distribution tests, including hydrometer analysis.

6. FIELD AND LABORATORY TEST RESULTS

The results of laboratory analysis of soil and water samples are presented in the attached laboratory report sheets, and are summarised in the following sections. Data from field testing is also presented in the following sections.

It is noted that some of the laboratory detection limits (PQLs) are higher than the respective guideline trigger values. They are however within laboratory Limits of Detection acknowledged by the NSW Department of Environment and Climate Change (formerly EPA).

Table 2 – Summary of Sediment Laboratory Results

Sample Location	PID (ppm)	Moisture Content (%)	Total Organic Carbon (%)	Metal/Metalloid (mg/kg)											Tributyltin (µg Sn/kg
				Antimony	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Silver	Selenium	Zinc	Arsenic	
SS1	1.1	42	2	<PQL	1.5	4.9	12	7	<PQL	3	<PQL	<PQL	46	6	NT
SS2	0.8	33	1	<PQL	0.6	7.6	13	9.9	<PQL	3.7	<PQL	<PQL	48	16	NT
SS3	1.1	35	1	<PQL	0.7	7.8	14	10	<PQL	3.9	<PQL	<PQL	51	18	<PQL
SS4	0.9	38	0.8	<PQL	0.6	6.7	10	9.1	<PQL	3.9	<PQL	<PQL	47	**22**	NT
SS5	1.1	26	1	<PQL	0.6	6.4	9.4	8	<PQL	3.5	<PQL	<PQL	44	15	<PQL
SS6	1.1	33	1	<PQL	<PQL	8	14	9.8	<PQL	3.8	<PQL	<PQL	56	12	NT
SS7	1.7	66	2	<PQL	1.3	17	22	18	<PQL	7.5	<PQL	4	110	18	NT
SS8	1.2	65	3	<PQL	**1.6**	18	23	20	<PQL	7.9	<PQL	<PQL	130	15	NT
SS9	0.8	66	3	<PQL	1.4	18	33	23	<PQL	7.7	<PQL	2	140	15	NT
SS10	1.2	65	4	<PQL	1.4	17	30	22	<PQL	7.1	<PQL	2	140	13	NT
SS11	0.9	69	3	<PQL	**1.9**	23	37	28	<PQL	9.4	<PQL	3	170	18	NT
SS12	1.3	65	3	<PQL	**1.7**	19	22	21	<PQL	8.5	<PQL	3	120	17	<PQL
SS13	1.2	66	4	<PQL	**1.7**	21	34	25	<PQL	8.9	<PQL	2	160	17	NT
SS14	1.2	62	3	<PQL	0.8	15	14	14	<PQL	7.3	<PQL	2	72	15	NT
SS15	0.8	63	3	<PQL	**1.8**	21	31	26	<PQL	8.6	<PQL	3	160	16	NT
QA1	-	33	0.7	<PQL	0.7	7.6	10	9.6	<PQL	4.3	<PQL	<PQL	52	20	NT
TB1	-	1	<PQL	<PQL	<PQL	0.6	0.6	<PQL	<PQL	<PQL	<PQL	<PQL	0.93	<PQL	NT
Laboratory PQL		1	0.05	2	0.5	0.5	0.5	2	0.15	0.2	1	2	0.5	3	0.5
ANZECC Sediment Quality Guidelines ISQG – Low Trigger Value	-	-	-	2	1.5	80	65	50	0.15	21	1	NC	200	20	5
ANZECC Sediment Quality Guidelines ISQG – High Trigger Value	-	-	-	25	10	370	270	220	1	52	3.7	NC	410	70	70

Notes to Table 2:

All results expressed on a dry weight basis
NC – No Criteria
PQL – Laboratory Practical Quantitation Limit
Shaded results indicate exceedence of ANZECC Sediment Quality ISQG Low Trigger Value (Ref 1)
QA1 – Replicate sample of SS5
TB1 – Trip Blank sample

Table 3 – Summary of Sediment Laboratory Results for OCP, OPP, PCB and PAH in Soil

Sample Location	Organics (µg/kg)																						
	Acenaphthene	Acenaphtalene	2 – Methylnaphthalene	Anthracene	Fluorene	Naphthalene	Phenanthrene	Low Molecular Weight PAHs	Benzo(a)anthreacene	Benzo(a)pyrene	Dibenzo(a,h)anthracene	Chrysene	Fluroanthene	Pyrene	High Molecular Weight PAHs	Total PAHs	Total DDT	p,p'-DDE	o,p'-+p,p'-DDD	Chlordane	Dieldrin	Endrin	Lindane	Total PCBs
SS1	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	20	<80	10	20	<PQL	10	20	20	<90	<170	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
SS2	<PQL	<PQL	10	<PQL	<PQL	<PQL	20	<80	10	20	<PQL	20	30	20	<110	<190	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
SS3	<PQL	<PQL	10	<PQL	<PQL	<PQL	20	<80	10	20	<PQL	20	30	20	<110	<190	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
SS4	<PQL	<PQL	10	<PQL	<PQL	<PQL	20	<80	10	20	<PQL	20	30	20	<110	<190	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
SS5	<PQL	<PQL	10	10	<PQL	<PQL	40	<100	20	30	<PQL	30	50	40	<180	<280	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
SS6	<PQL	<PQL	20	10	<PQL	<PQL	10	<80	20	20	<PQL	30	40	40	<160	<240	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
SS7	<20	<20	30	<20	<20	<20	60	<190	30	40	<20	40	80	60	<270	<460	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
SS8	<20	<20	20	<20	<20	<20	70	<190	30	40	<20	50	90	70	<300	<490	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
SS9	<20	<20	60	30	<20	<20	140	<310	70	80	<20	90	160	130	<550	<860	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
SS10	<20	<20	60	30	<20	20	130	<300	50	60	<20	80	140	110	<460	<760	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
SS11	<20	<20	50	30	<20	<20	120	<280	60	70	<20	80	140	180	<550	<830	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
SS12	<20	<20	30	<20	<20	<20	60	<190	30	50	<20	50	90	80	<320	<510	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
SS13	<20	<20	40	30	<20	<20	110	<260	60	70	<20	70	130	110	<460	<720	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
SS14	<20	<20	20	<20	<20	<20	50	<170	20	30	<20	40	60	50	<220	<390	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
SS15	<20	<20	40	30	<20	<20	100	<250	50	60	<20	70	130	110	<440	<690	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
QA1	<PQL	<PQL	20	<PQL	<PQL	<PQL	30	<100	20	20	<PQL	20	40	30	<140	<240	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
TB1	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
Laboratory PQL	10	10	10	10	10	10	10	70	10	10	10	10	10	10	60	130		1	1	1	1	1	1	10
ANZECC Sediment Quality Guidelines ISQG – Low Trigger Value (Ref 1)	16	44	NC	85	19	160	240	552	261	430	63	384	600	665	1700	4000	1.6	2.2	2	0.5	0.02	0.02	0.32	23
ANZECC Sediment Quality Guidelines ISQG – High Trigger Value (Ref 1)	500	640	NC	1100	540	2100	1500	3160	1600	1600	260	2800	5100	2600	9600	45000	46	27	20	6	8	8	1	NC

Notes to Table 3:

All results expressed on a dry weight basis
NC – No Criteria
PQL – Laboratory Practical Quantitation Limit
Shaded results indicate exceedence of ANZECC Sediment Quality ISQG Low Trigger Value (Ref 1)
QA1 – Replicate sample of SS5
TB1 – Trip Blank sample

Table 4 – Summary of Particle Size Distribution Tests

Location	Depth (m)	% Sand and Gravel (coarser than 75 μm sieve)	% Silt and Clay (finer than 75 μm sieve)	Description
201	0 – 0.45	55	45	Silty sand/sandy silt
202	0 – 0.45	38	62	Sandy clayey silt

Table 5 – Results of Field Testing on Lake Water

Location	Parameter				
	pH	ORP (mv)	EC (μS/cm)	DO (μg/L)	Turbidity (NTU)
SS1	7.94	175	42,570	9783	6.5
SS2	8.02	164	42,640	8324	41.9
SS3	8.02	177	42,560	8349	6
SS4	8.04	191	42,510	9535	5.6
SS5	8.05	196	42,350	9940	7.9
SS6	8.04	199	42,820	9347	5.4
SS7	8.04	199	42,780	9428	5.7
SS8	8.05	210	42,960	9572	15.2
SS9	7.94	237	42,200	9420	15.5
SS10	8.04	205	42,860	9610	14.1
SS11	8.04	247	42,560	9470	6.3
SS12	8.05	259	42,410	9516	3.1
SS13	8.05	237	42,840	9523	9.7
SS14	8.05	267	42,400	9487	5.5
SS15	8.06	268	42,371	9045	87.7
Minimum	7.94	164	42,200	8324	3.1
Maximum	8.06	268	42,960	9940	87.7
Average	8.03	215	42,589	9357	16

Notes to Table 5:

ORP – Oxidation reduction potential
EC – Electrical conductivity
DO – Dissolved oxygen

Table 6 – Summary of Laboratory Results for Lake Water Chemistry

Location	Analyte (µg/L)																Analyte (mg/L)				
	Antimony	Arsenic	Barium	Beryllium	Boron	Cadmium	Chromium	Copper	Cobalt	Lead	Manganese	Molybdenum	Nickel	Selenium	Zinc	Tin	Mercury	Nitrate as N	Chloride, Cl	Sulphate, SO4	Total Phosphorus as P	Total Nitrogen
SS3	1.4	2.8	11	<PQL	5700	0.11	12	2.6	2.6	<PQL	<PQL	9.3	5.2	8.5	15	<PQL	<PQL	<PQL	17,000	2,500	<PQL	<PQL
SS12	2.0	2.7	11	<PQL	5700	<PQL	12	2.8	2.6	<PQL	<PQL	9.7	5.1	9.5	15	0.03	<PQL	<PQL	18,000	2,500	<PQL	<PQL
Laboratory PQL	1	1	1	1	1	0.1	1	1	1	1	1	1	1	2	1	0.03	5E-04	1	1	1	1	10

7. STATISTICAL ANALYSIS OF RESULTS FOR LAKE BED SEDIMENT

Some minor exceedences were observed within individual results for the heavy metals testing of lake bed sediment. Therefore, a statistical analysis has been undertaken of the heavy metals results, and the 95% upper confidence limit (UCL) calculated using the programme ProUCL 4.0.

The 95% UCL uses the laboratory results to calculate the arithmetic average contaminant concentration which has a 95% probability of not being exceeded. The NSW EPA Sampling Design Guidelines (Ref 2) allows the use of the 95% UCL as a means to compare a batch of results to the relevant guidelines or trigger values.

The 95% UCL was not calculated for the suite of PAH, PCB, OCP and OPP results, as there were no individual exceedences of the Sediment Quality Guidelines (Ref 1).

The 95% UCL was calculated using the 15 laboratory test results from samples SS1 to SS15, and excluded the result of the blind duplicate sample collected for QA-QC purposes (Sample QA1). A statistical summary and the results are presented in the following table:

Table 7 – Summary of Statistical Analysis of Lake Bed Sediments

Analyte	PQL (mg/kg)	ISQG-Low (Trigger Value)[1]	Min Value (mg/kg)	Max Value (mg/kg)	95% UCL Value[2] (mg/kg)
Arsenic	3	20	6	22	17.1
Antimony	2	2	<PQL	<PQL	NA (<2)
Cadmium	0.5	1.5	<PQL	1.9	1.4
Chromium	0.5	80	4.9	23	21.2
Copper	0.5	65	9.4	37	25.6
Lead	2	50	7	28	20.1
Nickel	0.2	21	3	9.4	7.4
Silver	1	1	<PQL	<PQL	NA (<1)
Selenium	2	NC	<PQL	4	3.0
Zinc	0.5	200	44	170	128
Mercury	0.15	0.15	<PQL	<PQL	NA (<0.15)

Notes to Table 8:

1 – Recommended Sediment Quality Guidelines from Australia and New Zealand Guidelines for Fresh and Marine Water Quality, 2000 (Ref 1)
2 – 95% UCL calculated using computer programme ProUCL 4.0 from the US EPA
PQL – Practical Quantification Limit
NA – Not Applicable
NC – No criteria
Bold and Shaded results exceed the ISQG – Low trigger value (Ref 1)

8. COMMENTS

The statistical analysis of the laboratory results for the lake bed sediment shows that while individual results exceed the trigger values for both Arsenic and Cadmium, the calculated 95% UCL for each of these analytes was below the ANZECC ISQG-Low trigger values (Ref 1). All results were below the ISQG-High values (Ref 1).

None of the results for individual species of the PAHs exceeded the ISQG – Low trigger values (Ref 1). All of the results for OCPs, OPPs and PCBs returned values below the respective detection limits, and similarly do not exceed the ISQG – Low trigger values (Ref 1).

The results of testing on samples of lake water have not been compared to any guidelines at this point in time. The purpose of these results is to provide background water data for future reference.

9. LIMITATIONS

DP has performed investigation and consulting services for this project in general accordance with current professional and industry standards for geochemical sampling and assessment.

Conditions different to those identified during field and laboratory sampling and testing may exist. Therefore DP, or any other reputable consultant, cannot provide unqualified warranties nor does DP assume any liability for site conditions not observed or accessible during the time of the investigations.

Despite all reasonable care and diligence, the conditions encountered and concentrations of contaminants measured may not be representative of conditions between the locations sampled and investigated. In addition, site characteristics may change over time in response to variations in natural conditions, chemical reactions and other events, eg. sediment movement and/or spillages of contaminating substances. These changes may occur subsequent to DP's investigations and assessment.

This report and associated documentation and the information herein have been prepared solely for the use of Johnson Property Group Pty Ltd and any reliance assumed by other parties on this report shall be at such parties own risk. Any ensuing liability resulting from use of the report by other parties cannot be transferred to DP.

DOUGLAS PARTNERS PTY LTD

Reviewed by:

Julie Wharton
Associate

John Harvey
Principal

REFERENCES

1. ANZECC (2000) “Australian and New Zealand Guidelines for Fresh and Marine Water Quality”, October 2000.

2. Contaminated Sites: Sampling Design Guidelines, NSW EPA, September 1995.

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NOTES RELATING TO THIS REPORT

Introduction

These notes have been provided to amplify the geotechnical report in regard to classification methods, specialist field procedures and certain matters relating to the Discussion and Comments section. Not all, of course, are necessarily relevant to all reports.

Geotechnical reports are based on information gained from limited subsurface test boring and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Description and Classification Methods

The methods of description and classification of soils and rocks used in this report are based on Australian Standard 1726, Geotechnical Site Investigations Code. In general, descriptions cover the following properties - strength or density, colour, structure, soil or rock type and inclusions.

Soil types are described according to the predominating particle size, qualified by the grading of other particles present (eg. sandy clay) on the following bases:

Soil Classification	Particle Size
Clay	less than 0.002 mm
Silt	0.002 to 0.06 mm
Sand	0.06 to 2.00 mm
Gravel	2.00 to 60.00 mm

Cohesive soils are classified on the basis of strength either by laboratory testing or engineering examination. The strength terms are defined as follows.

Classification	Undrained Shear Strength kPa
Very soft	less than 12
Soft	12—25
Firm	25—50
Stiff	50—100
Very stiff	100—200
Hard	Greater than 200

Non-cohesive soils are classified on the basis of relative density, generally from the results of standard penetration tests (SPT) or Dutch cone penetrometer tests (CPT) as below:

Relative Density	SPT "N" Value (blows/300 mm)	CPT Cone Value (q_c — MPa)
Very loose	less than 5	less than 2
Loose	5—10	2—5
Medium dense	10—30	5—15
Dense	30—50	15—25
Very dense	greater than 50	greater than 25

Rock types are classified by their geological names. Where relevant, further information regarding rock classification is given on the following sheet.

Sampling

Sampling is carried out during drilling to allow engineering examination (and laboratory testing where required) of the soil or rock.

Disturbed samples taken during drilling provide information on colour, type, inclusions and, depending upon the degree of disturbance, some information on strength and structure.

Undisturbed samples are taken by pushing a thin-walled sample tube into the soil and withdrawing with a sample of the soil in a relatively undisturbed state. Such samples yield information on structure and strength, and are necessary for laboratory determination of shear strength and compressibility. Undisturbed sampling is generally effective only in cohesive soils.

Details of the type and method of sampling are given in the report.

Drilling Methods.

The following is a brief summary of drilling methods currently adopted by the Company and some comments on their use and application.

Test Pits — these are excavated with a backhoe or a tracked excavator, allowing close examination of the in-situ soils if it is safe to descent into the pit. The depth of penetration is limited to about 3 m for a backhoe and up to 6 m for an excavator. A potential disadvantage is the disturbance caused by the excavation.

Large Diameter Auger (eg. Pengo) — the hole is advanced by a rotating plate or short spiral auger, generally 300 mm or larger in diameter. The cuttings are returned to the surface at intervals (generally of not more than 0.5 m) and are disturbed but usually unchanged in moisture content. Identification of soil strata is generally much more reliable than with continuous spiral flight augers, and is usually supplemented by occasional undisturbed tube sampling.

Continuous Sample Drilling — the hole is advanced by pushing a 100 mm diameter socket into the ground and withdrawing it at intervals to extrude the sample. This is the most reliable method of drilling in soils, since moisture content is unchanged and soil structure, strength, etc. is only marginally affected.

Continuous Spiral Flight Augers — the hole is advanced using 90—115 mm diameter continuous spiral flight augers which are withdrawn at intervals to allow sampling or in-situ testing. This is a relatively economical means of drilling in clays and in sands above the water

table. Samples are returned to the surface, or may be collected after withdrawal of the auger flights, but they are very disturbed and may be contaminated. Information from the drilling (as distinct from specific sampling by SPTs or undisturbed samples) is of relatively lower reliability, due to remoulding, contamination or softening of samples by ground water.

Non-core Rotary Drilling — the hole is advanced by a rotary bit, with water being pumped down the drill rods and returned up the annulus, carrying the drill cuttings. Only major changes in stratification can be determined from the cuttings, together with some information from 'feel' and rate of penetration.

Rotary Mud Drilling — similar to rotary drilling, but using drilling mud as a circulating fluid. The mud tends to mask the cuttings and reliable identification is again only possible from separate intact sampling (eg. from SPT).

Continuous Core Drilling — a continuous core sample is obtained using a diamond-tipped core barrel, usually 50 mm internal diameter. Provided full core recovery is achieved (which is not always possible in very weak rocks and granular soils), this technique provides a very reliable (but relatively expensive) method of investigation.

Standard Penetration Tests

Standard penetration tests (abbreviated as SPT) are used mainly in non-cohesive soils, but occasionally also in cohesive soils as a means of determining density or strength and also of obtaining a relatively undisturbed sample. The test procedure is described in Australian Standard 1289, "Methods of Testing Soils for Engineering Purposes" — Test 6.3.1.

The test is carried out in a borehole by driving a 50 mm diameter split sample tube under the impact of a 63 kg hammer with a free fall of 760 mm. It is normal for the tube to be driven in three successive 150 mm increments and the 'N' value is taken as the number of blows for the last 300 mm. In dense sands, very hard clays or weak rock, the full 450 mm penetration may not be practicable and the test is discontinued.

The test results are reported in the following form.

- In the case where full penetration is obtained with successive blow counts for each 150 mm of say 4, 6 and 7

  as 4, 6, 7
  N = 13

- In the case where the test is discontinued short of full penetration, say after 15 blows for the first 150 mm and 30 blows for the next 40 mm

  as 15, 30/40 mm.

The results of the tests can be related empirically to the engineering properties of the soil.

Occasionally, the test method is used to obtain samples in 50 mm diameter thin walled sample tubes in clays. In such circumstances, the test results are shown on the borelogs in brackets.

Cone Penetrometer Testing and Interpretation

Cone penetrometer testing (sometimes referred to as Dutch cone — abbreviated as CPT) described in this report has been carried out using an electrical friction cone penetrometer. The test is described in Australian Standard 1289, Test 6.4.1.

In the tests, a 35 mm diameter rod with a cone-tipped end is pushed continuously into the soil, the reaction being provided by a specially designed truck or rig which is fitted with an hydraulic ram system. Measurements are made of the end bearing resistance on the cone and the friction resistance on a separate 130 mm long sleeve, immediately behind the cone. Transducers in the tip of the assembly are connected by electrical wires passing through the centre of the push rods to an amplifier and recorder unit mounted on the control truck.

As penetration occurs (at a rate of approximately 20 mm per second) the information is plotted on a computer screen and at the end of the test is stored on the computer for later plotting of the results.

The information provided on the plotted results comprises: —

- Cone resistance — the actual end bearing force divided by the cross sectional area of the cone — expressed in MPa.
- Sleeve friction — the frictional force on the sleeve divided by the surface area — expressed in kPa.
- Friction ratio — the ratio of sleeve friction to cone resistance, expressed in percent.

There are two scales available for measurement of cone resistance. The lower scale (0—5 MPa) is used in very soft soils where increased sensitivity is required and is shown in the graphs as a dotted line. The main scale (0—50 MPa) is less sensitive and is shown as a full line.

The ratios of the sleeve friction to cone resistance will vary with the type of soil encountered, with higher relative friction in clays than in sands. Friction ratios of 1%—2% are commonly encountered in sands and very soft clays rising to 4%—10% in stiff clays.

In sands, the relationship between cone resistance and SPT value is commonly in the range:—

q_c (MPa) = (0.4 to 0.6) N (blows per 300 mm)

In clays, the relationship between undrained shear strength and cone resistance is commonly in the range:—

q_c = (12 to 18) c_u

Interpretation of CPT values can also be made to allow estimation of modulus or compressibility values to allow calculation of foundation settlements.

Inferred stratification as shown on the attached reports is assessed from the cone and friction traces and from experience and information from nearby boreholes, etc. This information is presented for general guidance, but must be regarded as being to some extent interpretive. The test method provides a continuous profile of engineering properties, and where precise information on soil classification is required, direct drilling and sampling may be preferable.

Hand Penetrometers

Hand penetrometer tests are carried out by driving a rod into the ground with a falling weight hammer and measuring the blows for successive 150 mm increments of penetration. Normally, there is a depth limitation of 1.2 m but this may be extended in certain conditions by the use of extension rods.

Two relatively similar tests are used.

- Perth sand penetrometer — a 16 mm diameter flat-ended rod is driven with a 9 kg hammer, dropping 600 mm (AS 1289, Test 6.3.3). This test was developed for testing the density of sands (originating in Perth) and is mainly used in granular soils and filling.
- Cone penetrometer (sometimes known as the Scala Penetrometer) — a 16 mm rod with a 20 mm diameter cone end is driven with a 9 kg hammer dropping 510 mm (AS 1289, Test 6.3.2). The test was developed initially for pavement subgrade investigations, and published correlations of the test results with California bearing ratio have been published by various Road Authorities.

Laboratory Testing

Laboratory testing is carried out in accordance with Australian Standard 1289 "Methods of Testing Soil for Engineering Purposes". Details of the test procedure used are given on the individual report forms.

Bore Logs

The bore logs presented herein are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable, or possible to justify on economic grounds. In any case, the boreholes represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes, the frequency of sampling and the possibility of other than 'straight line' variations between the boreholes.

Ground Water

Where ground water levels are measured in boreholes, there are several potential problems;

- In low permeability soils, ground water although present, may enter the hole slowly or perhaps not at all during the time it is left open.
- A localised perched water table may lead to an erroneous indication of the true water table.
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report.
- The use of water or mud as a drilling fluid will mask any ground water inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water observations are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Engineering Reports

Engineering reports are prepared by qualified personnel and are based on the information obtained and on current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal (eg. a three storey building), the information and interpretation may not be relevant if the design proposal is changed (eg. to a twenty storey building). If this happens, the Company will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface condition, discussion of geotechnical aspects and recommendations or suggestions for design and construction. However, the Company cannot always anticipate or assume responsibility for:

- unexpected variations in ground conditions — the potential for this will depend partly on bore spacing and sampling frequency
- changes in policy or interpretation of policy by statutory authorities
- the actions of contractors responding to commercial pressures.

If these occur, the Company will be pleased to assist with investigation or advice to resolve the matter.

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, the Company requests that it immediately be notified. Most problems are much more readily resolved when conditions are exposed than at some later stage, well after the event.

Reproduction of Information for Contractual Purposes

Attention is drawn to the document "Guidelines for the Provision of Geotechnical Information in Tender Documents", published by the Institution of Engineers, Australia. Where information obtained from this investigation is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section

is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. The Company would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The Company will always be pleased to provide engineering inspection services for geotechnical aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

AN ENGINEERING CLASSIFICATION OF SEDIMENTARY ROCKS IN THE SYDNEY AREA

This classification system provides a standardized terminology for the engineering description of the sandstone and shales in the Sydney area, but the terms and definitions may be used elsewhere when applicable.

Under this system rocks are classified by Rock Type, Degree of Weathering, Strength, Stratification Spacing, and Degree of Fracturing. These terms do not cover the full range of engineering properties. Descriptions of rock may also need to refer to other properties (e.g. durability, abrasiveness, etc.) where these are relevant.

ROCK TYPE DEFINITIONS

Rock Type	Definition
Conglomerate:	More than 50% of the rock consists of gravel sized (greater than 2mm) fragments
Sandstone:	More than 50% of the rock consists of sand sized (.06 to 2mm) fragments
Siltstone:	More than 50% of the rock consists of silt-sized (less than 0.06mm) granular particles and the rock is not laminated
Claystone:	More than 50% of the rock consists of clay or sericitic material and the rock is not laminated
Shale:	More than 50% of the rock consists of silt or clay sized particles and the rock is laminated

Rocks possessing characteristics of two groups are described by their predominant particle size with reference also to the minor constituents, e.g. clayey sandstone, sandy shale.

DEGREE OF WEATHERING

Term	Symbol	Definition
Extremely Weathered	EW	Rock substance affected by weathering to the extent that the rock exhibits soil properties - i.e. it can be remoulded and can be classified according to the Unified Classification System, but the texture of the original rock is still evident.
Highly Weathered	HW	Rock substance affected by weathering to the extent that limonite staining or bleaching affects the whole of the rock substance and other signs of chemical or physical decomposition are evident. Porosity and strength may be increased or decreased compared to the fresh rock usually as a result of iron leaching or deposition. The colour and strength of the original fresh rock substance is no longer recognisable.
Moderately Weathered	MW	Rock substance affected by weathering to the extent that staining or discolouration of the rock substance usually by limonite has taken place. The colour and texture of the fresh rock is no longer recognisable.
Slightly Weathered	SW	Rock substance affected by weathering to the extent that partial staining or discolouration of the rock substance usually by limonite has taken place. The colour and texture of the fresh rock is recognisable.
Fresh	Fs	Rock substance unaffected by weathering, limonite staining along joints.
Fresh	Fr	Rock substance unaffected by weathering.

STRATIFICATION SPACING

Term	Separation of Stratification Planes
Thinly laminated	<6 mm
Laminated	6 mm to 20 mm
Very thinly bedded	20 mm to 60 mm
Thinly bedded	60 mm to 0.2 m
Medium bedded	0.2 m to 0.6 m
Thickly bedded	0.6 m to 2 m
Very thickly bedded	>2 m

ROCK STRENGTH

Rock strength is defined by the Point Load Strength Index (Is 50) and refers to the strength of the rock substance in the direction normal to the bedding. The test procedure is described by the International Society of Rock Mechanics (Reference).

Strength Term	Is(50) MPa	Field Guide	Approx. qu MPa*
Extremely Low:	0.03	Easily remoulded by hand to a material with soil properties	0.7
Very Low:	0.1	May be crumbled in the hand. Sandstone is “sugary” and friable.	2.4
Low:	0.3	A piece of core 150 mm long x 50 mm dia. may be broken by hand and easily scored with a knife. Sharp edges of core may be friable and break during handling.	7
Medium:	1	A piece of core 150 mm long x 50 mm dia. can be broken by hand with considerable difficulty. Readily scored with knife.	24
High:	3	A piece of core 150 mm long x 50 mm dia. cannot be broken by unaided hands, can be slightly scratched or scored with knife.	70
Very High:	10	A piece of core 150 mm long x 50 mm dia. may be broken readily with hand held hammer. Cannot be scratched with pen knife.	240
Extremely High:		A piece of core 150 mm long x 50 mm dia. is difficult to break with hand held hammer. Rings when struck with a hammer.	

* The approximate unconfined compressive strength (qu) shownin the table is based on an assumed ratio to the point load index of 24:1. This ratio may vary widely.

DEGREE OF FRACTURING

This classification applies to diamond drill cores and refers to the spacing of all types of natural fractures along which the core is discontinuous. These include bedding plane partings, joints and other rock defects, but exclude known artificial fractures such as drilling breaks

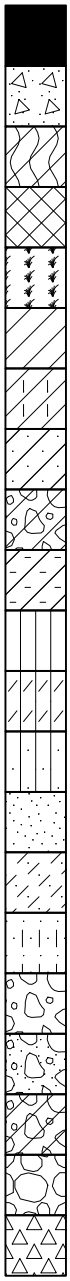
Term	Description
Fragmented:	The core is comprised primarily of fragments of length less than 20 mm, and mostly of width less than the core diameter.
Highly Fractured:	Core lengths are generally less than 20 mm - 40 mm with occasional fragments.
Fractured:	Core lengths are mainly 30 mm - 100 mm with occasional shorter and longer sections.
Slightly Fractured:	Core lengths are generally 300 mm - 1000 mm with occasional longer sections and occasional sections of 100 mm - 300 mm.
Unbroken:	The core does not contain any fracture.

REFERENCE

International Society of Rock Mechanics, Commission on Standardisation of Laboratory and Field Tests, Suggested Methods for Determining the Uniaxial Compressive Strength of Rock Materials and the Point Load Strength Index, Committee on Laboratory Tests Document No. 1 Final Draft October 1972

GRAPHIC SYMBOLS FOR SOIL & ROCK

SOIL



BITUMINOUS CONCRETE

CONCRETE

TOPSOIL

FILLING

PEAT

CLAY

SILTY CLAY

SANDY CLAY

GRAVELLY CLAY

SHALY CLAY

SILT

CLAYEY SILT

SANDY SILT

SAND

CLAYEY SAND

SILTY SAND

GRAVEL

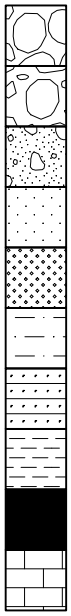
SANDY GRAVEL

CLAYEY GRAVEL

COBBLES/BOULDERS

TALUS

SEDIMENTARY ROCK



BOULDER CONGLOMERATE

CONGLOMERATE

CONGLOMERATIC SANDSTONE

SANDSTONE FINE GRAINED

SANDSTONE COARSE GRAINED

SILTSTONE

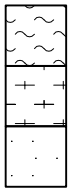
LAMINITE

MUDSTONE, CLAYSTONE, SHALE

COAL

LIMESTONE

METAMORPHIC ROCK

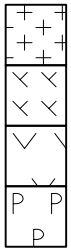


SLATE, PHYLITTE, SCHIST

GNEISS

QUARTZITE

IGNEOUS ROCK



GRANITE

DOLERITE, BASALT

TUFF

PORPHYRY

Douglas Partners
Geotechnics · Environment · Groundwater

CLIENT: Johnson Property Group Pty Ltd **DATE:** 25.9.07

PROJECT: Proposed Trinity Point Marina **PROJECT NO:** 39823B

LOCATION: Morisset Park, Lake Macquarie

Sample No	Container Type	Sample/Material Description	PID Reading (ppm)	Depth of Water at Time of Sampling (m)
SS1	2 jars and 1L bag and snap lock	Dark grey silty clayey sand, trace shell	1.1	1.8
SS2	2 jars and 1L bag and snap lock	Dark grey fine to medium grained silty clayey sand	0.8	3.3
SS3	2 jars and 1L bag and snap lock 2L water	Dark grey low plasticity silty sand/sandy silt, some clay	1.1	3.3
SS4	2 jars, 1L bag and snap lock and 2L water	Dark grey low plasticity silty sand/sandy silt, some clay	0.9	4.1
SS5/QA1	2 jars, 1L bag and snap lock and 2L water	Dark grey low plasticity silty sand/sandy silt, some clay	1.1	4.8
SS6	2 jars, 1L bag and snap lock and 2L water	Dark grey low plasticity silty sand/sandy silt, some clay	1.1	4.2
SS7	2 jars, 1L bag and snap lock and 2L water	Dark grey sandy clayey silt with trace shells	1.7	5.1
SS8	2 jars, 1L bag and snap lock and 2L water	Dark grey sandy clayey silt with trace shells	1.2	5.2
SS9	2 jars, 1L bag and snap lock and 2L water	Dark grey low plasticity sandy silty clay, trace shells	0.8	5.3
SS10	2 jars, 1L bag and snap lock and 2L water	Dark grey low plasticity sandy silty clay, trace shells	1.2	5.4
SS11	2 jars, 1L bag and snap lock and 2L water	Dark grey low plasticity sandy silty clay, trace shells	0.9	5.1
SS12	2 jars, 1L bag and snap lock and 2L water	Dark grey low plasticity sandy silty clay, trace shells	1.3	5.2
SS13	2 jars, 1L bag and snap lock and 2L water	Dark grey low plasticity sandy silty clay, trace shells	1.2	5.3
SS14	2 jars, 1L bag and snap lock and 2L water	Dark grey low plasticity sandy silty clay, trace shells	1.2	5.3
SS15	2 jars, 1L bag and snap lock and 2L water	Dark grey low plasticity sandy silty clay, trace shells	0.8	5.4

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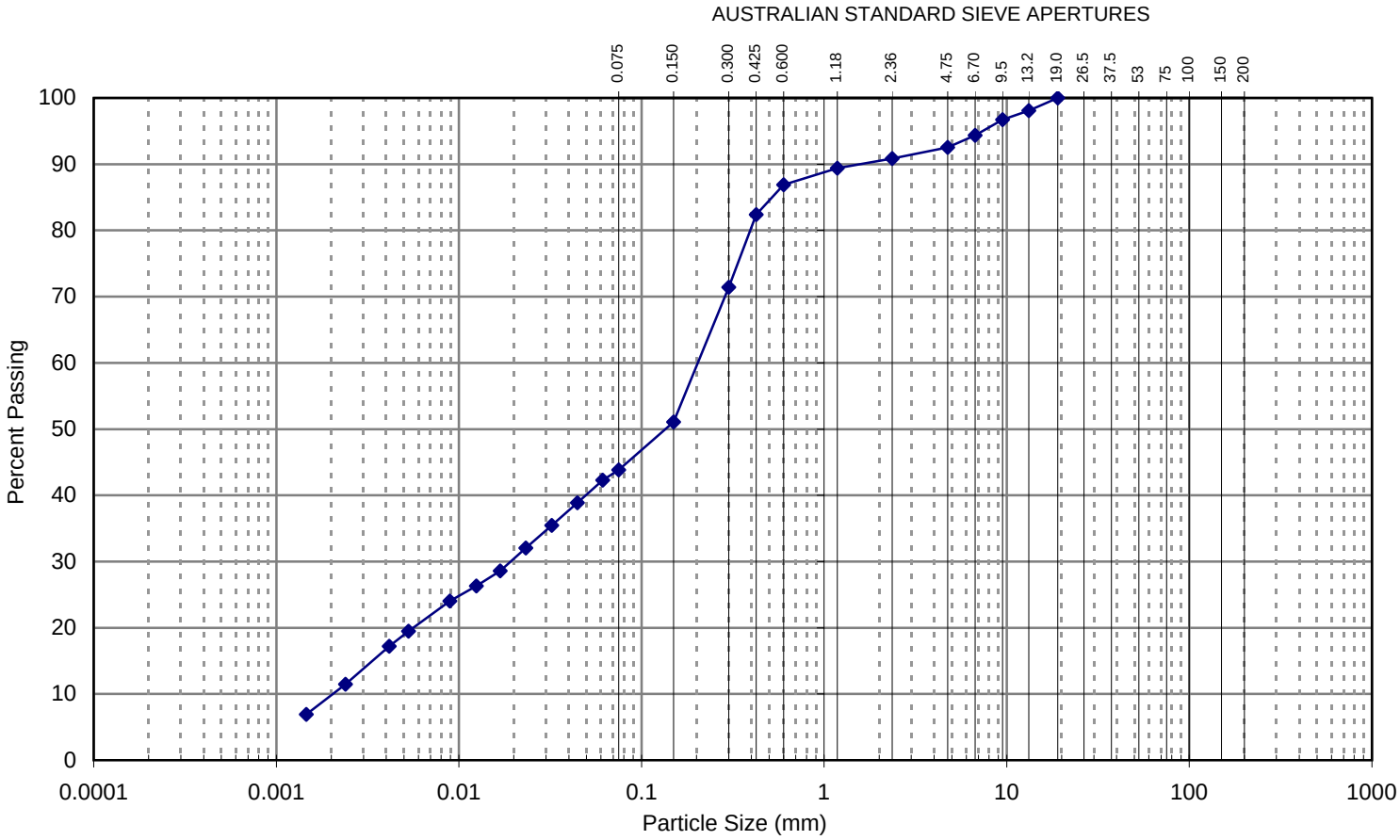
newcastle@douglaspartners.com.au

RESULTS OF PARTICLE SIZE DISTRIBUTION TEST

Client :	Johnson Property Group Pty Ltd	**Project No. :**	39823B
		Report No. :	N07-207
Project :	Trinity Point Marina & Mixed Use Resort	**Report Date :**	1/11/2007
Location :	off Henry Street, Morisset	**Date Sampled:**	-
Test Location :	201	**Date of Test:**	26/10/2007
Depth / Layer :	0.0-0.45m	**Page:**	1 of 1



CLAY FRACTION	SILT FRACTION			SAND FRACTION			GRAVEL FRACTION			COBBLES
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	
0.002	0.006	0.02	0.06	0.2	0.6	2.0	6.0	20	60	

Description: Silty SAND/Sandy SILT

Test Method(s): AS 1289.3.6.3-1995 **Loss in pretreatment:** N/A

Sampling Method(s): AS 1289.1.2.1 (6.2) - 1998, AS 1289.1.1 - 2002 **Type of Hydrometer:** g/l

Method of Dispersion: Sodium Hexametaphosphate

Remarks:

NATA Accredited Laboratory Number: 828
This Document is issued in accordance with NATA's accreditation requirements.
Accredited for compliance with ISO/IEC 17025

Approved Signatory:

Tested:	DR
Checked:	DM

Dave Millard
Laboratory Manager

Douglas Partners
Geotechnics · Environment · Groundwater

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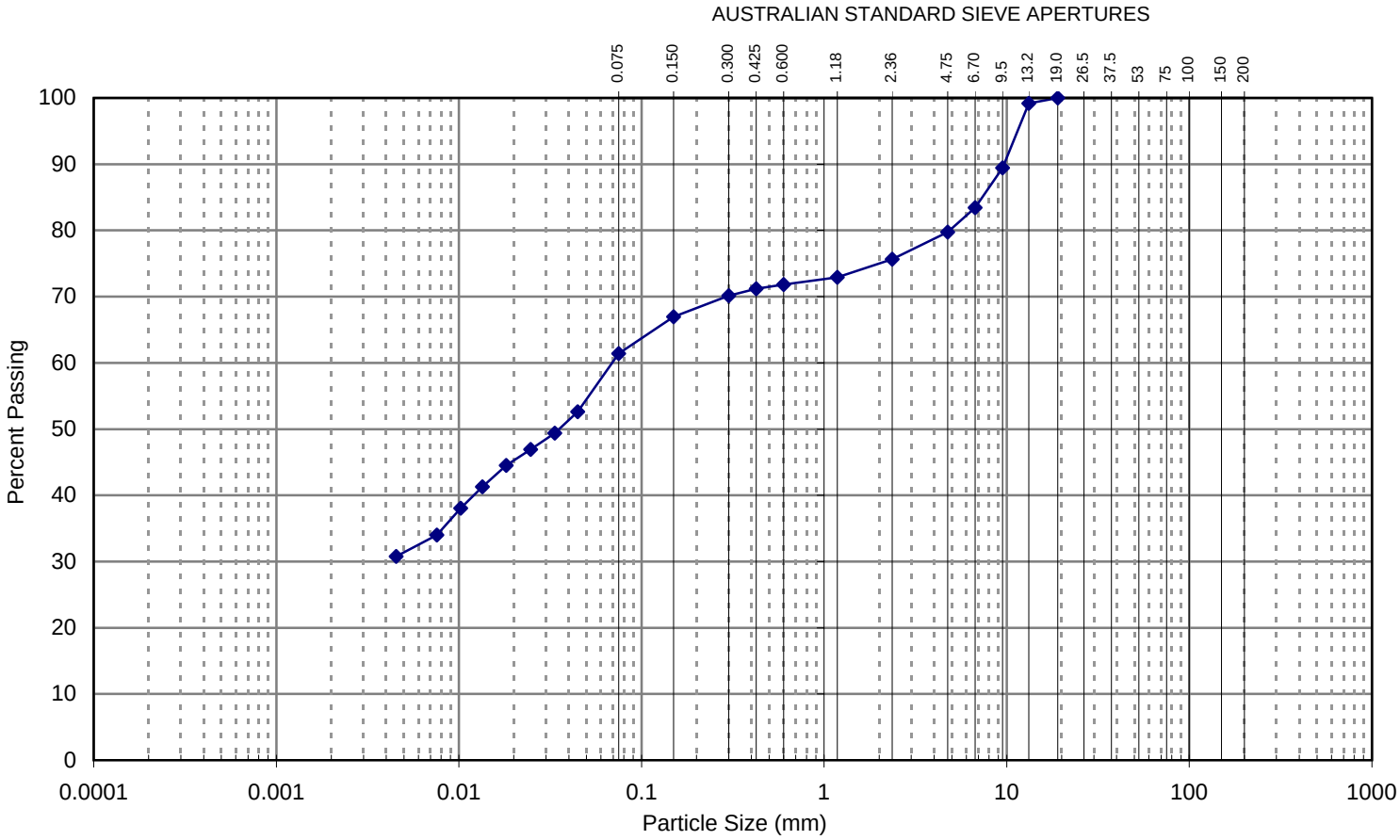
RESULTS OF PARTICLE SIZE DISTRIBUTION TEST

Client :	Johnson Property Group Pty Ltd	**Project No. :**	39823B
		Report No. :	N07-207b
Project :	Trinity Point Marina & Mixed Use Resort	**Report Date :**	1/11/2007
Location :	off Henry Street, Morisset	**Date Sampled:**	-
Test Location :	202	**Date of Test:**	25/10/2007
Depth / Layer :	0.0-0.45m	**Page:**	1 of 1



CLAY FRACTION	SILT FRACTION			SAND FRACTION			GRAVEL FRACTION			COBBLES
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse	
0.002	0.006	0.02	0.06	0.2	0.6	2.0	6.0	20	60	

Description: Sandy Silty CLAY

Test Method(s): AS 1289.3.6.3-1995 **Loss in pretreatment:** N/A

Sampling Method(s): AS 1289.1.2.1 (6.2) - 1998, AS 1289.1.1 - 2002 **Type of Hydrometer:** g/l

Method of Dispersion: Sodium Hexametaphosphate

Remarks:

NATA ACCREDITED FOR TECHNICAL

NATA Accredited Laboratory Number: 828

This Document is issued in accordance with NATA's accreditation requirements.
Accredited for compliance with ISO/IEC 17025

Approved Signatory:

Tested:	DR
Checked:	DM

Dave Millard
Laboratory Manager

24 October 2007 **TEST REPORT**

Douglas Partners Pty Ltd
Box 324
Hunter Region Mail Centre
NSW 2310

Your Reference: 39823B, Trinity Point (Soils)
Report Number: 55469B-R

Attention: Brent Kerry

Dear Brent
The following samples were received from you on the date indicated.

Samples: Qty.	17 Soils
Date of Receipt of Samples:	27/09/07 & 28/09/07
Date of Receipt of Instructions:	01/10/07@2.16pm
Date Preliminary Report Emailed:	Not Issued

These samples were analysed in accordance with your written instructions.
A copy of the instructions is attached with the analytical report.

The results and associated quality control are contained in the following pages of this report.
Unless otherwise stated, solid samples are expressed on a dry weight basis (moisture has been supplied for your information only), air and liquid samples as received.

Should you have any queries regarding this report please contact the undersigned.

This report cancels and supersedes report No. 55469B issued by SGS Environmental Services.
Yours faithfully
SGS ENVIRONMENTAL SERVICES

Ly Kim Ha
Senior Organic Chemist

Edward Ibrahim
Laboratory Services Manager

Alexandra Stenta
Key Account Representative

SGS Australia Pty Ltd
ABN 44 000 964 278
Environmental Services Unit 16, 33 Maddox Street, Alexandria Australia
t (02) 8594 0400 f (02) 8594 0499
www.au.sgs.com
Member of the SGS Group

PAHs in Soil Our Reference: Your Reference Sample Type Date Sampled	UNITS ---------- ----------	55469B-R-1 SS1 Soil 25/09/2007	55469B-R-2 SS2 Soil 25/09/2007	55469B-R-3 SS3 Soil 25/09/2007	55469B-R-4 SS4 Soil 25/09/2007	55469B-R-5 SS5 Soil 25/09/2007
Acenaphthene	µg/kg	<10	<10	<10	<10	<10
Acenaphthylene	µg/kg	<10	<10	<10	<10	<10
2-Methylnaphthalene	µg/kg	<10	10	10	10	10
Anthracene	µg/kg	<10	<10	<10	<10	10
Fluorene	µg/kg	<10	<10	<10	<10	<10
Naphthalene	µg/kg	<10	<10	<10	<10	<10
Phenanthrene	µg/kg	20	20	20	20	40
Low MW PAH's	µg/kg	<80	<80	<80	<80	<100
Benzo[*a*]anthracene	µg/kg	10	10	10	10	20
Benzo[*a*]pyrene	µg/kg	20	20	20	20	30
Dibenzo[*ah*]anthracene	µg/kg	<10	<10	<10	<10	<10
Chrysene	µg/kg	10	20	20	20	30
Fluoranthene	µg/kg	20	30	30	30	50
Pyrene	µg/kg	20	20	20	20	40
High MW PAH's	µg/kg	<90	<110	<110	<110	<180
p -Terphenyl-*d14*	%	106	106	108	108	110

PAHs in Soil Our Reference: Your Reference Sample Type Date Sampled	UNITS ---------- ----------	55469B-R-6 SS6 Soil 25/09/2007	55469B-R-7 SS7 Soil 25/09/2007	55469B-R-8 SS8 Soil 25/09/2007	55469B-R-9 SS9 Soil 25/09/2007	55469B-R-10 SS10 Soil 25/09/2007
Acenaphthene	µg/kg	<10	<20	<20	<20	<20
Acenaphthylene	µg/kg	<10	<20	<20	<20	<20
2-Methylnaphthalene	µg/kg	20	30	20	60	60
Anthracene	µg/kg	10	<20	<20	30	30
Fluorene	µg/kg	<10	<20	<20	<20	<20
Naphthalene	µg/kg	<10	<20	<20	<20	20
Phenanthrene	µg/kg	10	60	70	140	130
Low MW PAH's	µg/kg	<80	<190	<190	<310	<300
Benzo[*a*]anthracene	µg/kg	20	30	30	70	50
Benzo[*a*]pyrene	µg/kg	20	40	40	80	60
Dibenzo[*ah*]anthracene	µg/kg	<10	<20	<20	<20	<20
Chrysene	µg/kg	30	40	50	90	80
Fluoranthene	µg/kg	40	80	90	160	140
Pyrene	µg/kg	40	60	70	130	110
High MW PAH's	µg/kg	<160	<270	<300	<550	<460
p -Terphenyl-*d14*	%	112	108	108	110	112

PAHs in Soil **Our Reference:** **Your Reference** **Sample Type** **Date Sampled**	**UNITS** ---------- ----------	**55469B-R-11** **SS11** **Soil** **25/09/2007**	**55469B-R-12** **SS12** **Soil** **25/09/2007**	**55469B-R-13** **SS13** **Soil** **25/09/2007**	**55469B-R-14** **SS14** **Soil** **25/09/2007**	**55469B-R-15** **SS15** **Soil** **25/09/2007**
Acenaphthene	µg/kg	<20	<20	<20	<20	<20
Acenaphthylene	µg/kg	<20	<20	<20	<20	<20
2-Methylnaphthalene	µg/kg	50	30	40	20	40
Anthracene	µg/kg	30	<20	30	<20	30
Fluorene	µg/kg	<20	<20	<20	<20	<20
Naphthalene	µg/kg	<20	<20	<20	<20	<20
Phenanthrene	µg/kg	120	60	110	50	100
Low MW PAH's	µg/kg	<280	<190	<260	<170	<250
Benzo[*a*]anthracene	µg/kg	60	30	60	20	50
Benzo[*a*]pyrene	µg/kg	70	50	70	30	60
Dibenzo[*ah*]anthracene	µg/kg	<20	<20	<20	<20	<20
Chrysene	µg/kg	80	50	70	40	70
Fluoranthene	µg/kg	140	90	130	60	130
Pyrene	µg/kg	180	80	110	50	110
High MW PAH's	µg/kg	<550	<320	<460	<220	<440
p -Terphenyl-*d14*	%	104	100	112	102	148

PAHs in Soil Our Reference: Your Reference Sample Type Date Sampled	UNITS ---------- ----------	55469B-R-16 QA1 Soil 25/09/2007	55469B-R-17 TB1 Soil 25/09/2007
Acenaphthene	µg/kg	<10	<10
Acenaphthylene	µg/kg	<10	<10
2-Methylnaphthalene	µg/kg	20	<10
Anthracene	µg/kg	<10	<10
Fluorene	µg/kg	<10	<10
Naphthalene	µg/kg	<10	<10
Phenanthrene	µg/kg	30	<10
Low MW PAH's	µg/kg	<100	<70
Benzo[*a*]anthracene	µg/kg	20	<10
Benzo[*a*]pyrene	µg/kg	20	<10
Dibenzo[*ah*]anthracene	µg/kg	<10	<10
Chrysene	µg/kg	20	<10
Fluoranthene	µg/kg	40	<10
Pyrene	µg/kg	30	<10
High MW PAH's	µg/kg	<140	<60
p -Terphenyl-*d14*	%	108	116

OC Pesticides in Soil Our Reference:	UNITS	55469B-R-1	55469B-R-2	55469B-R-3	55469B-R-4	55469B-R-5
Your Reference	----------	SS1	SS2	SS3	SS4	SS5
Sample Type	----------	Soil	Soil	Soil	Soil	Soil
Date Sampled		25/09/2007	25/09/2007	25/09/2007	25/09/2007	25/09/2007
OC		#	#	#	#	#

OC Pesticides in Soil Our Reference:	UNITS	55469B-R-6	55469B-R-7	55469B-R-8	55469B-R-9	55469B-R-10
Your Reference	----------	SS6	SS7	SS8	SS9	SS10
Sample Type	----------	Soil	Soil	Soil	Soil	Soil
Date Sampled		25/09/2007	25/09/2007	25/09/2007	25/09/2007	25/09/2007
OC		#	#	#	#	#

OC Pesticides in Soil Our Reference:	UNITS	55469B-R-11	55469B-R-12	55469B-R-13	55469B-R-14	55469B-R-15
Your Reference	----------	SS11	SS12	SS13	SS14	SS15
Sample Type	----------	Soil	Soil	Soil	Soil	Soil
Date Sampled		25/09/2007	25/09/2007	25/09/2007	25/09/2007	25/09/2007
OC		#	#	#	#	#

OC Pesticides in Soil Our Reference:	UNITS	55469B-R-16	55469B-R-17
Your Reference	----------	QA1	TB1
Sample Type	----------	Soil	Soil
Date Sampled		25/09/2007	25/09/2007
OC		#	#

OP Pesticides in Soil Our Reference: Your Reference Sample Type Date Sampled	UNITS ---------- ----------	55469B-R-1 SS1 Soil 25/09/2007	55469B-R-2 SS2 Soil 25/09/2007	55469B-R-3 SS3 Soil 25/09/2007	55469B-R-4 SS4 Soil 25/09/2007	55469B-R-5 SS5 Soil 25/09/2007
OP		#	#	#	#	#

OP Pesticides in Soil Our Reference: Your Reference Sample Type Date Sampled	UNITS ---------- ----------	55469B-R-6 SS6 Soil 25/09/2007	55469B-R-7 SS7 Soil 25/09/2007	55469B-R-8 SS8 Soil 25/09/2007	55469B-R-9 SS9 Soil 25/09/2007	55469B-R-10 SS10 Soil 25/09/2007
OP		#	#	#	#	#

OP Pesticides in Soil Our Reference: Your Reference Sample Type Date Sampled	UNITS ---------- ----------	55469B-R-11 SS11 Soil 25/09/2007	55469B-R-12 SS12 Soil 25/09/2007	55469B-R-13 SS13 Soil 25/09/2007	55469B-R-14 SS14 Soil 25/09/2007	55469B-R-15 SS15 Soil 25/09/2007
OP		#	#	#	#	#

OP Pesticides in Soil Our Reference: Your Reference Sample Type Date Sampled	UNITS ---------- ----------	55469B-R-16 QA1 Soil 25/09/2007	55469B-R-17 TB1 Soil 25/09/2007
OP		#	#

PCBs in Soil Our Reference: Your Reference Sample Type Date Sampled	UNITS ---------- ----------	55469B-R-1 SS1 Soil 25/09/2007	55469B-R-2 SS2 Soil 25/09/2007	55469B-R-3 SS3 Soil 25/09/2007	55469B-R-4 SS4 Soil 25/09/2007	55469B-R-5 SS5 Soil 25/09/2007
PCB		#	#	#	#	#

PCBs in Soil Our Reference: Your Reference Sample Type Date Sampled	UNITS ---------- ----------	55469B-R-6 SS6 Soil 25/09/2007	55469B-R-7 SS7 Soil 25/09/2007	55469B-R-8 SS8 Soil 25/09/2007	55469B-R-9 SS9 Soil 25/09/2007	55469B-R-10 SS10 Soil 25/09/2007
PCB		#	#	#	#	#

PCBs in Soil Our Reference: Your Reference Sample Type Date Sampled	UNITS ---------- ----------	55469B-R-11 SS11 Soil 25/09/2007	55469B-R-12 SS12 Soil 25/09/2007	55469B-R-13 SS13 Soil 25/09/2007	55469B-R-14 SS14 Soil 25/09/2007	55469B-R-15 SS15 Soil 25/09/2007
PCB		#	#	#	#	#

PCBs in Soil Our Reference: Your Reference Sample Type Date Sampled	UNITS ---------- ----------	55469B-R-16 QA1 Soil 25/09/2007	55469B-R-17 TB1 Soil 25/09/2007
PCB		#	#

Organtin Compounds Our Reference: Your Reference Sample Type Date Sampled	UNITS ---------- ----------	55469B-R-3 SS3 Soil 25/09/2007	55469B-R-5 SS5 Soil 25/09/2007	55469B-R-12 SS12 Soil 25/09/2007
Tributyltin	µgSn/kg	<0.5	<0.5	<0.5
Surrogate (Tripropyltin)	%	57	88	95

Inorganics Our Reference:	UNITS	55469B-R-1	55469B-R-2	55469B-R-3	55469B-R-4	55469B-R-5
Your Reference	----------	SS1	SS2	SS3	SS4	SS5
Sample Type	----------	Soil	Soil	Soil	Soil	Soil
Date Sampled		25/09/2007	25/09/2007	25/09/2007	25/09/2007	25/09/2007
Total Organic Carbon	%	2	1.0	1	0.8	1

Inorganics Our Reference:	UNITS	55469B-R-6	55469B-R-7	55469B-R-8	55469B-R-9	55469B-R-10
Your Reference	----------	SS6	SS7	SS8	SS9	SS10
Sample Type	----------	Soil	Soil	Soil	Soil	Soil
Date Sampled		25/09/2007	25/09/2007	25/09/2007	25/09/2007	25/09/2007
Total Organic Carbon	%	1	2	3	3	4

Inorganics Our Reference:	UNITS	55469B-R-11	55469B-R-12	55469B-R-13	55469B-R-14	55469B-R-15
Your Reference	----------	SS11	SS12	SS13	SS14	SS15
Sample Type	----------	Soil	Soil	Soil	Soil	Soil
Date Sampled		25/09/2007	25/09/2007	25/09/2007	25/09/2007	25/09/2007
Total Organic Carbon	%	3	3	4	3	3

Inorganics Our Reference:	UNITS	55469B-R-16	55469B-R-17
Your Reference	----------	QA1	TB1
Sample Type	----------	Soil	Soil
Date Sampled		25/09/2007	25/09/2007
Total Organic Carbon	%	0.7	<0.05

Method ID	Methodology Summary
Ext-003	Analysis subcontracted to SGS Environmental Perth.
SEO-030	PAHs by GC/MS - Determination of Polynuclear Aromatic Hydrocarbons (PAH's) by Gas Chromatography / Mass Spectrometry following extraction with dichloromethane or dichloromethane/acetone. The surrogate spike used is p-Terphenyl-d14.
Ext-048	Subcontracted analysis to Analytical National Measurement Institute, NSW.
Ext-041	Analysis subcontracted to Advanced Analytical Australia Pty Ltd.
CEI-019	This method is used to then determine the Total Organic Carbon in soils for agricultural purposes.

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Acenaphthene	µg/kg	10	Ext-003	<10	55469B-2	<10 || <10	[NR]	[NR]
Acenaphthylene	µg/kg	10	Ext-003	<10	55469B-2	<10 || <10	[NR]	[NR]
2-Methylnaphthalene	µg/kg	10	SEO-030	<10	55469B-2	10 || 10 || RPD: 0	[NR]	[NR]
Anthracene	µg/kg	10	Ext-003	<10	55469B-2	<10 || <10	[NR]	[NR]
Fluorene	µg/kg	10	Ext-003	<10	55469B-2	<10 || <10	55469B-15	107 || 102 || RPD: 5
Naphthalene	µg/kg	10	Ext-003	<10	55469B-2	<10 || <10	55469B-15	104 || 92 || RPD: 12
Phenanthrene	µg/kg	10	Ext-003	<10	55469B-2	20 || 30 || RPD: 40	55469B-15	129 || 122 || RPD: 6
Low MW PAH's	µg/kg	70	Ext-003	<70	55469B-2	<80 || <90	[NR]	[NR]
Benzo[*a*]anthracene	µg/kg	10	Ext-003	<10	55469B-2	10 || 10 || RPD: 0	55469B-15	94 || 87 || RPD: 8
Benzo[*a*]pyrene	µg/kg	10	Ext-003	<10	55469B-2	20 || 20 || RPD: 0	55469B-15	93 || 86 || RPD: 8
Dibenzo[*ah*]anthracene	µg/kg	10	Ext-003	<10	55469B-2	<10 || <10	[NR]	[NR]
Chrysene	µg/kg	10	Ext-003	<10	55469B-2	20 || 20 || RPD: 0	[NR]	[NR]
Fluoranthene	µg/kg	10	Ext-003	<10	55469B-2	30 || 30 || RPD: 0	[NR]	[NR]
Pyrene	µg/kg	10	Ext-003	<10	55469B-2	20 || 20 || RPD: 0	55469B-15	104 || 97 || RPD: 7
High MW PAH's	µg/kg	60	Ext-003	<60	55469B-2	<110 || <110	[NR]	[NR]
p -Terphenyl-*d* 14	%	0	Ext-003	110	55469B-2	106 || 118 || RPD: 11	55469B-15	104 || 106 || RPD: 2

QUALITY CONTROL OC Pesticides in Soil	UNITS	PQL	METHOD	Blank
OC			Ext-048	#

QUALITY CONTROL OP Pesticides in Soil	UNITS	PQL	METHOD	Blank
OP			Ext-048	#

QUALITY CONTROL PCBs in Soil	UNITS	PQL	METHOD	Blank
PCB			Ext-048	#

QUALITY CONTROL Organtin Compounds	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Tributyltin	µgSn/kg	0.5	Ext-041	<0.5	55469B-3	<0.5 || <0.5	55469B-3	109 || [N/T]
Surrogate (Tripropyltin)	%		Ext-041	130	55469B-3	57 || 65 || RPD: 13	55469B-3	87 || [N/T]

QUALITY CONTROL Inorganics	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Total Organic Carbon	%	0.05	CEI-019	<0.05	55469B-1	2 || 2 || RPD: 0	55469B-2	89 || [N/T]

QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Acenaphthene	µg/kg	55469B-11	<20 || <20
Acenaphthylene	µg/kg	55469B-11	<20 || <20
2-Methylnaphthalene	µg/kg	55469B-11	50 || 60 || RPD: 18
Anthracene	µg/kg	55469B-11	30 || 30 || RPD: 0
Fluorene	µg/kg	55469B-11	<20 || <20
Naphthalene	µg/kg	55469B-11	<20 || <20
Phenanthrene	µg/kg	55469B-11	120 || 140 || RPD: 15
Low MW PAH's	µg/kg	55469B-11	<280 || <310
Benzo[*a*]anthracene	µg/kg	55469B-11	60 || 70 || RPD: 15
Benzo[*a*]pyrene	µg/kg	55469B-11	70 || 80 || RPD: 13
Dibenzo[*ah*]anthracene	µg/kg	55469B-11	<20 || 20
Chrysene	µg/kg	55469B-11	80 || 90 || RPD: 12
Fluoranthene	µg/kg	55469B-11	140 || 160 || RPD: 13
Pyrene	µg/kg	55469B-11	180 || 130 || RPD: 32
High MW PAH's	µg/kg	55469B-11	<550 || <550
p -Terphenyl-*d14*	%	55469B-11	104 || 108 || RPD: 4

QUALITY CONTROL Inorganics	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Total Organic Carbon	%	55469B-10	4 || 4 || RPD: 0	LCS	93 || [N/T]

Result Codes

[INS]	:	Insufficient Sample for this test	[HBG]	:	Results not Reported due to High Background Interference
[NR]	:	Not Requested	*	:	Not part of NATA Accreditation
[NT]	:	Not tested	[N/A]	:	Not Applicable

Result Comments

Low Level PAH's analysed by SGS Perth, Report No 13627A.

The LOR for sample numbers 7- 15 has been raised by a dilution factor of two due to sample matrix interference.

Low Level OC/OP/PCB's analysed by NMI, Report No. SGSA01/071002 (Report attached)

Tributyltin analysed by Advanced Analytical, Report No A07/2644.

Date Organics extraction commenced: 02/10/07
NATA Corporate Accreditation No. 2562, Site No 4354
Note: Test results are not corrected for recovery (excluding Dioxins/Furans* and PAH in XAD and PUF).

Quality Control Protocol

Reagent Blank: Sample free reagents carried through the preparation/extraction/digestion procedure and analysed at the beginning of every sample batch analysis. For larger projects, a reagent blank is prepared and analysed with every 20 samples.
Duplicate: A separate portion of a sample being analysed which is treated the same as the other samples in the batch. A duplicate is prepared at least every 10 samples.
Matrix Spike Duplicates: Sample replicates spiked with identical concentrations of target analyte(s). The spiking occurs during the sample preparation and prior to the extraction/digestion procedure. They are used to document the precision and bias of a method in a given sample matrix. Where there is not enough sample available to prepare a spiked sample, another known soil/sand or water (or Milli-Q water) may be used. A duplicate spiked sample is prepared at least every 20 samples.
Surrogate Spike: Added to all samples requiring analysis for organics (where relevant) prior to extraction. Used to determine the extraction efficiency. They are organic compounds which are similar to the target analyte(s) in chemical composition and behaviour in the analytical process, but which are not normally found in environmental samples.
Internal Standard: Added to all samples requiring analysis for organics (where relevant) after the extraction process; the compounds serve to give a standard of retention time and response, which is invariant from run-to-run with the instruments.
Control Standards: Prepared from a source independent of the calibration standards. At least one control standard is included in each run to confirm calibration validity.
Additional QC Samples: A calibration standard and blank are run after every 20 samples of an instrumental analysis run to assess analytical drift.

3 October 2007 **TEST REPORT**

Douglas Partners Pty Ltd
Box 324
Hunter Region Mail Centre
NSW 2310

Your Reference: 39823B, Trinity Point (Metals-Soils)
Report Number: 55469-R

Attention: Brent Kerry

Dear Brent
The following samples were received from you on the date indicated.

Samples: Qty.	17 Soils
Date of Receipt of Samples:	27/09/07 & 28/09/07
Date of Receipt of Instructions:	28/09/07
Date Preliminary Report Emailed:	Not Issued

These samples were analysed in accordance with your written instructions.
A copy of the instructions is attached with the analytical report.

The results and associated quality control are contained in the following pages of this report.
Unless otherwise stated, solid samples are expressed on a dry weight basis (moisture has been supplied for your information only), air and liquid samples as received.

Should you have any queries regarding this report please contact the undersigned.

This report cancels and supersedes report No. 55469 issued by SGS Environmental Services due to incorrect level of reporting for SIlver in previous report.

Yours faithfully
SGS ENVIRONMENTAL SERVICES

Ly Kim Ha
Senior Organic Chemist

Edward Ibrahim
Laboratory Services Manager

Alexandra Stenta
Key Account Representative

Metals in Soil by ICP-OES Our Reference: Your Reference Sample Type Date Sampled	UNITS ---------- ----------	55469-R-1 SS1 Soil 25/09/2007	55469-R-2 SS2 Soil 25/09/2007	55469-R-3 SS3 Soil 25/09/2007	55469-R-4 SS4 Soil 25/09/2007	55469-R-5 SS5 Soil 25/09/2007
Arsenic	mg/kg	6	16	18	22	15
Antimony	mg/kg	<2	<2	<2	<2	<2
Cadmium	mg/kg	1.5	0.6	0.7	0.6	0.6
Chromium	mg/kg	4.9	7.6	7.8	6.7	6.4
Copper	mg/kg	12	13	14	10	9.4
Lead	mg/kg	7	9.9	10	9.1	8
Nickel	mg/kg	3.0	3.7	3.9	3.9	3.5
Silver	mg/kg	<1	<1	<1	<1	<1
Selenium	mg/kg	<2	<2	<2	<2	<2
Zinc	mg/kg	46	48	51	47	44

Metals in Soil by ICP-OES Our Reference: Your Reference Sample Type Date Sampled	UNITS ---------- ----------	55469-R-6 SS6 Soil 25/09/2007	55469-R-7 SS7 Soil 25/09/2007	55469-R-8 SS8 Soil 25/09/2007	55469-R-9 SS9 Soil 25/09/2007	55469-R-10 SS10 Soil 25/09/2007
Arsenic	mg/kg	12	18	15	15	13
Antimony	mg/kg	<2	<2	<2	<2	<2
Cadmium	mg/kg	<0.5	1.3	1.6	1.4	1.4
Chromium	mg/kg	8.0	17	18	18	17
Copper	mg/kg	14	22	23	33	30
Lead	mg/kg	9.8	18	20	23	22
Nickel	mg/kg	3.8	7.5	7.9	7.7	7.1
Silver	mg/kg	<1	<1	<1	<1	<1
Selenium	mg/kg	<2	4	<2	2	2
Zinc	mg/kg	56	110	130	140	140

Metals in Soil by ICP-OES Our Reference: Your Reference Sample Type Date Sampled	UNITS ---------- ----------	55469-R-11 SS11 Soil 25/09/2007	55469-R-12 SS12 Soil 25/09/2007	55469-R-13 SS13 Soil 25/09/2007	55469-R-14 SS14 Soil 25/09/2007	55469-R-15 SS15 Soil 25/09/2007
Arsenic	mg/kg	18	17	17	15	16
Antimony	mg/kg	<2	<2	<2	<2	<2
Cadmium	mg/kg	1.9	1.7	1.7	0.8	1.8
Chromium	mg/kg	23	19	21	15	21
Copper	mg/kg	37	22	34	14	31
Lead	mg/kg	28	21	25	14	26
Nickel	mg/kg	9.4	8.5	8.9	7.3	8.6
Silver	mg/kg	<1	<1	<1	<1	<1
Selenium	mg/kg	3	3	2	2	3
Zinc	mg/kg	170	120	160	72	160

Metals in Soil by ICP-OES Our Reference: Your Reference Sample Type Date Sampled	UNITS ---------- ----------	55469-R-16 QA1 Soil 25/09/2007	55469-R-17 TB1 Soil 25/09/2007
Arsenic	mg/kg	20	<3
Antimony	mg/kg	<2	<2
Cadmium	mg/kg	0.7	<0.5
Chromium	mg/kg	7.6	0.6
Copper	mg/kg	10	0.6
Lead	mg/kg	9.6	<2
Nickel	mg/kg	4.3	<0.2
Silver	mg/kg	<1	<1
Selenium	mg/kg	<2	<2
Zinc	mg/kg	52	0.93

Mercury,Cold Vapor/Hg Analyser						
Our Reference:	UNITS	55469-R-1	55469-R-2	55469-R-3	55469-R-4	55469-R-5
Your Reference	----------	SS1	SS2	SS3	SS4	SS5
Sample Type	----------	Soil	Soil	Soil	Soil	Soil
Date Sampled		25/09/2007	25/09/2007	25/09/2007	25/09/2007	25/09/2007
Mercury	mg/kg	<0.15	<0.15	<0.15	<0.15	<0.15

Mercury,Cold Vapor/Hg Analyser						
Our Reference:	UNITS	55469-R-6	55469-R-7	55469-R-8	55469-R-9	55469-R-10
Your Reference	----------	SS6	SS7	SS8	SS9	SS10
Sample Type	----------	Soil	Soil	Soil	Soil	Soil
Date Sampled		25/09/2007	25/09/2007	25/09/2007	25/09/2007	25/09/2007
Mercury	mg/kg	<0.15	<0.15	<0.15	<0.15	<0.15

Mercury,Cold Vapor/Hg Analyser						
Our Reference:	UNITS	55469-R-11	55469-R-12	55469-R-13	55469-R-14	55469-R-15
Your Reference	----------	SS11	SS12	SS13	SS14	SS15
Sample Type	----------	Soil	Soil	Soil	Soil	Soil
Date Sampled		25/09/2007	25/09/2007	25/09/2007	25/09/2007	25/09/2007
Mercury	mg/kg	<0.15	<0.15	<0.15	<0.15	<0.15

Mercury,Cold Vapor/Hg Analyser			
Our Reference:	UNITS	55469-R-16	55469-R-17
Your Reference	----------	QA1	TB1
Sample Type	----------	Soil	Soil
Date Sampled		25/09/2007	25/09/2007
Mercury	mg/kg	<0.15	<0.15

Moisture						
Our Reference:	UNITS	55469-R-1	55469-R-2	55469-R-3	55469-R-4	55469-R-5
Your Reference	----------	SS1	SS2	SS3	SS4	SS5
Sample Type	----------	Soil	Soil	Soil	Soil	Soil
Date Sampled		25/09/2007	25/09/2007	25/09/2007	25/09/2007	25/09/2007
Moisture	%	42	33	35	38	26

Moisture						
Our Reference:	UNITS	55469-R-6	55469-R-7	55469-R-8	55469-R-9	55469-R-10
Your Reference	----------	SS6	SS7	SS8	SS9	SS10
Sample Type	----------	Soil	Soil	Soil	Soil	Soil
Date Sampled		25/09/2007	25/09/2007	25/09/2007	25/09/2007	25/09/2007
Moisture	%	33	66	65	66	65

Moisture						
Our Reference:	UNITS	55469-R-11	55469-R-12	55469-R-13	55469-R-14	55469-R-15
Your Reference	----------	SS11	SS12	SS13	SS14	SS15
Sample Type	----------	Soil	Soil	Soil	Soil	Soil
Date Sampled		25/09/2007	25/09/2007	25/09/2007	25/09/2007	25/09/2007
Moisture	%	69	65	66	62	63

Moisture			
Our Reference:	UNITS	55469-R-16	55469-R-17
Your Reference	----------	QA1	TB1
Sample Type	----------	Soil	Soil
Date Sampled		25/09/2007	25/09/2007
Moisture	%	33	1

Method ID	Methodology Summary
SEM-010	Metals - Determination of various metals by ICP-AES following aqua regia digest.
SEM-005	Mercury - Determination of Mercury by Cold Vapour Generation Atomic Absorption Spectroscopy.
AN002	Preparation of soils, sediments and sludges undergo analysis by either air drying, compositing, subsampling and 1:5 soil water extraction where required. Moisture content is determined by drying the sample at 105 ± 5°C.

QUALITY CONTROL Metals in Soil by ICP-OES	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Arsenic	mg/kg	3	SEM-010	<3	55469-1	6 || 8 || RPD: 29	55469-2	96 || [N/T]
Antimony	mg/kg	2	SEM-010	<3	55469-1	<2 || <2	55469-2	87 || [N/T]
Cadmium	mg/kg	0.5	SEM-010	<0.5	55469-1	1.5 || 1.8 || RPD: 18	55469-2	94 || [N/T]
Chromium	mg/kg	0.5	SEM-010	<0.5	55469-1	4.9 || 5.5 || RPD: 12	55469-2	96 || [N/T]
Copper	mg/kg	0.5	SEM-010	<0.5	55469-1	12 || 14 || RPD: 15	55469-2	93 || [N/T]
Lead	mg/kg	2	SEM-010	<2	55469-1	7 || 8 || RPD: 13	55469-2	83 || [N/T]
Nickel	mg/kg	0.2	SEM-010	<0.5	55469-1	3.0 || 3.4 || RPD: 12	55469-2	91 || [N/T]
Silver	mg/kg	1	SEM-010	<2	55469-1	<1 || <1	55469-2	100 || [N/T]
Selenium	mg/kg	2	SEM-010	<2	55469-1	<2 || <2	55469-2	81 || [N/T]
Zinc	mg/kg	0.5	SEM-010	<0.5	55469-1	46 || 52 || RPD: 12	55469-2	87 || [N/T]

QUALITY CONTROL Mercury,Cold Vapor/Hg Analyser	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Mercury	mg/kg	0.15	SEM-005	<0.15	55469-1	<0.15 || <0.15	55469-2	80 || [N/T]

QUALITY CONTROL Moisture	UNITS	PQL	METHOD	Blank
Moisture	%	1	AN002	<1

QUALITY CONTROL Metals in Soil by ICP-OES	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Arsenic	mg/kg	55469-11	18 || 21 || RPD: 15
Antimony	mg/kg	55469-11	<2 || <2
Cadmium	mg/kg	55469-11	1.9 || 2.2 || RPD: 15
Chromium	mg/kg	55469-11	23 || 25 || RPD: 8
Copper	mg/kg	55469-11	37 || 42 || RPD: 13
Lead	mg/kg	55469-11	28 || 31 || RPD: 10
Nickel	mg/kg	55469-11	9.4 || 10 || RPD: 6
Silver	mg/kg	55469-11	<1 || [N/T]
Selenium	mg/kg	55469-11	3 || 2 || RPD: 40
Zinc	mg/kg	55469-11	170 || 190 || RPD: 11

QUALITY CONTROL Mercury,Cold Vapor/Hg Analyser	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Mercury	mg/kg	55469-11	<0.15 || <0.15

Result Codes

[INS]	:	Insufficient Sample for this test	[HBG]	:	Results not Reported due to High Background Interference
[NR]	:	Not Requested	*	:	Not part of NATA Accreditation
[NT]	:	Not tested	[N/A]	:	Not Applicable

Result Comments

Date Organics extraction commenced: N/A
NATA Corporate Accreditation No. 2562, Site No 4354
Note: Test results are not corrected for recovery (excluding Dioxins/Furans* and PAH in XAD and PUF).
This document is issued, on the Client's behalf, by the Company under its General Conditions of Service available on request and accessible at http://www.sgs.com/terms_and_conditions.htm. The Client's attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

Any other holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents.

Quality Control Protocol

Reagent Blank: Sample free reagents carried through the preparation/extraction/digestion procedure and analysed at the beginning of every sample batch analysis. For larger projects, a reagent blank is prepared and analysed with every 20 samples.
Duplicate: A separate portion of a sample being analysed which is treated the same as the other samples in the batch. A duplicate is prepared at least every 10 samples.
Matrix Spike Duplicates: Sample replicates spiked with identical concentrations of target analyte(s). The spiking occurs during the sample preparation and prior to the extraction/digestion procedure. They are used to document the precision and bias of a method in a given sample matrix. Where there is not enough sample available to prepare a spiked sample, another known soil/sand or water (or Milli-Q water) may be used. A duplicate spiked sample is prepared at least every 20 samples.
Surrogate Spike: Added to all samples requiring analysis for organics (where relevant) prior to extraction. Used to determine the extraction efficiency. They are organic compounds which are similar to the target analyte(s) in chemical composition and behaviour in the analytical process, but which are not normally found in environmental samples.
Internal Standard: Added to all samples requiring analysis for organics (where relevant) after the extraction process; the compounds serve to give a standard of retention time and response, which is invariant from run-to-run with the instruments.
Control Standards: Prepared from a source independent of the calibration standards. At least one control standard is included in each run to confirm calibration validity.
Additional QC Samples: A calibration standard and blank are run after every 20 samples of an instrumental analysis run to assess analytical drift.

REPORT OF ANALYSIS

Client	: SGS AUST ENVIRONMENTAL SRVS	Job No.	: SGSA01/071002
	UNIT 16	Quote No.	: QT-00782
	33 MADDOX ST	Order No.	:
	ALEXANDRIA NSW 2015	Date Sampled	:
		Date Received	: 2-OCT-2007
Attention	: ANGELA	Sampled By	: CLIENT
Project Name	:		
Your Client Services Manager	: BRIAN WOODWARD	Phone	: (02) 94490151

Lab Reg No.	Sample Ref	Sample Description
N07/035035	55469B-1	SOIL RN55469B
N07/035036	55469B-2	SOIL RN55469B
N07/035037	55469B-3	SOIL RN55469B
N07/035038	55469B-4	SOIL RN55469B

Lab Reg No.		N07/035035	N07/035036	N07/035037	N07/035038	
Sample Reference	Units	55469B-1	55469B-2	55469B-3	55469B-4	Method
Organochlorine (OC) Pesticides						
HCB	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
Heptachlor	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
Heptachlor epoxide	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
Aldrin	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
gamma-BHC (Lindane)	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
alpha-BHC	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
beta-BHC	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
delta-BHC	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
trans-Chlordane	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
cis-Chlordane	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
Oxychlordane	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
Dieldrin	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
pp-DDE	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
pp-DDD	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
pp-DDT	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
Endrin	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
Endrin Aldehyde	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
Endrin Ketone	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
alpha-Endosulfan	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
beta-Endosulfan	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
Endosulfan Sulfate	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
Methoxychlor	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
PCB Aroclors						
Aroclor 1016	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Aroclor 1221	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Aroclor 1232	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Aroclor 1242	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Aroclor 1248	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19

REPORT OF ANALYSIS

Lab Reg No.		N07/035035	N07/035036	N07/035037	N07/035038	
Sample Reference	Units	55469B-1	55469B-2	55469B-3	55469B-4	Method
PCB Aroclors						
Aroclor 1254	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Aroclor 1260	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Total PCB's (as above)	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Organophosphate (OP) Pesticides						
Dichlorvos	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Demeton-S-Methyl	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Diazinon	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Dimethoate	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Chlorpyrifos	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Chlorpyrifos Methyl	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Malathion	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Fenthion	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Ethion	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Fenitrothion	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Chlorfenvinphos (E)	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Chlorfenvinphos (Z)	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Parathion (Ethyl)	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Parathion Methyl	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Pirimiphos Methyl	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Pirimiphos Ethyl	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Azinphos Methyl	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Azinphos Ethyl	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Surrogate						
Surrogate OC Rec.	%	75	74	89	88	NR_19
Surrogate OP Rec.	%	107	105	108	108	NR_19
Dates						
Date extracted		5-OCT-2007	5-OCT-2007	5-OCT-2007	5-OCT-2007	
Date analysed		8-OCT-2007	8-OCT-2007	8-OCT-2007	8-OCT-2007	

Danny Slee, Section Manager
Organics - NSW
Accreditation No. 198

9-OCT-2007

REPORT OF ANALYSIS

Lab Reg No.		N07/035035	N07/035036	N07/035037	N07/035038	
Sample Reference	Units	55469B-1	55469B-2	55469B-3	55469B-4	Method
Trace Elements						
Total Solids	%	55.9	65.3	62.3	65.2	NT2_49

Nasir Shikdar, Analyst
Inorganics - NSW
Accreditation No. 198

9-OCT-2007

REPORT OF ANALYSIS

Client	: SGS AUST ENVIRONMENTAL SRVS	Job No.	: SGSA01/071002
	UNIT 16	Quote No.	: QT-00782
	33 MADDOX ST	Order No.	:
	ALEXANDRIA NSW 2015	Date Sampled	:
		Date Received	: 2-OCT-2007
Attention	: ANGELA	Sampled By	: CLIENT
Project Name	:		
Your Client Services Manager	: BRIAN WOODWARD	Phone	: (02) 94490151

Lab Reg No.	Sample Ref	Sample Description
N07/035039	55469B-5	SOIL RN55469B
N07/035040	55469B-6	SOIL RN55469B
N07/035041	55469B-7	SOIL RN55469B
N07/035042	55469B-8	SOIL RN55469B

Lab Reg No.		N07/035039	N07/035040	N07/035041	N07/035042	
Sample Reference	Units	55469B-5	55469B-6	55469B-7	55469B-8	Method
Organochlorine (OC) Pesticides						
HCB	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
Heptachlor	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
Heptachlor epoxide	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
Aldrin	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
gamma-BHC (Lindane)	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
alpha-BHC	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
beta-BHC	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
delta-BHC	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
trans-Chlordane	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
cis-Chlordane	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
Oxychlordane	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
Dieldrin	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
pp-DDE	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
pp-DDD	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
pp-DDT	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
Endrin	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
Endrin Aldehyde	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
Endrin Ketone	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
alpha-Endosulfan	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
beta-Endosulfan	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
Endosulfan Sulfate	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
Methoxychlor	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
PCB Aroclors						
Aroclor 1016	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Aroclor 1221	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Aroclor 1232	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Aroclor 1242	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Aroclor 1248	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19

REPORT OF ANALYSIS

Lab Reg No.		N07/035039	N07/035040	N07/035041	N07/035042	
Sample Reference	Units	55469B-5	55469B-6	55469B-7	55469B-8	Method
PCB Aroclors						
Aroclor 1254	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Aroclor 1260	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Total PCB's (as above)	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Organophosphate (OP) Pesticides						
Dichlorvos	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Demeton-S-Methyl	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Diazinon	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Dimethoate	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Chlorpyrifos	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Chlorpyrifos Methyl	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Malathion	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Fenthion	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Ethion	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Fenitrothion	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Chlorfenvinphos (E)	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Chlorfenvinphos (Z)	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Parathion (Ethyl)	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Parathion Methyl	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Pirimiphos Methyl	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Pirimiphos Ethyl	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Azinphos Methyl	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Azinphos Ethyl	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Surrogate						
Surrogate OC Rec.	%	94	92	81	90	NR_19
Surrogate OP Rec.	%	82	66	75	94	NR_19
Dates						
Date extracted		5-OCT-2007	5-OCT-2007	5-OCT-2007	5-OCT-2007	
Date analysed		8-OCT-2007	8-OCT-2007	8-OCT-2007	8-OCT-2007	

Danny Slee, Section Manager
Organics - NSW
Accreditation No. 198

9-OCT-2007

REPORT OF ANALYSIS

Lab Reg No.		N07/035039	N07/035040	N07/035041	N07/035042	
Sample Reference	Units	55469B-5	55469B-6	55469B-7	55469B-8	Method
Trace Elements						
Total Solids	%	58.2	64	35	33.1	NT2_49

Nasir Shikdar, Analyst
Inorganics - NSW
Accreditation No. 198

9-OCT-2007

REPORT OF ANALYSIS

Client	: SGS AUST ENVIRONMENTAL SRVS	Job No.	: SGSA01/071002
	UNIT 16	Quote No.	: QT-00782
	33 MADDOX ST	Order No.	:
	ALEXANDRIA NSW 2015	Date Sampled	:
		Date Received	: 2-OCT-2007
Attention	: ANGELA	Sampled By	: CLIENT
Project Name	:		
Your Client Services Manager	: BRIAN WOODWARD	Phone	: (02) 94490151

Lab Reg No.	Sample Ref	Sample Description
N07/035043	55469B-9	SOIL RN55469B
N07/035044	55469B-10	SOIL RN55469B
N07/035045	55469B-11	SOIL RN55469B
N07/035046	55469B-12	SOIL RN55469B

Lab Reg No. / Sample Reference	Units	N07/035043 55469B-9	N07/035044 55469B-10	N07/035045 55469B-11	N07/035046 55469B-12	Method
Organochlorine (OC) Pesticides						
HCB	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
Heptachlor	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
Heptachlor epoxide	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
Aldrin	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
gamma-BHC (Lindane)	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
alpha-BHC	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
beta-BHC	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
delta-BHC	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
trans-Chlordane	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
cis-Chlordane	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
Oxychlordane	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
Dieldrin	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
pp-DDE	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
pp-DDD	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
pp-DDT	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
Endrin	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
Endrin Aldehyde	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
Endrin Ketone	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
alpha-Endosulfan	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
beta-Endosulfan	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
Endosulfan Sulfate	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
Methoxychlor	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
PCB Aroclors						
Aroclor 1016	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Aroclor 1221	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Aroclor 1232	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Aroclor 1242	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Aroclor 1248	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19

REPORT OF ANALYSIS

Lab Reg No.		N07/035043	N07/035044	N07/035045	N07/035046	
Sample Reference	Units	55469B-9	55469B-10	55469B-11	55469B-12	Method
PCB Aroclors						
Aroclor 1254	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Aroclor 1260	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Total PCB's (as above)	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Organophosphate (OP) Pesticides						
Dichlorvos	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Demeton-S-Methyl	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Diazinon	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Dimethoate	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Chlorpyrifos	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Chlorpyrifos Methyl	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Malathion	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Fenthion	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Ethion	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Fenitrothion	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Chlorfenvinphos (E)	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Chlorfenvinphos (Z)	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Parathion (Ethyl)	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Parathion Methyl	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Pirimiphos Methyl	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Pirimiphos Ethyl	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Azinphos Methyl	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Azinphos Ethyl	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Surrogate						
Surrogate OC Rec.	%	88	93	79	73	NR_19
Surrogate OP Rec.	%	100	86	131	133	NR_19
Dates						
Date extracted		5-OCT-2007	5-OCT-2007	5-OCT-2007	5-OCT-2007	
Date analysed		8-OCT-2007	8-OCT-2007	8-OCT-2007	8-OCT-2007	

Danny Slee, Section Manager
Organics - NSW
Accreditation No. 198

9-OCT-2007

REPORT OF ANALYSIS

Lab Reg No.		N07/035043	N07/035044	N07/035045	N07/035046	
Sample Reference	Units	55469B-9	55469B-10	55469B-11	55469B-12	Method
Trace Elements						
Total Solids	%	34	36.5	32	37.3	NT2_49

Nasir Shikdar, Analyst
Inorganics - NSW
Accreditation No. 198

9-OCT-2007

REPORT OF ANALYSIS

Client	: SGS AUST ENVIRONMENTAL SRVS	Job No.	: SGSA01/071002
	UNIT 16	Quote No.	: QT-00782
	33 MADDOX ST	Order No.	:
	ALEXANDRIA NSW 2015	Date Sampled	:
		Date Received	: 2-OCT-2007
Attention	: ANGELA	Sampled By	: CLIENT
Project Name	:		
Your Client Services Manager	: BRIAN WOODWARD	Phone	: (02) 94490151

Lab Reg No.	Sample Ref	Sample Description
N07/035047	55469B-13	SOIL RN55469B
N07/035048	55469B-14	SOIL RN55469B
N07/035049	55469B-15	SOIL RN55469B
N07/035050	55469B-16	SOIL RN55469B

Lab Reg No. / Sample Reference	Units	N07/035047 55469B-13	N07/035048 55469B-14	N07/035049 55469B-15	N07/035050 55469B-16	Method
Organochlorine (OC) Pesticides						
HCB	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
Heptachlor	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
Heptachlor epoxide	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
Aldrin	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
gamma-BHC (Lindane)	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
alpha-BHC	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
beta-BHC	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
delta-BHC	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
trans-Chlordane	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
cis-Chlordane	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
Oxychlordane	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
Dieldrin	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
pp-DDE	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
pp-DDD	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
pp-DDT	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
Endrin	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
Endrin Aldehyde	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
Endrin Ketone	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
alpha-Endosulfan	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
beta-Endosulfan	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
Endosulfan Sulfate	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
Methoxychlor	mg/kg	< 0.001	< 0.001	< 0.001	< 0.001	NR_19
PCB Aroclors						
Aroclor 1016	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Aroclor 1221	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Aroclor 1232	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Aroclor 1242	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Aroclor 1248	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19

REPORT OF ANALYSIS

Lab Reg No.		N07/035047	N07/035048	N07/035049	N07/035050	
Sample Reference	Units	55469B-13	55469B-14	55469B-15	55469B-16	Method
PCB Aroclors						
Aroclor 1254	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Aroclor 1260	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Total PCB's (as above)	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Organophosphate (OP) Pesticides						
Dichlorvos	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Demeton-S-Methyl	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Diazinon	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Dimethoate	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Chlorpyrifos	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Chlorpyrifos Methyl	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Malathion	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Fenthion	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Ethion	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Fenitrothion	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Chlorfenvinphos (E)	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Chlorfenvinphos (Z)	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Parathion (Ethyl)	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Parathion Methyl	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Pirimiphos Methyl	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Pirimiphos Ethyl	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Azinphos Methyl	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Azinphos Ethyl	mg/kg	< 0.01	< 0.01	< 0.01	< 0.01	NR_19
Surrogate						
Surrogate OC Rec.	%	80	76	70	84	NR_19
Surrogate OP Rec.	%	146	84	90	92	NR_19
Dates						
Date extracted		5-OCT-2007	5-OCT-2007	5-OCT-2007	5-OCT-2007	
Date analysed		8-OCT-2007	8-OCT-2007	8-OCT-2007	8-OCT-2007	

Danny Slee, Section Manager
Organics - NSW
Accreditation No. 198

9-OCT-2007

REPORT OF ANALYSIS

Lab Reg No.		N07/035047	N07/035048	N07/035049	N07/035050	
Sample Reference	Units	55469B-13	55469B-14	55469B-15	55469B-16	Method
Trace Elements						
Total Solids	%	35	38.9	35.3	59.2	NT2_49

Nasir Shikdar, Analyst
Inorganics - NSW
Accreditation No. 198

9-OCT-2007

REPORT OF ANALYSIS

Client	: SGS AUST ENVIRONMENTAL SRVS	Job No.	: SGSA01/071002
	UNIT 16	Quote No.	: QT-00782
	33 MADDOX ST	Order No.	:
	ALEXANDRIA NSW 2015	Date Sampled	:
		Date Received	: 2-OCT-2007
Attention	: ANGELA	Sampled By	: CLIENT
Project Name	:		
Your Client Services Manager	: BRIAN WOODWARD	Phone	: (02) 94490151

Lab Reg No.	Sample Ref	Sample Description
N07/035051	55469B-17	SOIL RN55469B

Lab Reg No.		N07/035051				
Sample Reference	Units	55469B-17				Method
Organochlorine (OC) Pesticides						
HCB	mg/kg	< 0.001				NR_19
Heptachlor	mg/kg	< 0.001				NR_19
Heptachlor epoxide	mg/kg	< 0.001				NR_19
Aldrin	mg/kg	< 0.001				NR_19
gamma-BHC (Lindane)	mg/kg	< 0.001				NR_19
alpha-BHC	mg/kg	< 0.001				NR_19
beta-BHC	mg/kg	< 0.001				NR_19
delta-BHC	mg/kg	< 0.001				NR_19
trans-Chlordane	mg/kg	< 0.001				NR_19
cis-Chlordane	mg/kg	< 0.001				NR_19
Oxychlordane	mg/kg	< 0.001				NR_19
Dieldrin	mg/kg	< 0.001				NR_19
pp-DDE	mg/kg	< 0.001				NR_19
pp-DDD	mg/kg	< 0.001				NR_19
pp-DDT	mg/kg	< 0.001				NR_19
Endrin	mg/kg	< 0.001				NR_19
Endrin Aldehyde	mg/kg	< 0.001				NR_19
Endrin Ketone	mg/kg	< 0.001				NR_19
alpha-Endosulfan	mg/kg	< 0.001				NR_19
beta-Endosulfan	mg/kg	< 0.001				NR_19
Endosulfan Sulfate	mg/kg	< 0.001				NR_19
Methoxychlor	mg/kg	< 0.001				NR_19
PCB Aroclors						
Aroclor 1016	mg/kg	< 0.01				NR_19
Aroclor 1221	mg/kg	< 0.01				NR_19
Aroclor 1232	mg/kg	< 0.01				NR_19
Aroclor 1242	mg/kg	< 0.01				NR_19
Aroclor 1248	mg/kg	< 0.01				NR_19
Aroclor 1254	mg/kg	< 0.01				NR_19
Aroclor 1260	mg/kg	< 0.01				NR_19
Total PCB's (as above)	mg/kg	< 0.01				NR_19

REPORT OF ANALYSIS

Lab Reg No.		N07/035051				
Sample Reference	Units	55469B-17				Method
Organophosphate (OP) Pesticides						
Dichlorvos	mg/kg	< 0.01				NR_19
Demeton-S-Methyl	mg/kg	< 0.01				NR_19
Diazinon	mg/kg	< 0.01				NR_19
Dimethoate	mg/kg	< 0.01				NR_19
Chlorpyrifos	mg/kg	< 0.01				NR_19
Chlorpyrifos Methyl	mg/kg	< 0.01				NR_19
Malathion	mg/kg	< 0.01				NR_19
Fenthion	mg/kg	< 0.01				NR_19
Ethion	mg/kg	< 0.01				NR_19
Fenitrothion	mg/kg	< 0.01				NR_19
Chlorfenvinphos (E)	mg/kg	< 0.01				NR_19
Chlorfenvinphos (Z)	mg/kg	< 0.01				NR_19
Parathion (Ethyl)	mg/kg	< 0.01				NR_19
Parathion Methyl	mg/kg	< 0.01				NR_19
Pirimiphos Methyl	mg/kg	< 0.01				NR_19
Pirimiphos Ethyl	mg/kg	< 0.01				NR_19
Azinphos Methyl	mg/kg	< 0.01				NR_19
Azinphos Ethyl	mg/kg	< 0.01				NR_19
Surrogate						
Surrogate OC Rec.	%	90				NR_19
Surrogate OP Rec.	%	136				NR_19
Dates						
Date extracted		5-OCT-2007				
Date analysed		8-OCT-2007				

Danny Slee, Section Manager
Organics - NSW
Accreditation No. 198

9-OCT-2007

Lab Reg No.		N07/035051				
Sample Reference	Units	55469B-17				Method
Trace Elements						
Total Solids	%	98.9				NT2_49

REPORT OF ANALYSIS

Lab Reg No.		N07/035051				
Sample Reference	Units	55469B-17				Method

Nasir Shikdar, Analyst
Inorganics - NSW
Accreditation No. 198

9-OCT-2007

All results are expressed on a dry weight basis.

ACCREDITED FOR TECHNICAL COMPETENCE

This report is issued in accordance with NATA's accreditation requirements.
Accreditated for compliance with ISO/IEC 17025.
This report shall not be reproduced except in full.
Results relate only to the sample(s) tested.

This Report supersedes reports: RN640943 RN641439

5 October 2007 **TEST REPORT**

Douglas Partners Pty Ltd
Box 324
Hunter Region Mail Centre
NSW 2310

Your Reference: 39823B, Trinity Point (Waters)
Report Number: 55469A

Attention: Brent Kerry

Dear Brent
The following samples were received from you on the date indicated.

Samples: Qty.	14 Waters
Date of Receipt of Samples:	27/09/07 & 28/09/07
Date of Receipt of Instructions:	28/09/07
Date Preliminary Report Emailed:	Not Issued

These samples were analysed in accordance with your written instructions.
A copy of the instructions is attached with the analytical report.

The results and associated quality control are contained in the following pages of this report. Unless otherwise stated, solid samples are expressed on a dry weight basis (moisture has been supplied for your information only), air and liquid samples as received.

Should you have any queries regarding this report please contact the undersigned.

Yours faithfully
SGS ENVIRONMENTAL SERVICES

Ly Kim Ha
Senior Organic Chemist

Edward Ibrahim
Laboratory Services Manager

Alexandra Stenta
Key Account Representative

SGS Australia Pty Ltd ABN 44 000 964 278 | Environmental Services Unit 16, 33 Maddox Street, Alexandria Australia t (02) 8594 0400 f (02) 8594 0499 | www.au.sgs.com
Member of the SGS Group

Trace HM (ICP-MS)-Dissolved Our Reference: Your Reference Sample Type Date Sampled	UNITS ---------- ----------	55469A-18 SS3 Water 25/09/2007	55469A-19 SS12 Water 25/09/2007
Antimony	µg/L	1.4	2.0
Arsenic	µg/L	2.8	2.7
Barium	µg/L	11	11
Beryllium	µg/L	<1.0	<1.0
Boron	µg/L	5,700	5,700
Cadmium	µg/L	0.11	<0.10
Chromium	µg/L	12	12
Copper	µg/L	2.6	2.8
Cobalt	µg/L	2.6	2.6
Lead	µg/L	<1.0	<1.0
Manganese	µg/L	<1.0	<1.0
Molybdenum	µg/L	9.3	9.7
Nickel	µg/L	5.2	5.1
Selenium	µg/L	8.5	9.5
Zinc	µg/L	15	15

Metals in water by ICP-OES			
Our Reference:	UNITS	55469A-18	55469A-19
Your Reference	----------	SS3	SS12
Sample Type	----------	Water	Water
Date Sampled		25/09/2007	25/09/2007
Tin (Dissolved)	mg/L	<0.03	0.03

Mercury,Cold Vapor/Hg Analyser			
Our Reference:	UNITS	55469A-18	55469A-19
Your Reference	----------	SS3	SS12
Sample Type	----------	Water	Water
Date Sampled		25/09/2007	25/09/2007
Mercury (Dissolved)	mg/L	<0.0005	<0.0005

Anions in water Our Reference: Your Reference Sample Type Date Sampled	UNITS ---------- ----------	55469A-18 SS3 Water 25/09/2007	55469A-19 SS12 Water 25/09/2007
Nitrite as N	mg/L	<1	<1
Nitrate as N	mg/L	<1	<1
Chloride, Cl	mg/L	17,000	18,000
Sulphate, SO4	mg/L	2,500	2,500

Inorganics Our Reference: Your Reference Sample Type Date Sampled	UNITS ---------- ----------	55469A-18 SS3 Water 25/09/2007	55469A-19 SS12 Water 25/09/2007
Total Phosphorus as P	mg/L	<1	<1
Total Kjeldahl Nitrogen	mg/L	<5	<5
Total Nitrogen	mg/L	<10	<10

Method ID	Methodology Summary
AN318	Determination of elements at trace levels in waters by ICP-MS. Method based on USEPA 6020A
SEM-010	Metals - Determination of various metals by ICP-AES following aqua regia digest.
SEM-005	Mercury - Determination of Mercury by Cold Vapour Generation Atomic Absorption Spectroscopy.
SEI-038	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA 20th ED, 4110-B.
SEI-067	Total Phosphorus - Jirka modification, followed by colorimetric determination using an Ascorbic Acid method, in accordance with APHA 20th ED, 4500-P-F. Analysis is carried out by SGS Environmental Services Welshpool.
SEI-033	Total Kjeldahl Nitrogen - determined titrimetrically, in accordance with APHA 20th ED, 4500-Norg B.

QUALITY CONTROL Trace HM (ICP-MS)-Dissolved	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Antimony	µg/L	1	AN318	<1.0	[NT]	[NT]	LCS	111 || [N/T]
Arsenic	µg/L	1	AN318	<1.0	[NT]	[NT]	LCS	87 || [N/T]
Barium	µg/L	1	AN318	<1.0	[NT]	[NT]	LCS	99 || [N/T]
Beryllium	µg/L	1	AN318	<1.0	[NT]	[NT]	LCS	98 || [N/T]
Boron	µg/L	1	AN318	<1.0	[NT]	[NT]	LCS	102 || [N/T]
Cadmium	µg/L	0.1	AN318	<0.10	[NT]	[NT]	LCS	98 || [N/T]
Chromium	µg/L	1	AN318	<1.0	[NT]	[NT]	LCS	103 || [N/T]
Copper	µg/L	1	AN318	<1.0	[NT]	[NT]	LCS	105 || [N/T]
Cobalt	µg/L	1	AN318	<1.0	[NT]	[NT]	LCS	95 || [N/T]
Lead	µg/L	1	AN318	<1.0	[NT]	[NT]	LCS	104 || [N/T]
Manganese	µg/L	1	AN318	<1.0	[NT]	[NT]	LCS	95 || [N/T]
Molybdenum	µg/L	1	AN318	<1.0	[NT]	[NT]	LCS	104 || [N/T]
Nickel	µg/L	1	AN318	<1.0	[NT]	[NT]	LCS	95 || [N/T]
Selenium	µg/L	2	AN318	<2.0	[NT]	[NT]	LCS	86 || [N/T]
Zinc	µg/L	1	AN318	<1.0	[NT]	[NT]	LCS	101 || [N/T]
QUALITY CONTROL Metals in water by ICP-OES	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Tin (Dissolved)	mg/L	0.03	SEM-010	<0.03	[NT]	[NT]	LCS	100 || [N/T]
QUALITY CONTROL Mercury,Cold Vapor/Hg Analyser	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Mercury (Dissolved)	mg/L	0.0005	SEM-005	<0.0005	[NT]	[NT]	LCS	90 || [N/T]
QUALITY CONTROL Anions in water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Nitrite as N	mg/L	0.05	SEI-038	<0.05	[NT]	[NT]	LCS	99 || [N/T]
Nitrate as N	mg/L	0.05	SEI-038	<0.05	[NT]	[NT]	LCS	99 || [N/T]
Chloride, Cl	mg/L	0.1	SEI-038	<0.1	[NT]	[NT]	LCS	97 || [N/T]
Sulphate, SO4	mg/L	0.4	SEI-038	<0.4	[NT]	[NT]	LCS	98 || [N/T]
QUALITY CONTROL Inorganics	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Total Phosphorus as P	mg/L	0.1	SEI-067	<0.10	55469A-18	<1 || [N/T]	LCS	90 || [N/T]
Total Kjeldahl Nitrogen	mg/L	0.5	SEI-033	<0.5	55469A-18	<5 || <5	LCS	88 || [N/T]
Total Nitrogen	mg/L	1	SEI-033	<1.0	55469A-18	<10 || <10	[NR]	[NR]

Result Codes

[INS]	:	Insufficient Sample for this test	[HBG]	:	Results not Reported due to High Background Interference
[NR]	:	Not Requested	*	:	Not part of NATA Accreditation
[NT]	:	Not tested	[N/A]	:	Not Applicable

Result Comments

NO2,NO3The LOR for sample number/s
_18,19__ has been raised by a dilution factor of __20___ respectively due to sample matrix interference.
LOR TKN and TKP has been raised due to matrix interference.
Date Organics extraction commenced: N/A
NATA Corporate Accreditation No. 2562, Site No 4354
Note: Test results are not corrected for recovery (excluding Dioxins/Furans* and PAH in XAD and PUF).

Quality Control Protocol

Reagent Blank: Sample free reagents carried through the preparation/extraction/digestion procedure and analysed at the beginning of every sample batch analysis. For larger projects, a reagent blank is prepared and analysed with every 20 samples.
Duplicate: A separate portion of a sample being analysed which is treated the same as the other samples in the batch. A duplicate is prepared at least every 10 samples.
Matrix Spike Duplicates: Sample replicates spiked with identical concentrations of target analyte(s). The spiking occurs during the sample preparation and prior to the extraction/digestion procedure. They are used to document the precision and bias of a method in a given sample matrix. Where there is not enough sample available to prepare a spiked sample, another known soil/sand or water (or Milli-Q water) may be used. A duplicate spiked sample is prepared at least every 20 samples.
Surrogate Spike: Added to all samples requiring analysis for organics (where relevant) prior to extraction. Used to determine the extraction efficiency. They are organic compounds which are similar to the target analyte(s) in chemical composition and behaviour in the analytical process, but which are not normally found in environmental samples.
Internal Standard: Added to all samples requiring analysis for organics (where relevant) after the extraction process; the compounds serve to give a standard of retention time and response, which is invariant from run-to-run with the instruments.
Control Standards: Prepared from a source independent of the calibration standards. At least one control standard is included in each run to confirm calibration validity.
Additional QC Samples: A calibration standard and blank are run after every 20 samples of an instrumental analysis run to assess analytical drift.

QUALITY ASSURANCE/QUALITY CONTROL
GEOCHEMICAL ASSESSMENT
PROPOSED TRINITY POINT MARINA
MORISSET PARK, LAKE MACQUARIE

Quality Assurance (QA) was maintained by:

- compliance with a Project Quality Plan written for the objectives of the study;
- using qualified engineers to undertake the field supervision and sampling;
- following the Douglas Partners Pty Ltd (DP) operating procedures for sampling, field testing and decontamination as presented in Table 1;
- using NATA registered laboratories for sample testing, that generally utilise standard laboratory methods of the US EPA, the APHA and NSW EPA.

Table 1 – Field Procedures

Abbreviation	Procedure Name
FPM LOG	Logging
FPM DECONT	Decontamination of Personnel and Equipment
FPM ENVID	Sample Identification, Handling, Transport and Storage of Contaminated Samples
FPM PIDETC	Operation of Field Analysers
FPM ENVSAMP	Sampling of Contaminated Soils

(from DP Field Procedures Manual)

Quality Control (QC) of the laboratory programme was achieved by the following means:

- check replicate – a specific sample was split in the field, placed in separate containers and labelled with different sample numbers, and sent to the laboratory for analysis;
- method blanks – the laboratory ran reagent blanks to confirm the equipment and standards used were uncontaminated;
- laboratory spikes – samples were spiked by the laboratory with a known concentration of contaminants and subsequently tested for percent recovery;
- trip blank – the laboratory supplied sample blanks which were included with field samples during transportation to check for potential cross contamination between samples during transport.

DISCUSSION

A. Check Replicate

The Relative Percent Difference (RPD) between replicate results is used as a measure of laboratory reproducibility and is given by the following:

$$RPD = \frac{ABS(\text{Replicate result } 1 - \text{Replicate result } 2)}{(\text{Replicate result } 1 + \text{Replicate result } 2)/2} \times 100$$

The RPD can have a value between 0% and 200%. An RPD data quality objective of up to 50% is generally considered to be acceptable for organic analysis, and 35% for inorganics (ie. Metals).

A summary of the results of the soil replicate QA/QC testing is provided in Table 2.

Table 2 – Results of Quality Control Analysis

Analyte	SS5	QA1	RPD (%)
Metals (mg/kg)			
As	15	20	29
Sb	<PQL	<PQL	N/A
Cd	0.6	0.7	15
Cr	6.4	7.6	17
Cu	9.4	10	6
Pb	8	9.6	18
Ni	3.5	4.3	21
Ag	<PQL	<PQL	N/A
Se	<PQL	<PQL	N/A
Zn	44	52	17
Hg	<PQL	<PQL	N/A
PAHs (µg/kg)			
Acenaphthene	<PQL	<PQL	N/A
Acenaphthylene	<PQL	<PQL	N/A
2-Methylnaphthalene	10	20	67
Anthracene	10	<PQL	N/A
Fluorene	<PQL	<PQL	N/A
Naphthalene	<PQL	<PQL	N/A
Phenanthrene	40	30	29
Low MW PAHs	<100	<100	0
Benzo[a]anthracene	20	20	0
Benzo[a]pyrene	30	20	40
Dibenzo[ah]anthracene	<PQL	<PQL	N/A
Chrysene	30	20	40
Fluoranthene	50	40	22
Pyrene	40	30	29
High MW PAHs	<180	<140	25
OPPs (µg/kg)	<PQL	<PQL	N/A
OCPs (µg/kg)	<PQL	<PQL	N/A
PCBs (µg/kg)	<PQL	<PQL	N/A

Notes to Table 2:

Results expressed on dry weight basis
PQL – Practical Quantitation Limit
N/A – Not Applicable

RPDs ranged from 0% to 67%, with slightly elevated RPDs found select individual PAH species. The concentrations for these analytes were very low (measured in μg/kg), resulting in high RPDs for small changes in concentration. The results are therefore considered to be acceptable.

B. Method Blanks

All method blanks returned results lower than the laboratory detection limit, therefore are acceptable.

C. Laboratory Spikes

Recoveries in the order of 70% to 130% are generally considered to be acceptable. The average percent recovery for individual contaminants ranged from 86% to 128% which is within the quality control objectives. The results should however be qualified and may slightly under-estimate or over-estimate contaminant concentrations in certain samples (ie. biased low or high respectively).

D. Trip Blank

The results of analysis of the trip blank are presented in the geochemical laboratory test reports.

For the analytes tested, the trip blank returned result which were generally below PQL. Results of slightly above the PQL were measured for Chromium, Copper and Zinc. These metals can occur naturally. It is considered that the results for the trip blank are within the quality control objectives.

CONCLUSIONS

In summary, it is noted that the magnitude of RPDs for field replicates (ie. blind replicates) are generally higher than the quality control objectives for the metals. This is because the concentrations for these analytes were very low, resulting in high RPDs for small changes in concentration. The results are therefore considered to be acceptable.

The accuracy and precision of the soil testing procedures, as inferred by the QA/QC data is generally considered to be of sufficient standard to allow the data reported to be used to interpret site conditions.

SGS Environmental Services
Unit 16, 33 Maddox St. Alexandria NSW 2015
Telephone Number : (+61 2) 8594 0400
Fax Number : (+61 2) 8594 0499

SAMPLE RECEIPT CONFIRMATION

COMPANY	:	Douglas Partners Pty Ltd	FAX NO.	:	02 4960 9601
ATTENTION	:	Brent Kerry	PAGES	:	1
FROM	:	Sample Receipt	DATE	:	3/10/07

This is to confirm that samples for Project **39823B, Trinity Point (Soils)** were received on **27/09/07 & 28/09/07** the results are expected to be ready on **16/10/2007** . Please quote SGS Reference: **55469B** when making enquiries regarding this project. Please refer to below which details information about the integrity of the samples and other useful information.

Samples will be held for 1 month for water samples and 2 months for soil samples from date of receipt of samples, unless otherwise instructed.

Samples received in good order:	YES
Samples received in correct containers:	YES
Samples received without headspace:	YES
Sufficient quantity supplied:	YES
Upon receipt sample temperature:	Cool
Cooling Method:	Ice
Sample containers provided by:	SGS
Samples Clearly Labelled:	YES
Turnaround time requested:	Standard
Completed documentation received:	YES

Comments:

Earliest ETA on results for subcontracted tests
will be by 16/10/07.
Terms and conditions are available from www.au.sgs.com

The signed chain of custody will be returned to you with the original report.

SGS Environmental Services
Unit 16, 33 Maddox St. Alexandria NSW 2015
Telephone Number : (+61 2) 8594 0400
Fax Number : (+61 2) 8594 0499

SAMPLE RECEIPT CONFIRMATION

COMPANY	:	Douglas Partners Pty Ltd	FAX NO.	:	02 4960 9601
ATTENTION	:	Brent Kerry	PAGES	:	1
FROM	:	Sample Receipt	DATE	:	2/10/07

This is to confirm that samples for Project **39823B, Trinity Point (Metals-Soils)** were received on **27/09/07 & 28/09/07** the results are expected to be ready on **3/10/2007** . Please quote SGS Reference: **55469** when making enquiries regarding this project. Please refer to below which details information about the integrity of the samples and other useful information.

Samples will be held for 1 month for water samples and 2 months for soil samples from date of receipt of samples, unless otherwise instructed.

Samples received in good order:	YES
Samples received in correct containers:	YES
Samples received without headspace:	YES
Sufficient quantity supplied:	YES
Upon receipt sample temperature:	Cool
Cooling Method:	Ice
Sample containers provided by:	SGS
Samples Clearly Labelled:	YES
Turnaround time requested:	Standard
Completed documentation received:	YES

Comments:

Terms and conditions are available from www.au.sgs.com

The signed chain of custody will be returned to you with the original report.

SGS Environmental Services
Unit 16, 33 Maddox St. Alexandria NSW 2015
Telephone Number : (+61 2) 8594 0400
Fax Number : (+61 2) 8594 0499

SAMPLE RECEIPT CONFIRMATION

COMPANY	:	Douglas Partners Pty Ltd	FAX NO.	:	02 4960 9601
ATTENTION	:	Brent Kerry	PAGES	:	1
FROM	:	Sample Receipt	DATE	:	2/10/07

This is to confirm that samples for Project **39823B, Trinity Point (Waters)** were received on **27/09/07 & 28/09/07** the results are expected to be ready on **8/10/2007** . Please quote SGS Reference: **55469A** when making enquiries regarding this project. Please refer to below which details information about the integrity of the samples and other useful information.

Samples will be held for 1 month for water samples and 2 months for soil samples from date of receipt of samples, unless otherwise instructed.

Samples received in good order:	YES
Samples received in correct containers:	YES
Samples received without headspace:	YES
Sufficient quantity supplied:	YES
Upon receipt sample temperature:	Cool
Cooling Method:	Ice
Sample containers provided by:	SGS
Samples Clearly Labelled:	YES
Turnaround time requested:	Standard
Completed documentation received:	YES

Comments:

Terms and conditions are available from www.au.sgs.com

The signed chain of custody will be returned to you with the original report.

CoC 1/10/07@2:16pm

Douglas Partners
Geotechnics · Environment · Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

SGS
Received 27/9/07
By Angela
Time 1:45 am/pm
Samples intact yes/no
Ice/Cooler Pack yes/no
Comments: 55469B

Project Name: TRINITY POINT
Project No: 39823B ..... DP Order No: *Same as for Metals request*
DP Contact Person: JULIE WHARTON / BRENT KERRY
Prior Storage: [esky] / [fridge] / shelved (circle)

To: SGS Australia PTY LTD
Unit 16/33 Maddox Street
ALEXANDRIA NSW 2015
Ph: (02) 8594 0400
Attn: Angela

	Sample ID	Date Sampled	Sample Type S-soil W-water	Lab ID	Analytes PAHs	PCB's	OCP	OPP	TBT	TOC		Notes
1	SS1	25/9/07	S		X	X	X	X		X		
2	SS2	25/9/07	S		X	X	X	X		X		
3	SS3	25/9/07	S		X	X	X	X	X	X		
4	SS4	25/9/07	S		X	X	X	X		X		
5	SS5	25/9/07	S		X	X	X	X	X	X		
6	SS6	25/9/07	S		X	X	X	X		X		
7	SS7	25/9/07	S		X	X	X	X		X		
8	SS8	25/9/07	S		X	X	X	X		X		
9	SS9	25/9/07	S		X	X	X	X		X		
10	SS10	25/9/07	S		X	X	X	X		X		
11	SS11	25/9/07	S		X	X	X	X		X		
12	SS12	25/9/07	S		X	X	X	X	X	X		
	PQL (S)		µg/kg		See Note 1	See Note 1	See Note 1	See Note 1	See Note 1	0.1%		
	PQL (W)		mg/L									

Note 1:
PAHs, PCBs, OCP and OPPs – Ultratrace to ANZECC Sediment Quality Guidline PQLs (see attached for full suite and max PQL)

Note 2:
Heavy metals already requested for this batch of samples

TOC – Total Organic Carbon

PQL = practical quantitation limit *As per Laboratory Method (Detection Limit)
# - Metals to Analyse (Please circle): As Cd Cr Cu Pb Zn Hg Ni Other
Date relinquished: 26/9/07
Total number of samples in container: samples at SGS already .....
Results required by: As soon as possible on Standard TAT .....
TAT (Circle): [Standard] 72 hr 48hr 24hr

SAMPLES RECEIVED
Please sign and date to acknowledge receipt of samples and return by fax
Signature: .....
Date: 2/10/07 Lab Ref: 55469B

Send results to:
Douglas Partners Pty Ltd
Address:
BOX 324 Hunter Region Mail Centre
NSW 2310
Fax: (02) 4960 9601