

10.1.1 Rationale for the Sampling and Analysis Plan

The justification of the sampling point regime for the assessment was based on the investigator's knowledge, experience and history of the site. The sampling approach adopted also provided for samples to be collected in an unbiased manner.

A total of four (4) locations were identified with cores taken down to natural soils where possible, and one (1) surface sample was taken. Natural material was encountered at a depth of ~ 0.2 – 0.6m and sampled through differing profiles at each location.

11 DISCUSSION

11.1 Contamination Assessment

Soil sampled at the site identified as 740-742 Pacific Highway, Sapphire Beach indicated no OPP, PAH total petroleum hydrocarbons (TPH) compounds, Monocyclic aromatic hydrocarbons ($C_6 - C_9$ and BTEX fractions), or PCB levels detected above Estimated Quantification Limit (EQL's). While OCPs were present at minor concentrations at BH1, no exceedances of the site acceptance criteria of NEHF A – Residential with Gardens and Access to Soils, were detected. Heavy metals present in the soils were also well within the site acceptance criteria of NEHF – A.

No exceedances of NSW EPA Phytotoxicity limits were recorded for soil samples taken on the site.

The groundwater sampled at the site indicated no contamination associated with Total Petroleum Hydrocarbon (TPH) compounds or Monocyclic aromatic hydrocarbons ($C_6 - C_9$ and BTEX fractions), OCPs, OPPs, PCBs or Heavy Metals PAHs.

Minor asbestos fragments were found on the surface around Borehole One (BH1), possibly from the restaurant or pre existing neighbouring structures located in the northwestern area of the site. The asbestos fragments did not appear to be wide spread and were of a relatively minor quantity. It was discovered through aerial photography that the restaurant was constructed pre 1984, and therefore may contain minor asbestos content. The resort proper was constructed in 1984 and 1993 and therefore is unlikely to contain major asbestos content. Since a detailed hazardous materials survey was not conducted, a more detailed inspection should be carried out prior to demolition or refurbishment.

The investigation revealed that the site does not contain any potential or actual Acid Sulphate Soils.

11.2 Remedial Requirements

The soils sampled on the site meet the site acceptance criteria of NEHF A – Residential with Gardens and Accessible Soils, most applicable to future site landuse. While some contaminants are present above background levels, they are not of concern given their low concentrations nor are they likely to impact upon the end land-use.

The groundwater also does not appear to be impacted by any contamination.

Minor Asbestos fragments were found on the surface of Borehole One (1) and the Restaurant on the site is suspected to contain minor asbestos content due to the age of the structure. A thorough Hazardous Material Survey should be undertaken before any demolition activities on the site

The Provisional Phytotoxicity Based Investigation Levels were not exceeded at any location for any analyte.

The investigation identified no Acid Sulphate Soils on the 740-742 Pacific Highway, Sapphire Beach site.

Based on the preliminary results obtained for the site at this stage, it is the opinion of David Lane Associates that remedial actions are not required on this site. Further investigation is required to identify construction industry hazards, such as asbestos and lead based paint. These need to be identified and documented, prior to demolition.

Figure 1

Site Location

DAVID LANE ASSOCIATES



DAVID LANE ASSOCIATES
Rural and Health Care
"Ayrfield" Lot 18
Old North Road - Rothbury

DESIGNED:
DLA

COMPILED:
NR

PROJ. No.

SITE LOCATION

CLIENT: **Attentus Projects and Property Pty Ltd**

LOCATION: **740-742 Pacific Highway
Sapphire Beach NSW**

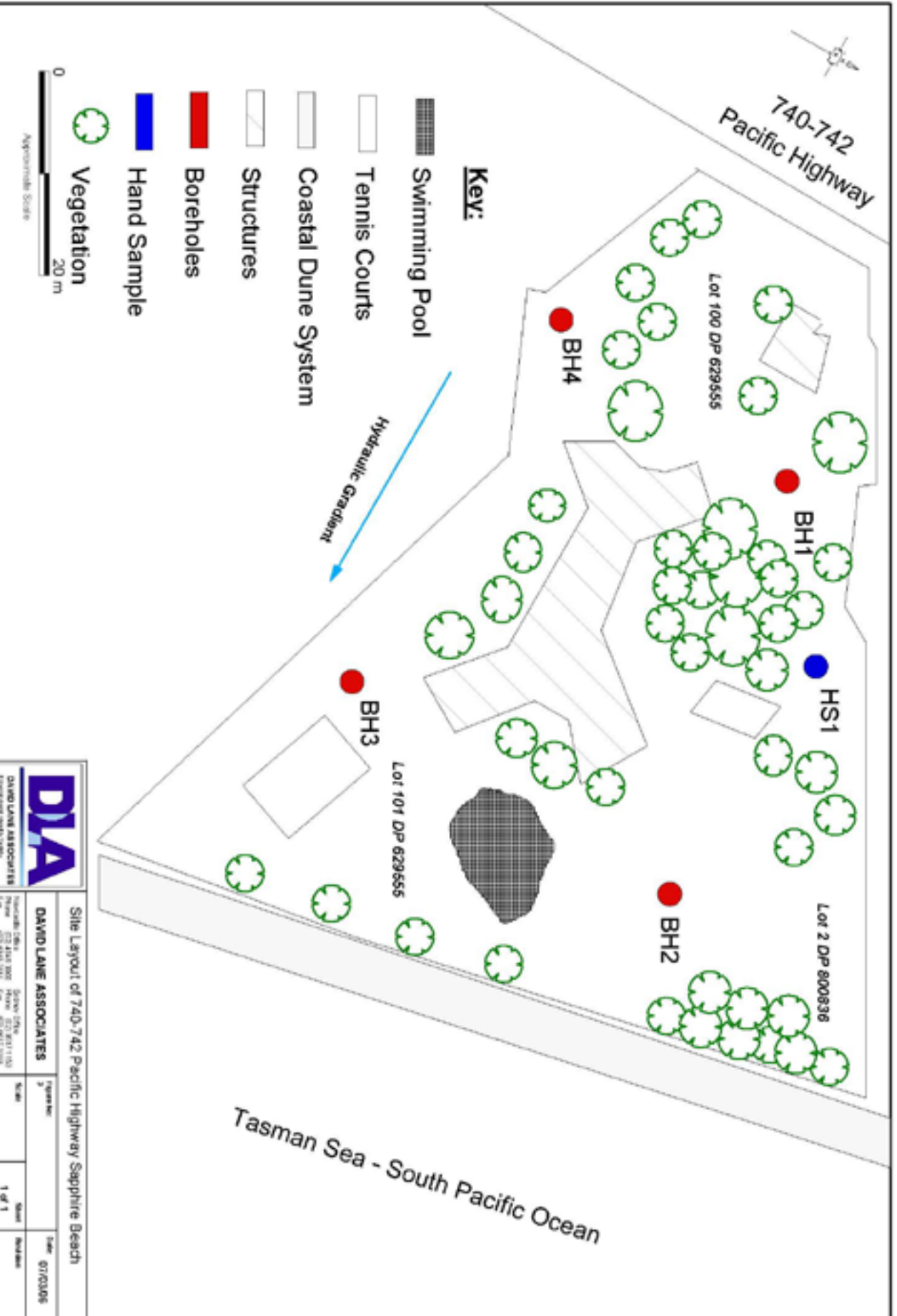
DRAWING:
8/03/2006

FIGURE:
1

Figure 2

Site Layout

DAVID LANE ASSOCIATES



DIA DAVID LANE ASSOCIATES <small>Environmental and Urban</small>			
Site Layout of 740-742 Pacific Highway Sapphire Beach			
DAVID LANE ASSOCIATES	2		07/03/06
<small> Telephone: 07 440 2000 Fax: 07 440 2001 Email: dila@dia.com.au </small>	<small> David Lane Director </small>	<small> Scale 1 of 1 </small>	<small> Date 07/03/06 </small>

Figure 3

Registered Site Survey Plan

DAVID LANE ASSOCIATES

Appendix 1

Analytical Data – Soil and Water



9 March 2006

TEST REPORT

David Lane Associates

3 Isabella Street
CAMPERDOWN
NSW 2050

Your Reference: CH-SAPPHIRE
Report Number: 43518

Attention: Brendan Stuart

Dear Brendan

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

Samples:	Qty.	9 Soils, 1 Water
Date of Receipt of Samples:		06/03/06
Date of Receipt of Instructions:		06/03/06
Date Preliminary Report Faxed:		Not Issued

These samples were analysed in accordance with your written instructions.

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).

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

NOTE: This is an INTERIM REPORT. Preliminary results supplied as advance advice awaiting final QA clearance

INITIALS: **Comments**

Date :

Time :

No of Pages Sent :

Edy Yours faithfully

Ap SGS ENVIRONMENTAL SERVICES



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SGS Australia Pty Ltd
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Member of the SGS Group

BTEX in Soil Our Reference: Your Reference Sample Type	UNITS ----- -----	43518-3 BH2-0.3 soil	43518-4 BH2-0.3A soil	43518-8 BH3-0.3 soil	43518-8 BH4-0.5 soil
Benzene	mg/kg	<0.5	<0.5	<0.5	<0.5
Toluene	mg/kg	<0.50	<0.50	<0.50	<0.50
Ethylbenzene	mg/kg	<0.5	<0.5	<0.5	<0.5
Total Xylenes	mg/kg	<1.5	<1.5	<1.5	<1.5
BTEX Surrogate (%)	%	93	101	80	82



Total Recoverable Hydrocarbons in Soil Our Reference: Your Reference Sample Type	UNITS ----- -----	43518-3 BH2-0.3 soil	43518-4 BH2-0.3A soil	43518-6 BH3-0.3 soil	43518-8 BH4-0.5 soil
TRH C ₆ - C ₉ P&T	mg/kg	<20	<20	<20	<20
TRH C ₁₀ - C ₁₄	mg/kg	<20	<20	<20	<20
TRH C ₁₅ - C ₂₈	mg/kg	<50	<50	<50	<50
TRH C ₂₉ - C ₃₆	mg/kg	<50	<50	<50	<50



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PAHs in Soil Our Reference: Your Reference Sample Type	UNITS ----- -----	43518-1 BH1-0.1 soil	43518-2 BH1-0.5 soil	43518-3 BH2-0.3 soil	43518-4 BH2-0.3A soil	43518-5 BH2-1.0 soil
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo[a]anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo[b,k]fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo[a]pyrene	mg/kg	<0.050	<0.050	<0.050	<0.050	<0.050
Indeno[1,2,3-cd]pyrene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Dibenzo[a,h]anthracene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo[ghi]perylene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Surrogate	%	115	114	119	96	111

PAHs in Soil Our Reference: Your Reference Sample Type	UNITS ----- -----	43518-6 BH3-0.3 soil	43518-7 BH3-1.0 soil	43518-8 BH4-0.5 soil	43518-9 HS-1 soil
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo[a]anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo[b,k]fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2
Benzo[a]pyrene	mg/kg	<0.050	<0.050	<0.050	<0.050
Indeno[1,2,3-cd]pyrene	mg/kg	<0.10	<0.10	<0.10	<0.10
Dibenzo[a,h]anthracene	mg/kg	<0.10	<0.10	<0.10	<0.10
Benzo[ghi]perylene	mg/kg	<0.10	<0.10	<0.10	<0.10
Surrogate	%	113	110	92	110



OC Pesticides in Soil Our Reference: Your Reference: Sample Type	UNITS ----- -----	43510-1 BH1-0.1 soil	43510-3 BH2-0.3 soil	43510-4 BH2-0.3A soil	43510-7 BH3-1.0 soil	43510-9 HS-1 soil
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC(Lindane)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	0.8	<0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-Endosulfan	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Chlordane	mg/kg	0.5	<0.1	<0.1	<0.1	<0.1
cis-Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-Endosulfan	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Sumgibile	%	105	93	95	94	104



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OP Pesticides in Soil Our Reference: Your Reference Sample Type	UNITS ----- -----	43518-1 BH1-0.1 soil	43518-3 BH2-0.3 soil	43518-4 BH2-0.3A soil	43518-7 BH3-1.0 soil	43518-9 HS-1 soil
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromofos Ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
OP_Sumgate 1	%	105	93	95	94	104



PCBs in Soil Our Reference: Your Reference Sample Type	UNITS ----- -----	43518-1 BH1-0.1 soil	43518-3 BH2-0.3 soil	43518-4 BH2-0.3A soil	43518-7 BH3-1.0 soil	43518-9 HS-1 soil
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1262	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1268	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total Positive PCB	mg/kg	<0.90	<0.90	<0.90	<0.90	<0.90
PCB_Surrogate 1	%	105	93	95	94	104



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Acid Extractable Metals in Soil Our Reference: Your Reference Sample Type	UNITS ----- -----	43518-1 BH1-0.1 soil	43518-2 BH1-0.5 soil	43518-3 BH2-0.3 soil	43518-4 BH2-0.3A soil	43518-5 BH2-1.0 soil
Arsenic	mg/kg	20	6	5	5	7
Cadmium	mg/kg	0.3	0.3	<0.1	<0.1	<0.1
Chromium	mg/kg	15	17	2.5	2.4	2.3
Copper	mg/kg	54	34	1.1	1.0	0.8
Lead	mg/kg	57	24	1	1	<1
Mercury	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel	mg/kg	3.7	3.3	0.6	0.6	0.7
Zinc	mg/kg	170	44	4.6	4.0	2.8

Acid Extractable Metals in Soil Our Reference: Your Reference Sample Type	UNITS ----- -----	43518-6 BH3-0.3 soil	43518-7 BH3-1.0 soil	43518-8 BH4-0.5 soil	43518-9 HS-1 soil
Arsenic	mg/kg	9	7	9	24
Cadmium	mg/kg	0.2	0.2	0.3	0.3
Chromium	mg/kg	11	6.0	14	20
Copper	mg/kg	29	15	69	42
Lead	mg/kg	14	9.2	19	41
Mercury	mg/kg	<0.05	<0.05	<0.05	<0.05
Nickel	mg/kg	6.8	6.6	11	3.7
Zinc	mg/kg	56	39	120	79

BTEX in Water Our Reference: Your Reference Sample Type	UNITS ----- -----	43518-10 BH3-W water
Benzene	mg/L	<0.001
Toluene	mg/L	<0.001
Ethylbenzene	mg/L	<0.001
Total Xylenes	mg/L	<0.003



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