

Published on DES Disclosure Log
RTI Act 2009

Appendix B

Registered Plan, Certificate of Title, EMR and CLR Search Results

CURRENT TITLE SEARCH
NATURAL RESOURCES AND WATER, QUEENSLAND

Request No: 2151088

Search Date: 09/10/2007 14:46

Title Reference: 50348760

Date Created: 04/04/2001

Previous Title: 17478158

REGISTERED OWNER

Dealing No: 710693247 15/06/2007

RADWAY PTY LTD A.C.N. 125 664 771

ESTATE AND LAND

Estate in Fee Simple

LOT 2 SURVEY PLAN 136512
County of MARCH Parish of VERNON
Local Government: HERVEY BAY CITY

EASEMENTS, ENCUMBRANCES AND INTERESTS

1. Rights and interests reserved to the Crown by
Deed of Grant No. 11265143 (POR 45)
2. MORTGAGE No 710693271 15/06/2007 at 10:10
NATIONAL AUSTRALIA BANK LIMITED A.B.N. 12 004 044 937
3. CAVEAT No 710845551 26/07/2007 at 10:32
COUNCIL OF THE CITY OF HERVEY BAY

ADMINISTRATIVE ADVICES - NIL
UNREGISTERED DEALINGS - NIL

CERTIFICATE OF TITLE ISSUED - No

Caution - Charges do not necessarily appear in order of priority

** End of Current Title Search **

COPYRIGHT THE STATE OF QUEENSLAND (NATURAL RESOURCES AND WATER) [2007]
Requested By: D APPLICATIONS ESPREON

Page 1/1

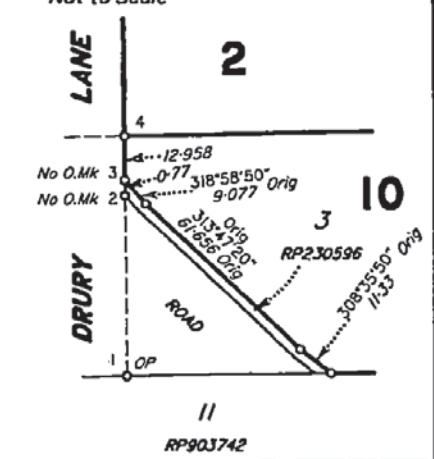
Relea

Land Title Act 1994; Land Act 1994
Form 21 Version 2

Sheet	of
1	1

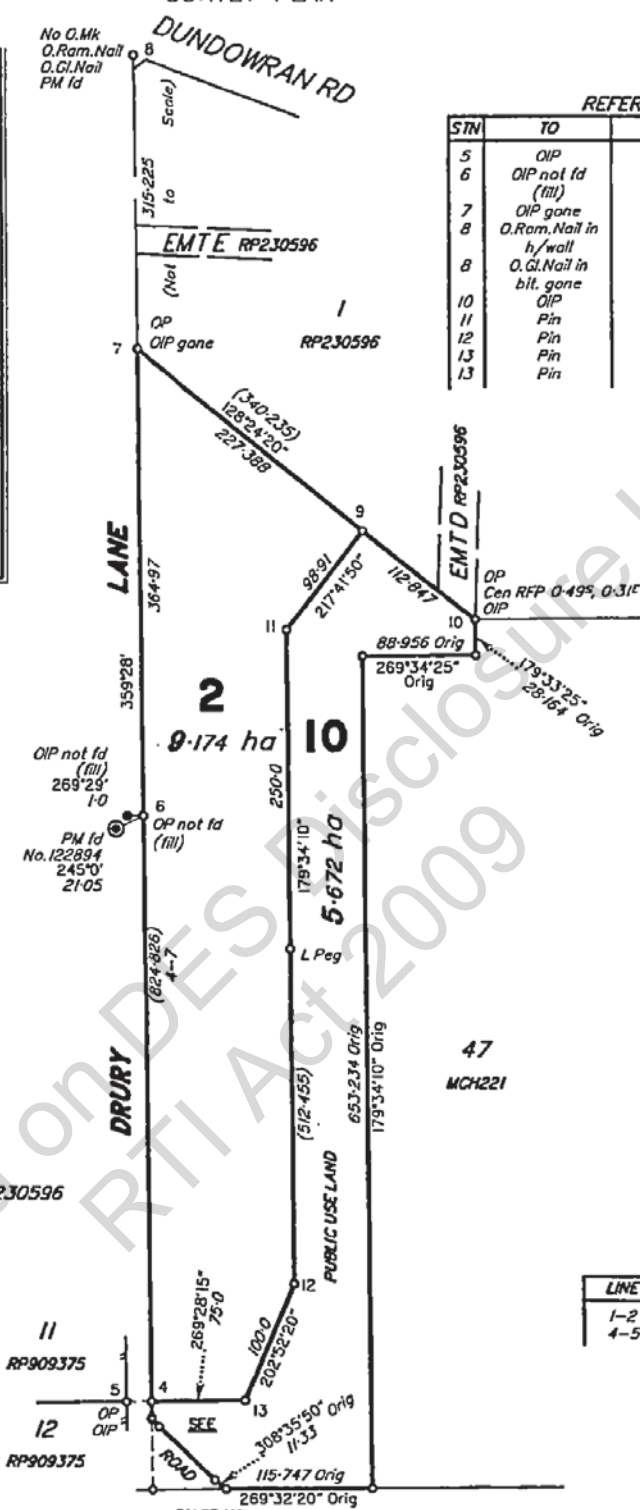
SURVEY PLAN

DIAGRAM
Not to Scale



REFERENCE MARKS

STN	TO	ORIGIN	BEARING	DIST
5	OIP		89°36'	0-964
6	OIP not fd (fill)		269°29'	1-0
7	OIP gone		308°24'20"	1-0
8	O. Rom. Nail in h/wall		313°43'50"	0-897
8	O. Gl. Nail in bit. gone		288°37'30"	2-37
10	OIP		239°30'25"	0-412
11	Pin		413°7'10"	1-5
12	Pin		328°22'	4-818
13	Pin		193°0'	1-004
13	Pin		196°07'	12-923



Original Information Copied From RP 230596
in the Dept of Natural Resources

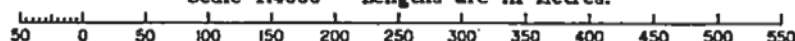
TRAVERSES ETC

LINE	BEARING	DISTANCE
1-2	359°28'	56.29
4-5	269°28'	20.117

PERMANENT MARKS

PM	ORIGIN	BEARING	DIST	NO
6-PM fd		245°0'	21-05	122894
8-PM fd		288°38'45"	19-885	121787

Scale 1:4000 - Lengths are in Metres.



CULLEN & COUPER PTY LTD ACN 050 842 503
hereby certify that the Company has surveyed the land
comprised in this plan by Adrian Charles COUPER,
Licensed Surveyor, for whose work the company accepts
responsibility, that the plan is accurate, that the
said survey was performed in accordance with the
Surveyors Act 1977 and the Surveyors Regulation 1992
and that the said survey was completed on 24/10/00.

CTPI 49-Sch4

CTPI 49-Sch4

Director

Date 27.10.00

Plan of Lots 2 & 10

Cancelling Lot 2 on RP230596

PARISH: **VERNON**

COUNTY: *March*

Meridian: *RP230596*

F/N's:	NO
--------	----

Scale: **1:4000**

Format: **STANDARD**

SP 136512

Plan Status:

704681284

\$307.00
02/04/2001 16:09

MH 400

WARNING : Folded or Mutilated Plans will not be accepted.
Plans may be rolled.
Information may not be placed in the outer margins.

Registered

s. Lodged by

MORTON & MORTON
SOLICITORS
130 WHATF STREET
AARVOROUGH Q 4650
PO BOX 123 DX 42130
TEL: (07) 1121 2236
FAX: (07) 1123 1784

MH 4005

(Include address, phone number, reference, and Lodger Code)

1. Certificate of Registered Owners or Lessees:

I/We COUNCIL OF THE CITY OF HERVEY BAY

(Names in full)

*as Registered Owners of this land agree to this plan and dedicate the Public Use
Land as shown hereon in accordance with Section 50 of the Land Title Act 1994.

*as Lessees of this land agree to this plan.

Signature of *Registered Owners *Lessees-

CTPI 49-Sch4

Mayor

CTPI 49-Sch4

Chief Executive Officer.

* Rule out whichever is inapplicable

2. Local Government Approval.

* COUNCIL OF THE CITY OF HERVEY BAY
hereby approves this plan in accordance with the:

% Integrated Planning Act 1997

Dated this Fifth day of March 2001

CTPI 49-Sch4

STEPHEN L WALLACE
Executive Manager -
Development Services being
the Officer duly delegated by
Hervey Bay City Council.* Insert the name of the Local Government. % Insert Integrated Planning Act 1997 or
Insert designation of signatory or delegation Local Government (Planning & Environment) Act 1990

3. Plans with Community Management Statement:

CMS Number:

Name:

4. References:

Dept File:

Local Govt:

Surveyor: 001958

5. Existing

Title Reference	Lot	Plan	Lots	Emts	Road
17478158	2	RP230596	2 & 10		

Created

Por. 45

2 & 10

Orig

Lots

7. Portion Allocation:

8. Map Reference:

9447-24421

9. Locality:

DUNDOWRAN

10. Local Government:

HERVEY BAY C. C.

11. Passed & Endorsed:

By: CULLEN & COUPER P/L

Date: 27-10-00

Signed: CTPI 49-Sch4

Designation: LIAISON OFFICER

12. Building Format Plans only.

I certify that:

- * As far as it is practical to determine, no part of the building shown on this plan encroaches onto adjoining lots or road;
- * Part of the building shown on this plan encroaches onto adjoining lots and road

Licensed Surveyor/Director * Date

*delete words not required

13. Lodgement Fees:

Survey Deposit	\$	
Lodgement	\$	
— New Titles	\$	
Photocopy	\$	
Postage	\$	
TOTAL	\$	

14. Insert
Plan
Number

SP 136512

QLD ENVIRONMENTAL PROTECTION AGENCY
ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)

Transaction ID: 736269 EMR Site Id: 34287 13 May 2005

This response relates to a search request received for the site:

Lot: 2 Plan: SP136512

EMR RESULT

The above site IS included on the Environmental Management Register.

The site you have searched has been subdivided from the following site, which is included on the EMR. Subdivided new parcels will remain on the EMR unless it can be shown that they are not located near the contaminating activity.

Lot: 2 Plan: RP230596
Address: DUNDOWRAN ROAD
DUNDOWRAN 4655

The site has been subject to the following Notifiable Activity pursuant to section 374 of the *Environmental Protection Act 1994*.

20 LANDFILL - disposing of waste (excluding inert construction and demolition waste).

CLR RESULT

The above site is NOT included on the Contaminated Land Register.

ADDITIONAL ADVICE

Note: The cost of a search increased on 2 July 2004 and is now \$30.70 per lot.

If you have any queries in relation to this search please phone (07) 3227 7370.

Lindi Bowen
Registrar, Contaminated Land Unit

Release

<https://www.confirm.citec.com.au/weblogic/C2Dispatcher/C2AUTHSearch/ResultBo...> 13/05/2005

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Appendix C

Certificate of Analysis and Chain of Custody Documents

Release



CERTIFICATE OF ANALYSIS

<i>Client</i>	: GOLDER ASSOCIATES	<i>Laboratory</i>	: Environmental Division Brisbane	<i>Page</i>	: 1 of 36
<i>Contact</i>	: CTPI 49-Sch4	<i>Contact</i>	: CTPI 49-Sch4	<i>Work Order</i>	: EB0709322
<i>Address</i>	: P O BOX 5569 MAROOCHYDORE SOUTH QLD AUSTRALIA 4558	<i>Address</i>	: 32 Shand Street Stafford QLD Australia 4053		
<i>E-mail</i>	: CTPI 49-S@golder.com.au	<i>E-mail</i>	: Services.Brisbane@alsenviro.com		
<i>Telephone</i>	: 5443 3511	<i>Telephone</i>	: +61-7-3243 7222		
<i>Facsimile</i>	: 5443 6645	<i>Facsimile</i>	: +61-7-3243 7218		
<i>Project</i>	: 077683504 Contamination	<i>Quote number</i>	: EN/002/05	<i>Date received</i>	: 20 Aug 2007
<i>Order number</i>	: MQ 4569			<i>Date issued</i>	: 30 Aug 2007
<i>C-O-C number</i>	: 077683504tr2			<i>No. of samples</i>	- Received : 227
<i>Site</i>	: - Not provided -				Analysed : 161

ALSE - Excellence in Analytical Testing



NATA Accredited Laboratory
825

This document is issued in
accordance with NATA's
accreditation requirements.

Accredited for compliance with
ISO/IEC 17025.

This document has been electronically signed by those names that appear on this report and are the authorised signatories. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

<i>Signatory</i>	<i>Position</i>	<i>Department</i>
CTPI 49-Sch4	Senior Inorganic Chemist	Inorganics - NATA 825 (818 - Brisbane)

Page Number : 2 of 36
Client : GOLDER ASSOCIATES
Work Order : EB0709322



Comments

This report for the ALSE reference EB0709322 supersedes any previous reports with this reference. Results apply to the samples as submitted. All pages of this report have been checked and approved for release.

This report contains the following information:

- Analytical Results for Samples Submitted
- Surrogate Recovery Data

The analytical procedures used by ALS Environmental have been developed from established internationally-recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported herein. Reference methods from which ALSE methods are based are provided in parenthesis.

When moisture determination has been performed, results are reported on a dry weight basis. When a reported 'less than' result is higher than the LOR, this may be due to primary sample extracts/digestion dilution and/or insufficient sample amount for analysis. Surrogate Recovery Limits are static and based on USEPA SW846 or ALS-QWI/EN38 (in the absence of specified USEPA limits). Where LOR of reported result differ from standard LOR, this may be due to high moisture, reduced sample amount or matrix interference. When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for process purposes. Abbreviations: CAS number = Chemical Abstract Services number, LOR = Limit of Reporting. * Indicates failed Surrogate Recoveries.

Specific comments for Work Order **EB0709322**

LCS recovery for EG005T analyses fall outside Dynamic Control Limits. They are however within ALS Static Control Limits and hence deemed acceptable.

Page Number : 3 of 36
 Client : GOLDER ASSOCIATES
 Work Order : EB0709322



ALS Environmental

Analytical Results

Analytical Results				Client Sample ID :	S1	S2	S2	S2	S2
				Sample Matrix Type / Description :	1	0.1	1	2	3
				Sample Date / Time :	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Date / Time :	17 Jul 2007	17 Jul 2007	17 Jul 2007	17 Jul 2007	17 Jul 2007
				Sample Date / Time :	15:00	15:00	15:00	15:00	15:00
				Laboratory Sample ID :					
					EB0709322-002	EB0709322-004	EB0709322-005	EB0709322-006	EB0709322-007
Analyte	CAS number	LOR	Units						
EA055: Moisture Content.									
Moisture Content (dried @ 103°C)				1.0 %	2.4	6.3	12.3	5.5	12.8
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg	<5	<5	6	<5	<5	
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1	
Chromium	7440-47-3	2	mg/kg	<2	<2	13	<2	<2	
Copper	7440-50-8	5	mg/kg	<5	<5	9	<5	<5	
Lead	7439-92-1	5	mg/kg	<5	<5	12	<5	<5	
Nickel	7440-02-0	2	mg/kg	<2	<2	22	<2	<2	
Zinc	7440-66-6	5	mg/kg	9	8	29	<5	<5	
EG035T: Total Mercury by FIMS.									
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	

Release

Page Number : 4 of 36
 Client : GOLDER ASSOCIATES
 Work Order : EB0709322



ALS Environmental

Analytical Results

Client Sample ID :				S3	S4	S4	S4	S4
Sample Matrix Type / Description :				1	0.1	1	2	3
Sample Date / Time :				SOIL	SOIL	SOIL	SOIL	SOIL
Laboratory Sample ID :				17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00
				EB0709322-009	EB0709322-011	EB0709322-012	EB0709322-013	EB0709322-014
Analyte	CAS number	LOR	Units					
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0 %		7.2	11.0	<1.0	15.8	21.4
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	<2	4	<2	4	<2
Copper	7440-50-8	5	mg/kg	<5	<5	<5	6	<5
Lead	7439-92-1	5	mg/kg	<5	12	20	37	<5
Nickel	7440-02-0	2	mg/kg	<2	3	<2	3	<2
Zinc	7440-66-6	5	mg/kg	<5	13	283	165	<5
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1

Release

Page Number : 5 of 36
 Client : GOLDER ASSOCIATES
 Work Order : EB0709322



ALS Environmental

Analytical Results

Client Sample ID :				S5	S5	S6	S7	S7
Sample Matrix Type / Description :				1	3	1	0.1	1
Sample Date / Time :				SOIL	SOIL	SOIL	SOIL	SOIL
Laboratory Sample ID :				17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00
				EB0709322-016	EB0709322-018	EB0709322-021	EB0709322-022	EB0709322-023
Analyte	CAS number	LOR	Units					
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0 %		19.7	15.7	<1.0	7.1	10.8
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	7	<5	<5	13	13
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	10	6	<2	11	14
Copper	7440-50-8	5	mg/kg	7	<5	<5	<5	<5
Lead	7439-92-1	5	mg/kg	7	<5	<5	9	7
Nickel	7440-02-0	2	mg/kg	9	<2	<2	5	11
Zinc	7440-66-6	5	mg/kg	18	<5	<5	10	10
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1

Release

Page Number : 6 of 36
 Client : GOLDER ASSOCIATES
 Work Order : EB0709322



ALS Environmental

Analytical Results

Client Sample ID :				S7 2 SOIL 17 Jul 2007 15:00	S7 3 SOIL 17 Jul 2007 15:00	S9 0.1 SOIL 17 Jul 2007 15:00	S9 1 SOIL 17 Jul 2007 15:00	S9 2 SOIL 17 Jul 2007 15:00
Sample Matrix Type / Description :								
Sample Date / Time :								
Laboratory Sample ID :				EB0709322-024	EB0709322-025	EB0709322-029	EB0709322-030	EB0709322-031
Analyte	CAS number	LOR	Units					
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0 %		17.3	<1.0	20.3	13.2	16.8
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	14	<5	5	6	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	18	6	11	9	14
Copper	7440-50-8	5	mg/kg	<5	<5	6	<5	<5
Lead	7439-92-1	5	mg/kg	7	<5	10	9	6
Nickel	7440-02-0	2	mg/kg	3	3	17	8	<2
Zinc	7440-66-6	5	mg/kg	12	<5	19	16	<5
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2

Release

Page Number : 7 of 36
 Client : GOLDER ASSOCIATES
 Work Order : EB0709322



ALS Environmental

Analytical Results

Client Sample ID :				S10	S11	S11	S11	S13
Sample Matrix Type / Description :				2	0.1	1	2	0.1
Sample Date / Time :				SOIL	SOIL	SOIL	SOIL	SOIL
Laboratory Sample ID :				17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00
Laboratory Sample ID :				EB0709322-035	EB0709322-036	EB0709322-037	EB0709322-038	EB0709322-041
Analyte	CAS number	LOR	Units					
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%	<1.0	6.3	10.9	17.9	5.8
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	13	<5	9	5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	11	16	<2	8	9
Copper	7440-50-8	5	mg/kg	<5	10	<5	9	8
Lead	7439-92-1	5	mg/kg	<5	10	<5	10	<5
Nickel	7440-02-0	2	mg/kg	4	27	<2	18	25
Zinc	7440-66-6	5	mg/kg	<5	16	<5	24	18
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	0.2	<0.1	<0.1	<0.1	<0.1

Release

Page Number : 8 of 36
 Client : GOLDER ASSOCIATES
 Work Order : EB0709322



ALS Environmental

Analytical Results

Analytical Results				Client Sample ID :	S13 1 SOIL 17 Jul 2007 15:00	S13 2 SOIL 17 Jul 2007 15:00	S13 3 SOIL 17 Jul 2007 15:00	S15 2 SOIL 17 Jul 2007 15:00	S16 1 SOIL 17 Jul 2007 15:00
				Sample Matrix Type / Description :					
				Sample Date / Time :					
				Laboratory Sample ID :					
Analyte	CAS number	LOR	Units	EB0709322-042	EB0709322-043	EB0709322-044	EB0709322-044	EB0709322-047	EB0709322-049
EA055: Moisture Content									
Moisture Content (dried @ 103°C)				1.0 %	<1.0	13.1	10.9	<1.0	7.5
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	<5	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	4	13	14	<2		4
Copper	7440-50-8	5	mg/kg	<5	13	<5	<5	<5	<5
Lead	7439-92-1	5	mg/kg	6	23	6	<5	<5	<5
Nickel	7440-02-0	2	mg/kg	3	29	5	<2		<2
Zinc	7440-66-6	5	mg/kg	<5	36	<5	<5	<5	<5
EG035T: Total Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1	<0.1

Release

Page Number : 9 of 36
 Client : GOLDER ASSOCIATES
 Work Order : EB0709322



ALS Environmental

Analytical Results

				Client Sample ID :	S16	S17	S17	S17	S19
				Sample Matrix Type / Description :	3	0.1	1	2	0.1
				Sample Date / Time :	SOIL	SOIL	SOIL	SOIL	SOIL
				Laboratory Sample ID :	17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00
					EB0709322-051	EB0709322-052	EB0709322-053	EB0709322-054	EB0709322-057
Analyte	CAS number	LOR	Units						
EA055: Moisture Content									
Moisture Content (dried @ 103°C)		1.0 %		10.7	8.0	<1.0	17.6	<1.0	
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5 mg/kg		<5	<5	<5	<5	6	
Cadmium	7440-43-9	1 mg/kg		<1	<1	<1	<1	<1	
Chromium	7440-47-3	2 mg/kg		7	13	10	19	3	
Copper	7440-50-8	5 mg/kg		<5	10	<5	<5	<5	
Lead	7439-92-1	5 mg/kg		<5	9	<5	<5	7	
Nickel	7440-02-0	2 mg/kg		3	29	7	<2	<2	
Zinc	7440-66-6	5 mg/kg		<5	28	<5	<5	15	
EG035T: Total Mercury by FIMS									
Mercury	7439-97-6	0.1 mg/kg		<0.1	<0.1	0.3	<0.1	<0.1	

Release

Page Number : 10 of 36
 Client : GOLDER ASSOCIATES
 Work Order : EB0709322



ALS Environmental

Analytical Results

Client Sample ID :				S20	S20	S20	S21	S21
Sample Matrix Type / Description :				0.1	1	3	0.1	1
Sample Date / Time :				SOIL	SOIL	SOIL	SOIL	SOIL
Laboratory Sample ID :				17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00
EB0709322-059				EB0709322-060	EB0709322-062	EB0709322-063	EB0709322-064	EB0709322-064
Analyte	CAS number	LOR	Units					
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0 %		<1.0	13.0	<1.0	7.1	10.0
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	16	<5	<5	8	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	11	3	4	12	<2
Copper	7440-50-8	5	mg/kg	<5	<5	<5	5	<5
Lead	7439-92-1	5	mg/kg	16	5	<5	11	<5
Nickel	7440-02-0	2	mg/kg	5	2	2	14	<2
Zinc	7440-66-6	5	mg/kg	14	<5	<5	13	6
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1

Release

Page Number : 11 of 36
 Client : GOLDER ASSOCIATES
 Work Order : EB0709322



ALS Environmental

Analytical Results

Client Sample ID :

Sample Matrix Type / Description :

Sample Date / Time :

Laboratory Sample ID :

				S21	S22	S22	S23	S23
				2	1	3	0.1	1
				SOIL	SOIL	SOIL	SOIL	SOIL
				17 Jul 2007	17 Jul 2007	17 Jul 2007	17 Jul 2007	17 Jul 2007
				15:00	15:00	15:00	15:00	15:00
				EB0709322-065	EB0709322-067	EB0709322-069	EB0709322-070	EB0709322-071
Analyte	CAS number	LOR	Units					
EA055: Moisture Content:								
Moisture Content (dried @ 103°C)		1.0	%	19.9	15.3	10.7	5.4	<1.0
EG005T: Total Metals by ICP-AES:								
Arsenic	7440-38-2	5	mg/kg	19	<5	<5	26	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	8	4	7	16	<2
Copper	7440-50-8	5	mg/kg	<5	<5	<5	8	<5
Lead	7439-92-1	5	mg/kg	12	<5	<5	24	<5
Nickel	7440-02-0	2	mg/kg	5	4	3	20	<2
Zinc	7440-66-6	5	mg/kg	8	6	<5	25	<5
EG035T: Total Mercury by FIMS:								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.1	0.1	<0.1

Release

Page Number : 12 of 36
 Client : GOLDER ASSOCIATES
 Work Order : EB0709322



ALS Environmental

Analytical Results

Client Sample ID :				S25	S25	S25	S25	S26
Sample Matrix Type / Description :				0.1	1	2	3	2
Sample Date / Time :				SOIL	SOIL	SOIL	SOIL	SOIL
Laboratory Sample ID :				17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00
Analyte	CAS number	LOR	Units	EB0709322-074	EB0709322-075	EB0709322-076	EB0709322-077	EB0709322-080
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0 %		10.4	9.2	19.3	12.3	4.9
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	5	14	6	<5	12
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	11	15	5	<2	14
Copper	7440-50-8	5	mg/kg	12	<5	<5	<5	8
Lead	7439-92-1	5	mg/kg	7	13	10	<5	10
Nickel	7440-02-0	2	mg/kg	34	6	3	<2	16
Zinc	7440-66-6	5	mg/kg	28	9	11	<5	19
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1

Release

Page Number : 13 of 36
 Client : GOLDER ASSOCIATES
 Work Order : EB0709322



ALS Environmental

Analytical Results

Client Sample ID :				S27 0.1 SOIL 17 Jul 2007 15:00	S27 1 SOIL 17 Jul 2007 15:00	S27 2 SOIL 17 Jul 2007 15:00	S27 3 SOIL 17 Jul 2007 15:00	S28 0.1 SOIL 17 Jul 2007 15:00
Sample Matrix Type / Description :								
Sample Date / Time :								
Laboratory Sample ID :				EB0709322-081	EB0709322-082	EB0709322-083	EB0709322-084	EB0709322-085
Analyte	CAS number	LOR	Units					
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0 %		15.4	15.5	12.3	14.9	17.4
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	3	<2	<2	3	3
Copper	7440-50-8	5	mg/kg	<5	<5	<5	<5	<5
Lead	7439-92-1	5	mg/kg	<5	<5	<5	6	10
Nickel	7440-02-0	2	mg/kg	5	2	<2	8	2
Zinc	7440-66-6	5	mg/kg	16	<5	<5	7	28
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	0.1	<0.1

Release

Page Number : 14 of 36
 Client : GOLDER ASSOCIATES
 Work Order : EB0709322



ALS Environmental

Analytical Results

Analytical Results				Client Sample ID :	S28	S28	S29	S29	S30
				1	2	1	2	0.1	
Sample Matrix Type / Description :				SOIL	SOIL	SOIL	SOIL	SOIL	
Sample Date / Time :				17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00	
Laboratory Sample ID :									
Analyte	CAS number	LOR	Units	EB0709322-086	EB0709322-087	EB0709322-090	EB0709322-091	EB0709322-093	
EA055: Moisture Content									
Moisture Content (dried @ 103°C)				1.0 %	16.6	4.5	23.5	12.4	13.5
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg	<5	7	9	<5	<5	
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1	
Chromium	7440-47-3	2	mg/kg	3	9	4	6	47	
Copper	7440-50-8	5	mg/kg	<5	19	<5	<5	<5	
Lead	7439-92-1	5	mg/kg	<5	112	6	<5	<5	
Nickel	7440-02-0	2	mg/kg	<2	15	<2	<2	18	
Zinc	7440-66-6	5	mg/kg	<5	99	15	<5	8	
EG035T: Total Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	0.2	<0.1	

Releas

Page Number : 15 of 36
 Client : GOLDER ASSOCIATES
 Work Order : EB0709322



ALS Environmental

Analytical Results

Analytical Results				Client Sample ID :	S30	S30	S31	S31	S31
				1	2	0.1	1	2	
Sample Matrix Type / Description :				SOIL	SOIL	SOIL	SOIL	SOIL	
Sample Date / Time :				17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00	
Laboratory Sample ID :				EB0709322-094	EB0709322-095	EB0709322-096	EB0709322-097	EB0709322-098	
Analyte	CAS number	LOR	Units						
EA055: Moisture Content									
Moisture Content (dried @ 103°C)				1.0 %	11.7	10.9	11.8	18.0	14.7
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	<5	<5	
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1	
Chromium	7440-47-3	2	mg/kg	8	182	8	4	7	
Copper	7440-50-8	5	mg/kg	<5	<5	<5	<5	9	
Lead	7439-92-1	5	mg/kg	<5	10	<5	16	12	
Nickel	7440-02-0	2	mg/kg	3	9	3	6	18	
Zinc	7440-66-6	5	mg/kg	<5	<5	<5	25	29	
EG035T: Total Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg	0.2	0.1	0.1	<0.1	<0.1	

Release

Page Number : 16 of 36
 Client : GOLDER ASSOCIATES
 Work Order : EB0709322



ALS Environmental

Analytical Results

				Client Sample ID :	S32 2 SOIL 17 Jul 2007 15:00	S33 0.1 SOIL 17 Jul 2007 15:00	S33 1 SOIL 17 Jul 2007 15:00	S33 2 SOIL 17 Jul 2007 15:00	S33 3 SOIL 17 Jul 2007 15:00
				Sample Matrix Type / Description :					
				Sample Date / Time :					
				Laboratory Sample ID :					
Analyte	CAS number	LOR	Units		EB0709322-101	EB0709322-102	EB0709322-103	EB0709322-104	EB0709322-105
EA055: Moisture Content									
Moisture Content (dried @ 103°C)		1.0	%		7.6	15.0	16.9	6.9	10.0
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		7	7	6	<5	9
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		21	13	6	4	6
Copper	7440-50-8	5	mg/kg		27	9	9	<5	<5
Lead	7439-92-1	5	mg/kg		6	8	33	<5	6
Nickel	7440-02-0	2	mg/kg		83	23	2	<2	3
Zinc	7440-66-6	5	mg/kg		38	21	82	<5	9
EG035T: Total Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	0.2	0.1	<0.1

Release

Page Number : 17 of 36
 Client : GOLDER ASSOCIATES
 Work Order : EB0709322



ALS Environmental

Analytical Results

Analytical Results				Client Sample ID :		S35	S35	S35	S36	S36
				Sample Matrix Type / Description :		0.1	2	4	0.1	1
				Sample Date / Time :		SOIL	SOIL	SOIL	SOIL	SOIL
				Laboratory Sample ID :		17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00
				EB0709322-106	EB0709322-108	EB0709322-110	EB0709322-111	EB0709322-112		
Analyte	CAS number	LOR	Units							
EA055: Moisture Content										
Moisture Content (dried @ 103°C)		1.0	%	18.7	20.7	11.4	5.7	10.9		
EG005T: Total Metals by ICP-AES										
Arsenic	7440-38-2	5	mg/kg	<5	7	<5	15	8		
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1		
Chromium	7440-47-3	2	mg/kg	4	6	30	11	10		
Copper	7440-50-8	5	mg/kg	<5	<5	16	<5	8		
Lead	7439-92-1	5	mg/kg	<5	7	16	11	11		
Nickel	7440-02-0	2	mg/kg	<2	2	24	6	16		
Zinc	7440-66-6	5	mg/kg	<5	<5	49	15	22		
EG035T: Total Mercury by FIMS										
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1		

Release

Page Number : 18 of 36
 Client : GOLDER ASSOCIATES
 Work Order : EB0709322



ALS Environmental

Analytical Results

Client Sample ID :				S36	S36	S36	S37	S37
Sample Matrix Type / Description :				2	3	4	1	2
Sample Date / Time :				SOIL	SOIL	SOIL	SOIL	SOIL
Laboratory Sample ID :				17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00
Laboratory Sample ID :				EB0709322-113	EB0709322-114	EB0709322-115	EB0709322-118	EB0709322-119
Analyte	CAS number	LOR	Units					
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0 %		12.2	10.9	11.4	17.0	15.5
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	26	<5	12	11	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	10	4	10	8	7
Copper	7440-50-8	5	mg/kg	7	<5	<5	5	6
Lead	7439-92-1	5	mg/kg	11	<5	11	11	10
Nickel	7440-02-0	2	mg/kg	12	2	5	11	10
Zinc	7440-66-6	5	mg/kg	22	<5	10	24	18
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1

Release

Page Number : 19 of 36
 Client : GOLDER ASSOCIATES
 Work Order : EB0709322



ALS Environmental

Analytical Results

Client Sample ID :				S38	S38	S38	S38	S38
Sample Matrix Type / Description :				0.1	1	2	3	4
Sample Date / Time :				SOIL	SOIL	SOIL	SOIL	SOIL
Laboratory Sample ID :				17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00
EB0709322-122				EB0709322-123	EB0709322-124	EB0709322-125	EB0709322-126	EB0709322-126
Analyte	CAS number	LOR	Units					
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%	10.5	13.8	18.6	9.5	14.9
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	5	18	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	1	<1	<1
Chromium	7440-47-3	2	mg/kg	10	7	9	5	8
Copper	7440-50-8	5	mg/kg	8	9	5	<5	16
Lead	7439-92-1	5	mg/kg	7	11	13	<5	8
Nickel	7440-02-0	2	mg/kg	23	19	6	3	30
Zinc	7440-66-6	5	mg/kg	18	26	11	<5	23
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1

Release

Page Number : 20 of 36
 Client : GOLDER ASSOCIATES
 Work Order : EB0709322



ALS Environmental

Analytical Results

Client Sample ID :				S39	S39	S39	S40	S40
Sample Matrix Type / Description :				1	2	4	0.1	1
Sample Date / Time :				SOIL	SOIL	SOIL	SOIL	SOIL
Laboratory Sample ID :				17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00
Laboratory Sample ID :				EB0709322-128	EB0709322-129	EB0709322-131	EB0709322-132	EB0709322-133
Analyte	CAS number	LOR	Units					
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%	21.7	20.2	15.5	20.0	18.8
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	7	7	<5	7
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	3	6	3	2	13
Copper	7440-50-8	5	mg/kg	5	14	<5	<5	6
Lead	7439-92-1	5	mg/kg	9	31	<5	<5	16
Nickel	7440-02-0	2	mg/kg	<2	4	<2	2	16
Zinc	7440-66-6	5	mg/kg	<5	45	5	43	18
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	0.1	<0.1

Release

Page Number : 21 of 36
 Client : GOLDER ASSOCIATES
 Work Order : EB0709322



ALS Environmental

Analytical Results

				Client Sample ID :	S40	S40	S41	S42	S42
				Sample Matrix Type / Description :	2 SOIL	3 SOIL	2 SOIL	1 SOIL	2 SOIL
				Sample Date / Time :	17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00
				Laboratory Sample ID :	EB0709322-134	EB0709322-135	EB0709322-138	EB0709322-140	EB0709322-141
Analyte	CAS number	LOR	Units						
EA055: Moisture Content									
Moisture Content (dried @ 103°C)		1.0 %		9.3	6.9	18.2	19.0	17.6	
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg	<5	<5	10	<5	<5	
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1	
Chromium	7440-47-3	2	mg/kg	2	6	7	10	3	
Copper	7440-50-8	5	mg/kg	<5	<5	9	<5	<5	
Lead	7439-92-1	5	mg/kg	<5	7	10	<5	14	
Nickel	7440-02-0	2	mg/kg	<2	<2	5	3	6	
Zinc	7440-66-6	5	mg/kg	<5	18	12	31	89	
EG035T: Total Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	

Release

Page Number : 22 of 36
 Client : GOLDER ASSOCIATES
 Work Order : EB0709322



ALS Environmental

Analytical Results

				Client Sample ID :	S42	S43	S43	S43	S43
				Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Date / Time :	17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00
				Laboratory Sample ID :	EB0709322-143	EB0709322-144	EB0709322-145	EB0709322-146	EB0709322-147
Analyte	CAS number	LOR	Units						
EA055: Moisture Content									
Moisture Content (dried @ 103°C)		1.0 %		14.9	7.8	18.4	16.8	17.2	
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg	7	<5	6	6	<5	
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1	
Chromium	7440-47-3	2	mg/kg	8	10	4	5	<2	
Copper	7440-50-8	5	mg/kg	6	11	6	<5	<5	
Lead	7439-92-1	5	mg/kg	10	6	7	7	<5	
Nickel	7440-02-0	2	mg/kg	10	28	6	3	<2	
Zinc	7440-66-6	5	mg/kg	22	34	34	87	9	
EG035T: Total Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	

Release

Page Number : 23 of 36
 Client : GOLDER ASSOCIATES
 Work Order : EB0709322



ALS Environmental

Analytical Results

Client Sample ID :

Sample Matrix Type / Description :

Sample Date / Time :

Laboratory Sample ID :

Analyte	CAS number	LOR	Units	EB0709322-148	EB0709322-149	EB0709322-151	EB0709322-153	EB0709322-155
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0 %		14.0	7.2	14.2	18.9	16.6
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	18	5	7	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	8	8	22	16	4
Copper	7440-50-8	5	mg/kg	<5	11	<5	5	<5
Lead	7439-92-1	5	mg/kg	<5	6	10	11	<5
Nickel	7440-02-0	2	mg/kg	4	5	8	3	<2
Zinc	7440-66-6	5	mg/kg	<5	23	7	18	10
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1

Release

Page Number : 24 of 36
 Client : GOLDER ASSOCIATES
 Work Order : EB0709322



ALS Environmental

Analytical Results

Client Sample ID :

Sample Matrix Type / Description :

Sample Date / Time :

Laboratory Sample ID :

Analyte	CAS number	LOR	Units	EB0709322-156	EB0709322-157	EB0709322-158	EB0709322-159	EB0709322-160
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%	19.9	20.2	21.5	15.5	18.5
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	21	7	<5
Cadmium	7440-43-9	1	mg/kg	1	<1	1	<1	<1
Chromium	7440-47-3	2	mg/kg	4	2	11	5	3
Copper	7440-50-8	5	mg/kg	<5	<5	<5	<5	11
Lead	7439-92-1	5	mg/kg	<5	<5	9	8	9
Nickel	7440-02-0	2	mg/kg	<2	<2	5	4	10
Zinc	7440-66-6	5	mg/kg	7	25	6	6	150
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1

Release

Page Number : 25 of 36
 Client : GOLDER ASSOCIATES
 Work Order : EB0709322



ALS Environmental

Analytical Results

Client Sample ID :

Sample Matrix Type / Description :

Sample Date / Time :

Laboratory Sample ID :

Analyte	CAS number	LOR	Units	EB0709322-161	EB0709322-163	EB0709322-164	EB0709322-166	EB0709322-167
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0 %		14.8	14.9	19.9	10.7	7.7
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	10	6	13	<5	<5
Cadmium	7440-43-9	1	mg/kg	1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	24	16	22	10	10
Copper	7440-50-8	5	mg/kg	20	13	20	<5	15
Lead	7439-92-1	5	mg/kg	10	14	23	<5	54
Nickel	7440-02-0	2	mg/kg	58	32	16	4	44
Zinc	7440-66-6	5	mg/kg	41	36	68	<5	23
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1

Release

Page Number : 26 of 36
 Client : GOLDER ASSOCIATES
 Work Order : EB0709322



ALS Environmental

Analytical Results

				Client Sample ID :	S47	S47	S47	S47	S47
				Sample Matrix Type / Description :	0.1	1	2	3	4
				Sample Date / Time :	SOIL	SOIL	SOIL	SOIL	SOIL
				Laboratory Sample ID :	17 Jul 2007	17 Jul 2007	17 Jul 2007	17 Jul 2007	17 Jul 2007
					15:00	15:00	15:00	15:00	15:00
					EB0709322-168	EB0709322-169	EB0709322-170	EB0709322-171	EB0709322-172
Analyte	CAS number	LOR	Units						
EA055: Moisture Content									
Moisture Content (dried @ 103°C)		1.0	%	13.8	15.1	15.7	16.6	9.9	
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg	5	<5	<5	<5	<5	
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1	
Chromium	7440-47-3	2	mg/kg	10	4	5	11	5	
Copper	7440-50-8	5	mg/kg	7	9	<5	10	<5	
Lead	7439-92-1	5	mg/kg	9	8	6	8	<5	
Nickel	7440-02-0	2	mg/kg	15	6	6	27	2	
Zinc	7440-66-6	5	mg/kg	18	205	25	95	<5	
EG035T: Total Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	0.1	

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Release

Page Number : 27 of 36
 Client : GOLDER ASSOCIATES
 Work Order : EB0709322



ALS Environmental

Analytical Results

				Client Sample ID :	S47	S47	S48	S48	S48
				Sample Matrix Type / Description :	5	6	1	2	3
				Sample Date / Time :	SOIL 17 Jul 2007 15:00	SOIL 17 Jul 2007 15:00	SOIL 17 Jul 2007 15:00	SOIL 17 Jul 2007 15:00	SOIL 17 Jul 2007 15:00
				Laboratory Sample ID :	EB0709322-173	EB0709322-174	EB0709322-177	EB0709322-178	EB0709322-179
Analyte	CAS number	LOR	Units						
EA055: Moisture Content									
Moisture Content (dried @ 103°C)		1.0 %		6.0	19.9	15.6	14.6	11.0	
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg	35	12	<5	<5	<5	
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1	
Chromium	7440-47-3	2	mg/kg	7	6	26	46	4	
Copper	7440-50-8	5	mg/kg	21	8	21	20	<5	
Lead	7439-92-1	5	mg/kg	20	15	49	14	<5	
Nickel	7440-02-0	2	mg/kg	22	7	71	44	<2	
Zinc	7440-66-6	5	mg/kg	29	17	43	48	<5	
EG035T: Total Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	

Release

Page Number : 28 of 36
 Client : GOLDER ASSOCIATES
 Work Order : EB0709322



ALS Environmental

Analytical Results

Client Sample ID :

Sample Matrix Type / Description :

Sample Date / Time :

Laboratory Sample ID :

Analyte	CAS number	LOR	Units	EB0709322-181	EB0709322-182	EB0709322-183	EB0709322-184	EB0709322-185
EA055: Moisture Content								
Moisture Content (dried @ 103°C)								
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg					
Cadmium	7440-43-9	1	mg/kg					
Chromium	7440-47-3	2	mg/kg					
Copper	7440-50-8	5	mg/kg					
Lead	7439-92-1	5	mg/kg					
Nickel	7440-02-0	2	mg/kg					
Zinc	7440-66-6	5	mg/kg					
EG035T: Total Mercury by FIMS								
Mercury								

Release

Page Number : 29 of 36
 Client : GOLDER ASSOCIATES
 Work Order : EB0709322



ALS Environmental

Analytical Results

Client Sample ID :

Sample Matrix Type / Description :

Sample Date / Time :

Laboratory Sample ID :

				S49	S50	S50	S51	S51
				4	1	3	0.1	1
				SOIL	SOIL	SOIL	SOIL	SOIL
				17 Jul 2007	17 Jul 2007	17 Jul 2007	17 Jul 2007	17 Jul 2007
				15:00	15:00	15:00	15:00	15:00
				EB0709322-186	EB0709322-188	EB0709322-190	EB0709322-191	EB0709322-192
Analyte	CAS number	LOR	Units					
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0 %		18.3	11.8	15.1	12.0	21.2
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	17	<5	8	5	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	10	<2	17	4	<2
Copper	7440-50-8	5	mg/kg	<5	<5	7	<5	<5
Lead	7439-92-1	5	mg/kg	8	<5	11	13	<5
Nickel	7440-02-0	2	mg/kg	4	<2	17	4	<2
Zinc	7440-66-6	5	mg/kg	8	21	24	12	19
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1

Released

Page Number : 30 of 36
 Client : GOLDER ASSOCIATES
 Work Order : EB0709322



ALS Environmental

Analytical Results

Client Sample ID :

Sample Matrix Type / Description :

Sample Date / Time :

Laboratory Sample ID :

Analyte	CAS number	LOR	Units	EB0709322-193	EB0709322-194	EB0709322-195	EB0709322-198	EB0709322-199
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0 %		19.1	21.4	19.8	18.7	3.5
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	8	<5	<5	11
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	4	7	7	6	7
Copper	7440-50-8	5	mg/kg	<5	<5	6	<5	6
Lead	7439-92-1	5	mg/kg	5	8	7	19	11
Nickel	7440-02-0	2	mg/kg	2	6	14	<2	12
Zinc	7440-66-6	5	mg/kg	19	28	17	<5	22
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1

Release

Page Number : 31 of 36
 Client : GOLDER ASSOCIATES
 Work Order : EB0709322



ALS Environmental

Analytical Results

				Client Sample ID :	S53	S53	S54	S54	S55
				Sample Matrix Type / Description :	1	2	0.1	1	2
				Sample Date / Time :	SOIL	SOIL	SOIL	SOIL	SOIL
				Laboratory Sample ID :	17 Jul 2007	17 Jul 2007	17 Jul 2007	17 Jul 2007	17 Jul 2007
					15:00	15:00	15:00	15:00	15:00
					EB0709322-200	EB0709322-201	EB0709322-202	EB0709322-203	EB0709322-206
Analyte	CAS number	LOR	Units						
EA055: Moisture Content									
Moisture Content (dried @ 103°C)		1.0 %		9.8	12.0	14.0	17.3	13.0	
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg	<5	10	6	<5	25	
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1	
Chromium	7440-47-3	2	mg/kg	6	4	5	10	9	
Copper	7440-50-8	5	mg/kg	<5	<5	<5	<5	<5	
Lead	7439-92-1	5	mg/kg	<5	60	8	7	<5	
Nickel	7440-02-0	2	mg/kg	3	<2	9	<2	<2	
Zinc	7440-66-6	5	mg/kg	<5	77	12	<5	<5	
EG035T: Total Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg	0.2	<0.1	<0.1	0.1	0.1	

Release

Page Number : 32 of 36
 Client : GOLDER ASSOCIATES
 Work Order : EB0709322



ALS Environmental

Analytical Results

				Client Sample ID :	S56	S57	S57	S57	S57
					3	0.1	1	2	3
				Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Date / Time :	17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00
				Laboratory Sample ID :					
					EB0709322-210	EB0709322-211	EB0709322-212	EB0709322-213	EB0709322-214
Analyte	CAS number	LOR	Units						
EA055: Moisture Content									
Moisture Content (dried @ 103°C)		1.0 %		37.0	29.3	18.8	17.0	10.8	
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg	5	111	<5	<5	<5	
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1	
Chromium	7440-47-3	2	mg/kg	5	86	6	4	4	
Copper	7440-50-8	5	mg/kg	<5	<5	<5	<5	<5	
Lead	7439-92-1	5	mg/kg	10	15	9	10	11	
Nickel	7440-02-0	2	mg/kg	7	<2	4	<2	4	
Zinc	7440-66-6	5	mg/kg	42	<5	876	771	14	
EG035T: Total Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	

Release

Page Number : 33 of 36
 Client : GOLDER ASSOCIATES
 Work Order : EB0709322



ALS Environmental

Analytical Results

Client Sample ID :				S58	S58	S58	S59	S59
Sample Matrix Type / Description :				1	2	4	0.1	1
Sample Date / Time :				SOIL	SOIL	SOIL	SOIL	SOIL
Laboratory Sample ID :				17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00
Laboratory Sample ID :				EB0709322-216	EB0709322-217	EB0709322-219	EB0709322-220	EB0709322-221
Analyte	CAS number	LOR	Units					
EA055: Moisture Content:								
Moisture Content (dried @ 103°C)		1.0 %		19.6	17.7	15.7	7.8	16.7
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	14	<5	6	14
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	<2	7	<2	7	5
Copper	7440-50-8	5	mg/kg	<5	<5	<5	7	<5
Lead	7439-92-1	5	mg/kg	<5	6	<5	6	6
Nickel	7440-02-0	2	mg/kg	<2	9	<2	24	10
Zinc	7440-66-6	5	mg/kg	<5	6	<5	36	24
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1

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Release

Page Number : 34 of 36
 Client : GOLDER ASSOCIATES
 Work Order : EB0709322



ALS Environmental

Analytical Results

Client Sample ID :				S59	S60	S60	S60	S60
Sample Matrix Type / Description :				2	0.1	Q	1	2
Sample Date / Time :				SOIL	SOIL	SOIL	SOIL	SOIL
Laboratory Sample ID :				17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00	17 Jul 2007 15:00
				EB0709322-222	EB0709322-223	EB0709322-224	EB0709322-225	EB0709322-226
Analyte	CAS number	LOR	Units					
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0 %		12.1	14.4	25.7	11.2	12.8
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	7	16	136	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	4	17	61	5	14
Copper	7440-50-8	5	mg/kg	<5	10	<5	11	<5
Lead	7439-92-1	5	mg/kg	<5	15	10	10	<5
Nickel	7440-02-0	2	mg/kg	2	16	<2	13	5
Zinc	7440-66-6	5	mg/kg	11	45	7	66	<5
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	0.1	0.1	<0.1	<0.1

Release

Page Number : 35 of 36
 Client : GOLDER ASSOCIATES
 Work Order : EB0709322



ALS Environmental

Analytical Results

Client Sample ID :

S60

Sample Matrix Type / Description :

3

SOIL

Sample Date / Time :

17 Jul 2007

15:00

Laboratory Sample ID :

EB0709322-227

Analyte	CAS number	LOR	Units				
EA055: Moisture Content							
Moisture Content (dried @ 103°C)		1.0 %		12.0			
EG005T: Total Metals by ICP-AES							
Arsenic	7440-38-2	5	mg/kg	6			
Cadmium	7440-43-9	1	mg/kg	<1			
Chromium	7440-47-3	2	mg/kg	5			
Copper	7440-50-8	5	mg/kg	<5			
Lead	7439-92-1	5	mg/kg	6			
Nickel	7440-02-0	2	mg/kg	3			
Zinc	7440-66-6	5	mg/kg	7			
EG035T: Total Mercury by FIMS							
Mercury	7439-97-6	0.1	mg/kg	<0.1			

Release

Page Number : 36 of 36
Client : GOLDER ASSOCIATES
Work Order : EB0709322



Surrogate Control Limits

- No surrogates present on this report.

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QUALITY CONTROL REPORT

Client	: GOLDER ASSOCIATES	Laboratory	: Environmental Division Brisbane	Page	: 1 of 18
Contact	: CTPI 49-Sch4	Contact	: CTPI 49-Sch4	Work order	: EB0709322
Address	: P O BOX 5569 MAROOCHYDORE SOUTH QLD AUSTRALIA 4558	Address	: 32 Shand Street Stafford QLD Australia 4053	Amendment No.	:
Project	: 077683504 Contamination	Quote number	: EN/002/05	Date received	: 20 Aug 2007
Order number	: MQ 4569			Date issued	: 30 Aug 2007
C-O-C number	: 077683504tr2				
Site	: - Not provided -				
E-mail	: CTPI 49-@golder.com.au	E-mail	: Services.Brisbane@alsenviro.com	No. of samples	
Telephone	: 5443 3511	Telephone	: +61-7-3243 7222	Received	: 227
Facsimile	: 5443 6645	Facsimile	: +61-7-3243 7218	Analysed	: 161

This final report for the ALSE work order reference EB0709322 supersedes any previous reports with this reference. Results apply to the samples as submitted. All pages of this report have been checked and approved for release.

This report contains the following information:

- Laboratory Duplicates (DUP); Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Samples (LCS); Recovery and Acceptance Limits
- Matrix Spikes (MS); Recovery and Acceptance Limits

Work order specific comments

LCS recovery for EG005T analyses fall outside Dynamic Control Limits. They are however within ALS Static Control Limits and hence deemed acceptable.

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Accredited for compliance with ISO/IEC 17025

This document has been electronically signed by those names that appear on this report and are the authorised signatories. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatory

CTPI 49-Sch4

Department

Inorganics - NATA 825 (818 - Brisbane)

Client : GOLDER ASSOCIATES
Project : 077683504 Contamination

Work Order : EB0709322
ALS Quote Reference : EN/002/05

Page Number : 2 of 18
Issue Date : 30 Aug 2007



Quality Control Report - Laboratory Duplicates (DUP)

The quality control term **Laboratory Duplicate** refers to an intralaboratory split sample randomly selected from the sample batch. Laboratory duplicates provide information on method precision and sample heterogeneity.

- Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot. Abbreviations: **LOR** = Limit of Reporting, **RPD** = Relative Percent Difference.

* Indicates failed QC. The permitted ranges for the RPD of Laboratory Duplicates (relative percent deviation) are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting:- Result < 10 times LOR, no limit - Result between 10 and 20 times LOR, 0% - 50% - Result > 20 times LOR, 0% - 20%

Matrix Type: SOIL

Laboratory Duplicates (DUP) Report

Laboratory Sample ID	Client Sample ID	Analyte name	LOR	Original Result	Duplicate Result	RPD
EA055: Moisture Content - (QC Lot: 478225)						
EB0709322-005	S2 - 1	Moisture Content (dried @ 103°C)	1.0 %	12.3	12.7	3.4
EB0709322-014	S4 - 3	Moisture Content (dried @ 103°C)	1.0 %	21.4	22.2	3.4
EA055: Moisture Content - (QC Lot: 478226)						
EB0709322-037	S11 - 1	Moisture Content (dried @ 103°C)	1.0 %	10.9	10.7	2.6
EB0709322-049	S16 - 1	Moisture Content (dried @ 103°C)	1.0 %	7.5	10.6	33.9
EA055: Moisture Content - (QC Lot: 478227)						
EB0709322-069	S22 - 3	Moisture Content (dried @ 103°C)	1.0 %	10.7	11.6	8.1
EB0709322-080	S26 - 2	Moisture Content (dried @ 103°C)	1.0 %	4.9	5.6	12.0
EA055: Moisture Content - (QC Lot: 478228)						
EB0709322-096	S31 - 0.1	Moisture Content (dried @ 103°C)	1.0 %	11.8	12.7	7.9
EB0709322-105	S33 - 3	Moisture Content (dried @ 103°C)	1.0 %	10.0	8.7	14.3
EA055: Moisture Content - (QC Lot: 478229)						
EB0709322-124	S38 - 2	Moisture Content (dried @ 103°C)	1.0 %	18.6	18.2	2.0
EB0709322-133	S40 - 1	Moisture Content (dried @ 103°C)	1.0 %	18.8	18.8	0.0
EA055: Moisture Content - (QC Lot: 478230)						
EB0709322-151	S44 - 1	Moisture Content (dried @ 103°C)	1.0 %	14.2	13.9	2.4
EB0709322-160	S45 - 3	Moisture Content (dried @ 103°C)	1.0 %	18.5	19.8	7.1
EA055: Moisture Content - (QC Lot: 478231)						
EB0709322-177	S48 - 1	Moisture Content (dried @ 103°C)	1.0 %	15.6	15.2	2.3
EB0709322-186	S49 - 4	Moisture Content (dried @ 103°C)	1.0 %	18.3	22.1	18.6
EA055: Moisture Content - (QC Lot: 478232)						
EB0709322-202	S54 - 0.1	Moisture Content (dried @ 103°C)	1.0 %	14.0	12.0	14.8
EB0709322-214	S57 - 3	Moisture Content (dried @ 103°C)	1.0 %	10.8	16.6	42.5
EA055: Moisture Content - (QC Lot: 478233)						
EB0709453-006	Anonymous	Moisture Content (dried @ 103°C)	1.0 %	6.2	6.0	1.8

Release



Client : GOLDER ASSOCIATES
Project : 077683504 Contamination

Work Order : EB0709322
ALS Quote Reference : EN/002/05

Page Number : 3 of 18
Issue Date : 30 Aug 2007

ALS Environmental

Matrix Type: SOIL

Laboratory Duplicates (DUP) Report

Laboratory Sample ID	Client Sample ID	Analyte name	LOR	Original Result	Duplicate Result	RPD
EA055: Moisture Content - continued						
EA055: Moisture Content - (QC Lot: 478233) - continued						
EB0709454-005	Anonymous	Moisture Content (dried @ 103°C)	1.0 %	6.0	6.4	5.6
EG005T: Total Metals by ICP-AES						
EG005T: Total Metals by ICP-AES - (QC Lot: 478220)						
EB0709322-016	S5 - 1	Arsenic	5 mg/kg	7	10	40.5
		Cadmium	1 mg/kg	<1	<1	0.0
		Chromium	2 mg/kg	10	10	0.0
		Copper	5 mg/kg	7	7	0.0
		Lead	5 mg/kg	7	7	0.0
		Nickel	2 mg/kg	9	14	40.3
		Zinc	5 mg/kg	18	22	21.4
EG005T: Total Metals by ICP-AES - (QC Lot: 478222)						
EB0709322-035 						

Client : GOLDER ASSOCIATES
Project : 077683504 Contamination

Work Order : EB0709322
ALS Quote Reference : EN/002/05

Page Number : 4 of 18
Issue Date : 30 Aug 2007



Matrix Type: SOIL

Laboratory Duplicates (DUP) Report

Laboratory Sample ID	Client Sample ID	Analyte name	LOR	Original Result	Duplicate Result	RPD
EG005T: Total Metals by ICP-AES - continued						
EG005T: Total Metals by ICP-AES - (QC Lot: 478269) - continued						
EB0709322-065	S21 - 2	Copper	5 mg/kg	<5	11	73.6
		Lead	5 mg/kg	12	13	9.7
		Nickel	2 mg/kg	5	13	93.9
		Zinc	5 mg/kg	8	13	49.4
EB0709322-080	S26 - 2	Arsenic	5 mg/kg	12	11	0.0
		Cadmium	1 mg/kg	<1	<1	0.0
		Chromium	2 mg/kg	14	14	0.0
		Copper	5 mg/kg	8	8	0.0
		Lead	5 mg/kg	10	10	0.0
		Nickel	2 mg/kg	16	13	26.4
		Zinc	5 mg/kg	19	23	18.1
EG005T: Total Metals by ICP-AES - (QC Lot: 478271)						
EB0709322-093	S30 - 0.1	Arsenic	5 mg/kg	<5	<5	0.0
		Cadmium	1 mg/kg	<1	<1	0.0
		Chromium	2 mg/kg	47	43	8.4
		Copper	5 mg/kg	<5	<5	0.0
		Lead	5 mg/kg	<5	5	0.0
		Nickel	2 mg/kg	18	7	86.6
		Zinc	5 mg/kg	8	<5	48.1
EB0709322-105	S33 - 3	Arsenic	5 mg/kg	9	6	39.9
		Cadmium	1 mg/kg	<1	<1	0.0
		Chromium	2 mg/kg	6	4	29.2
		Copper	5 mg/kg	<5	<5	0.0
		Lead	5 mg/kg	6	6	0.0
		Nickel	2 mg/kg	3	2	0.0
		Zinc	5 mg/kg	9	10	0.0
EG005T: Total Metals by ICP-AES - (QC Lot: 478275)						
EB0709322-119	S37 - 2	Arsenic	5 mg/kg	<5	<5	0.0
		Cadmium	1 mg/kg	<1	<1	0.0



Client : GOLDER ASSOCIATES
Project : 077683504 Contamination

Work Order : EB0709322
ALS Quote Reference : EN/002/05

Page Number : 5 of 18
Issue Date : 30 Aug 2007

ALS Environmental

Matrix Type: SOIL

Laboratory Duplicates (DUP) Report

Laboratory Sample ID	Client Sample ID	Analyte name	LOR	Original Result	Duplicate Result	RPD
EG005T: Total Metals by ICP-AES - continued						
EG005T: Total Metals by ICP-AES - (QC Lot: 478276) - continued						
EB0709322-119	S37 - 2	Chromium	2 mg/kg	7	7	0.0
		Copper	5 mg/kg	6	8	33.0
		Lead	5 mg/kg	10	15	33.5
		Nickel	2 mg/kg	10	11	0.0
		Zinc	5 mg/kg	18	18	0.0
EB0709322-133	S40 - 1	Arsenic	5 mg/kg	7	7	0.0
		Cadmium	1 mg/kg	<1	<1	0.0
		Chromium	2 mg/kg	13	6	70.6
		Copper	5 mg/kg	6	<5	0.0
		Lead	5 mg/kg	16	12	25.1
		Nickel	2 mg/kg	16	2	148
		Zinc	5 mg/kg	18	9	69.0
EG005T: Total Metals by ICP-AES - (QC Lot: 478277)						
EB0709322-147	S43 - 3	Arsenic	5 mg/kg	<5	<5	0.0
		Cadmium	1 mg/kg	<1	<1	0.0
		Chromium	2 mg/kg	<2	<2	0.0
		Copper	5 mg/kg	<5	<5	0.0
		Lead	5 mg/kg	<5	<5	0.0
		Nickel	2 mg/kg	<2	<2	0.0
		Zinc	5 mg/kg	9	6	36.1
EB0709322-160	S45 - 3	Arsenic	5 mg/kg	<5	<5	0.0
		Cadmium	1 mg/kg	<1	<1	0.0
		Chromium	2 mg/kg	3	3	0.0
		Copper	5 mg/kg	11	10	0.0
		Lead	5 mg/kg	9	9	0.0
		Nickel	2 mg/kg	10	11	0.0
		Zinc	5 mg/kg	150	167	11.1
EG005T: Total Metals by ICP-AES - (QC Lot: 478367)						
EB0709322-172	S47 - 4	Arsenic	5 mg/kg	<5	<5	0.0

Release



ALS Environmental

Client : GOLDER ASSOCIATES
Project : 077683504 Contamination

Work Order : EB0709322
ALS Quote Reference : EN/002/05

Page Number : 6 of 18
Issue Date : 30 Aug 2007

Matrix Type: SOIL

Laboratory Duplicates (DUP) Report

Laboratory Sample ID	Client Sample ID	Analyte name	LOR	Original Result	Duplicate Result	RPD
EG005T: Total Metals by ICP-AES - continued						
EG005T: Total Metals by ICP-AES - (QC Lot: 478367) - continued						
EB0709322-172	S47 - 4	Cadmium	1 mg/kg	<1	<1	0.0
		Chromium	2 mg/kg	5	5	0.0
		Copper	5 mg/kg	<5	<5	0.0
		Lead	5 mg/kg	<5	<5	0.0
		Nickel	2 mg/kg	2	2	0.0
		Zinc	5 mg/kg	<5	<5	0.0
EB0709322-186	S49 - 4	Arsenic	5 mg/kg	17	17	0.0
		Cadmium	1 mg/kg	<1	<1	0.0
		Chromium	2 mg/kg	10	6	52.6
		Copper	5 mg/kg	<5	<5	0.0
		Lead	5 mg/kg	8	7	0.0
		Nickel	2 mg/kg	4	<2	74.8
		Zinc	5 mg/kg	8	<5	43.1
EG005T: Total Metals by ICP-AES - (QC Lot: 478369)						
EB0709322-199	S53 - 0.1	Arsenic	5 mg/kg	11	<5	75.0
		Cadmium	1 mg/kg	<1	<1	0.0
		Chromium	2 mg/kg	7	8	0.0
		Copper	5 mg/kg	6	<5	0.0
		Lead	5 mg/kg	11	10	10.7
		Nickel	2 mg/kg	12	10	22.0
		Zinc	5 mg/kg	22	17	23.8
EB0709322-214	S57 - 3	Arsenic	5 mg/kg	<5	<5	0.0
		Cadmium	1 mg/kg	<1	<1	0.0
		Chromium	2 mg/kg	4	2	39.0
		Copper	5 mg/kg	<5	<5	0.0
		Lead	5 mg/kg	11	<5	74.1
		Nickel	2 mg/kg	4	4	0.0
		Zinc	5 mg/kg	14	7	66.0
EG005T: Total Metals by ICP-AES - (QC Lot: 478774)						
				mg/kg	mg/kg	%

Release



Client : GOLDER ASSOCIATES
Project : 077683504 Contamination

Work Order : EB0709322
ALS Quote Reference : EN/002/05

Page Number : 7 of 18
Issue Date : 30 Aug 2007

ALS Environmental

Matrix Type: SOIL

Laboratory Duplicates (DUP) Report

Matrix Type: SOIL						
Laboratory Sample ID	Client Sample ID	Analyte name	LOR	Original Result	Duplicate Result	RPD
EG005T: Total Metals by ICP-AES - continued						
EG005T: Total Metals by ICP-AES - (QC Lot: 478774) - continued				mg/kg	mg/kg	%
EB0709322-221	S59 - 1	Arsenic	5 mg/kg	14	15	0.0
		Cadmium	1 mg/kg	<1	<1	0.0
		Chromium	2 mg/kg	5	7	24.8
		Copper	5 mg/kg	<5	<5	0.0
		Lead	5 mg/kg	6	7	18.3
		Nickel	2 mg/kg	10	9	0.0
		Zinc	5 mg/kg	24	41	53.3
EG035T: Total Mercury by FIMS						
EG035T: Total Mercury by FIMS - (QC Lot: 478221)				mg/kg	mg/kg	%
EB0709322-016	S5 - 1	Mercury	0.1 mg/kg	<0.1	<0.1	0.0
EG035T: Total Mercury by FIMS - (QC Lot: 478223)				mg/kg	mg/kg	%
EB0709322-035	S10 - 2	Mercury	0.1 mg/kg	0.2	0.3	0.0
EB0709322-051	S16 - 3	Mercury	0.1 mg/kg	<0.1	<0.1	0.0
EG035T: Total Mercury by FIMS - (QC Lot: 478270)				mg/kg	mg/kg	%
EB0709322-065	S21 - 2	Mercury	0.1 mg/kg	<0.1	<0.1	0.0
EB0709322-080	S26 - 2	Mercury	0.1 mg/kg	<0.1	<0.1	0.0
EG035T: Total Mercury by FIMS - (QC Lot: 478272)				mg/kg	mg/kg	%
EB0709322-094	S30 - 1	Mercury	0.1 mg/kg	0.2	0.1	0.0
EB0709322-105	S33 - 3	Mercury	0.1 mg/kg	<0.1	<0.1	0.0
EG035T: Total Mercury by FIMS - (QC Lot: 478276)				mg/kg	mg/kg	%
EB0709322-119	S37 - 2	Mercury	0.1 mg/kg	<0.1	<0.1	0.0
EB0709322-133	S40 - 1	Mercury	0.1 mg/kg	<0.1	<0.1	0.0
EG035T: Total Mercury by FIMS - (QC Lot: 478278)				mg/kg	mg/kg	%
EB0709322-147	S43 - 3	Mercury	0.1 mg/kg	<0.1	<0.1	0.0
EB0709322-160	S45 - 3	Mercury	0.1 mg/kg	<0.1	0.1	0.0
EG035T: Total Mercury by FIMS - (QC Lot: 478368)				mg/kg	mg/kg	%
EB0709322-172	S47 - 4	Mercury	0.1 mg/kg	0.1	0.1	0.0
EB0709322-186	S49 - 4	Mercury	0.1 mg/kg	<0.1	<0.1	0.0
EG035T: Total Mercury by FIMS - (QC Lot: 478370)				mg/kg	mg/kg	%

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Release



ALS Environmental

Client : GOLDER ASSOCIATES
Project : 077683504 Contamination

Work Order : EB0709322
ALS Quote Reference : EN/002/05

Page Number : 8 of 18
Issue Date : 30 Aug 2007

Laboratory Duplicates (DUP) Report

Matrix Type: SOIL

Laboratory Sample ID	Client Sample ID	Analyte name	LOR	Original Result	Duplicate Result	RPD
EG035T: Total Mercury by FIMS - continued						
EG035T: Total Mercury by FIMS - (QC Lot: 478370) - continued				mg/kg	mg/kg	%
EB0709322-199	S53 - 0.1	Mercury	0.1 mg/kg	<0.1	<0.1	0.0
EB0709322-214	S57 - 3	Mercury	0.1 mg/kg	<0.1	<0.1	0.0
EG035T: Total Mercury by FIMS - (QC Lot: 478775)				mg/kg	mg/kg	%
EB0709322-221	S59 - 1	Mercury	0.1 mg/kg	<0.1	<0.1	0.0

Release

Client : GOLDER ASSOCIATES
Project : 077683504 Contamination

Work Order : EB0709322
ALS Quote Reference : EN/002/05

Page Number : 9 of 18
Issue Date : 30 Aug 2007



Quality Control Report - Method Blank (MB) and Laboratory Control Samples (LCS)

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC type is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a known, interference free matrix spiked with target analytes or certified reference material. The purpose of this QC type is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of actual laboratory data. Flagged outliers on control limits for inorganics tests may be within the NEPM specified data quality objective of recoveries in the range of 70 to 130%. Where this occurs, no corrective action is taken. Abbreviations: LOR = Limit of reporting.

Matrix Type: SOIL

Method Blank (MB) and Laboratory Control Samples (LCS) Report

Matrix type: SOIL		Method blank result	Actual Results		Recovery Limits	
Analyte name	LOR		Spike concentration	Spike Recovery	Dynamic Recovery Limits	
				LCS	Low	High
EG005T: Total Metals by ICP-AES						
EG005T: Total Metals by ICP-AES - (QC Lot: 478220)			mg/kg		%	%
Arsenic	5 mg/kg	<5	—	—	—	—
	5 mg/kg	—	13.8	99.9	82.9	116
Cadmium	1 mg/kg	<1	—	—	—	—
	1 mg/kg	—	2.82	107	81.8	112
Chromium	2 mg/kg	—	61.6	104	91.2	115
	2 mg/kg	<2	—	—	—	—
Copper	5 mg/kg	—	54.7	107	92.1	118
	5 mg/kg	<5	—	—	—	—
Lead	5 mg/kg	<5	—	—	—	—
	5 mg/kg	—	55.5	98.9	88.1	111
Nickel	2 mg/kg	—	55.1	104	91.1	117
	2 mg/kg	<2	—	—	—	—
Zinc	5 mg/kg	<5	—	—	—	—
	5 mg/kg	—	105	101	88.1	116
EG005T: Total Metals by ICP-AES - (QC Lot: 478222)			mg/kg		%	%
Arsenic	5 mg/kg	—	13.8	108	82.9	116
	5 mg/kg	<5	—	—	—	—
Cadmium	1 mg/kg	—	2.82	115	81.8	112
	1 mg/kg	<1	—	—	—	—
Chromium	2 mg/kg	<2	—	—	—	—
	2 mg/kg	—	61.6	110	91.2	115
Copper	5 mg/kg	<5	—	—	—	—
	5 mg/kg	—	54.7	112	92.1	118
Lead	5 mg/kg	—	55.5	105	88.1	111
	5 mg/kg	<5	—	—	—	—

Release

Client : GOLDER ASSOCIATES
Project : 077683504 Contamination

Work Order : EB0709322
ALS Quote Reference : EN/002/05

Page Number : 10 of 18
Issue Date : 30 Aug 2007



Matrix Type: SOIL

Method Blank (MB) and Laboratory Control Samples (LCS) Report

		Method blank result	Actual Results		Recovery Limits	
Analyte name	LOR		Spike concentration	Spike Recovery LCS	Dynamic Recovery Limits	
					Low	High
EG005T: Total Metals by ICP-AES - continued						
EG005T: Total Metals by ICP-AES - (QC Lot: 478222) - continued		mg/kg	mg/kg	%	%	%
Nickel	2 mg/kg	<2	—	—	—	—
	2 mg/kg	—	55.1	111	91.1	117
Zinc	5 mg/kg	—	105	108	88.1	116
	5 mg/kg	<5	—	—	—	—
EG005T: Total Metals by ICP-AES - (QC Lot: 478269)		mg/kg	mg/kg	%	%	%
Arsenic	5 mg/kg	<5	—	—	—	—
	5 mg/kg	—	13.8	100	82.9	116
Cadmium	1 mg/kg	—	2.82	103	81.8	112
	1 mg/kg	<1	—	—	—	—
Chromium	2 mg/kg	<2	—	—	—	—
	2 mg/kg	—	61.6	101	91.2	115
Copper	5 mg/kg	<5	—	—	—	—
	5 mg/kg	—	54.7	104	92.1	118
Lead	5 mg/kg	—	55.5	95.4	88.1	111
	5 mg/kg	<5	—	—	—	—
Nickel	2 mg/kg	<2	—	—	—	—
	2 mg/kg	—	55.1	102	91.1	117
Zinc	5 mg/kg	<5	—	—	—	—
	5 mg/kg	—	105	97.6	88.1	116
EG005T: Total Metals by ICP-AES - (QC Lot: 478271)		mg/kg	mg/kg	%	%	%
Arsenic	5 mg/kg	<5	—	—	—	—
	5 mg/kg	—	13.8	106	82.9	116
Cadmium	1 mg/kg	—	2.82	106	81.8	112
	1 mg/kg	<1	—	—	—	—
Chromium	2 mg/kg	<2	—	—	—	—
	2 mg/kg	—	61.6	104	91.2	115
Copper	5 mg/kg	<5	—	—	—	—
	5 mg/kg	—	54.7	105	92.1	118
Lead	5 mg/kg	—	55.5	98.8	88.1	111
	5 mg/kg	<5	—	—	—	—

Released

Client : GOLDER ASSOCIATES
Project : 077683504 Contamination

Work Order : EB0709322
ALS Quote Reference : EN002/05

Page Number : 11 of 18
Issue Date : 30 Aug 2007



Matrix Type: SOIL

Method Blank (MB) and Laboratory Control Samples (LCS) Report

		Method blank result	Actual Results		Recovery Limits	
Analyte name	LOR		Spike concentration	Spike Recovery LCS	Dynamic Recovery Limits	
					Low	High
EG005T: Total Metals by ICP-AES - continued						
EG005T: Total Metals by ICP-AES - (QC Lot: 478271) - continued		mg/kg	mg/kg	%	%	%
Nickel	2 mg/kg	<2	—	—	—	—
	2 mg/kg	—	55.1	105	91.1	117
Zinc	5 mg/kg	<5	—	—	—	—
	5 mg/kg	—	105	102	88.1	116
EG005T: Total Metals by ICP-AES - (QC Lot: 478275)		mg/kg	mg/kg	%	%	%
Arsenic	5 mg/kg	—	13.8	100	82.9	116
	5 mg/kg	<5	—	—	—	—
Cadmium	1 mg/kg	<1	—	—	—	—
	1 mg/kg	—	2.82	111	81.8	112
Chromium	2 mg/kg	—	61.6	105	91.2	115
	2 mg/kg	<2	—	—	—	—
Copper	5 mg/kg	—	54.7	108	92.1	118
	5 mg/kg	<5	—	—	—	—
Lead	5 mg/kg	<5	—	—	—	—
	5 mg/kg	—	55.5	98.9	88.1	111
Nickel	2 mg/kg	—	55.1	106	91.1	117
	2 mg/kg	<2	—	—	—	—
Zinc	5 mg/kg	—	105	101	88.1	116
	5 mg/kg	<5	—	—	—	—
EG005T: Total Metals by ICP-AES - (QC Lot: 478277)		mg/kg	mg/kg	%	%	%
Arsenic	5 mg/kg	—	13.8	101	82.9	116
	5 mg/kg	<5	—	—	—	—
Cadmium	1 mg/kg	<1	—	—	—	—
	1 mg/kg	—	2.82	110	81.8	112
Chromium	2 mg/kg	—	61.6	104	91.2	115
	2 mg/kg	<2	—	—	—	—
Copper	5 mg/kg	—	54.7	105	92.1	118
	5 mg/kg	<5	—	—	—	—
Lead	5 mg/kg	<5	—	—	—	—
	5 mg/kg	—	55.5	97.8	88.1	111

Released

Release

Client : GOLDER ASSOCIATES
Project : 077683504 Contamination

Work Order : EB0709322
ALS Quote Reference : EN/002/05

Page Number : 12 of 18
Issue Date : 30 Aug 2007



Matrix Type: SOIL

Method Blank (MB) and Laboratory Control Samples (LCS) Report

Matrix type: SOIL		Method blank result	Actual Results		Recovery Limits	
Analyte name	LOR		Spike concentration	Spike Recovery	Dynamic Recovery Limits	
					Low	High
EG005T: Total Metals by ICP-AES - continued						
EG005T: Total Metals by ICP-AES - (QC Lot: 478277) - continued		mg/kg	mg/kg	%	%	%
Nickel	2 mg/kg	—	55.1	104	91.1	117
	2 mg/kg	<2	—	—	—	—
Zinc	5 mg/kg	—	105	103	88.1	116
	5 mg/kg	<5	—	—	—	—
EG005T: Total Metals by ICP-AES - (QC Lot: 478367)		mg/kg	mg/kg	%	%	%
Arsenic	5 mg/kg	—	13.8	98.1	82.9	116
	5 mg/kg	<5	—	—	—	—
Cadmium	1 mg/kg	<1	—	—	—	—
	1 mg/kg	—	2.82	101	81.8	112
Chromium	2 mg/kg	—	61.6	105	91.2	115
	2 mg/kg	<2	—	—	—	—
Copper	5 mg/kg	—	54.7	106	92.1	118
	5 mg/kg	<5	—	—	—	—
Lead	5 mg/kg	<5	—	—	—	—
	5 mg/kg	—	55.5	99.3	88.1	111
Nickel	2 mg/kg	—	55.1	104	91.1	117
	2 mg/kg	<2	—	—	—	—
Zinc	5 mg/kg	—	105	103	88.1	116
	5 mg/kg	<5	—	—	—	—
EG005T: Total Metals by ICP-AES - (QC Lot: 478369)		mg/kg	mg/kg	%	%	%
Arsenic	5 mg/kg	—	13.8	101	82.9	116
	5 mg/kg	<5	—	—	—	—
Cadmium	1 mg/kg	<1	—	—	—	—
	1 mg/kg	—	2.82	108	81.8	112
Chromium	2 mg/kg	<2	—	—	—	—
	2 mg/kg	—	61.6	108	91.2	115
Copper	5 mg/kg	—	54.7	111	92.1	118
	5 mg/kg	<5	—	—	—	—
Lead	5 mg/kg	<5	—	—	—	—
	5 mg/kg	—	55.5	105	88.1	111

Released

Client : GOLDER ASSOCIATES
Project : 077683504 Contamination

Work Order : EB0709322
ALS Quote Reference : EN/002/05

Page Number : 13 of 18
Issue Date : 30 Aug 2007



Matrix Type: SOIL

Method Blank (MB) and Laboratory Control Samples (LCS) Report

		Method blank result	Actual Results		Recovery Limits	
Analyte name	LOR		Spike concentration	Spike Recovery LCS	Dynamic Recovery Limits	
					Low	High
EG005T: Total Metals by ICP-AES - continued						
EG005T: Total Metals by ICP-AES - (QC Lot: 478369) - continued		mg/kg	mg/kg	%	%	%
Nickel	2 mg/kg	—	55.1	111	91.1	117
	2 mg/kg	<2	—	—	—	—
Zinc	5 mg/kg	—	105	110	88.1	116
	5 mg/kg	<5	—	—	—	—
EG005T: Total Metals by ICP-AES - (QC Lot: 478774)		mg/kg	mg/kg	%	%	%
Arsenic	5 mg/kg	<5	—	—	—	—
	5 mg/kg	—	13.8	100	82.9	116
Cadmium	1 mg/kg	—	2.82	104	81.8	112
	1 mg/kg	<1	—	—	—	—
Chromium	2 mg/kg	<2	—	—	—	—
	2 mg/kg	—	61.6	108	91.2	115
Copper	5 mg/kg	<5	—	—	—	—
	5 mg/kg	—	54.7	109	92.1	118
Lead	5 mg/kg	—	55.5	104	88.1	111
	5 mg/kg	<5	—	—	—	—
Nickel	2 mg/kg	<2	—	—	—	—
	2 mg/kg	—	55.1	109	91.1	117
Zinc	5 mg/kg	—	105	106	88.1	116
	5 mg/kg	<5	—	—	—	—
EG035T: Total Mercury by FIMS						
EG035T: Total Mercury by FIMS - (QC Lot: 478221)		mg/kg	mg/kg	%	%	%
Mercury	0.1 mg/kg	<0.1	—	—	—	—
	0.10 mg/kg	—	1.34	114	70	129
EG035T: Total Mercury by FIMS - (QC Lot: 478223)		mg/kg	mg/kg	%	%	%
Mercury	0.10 mg/kg	—	1.34	115	70	129
	0.1 mg/kg	<0.1	—	—	—	—
EG035T: Total Mercury by FIMS - (QC Lot: 478270)		mg/kg	mg/kg	%	%	%
Mercury	0.10 mg/kg	—	1.34	116	70	129
	0.1 mg/kg	<0.1	—	—	—	—

Released

Client : GOLDER ASSOCIATES
Project : 077683504 Contamination

Work Order : EB0709322
ALS Quote Reference : EN/002/05

Page Number : 14 of 18
Issue Date : 30 Aug 2007



Matrix Type: SOIL

Method Blank (MB) and Laboratory Control Samples (LCS) Report

Analyte name	LOR	Method blank result	Actual Results		Recovery Limits	
			Spike concentration	Spike Recovery	Dynamic Recovery Limits	
					Low	High
EG035T: Total Mercury by FIMS - continued						
EG035T: Total Mercury by FIMS - (QC Lot: 478272)		mg/kg	mg/kg	%	%	%
Mercury	0.1 mg/kg	<0.1	—	—	—	—
	0.10 mg/kg	—	1.34	124	70	129
EG035T: Total Mercury by FIMS - (QC Lot: 478276)		mg/kg	mg/kg	%	%	%
Mercury	0.1 mg/kg	<0.1	—	—	—	—
	0.10 mg/kg	—	1.34	115	70	129
EG035T: Total Mercury by FIMS - (QC Lot: 478278)		mg/kg	mg/kg	%	%	%
Mercury	0.1 mg/kg	<0.1	—	—	—	—
	0.10 mg/kg	—	1.34	110	70	129
EG035T: Total Mercury by FIMS - (QC Lot: 478368)		mg/kg	mg/kg	%	%	%
Mercury	0.10 mg/kg	—	1.34	114	70	129
	0.1 mg/kg	<0.1	—	—	—	—
EG035T: Total Mercury by FIMS - (QC Lot: 478370)		mg/kg	mg/kg	%	%	%
Mercury	0.10 mg/kg	—	1.34	111	70	129
	0.1 mg/kg	<0.1	—	—	—	—
EG035T: Total Mercury by FIMS - (QC Lot: 478775)		mg/kg	mg/kg	%	%	%
Mercury	0.1 mg/kg	<0.1	—	—	—	—
	0.10 mg/kg	—	1.34	109	70	129

Release

Client : GOLDER ASSOCIATES
Project : 077683504 Contamination

Work Order : EB0709322
ALS Quote Reference : EN/002/05

Page Number : 15 of 18
Issue Date : 30 Aug 2007



Quality Control Report - Matrix Spikes (MS)

The quality control term **Matrix Spike (MS)** refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC type is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQO's). 'Ideal' recovery ranges stated may be waived in the event of sample matrix interferences. - Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot. Abbreviations: **LOR** = Limit of Reporting, **RPD** = Relative Percent Difference.

* Indicates failed QC

Matrix Type: SOIL

Matrix Spike (MS) Report

					Actual Results		Recovery Limits	
Analyte name	Laboratory Sample ID	Client Sample ID	LOR	Spike Concentration	Sample Result	Spike Recovery	Static Limits	
						MS	Low	High
EG005T: Total Metals by ICP-AES								
EG005T: Total Metals by ICP-AES - (QC Lot: 478220)				mg/kg	mg/kg	%	%	%
Arsenic	EB0709322-004	S2 - 0.1	5 mg/kg	50	<5	104	70	130
Cadmium			1 mg/kg	25	<1	105	70	130
Chromium			2 mg/kg	50	<2	108	70	130
Copper			5 mg/kg	50	<5	110	70	130
Lead			5 mg/kg	50	<5	105	70	130
Nickel			2 mg/kg	50	<2	104	70	130
Zinc			5 mg/kg	50	8	109	70	130
EG005T: Total Metals by ICP-AES - (QC Lot: 478222)				mg/kg	mg/kg	%	%	%
Arsenic	EB0709322-036	S11 - 0.1	5 mg/kg	50	13	94.8	70	130
Cadmium			1 mg/kg	25	<1	99.5	70	130
Chromium			2 mg/kg	50	16	93.2	70	130
Copper			5 mg/kg	50	10	109	70	130
Lead			5 mg/kg	50	10	98.4	70	130
Nickel			2 mg/kg	50	27	101	70	130
Zinc			5 mg/kg	50	16	101	70	130
EG005T: Total Metals by ICP-AES - (QC Lot: 478269)				mg/kg	mg/kg	%	%	%
Arsenic	EB0709322-065	S21 - 2	5 mg/kg	50	19	83.7	70	130
Cadmium			1 mg/kg	25	<1	98.9	70	130
Chromium			2 mg/kg	50	8	113	70	130
Copper			5 mg/kg	50	<5	110	70	130
Lead			5 mg/kg	50	12	98.1	70	130
Nickel			2 mg/kg	50	5	113	70	130
Zinc			5 mg/kg	50	8	109	70	130
EG005T: Total Metals by ICP-AES - (QC Lot: 478271)				mg/kg	mg/kg	%	%	%
Arsenic	EB0709322-094	S30 - 1	5 mg/kg	50	<5	97.3	70	130

Client : GOLDER ASSOCIATES
Project : 077683504 Contamination

Work Order : EB0709322
ALS Quote Reference : EN/002/05

Page Number : 16 of 18
Issue Date : 30 Aug 2007



Matrix Type: SOIL

Matrix Spike (MS) Report

					Actual Results		Recovery Limits	
Analyte name	Laboratory Sample ID	Client Sample ID	LOR	Spike Concentration	Sample Result	Spike Recovery	Static Limits	
						MS	Low	High
EG005T: Total Metals by ICP-AES - continued								
EG005T: Total Metals by ICP-AES - (QC Lot: 478271) - continued				mg/kg	mg/kg	%	%	%
Cadmium	EB0709322-094	S30 - 1	1 mg/kg	25	<1	103	70	130
Chromium			2 mg/kg	50	8	104	70	130
Copper			5 mg/kg	50	<5	105	70	130
Lead			5 mg/kg	50	<5	102	70	130
Nickel			2 mg/kg	50	3	103	70	130
Zinc			5 mg/kg	50	<5	106	70	130
EG005T: Total Metals by ICP-AES - (QC Lot: 478275)				mg/kg	mg/kg	%	%	%
Arsenic	EB0709322-122	S38 - 0.1	5 mg/kg	50	<5	102	70	130
Cadmium			1 mg/kg	25	<1	101	70	130
Chromium			2 mg/kg	50	10	97.3	70	130
Copper			5 mg/kg	50	8	109	70	130
Lead			5 mg/kg	50	7	103	70	130
Nickel			2 mg/kg	50	23	86.5	70	130
Zinc			5 mg/kg	50	18	96.0	70	130
EG005T: Total Metals by ICP-AES - (QC Lot: 478277)				mg/kg	mg/kg	%	%	%
Arsenic	EB0709322-148	S43 - 4	5 mg/kg	50	<5	99.8	70	130
Cadmium			1 mg/kg	25	<1	106	70	130
Chromium			2 mg/kg	50	6	107	70	130
Copper			5 mg/kg	50	<5	112	70	130
Lead			5 mg/kg	50	<5	105	70	130
Nickel			2 mg/kg	50	4	106	70	130
Zinc			5 mg/kg	50	<5	109	70	130
EG005T: Total Metals by ICP-AES - (QC Lot: 478367)				mg/kg	mg/kg	%	%	%
Arsenic	EB0709322-173	S47 - 5	5 mg/kg	50	35	94.3	70	130
Cadmium			1 mg/kg	25	<1	100	70	130
Chromium			2 mg/kg	50	7	102	70	130
Copper			5 mg/kg	50	21	103	70	130
Lead			5 mg/kg	50	20	101	70	130
Nickel			2 mg/kg	50	22	93.9	70	130

Client : GOLDER ASSOCIATES
Project : 077683504 Contamination

Work Order : EB0709322
ALS Quote Reference : EN/002/05

Page Number : 17 of 18
Issue Date : 30 Aug 2007



Matrix Type: SOIL

Matrix Spike (MS) Report

					Actual Results		Recovery Limits	
Analyte name	Laboratory Sample ID	Client Sample ID	LOR	Spike Concentration	Sample Result	Spike Recovery	Static Limits	
						MS	Low	High
EG005T: Total Metals by ICP-AES - continued								
EG005T: Total Metals by ICP-AES - (QC Lot: 478367) - continued				mg/kg	mg/kg	%	%	%
Zinc	EB0709322-173	S47 - 5	5 mg/kg	50	29	96.1	70	130
EG005T: Total Metals by ICP-AES - (QC Lot: 478369)				mg/kg	mg/kg	%	%	%
Arsenic	EB0709322-200	S53 - 1	5 mg/kg	50	<5	97.2	70	130
Cadmium			1 mg/kg	25	<1	105	70	130
Chromium			2 mg/kg	50	6	104	70	130
Copper			5 mg/kg	50	<5	110	70	130
Lead			5 mg/kg	50	<5	104	70	130
Nickel			2 mg/kg	50	3	104	70	130
Zinc			5 mg/kg	50	<5	109	70	130
EG005T: Total Metals by ICP-AES - (QC Lot: 478774)				mg/kg	mg/kg	%	%	%
Arsenic	EB0709322-222	S59 - 2	5 mg/kg	50	7	105	70	130
Cadmium			1 mg/kg	25	<1	106	70	130
Chromium			2 mg/kg	50	4	106	70	130
Copper			5 mg/kg	50	<5	111	70	130
Lead			5 mg/kg	50	<5	105	70	130
Nickel			2 mg/kg	50	2	108	70	130
Zinc			5 mg/kg	50	11	114	70	130
EG035T: Total Mercury by FIMS								
EG035T: Total Mercury by FIMS - (QC Lot: 478221)				mg/kg	mg/kg	%	%	%
Mercury	EB0709322-004	S2 - 0.1	0.1 mg/kg	5.0	<0.1	108	70	130
EG035T: Total Mercury by FIMS - (QC Lot: 478223)				mg/kg	mg/kg	%	%	%
Mercury	EB0709322-036	S11 - 0.1	0.1 mg/kg	5.0	<0.1	111	70	130
EG035T: Total Mercury by FIMS - (QC Lot: 478270)				mg/kg	mg/kg	%	%	%
Mercury	EB0709322-065	S21 - 2	0.1 mg/kg	5.0	<0.1	109	70	130
EG035T: Total Mercury by FIMS - (QC Lot: 478272)				mg/kg	mg/kg	%	%	%
Mercury	EB0709322-094	S30 - 1	0.1 mg/kg	5.0	0.2	102	70	130
EG035T: Total Mercury by FIMS - (QC Lot: 478276)				mg/kg	mg/kg	%	%	%
Mercury	EB0709322-122	S38 - 0.1	0.1 mg/kg	5.0	<0.1	98.2	70	130

Release

Client : GOLDER ASSOCIATES
Project : 077683504 Contamination

Work Order : EB0709322
ALS Quote Reference : EN/002/05

Page Number : 18 of 18
Issue Date : 30 Aug 2007



Matrix Type: SOIL

Matrix Spike (MS) Report

					Actual Results		Recovery Limits	
Analyte name	Laboratory Sample ID	Client Sample ID	LOR	Spike Concentration	Sample Result	Spike Recovery	Static Limits	
						MS	Low	High
EG035T: Total Mercury by FIMS - continued								
EG035T: Total Mercury by FIMS - (QC Lot: 478278)				mg/kg	mg/kg	%	%	%
Mercury	EB0709322-148	S43 - 4	0.1 mg/kg	5.0	<0.1	97.1	70	130
EG035T: Total Mercury by FIMS - (QC Lot: 478368)				mg/kg	mg/kg	%	%	%
Mercury	EB0709322-173	S47 - 5	0.1 mg/kg	5.0	<0.1	112	70	130
EG035T: Total Mercury by FIMS - (QC Lot: 478370)				mg/kg	mg/kg	%	%	%
Mercury	EB0709322-200	S53 - 1	0.1 mg/kg	5.0	0.2	112	70	130
EG035T: Total Mercury by FIMS - (QC Lot: 478775)				mg/kg	mg/kg	%	%	%
Mercury	EB0709322-222	S59 - 2	0.1 mg/kg	5.0	<0.1	105	70	130



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32 SHAND STREET STAFFORD QLD 4053

GOLDER ASSOCIATES PTY LTD

Unit 1, Dulwich Centre

Manly Road

Manly NSW 1505

Phone (02) 94433511

Fax (02) 94434443

Order No. 140 4569 Project No. 07183304
Project: Construction
C.O.C. No. 072681504/2 Quotation No. EN000205
Sampled By: CK Contact Name: CTPI 49
Email Report to: CTPI@stl.com.au
Prior Storage: NO

SAMPLE ID	Sample Depth (m)	Media	No. of 250 ml Jars	SAMPLE DATE	Tested	Q	Lab
1-51	0.1	soil	1	17/01/2007	✓	✓	✓
2-51	1	soil	1	17/01/2007	✓	✓	✓
3-51	2	soil	1	17/01/2007	✓	✓	✓
4-52	0.1	soil	1	17/01/2007	✓	✓	✓
5-52	1	soil	1	17/01/2007	✓	✓	✓
6-52	2	soil	1	17/01/2007	✓	✓	✓
7-52	3	soil	1	17/01/2007	✓	✓	✓
8-53	0.1	soil	1	17/01/2007	✓	✓	✓
9-53	1	soil	1	17/01/2007	✓	✓	✓
10-53	2	soil	1	17/01/2007	✓	✓	✓
11-54	0.1	soil	1	17/01/2007	✓	✓	✓
12-54	1	soil	1	17/01/2007	✓	✓	✓
13-54	2	soil	1	17/01/2007	✓	✓	✓
14-54	3	soil	1	17/01/2007	✓	✓	✓
15-55	0.1	soil	1	17/01/2007	✓	✓	✓
16-55	1	soil	1	17/01/2007	✓	✓	✓
17-55	2	soil	1	17/01/2007	✓	✓	✓
18-55	3	soil	1	17/01/2007	✓	✓	✓
19-56	0.1	soil	1	17/01/2007	✓	✓	✓
20-56	1	soil	1	17/01/2007	✓	✓	✓
21-56	2	soil	1	17/01/2007	✓	✓	✓
22-56	3	soil	1	17/01/2007	✓	✓	✓
23-57	0.1	soil	1	17/01/2007	✓	✓	✓
24-57	1	soil	1	17/01/2007	✓	✓	✓
25-57	2	soil	1	17/01/2007	✓	✓	✓
26-57	3	soil	1	17/01/2007	✓	✓	✓
27-58	0.1	soil	1	17/01/2007	✓	✓	✓
28-58	1	soil	1	17/01/2007	✓	✓	✓
29-58	2	soil	1	17/01/2007	✓	✓	✓
30-58	3	soil	1	17/01/2007	✓	✓	✓
31-59	0.1	soil	1	17/01/2007	✓	✓	✓
32-59	1	soil	1	17/01/2007	✓	✓	✓
33-59	2	soil	1	17/01/2007	✓	✓	✓
34-59	3	soil	1	17/01/2007	✓	✓	✓
35-60	0.1	soil	1	17/01/2007	✓	✓	✓
36-60	1	soil	1	17/01/2007	✓	✓	✓
37-60	2	soil	1	17/01/2007	✓	✓	✓
38-60	3	soil	1	17/01/2007	✓	✓	✓
39-61	0.1	soil	1	17/01/2007	✓	✓	✓
40-61	1	soil	1	17/01/2007	✓	✓	✓
41-61	2	soil	1	17/01/2007	✓	✓	✓
42-61	3	soil	1	17/01/2007	✓	✓	✓
43-62	0.1	soil	1	17/01/2007	✓	✓	✓
44-62	1	soil	1	17/01/2007	✓	✓	✓
45-62	2	soil	1	17/01/2007	✓	✓	✓
46-62	3	soil	1	17/01/2007	✓	✓	✓
47-63	0.1	soil	1	17/01/2007	✓	✓	✓
48-63	1	soil	1	17/01/2007	✓	✓	✓
49-63	2	soil	1	17/01/2007	✓	✓	✓
50-63	3	soil	1	17/01/2007	✓	✓	✓
51-64	0.1	soil	1	17/01/2007	✓	✓	✓
52-64	1	soil	1	17/01/2007	✓	✓	✓
53-64	2	soil	1	17/01/2007	✓	✓	✓
54-64	3	soil	1	17/01/2007	✓	✓	✓
55-65	0.1	soil	1	17/01/2007	✓	✓	✓
56-65	1	soil	1	17/01/2007	✓	✓	✓
57-65	2	soil	1	17/01/2007	✓	✓	✓
58-65	3	soil	1	17/01/2007	✓	✓	✓
59-66	0.1	soil	1	17/01/2007	✓	✓	✓
60-66	1	soil	1	17/01/2007	✓	✓	✓
61-66	2	soil	1	17/01/2007	✓	✓	✓
62-66	3	soil	1	17/01/2007	✓	✓	✓
63-67	0.1	soil	1	17/01/2007	✓	✓	✓
64-67	1	soil	1	17/01/2007	✓	✓	✓
65-67	2	soil	1	17/01/2007	✓	✓	✓
66-67	3	soil	1	17/01/2007	✓	✓	✓
67-68	0.1	soil	1	17/01/2007	✓	✓	✓
68-68	1	soil	1	17/01/2007	✓	✓	✓
69-68	2	soil	1	17/01/2007	✓	✓	✓
70-68	3	soil	1	17/01/2007	✓	✓	✓

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6909-C

Environmental Division
Brisbane

MF. Work Order

EB0709322



Telephone : + 61-7-3243 7222

Keywords:

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ALS

11 HAND STREET STAFFORD Q11 4QS

GOLDER ASSOCIATES PTY LTD

Unit 1: Defense Control

Булганов Р.С.

Manufacturers DM 4552

Phone #1: (972) 944-3351

Tel.: (07) 54-6364-65

72 : (17) 549,663

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GOLDER ASSOCIATES PTY LTD

Unit 1 Defense Centre

Keywords

Universität Bonn 53115

Phone: 813.972.5411 x111

1000 3641661

1000

SAMPLE ID	Sample Depth (m)	Station	No. of 150 ml Jars	SAMPLE DATE	W	S	Active
S22 1.2	0.1	208	1	18/07/2007	✓		
S29 1.2	1	208	1	18/07/2007	✓	✓	
S29 1.2	2	208	1	18/07/2007	✓	✓	
S29 1.2	3	208	1	18/07/2007	✓	✓	
S22 1.2	4	208	1	18/07/2007	✓	✓	
S40 1.2	0.1	208	1	18/07/2007	✓	✓	
S40 1.2	1	208	1	18/07/2007	✓	✓	
S40 1.2	2	208	1	18/07/2007	✓	✓	
S40 1.2	3	208	1	18/07/2007	✓	✓	
S41 1.2	0.1	208	1	18/07/2007	✓	✓	
S41 1.2	1	208	1	18/07/2007	✓	✓	
S41 1.2	2	208	1	18/07/2007	✓	✓	
S47 1.2	0.1	208	1	18/07/2007	✓	✓	
S42 1.2	1	208	1	18/07/2007	✓	✓	
S42 1.2	2	208	1	18/07/2007	✓	✓	
S42 1.2	3	208	1	18/07/2007	✓	✓	
S42 1.2	4	208	1	18/07/2007	✓	✓	
S43 1.2	0.1	208	1	18/07/2007	✓	✓	
S43 1.2	1	208	1	18/07/2007	✓	✓	
S43 1.2	2	208	1	18/07/2007	✓	✓	
S43 1.2	3	208	1	18/07/2007	✓	✓	
S43 1.2	4	208	1	18/07/2007	✓	✓	
S43 1.2	5	208	1	18/07/2007	✓	✓	
S44 1.2	0.1	208	1	18/07/2007	✓	✓	
S44 1.2	1	208	1	18/07/2007	✓	✓	
S44 1.2	2	208	1	18/07/2007	✓	✓	
S44 1.2	3	208	1	18/07/2007	✓	✓	
S44 1.2	4	208	1	18/07/2007	✓	✓	
S44 1.2	5	208	1	18/07/2007	✓	✓	
S45 1.2	0.1	208	1	18/07/2007	✓	✓	
S45 1.2	0	208	1	18/07/2007	✓	✓	
S45 1.2	1	208	1	18/07/2007	✓	✓	
S45 1.2	2	208	1	18/07/2007	✓	✓	
S45 1.2	3	208	1	18/07/2007	✓	✓	
S45 1.2	4	208	1	18/07/2007	✓	✓	
S45 1.2	5	208	1	18/07/2007	✓	✓	
S46 1.2	0.1	208	1	18/07/2007	✓	✓	
S46 1.2	1	208	1	18/07/2007	✓	✓	
S46 1.2	2	208	1	18/07/2007	✓	✓	
S46 1.2	3	208	1	18/07/2007	✓	✓	
S46 1.2	4	208	1	18/07/2007	✓	✓	
S46 1.2	5	208	1	18/07/2007	✓	✓	
S47 1.2	0.1	208	1	18/07/2007	✓	✓	
S47 1.2	1	208	1	18/07/2007	✓	✓	
S47 1.2	2	208	1	18/07/2007	✓	✓	
S47 1.2	3	208	1	18/07/2007	✓	✓	
S47 1.2	4	208	1	18/07/2007	✓	✓	
S47 1.2	5	208	1	18/07/2007	✓	✓	
S47 1.2	6	208	1	18/07/2007	✓	✓	
S47 1.2	7	208	1	18/07/2007	✓	✓	
S47 1.2	8	208	1	18/07/2007	✓	✓	
S47 1.2	9	208	1	18/07/2007	✓	✓	
S47 1.2	10	208	1	18/07/2007	✓	✓	
S47 1.2	11	208	1	18/07/2007	✓	✓	
S47 1.2	12	208	1	18/07/2007	✓	✓	
S47 1.2	13	208	1	18/07/2007	✓	✓	
S47 1.2	14	208	1	18/07/2007	✓	✓	
S47 1.2	15	208	1	18/07/2007	✓	✓	
S47 1.2	16	208	1	18/07/2007	✓	✓	
S47 1.2	17	208					

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33 SLAND STREET STAFFORD QLD 4053

GOLDER ASSOCIATES PTY LTD

Unit 8 Dulwich Centre

Kingsgrove Place

Maroonbyrne QLD 4058

Phone: (07) 54435511

Fax: (07) 54436645

Order No.: MO 4507 Project No.: 01783524
Project: Contamination
C.O.C. No.: 0768350471 Quotation No.: RN/002/05
Sampled By: CK Client Name: CTPI 49
Email Report to: CTPI@alor.com.au
Prior Storage: USKY

SAMPLE ID	Sample Depth (m)	Media	No. of 150 ml Jars	SAMPLE DATE	Test	Q	Adverse
S13 14.6	0.1	soil	1	20/07/2007	✓		
S12 14.7	1	soil	1	20/07/2007	✓		
S12 14.8	9	soil	1	20/07/2007	✓		
S13 14.9	0.1	soil	1	20/07/2007	✓		
S13 15.0	1	soil	1	20/07/2007	✓		
S12 15.1	2	soil	1	20/07/2007	✓		
S14 15.2	0.1	soil	1	20/07/2007	✓		
S14 15.3	1	soil	1	20/07/2007	✓		
S15 15.4	0.1	soil	1	20/07/2007	✓		
S15 15.5	1	soil	1	20/07/2007	✓		
S15 15.6	2	soil	1	20/07/2007	✓		
S14 15.7	0.1	soil	1	20/07/2007	✓		
S14 15.8	0	soil	1	20/07/2007	✓		
S14 15.9	2	soil	1	20/07/2007	✓		
S14 16.0	3	soil	1	20/07/2007	✓		
S17 16.1	0.1	soil	1	20/07/2007	✓		
S17 16.2	1	soil	1	20/07/2007	✓		
S17 16.3	2	soil	1	20/07/2007	✓		
S17 16.4	3	soil	1	20/07/2007	✓		
S18 16.5	0.1	soil	1	20/07/2007	✓		
S18 16.6	1	soil	1	20/07/2007	✓		
S18 16.7	2	soil	1	20/07/2007	✓		
S18 16.8	3	soil	1	20/07/2007	✓		
S19 16.9	4	soil	1	20/07/2007	✓		
S19 17.0	8.1	soil	1	20/07/2007	✓		
S19 17.1	1	soil	1	20/07/2007	✓		
S19 17.2	2	soil	1	20/07/2007	✓		
S19 17.3	3	soil	1	20/07/2007	✓		
S19 17.4	8.1	soil	1	20/07/2007	✓		
S19 17.5	0	soil	1	20/07/2007	✓		
S19 17.6	1	soil	1	20/07/2007	✓		
S19 17.7	2	soil	1	20/07/2007	✓		
S19 17.8	3	soil	1	20/07/2007	✓		

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Parsons
Brinckerhoff
Australia
Pty Limited
Level 12, 348 Edward Street
Brisbane QLD 4000
GPO Box 2907
Brisbane QLD 4001
Telephone +61 7 3218 2222
Facsimile +61 7 3831 4223
Email brisbane@pb.com.au

ABN 80 078 004 788
NCSI Certified Quality System ISO 9001

Certificate of Analysis

CLIENT: ALS
CLIENT ADDRESS: PO Box 66 Everton Park. Qld.
TELEPHONE: 3243 7222
FAX: 3243 7259
CONTACT: CTPI 49-Sch4
LOCATION: EB0709322
SAMPLED BY: As Received
TEST METHOD:

CERTIFICATE NO 2139079B-3484
DATE SAMPLED: n/a
DATE RECEIVED: 23/08/2007
DATE ANALYSED: 28/08/2007

Qualitative Identification of asbestos types in bulk samples at Parsons Brinckerhoff Queensland Laboratory by polarised light microscopy, including dispersion staining techniques using Parsons Brinckerhoff in-house method No.1 and N.A.T.A accreditation No.8607. This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC:17025.

Lab Number	Sample Id	Sample Description	Sample Dimensions cm	Identification Type
M001	S1 0.1	Soil	N/A	NAD
M002	S1 1	Soil	N/A	NAD
M003	S2 1	Soil	N/A	NAD
M004	S2 2	Soil	N/A	NAD
M005	S5 1	Soil	N/A	NAD
M006	S11 1	Soil	N/A	NAD
M007	S15 1	Soil	N/A	NAD
M008	S21 1	Soil	N/A	NAD
M009	S37 1	Soil	N/A	NAD

LEGEND

NAD - No Asbestos Detected
CH - Chrysotile Asbestos Detected
A - Amosite Asbestos Detected
C - Crocidolite Asbestos Detected
UMF - Unknown Mineral Fibres Detected



ACCREDITED FOR
TECHNICAL
COMPETENCE

Notes:

If no asbestos is detected in vinyl tiles, mastics, sealants, epoxy resins and ore samples then confirmation by another independent analytical technique is advised due to the nature of the samples.

The results contained within this report relate only to the sample(s) submitted for testing. PB accepts no responsibility for the initial collection, packaging or transportation of samples submitted by external persons. NATA does not accredit sampling. This document may not be reproduced except in full.

**Over a Century of
Engineering Excellence**

Approved Identifier

Name: CTPI 49-Sch4

Signature: CTPI 49-Sch4

Approved Sign

Name: CTPI 49-Sch4

Signature

AUTHORISATION DATE

28/08/2007

Page 1 of 2



Persons Level 12, 348 Edward Street
Brinckerhoff Brisbane QLD 4000
Australia GPO Box 2907
Pty Limited Brisbane QLD 4001
Telephone +61 7 3218 2222
Facsimile +61 7 3831 4223
Email brisbane@pb.com.au

ABN 80 078 004 798
NCSI Certified Quality System ISO 9001

Certificate of Analysis

Certificate: ALS

Certificate NO: 2139079B-3484

LOCATION: EB0709322

<u>Lab Number</u>	<u>Sample Id</u>	<u>Sample Description</u>	<u>Sample Dimensions cm</u>	<u>Identification Type</u>
M010	S42 1	Soil	N/A	NAD
M011	S42 2	Soil	N/A	NAD
M012	S46 1	Soil	N/A	NAD
M013	S48 1	Soil	N/A	NAD
M014	S48 3	Soil	N/A	NAD

LEGEND

NAD - No Asbestos Detected
CH - Chrysotile Asbestos Detected
A - Amosite Asbestos Detected
C - Crocidolite Asbestos Detected
UMF - Unknown Mineral Fibres Detected



ACCREDITED FOR
TECHNICAL
COMPETENCE

Notes:

If no asbestos is detected in vinyl tiles, mastics, sealants, epoxy resins and ore samples then confirmation by another independent analytical technique is advised due to the nature of the samples.

The results contained within this report relate only to the sample(s) submitted for testing. PB accepts no responsibility for the initial collection, packaging or transportation of samples submitted by external persons. NATA does not accredit sampling. This document may not be reproduced except in full.

**Over a Century of
Engineering Excellence**

Approved Identifier

Name: CTPI 49-Sch4
CTPI 49-Sch4

Signature

Approved Sig

Name: CTPI 49-Sch4

Signature

AUTHORISATION DATE

28/08/2007

Page 2 of 2



ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive report

Client Details

Client : **GOLDER ASSOCIATES**
Contact : **CTPI 49-Sch4**
Address : **P O BOX 5569 MAROOCHYDORE SOUTH
QLD AUSTRALIA 4558**

Project : **077683504 Contamination**
Order number : **MQ 4569**
C-O-C Number : **077683504tr2**
Site : **- Not provided -**
Sampler : **CK**

E-mail : **CTPI 49@golder.com.au**
Telephone : **5443 3511**
Facsimile : **5443 6645**

Laboratory Details

Laboratory : **Environmental Division Brisbane**
Manager : **CTPI 49-Sch4**
Address : **32 Shand Street Stafford QLD Australia 4053**

Quote number : **ES20050035**
Work order : **EB0709322**

E-mail : **Services.Brisbane@alsenviro.com**
Telephone : **+61-7-3243 7222**
Facsimile : **+61-7-3243 7218**

Dates

Date Samples Received : **20 Aug 2007** SRA Issue Date : **23 Aug 2007**
Scheduled Reporting Date : **30 Aug 2007** Client Requested Date : **30 Aug 2007**

Delivery Details

Mode of Delivery : **Samples on hand.** Temperature : **AMBIENT**
No. of coolers/boxes : **REBATCH** No. of samples - Received : **227**
Security Seal : **Intact.** - Analysed : **163**

Comments

- **Samples received in appropriately pretreated and preserved containers.**
 - **Sample(s) have been received within recommended holding times.**
 - **Asbestos analysis will be subcontracted to Parson's Brinckerhoff.**
-
- Please direct any turn around / technical queries to the laboratory contact designated above.
 - Sample Disposal - Aqueous (14 days), Solid (90 days) from date of completion of work order.
 - Please direct any queries related to sample condition / numbering / breakages to Maggie Kahi.
 - Analytical work for this work order will be conducted at ALSE Brisbane.
 - When the sampling time is not supplied on the COC documentation, ALSE defaults the sampling time to that of the COC 'relinquishment' time (if supplied). If this also is not supplied, ALSE defaults the sampling time to the 'time of receipt at Laboratory'.

Disclaimer : This document contains privileged and confidential information intended only for the use of the addressee. If you are not the addressee, you are hereby notified that you must not disseminate, copy or take action of its contents. If you have received this document in error, please notify ALS immediately.

SAMPLE RECEIPT NOTIFICATION (SRN) - continued

Client : GOLDER ASSOCIATES
Project : 077683504 Contamination

Work Order : EB0709322
ALS Quote Reference : ES20050035



Summary of Sample(s) / Container(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as moisture and preparation tasks, that form an implicit part of that package.

ALS Sample ID.	Client Sample ID - Sample Date	Requested Analysis									
		ASB-SOL - SOIL Asbestos - Count (Solid)	S-02 - SOIL 8 Metals (incl. Digestion)								
EB0709322-001	S1 - 0.1 - 17 Jul 2007	1									
EB0709322-002	S1 - 1 - 17 Jul 2007	1	1								
EB0709322-003	S1 - 2 - 17 Jul 2007										
EB0709322-004	S2 - 0.1 - 17 Jul 2007		1								
EB0709322-005	S2 - 1 - 17 Jul 2007	1	1								
EB0709322-006	S2 - 2 - 17 Jul 2007	1	1								
EB0709322-007	S2 - 3 - 17 Jul 2007		1								
EB0709322-008	S3 - 0.1 - 17 Jul 2007										
EB0709322-009	S3 - 1 - 17 Jul 2007		1								
EB0709322-010	S3 - 2 - 17 Jul 2007										
EB0709322-011	S4 - 0.1 - 17 Jul 2007		1								
EB0709322-012	S4 - 1 - 17 Jul 2007		1								
EB0709322-013	S4 - 2 - 17 Jul 2007		1								
EB0709322-014	S4 - 3 - 17 Jul 2007		1								
EB0709322-015	S5 - 0.1 - 17 Jul 2007										
EB0709322-016	S5 - 1 - 17 Jul 2007	1	1								
EB0709322-017	S5 - 2 - 17 Jul 2007										
EB0709322-018	S5 - 3 - 17 Jul 2007		1								
EB0709322-019	S6 - 0.1 - 17 Jul 2007										
EB0709322-020	S6 - 0.1Q - 17 Jul 2007										
EB0709322-021	S6 - 1 - 17 Jul 2007		1								
EB0709322-022	S7 - 0.1 - 17 Jul 2007		1								
EB0709322-023	S7 - 1 - 17 Jul 2007		1								
EB0709322-024	S7 - 2 - 17 Jul 2007		1								
EB0709322-025	S7 - 3 - 17 Jul 2007		1								
EB0709322-026	S8 - 0.1 - 17 Jul 2007										
EB0709322-027	S8 - 1 - 17 Jul 2007										
EB0709322-028	S8 - 2 - 17 Jul 2007										
EB0709322-029	S9 - 0.1 - 17 Jul 2007		1								
EB0709322-030	S9 - 1 - 17 Jul 2007		1								
EB0709322-031	S9 - 2 - 17 Jul 2007		1								
EB0709322-032	S10 - 0.1 - 17 Jul 2007										
EB0709322-033	S10 - Q - 17 Jul 2007										
EB0709322-034	S10 - 1 - 17 Jul 2007										
EB0709322-035	S10 - 2 - 17 Jul 2007		1								
EB0709322-036	S11 - 0.1 - 17 Jul 2007		1								
EB0709322-037	S11 - 1 - 17 Jul 2007	1	1								
EB0709322-038	S11 - 2 - 17 Jul 2007		1								
EB0709322-039	S12 - 0.1 - 17 Jul 2007										
EB0709322-040	S12 - 1 - 17 Jul 2007										
EB0709322-041	S13 - 0.1 - 17 Jul 2007		1								
EB0709322-042	S13 - 1 - 17 Jul 2007		1								
EB0709322-043	S13 - 2 - 17 Jul 2007		1								
EB0709322-044	S13 - 3 - 17 Jul 2007		1								
EB0709322-045	S15 - 0.1 - 17 Jul 2007										

Release

SAMPLE RECEIPT NOTIFICATION (SRN) - continued

Client : GOLDER ASSOCIATES
Project : 077683504 Contamination

Work Order : EB0709322
ALS Quote Reference : ES20050035



ALS Sample ID.	Client Sample ID - Sample Date	Requested Analysis									
		ASB-SOL - SOIL Asbestos - Count (Solid)	S-02 - SOIL 8 Metals (Incl. Digestion)								
EB0709322-046	S15 - 1 - 17 Jul 2007	1									
EB0709322-047	S15 - 2 - 17 Jul 2007		1								
EB0709322-048	S16 - 0.1 - 17 Jul 2007										
EB0709322-049	S16 - 1 - 17 Jul 2007		1								
EB0709322-050	S16 - 2 - 17 Jul 2007										
EB0709322-051	S16 - 3 - 17 Jul 2007		1								
EB0709322-052	S17 - 0.1 - 17 Jul 2007		1								
EB0709322-053	S17 - 1 - 17 Jul 2007		1								
EB0709322-054	S17 - 2 - 17 Jul 2007		1								
EB0709322-055	S18 - 0.1 - 17 Jul 2007										
EB0709322-056	S18 - 1 - 17 Jul 2007										
EB0709322-057	S19 - 0.1 - 17 Jul 2007		1								
EB0709322-058	S19 - 1 - 17 Jul 2007										
EB0709322-059	S20 - 0.1 - 17 Jul 2007		1								
EB0709322-060	S20 - 1 - 17 Jul 2007		1								
EB0709322-061	S20 - 2 - 17 Jul 2007										
EB0709322-062	S20 - 3 - 17 Jul 2007		1								
EB0709322-063	S21 - 0.1 - 17 Jul 2007		1								
EB0709322-064	S21 - 1 - 17 Jul 2007	1	1								
EB0709322-065	S21 - 2 - 17 Jul 2007		1								
EB0709322-066	S22 - 0.1 - 17 Jul 2007										
EB0709322-067	S22 - 1 - 17 Jul 2007		1								
EB0709322-068	S22 - 2 - 17 Jul 2007										
EB0709322-069	S22 - 3 - 17 Jul 2007		1								
EB0709322-070	S23 - 0.1 - 17 Jul 2007		1								
EB0709322-071	S23 - 1 - 17 Jul 2007		1								
EB0709322-072	S24 - 0.1 - 17 Jul 2007										
EB0709322-073	S24 - 1 - 17 Jul 2007										
EB0709322-074	S25 - 0.1 - 17 Jul 2007		1								
EB0709322-075	S25 - 1 - 17 Jul 2007		1								
EB0709322-076	S25 - 2 - 17 Jul 2007		1								
EB0709322-077	S25 - 3 - 17 Jul 2007		1								
EB0709322-078	S26 - 0.1 - 17 Jul 2007										
EB0709322-079	S26 - 1 - 17 Jul 2007										
EB0709322-080	S26 - 2 - 17 Jul 2007		1								
EB0709322-081	S27 - 0.1 - 17 Jul 2007		1								
EB0709322-082	S27 - 1 - 17 Jul 2007		1								
EB0709322-083	S27 - 2 - 17 Jul 2007		1								
EB0709322-084	S27 - 3 - 17 Jul 2007		1								
EB0709322-085	S28 - 0.1 - 17 Jul 2007		1								
EB0709322-086	S28 - 1 - 17 Jul 2007		1								
EB0709322-087	S28 - 2 - 17 Jul 2007		1								
EB0709322-088	S29 - 0.1 - 17 Jul 2007										
EB0709322-089	S29 - Q - 17 Jul 2007										
EB0709322-090	S29 - 1 - 17 Jul 2007		1								
EB0709322-091	S29 - 2 - 17 Jul 2007		1								
EB0709322-092	S29 - 3 - 17 Jul 2007										
EB0709322-093	S30 - 0.1 - 17 Jul 2007		1								
EB0709322-094	S30 - 1 - 17 Jul 2007		1								

Release

SAMPLE RECEIPT NOTIFICATION (SRN) - continued

Client : GOLDER ASSOCIATES
Project : 077683504 Contamination

Work Order : EB0709322
ALS Quote Reference : ES20050035



ALS Sample ID.	Client Sample ID - Sample Date	Requested Analysis									
		ASB-SOL - SOIL Asbestos - Count (Solid)	S-02 - SOIL 8 Metals (incl. Digestion)								
EB0709322-095	S30 - 2 - 17 Jul 2007		1								
EB0709322-096	S31 - 0.1 - 17 Jul 2007		1								
EB0709322-097	S31 - 1 - 17 Jul 2007		1								
EB0709322-098	S31 - 2 - 17 Jul 2007		1								
EB0709322-099	S32 - 0.1 - 17 Jul 2007										
EB0709322-100	S32 - 1 - 17 Jul 2007										
EB0709322-101	S32 - 2 - 17 Jul 2007		1								
EB0709322-102	S33 - 0.1 - 17 Jul 2007		1								
EB0709322-103	S33 - 1 - 17 Jul 2007		1								
EB0709322-104	S33 - 2 - 17 Jul 2007		1								
EB0709322-105	S33 - 3 - 17 Jul 2007		1								
EB0709322-106	S35 - 0.1 - 17 Jul 2007		1								
EB0709322-107	S35 - 1 - 17 Jul 2007										
EB0709322-108	S35 - 2 - 17 Jul 2007		1								
EB0709322-109	S35 - 3 - 17 Jul 2007										
EB0709322-110	S35 - 4 - 17 Jul 2007		1								
EB0709322-111	S36 - 0.1 - 17 Jul 2007		1								
EB0709322-112	S36 - 1 - 17 Jul 2007		1								
EB0709322-113	S36 - 2 - 17 Jul 2007		1								
EB0709322-114	S36 - 3 - 17 Jul 2007		1								
EB0709322-115	S36 - 4 - 17 Jul 2007		1								
EB0709322-116	S37 - 0.1 - 17 Jul 2007										
EB0709322-117	S37 - Q - 17 Jul 2007										
EB0709322-118	S37 - 1 - 17 Jul 2007	1	1								
EB0709322-119	S37 - 2 - 17 Jul 2007		1								
EB0709322-120	S37 - 3 - 17 Jul 2007										
EB0709322-121	S37 - 4 - 17 Jul 2007										
EB0709322-122	S38 - 0.1 - 17 Jul 2007		1								
EB0709322-123	S38 - 1 - 17 Jul 2007		1								
EB0709322-124	S38 - 2 - 17 Jul 2007		1								
EB0709322-125	S38 - 3 - 17 Jul 2007		1								
EB0709322-126	S38 - 4 - 17 Jul 2007		1								
EB0709322-127	S39 - 0.1 - 17 Jul 2007										
EB0709322-128	S39 - 1 - 17 Jul 2007		1								
EB0709322-129	S39 - 2 - 17 Jul 2007		1								
EB0709322-130	S39 - 3 - 17 Jul 2007										
EB0709322-131	S39 - 4 - 17 Jul 2007		1								
EB0709322-132	S40 - 0.1 - 17 Jul 2007		1								
EB0709322-133	S40 - 1 - 17 Jul 2007		1								
EB0709322-134	S40 - 2 - 17 Jul 2007		1								
EB0709322-135	S40 - 3 - 17 Jul 2007		1								
EB0709322-136	S41 - 0.1 - 17 Jul 2007										
EB0709322-137	S41 - 1 - 17 Jul 2007										
EB0709322-138	S41 - 2 - 17 Jul 2007		1								
EB0709322-139	S42 - 0.1 - 17 Jul 2007										
EB0709322-140	S42 - 1 - 17 Jul 2007	1	1								
EB0709322-141	S42 - 2 - 17 Jul 2007	1	1								
EB0709322-142	S42 - 3 - 17 Jul 2007										
EB0709322-143	S42 - 4 - 17 Jul 2007		1								

Release

SAMPLE RECEIPT NOTIFICATION (SRN) - continued

Client : GOLDER ASSOCIATES
Project : 077683504 Contamination

Work Order : EB0709322
ALS Quote Reference : ES20050035



ALS Sample ID.	Client Sample ID - Sample Date	Requested Analysis									
		ASB-SOL - SOIL Asbestos - Count (Solid)	S-02 - SOIL 8 Metals (incl. Digestion)								
EB0709322-144	S43 - 0.1 - 17 Jul 2007		1								
EB0709322-145	S43 - 1 - 17 Jul 2007		1								
EB0709322-146	S43 - 2 - 17 Jul 2007		1								
EB0709322-147	S43 - 3 - 17 Jul 2007		1								
EB0709322-148	S43 - 4 - 17 Jul 2007		1								
EB0709322-149	S43 - 5 - 17 Jul 2007		1								
EB0709322-150	S44 - 0.1 - 17 Jul 2007										
EB0709322-151	S44 - 1 - 17 Jul 2007		1								
EB0709322-152	S44 - 2 - 17 Jul 2007										
EB0709322-153	S44 - 3 - 17 Jul 2007		1								
EB0709322-154	S44 - 4 - 17 Jul 2007										
EB0709322-155	S44 - 5 - 17 Jul 2007		1								
EB0709322-156	S45 - 0.1 - 17 Jul 2007		1								
EB0709322-157	S45 - Q - 17 Jul 2007		1								
EB0709322-158	S45 - 1 - 17 Jul 2007		1								
EB0709322-159	S45 - 2 - 17 Jul 2007		1								
EB0709322-160	S45 - 3 - 17 Jul 2007		1								
EB0709322-161	S45 - 4 - 17 Jul 2007		1								
EB0709322-162	S46 - 0.1 - 17 Jul 2007										
EB0709322-163	S46 - 1 - 17 Jul 2007	1	1								
EB0709322-164	S46 - 2 - 17 Jul 2007		1								
EB0709322-165	S46 - 3 - 17 Jul 2007										
EB0709322-166	S46 - 4 - 17 Jul 2007		1								
EB0709322-167	S46 - 5 - 17 Jul 2007		1								
EB0709322-168	S47 - 0.1 - 17 Jul 2007		1								
EB0709322-169	S47 - 1 - 17 Jul 2007		1								
EB0709322-170	S47 - 2 - 17 Jul 2007		1								
EB0709322-171	S47 - 3 - 17 Jul 2007		1								
EB0709322-172	S47 - 4 - 17 Jul 2007		1								
EB0709322-173	S47 - 5 - 17 Jul 2007		1								
EB0709322-174	S47 - 6 - 17 Jul 2007		1								
EB0709322-175	S48 - 0.1 - 17 Jul 2007										
EB0709322-176	S48 - Q - 17 Jul 2007										
EB0709322-177	S48 - 1 - 17 Jul 2007	1	1								
EB0709322-178	S48 - 2 - 17 Jul 2007	1	1								
EB0709322-179	S48 - 3 - 17 Jul 2007	1	1								
EB0709322-180	S48 - 4 - 17 Jul 2007										
EB0709322-181	S48 - 5 - 17 Jul 2007		1								
EB0709322-182	S49 - 0.1 - 17 Jul 2007		1								
EB0709322-183	S49 - 1 - 17 Jul 2007		1								
EB0709322-184	S49 - 2 - 17 Jul 2007		1								
EB0709322-185	S49 - 3 - 17 Jul 2007		1								
EB0709322-186	S49 - 4 - 17 Jul 2007		1								
EB0709322-187	S50 - 0.1 - 17 Jul 2007										
EB0709322-188	S50 - 1 - 17 Jul 2007		1								
EB0709322-189	S50 - 2 - 17 Jul 2007										
EB0709322-190	S50 - 3 - 17 Jul 2007		1								
EB0709322-191	S51 - 0.1 - 17 Jul 2007		1								
EB0709322-192	S51 - 1 - 17 Jul 2007		1								

SAMPLE RECEIPT NOTIFICATION (SRN) - continued

Client : GOLDER ASSOCIATES
Project : 077683504 Contamination

Work Order : EB0709322
ALS Quote Reference : ES20050035



ALS Sample ID.	Client Sample ID - Sample Date	Requested Analysis									
		ASB-SOL - SOIL Asbestos - Count (Solid)	S-02 - SOIL 8 Metals (incl. Digestion)								
EB0709322-193	S51 - 2 - 17 Jul 2007		1								
EB0709322-194	S51 - 3 - 17 Jul 2007		1								
EB0709322-195	S51 - 4 - 17 Jul 2007		1								
EB0709322-196	S52 - 0.1 - 17 Jul 2007										
EB0709322-197	S52 - 1 - 17 Jul 2007										
EB0709322-198	S52 - 2 - 17 Jul 2007		1								
EB0709322-199	S53 - 0.1 - 17 Jul 2007		1								
EB0709322-200	S53 - 1 - 17 Jul 2007		1								
EB0709322-201	S53 - 2 - 17 Jul 2007		1								
EB0709322-202	S54 - 0.1 - 17 Jul 2007		1								
EB0709322-203	S54 - 1 - 17 Jul 2007		1								
EB0709322-204	S55 - 0.1 - 17 Jul 2007										
EB0709322-205	S55 - 1 - 17 Jul 2007										
EB0709322-206	S55 - 2 - 17 Jul 2007		1								
EB0709322-207	S56 - 0.1 - 17 Jul 2007										
EB0709322-208	S56 - Q - 17 Jul 2007										
EB0709322-209	S56 - 2 - 17 Jul 2007										
EB0709322-210	S56 - 3 - 17 Jul 2007		1								
EB0709322-211	S57 - 0.1 - 17 Jul 2007		1								
EB0709322-212	S57 - 1 - 17 Jul 2007		1								
EB0709322-213	S57 - 2 - 17 Jul 2007		1								
EB0709322-214	S57 - 3 - 17 Jul 2007		1								
EB0709322-215	S58 - 0.1 - 17 Jul 2007										
EB0709322-216	S58 - 1 - 17 Jul 2007		1								
EB0709322-217	S58 - 2 - 17 Jul 2007		1								
EB0709322-218	S58 - 3 - 17 Jul 2007										
EB0709322-219	S58 - 4 - 17 Jul 2007		1								
EB0709322-220	S59 - 0.1 - 17 Jul 2007		1								
EB0709322-221	S59 - 1 - 17 Jul 2007		1								
EB0709322-222	S59 - 2 - 17 Jul 2007		1								
EB0709322-223	S60 - 0.1 - 17 Jul 2007		1								
EB0709322-224	S60 - Q - 17 Jul 2007		1								
EB0709322-225	S60 - 1 - 17 Jul 2007		1								
EB0709322-226	S60 - 2 - 17 Jul 2007		1								
EB0709322-227	S60 - 3 - 17 Jul 2007		1								
Total(s) :		15	161								

Release

SAMPLE RECEIPT NOTIFICATION (SRN) - continued

Client : GOLDER ASSOCIATES
Project : 077683504 Contamination

Work Order : EB0709322
ALS Quote Reference : ES20050035



Requested Reports

- CTPI 49-Sch4
 - Trigger - Subcontract Report Email CTP @golder.com.au
 - A4 - AU Certificate of Analysis - NEPM format Email @golder.com.au
 - A4 - AU Quality Control Report - NEPM format Email @golder.com.au
 - A4 - AU Interpretive Quality Control Report - NEPM format Email @golder.com.au
 - EDI Format - GHDNEW Email @golder.com.au
 - Default - Chain of Custody Email @golder.com.au
 - A4 - AU Sample Receipt Notification - Comprehensive format Email @golder.com.au
- CTPI 49-Sch4
 - Trigger - Subcontract Report Email CTPI 49- @golder.com.au
 - A4 - AU Certificate of Analysis - NEPM format Email @golder.com.au
 - A4 - AU Quality Control Report - NEPM format Email @golder.com.au
 - A4 - AU Interpretive Quality Control Report - NEPM format Email @golder.com.au
 - EDI Format - GHDNEW Email @golder.com.au
 - Default - Chain of Custody Email @golder.com.au
 - A4 - AU Sample Receipt Notification - Comprehensive format Email @golder.com.au
- THE ACCOUNTS PAYABLE (MRCHYDRE)
 - A4 - AU Tax Invoice Email apmaroochydore@golder.com.au

Sample Container(s) / Preservation Non-Compliance Log

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- No sample container / preservation non-compliance exist.


CERTIFICATE OF ANALYSIS

Client	: GOLDER ASSOCIATES	Laboratory	: Environmental Division Brisbane	Page	: 1 of 6
Contact	: CTPI 49-Sch4	Contact	: CTPI 49-Sch4	Work Order	: EB0708618
Address	: P O BOX 5569 MAROOCHYDORE SOUTH QLD AUSTRALIA 4558	Address	: 32 Shand Street Stafford QLD Australia 4053		
E-mail	: CTPI 49-S@golder.com.au	E-mail	: Services.Brisbane@alsenviro.com		
Telephone	: 5443 3511	Telephone	: +61-7-3243 7222	Date received	: 3 Aug 2007
Facsimile	: 5443 6645	Facsimile	: +61-7-3243 7218	Date issued	: 13 Aug 2007
Project	: 077683504 (LOT 2) INDUSTRIAL-L	Quote number	: EN/002/05	No. of samples	- Received : 3
Order number	: MQ 4046				- Analysed : 3
C-O-C number	: - Not provided -				
Site	: - Not provided -				

ALSE - Excellence in Analytical Testing


NATA Accredited Laboratory
825

This document is issued in
accordance with NATA's
accreditation requirements.

Accredited for compliance with
ISO/IEC 17025.

This document has been electronically signed by those names that appear on this report and are the authorised signatories. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatory	Position	Department
CTPI 49-Sch4	Senior Organic Chemist	Organics - NATA 825 (818 - Brisbane)
CTPI 49-Sch4	Senior Inorganic Chemist	Inorganics - NATA 825 (818 - Brisbane)

Page Number : 2 of 6
Client : GOLDER ASSOCIATES
Work Order : EB0708618



Comments

This report for the ALSE reference EB0708618 supersedes any previous reports with this reference. Results apply to the samples as submitted. All pages of this report have been checked and approved for release.

This report contains the following information:

- Analytical Results for Samples Submitted
- Surrogate Recovery Data

The analytical procedures used by ALS Environmental have been developed from established internationally-recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported herein. Reference methods from which ALSE methods are based are provided in parenthesis.

When moisture determination has been performed, results are reported on a dry weight basis. When a reported 'less than' result is higher than the LOR, this may be due to primary sample extracts/digestion dilution and/or insufficient sample amount for analysis. Surrogate Recovery Limits are static and based on USEPA SW846 or ALS-QWI/EN38 (in the absence of specified USEPA limits). Where LOR of reported result differ from standard LOR, this may be due to high moisture, reduced sample amount or matrix interference. When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for process purposes. Abbreviations: CAS number = Chemical Abstract Services number, LOR = Limit of Reporting. * Indicates failed Surrogate Recoveries.

Specific comments for Work Order **EB0708618**

EP068: Results for Monocrotophos should be scrutinised as QC data indicates abnormally low recovery.

EP068, EP071: Particular samples required dilution prior to extraction due to matrix interferences. Samples contained high sediment levels. LOR values have been adjusted accordingly.

Release

Page Number : 3 of 6
 Client : GOLDR ASSOCIATES
 Work Order : EB0708618



ALS Environmental

Analytical Results

Client Sample ID :
 Sample Matrix Type / Description :
 Sample Date / Time :
 Laboratory Sample ID :

				BH 1 WATER 2 Aug 2007 15:00	BH 2 WATER 2 Aug 2007 15:00	BH 3 WATER 2 Aug 2007 15:00		
				EB0708618-001	EB0708618-002	EB0708618-003		
Analyte	CAS number	LOR	Units					
EG020F: Dissolved Metals by ICP-MS								
Arsenic	7440-38-2	0.001 mg/L		0.003	<0.001	<0.001		
Cadmium	7440-43-9	0.0001 mg/L		<0.0001	<0.0001	0.0002		
Chromium	7440-47-3	0.001 mg/L		0.001	<0.001	<0.001		
Copper	7440-50-8	0.001 mg/L		0.003	0.002	0.001		
Lead	7439-92-1	0.001 mg/L		0.002	<0.001	<0.001		
Nickel	7440-02-0	0.001 mg/L		0.002	<0.001	<0.001		
Zinc	7440-66-6	0.005 mg/L		0.023	0.008	0.019		
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001 mg/L		<0.0001	<0.0001	<0.0001		
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.5 µg/L		<2.5	<1.1	<5.0		
Hexachlorobenzene (HCB)	118-74-1	0.5 µg/L		<2.5	<1.1	<5.0		
beta-BHC	319-85-7	0.5 µg/L		<2.5	<1.1	<5.0		
gamma-BHC	58-89-9	0.5 µg/L		<2.5	<1.1	<5.0		
delta-BHC	319-86-8	0.5 µg/L		<2.5	<1.1	<5.0		
Heptachlor	76-44-8	0.5 µg/L		<2.5	<1.1	<5.0		
Aldrin	309-00-2	0.5 µg/L		<2.5	<1.1	<5.0		
Heptachlor epoxide	1024-57-3	0.5 µg/L		<2.5	<1.1	<5.0		
trans-Chlordane	5103-74-2	0.5 µg/L		<2.5	<1.1	<5.0		
alpha-Endosulfan	959-98-8	0.5 µg/L		<2.5	<1.1	<5.0		
cis-Chlordane	5103-71-9	0.5 µg/L		<2.5	<1.1	<5.0		
Dieldrin	60-57-1	0.5 µg/L		<2.5	<1.1	<5.0		
4,4'-DDE	72-55-9	0.5 µg/L		<2.5	<1.1	<5.0		
Endrin	72-20-8	0.5 µg/L		<2.5	<1.1	<5.0		
beta-Endosulfan	33213-85-9	0.5 µg/L		<2.5	<1.1	<5.0		
4,4'-DDD	72-54-8	0.5 µg/L		<2.5	<1.1	<5.0		
Endrin aldehyde	7421-93-4	0.5 µg/L		<2.5	<1.1	<5.0		
Endosulfan sulfate	1031-07-8	0.5 µg/L		<2.5	<1.1	<5.0		
4,4'-DDT	50-29-3	2 µg/L		<2	<2	<5		
Endrin ketone	53494-70-5	0.5 µg/L		<2.5	<1.1	<5.0		
Methoxychlor	72-43-5	2 µg/L		<2	<2	<5		
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.5 µg/L		<2.5	<1.1	<5.0		
Demeton-S-methyl	919-86-8	0.5 µg/L		<2.5	<1.1	<5.0		
Monocrotophos	6923-22-4	2 µg/L		<2	<2	<5		
Dimethoate	60-51-5	0.5 µg/L		<2.5	<1.1	<5.0		
Diazinon	333-41-5	0.5 µg/L		<2.5	<1.1	<5.0		

Release

Page Number : 4 of 6
 Client : GOLDER ASSOCIATES
 Work Order : EB0708618



ALS Environmental

Analytical Results

Client Sample ID :
 Sample Matrix Type / Description :
 Sample Date / Time :
 Laboratory Sample ID :

				BH 1 WATER 2 Aug 2007 15:00	BH 2 WATER 2 Aug 2007 15:00	BH 3 WATER 2 Aug 2007 15:00		
				EB0708618-001	EB0708618-002	EB0708618-003		
Analyte	CAS number	LOR	Units					
EP068B: Organophosphorus Pesticides (OP)								
Chlorpyrifos-methyl	5598-13-0	0.5	µg/L	<2.5	<1.1	<5.0		
Parathion-methyl	298-00-0	2	µg/L	<2	<2	<5		
Malathion	121-75-5	0.5	µg/L	<2.5	<1.1	<5.0		
Fenthion	55-38-9	0.5	µg/L	<2.5	<1.1	<5.0		
Chlorpyrifos	2921-88-2	0.5	µg/L	<2.5	<1.1	<5.0		
Parathion	56-38-2	2	µg/L	<2	<2	<5		
Pirimphos-ethyl	23505-41-1	0.5	µg/L	<2.5	<1.1	<5.0		
Chlorfenvinphos	470-90-6	0.5	µg/L	<2.5	<1.1	<5.0		
Bromophos-ethyl	4824-78-6	0.5	µg/L	<2.5	<1.1	<5.0		
Fenamiphos	22224-92-6	0.5	µg/L	<2.5	<1.1	<5.0		
Prothiofos	34643-46-4	0.5	µg/L	<2.5	<1.1	<5.0		
Ethion	563-12-2	0.5	µg/L	<2.5	<1.1	<5.0		
Carbophenothion	786-19-6	0.5	µg/L	<2.5	<1.1	<5.0		
Azinphos Methyl	86-50-0	0.5	µg/L	<2.5	<1.1	<5.0		
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	<1.0	<1.0	<1.0		
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	<1.0	<1.0		
Acenaphthene	83-32-9	1.0	µg/L	<1.0	<1.0	<1.0		
Fluorene	86-73-7	1.0	µg/L	<1.0	<1.0	<1.0		
Phenanthrene	85-01-8	1.0	µg/L	<1.0	<1.0	<1.0		
Anthracene	120-12-7	1.0	µg/L	<1.0	<1.0	<1.0		
Fluoranthene	206-44-0	1.0	µg/L	<1.0	<1.0	<1.0		
Pyrene	129-00-0	1.0	µg/L	<1.0	<1.0	<1.0		
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	<1.0	<1.0		
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.0	<1.0		
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	<1.0	<1.0		
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.0	<1.0		
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<1.0		
Indeno(1,2,3-cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.0	<1.0		
Dibenz(a,h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.0	<1.0		
Benzo(g,h,i)perylene	191-24-2	1.0	µg/L	<1.0	<1.0	<1.0		
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction		20	µg/L	<20	<20	<20		
C10 - C14 Fraction		50	µg/L	<250	<100	<500		
C15 - C28 Fraction		100	µg/L	600	300	<1000		
C29 - C36 Fraction		50	µg/L	390	200	<500		

Release

Page Number : 5 of 6
 Client : GOLDER ASSOCIATES
 Work Order : EB0708618



ALS Environmental

Analytical Results

Client Sample ID :
 Sample Matrix Type / Description :
 Sample Date / Time :
 Laboratory Sample ID :

				BH 1 WATER 2 Aug 2007 15:00	BH 2 WATER 2 Aug 2007 15:00	BH 3 WATER 2 Aug 2007 15:00		
				EB0708618-001	EB0708618-002	EB0708618-003		
Analyte	CAS number	LOR	Units					
EP080: BTEX								
Benzene	71-43-2	1	µg/L	<1	<1	<1		
Toluene	108-88-3	2	µg/L	<2	<2	<2		
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2		
meta- & para-Xylene	108-38-3	2	µg/L	<2	<2	<2		
	106-42-3							
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2		
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.1	%	98.1	114	108		
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	90.4	109	98.2		
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	33.1	38.0	33.4		
2-Chlorophenol-D4	93951-73-6	0.1	%	78.3	90.3	77.4		
2,4,6-Tribromophenol	118-79-6	0.1	%	116	129	102		
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	84.8	107	93.6		
Anthracene-d10	1719-06-8	0.1	%	83.9	96.3	98.5		
4-Terphenyl-d14	1718-51-0	0.1	%	96.7	111	111		
EP080S: TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	111	114	103		
Toluene-D8	2037-26-5	0.1	%	89.6	93.4	91.6		
4-Bromofluorobenzene	460-00-4	0.1	%	94.4	97.1	91.9		

Release

Page Number : 6 of 6
Client : GOLDER ASSOCIATES
Work Order : EB0708618



ALS Environmental

Surrogate Control Limits

Matrix Type: WATER - Surrogate Control Limits

Surrogate Control Limits

Method name	Analyte name	Lower Limit	Upper Limit
EP068: Pesticides			
EP068S: Organochlorine Pesticide Surrogate	Dibromo-DDE	10	136
EP068T: Organophosphorus Pesticide Surrogate	DEF	10	110
EP075(SIM): PAH/Phenols (GC/MS - SIM)			
EP075(SIM)S: Phenolic Compound Surrogates	Phenol-d6	10	94
	2-Chlorophenol-D4	23	134
	2,4,6-Tribromophenol	10	123
EP075(SIM)T: PAH Surrogates	2-Fluorobiphenyl	43	118
	Anthracene-d10	27	133
	4-Terphenyl-d14	33	141
EP080: TPH Volatiles/BTEX			
EP080S: TPH(V)/BTEX Surrogates	1,2-Dichloroethane-D4	80	120
	Toluene-D8	88	110
	4-Bromofluorobenzene	86	115

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TESTING REQUEST FORM

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ALS ENVIRONMENTAL

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Environmental Division

Brisbane

Work Order

EB0708618



Telephone : + 61-7-3243 7222

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Page 80 of 337



QUALITY CONTROL REPORT

Client	: GOLDER ASSOCIATES	Laboratory	: Environmental Division Brisbane	Page	: 1 of 10
Contact	: CTPI 49-Sch4	Contact	: CTPI 49-Sch4	Work order	: EB0708618
Address	: P O BOX 5569 MAROOCHYDORE SOUTH QLD AUSTRALIA 4558	Address	: 32 Shand Street Stafford QLD Australia 4053	Amendment No.	:
Project	: 077683504 (LOT 2) INDUSTRIAL-L	Quote number	: EN/002/05	Date received	: 3 Aug 2007
Order number	: MQ 4046			Date issued	: 13 Aug 2007
C-O-C number	: - Not provided -			No. of samples	
Site	: - Not provided -			Received	: 3
E-mail	: CTPI 49@golder.com.au	E-mail	: Services.Brisbane@alsenviro.com	Analysed	: 3
Telephone	: 5443 3511	Telephone	: +61-7-3243 7222		
Facsimile	: 5443 6645	Facsimile	: +61-7-3243 7218		

This final report for the ALSE work order reference EB0708618 supersedes any previous reports with this reference.

Results apply to the samples as submitted. All pages of this report have been checked and approved for release.

This report contains the following information:

- Laboratory Duplicates (DUP); Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Samples (LCS); Recovery and Acceptance Limits
- Matrix Spikes (MS); Recovery and Acceptance Limits

Work order specific comments

EP068, EP071: Particular samples required dilution prior to extraction due to matrix interferences. Samples contained high sediment levels. LOR values have been adjusted accordingly.

EP068: Results for Monocrotophos should be scrutinised as QC data indicates abnormally low recovery.

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Accredited for compliance with ISO/IEC 17025

This document has been electronically signed by those names that appear on this report and are the authorised signatories. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatory

CTPI 49-Sch4
CTPI 49-Sch4

Department

Organics - NATA 825 (818 - Brisbane)
Inorganics - NATA 825 (818 - Brisbane)



Client : GOLDER ASSOCIATES
Project : 077683504 (LOT 2) INDUSTRIAL-L

Work Order : EB0708618
ALS Quote Reference : EN/002/05

Page Number : 2 of 10
Issue Date : 13 Aug 2007

ALS Environmental

Quality Control Report - Laboratory Duplicates (DUP)

The quality control term Laboratory Duplicate refers to an intralaboratory split sample randomly selected from the sample batch. Laboratory duplicates provide information on method precision and sample heterogeneity.

- Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot. Abbreviations: LOR = Limit of Reporting, RPD = Relative Percent Difference.

* Indicates failed QC. The permitted ranges for the RPD of Laboratory Duplicates (relative percent deviation) are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting:- Result < 10 times LOR, no limit - Result between 10 and 20 times LOR, 0% - 50% - Result > 20 times LOR, 0% - 20%

Matrix Type: WATER

Laboratory Duplicates (DUP) Report

Matrix type: WATER						
Laboratory Sample ID	Client Sample ID	Analyte name	LOR	Original Result	Duplicate Result	RPD
EG020F: Dissolved Metals by ICP-MS						
EG020F: Dissolved Metals by ICP-MS - (QC Lot: 465683)				mg/L	mg/L	%
EB0708626-001 <						

Client : GOLDER ASSOCIATES
Project : 077683504 (LOT 2) INDUSTRIAL-L

Work Order : EB0708618
ALS Quote Reference : EN/002/05

Page Number : 3 of 10
Issue Date : 13 Aug 2007



Matrix Type: WATER

Laboratory Duplicates (DUP) Report

Laboratory Sample ID	Client Sample ID	Analyte name	LOR	Original Result	Duplicate Result	RPD
EP080: BTEX - continued						
EP080: BTEX - (QC Lot: 466262) - continued				µg/L	µg/L	%
EB0708612-052	Anonymous	Ethylbenzene	2 µg/L	<2	<2	0.0
		meta- & para-Xylene	2 µg/L	<2	<2	0.0
		ortho-Xylene	2 µg/L	<2	<2	0.0

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Client : GOLDER ASSOCIATES
Project : 077683504 (LOT 2) INDUSTRIAL-L

Work Order : EB0708618
ALS Quote Reference : EN/002/05

Page Number : 4 of 10
Issue Date : 13 Aug 2007

Quality Control Report - Method Blank (MB) and Laboratory Control Samples (LCS)

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC type is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a known, interference free matrix spiked with target analytes or certified reference material. The purpose of this QC type is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of actual laboratory data. Flagged outliers on control limits for inorganics tests may be within the NEPM specified data quality objective of recoveries in the range of 70 to 130%. Where this occurs, no corrective action is taken. Abbreviations: LOR = Limit of reporting.

Matrix Type: WATER

Method Blank (MB) and Laboratory Control Samples (LCS) Report

		Method blank result	Actual Results		Recovery Limits	
Analyte name	LOR		Spike concentration	Spike Recovery	Dynamic Recovery Limits	
				LCS	Low	High
EG020F: Dissolved Metals by ICP-MS						
EG020F: Dissolved Metals by ICP-MS - (QC Lot: 466683)		mg/L	mg/L	%	%	%
Arsenic	0.001 mg/L	—	0.1000	87.6	72.6	121
	0.001 mg/L	<0.001	—	—	—	—
Cadmium	0.0001 mg/L	<0.0001	—	—	—	—
	0.0001 mg/L	—	0.1000	97.6	85	110
Chromium	0.001 mg/L	—	0.1000	99.0	81.8	128
	0.001 mg/L	<0.001	—	—	—	—
Copper	0.001 mg/L	—	0.200	99.0	85.2	117
	0.001 mg/L	<0.001	—	—	—	—
Lead	0.001 mg/L	—	0.1000	93.7	86.7	112
	0.001 mg/L	<0.001	—	—	—	—
Nickel	0.001 mg/L	—	0.1000	93.9	84.4	116
	0.001 mg/L	<0.001	—	—	—	—
Zinc	0.005 mg/L	<0.005	—	—	—	—
	0.005 mg/L	—	0.200	103	81.3	130
EG035F: Dissolved Mercury by FIMS						
EG035F: Dissolved Mercury by FIMS - (QC Lot: 467369)		mg/L	mg/L	%	%	%
Mercury	0.0001 mg/L	<0.0001	—	—	—	—
	0.0001 mg/L	—	0.010	102	70	130
EP068A: Organochlorine Pesticides (OC)						
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 465536)		µg/L	µg/L	%	%	%
4,4'-DDD	0.5 µg/L	—	5	89.7	55	132
	0.5 µg/L	<0.5	—	—	—	—
4,4'-DDE	0.5 µg/L	<0.5	—	—	—	—
	0.5 µg/L	—	5	84.8	56	130

Release

Client : GOLDER ASSOCIATES
Project : 077683504 (LOT 2) INDUSTRIAL-L

Work Order : EB0708618
ALS Quote Reference : EN/002/05

Page Number : 5 of 10
Issue Date : 13 Aug 2007



Matrix Type: WATER

Method Blank (MB) and Laboratory Control Samples (LCS) Report

		Method blank result	Actual Results		Recovery Limits	
Analyte name	LOR		Spike concentration	Spike Recovery LCS	Dynamic Recovery Limits	
					Low	High
EP068A: Organochlorine Pesticides (OC) - continued						
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 465535) - continued		µg/L	µg/L	%	%	%
4,4'-DDT	2.0 µg/L	—	5	89.7	40	130
	2 µg/L	<2	—	—	—	—
Aldrin	0.5 µg/L	—	5	85.1	57	125
	0.5 µg/L	<0.5	—	—	—	—
alpha-BHC	0.5 µg/L	<0.5	—	—	—	—
	0.5 µg/L	—	5	88.9	58	129
alpha-Endosulfan	0.5 µg/L	—	5	87.9	57	129
	0.5 µg/L	<0.5	—	—	—	—
beta-BHC	0.5 µg/L	<0.5	—	—	—	—
	0.5 µg/L	—	5	88.7	57	130
beta-Endosulfan	0.5 µg/L	<0.5	—	—	—	—
	0.5 µg/L	—	5	91.4	56	131
cis-Chlordane	0.5 µg/L	—	5	86.5	57	128
	0.5 µg/L	<0.5	—	—	—	—
delta-BHC	0.5 µg/L	—	5	113	52	133
	0.5 µg/L	<0.5	—	—	—	—
Dieldrin	0.5 µg/L	—	5	87.3	56	131
	0.5 µg/L	<0.5	—	—	—	—
Endosulfan sulfate	0.5 µg/L	<0.5	—	—	—	—
	0.5 µg/L	—	5	108	50	134
Endrin	0.5 µg/L	<0.5	—	—	—	—
	0.5 µg/L	—	5	86.3	51	134
Endrin aldehyde	0.5 µg/L	<0.5	—	—	—	—
	0.5 µg/L	—	5	90.7	53	134
Endrin ketone	0.5 µg/L	—	5	91.2	44	143
	0.5 µg/L	<0.5	—	—	—	—
gamma-BHC	0.5 µg/L	—	5	91.4	56	130
	0.5 µg/L	<0.5	—	—	—	—
Heptachlor	0.5 µg/L	—	5	83.5	49	131
	0.5 µg/L	<0.5	—	—	—	—

Released

Client : GOLDER ASSOCIATES
Project : 077683504 (LOT 2) INDUSTRIAL-L

Work Order : EB0708618
ALS Quote Reference : EN/002/05

Page Number : 6 of 10
Issue Date : 13 Aug 2007



Matrix Type: WATER

Method Blank (MB) and Laboratory Control Samples (LCS) Report

		Method blank result	Actual Results		Recovery Limits	
			Spike concentration	Spike Recovery	Dynamic Recovery Limits	
Analyte name	LOR			LCS	Low	High
EP068A: Organochlorine Pesticides (OC) - continued						
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 465535) - continued		µg/L	µg/L	%	%	%
Heptachlor epoxide	0.5 µg/L	—	5	90.0	56	129
	0.5 µg/L	<0.5	—	—	—	—
Hexachlorobenzene (HCB)	0.5 µg/L	—	5	86.5	51	135
	0.5 µg/L	<0.5	—	—	—	—
Methoxychlor	2 µg/L	<2	—	—	—	—
	2.0 µg/L	—	5	82.5	40	130
trans-Chlordane	0.5 µg/L	<0.5	—	—	—	—
	0.5 µg/L	—	5	85.6	54	131
EP068B: Organophosphorus Pesticides (OP)						
EP068B: Organophosphorus Pesticides (OP) - (QC Lot: 465535)		µg/L	µg/L	%	%	%
Methyl Azinphos	0.5 µg/L	—	5	100	34	130
	0.5 µg/L	<0.5	—	—	—	—
Bromophos-ethyl	0.5 µg/L	—	5	86.8	54	132
	0.5 µg/L	<0.5	—	—	—	—
Carbophenothion	0.5 µg/L	—	5	87.0	54	132
	0.5 µg/L	<0.5	—	—	—	—
Chlorfenvinphos	0.5 µg/L	—	5	88.5	54	133
	0.5 µg/L	<0.5	—	—	—	—
Chlorpyrifos	0.5 µg/L	<0.5	—	—	—	—
	0.5 µg/L	—	5	87.1	51	138
Chlorpyrifos-methyl	0.5 µg/L	<0.5	—	—	—	—
	0.5 µg/L	—	5	91.5	56	129
Demeton-S-methyl	0.5 µg/L	<0.5	—	—	—	—
	0.5 µg/L	—	5	95.1	40	130
Diazinon	0.5 µg/L	<0.5	—	—	—	—
	0.5 µg/L	—	5	87.9	48	139
Dichlorvos	0.5 µg/L	<0.5	—	—	—	—
	0.5 µg/L	—	5	85.5	47	133
Dimethoate	0.5 µg/L	—	5	84.1	48	132
	0.5 µg/L	<0.5	—	—	—	—

Release

Client : GOLDER ASSOCIATES
Project : 077683504 (LOT 2) INDUSTRIAL-L

Work Order : EB0708618
ALS Quote Reference : EN/002/05

Page Number : 7 of 10
Issue Date : 13 Aug 2007



Matrix Type: WATER

Method Blank (MB) and Laboratory Control Samples (LCS) Report

		Method blank result	Actual Results		Recovery Limits	
Analyte name	LOR		Spike concentration	Spike Recovery LCS	Dynamic Recovery Limits	
					Low	High
EP068B: Organophosphorus Pesticides (OP) - continued						
EP068B: Organophosphorus Pesticides (OP) - (QC Lot: 465535) - continued			µg/L	µg/L	%	%
Ethion	0.5 µg/L	—	5	86.9	41	130
	0.5 µg/L	<0.5	—	—	—	—
Fenamiphos	0.5 µg/L	—	5	83.0	39	143
	0.5 µg/L	<0.5	—	—	—	—
Fenthion	0.5 µg/L	—	5	90.7	50	129
	0.5 µg/L	<0.5	—	—	—	—
Malathion	0.5 µg/L	—	5	92.9	54	133
	0.5 µg/L	<0.5	—	—	—	—
Monocrotophos	2.0 µg/L	—	5	ND	10	100
	2 µg/L	<2	—	—	—	—
Parathion	2 µg/L	<2	—	—	—	—
	2.0 µg/L	—	5	86.5	45	142
Parathion-methyl	2 µg/L	<2	—	—	—	—
	2.0 µg/L	—	5	93.4	48	138
Pirimphos-ethyl	0.5 µg/L	—	5	87.8	44	132
	0.5 µg/L	<0.5	—	—	—	—
Prothiofos	0.5 µg/L	—	5	86.8	47	138
	0.5 µg/L	<0.5	—	—	—	—
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 465534)			µg/L	µg/L	%	%
Acenaphthene	1 µg/L	—	5	80.1	50	110
	1.0 µg/L	<1.0	—	—	—	—
Acenaphthylene	1.0 µg/L	<1.0	—	—	—	—
	1 µg/L	—	5	80.4	51	113
Anthracene	1 µg/L	—	5	88.8	46	112
	1.0 µg/L	<1.0	—	—	—	—
Benz(a)anthracene	1.0 µg/L	<1.0	—	—	—	—
	1 µg/L	—	5	76.5	53	115
Benzo(a)pyrene	0.5 µg/L	<0.5	—	—	—	—
	0.5 µg/L	—	5	81.6	49	116

Released under E.O. 14176

Client : GOLDER ASSOCIATES
Project : 077683504 (LOT 2) INDUSTRIAL-L

Work Order : EB0708618
ALS Quote Reference : EN/002/05

Page Number : 8 of 10
Issue Date : 13 Aug 2007



Matrix Type: WATER

Method Blank (MB) and Laboratory Control Samples (LCS) Report

		Method blank result	Actual Results		Recovery Limits	
Analyte name	LOR		Spike concentration	Spike Recovery LCS	Dynamic Recovery Limits	
					Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - continued						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 465534) - continued		µg/L	µg/L	%	%	%
Benzo(b)fluoranthene	1 µg/L	---	5	77.7	48	127
	1.0 µg/L	<1.0	---	---	---	---
Benzo(g,h,i)perylene	1 µg/L	---	5	95.5	41	130
	1.0 µg/L	<1.0	---	---	---	---
Benzo(k)fluoranthene	1 µg/L	---	5	85.4	46	121
	1.0 µg/L	<1.0	---	---	---	---
Chrysene	1 µg/L	---	5	79.6	50	114
	1.0 µg/L	<1.0	---	---	---	---
Dibenz(a,h)anthracene	1.0 µg/L	<1.0	---	---	---	---
	1 µg/L	---	5	103	32	130
Fluoranthene	1.0 µg/L	<1.0	---	---	---	---
	1 µg/L	---	5	76.9	53	112
Fluorene	1.0 µg/L	<1.0	---	---	---	---
	1 µg/L	---	5	80.7	55	113
Indeno(1,2,3,cd)pyrene	1 µg/L	---	5	102	44	130
	1.0 µg/L	<1.0	---	---	---	---
Naphthalene	1.0 µg/L	<1.0	---	---	---	---
	1 µg/L	---	5	77.7	48	106
Phenanthrene	1 µg/L	---	5	76.8	54	110
	1.0 µg/L	<1.0	---	---	---	---
Pyrene	1.0 µg/L	<1.0	---	---	---	---
	1 µg/L	---	5	77.0	52	112
EP080/071: Total Petroleum Hydrocarbons						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 465533)		µg/L	µg/L	%	%	%
C10 - C14 Fraction	50 µg/L	---	600	81.6	49	133
	50 µg/L	<50	---	---	---	---
C15 - C28 Fraction	100 µg/L	---	1020	94.5	58	130
	100 µg/L	<100	---	---	---	---
C29 - C36 Fraction	50 µg/L	<50	---	---	---	---

Release

Client : GOLDER ASSOCIATES
Project : 077683504 (LOT 2) INDUSTRIAL-L

Work Order : EB0708618
ALS Quote Reference : EN/002/05

Page Number : 9 of 10
Issue Date : 13 Aug 2007



Matrix Type: WATER

Method Blank (MB) and Laboratory Control Samples (LCS) Report

		Method blank result	Actual Results		Recovery Limits	
Analyte name	LOR		Spike concentration	Spike Recovery	Dynamic Recovery Limits	
				LCS	Low	High
EP080/071: Total Petroleum Hydrocarbons - continued:						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 466262)		µg/L	µg/L	%	%	%
C6 - C9 Fraction	20 µg/L	<20	—	—	—	—
	20 µg/L	—	260	86.6	73	131
EP080: BTEX						
EP080: BTEX - (QC Lot: 466262)		µg/L	µg/L	%	%	%
Benzene	1 µg/L	<1	—	—	—	—
	1 µg/L	—	10	99.6	73	129
Ethylbenzene	2 µg/L	—	10	92.8	74	126
	2 µg/L	<2	—	—	—	—
meta- & para-Xylene	2 µg/L	—	10	94.7	71	129
	2 µg/L	<2	—	—	—	—
ortho-Xylene	2 µg/L	—	10	92.8	75	127
	2 µg/L	<2	—	—	—	—
Toluene	2 µg/L	<2	—	—	—	—
	2 µg/L	—	10	94.5	75	127

Release



Client : GOLDER ASSOCIATES
Project : 077683504 (LOT 2) INDUSTRIAL-L

Work Order : EB0708618
ALS Quote Reference : EN/002/05

Page Number : 10 of 10
Issue Date : 13 Aug 2007

Quality Control Report - Matrix Spikes (MS)

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC type is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQO's). 'Ideal' recovery ranges stated may be waived in the event of sample matrix interferences. - Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot. Abbreviations: LOR = Limit of Reporting, RPD = Relative Percent Difference.

* Indicates failed QC

Matrix Type: WATER

Matrix Spike (MS) Report

					Actual Results		Recovery Limits	
Analyte name	Laboratory Sample ID	Client Sample ID	LOR	Spike Concentration	Sample Result	Spike Recovery	Static Limits	
						MS	Low	High
EG020F: Dissolved Metals by ICP-MS								
EG020F: Dissolved Metals by ICP-MS - (QC Lot: 465683)				mg/L	mg/L	%	%	%
Arsenic	EB0708618-002	BH 2	0.001 mg/L	0.100	<0.001	91.7	70	130
Cadmium			0.0001 mg/L	0.100	<0.0001	100	70	130
Chromium			0.001 mg/L	0.100	<0.001	102	70	130
Copper			0.001 mg/L	0.100	0.002	102	70	130
Lead			0.001 mg/L	0.100	<0.001	93.3	70	130
Nickel			0.001 mg/L	0.100	<0.001	103	70	130
Zinc			0.005 mg/L	0.100	0.008	111	70	130
EG035F: Dissolved Mercury by FIMS								
EG035F: Dissolved Mercury by FIMS - (QC Lot: 467359)				mg/L	mg/L	%	%	%
Mercury	EB0708544-001	Anonymous	0.0001 mg/L	0.01	<0.0001	104	70	130
EP080/071: Total Petroleum Hydrocarbons								
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 466262)				µg/L	µg/L	%	%	%
C6 - C9 Fraction	EB0708612-053	Anonymous	20 µg/L	140	<20	78.0	70	130
EP080: BTEX								
EP080: BTEX - (QC Lot: 466262)				µg/L	µg/L	%	%	%
Benzene	EB0708612-053	Anonymous	1 µg/L	10	<1	96.1	70	130
Toluene			2 µg/L	10	<2	83.7	70	130

TESTING REQUEST FORM

Forward to:

ALS ENVIRONMENTAL

32 SHAND STREET STAFFORD QLD 4053

GOLDER ASSOCIATES PTY LTD

Unit 1 Dalton Centre

Phone: : (07) 54433511

Newspaper Place

Fax : (07) 54436645

Maroochydore Qld 4558

Page 1
of 1

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Environmental Division
Brisbane
Work Order

EB0708618



Telephone : +61-7-3243 7222

05683018tr2

Page 91 of 337



ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive report

Client Details		Laboratory Details	
Client	: GOLDER ASSOCIATES	Laboratory	: Environmental Division Brisbane
Contact	: CTPI 49-Sch4	Manager	: CTPI 49-Sch4
Address	: P O BOX 5569 MAROOCHYDORE SOUTH QLD AUSTRALIA 4558	Address	: 32 Shand Street Stafford QLD Australia 4053
Project	: 077683504 (LOT 2) INDUSTRIAL-L	Quote number	: ES20050035
Order number	: MQ 4046	Work order	: EB0708618
C-O-C Number	: - Not provided -		
Site	: - Not provided -		
Sampler	: CK		
E-mail	: CTPI 49@golder.com.au	E-mail	: Services.Brisbane@alsenviro.com
Telephone	: 5443 3511	Telephone	: +61-7-3243 7222
Facsimile	: 5443 6645	Facsimile	: +61-7-3243 7218

Dates

Date Samples Received	: 3 Aug 2007	SRA Issue Date	: 6 Aug 2007
Scheduled Reporting Date	: 10 Aug 2007	Client Requested Date	: 10 Aug 2007

Delivery Details

Mode of Delivery	: Carrier.	Temperature	: 5.6 C - Ice present
No. of coolers/boxes	: 1 MEDIUM 1 SMALL	No. of samples - Received	3
Security Seal	: Intact.	- Analysed	3

Comments

- Sample containers do not comply to pretreatment / preservation standards (AS, APHA, USEPA). Please refer to the 'Sample Container(s) / Preservation Non-Compliance Log' at the end of this report for details.
- Sample(s) have been received within recommended holding times.
- Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (14 days), Solid (90 days) from date of completion of work order.
- Please direct any queries related to sample condition / numbering / breakages to Maggie Kahi.
- Analytical work for this work order will be conducted at ALSE Brisbane.
- When the sampling time is not supplied on the COC documentation, ALSE defaults the sampling time to that of the COC 'relinquishment' time (if supplied). If this also is not supplied, ALSE defaults the sampling time to the 'time of receipt at Laboratory'.

Disclaimer : This document contains privileged and confidential information intended only for the use of the addressee. If you are not the addressee, you are hereby notified that you must not disseminate, copy or take action of its contents. If you have received this document in error, please notify ALS immediately.

SAMPLE RECEIPT NOTIFICATION (SRN) - continued

Client : GOLDER ASSOCIATES
Project : 077683504 (LOT 2) INDUSTRIAL-L

Work Order : EB0708618
ALS Quote Reference : ES20050035



Summary of Sample(s) / Container(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as moisture and preparation tasks, that form an implicit part of that package.

ALS Sample ID.	Client Sample ID - Sample Date	Requested Analysis									
		W-02 - WATER 8 Metals	W-07 - WATER TPH/BTEX/PAH	W-12 - WATER OC/OP Pesticides							
EB0708618-001	BH 1 - 2 Aug 2007	●	●	●							
EB0708618-002	BH 2 - 2 Aug 2007	●	●	●							
EB0708618-003	BH 3 - 2 Aug 2007	●	●	●							
Total(s) :		3	3	3							

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SAMPLE RECEIPT NOTIFICATION (SRN) - continued

Client : GOLDER ASSOCIATES
Project : 077683504 (LOT 2) INDUSTRIAL-L

Work Order : EB0708618
ALS Quote Reference : ES20050035



Requested Reports

- CTPI 49-Sch4
 - A4 - AU Interpretive Quality Control Report - NEPM format Email CTPI 49-@golder.com.au
 - A4 - AU Certificate of Analysis - NEPM format Email @golder.com.au
 - A4 - AU Quality Control Report - NEPM format Email @golder.com.au
 - EDI Format - GHDNEW Email @golder.com.au
 - Default - Chain of Custody Email @golder.com.au
 - A4 - AU Sample Receipt Notification - Comprehensive format Email @golder.com.au
- THE ACCOUNTS PAYABLE (MRCHYDRE)
 - A4 - AU Tax Invoice Email apmaroochydore@golder.com.au

Sample Container(s) / Preservation Non-Compliance Log

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

Method	Sample Container Received	Preferred Sample Container for Analysis
Client Sample ID (ALS Sample ID.)		
● EG020A-F : Dissolved Metals by ICP-MS - Suite A		
- BH 2 (EB0708618-002)	- Amber Glass Bottle - Unpreserved	- Clear Plastic Bottle - Nitric Acid; Filtered
● EG035F : Dissolved Mercury by FIMS		
- BH 2 (EB0708618-002)	- Amber Glass Bottle - Unpreserved	- Clear Plastic Bottle - Nitric Acid; Filtered



Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: EB0713039	Page	: 1 of 4
Client	: GOLDER ASSOCIATES	Laboratory	: Environmental Division Brisbane
Contact	: CTPI 49-Sch4	Contact	: CTPI 49-Sch4
Address	: P O BOX 5569 MAROOCHYDORE SOUTH QLD AUSTRALIA 4558	Address	: 32 Shand Street Stafford QLD Australia 4053
E-mail	: CTPI 49-@golder.com.au	E-mail	: Services.Brisbane@alsenviro.com
Telephone	: +61 07 5443 3511	Telephone	: +61-7-3243 7222
Facsimile	: +61 07 5443 6645	Facsimile	: +61-7-3243 7218
Project	: 077683504 (LOT 2) INDUSTRIAL-LOT 2 DRURY LANE	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: MQ 4860	Date Samples Received	: 08-NOV-2007
C-O-C number	: ---	Issue Date	: 13-NOV-2007
Sampler	: CK	No. of samples received	: 3
Site	: ---	No. of samples analysed	: 3
Quote number	: EN/002/05		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits



NATA Accredited Laboratory 825

This document is issued in
accordance with NATA
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Accredited for compliance with
ISO/IEC 17025.

Signatories

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

Signatories	Position	Accreditation Category
CTPI 49-Sch4	Senior Analyst	Organics

Environmental Division Brisbane
Part of the **ALS Laboratory Group**
32 Shand Street Stafford QLD Australia 4053
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Page : 2 of 4
Work Order : EB0713039
Client : GOLDER ASSOCIATES
Project : 077683504 (LOT 2) INDUSTRIAL-LOT 2 DRURY LANE



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been preformed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for process purposes.

Key : CAS Number = Chemistry Abstract Services number

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

- Semi-volatile TPH: Insufficient sample has been provided for standard analysis for sample BH2. Where applicable LOR values have been adjusted accordingly.

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Page : 3 of 4
 Work Order : EB0713039
 Client : GOLDER ASSOCIATES
 Project : 077683504 (LOT 2) INDUSTRIAL-LOT 2 DRURY LANE



Analytical Results

Sub-Matrix: WATER

				Client sample ID	BH 1	BH 2	BH 3		
				Client sampling date / time	07-NOV-2007 15:00	07-NOV-2007 15:00	07-NOV-2007 15:00		
Compound	CAS Number	LOR	Unit		EB0713039-001	EB0713039-002	EB0713039-003		
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	—	20	µg/L		<20	<20	<20	—	—
C10 - C14 Fraction	—	50	µg/L		<50	<50	<50	—	—
C15 - C28 Fraction	—	100	µg/L		100	<100	200	—	—
C29 - C36 Fraction	—	50	µg/L		110	<70	100	—	—
EP080: BTEX									
Benzene	71-43-2	1	µg/L		<1	<1	<1	—	—
Toluene	108-88-3	2	µg/L		<2	<2	<2	—	—
Ethylbenzene	100-41-4	2	µg/L		<2	<2	<2	—	—
meta- & para-Xylene	108-38-3 108-42-3	2	µg/L		<2	<2	<2	—	—
ortho-Xylene	95-47-6	2	µg/L		<2	<2	<2	—	—
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.1	%		118	105	119	—	—
Toluene-D8	2037-26-5	0.1	%		98.3	100	97.4	—	—
4-Bromofluorobenzene	460-00-4	0.1	%		110	104	106	—	—

Release

Page : 4 of 4
Work Order : EB0713039
Client : GOLDER ASSOCIATES
Project : 077683504 (LOT 2) INDUSTRIAL-LOT 2 DRURY LANE



Surrogate Control Limits

Sub-Matrix: WATER

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP030S: TPH(VI)TEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	80	120
Toluene-D8	2037-26-5	88	110
4-Bromofluorobenzene	460-00-4	86	115

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32 SHAND STREET STAFFORD QLD 4053

GOLDER ASSOCIATES PTY LTD

Unit 1 Dalton Centre

Newspaper Place

Maroochydore Qld 4558

Phone: : (07) 54433511

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Order

EB0713039



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Environmental Division

QUALITY CONTROL REPORT

Work Order	: EB0713039	Page	: 1 of 5
Client	: GOLDER ASSOCIATES	Laboratory	: Environmental Division Brisbane
Contact	: CTPI 49-Sch4	Contact	: CTPI 49-Sch4
Address	: P O BOX 5569 MAROOCHYDORE SOUTH QLD AUSTRALIA 4558	Address	: 32 Shand Street Stafford QLD Australia 4053
E-mail	: CTPI 49-@golder.com.au	E-mail	: Services.Brisbane@alsenviro.com
Telephone	: +61 07 5443 3511	Telephone	: +61-7-3243 7222
Facsimile	: +61 07 5443 6645	Facsimile	: +61-7-3243 7218
Project	: 077683504 (LOT 2) INDUSTRIAL-LOT 2 DRURY LANE	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Site	: —	Date Samples Received	: 08-NOV-2007
C-O-C number	: —	Issue Date	: 13-NOV-2007
Sampler	: CK	No. of samples received	: 3
Order number	: MQ 4860	No. of samples analysed	: 3
Quote number	: EN/002/05		

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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits



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ACCREDITATION

NATA Accredited Laboratory 825

This document is issued in
accordance with NATA
accreditation requirements.

Accredited for compliance with
ISO/IEC 17025.

Signatories

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

Signatories	Position	Accreditation Category
CTPI 49-Sch4	Senior Analyst	Organics

Environmental Division Brisbane

Part of the **ALS Laboratory Group**

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Tel. +61-7-3243 7222 Fax. +61-7-3243 7218 www.alsglobal.com

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Page : 2 of 5
Work Order : EB0713039
Client : GOLDER ASSOCIATES
Project : 077683504 (LOT 2) INDUSTRIAL-LOT 2 DRURY LANE



General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been preformed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
 CAS Number = Chemistry Abstract Services number
 LOR = Limit of reporting
 RPD = Relative Percentage Difference
 # = Indicates failed QC

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Page : 3 of 5
 Work Order : EB0713039
 Client : GOLDER ASSOCIATES
 Project : 077683504 (LOT 2) INDUSTRIAL-LOT 2 DRURY LANE



Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR:- No Limit; Result between 10 and 20 times LOR:- 0% - 50%; Result > 20 times LOR:- 0% - 20%.

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method/Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080/074: Total Petroleum Hydrocarbons (QC Lot: 530604)									
EB0712954-002	Anonymous	EP080: C8 - C9 Fraction	—	20	µg/L	Anonymous	Anonymous	Anonymous	Anonymous
EB0713023-006	Anonymous	EP080: C6 - C9 Fraction	—	20	µg/L	Anonymous	Anonymous	Anonymous	Anonymous
EP080/074: Total Petroleum Hydrocarbons (QC Lot: 530616)									
EB0713039-001	BH 1	EP071: C10 - C14 Fraction	—	50	µg/L	<50	<50	0.0	No Limit
		EP071: C15 - C28 Fraction	—	100	µg/L	100	300	79.8	No Limit
		EP071: C29 - C36 Fraction	—	50	µg/L	110	110	0.0	No Limit
EB0713039-003	BH 3	EP071: C10 - C14 Fraction	—	50	µg/L	<50	<50	0.0	No Limit
		EP071: C15 - C28 Fraction	—	100	µg/L	200	100	0.0	No Limit
		EP071: C29 - C36 Fraction	—	50	µg/L	100	80	28.5	No Limit
EP080/BTEX (QC Lot: 530604)									
EB0712954-002	Anonymous	EP080: Benzene	71-43-2	1	µg/L	Anonymous	Anonymous	Anonymous	Anonymous
		EP080: Toluene	108-88-3	2	µg/L	Anonymous	Anonymous	Anonymous	Anonymous
		EP080: Ethylbenzene	100-41-4	2	µg/L	Anonymous	Anonymous	Anonymous	Anonymous
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	Anonymous	Anonymous	Anonymous	Anonymous
		EP080: ortho-Xylene	106-42-3	2	µg/L	Anonymous	Anonymous	Anonymous	Anonymous
EB0713023-006	Anonymous	EP080: Benzene	71-43-2	1	µg/L	Anonymous	Anonymous	Anonymous	Anonymous
		EP080: Toluene	108-88-3	2	µg/L	Anonymous	Anonymous	Anonymous	Anonymous
		EP080: Ethylbenzene	100-41-4	2	µg/L	Anonymous	Anonymous	Anonymous	Anonymous
		EP080: meta- & para-Xylene	108-38-3	2	µg/L	Anonymous	Anonymous	Anonymous	Anonymous
		EP080: ortho-Xylene	106-42-3	2	µg/L	Anonymous	Anonymous	Anonymous	Anonymous

Page : 4 of 5
 Work Order : EB0713039
 Client : GOLDER ASSOCIATES
 Project : 077683504 (LOT 2) INDUSTRIAL-LOT 2 DRURY LANE



Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: WATER

		Method Blank (MB) Report			Laboratory Control Spike (LCS) Report			
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%)	
							Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 530601)								
EP080: C6 - C9 Fraction	---	20	µg/L	<20	260 µg/L	110	73	131
EP080/071: Total Petroleum Hydrocarbons (QCLot: 530618)								
EP071: C10 - C14 Fraction	---	50	µg/L	<50	600 µg/L	73.8	49	128
EP071: C15 - C28 Fraction	---	100	µg/L	<100	1020 µg/L	90.6	58	130
EP071: C29 - C36 Fraction	---	50	µg/L	<50	---	---	---	---
EP080: BTEX (QCLot: 530601)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	91.6	73	129
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	93.2	75	127
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	98.3	74	126
EP080: meta- & para-Xylene	108-38-3	2	µg/L	<2	10 µg/L	96.4	71	129
	106-42-3							
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	102	75	127

Release

Page : 5 of 5
 Work Order : EB0713039
 Client : GOLDER ASSOCIATES
 Project : 077683504 (LOT 2) INDUSTRIAL-LOT 2 DRURY LANE



Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: WATER

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
					MS	Low	High
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number				
EP080/071: Total Petroleum Hydrocarbons (QCLot: 530601)							
EB0712954-003	Anonymous	EP080: C6 - C9 Fraction	---	Anonymous	Anonymous	Anonymous	Anonymous
EP080/071: Total Petroleum Hydrocarbons (QCLot: 530618)							
EB0713039-002	BH 2	EP071: C10 - C14 Fraction	---	524 µg/L	77.5	70	130
		EP071: C15 - C28 Fraction	---	840 µg/L	118	70	130
EP080: BTEX (QCLot: 530601)							
EB0712954-003	Anonymous	EP080: Benzene	71-43-2	Anonymous	Anonymous	Anonymous	Anonymous
		EP080: Toluene	108-88-3	Anonymous	Anonymous	Anonymous	Anonymous

Release



Environmental Division

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive Report

Work Order : **EB0713039**

Client : **GOLDER ASSOCIATES**

Contact : **CTPI 49-Sch4**

Address : **P O BOX 5569 MAROOCHYDORE
SOUTH QLD AUSTRALIA 4558**

E-mail : **CTPI 49@golder.com.au**

Telephone : **+61 07 5443 3511**

Facsimile : **+61 07 5443 6645**

Project : **077683504 (LOT 2) INDUSTRIAL-LOT
2 DRURY LANE**

Order number : **MQ 4860**

C-O-C number : **---**

Site : **---**

Sampler : **CK**

Laboratory : **Environmental Division Brisbane**

Contact : **CTPI 49-Sch4**

Address : **32 Shand Street Stafford QLD Australia
4053**

E-mail : **Services.Brisbane@alsenviro.com**

Telephone : **+61-7-3243 7222**

Facsimile : **+61-7-3243 7218**

Page : **1 of 2**

Quote number : **ES20050035 (EN/002/05)**

QC Level : **NEPM 1999 Schedule B(3) and ALS
QCS3 requirement**

Dates

Date Samples Received : **08-NOV-2007**

Client Requested Due Date : **15-NOV-2007**

Issue Date : **09-NOV-2007 10:36**

Scheduled Reporting Date : **19-NOV-2007**

Delivery Details

Mode of Delivery : **Carrier**

No. of coolers/boxes : **1 LARGE**

Security Seal : **Intact.**

Temperature : **12.4 C**

No. of samples received : **3**

No. of samples analysed : **3**

General Comments

- This report contains the following information:
 - Sample Container(s)/Preservation Non-Compliances
 - Summary of Sample(s) and Requested Analysis
 - Requested Deliverables
- **Samples received in appropriately pretreated and preserved containers.**
- **Sample(s) have been received within recommended holding times.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Please direct any queries related to sample condition / numbering / breakages to Maggie Kahl.
- Analytical work for this work order will be conducted at ALS Brisbane.
- Sample Disposal - Aqueous (14 days), Solid (90 days) from date of completion of work order.

Issue Date : 09-NOV-2007 10:36
Page : 2 of 2
Work Order : EB0713039
Client : GOLDER ASSOCIATES



Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- No sample container / preservation non-compliance exist.

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for process purposes.

Matrix: **WATER**

Laboratory sample ID	Client sampling date / time	Client sample ID	WATER - W-04 TPH/BTEX
EB0713039-001	07-NOV-2007 15:00	BH 1	✓
EB0713039-002	07-NOV-2007 15:00	BH 2	✓
EB0713039-003	07-NOV-2007 15:00	BH 3	✓

Requested Deliverables

CTPI 49-Sch4

- A4 - AU Certificate of Analysis - NATA
- A4 - AU Interpretive Quality Control Report - No Anonymous
- A4 - AU Quality Control Report - NATA - No Anonymous
- A4 - AU Sample Receipt Notification - Environmental
- Default - Chain of Custody
- EDI Format - GHDNEW

THE ACCOUNTS PAYABLE (MRCHYDRE)

- A4 - AU Tax Invoice

Email
Email
Email
Email
Email
Email

CTPI 49-@golder.com.au
@golder.com.au
@golder.com.au
@golder.com.au
@golder.com.au
@golder.com.au

Email

apmaroochydore@golder.com.au

Appendix D
Important Information About Your Environmental Site
Assessment

Important Information About Your

Environmental Site Assessment

These notes have been prepared by Golder Associates Pty Ltd using guidelines prepared by ASFE; The Association of Engineering Firms Practising in the Geosciences, of which Golder Associates Pty Ltd is a member. They are offered to help you in the interpretation of your Environmental Site Assessment (ESA) report.

Reasons For Conducting An ESA

ESA's are typically, though not exclusively carried out in the following circumstances :

- as pre-acquisition assessments, on behalf of either purchaser or vendor, when a property is to be sold;
- as pre-development assessments, when a property or area of land is to be redeveloped or have its use changed, for example, from a factory to a residential subdivision;
- as pre-development assessments of greenfield sites, to establish "baseline" conditions and assess environmental, geological and hydrogeological constraints to the development of, for example, a landfill; and
- as audits of the environmental effects of an ongoing operation.

Each of these circumstances requires a specific approach to the assessment of soil and groundwater contamination. In all cases, however, the objective is to identify and if possible quantify the risks which unrecognised contamination poses to the proposed activity. Such risks may be both financial, for example, clean-up costs or limitations on site use, and physical, for example, health risks to site users or the public.

The Limitations of An ESA

Although the information provided by an ESA can reduce exposure to such risks, no ESA, however diligently carried out, can eliminate them. Even a rigorous professional assessment may fail to detect all contamination on a site. Contaminants may be present in areas that were not surveyed or sampled, or may migrate to areas which showed no signs of contamination when sampled.

An ESA Report Is Based On A Unique Set of Project Specific Factors

Your environmental report should not be used :

- When the nature of the proposed development is changed, for example, if a residential development is proposed instead of a commercial one;

- When the size or configuration of the proposed development is altered;
- when the location or orientation of the proposed structure is modified;
- When there is a change of ownership; or
- For the application to an adjacent site.

To help avoid costly problems, refer to your consultant to determine how any factors which have changed subsequent to the date of the report may affect its recommendations.

ESA "Findings" Are Professional Estimates

Site assessment identifies actual subsurface conditions only at those points where samples are taken, when they are taken. Data derived through sampling and subsequent laboratory testing are interpreted by geologists, engineers or scientists who then render an opinion about overall subsurface conditions, the nature and extent of contamination, its likely impact on the proposed development and appropriate remediation measures. Actual conditions may differ from those inferred to exist, because no professional, no matter how qualified, and no subsurface exploration program, no matter how comprehensive, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than a report indicates. Actual conditions in areas not sampled may differ from predictions. Nothing can be done to prevent the unanticipated, but steps can be taken to help minimise its impact. For this reason, owners should retain the services of their consultants through the development stage, to identify variations, conduct additional tests which may be needed, and to recommend solutions to problems encountered on site.

Subsurface Conditions Can Change

Subsurface conditions are changed by natural processes and the activity of man. Because an ESA report is based on conditions which existed at the time of subsurface exploration, decisions should not be based on an ESA report whose adequacy may have been affected by time. Speak with the consultant to learn if additional tests are advisable.

ESA Services Are Performed For Specific Purposes And Persons

Every study and ESA report is prepared in response to a specific Brief to meet the specific needs of specific individuals. A report prepared for a consulting civil engineer may not be adequate for a construction contractor, or even some other consulting civil engineer. A report should not be used by other persons for any purpose, or by the client for a different purpose. No individual other than the client should apply a report even apparently for its intended purpose without first conferring with the consultant. No person should apply a report for any purpose other than that originally contemplated without first conferring with the consultant.

An ESA Report Is Subject To Misinterpretation

Costly problems can occur when design professionals develop their plans based on misinterpretations of an ESA. To help avoid these problems, the environmental consultant should be retained to work with appropriate design professionals to explain relevant findings and to review the adequacy of their plans and specifications relative to contamination issues.

Logs Should Not Be Separated From The Engineering Report

Final borehole or test pit logs are developed by environmental scientists, engineers or geologists based upon their interpretation of field logs (assembled by site personnel) and laboratory evaluation of field samples.

Only final logs are customarily included in our reports. These logs should no under any circumstances be redrawn for inclusion in site remediation or other design drawings, because drafters may commit errors or omissions in the transfer process. Although photographic reproduction eliminates this problem, it does nothing to minimise the possibility of contractors misinterpreting the logs during bid preparation. When this occurs, delays, disputes and unanticipated costs are the all-too-frequent result.

To reduce the likelihood of boring log misinterpretation, the complete report must be available to persons or organisations involved in the project, such as contractors, for their use. Those who do not provide such access may proceed under the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing all the available information to persons and organisations such as contractors helps prevent costly construction problems and the adversarial attitudes which may aggravate them to disproportionate scale.

Read Responsibility Clauses Closely

Because an ESA is based extensively on judgement and opinion, it is necessarily less exact than other disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, model clauses have been developed for use in written transmittals. These are not exculpatory clauses designed to foist liabilities onto some other party. Rather, they are definitive clauses which identify where your consultant's responsibilities begin and end. Their use helps all parties involved recognise their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your ESA report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

Golder Associates Pty Ltd

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REPORT ON

**STAGE 1 PRELIMINARY SITE INVESTIGATION
LOT 2 ON SP136512
DRURY LANE
DUNDOWRAN, QUEENSLAND 4655**

Submitted to:

Radway Pty Ltd
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November 2007

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Page 110 of 337



ASSOCIATION OF CONSULTING
ENGINEERS AUSTRALIA

EXECUTIVE SUMMARY

In February 2006 Golder Associates Pty Ltd (Golder) undertook a Preliminary Contamination Assessment for due diligence purposes at Lot 2 on SP136512 Drury Lane (the site), Dundowran, Queensland (refer Figure 1). In August 2007, Radway Pty Ltd commissioned Golder Associates Pty Ltd (Golder) to update the assessment to complete a Stage 1 Preliminary Site Investigation (contamination) report to be submitted with a Development Application to redevelop this site as an industrial subdivision.

The conclusions drawn from this Stage 1 PSI are as follows:

- The site history indicates that Lot 2 SP136512 was historically used for sand extraction. Following sand extraction, filling was undertaken across the majority of the site to return it to about its original level. The uncontrolled filling of the site resulted in Lot 2 SP136512 been listed on the EMR for Notifiable Activity No.20: Landfill – disposing of waste. Potential contamination sources identified by the site history and inspection was uncontrolled fill. The site has not been used for disposal of putrescibles or domestic waste.
- Demolition wastes including concrete, bitumen, bricks, and gravel were observed in stockpiles located across the central part of the site. It should be noted that concrete pieces were greater than 300 mm and as a result do not meet the EPA "Inert Waste" Criteria. There was no evidence of sheeting fragments in stockpiles on the exposed fill surface or in shallow samples collected from the central part of the site. Limited chemical testing for potential contaminants (metals, TPH, BTEX, PCB, Phenols, PAH, and OC/OP's) in surface soil samples from within the uncontrolled fill did not detect concentrations of these potential contaminants that would represent a human health or environmental risk. However, the vertical and horizontal extent of the uncontrolled fill has not been sufficiently delineated and as such, potential contaminants within the uncontrolled fills have not been sufficiently characterised. Additional, statistically robust, sampling and analysis of the uncontrolled fills would be required to adequately characterise them and confirm their contamination status.

In order to confirm the suitability of the site for the proposed use, a Stage 2 Investigation is recommended. The Stage 2 investigation should include:

- Assessment of the groundwater regime and quality.
- Further investigation to evaluate the vertical and horizontal extents of the uncontrolled fill.
- Collection and analysis of uncontrolled fills for potential contaminants to allow a robust assessment of risk to future industrial users.

Following completion of a detailed investigation (Stage 2 Investigation), a site management plan / remediation action plan will be developed outlining requirements to make the site suitable for future industrial use.

Release

TABLE OF CONTENTS

SECTION	PAGE
1.0 INTRODUCTION	1
2.0 SITE DESCRIPTION	1
2.1 Property Details	1
2.2 Description of Development	1
2.3 Geology	2
2.4 Topography & Surface Drainage	2
2.5 Hydrogeology	2
3.0 SITE HISTORY	3
3.1 Historical Information Sources	3
3.2 Aerial Photograph Review	3
3.3 Ownership	4
3.4 Search of EMR & CLR	5
3.5 Interviews	5
3.6 Site Inspection	6
3.7 Potential for Contamination Based on Site history	6
4.0 FIELD INVESTIGATION	6
4.1 General	6
4.2 Sampling and Handling Procedures	7
4.3 Laboratory Analysis	7
5.0 ASSESSMENT CRITERIA	8
5.1 Soil Assessment Criteria	8
6.0 DISCUSSION OF RESULTS	8
6.1 Subsurface Conditions	8
6.2 Uncontrolled Fill	9
6.2.1 Organics	9
6.2.2 Inorganics	9
6.3 QA/QC results	9
7.0 CONCLUSIONS	10
7.1 Conclusions	10
7.2 Recommendations	11
8.0 LIMITATIONS OF THIS REPORT	11
9.0 REFERENCES	12

Release

LIST OF TABLES

Table 1	Analysis Program and Time Frame
Table 2	Summary of Analytical Results Inorganics
Table 3	Summary of Analytical Results Chlorinated Hydrocarbons
Table 4	Summary of Analytical Results Phenolic Compounds
Table 5	Summary of Analytical Results Polynuclear Aromatic Hydrocarbons
Table 6	Summary of Analytical Results Total Petroleum Hydrocarbons, Monocyclic Aromatic Hydrocarbons
Table 7	Summary of Analytical Results Organochlorine Pesticides
Table 8	Summary of Analytical Results Organophosphorus Pesticides
Table 9	Quality Assurance / Control – Summary of Analytical Results

LIST OF FIGURES

Figure 1	Site Locality Plan
Figure 2	Soil Sampling Locations

LIST OF APPENDICES

Appendix A	EMR/CLR Searches, Registered Plan and Certificates of Title
Appendix B	Field Investigation Results
Appendix C	Certificate of Analysis & Chain of Custody Documents
Appendix D	“Important Information About Your Environmental Site Assessment”

1.0 INTRODUCTION

In February 2006 Golder Associates Pty Ltd (Golder) undertook a Preliminary Contamination Assessment for due diligence purposes at Lot 2 on SP136512 Drury Lane (the site), Dundowran, Queensland (refer Figure 1). In August 2007, Radway Pty Ltd commissioned Golder Associates Pty Ltd (Golder) to update the assessment to complete a Stage 1 Preliminary Site Investigation (contamination) report to be submitted with a Development Application to redevelop this site as an industrial subdivision.

This report has been prepared to provide site history information and limited, targeted sampling to identify potential contamination sources in line with the requirements of a Stage 1 Preliminary Site Investigation (PSI) as outlined in the *Draft Guidelines for the Assessment & Management of Contaminated Land in Queensland* published by the Queensland Department of Environment, May 1998 (Reference 1).

2.0 SITE DESCRIPTION

2.1 Property Details

Details of the property are summarised below. The relevant current certificates of title and registered plans are presented in Appendix A.

Property Description	Details
Owners	Radway Pty Ltd
Lot and Plan	Lot 2 on SP136512, County of March, Parish of Vernon
Area	Approximately 9.174 Hectares
Current Zoning	Industrial
Local Government	Hervey Bay City

The site is located on the western side of Drury Lane (a gravel surfaced road). The site is bounded to the west by a large acreage property that shown signs of past sand extraction works, to the south by a wide drainage channel, and to the north by vacant land and an existing drainage channel. One of the three properties to the north comprises the Drury Sand Plant works which is still in operation.

2.2 Description of Development

Although the proposed industrial subdivisional layout had not been finalised at the time of reporting, we understand that extensive filling will be required to raise the existing site levels.

2.3 Geology

Available geological information¹ indicates that the site is underlain by Quaternary (Holocene) age "*beach ridges: sand, shelly sand, minor gravel*", possibly overlying slightly older (Pleistocene) sediments of "*Undifferentiated coastal plains: sand, silt, mud*". The Quaternary sediments are underlain at depth by the early Cretaceous age Maryborough Formation containing "*mudstone, siltstone, shale, sandstone*".

For most of the site, the upper sand (Holocene aged layer) appears to have been removed as part of previous sand extraction works and replaced with uncontrolled fill.

2.4 Topography & Surface Drainage

The regional topography is generally low and flat comprising large tracts of Wallum heath and ti-tree swamps. The nearest creek is approximately 2 km north (Eli Creek) and the ocean is approximately 500m beyond Eli Creek. A manmade lake is located approximately 300m to the north east of the site.

At the time of the investigation, the site showed the effects of past sand extraction work and filling. The central portion of the site was about 2 m to 3 m higher than the northern and southern portions of the site. Much of the site is variable in slope, with elevated areas of fill materials. It appears that majority of the site has been filled. At the time of the investigation, the south-eastern portion of the site was lowlying and inundated with water. During the 2006 investigation the site was covered in thick grass and scattered shrubs. However, during the 2007 investigation most of the site covered in bare earth with minimal grass cover due to recent excavation works.

Surface drainage generally follows the contours towards the low lying areas in the eastern and southern boundaries of the site. The site is generally well drained, with stormwater run-off expected to be shed as sheet flow.

2.5 Hydrogeology

Groundwater was not encountered during the Stage 1 PSI, however a acid sulphate soils investigation (refer Golder Report 077683504(AE), dated September 2007) indicated groundwater to be between 2.2m to 3.7m below existing ground level. Groundwater depths varied and were dependent on site topography. A reticulated supply system provides potable water for the Dundowran region. The possible use of groundwater within the area and surrounding suburbs is expected to be limited to irrigation.

Given past activities and uncontrolled filling on the site, we recommend that groundwater monitoring is undertaken as part of a Stage 2 Investigation at the site.

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3.0 SITE HISTORY

3.1 Historical Information Sources

The information detailed below was reviewed to assess the history of the site and the surrounding area:

Historical Information Sources

Source	Location of Source	Years or Date of Information Source	Details
Aerial Photographs	Department of Natural Resources & Mines (DNR&M) Google Earth	1948 1966 1986 2003 2004	Pialba-Sandy, Run 2 frame 5093 Pialba, Run 2, frame 40 Hervey Bay, Run 2, frame 81 Pailba, Run 9, frame 154
Titles Search / Deeds	Department of Natural Resources & Mines (DNR&M)	Current Title and Historical Titles back to 1914	
Interview		Mr. John McGowan	Representative of Hervey Bay City Council
EMR/CLR	Environmental Protection Agency (QLD)	2007	

3.2 Aerial Photograph Review

A summary of our observations based on the aerial photography review is provided below.

Aerial Photograph Review

Photograph Date	Description of Immediate Site	Description of Surrounding Area
1948	The site appears to be covered in dense vegetation.	Surrounding areas also covered in dense vegetation
1966	The site appears to be very similar to the 1948 aerial photograph.	Apart from minor cropping to the east of the site, the remaining area surrounding the site appears to be similar to the 1948 aerial photograph.
1986	60% of the site appears to be cleared with the remaining 40% (southern part of site) still covered in dense vegetation.	The now appears to be extensive clearing to the west and north of the site. Dense vegetation and minor cropping still exist to the east of the site. What appears to be drain is now evident immediately south of the site.
2003	70% of the site appears to be cleared with the remaining 30% (southern part of site) still covered in dense vegetation.	Extensive clearing to the west and north of the site is still evident. Dense vegetation still exists to the east of the site. What appears to be industrial sheds are now evident to the south of the site.

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Photograph Date	Description of Immediate Site	Description of Surrounding Area
2004	The site appears similar to the 2003 aerial photograph	The surrounding areas appear similar to the 2003 aerial photograph

3.3 Ownership

Lot 2 on SP136512 is currently owned by Radway Pty Ltd. Current and Historical Titles were obtained from the Department of Natural Resources and Mines. A summary of previous owners, based on a review of the titles information, is provided in Table 3. Copies of relevant information obtained are attached in Appendix A including current registered plans.

OWNERSHIP HISTORY – LOT 2 on SP136512

OWNER	PARCEL	PERIOD
Radway Pty Ltd	Lot 2 on SP136512	June 2007 to present
Hervey bay City Council	Lot 2 on SP136512	April 2000 to June 2007
	Lot 2 on RP230596 subdivided into Lots 2 and 10 on SP136512	October 2000
	Lot 2 on RP230596	December 1993 to October 2000
CTPI 49-Sch4	Lot 2 on RP230596	April 1990 to December 1993
Portwell Pty Ltd	Lot 2 on RP230596	March 1990 to April 1990
	Lot 4 on RP190323 subdivided into Lots 1 to 3 on RP230596	March 1990
	Lot 4 on RP190323	October 1988 to March 1990
CTPI 49-Sch4	Lot 4 on RP190323	July 1984 to October 1988
	Lot 2 on RP177006 subdivided into Lots 2 to 4 on RP190323	June 1984
	Lot 2 on RP177006	September 1982 to June 1984
CTPI 49-Sch4	Lot 2 on RP177006	September 1981 to September 1982
	Portion 45 subdivided into Lots 1 and 2 on RP177006	September 1981
	Portion 45	June 1948 to September 1981

CTPI 49-Sch4	Portion 45	November 1935 to June 1948
CTPI 49-Sch4	Portion 45	March 1914 (Deed of Grant) to November 1935

3.4 Search of EMR & CLR

A search of the Environmental Management Register (EMR) indicates that Lot 2 on SP136512 is listed on the Environmental Management Register (EMR). The site been subdivided from Lot 2 on RP230596 which was originally listed on the EMR for - Notifiable Activity No.20: LANDFILL – disposing of waste.

A search of the Contaminated Land Register (CLR) indicated that Lot 2 on SP136512 was not listed on the Contaminated Land Register. A copy of the search results from the Queensland Environmental Protection Agency is presented in Appendix A.

3.5 Interviews

An interview was conducted with Mr John McGowan (representative from Hervey Bay City Council – City Works department) on 18 January 2006. To Mr McGowan's knowledge the site had been used by Council to dispose of materials associated with road construction throughout the Council area. Mr McGowan indicated that this included materials excavated during the construction of footpaths.

Mr McGowan had only knowledge of the site from 2001 and he believed that the site had been used as disposal site for similar materials prior to this time. To his knowledge no putrescibles wastes were disposed of at the site. Mr McGowan also said that signs, saying no dumping, and fences had been installed at the site to prevent unauthorised persons from dumping.

An interview was conducted with CTPI 49-Sch4 (owner of Drury Sand Plant works) on the 14 November 2007. Findings from this interview are summarised below:

- According to CTPI 49-Sch4 the site has been used for sand extraction from the late 1960's to the late 1990's. The CTPI 49-Sch4 were conducting all sand extraction works.
- According to CTPI 49-Sch4 the site was undisturbed prior to 1966. Vegetation has progressively been removed prior to sand extraction.
- CTPI 49-Sch4 indicated that the site had received uncontrolled fill during the 1980's and 1990's. CTPI 49-Sch4 recalled that the source of uncontrolled fill was mostly road construction waste from the local council including concrete, steel, wood and bitumen.
- According to CTPI 49-Sch4 there has never been any fuel storage onsite.

3.6 Site Inspection

A site inspection was conducted by an environmental scientist on 17 July 2007.

The site was accessed via a dirt track from Drury Lane. The central portion of the site was about 2 m to 3 m higher than the northern and southern portions of the site. Several large stockpiles and elevated areas of fill materials including building rubble and road wastes were located in the central portion of the site. Concrete, bitumen, bricks and gravel were observed in stockpiles. It should be noted that concrete pieces were observed within these stockpiles of greater than 300 mm in diameter.

It appeared that a large portion of the site has been filled. At the time of the inspection, the south-eastern portion of the site was low-lying and inundated with water. Most of the site comprised bare earth with minimal grass cover due to recent excavation works. The south-east corner of the site contained dense bushland and does not appear to have been disturbed previously.

No vegetation stress, staining or odours (that may indicate the presence of possible contamination) were observed during the site inspection.

3.7 Potential for Contamination Based on Site history

The site is listed on the EMR for the Notifiable Activity No.20: Landfill – disposing of waste.

Based on available historical information and our site inspection, potential contamination sources are summarised below:

Potential Contamination Source	Potential Contaminant
Uncontrolled fill	Hydrocarbons (TPH & BTEX), PAH Phenols, PCB, Metals (As, Cd, Cr, Cu, Pb, Ni, Hg, Zn), organochlorine and organophosphorous pesticides and asbestos

4.0 FIELD INVESTIGATION

4.1 General

A field investigation was conducted on 19 January 2006 and consisted drilling ten hand auger holes (S1 to S10) to a depth of 0.1 m below the existing ground surface across the central part of the site.

Soil investigation locations are shown on Figure 2.

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An environmental scientist from Golder Associates positioned the hand auger holes and recovered soil samples.

4.2 Sampling and Handling Procedures

Soil samples were collected by experienced personnel in accordance with standard procedures documented in Golder Associates Technical Procedures. These procedures generally include decontamination, sample handling, sample storage and chain of custody documentation. A brief outline of key procedures is provided below:

- All equipment used in the sampling process was decontaminated on arrival at site and prior to collection of each sample. Decontamination included the scrubbing and washing of equipment with a biodegradable phosphate free detergent, followed by washing in potable water and then rinsing with de-ionised water.
- Sample containers appropriate for the analysis proposed were supplied by the testing laboratories. Where required, appropriate preservatives were placed in containers by the laboratory prior to shipment to Golder Associates. Sample containers were marked with a unique sample number, the sample location, the sample depth, date and Golder Associates' project number.
- Samples requiring organic analysis were immediately placed in airtight containers supplied by the testing laboratory and then placed into a chilled insulated esky for transportation to the laboratory. If required, samples were stored overnight in a refrigerator at Golder Associates Maroochydore office.
- Chain of custody and analysis request forms were completed and sent with soil samples to the testing laboratory.
- Nitrile gloves were worn at all times and sampling procedures used were aimed at preventing cross-contamination of samples.

4.3 Laboratory Analysis

All ten soil samples collected during the investigation were selected for laboratory analysis. The ten soil samples were analysed for heavy metals (arsenic, cadmium, chromium, copper, nickel, lead, zinc, and mercury), total petroleum hydrocarbons (TPH), benzene toluene ethylbenzene, and xylenes (BTEX), polycyclic aromatic hydrocarbons (PAH), phenols, polychlorinated biphenyls (PCBs) and organochlorine and organophosphorus pesticides testing. As no fragments of fibrous sheeting were detected, sampling for asbestos was not conducted during the Stage 1 investigation. One blind duplicate sample was also collected and analysed for quality assurance/control purposes.

The analysis program and time frame are presented in Table 1.

Laboratory analyses were conducted by Australian Laboratory Services Pty Ltd (ALS). ALS is NATA accredited for the tests conducted. The laboratory test results are summarised in Tables 2 to 8. Quality Assurance/Control results are summarised in Table 9.

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Laboratory certificates of analysis and chain of custody documentation are presented in Appendix C.

5.0 ASSESSMENT CRITERIA

5.1 Soil Assessment Criteria

Contaminated land in Queensland is managed on a risk based approach assessed on suitability for a specified end land-use. Under this risk-based process, the potential risk to the environment and human health need to be assessed.

To evaluate the level of risk, the results of chemical analyses on soil samples collected during the field investigation were compared with published criteria. The main criteria used in this report are presented in the *Draft Guidelines for Assessment and Management of Contaminated Land in Queensland*, May 1998 (Reference 1), and for hydrocarbons a draft internal guideline issued in 1999 by EPA's Contaminated Land Unit (Reference 2).

Contaminant concentrations below Queensland Environmental Investigation Threshold Levels (EILs) are generally accepted as indicating negligible potential environmental impact. Contaminant concentrations above these EILs indicate that impacted soils may need to be removed or site specific assessment of their environmental impact is required.

Current Queensland Guidelines (Reference 1) also provide some Health Based Investigation Threshold Levels (HILs). Contaminant concentrations which exceed these levels may represent a threat to human health and require specific assessment of risk. For this site the "F" type exposure setting (Commercial/Industrial – includes premises such as shops and offices as well as factories and industrial sites) has been considered. Where contaminant concentrations are below the HIL then the risk to human health is considered to be negligible. Where contaminant concentrations exceed the HIL, they may represent a risk to human health and soil removal or a more specific assessment of risk may be required.

Based on the above, the adopted assessment criteria are listed in Tables 2 to 8.

6.0 DISCUSSION OF RESULTS

6.1 Subsurface Conditions

The subsurface conditions encountered within the uncontrolled fill comprised silty sandy clay fill to depths of 0.1 m (maximum depth of investigation). There was no evidence of sheeting fragments within the stockpiles, on the fill surface or in materials exposed during sampling. No groundwater was encountered during the limited drilling.

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6.2 Uncontrolled Fill

6.2.1 Organics

Soil samples S1 to S10 were analysed for OC/OP's, TPH, BTEX, PAH's, PCB'S and phenols.

Organochlorine and organophosphorus pesticide, TPH, BTEX, PCB and phenol concentrations in all soil samples analysed for these parameters were below laboratory detection levels and the environmental assessment criteria.

PAH concentrations in all soil samples analysed for these parameters were below laboratory detection levels and the health based assessment criteria for industrial land use.

6.2.2 Inorganics

Soil samples S1 to S10 were analysed for a suite of metals – arsenic, cadmium, chromium, copper, lead, nickel, zinc and mercury.

Soil samples S8 0.1.m revealed a concentration of arsenic (22mg/kg) marginally exceeding the environmental assessment criterion but well below the health based assessment criterion. The concentrations detected were well below the NEPM hotspot criterion of 2.5 times the (environmental) assessment criterion and therefore this soil sample is not considered to represent a significant environmental risk.

Soil samples S10 0.1.m revealed a concentration of nickel (90mg/kg) exceeding the environmental assessment criterion but well below the health based assessment criterion. The concentrations detected were well below the NEPM hotspot criterion of 2.5 times the (environmental) assessment criterion and therefore this soil sample is not considered to represent a significant environmental risk.

Metals concentrations in all other soil samples analysed for these parameters were below the environmental assessment criteria.

6.3 QA/QC results

The results of QA and QC testing have been assessed in terms of Relative Percent Difference (RPD). The QA/QC results are summarised in Table 9.

The results of blind duplicate samples and testing have been assessed in terms of Relative Percent Difference (RPD). One duplicate sample was analysed and assessed for a metals suite. The highest RPD's value is shown below:

- S8 RPD value of 150% (Nickel). This type of variation is not uncommon at the low concentrations detected and is considered to be associated with sample heterogeneity rather than sampling error.

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- S8 RPD value of 75% (Arsenic). This type of variation is not uncommon at the low concentrations detected and is considered to be associated with sample heterogeneity rather than sampling error.
- S8 RPD value of 66% (Zinc). This type of variation is not uncommon at the low concentrations detected and is considered to be associated with sample heterogeneity rather than sampling error.

All blind duplicate sample results except for three (nickel, arsenic, and zinc) were acceptable with RPDs within the acceptable range of <50%. These results are considered to be a function of the heterogeneous distribution of metals in the soil.

Internal QA/QC RPD assessment by the laboratory was acceptable.

Given the above, the laboratory testing results are considered to be representative and acceptable.

7.0 CONCLUSIONS

7.1 Conclusions

The conclusions drawn from this Stage 1 PSI are as follows:

- The site history indicates that Lot 2 SP136512 was historically used for sand extraction. Following sand extraction, filling was undertaken across the majority of the site to return it to about its original level. The uncontrolled filling of the site resulted in Lot 2 SP136512 being listed on the EMR for Notifiable Activity No.20: Landfill – disposing of waste. Potential contamination sources identified by the site history and inspection was uncontrolled fill. The site has not been used for disposal of putrescibles or domestic waste.
- Demolition wastes including concrete, bitumen, bricks, and gravel were observed in stockpiles located across the central part of the site. It should be noted that concrete pieces were greater than 300 mm and as a result do not meet the EPA “Inert Waste” Criteria. There was no evidence of sheeting fragments in stockpiles on the exposed fill surface or in shallow samples collected from the central part of the site. Limited chemical testing for potential contaminants (metals, TPH, BTEX, PCB, Phenols, PAH, and OC/OP's) in surface soil samples from within the uncontrolled fill did not detect concentrations of these potential contaminants that would represent a human health or environmental risk. However, the vertical and horizontal extent of the uncontrolled fill has not been sufficiently delineated and as such, potential contaminants within the uncontrolled fills have not been sufficiently characterised. Additional, statistically robust, sampling and analysis of the uncontrolled fills would be required to adequately characterise them and confirm their contamination status.

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7.2 Recommendations

In order to confirm the suitability of the site for the proposed use, a Stage 2 Investigation is recommended. The Stage 2 investigation should include:

- Assessment of the groundwater regime and quality.
- Further investigation to evaluate the vertical and horizontal extents of the uncontrolled fill.
- Collection and analysis of uncontrolled fills for potential contaminants to allow a robust assessment of risk to future industrial users.

Following completion of a detailed investigation (Stage 2 Investigation), a site management plan / remediation action plan will be developed outlining requirements to make the site suitable for future industrial use.

8.0 LIMITATIONS OF THIS REPORT

This report has been prepared in accordance with the agreement between Radway Pty Ltd and Golder Associates Pty Ltd (Golder Associates). The services performed by Golder Associates have been conducted in a manner consistent with the level of quality and skill generally exercised by members of its profession and consulting practice. No warranty or guarantee of site conditions is intended.

This report is solely for the use of Radway Pty Ltd, Cardno (Qld) Pty Ltd and the Environmental Protection Agency. Any reliance of this report by third parties shall be at such party's sole risk and may not contain sufficient information for purposes of other parties or for other uses. This report shall only be presented in full and may not be used to support any other objective than those set out in the report, except where written approval with comments are provided by Golder Associates.

Attached as Appendix D is a document entitled "Important Information About Your Environmental Site Assessment" which should be read in conjunction with this report. We would be pleased to answer any questions about this important information.

GOLDER ASSOCIATES PTY LTD

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9.0 REFERENCES

DoE (1998), *Draft Guidelines for the Assessment & Management of Contaminated Land in Queensland*, Department of Environment, May 1998.

EPA (1999), *Waste & Technical Services Branch Contaminated Land Unit Draft Internal Guidelines*, January 1999.

Published on DES Disclosure Log
RTI Act 2009

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TABLE 4
ANALYSIS PROGRAM AND TIME FRAME
Lot 2 SP136512, Drury Lane, Stage 1 Investigation

Test Location	Media	Sample Number	Sample Depth (m)	Sampling Date (1)	Laboratory Submission Date	Date of Laboratory Extraction (2)	Analysis	Approx. Holding Time (2)-(1) days	Lowest "Maximum Sample Holding Time" (days)
Uncontrolled Fill Area	Soil	S1	0.1	19/01/2006	20/01/2006	27/01/2006	Metals, PCB, OC/OP'S, Phenols, PAH, TPH/BTEX	8	14
	Soil	S2	0.1	19/01/2006	20/01/2006	27/01/2006	Metals, PCB, OC/OP'S, Phenols, PAH, TPH/BTEX	8	14
	Soil	S3	0.1	19/01/2006	20/01/2006	27/01/2006	Metals, PCB, OC/OP'S, Phenols, PAH, TPH/BTEX	8	14
	Soil	S4	0.1	19/01/2006	20/01/2006	27/01/2006	Metals, PCB, OC/OP'S, Phenols, PAH, TPH/BTEX	8	14
	Soil	S5	0.1	19/01/2006	20/01/2006	27/01/2006	Metals, PCB, OC/OP'S, Phenols, PAH, TPH/BTEX	8	14
	Soil	S6	0.1	19/01/2006	20/01/2006	27/01/2006	Metals, PCB, OC/OP'S, Phenols, PAH, TPH/BTEX	8	14
	Soil	S7	0.1	19/01/2006	20/01/2006	27/01/2006	Metals, PCB, OC/OP'S, Phenols, PAH, TPH/BTEX	8	14
	Soil	S8	0.1	19/01/2006	20/01/2006	27/01/2006	Metals, PCB, OC/OP'S, Phenols, PAH, TPH/BTEX	8	14
	Soil	S9	0.1	19/01/2006	20/01/2006	27/01/2006	Metals, PCB, OC/OP'S, Phenols, PAH, TPH/BTEX	8	14
	Soil	S10	0.1	19/01/2006	20/01/2006	27/01/2006	Metals, PCB, OC/OP'S, Phenols, PAH, TPH/BTEX	8	14
	Soil	S11	0.1	19/01/2006	20/01/2006	27/01/2006	Metals, PCB, OC/OP'S, Phenols, PAH, TPH/BTEX	8	14

Note:

Metals - Arsenic, Cadmium, Chromium, Copper, Lead, Nickel, Zinc, and Mercury
 TPH - Total Petroleum Hydrocarbons
 BTEX - Benzene, Toluene, Ethylbenzene, meta- & para-Xylene
 PAH - Polynuclear Aromatic Hydrocarbons
 OC/OP'S - Organochlorine and Organophosphorus Pesticides
 PCB - Polychlorinated Biphenyls

Client
 Job Title
 Address

Radway Pty Ltd
 Stage 1 Investigation
 Lot 2, Drury Lane, Dundowran



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Table 5
SUMMARY OF ANALYTICAL RESULTS INORGANICS
Lot 2 SP136512, Drury Lane, Stage 1 PSI

Location	Sample	Depth (m)	METALS							
			Arsenic mg/kg	Cadmium mg/kg	Chromium mg/kg	Copper mg/kg	Lead mg/kg	Nickel mg/Kg	Zinc mg/kg	Mercury mg/kg
Uncontrolled Fill Area	S1	0.1	7	<1	12	8	8	24	18	<0.1
	S2	0.1	<5	<1	7	<5	<5	11	13	<0.1
	S3	0.1	7	<1	14	13	<5	39	20	<0.1
	S4	0.1	<5	<1	18	16	<5	51	28	<0.1
	S5	0.1	<5	<1	3	<5	<5	7	10	<0.1
	S6	0.1	<5	<1	2	<5	<5	5	<5	<0.1
	S7	0.1	5	<1	2	<5	<5	<2	<5	<0.1
	S8	0.1	22	<1	15	7	8	14	14	<0.1
	S9	0.1	6	<1	11	6	10	8	17	<0.1
	S10	0.1	<5	<1	14	30	<5	90	44	<0.1
	S11	0.1	10	<1	12	<5	7	<2	7	<0.1
Environmental Investigation Levels ⁽¹⁾			20	3	50	60	300	60	400	1
Industrial/Commercial based Investigation Levels - Level F (Industrial/Commercial) ⁽¹⁾			500	100	500	5000	1500	3000	35000	75

Notes

All results are expressed as mg/kg

(1) Environmental and Industrial/Commercial Investigation Levels from Draft Guidelines for Assessment and Management of Contaminated Land in Queensland, May 1998

Except where indicated, chromium expected as Cr(III)

< Value represents the Laboratory LOR

Figures that are bold underline indicate exceedence of relevant adopted DoE EIL criteria¹

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Address	Lot 2, Drury Lane, Dundowran



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TABLE 6**SUMMARY OF ANALYTICAL RESULTS CHLORINATED HYDROCARBONS****Lot 2 SP136512, Drury Lane, Stage 1 PSI**

			Polychlorinated Biphenyls	
Test Location	Lot Number	Sample Number	Sample Depth (m)	Total PCB
Uncontrolled Fill Area	Lot 2 RP230596	S1	0.1	<0.10
	Lot 2 RP230596	S2	0.1	<0.10
	Lot 2 RP230596	S3	0.1	<0.10
	Lot 2 RP230596	S4	0.1	<0.10
	Lot 2 RP230596	S5	0.1	<0.10
	Lot 2 RP230596	S6	0.1	<0.10
	Lot 2 RP230596	S7	0.1	<0.10
	Lot 2 RP230596	S8	0.1	<0.10
	Lot 2 RP230596	S9	0.1	<0.10
	Lot 2 RP230596	S10	0.1	<0.10
	Lot 2 RP230596	S11	0.1	<0.10
Environmental Investigation Levels(1)				1
Industrial/Commercial based Investigation Levels - Level F (Industrial/Commercial)(1)				50

Notes

All results are expressed as mg/kg unless otherwise specified

(1) Environmental and Commercial/Industrial Based Investigation Levels from Draft Guidelines for Assessment and Management of Contaminated Land in Queensland, May 1998

Figures that are bold underline indicate exceedence of relevant adopted DoE EIL criteria¹

< Value represents the Laboratory LOR

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TABLE 7
SUMMARY OF ANALYTICAL RESULTS PHENOLIC COMPOUNDS

Lot 2 SP136512, Drury Lane, Stage 1 PSI

			*1 Individual Phenolic Compounds					
Test Location	Sample Number	Sample Depth (m)	Phenol	2-Chlorophenol	2-Nitrophenol	2-Methylphenol	Pentachloro phenol	2,4-Dichlorophenol
Uncontrolled Fill Area	S1	0.1	<0.5	<0.5	<0.5	<1.0	<2.0	<0.5
	S2	0.1	<0.5	<0.5	<0.5	<1.0	<2.0	<0.5
	S3	0.1	<0.5	<0.5	<0.5	<1.0	<2.0	<0.5
	S4	0.1	<0.5	<0.5	<0.5	<1.0	<2.0	<0.5
	S5	0.1	<0.5	<0.5	<0.5	<1.0	<2.0	<0.5
	S6	0.1	<0.5	<0.5	<0.5	<1.0	<2.0	<0.5
	S7	0.1	<0.5	<0.5	<0.5	<1.0	<2.0	<0.5
	S8	0.1	<0.5	<0.5	<0.5	<1.0	<2.0	<0.5
	S9	0.1	<0.5	<0.5	<0.5	<1.0	<2.0	<0.5
	S10	0.1	<0.5	<0.5	<0.5	<1.0	<2.0	<0.5
	S11	0.1	<0.5	<0.5	<0.5	<1.0	<2.0	<0.5
Industrial/Commercial based Investigation Levels - Level F (Industrial/Commercial)(1)			42500	-	-	-	-	-

Notes

All results are expressed as mg/kg unless otherwise specified

(1) Environmental and Commercial/Industrial Based Investigation Levels from Draft Guidelines for Assessment and Management of Contaminated Land in Queensland, May 1998

*1 Table shows only common analytes a total of 12 individual Phenolic Compounds were reported. All individual phenols not shown in table were below laboratory detection levels.

< Value represents the Laboratory LOR

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Stage 2 PSI
Lot 2, Drury Lane, Dundowran



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TABLE 8
SUMMARY OF ANALYTICAL RESULTS POLYNUCLEAR AROMATIC HYDROCARBONS

Lot 2 SP136512, Drury Lane, Stage 1 PSI

		*1 Individual Polynuclear Aromatic Hydrocarbons																	
Test Location	Sample Number	Sample Depth (m)	Benzo-a pyrene	Naphth alene	Acenap thylene	Phenan threne	Benz(a) anthrac ene	Benzo(b) flouroanth ene	Benzo(k) flouroanth ene	Indeno(1,2,3.cd)p yrene	Dibenz(a,h) anthra cene	Benzo(g,h,i) peryle ne	Fluorene	Pyrene	Chrysene	Fluoran thene	Acenap hthene	Anthracene	Total PAH
Uncontrolled Fill Area	S1	0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<8
	S2	0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<8
	S3	0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<8
	S4	0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<8
	S5	0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<8
	S6	0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<8
	S7	0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<8
	S8	0.1	0.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	1	0.8	<0.5	<0.5	9.4
	S9	0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<8
	S10	0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<8
	S11	0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<8
Industrial/Commercial based Investigation Levels - Level F (Industrial/Commercial)(1)			5	-									-	-	-	-	-	-	100

Notes

All results are expressed as mg/kg unless otherwise specified

(1) Environmental and Commercial/Industrial Based Investigation Levels from Draft Guidelines for Assessment and Management of Contaminated Land in Queensland, May 1998

*1 Table shows only common analytes a total of 16 individual Polynuclear Aromatic Hydrocarbons were reported. All individual hydrocarbons not shown in table were below laboratory detection levels.

< Value represents the Laboratory LOR

Client Radway Pty Ltd
Job Title Stage 2 PSI
Address Lot 2, Drury Lane, Dundowran



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TABLE 9
SUMMARY OF ANALYTICAL RESULTS TOTAL PETROLEUM HYDROCARBONS, MONOCYCLIC AROMATIC
HYDROCARBONS

Lot 2 SP136512, Drury Lane, Stage 1 PSI

Test Location	Sample Number	Sample Depth (m)	C ₆ -C ₉	C ₁₀ -C ₁₄	C ₁₅ -C ₂₈	C ₂₉ -C ₃₆	Benzene	Toluene	Ethyl Benzene	meta- & para-Xylene	ortho-Xylene
Uncontrolled Fill Area	S1	0.1	<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5
	S2	0.1	<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5
	S3	0.1	<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5
	S4	0.1	<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5
	S5	0.1	<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5
	S6	0.1	<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5
	S7	0.1	<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5
	S8	0.1	<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5
	S9	0.1	<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5
	S10	0.1	<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5
	S11	0.1	<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5
Environmental Investigation Thresholds ⁽¹⁾			100	100	1000	1000	1	7 (total BTEX)			

Notes

All results are expressed as mg/kg unless otherwise specified

(1) Draft Internal Guideline - QLD EPA Contaminated Land Unit, January 1999

< value represents the laboratory LOR

Client Radway Pty Ltd
 Job Title Stage 2 PSI
 Address Lot 2, Drury Lane, Dundowran



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TABLE 10
SUMMARY OF ANALYTICAL RESULTS ORGANOCHLORINE PESTICIDES

Lot 2 SP136512, Drury Lane, Stage 1 PSI

Test Location	Lot Number	Sample Number	Sample Depth (m)	Individual Organochlorine Pesticides*															
				alpha-BHC	beta-BHC	delta-BHC	gamma-Chlordane	alpha-Chlordane	Lindane	Heptachlor	alpha-Endosulfan	beta-Endosulfan	Heptachlor epoxide	Aldrin	Dieldrin	Endrin	DDD	DDE	DDT
Uncontrolled Fill Area	Lot 2 RP230596	S1	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
	Lot 2 RP230596	S2	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
	Lot 2 RP230596	S3	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
	Lot 2 RP230596	S4	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
	Lot 2 RP230596	S5	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
	Lot 2 RP230596	S6	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
	Lot 2 RP230596	S7	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
	Lot 2 RP230596	S8	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
	Lot 2 RP230596	S9	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
	Lot 2 RP230596	S10	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
	Lot 2 RP230596	S11	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
Environmental Investigation Levels ⁽¹⁾				-	-	-	-	-	-	-	-	-	-	0.2		-	0.2		
Industrial/Commercial based Investigation Levels - Level F (Industrial/Commercial) ⁽¹⁾				-	-	-	250		-	50	-	-	-	50		-	1000		

Notes

All results are expressed as mg/kg unless otherwise specified

⁽¹⁾ Environmental and Industrial/Commercial Based Investigation Levels from Draft Guidelines for Assessment and Management of Contaminated Land in Queensland, May 1998

* Table shows only common analytes, a total of 21 individual organochlorine pesticides were reported. All individual pesticides not shown in table were below laboratory detection levels.

< Value represents the Laboratory LOR

Client Radway Pty Ltd
Job Title Stage 2 PSI
Address Lot 2, Drury Lane, Dundowran



Release

TABLE 11
SUMMARY OF ANALYTICAL RESULTS ORGANOPHOSPHORUS PESTICIDES
Lot 2 SP136512, Drury Lane, Stage 1 PSI

Test Location	Lot Number	Sample Number	Sample Depth (m)	Individual Organophosphorus Pesticides*							
				Dichlorvos	Chlorpyrifos	Fenthion	Demeton-S-methyl	Diazinon	Dimethoate	Malathion	Parathion
Uncontrolled Fill Area	Lot 2 RP230596	S1	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
	Lot 2 RP230596	S2	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
	Lot 2 RP230596	S3	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
	Lot 2 RP230596	S4	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
	Lot 2 RP230596	S5	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
	Lot 2 RP230596	S6	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
	Lot 2 RP230596	S7	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
	Lot 2 RP230596	S8	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
	Lot 2 RP230596	S9	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
	Lot 2 RP230596	S10	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
	Lot 2 RP230596	S11	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
Environmental Investigation Levels ⁽¹⁾				-	-	-	-	-	-	-	-

Notes

All results are expressed as mg/kg unless otherwise specified

(1) Draft Guidelines for the Assessment & Management of Contaminated Land in Queensland, May 1998

* Table shows only common analytes a total of 19 individual organophosphorus pesticides were reported. All individual pesticides not shown in table were below laboratory detection levels.

< Value represents the Laboratory LOR



Client
Job Title
Address

Radway Pty Ltd
Stage 2 PSI
Lot 2, Drury Lane, Dundowran

Release

TABLE 12
SUMMARY OF QA/QC ANALYTICAL RESULTS - PRELIMINARY INVESTIGATION

Lot 2 SP136512, Drury Lane, Stage 1 PSI

Sample	Depth (m)	Collect Date	Sample Type	METALS							
				Lead mg/kg	Nickel mg/kg	Arsenic mg/kg	Cadmium mg/kg	Chromium mg/kg	Copper mg/Kg	Zinc mg/kg	Mercury mg/kg
S8	0.1	19/01/2006	soil	8	14	22	<1	15	7	14	<0.1
S11	0.1	19/01/2006	soil	7	<2	10	<1	12	<5	7	<0.1
Relative Percentage Difference Values %				13	150	75	0	22	33	66	0

Notes

a All results are expressed as mg/kg

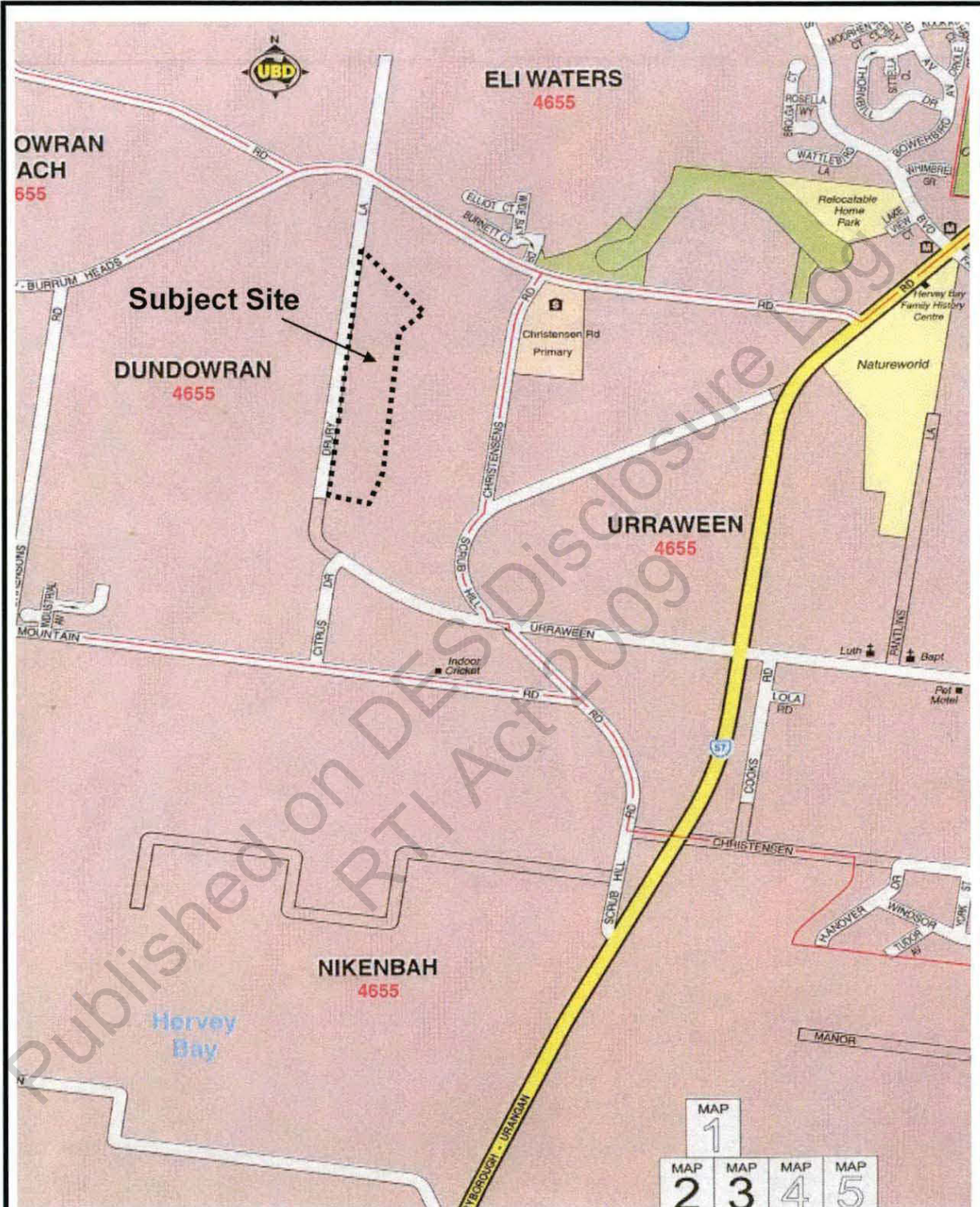
b <LOR = Less than detection limit

c Except where indicated, chromium expected as Cr(III)



Release

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NOTE: THE * BESIDE THE TYPED INITIAL DENOTES THAT THE ORIGINAL DRAWING WAS SIGNED OR INITIALED BY THAT RESPECTIVE PERSON.

	CLIENT Radway Pty Ltd		PROJECT Industrial, Lot 2 Drury Lane, Dundowran	
	DRAWN JM	DATE 3/08/07	TITLE SITE LOCATION	
	CHECKED PKS*	DATE 8/08/07		
	SCALE 1:20,000		PROJECT No 077683504	FIGURE No 1

J:\2006\Environmental\06683021\Tasks 1000-2000-3000\03_FIGURES_DRAWINGS\Fig01.ppt

Release



NOTE:

- 1) DCDB COPYRIGHT THE STATE OF QUEENSLAND (DEPARTMENT OF NATURAL RESOURCES & WATER)
- 2) IMAGERY COPYRIGHT GOOGLE EARTH 2007



CLIENT Radway Pty Ltd		PROJECT Industrial, Lot 2 Drury Lane, Dundowran	
DRAWN JM	DATE 25-07-07	TITLE SOIL SAMPLING LOCATIONS	Release
CHECKED PKS*	DATE 27-07-07		
SCALE As Shown	PROJECT NO. 077683504	Page 136 of 337	REV NO. A3

NOTE: THE * BESIDE THE TYPED INITIALS DENOTES THE ORIGINAL DRAWING ISSUE WAS SIGNED OR INITIALED BY THAT RESPECTIVE PERSON.

Published on DES Disclosure Log
RTI Act 2009

Appendix A

EMR/CLR Searches, Registered Plan and Certificates of Title

Release

QLD ENVIRONMENTAL PROTECTION AGENCY
ENVIRONMENTAL MANAGEMENT REGISTER (EMR)
CONTAMINATED LAND REGISTER (CLR)

Transaction ID: 736269 EMR Site Id: 34287 13 May 2005

This response relates to a search request received for the site:

Lot: 2 Plan: SP136512

EMR RESULT

The above site IS included on the Environmental Management Register.

The site you have searched has been subdivided from the following site, which is included on the EMR. Subdivided new parcels will remain on the EMR unless it can be shown that they are not located near the contaminating activity.

Lot: 2 Plan: RP230596
Address: DUNDOWRAN ROAD
DUNDOWRAN 4655

The site has been subject to the following Notifiable Activity pursuant to section 374 of the *Environmental Protection Act 1994*.

LANDFILL - disposing of waste (excluding inert construction and demolition waste).

CLR RESULT

The above site is NOT included on the Contaminated Land Register.

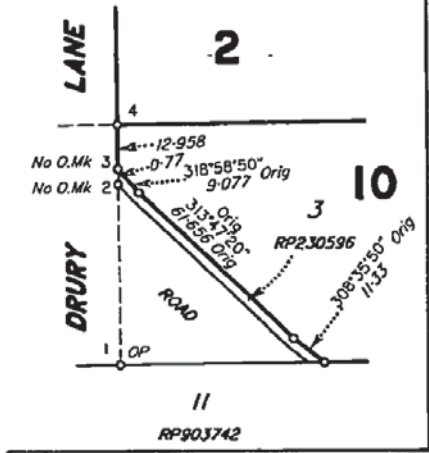
ADDITIONAL ADVICE

Note: The cost of a search increased on 2 July 2004 and is now \$30.70 per lot.

If you have any queries in relation to this search please phone (07) 3227 7370.

Lindi Bowen
Registrar, Contaminated Land Unit

Release

Land Title Act 1994; Land Act 1994
Form 21 Version 2Sheet
1 of
1**DIAGRAM**
Not to Scale**SURVEY PLAN**No O.Mk
O.Ram.Nail
O.Gl.Nail
PM Id**DUNDOWRAN RD****REFERENCE MARKS**

STN	TO	ORIGIN	BEARING	DIST
5	OIP		89°36'	0-964
6	OIP not fd (fil)		269°29'	1-0
7	OIP gone		308°24'20"	1-0
8	O.Ram.Nail in h/wall		313°43'50"	0-897
8	O.Gl.Nail in bit. gone		288°37'30"	2-37
10	OIP		239°30'25"	0-412
11	Pin		41°37'10"	1-5
12	Pin		328°22'	4-818
13	Pin		193°0'	1-004
13	Pin		196°07'	12-923

LANE**2****10****9-174 ha****5-672 ha****10****47****MCH221****DRURY****LANE****2****10****9-174 ha****5-672 ha****10****47****MCH221****DRURY****LANE****2****10****9-174 ha****5-672 ha****10****47****MCH221****DRURY****LANE****2****10****9-174 ha****5-672 ha****10****47****MCH221****DRURY****LANE****2****10****9-174 ha****5-672 ha****10****47****MCH221****DRURY****LANE****2****10****9-174 ha****5-672 ha****10****47****MCH221****DRURY****LANE****2****10****9-174 ha****5-672 ha****10****47****MCH221****DRURY****LANE****2****10****9-174 ha****5-672 ha****10****47****MCH221****DRURY****LANE****2****10****9-174 ha****5-672 ha****10****47****MCH221****DRURY****LANE****2****10****9-174 ha****5-672 ha****10****47****MCH221****DRURY****LANE****2****10****9-174 ha****5-672 ha****10****47****MCH221****DRURY****LANE****2****10****9-174 ha****5-672 ha****10****47****MCH221****DRURY****LANE****2****10****9-174 ha****5-672 ha****10****47****MCH221****DRURY****LANE****2****10****9-174 ha****5-672 ha****10****47****MCH221****DRURY****LANE****2****10****9-174 ha****5-672 ha****10****47****MCH221****DRURY****LANE****2****10****9-174 ha****5-672 ha****10****47****MCH221****DRURY****LANE****2****10****9-174 ha****5-672 ha****10****47****MCH221****DRURY****LANE****2****10****9-174 ha****5-672 ha****10****47****MCH221****DRURY****LANE****2****10****9-174 ha****5-672 ha****10****47****MCH221****DRURY****LANE****2****10****9-174 ha****5-672 ha****10****47****MCH221****DRURY****LANE****2****10****9-174 ha****5-672 ha****10****47****MCH221****DRURY****LANE****2****10****9-174 ha****5-672 ha****10****47****MCH221****DRURY****LANE****2****10****9-174 ha****5-672 ha****10****47****MCH221****DRURY****LANE****2****10****9-174 ha****5-672 ha****10****47****MCH221****DRURY****LANE****2****10****9-174 ha****5-672 ha****10****47****MCH221****DRURY****LANE****2****10****9-174 ha****5-672 ha****10****47****MCH221****DRURY****LANE****2****10****9-174 ha****5-672 ha****10****47****MCH221****DRURY****LANE****2****10****9-174 ha****5-672 ha****10****47****MCH221****DRURY****LANE****2****10****9-174 ha****5-672 ha****10****47****MCH221****DRURY****LANE****2****10****9-174 ha****5-672 ha****10****47****MCH221****DRURY****LANE****2****10****9-174 ha****5-672 ha****10****47****MCH221****DRURY****LANE****2****10****9-174 ha****5-672 ha****10****47****MCH221****DRURY****LANE****2****10****9-174 ha****5-672 ha****10**

704681284

MH 400

\$307.00
02/04/2001 16:09

WARNING : Folded or Mutilated Plans will not be accepted.
Plans may be rolled.
Information may not be placed in the outer margins.

Registered

5. Lodged by

MORTON & MORTON
SOLICITORS
130 WHARF STREET
MAYECROUCH Q 4650
PO BOX 123 DX 42130
TEL: (07) 3121 2236
FAX: (07) 3123 1784

MH 005

(Include address, phone number, reference, and Lodger Code)

1. Certificate of Registered Owners or Lessees:

I/We COUNCIL OF THE CITY OF HERVEY BAY

6. Existing

Created

Title Reference	Lot	Plan	Lots	Emts	Road
17478158	2	RP230596	2 & 10		

(Names in full)

* as Registered Owners of this land agree to this plan and dedicate the Public Use Land as shown hereon in accordance with Section 50 of the Land Title Act 1994.

* as Lessees of this land agree to this plan.

Signature of *Registered Owners *Lessees
CTPI 49-Sch4

Mayor
CTPI 49-Sch4

Chief Executive Officer.

* Rule out whichever is inapplicable

2. Local Government Approval.

* COUNCIL OF THE CITY OF HERVEY BAY

hereby approves this plan in accordance with the:

* Integrated Planning Act 1997

Dated CTPI 49-Sch4 day of March 2001

STEPHEN L WALLACE
Executive Manager -
Development Services being
the Officer duly delegated by
Hervey Bay City Council.

* Insert the name of the Local Government. % Insert Integrated Planning Act 1997 or
Insert designation of signatory or delegation Local Government (Planning & Environment) Act 1990

3. Plans with Community Management Statement:

CMS Number:

Name:

4. References:

Dept File:

Local Govt:

Surveyor: 001958

Por. 45

2 & 10

Orig

Lots

7. Portion Allocation:

a. Map Reference:

9447-24421

9. Locality:

DUNDOWRAN

10. Local Government:

HERVEY BAY C. C.

11. Passed & Endorsed:

By: CULLEN & COUPER P/LDate: 27.10.00Signed: CTPI 49-Sch4Designation: LIAISON OFFICER

12. Building Format Plans only.

I certify that:

* As far as it is practical to determine, no part of the building shown on this plan encroaches onto adjoining lots or road;

* Part of the building shown on this plan encroaches onto adjoining * lots and road

Licensed Surveyor/Director * Date
*delete words not required

13. Lodgement Fees:

Survey Deposit \$ _____
Lodgement \$ _____
New Titles \$ _____
Photocopy \$ _____
Postage \$ _____
TOTAL \$ _____

14. Insert
Plan
Number

SP 136512

CURRENT TITLE SEARCH
NATURAL RESOURCES AND WATER, QUEENSLAND

Request No: 2151088
Search Date: 09/10/2007 14:46

Title Reference: 50348760
Date Created: 04/04/2001

Previous Title: 17478158

REGISTERED OWNER

Dealing No: 710693247 15/06/2007

RADWAY PTY LTD A.C.N. 125 664 771

ESTATE AND LAND

Estate in Fee Simple

LOT 2 SURVEY PLAN 136512
County of MARCH Parish of VERNON
Local Government: HERVEY BAY CITY

EASEMENTS, ENCUMBRANCES AND INTERESTS

1. Rights and interests reserved to the Crown by
Deed of Grant No. 11265143 (POR 45)
2. MORTGAGE No 710693271 15/06/2007 at 10:10
NATIONAL AUSTRALIA BANK LIMITED A.B.N. 12 004 044 937
3. CAVEAT No 710845551 26/07/2007 at 10:32
COUNCIL OF THE CITY OF HERVEY BAY

ADMINISTRATIVE ADVICES - NIL
UNREGISTERED DEALINGS - NIL

CERTIFICATE OF TITLE ISSUED - No

Caution - Charges do not necessarily appear in order of priority

** End of Current Title Search **

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Requested By: D APPLICATIONS ESPREON

M2-Govt Printer, Qld

CERTIFICATE OF TITLE

(Page 1)

81777

Dealing No.: K197729V

Vol. 7478 Fol. 158

QUEENSLAND

VOL: 7478 FOLIO:158



17478158

Previous Title:

Vol. 6629 Fol. 244



Issued: 8 March, 1990

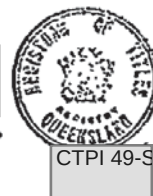
I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such easements encumbrances and interests as are shown in the Second Schedule.

Witness

CTPI 49-Sch4

CTPI 49-Sch4

Registrar of Titles.

ESTATE AND LAND

Estate in Fee Simple in Lot 2 on RP230596 County of March Parish of Vernon
Containing 14.85 hectares

FIRST SCHEDULEPORTWELL PTY LTDSECOND SCHEDULE

1. Rights and interests reserved to the Crown by Deed of Grant No. 103133 (Por 45).
2. Mortgage No. J906062Y to National Australia Bank Limited Produced 9 May 1989
Registered 15 May 1989.

RELEASED VIDE P/REL No. K237923K

11 APR 1990

CTPI 49-Sch4



NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR OF TITLES ARE CANCELLED
PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON

FOR DETAILS OF DESCRIPTION, DIMENSIONS AND MARKING OF BOUNDARIES REFER TO
SURVEY PLAN REFERRED TO ABOVE.

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT			RECORDED
	NATURE	NUMBER	PRODUCED	
 CTPI 49-Sch4 Council of the City of Hervey Bay	Tfr	K237925L L674469N	9APR1990 8OCT1993	11 APR 1990 -9 DEC 1993 CTPI 49-Sch4 

SECOND SCHEDULE (continued)

INSTRUMENT			PARTICULARS	RECORDED	CANCELLATION INSTRUMENT		
NATURE	NUMBER	PRODUCED			NUMBER	PRODUCED	RECORDED
Ease	K197735R	2MAR1990	to Council of the City of Hervey Bay over Easement C on RP230596	9 MAR 1990 CTPI 49-Sch4 			
Mortgage	K237930K	9APR1990	Australia and New Zealand Banking Group Limited	11 APR 1990 CTPI 49-Sch4 	L674468K	8OCT1993	-9 DEC 1993 CTPI 49-Sch4 

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR OF TITLES ARE CANCELLED.

* Dealings with this Lease will be Recorded on the Original Lease only instead of on this Certificate of Title.

2
Previous

QUEENSLAND

CERTIFICATE OF TITLE

Original
Deed of Grant

Vol. 6629 Fol. 244

103133 (Por 45)

VOL: 6629 FOLIO: 244

Dealing No.. H300703

Reference to previous

Vol. 6173 Fol. 116

Issued: 11 July 1984



16629244

(Page 1)

SCALED

I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such easements encumbrances and interests as are shown in the Second Schedule

Witness:

CTPI 49-Sch4

CTPI 49-Sch4

Registrar of Titles.



CTP

Estate and Land Referred To

Estate in Fee Simple in Lot 4 on registered Plan No. 190323 County of March Parish of Vernon
Containing 31.23 hectares

FIRST SCHEDULE

CTPI 49-Sch4

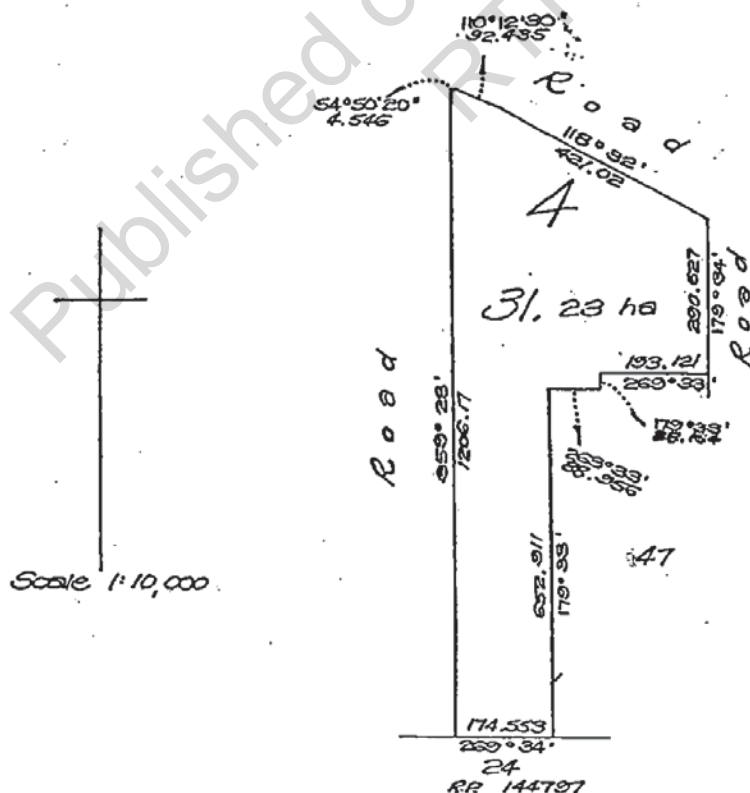
SECOND SCHEDULE

1. Rights and interests reserved to the Crown by the Deed of Grant above referred to.
2. ~~Agreement No. H300704 over Lots 3 and 4 on RP 190323 under Section 34 of the Local Government Act Produced 4 Jun 1984 Registered 26 JUN 1984 5986805~~

29 MAR 1985

CTPI 49-Sch4

PLAN OF LAND



NOTE: Entries ruled through and authenticated by the Seal of the Registrar of Titles are cancelled.

REGISTERED PROPRIETOR		INSTRUMENT		REGISTERED	Signature of Registrar of Titles
NATURE	Plan	NUMBER	PRODUCED		
By Plan Cat. No. 191932 part of the within land is surveyed into Easements A and B		H515807	11 FEB 1985	29 MAR 1985	CTPI 49-Sch
Portwell Pty Ltd	Tfr	J662596V	19 OCT 1988	27 OCT 1988	CTPI 49-Sch
By Plan Cat. No. 230596 the within land is subdivided into Lots 1 to 3 and proposed Easements D and E in Lot 1 and Lot 2 and an area has been dedicated for road purposes. Cancelled except Lot 3 vide Vol. 7478 Fol. 157-158	Plan	K197729V	2 MAR 1990	-8 MAR 1990	CTPI 49-Sch
Lot 3 on RP230596 to Council of the City of Hervey Bay as trustee. Cancelled vide Vol. 7478 Fol. 159	Nom/T'tees	K197739D	2 MAR 1990	-8 MAR 1990	CTPI 49-Sch

FULLY CANCELLED

Trk 155907Pw101-3-90 h/c 90/3046.
 Plan K1559046 with RE-2-90 with 197729V.
 Plan K155906 with RE-3-90 with 197739V.
 Plan K1559127 with RE-3-90 with K197739V.
 Plan K1559107 with RE-3-90 with 197739V.
 Plan K155911M with RE-3-90 with K197739V.

SECOND SCHEDULE (continued)

INSTRUMENT			PARTICULARS	REGISTERED	Signature of Registrar of Titles	CANCELLATION				Signature of Registrar of Titles
NATURE	NUMBER	PRODUCED				INSTRUMENT		REGISTERED		
Trk	H545807	11 FEB 1985	to Council of the City of Hervey Bay over Easements A and B on R.P. 491932	29 MAR 1985	CTPI 49-Sch	Surrender	K185909B	19 FEB 1990	-8 MAR 1990	CTPI 49-Sch
Mtge	J662597X	19 OCT 1988	CTPI 49-Sch4	27 OCT 1988	CTPI 49-Sch4	Release:	J906059D	9 MAY 1989	15 MAY 1989	CTPI 49-Sch4
Mtge	J906062Y	9 MAY 1989	National Australia Bank Limited	15 MAY 1989						
P/Rel	K197737X	2 MAR 1990	of Mortgage No. J906062Y is released so far as relates to Lot 3 on RP230596	-8 MAR 1990	CTPI 49-Sch					

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR OF TITLES ARE CANCELLED.

* Dealings with this Lease will be Registered on the Original Lease only instead of on this Certificate of Title

3
pmu

QUEENSLAND.

CERTIFICATE OF TITLE

Original
Deed of Grant
103133 (Por 45)

Register
Vol. 6173 Fol. 116



VOL: 6173 FOLIO: 116



16173116

(Page 1)

Dealing No.. G438191

Reference to previous

Vol. 3583 Fol. 17

Issued: 14 September, 1981



CTPI 49-Sch4

Registrar of Titles.

Estate and Land Referred To

Estate in Fee Simple in Lot 2 on registered Plan No. 177006 County of March Parish of Vernon
Containing 44.6149 hectares Exclusive of 1.0547 hectares for a surveyed road and 5000 square metres for Lot 1 on registered Plan No. 177006.

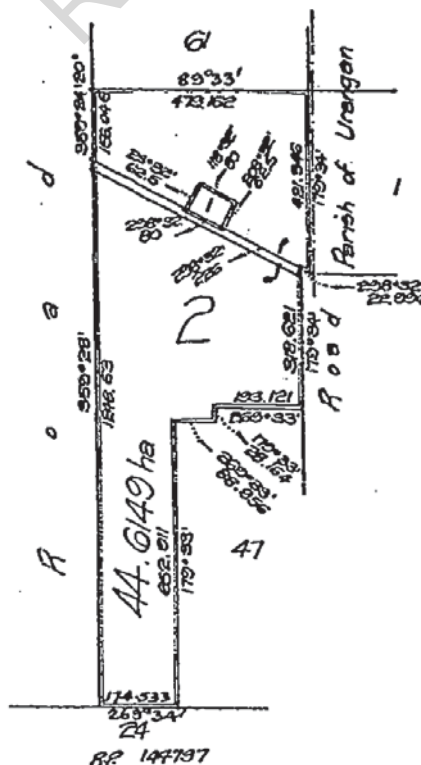
FIRST SCHEDULE

CTPI 49-Sch4

SECOND SCHEDULE

1. Rights and interests reserved to the Crown by the Deed of Grant above referred to.

PLAN OF LAND



QUEENSLAND.

FULLY CANCELLED

1265 | 143



Vol. **3583** Folio **17**

IVY MAY STEVENS

CTPI 49-Sch4

12

now seized _____ of an Estate in Fee-simple, subject nevertheless to such encumbrances, liens, and interests as are by memorandum notified hereon, in All that piece of Land situated in the County of March Parish of Vernon City of _____

Containing One hundred and eleven acres one rood thirty seven perches Exclusive of 2 acres 2
roods 14 perches for a surveyed road

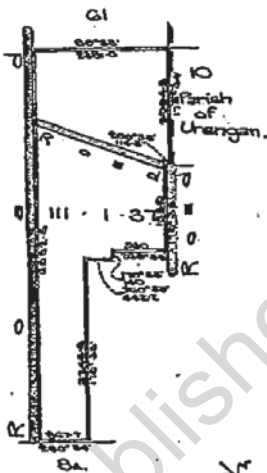
more or less, as shown on the Plan hereon, and therein edged red, Being Portion 45

Saving Always to the Crown all the rights and interests reserved to it by Deed of Grant No. 103133

In Witness whereof, I have hereunto signed my name and affixed my seal, this nineteenth day of June One thousand nine hundred and sixty three

Signed, Sealed, and Delivered in CTPI 49-Sch4

Scale, 20 chains per inch.



CTPI 49-Sch4

REGISTRAR OF TITLES

No. D18015

CTPI 49-Sch4

to The Commitee

Produced 12

Registered 20

Limited



REGISTRAR OF TITLES

BY PLAN CAT. No. 177006 the within land is subdivided
into Lots 1 and 2

125-2 (28)

No. 64-38191 PRODUCED 13 June 1981

REGD. 15 SEP 1986
CTRI 10 Sep 86

CTFI 49-SC14

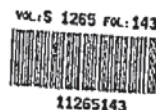
Reference to New Titles:
Vol: 675

Fol: 115, 116 REGISTRAR OF TITLES

FULLY CANCELLED

Form 1.]

QUEENSLAND.



DEED OF GRANT OF LAND.

No. 103133

ACQUIRED BY Agricultural Selection

George the Fifth, by the Grace of God, of the United Kingdom of Great Britain and Ireland, and of the British Dominions beyond the Seas, King, Defender of the Faith:—

Et Illi to whom these Presents shall come, Greeting:

WHEREAS, in conformity with the Laws and Regulations in force for the alienation of Crown Lands in Our State of Queensland, Colfred Ocasius Stephenson has become entitled to a Deed of Grant in Fee-simple of the Land hereinafter described: Now Know Ye that, in consideration of the premises and of the sum of Shillings pounds eighteen shillings and nine pence Sterling, for Us, and on Our behalf paid into the Treasury of Our said State, and in further consideration of the Quit-Rent hereinafter reserved, We, with the advice of The Executive Council of Our said State, have Granted, and for Us, Our Heirs and Successors, do hereby Grant, unto the said Colfred Ocasius Stephenson

Administrators and assigns, subject to the Reservations hereinafter mentioned, All that Parcel of Land in Our said State, containing by admeasurement One hundred and eleven Acres one rood thirty seven perches be the same more

or less, situated in the County of March Parish of Maroon Section Eighty five Maroon District

Being the Land selected as Agricultural Homestead No 1327 Commencing at the South-west corner of portion 61 and bounded thence on the North by that portion bearing 89 degrees 33 minutes forty three chains and eighty one and nine tenths links on the East by portion 10 bearing 179 degrees 31 minutes thirty three chains and ninety five and a half links by a road bearing 289 degrees 33 minutes one chain and fourteen and three tenths links and by a line and a road bearing 179 degrees 33 minutes fifteen chains and fifty nine links on the South by portion 17 bearing 169 degrees 33 minutes nine chains and sixty links 179 degrees 33 minutes one chain and forty links and 269 degrees 33 minutes four chains and forty two and two tenths links again on the East by that portion bearing 179 degrees 33 minutes thirty two chains and forty five and six tenths links on the South by portion 18 bearing 269 degrees 31 minutes eight chains and twenty seven and two tenths links and on the West by a road bearing 259 degrees 29 minutes sixty nine chains and eighty two and a half links to the point of commencement Exclusive of Six Acres two roods fourteen perches for a surveyed Road

as shown on Plan of Survey deposited in the Survey Office, with all the Rights and Appurtenances whatsoever thereto belonging but not including any part of the said Land on any of them

To Hold unto the said Colfred Ocasius Stephenson his Administrators and assigns for ever, Yielding and Paying therefor Yearly unto Us, Our Heirs and Successors, the Quit-Rent of One Peppercorn for ever, if demanded: But Subject nevertheless to the several Conditions and Reservations contained in and declared by "The Land Act of 1910," and "The Mining on Private Land Act of 1909." And We do hereby reserve unto Us, Our Heirs and Successors, all Gold and Minerals (the term "Minerals" to have the same meaning as in "The Mining on Private Land Act of 1909"), and all Mines of Gold and Minerals, on and below the surface of the said Land: And We do hereby also reserve unto Us, Our Heirs and Successors, and to such persons as shall from time to time be duly authorised by Us in that behalf, the free right and privilege of access, including ingress, egress, and regress, into, upon, over, and out of the said Land, for the purpose of searching for or working Gold and Minerals or any of them, or Mines of Gold and Minerals or any of them, in any part of the said Land: In Testimony Whereof, We have caused this Our Grant to be Sealed with the Seal of Our said State.

WITNESS Our Trusty and Well-beloved Sir WILLIAM MACGREGOR, Doctor of Medicine, Knight Grand Cross of Our Most Distinguished Order of St. Michael and St. George, Companion of Our Most Honourable Order of the Bath, Governor of Our State of QUEENSLAND and its Dependencies, in the Commonwealth of Australia, at Government House, Brisbane, in Queensland aforesaid, this Thirtieth day of March in the fourth year of Our Reign, and in the year of Our Lord One thousand nine hundred and twelve

CTPI 49-Sch4

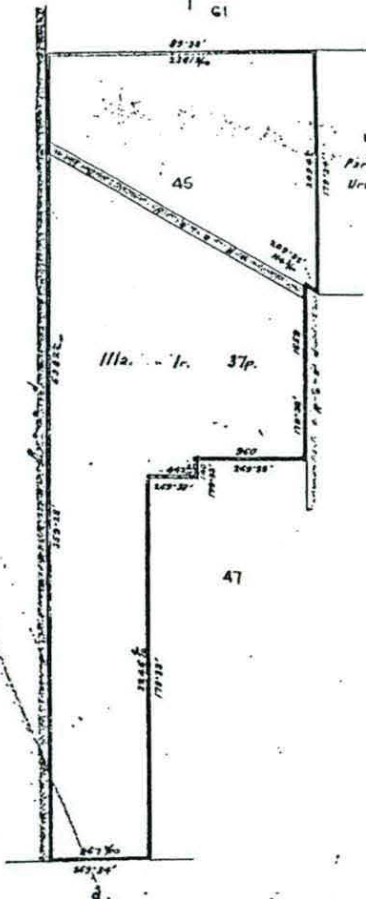
ENTERED in the Register of Conveying Land Purchases in Book 184 Folio 114, in the Survey Office, Brisbane this Thirtieth day of March, 1912 CTPI 49-Sch4

for the SECRETARY-GENERAL

ENTERED in the Register Book, Vol. 1265, Folio 143, this Twentieth day of March, 1912 CTPI 49-Sch4

Acting REGISTRAR OF TITLES

Parish of Vernon



Scale 10 chains to an inch
M.D. 221

No. 64222 A Bill of Mortgage produced 24 June 1915 at 9.46 a.m., registered 24 June 1915, from CTPI 49-Sch4 to The Bank of New South Wales to secure the repayment of the monies and interest therein referred to. CTPI 49-Sch4
Dep. Registrar of Titles.

No. 769227 (Bill of Mortgage produced 7 May 1922 at 9.17 a.m., registered 14 May 1922) from CTPI 49-Sch4 to The Commissioner of the Queensland Government Savings Bank to secure the repayment of the monies and interest therein referred to. CTPI 49-Sch4
Deputy Registrar of Titles.

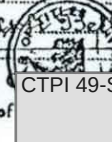
PURSUANT to Memo. of TRANSFER No. 276976 produced 12 Dec. 1935 at 11.14 a.m., registered 19 Dec. 1935 CTPI 49-Sch4

now SEISED of an Estate IN FEE SIMPLE in the WHOLE of the within Land. By AGOSTINER CTPI 49-Sch4



REGISTRAR OF TITLES

No. 276977 BILL OF MORTGAGE produced 12 Dec. 1935 at 11.12 a.m., registered 19 Dec. 1935 from CTPI 49-Sch4 to THE COMMONWEALTH BANK to secure the payment of the monies and interest therein referred to. CTPI 49-Sch4



REGISTRAR OF TITLES

No. 1352013 BILL OF MORTGAGE produced 26 Nov. 1937 at 10.28 a.m., registered 1 Dec. 1937 from CTPI 49-Sch4 to Bank of New South Wales to secure the payment of the monies and interest therein referred to. CTPI 49-Sch4



PURSUANT to Memo. of TRANSFER No. 8760074 produced 10 Dec. 1947 at 2.27 p.m., registered 15 Jan. 1948 CTPI 49-Sch4

now SEISED of an Estate IN FEE SIMPLE in the WHOLE of the within Land. CTPI 49-Sch4



No. 8760075 BILL OF MORTGAGE produced 10 Dec. 1947 at 2.4 p.m., registered 15 Jan. 1948 from CTPI 49-Sch4 to Commonwealth Bank of Australia to secure the payment of the monies and interest therein referred to. CTPI 49-Sch4



REGISTRAR OF TITLES

No. D 18014 Request to issue Certificate of Title for The whole of the land

Produced 12 June 1963 at 9.35 a.m. Registered 14 June 1963

Vol. 3583 Fol. 11

CTPI 49-Sch4



REGISTRAR OF TITLES

Published on DES Disclosure Log
RTI Act 2009

Appendix B

Site Photographs

Release

Stage 1 Photographs



Photo 1: Sampling location S1 looking east



Photo 2: Sampling location S2 looking east

Release

Stage 1 Photographs



Photo 3: Sampling location S3 looking east



Photo 4: Sampling location S4 looking north

Stage 1 Photographs



Photo 5: Sampling location S5 looking east



Photo 6: Sampling location S6 looking north west

Release

Stage 1 Photographs



Photo 7: Sampling location S7 looking east



Photo 8: Sampling location S8 looking east

Release

Stage 1 Photographs



Photo 9: Sampling location S9 looking south east



Photo 10: Sampling location S10 looking west

Release

Published on DES Disclosure Log
RTI Act 2009

Appendix C

Certificates of Analysis and Chain of Custody Documents

Release



ALS Environmental

CERTIFICATE OF ANALYSIS

Client	: GOLDER ASSOCIATES	Laboratory	: ALS Environmental Brisbane	Page	: 1 of 12
Contact	: CTPI 49-Sch4	Contact	: CTPI 49-Sch4	Work Order	: EB0600625
Address	: P O BOX 5589 MAROOCHYDORE SOUTH QLD AUSTRALIA 4558	Address	: 32 Shand Street Stafford QLD Australia 4053		
E-mail	: CTPI 49@golder.com.au	E-mail	: CTPI 49-Sch4@alsenviro.com		
Telephone	: 07 5443 3511	Telephone	: 61-7-32437222	Date received	: 20 Jan 2008
Facsimile	: 07 5443 6845	Facsimile	: 61-7-32437259	Date issued	: 2 Feb 2008
Project	: 06683002 Hervey Bay	Quote number	: EN/002/05	No. of samples	- Received : 11
Order number	: MQ3521				Analysed : 11
C-O-C number	: 06683002-tr1				
Site	: - Not provided -				

ALSE - Excellence in Analytical Testing



NATA Accredited Laboratory
825

This document is issued in
accordance with NATA's
accreditation requirements.

Accredited for compliance with
ISO/IEC 17025.

This document has been digitally signed by those names that appear on this report and are the authorised signatories. Digital signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatory	Position	Department
CTPI 49-Sch4	Senior Organic Chemist	Organics - NATA 818 (Brisbane)
CTPI 49-Sch4	Laboratory Diagnostician	Inorganics - NATA 818 (Brisbane)

Page Number : 2 of 12
Client : GOLDER ASSOCIATES
Work Order : EB0600625



Comments

This report for the ALSE reference EB0600625 supersedes any previous reports with this reference. Results apply to the samples as submitted. All pages of this report have been checked and approved for release.

This report contains the following information:

- **Analytical results for samples submitted**

When moisture determination has been performed, results are reported on a dry weight basis. When a reported 'less than' result is higher than the LOR, this may be due to primary sample extracts/digestion dilution and/or insufficient sample amount for analysis. Surrogate Recovery Limits are static and based on USEPA SW846 or ALS-QW/EN38 (in the absence of specified USEPA limits). Where LOR of reported result differ from standard LOR, this may be due to high moisture, reduced sample amount or matrix interference. When date(s) and/or time(s) are shown bracketed, these have been assumed by the laboratory for process purposes. Abbreviations: CAS number = Chemical Abstract Services number, LOR = Limit of Reporting. * Indicates failed Surrogate Recoveries.

- **Surrogate control limits**

The analytical procedures used by ALS Environmental are based on established internationally-recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house procedure are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported herein. Reference methods from which ALSE methods are based are provided in parenthesis.

Specific comments for Work Order EB0600625

EP068: Poor matrix spike recovery due to matrix interference. Confirmed by re-extraction and re-analysis.

EP068: Particular samples required dilution prior to analysis due to matrix interferences. LOR values have been adjusted accordingly.

Page Number : 3 of 12
 Client : GOLDER ASSOCIATES
 Work Order : EB0600625



ALS Environmental

Analytical Results

Client Sample ID :				S1	S2	S3	S4	S5
Sample Matrix Type / Description :				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time :				19 Jan 2006 15:00	19 Jan 2006 15:00	19 Jan 2006 15:00	19 Jan 2006 15:00	19 Jan 2006 15:00
Laboratory Sample ID :				EB0600625-001	EB0600625-002	EB0600625-003	EB0600625-004	EB0600625-005
Analyte	CAS number	LOR	Units					
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%	1.4	1.2	2.0	<1.0	3.8
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	7	<5	7	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	12	7	14	18	3
Copper	7440-50-8	5	mg/kg	8	<5	13	16	<5
Lead	7439-92-1	5	mg/kg	8	<5	<5	<5	<5
Nickel	7440-02-0	2	mg/kg	24	11	39	51	7
Zinc	7440-66-6	5	mg/kg	18	13	20	28	10
EG020T: Total Metals by ICP-MS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls		0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
beta-Endosulfan	33213-85-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05

Release

A Campbell Brothers Limited Company

Page Number : 4 of 12
 Client : GOLDER ASSOCIATES
 Work Order : EB0600625



ALS Environmental

Analytical Results

Client Sample ID :				S1	S2	S3	S4	S5
Sample Matrix Type / Description :				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time :				19 Jan 2006 15:00	19 Jan 2006 15:00	19 Jan 2006 15:00	19 Jan 2006 15:00	19 Jan 2006 15:00
Laboratory Sample ID :				EB0600625-001	EB0600625-002	EB0600625-003	EB0600625-004	EB0600625-005
Analyte	CAS number	LOR	Units					
EP068B: Organophosphorus Pesticides (OP)								
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,6-Dichlorophenol	87-85-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-88-5	2.0	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5

Release

A Campbell Brothers Limited Company

Page Number : 5 of 12
 Client : GOLDER ASSOCIATES
 Work Order : EB0600625



ALS Environmental

Analytical Results

Client Sample ID :				S1	S2	S3	S4	S5
Sample Matrix Type / Description :				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time :				19 Jan 2006 15:00	19 Jan 2006 15:00	19 Jan 2006 15:00	19 Jan 2006 15:00	19 Jan 2006 15:00
Laboratory Sample ID :				EB0600625-001	EB0600625-002	EB0600625-003	EB0600625-004	EB0600625-005
Analyte	CAS number	LOR	Units					
EP075(S/M)B: Polynuclear Aromatic Hydrocarbons								
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1,2,3-cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction		2	mg/kg	<2	<2	<2	<2	<2
C10 - C14 Fraction		50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction		100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction		100	mg/kg	<100	<100	<100	<100	<100
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
meta- & para-Xylene	108-38-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
ortho-Xylene	106-42-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	64.0	70.9	60.0	65.7	68.4
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE		0.1	%	65.9	65.8	71.6	77.1	66.4
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	80.5	78.0	75.5	75.6	76.4
EP075(S/M)S: Phenolic Compound Surrogates								
2-Fluorophenol	367-12-4	0.1	%	86.5	83.6	85.9	86.1	85.6
Phenol-d8	13127-88-3	0.1	%	85.0	84.2	82.4	83.9	83.0
2-Chlorophenol-D4	93951-73-6	0.1	%	87.4	87.5	87.0	84.8	84.8
2,4,6-Tribromophenol	118-79-6	0.1	%	91.2	85.6	92.0	85.2	89.7
EP075(S/M)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	91.8	87.0	90.1	88.9	93.2
Anthracene-d10	1719-06-8	0.1	%	95.8	91.8	81.4	84.9	89.7

Release

A Campbell Brothers Limited Company

Page Number : 6 of 12
 Client : GOLDER ASSOCIATES
 Work Order : EB0600625



ALS Environmental

Analytical Results

Client Sample ID :	S1	S2	S3	S4	S5
Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time :	19 Jan 2006 15:00	19 Jan 2006 15:00	19 Jan 2006 15:00	19 Jan 2006 15:00	19 Jan 2006 15:00
Laboratory Sample ID :	EB0600625-001	EB0600625-002	EB0600625-003	EB0600625-004	EB0600625-005

Analyte	CAS number	LOR	Units					
EP075(SIM) PAH Surrogates								
4-Terphenyl-d14	1718-51-0	0.1	%	98.1	88.9	88.3	92.3	89.2
EP080S TPH(V)/BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	108	103	96.7	106	108
Toluene-D8	2037-26-5	0.1	%	110	106	99.6	112	107
4-Bromofluorobenzene	460-00-4	0.1	%	103	99.7	99.3	107	104

Release

Page Number : 7 of 12
 Client : GOLDER ASSOCIATES
 Work Order : EB0600825



ALS Environmental

Analytical Results

Client Sample ID :				S6	S7	S8	S9	S10
Sample Matrix Type / Description :				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time :				19 Jan 2006 15:00	19 Jan 2006 15:00	19 Jan 2006 15:00	19 Jan 2006 15:00	19 Jan 2006 15:00
Laboratory Sample ID :				EB0600625-008	EB0600625-007	EB0600625-008	EB0600625-009	EB0600625-010
Analyte	CAS number	LOR	Units					
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%	<1.0	9.7	9.5	7.9	1.2
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	5	22	6	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	2	2	15	11	14
Copper	7440-50-8	5	mg/kg	<5	<5	7	8	30
Lead	7439-92-1	5	mg/kg	<5	<5	8	10	<5
Nickel	7440-02-0	2	mg/kg	5	<2	14	8	90
Zinc	7440-66-6	5	mg/kg	<5	<5	14	17	44
EG020T: Total Metals by ICP-MS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP068: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls		0.10	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.50
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.25
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.25
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.25
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.25
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.25
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.25
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.25
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.25
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.25
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.25
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.25
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.25
4,4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.25
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.25
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.25
4,4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.25
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.25
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.25
4,4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.25
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.25
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.25

Release

A Campbell Brothers Limited Company

Page Number : 8 of 12
 Client : GOLDER ASSOCIATES
 Work Order : EB0600625



ALS Environmental

Analytical Results

Client Sample ID :				S6	S7	S8	S9	S10
Sample Matrix Type / Description :				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time :				19 Jan 2006 15:00	19 Jan 2006 15:00	19 Jan 2006 15:00	19 Jan 2006 15:00	19 Jan 2006 15:00
Laboratory Sample ID :				EB0600625-008	EB0600625-007	EB0600625-008	EB0600625-009	EB0600625-010
Analyte	CAS number	LOR	Units					
EP068B: Organophosphorus Pesticides (OP)								
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.25
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.25
Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.25
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.2
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.25
Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.25
Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.25
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.2
Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.25
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.25
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.25
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.25
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.25
Prothiofos	34843-46-4	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.25
Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.25
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.25
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.25
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5

Release

A Campbell Brothers Limited

Page Number : 9 of 12
 Client : GOLDER ASSOCIATES
 Work Order : EB0600625



ALS Environmental

Analytical Results

Client Sample ID :				S6	S7	S8	S9	S10
Sample Matrix Type / Description :				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time :				19 Jan 2006 15:00	19 Jan 2006 15:00	19 Jan 2006 15:00	19 Jan 2006 15:00	19 Jan 2006 15:00
Laboratory Sample ID :				EB0600625-008	EB0600625-007	EB0600625-008	EB0600625-009	EB0600625-010
Analyte	CAS number	LOR	Units					
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1,2,3-cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction		2	mg/kg	<2	<2	<2	<2	<2
C10 - C14 Fraction		50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction		100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction		100	mg/kg	<100	<100	<100	<100	<100
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
meta- & para-Xylene	108-38-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
ortho-Xylene	106-42-3							
	95-47-6	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
EP068S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	63.5	68.1	59.4	61.1	81.6
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE		0.1	%	53.0	66.4	66.4	77.6	74.0
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	64.3	82.4	72.2	71.7	83.0
EP075(SIM)S: Phenolic Compound Surrogates								
2-Fluorophenol	367-12-4	0.1	%	83.3	84.6	85.0	87.3	84.2
Phenol-d6	13127-88-3	0.1	%	82.4	81.6	81.9	84.2	82.1
2-Chlorophenol-D4	93951-73-6	0.1	%	85.7	84.9	85.4	88.1	85.1
2,4,6-Tribromophenol	118-79-6	0.1	%	81.4	84.3	86.8	87.1	83.5
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	85.3	89.6		95.3	85.6
Anthracene-d10	1719-06-8	0.1	%	91.1	88.5	91.1	96.8	99.8

Release

A Campbell Brothers Limited Company

Page Number : 10 of 12
 Client : GOLDER ASSOCIATES
 Work Order : EB0600625



ALS Environmental

Analytical Results

Client Sample ID :				S6	S7	S8	S9	S10
Sample Matrix Type / Description :				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time :				19 Jan 2006 15:00	19 Jan 2006 15:00	19 Jan 2006 15:00	19 Jan 2006 15:00	19 Jan 2006 15:00
Laboratory Sample ID :				EB0600625-006	EB0600625-007	EB0600625-008	EB0600625-009	EB0600625-010
Analyte	CAS number	LOR	Units					
EP075(SIM) PAH Surrogates								
4-Terphenyl-d14	1718-51-0	0.1	%	88.7	87.2	89.4	92.8	94.7
EP080S TPH(M) BTEX Surrogates								
1,2-Dichloroethane-D4	17060-07-0	0.1	%	110	104	107	98.5	104
Toluene-D8	2037-26-5	0.1	%	110	102	102	104	108
4-Bromofluorobenzene	460-00-4	0.1	%	104	98.6	98.0	90.9	97.8

Release

A Campbell Brothers Limited Company

Page Number : 11 of 12
 Client : GOLDER ASSOCIATES
 Work Order : EB0600625



ALS Environmental

Analytical Results

Client Sample ID : S11
 Sample Matrix Type / Description : SOIL
 Sample Date / Time : 19 Jan 2006 15:00
 Laboratory Sample ID : EB0600625-011

Analyte	CAS number	LOR	Units				
EA055: Moisture Content							
Moisture Content (dried @ 103°C)		1.0	%	9.0			
EG005T: Total Metals by ICP-AES							
Arsenic	7440-38-2	5	mg/kg	10			
Cadmium	7440-43-9	1	mg/kg	<1			
Chromium	7440-47-3	2	mg/kg	12			
Copper	7440-50-8	5	mg/kg	<5			
Lead	7439-92-1	5	mg/kg	7			
Nickel	7440-02-0	2	mg/kg	<2			
Zinc	7440-66-6	5	mg/kg	7			
EG020T: Total Metals by ICP-MS							
Mercury	7439-97-8	0.1	mg/kg	<0.1			

Release

A Campbell Brothers Limited Company

Page Number : 12 of 12
 Client : GOLDER ASSOCIATES
 Work Order : EB0600825



Surrogate Control Limits

Matrix Type: SOIL - Surrogate Control Limits

Surrogate Control Limits

Method name	Analyte name	Lower Limit	Upper Limit
EP066: Polychlorinated Biphenyls (PCB)			
EP066S: PCB Surrogate	Decachlorobiphenyl	10	164
EP068: Pesticides by GC/MS			
EP068S: Organochlorine Pesticide Surrogate	Dibromo-DDE	10	136
EP068T: Organophosphorus Pesticide Surrogate	DEF	10	110
EP075(SIM): PAH/Phenols (SIM)			
EP075(SIM)S: Phenolic Compound Surrogates	2-Fluorophenol	25	121
	Phenol-d6	24	113
	2-Chlorophenol-D4	23	134
	2,4,6-Tribromophenol	19	122
	2-Fluorobiphenyl	30	115
EP075(SIM)T: PAH Surrogates	Anthracene-d10	27	133
	4-Terphenyl-d14	18	137
EP080: TPH Volatiles/BTEX			
EP080S: TPH(V)/BTEX Surrogates	1,2-Dichloroethane-D4	80	120
	Toluene-D8	81	117
	4-Bromofluorobenzene	74	121

Release



Forward to:

TESTING REQUEST FORM

ALS ENVIRONMENTAL

32 SHAND STREET STAFFORD QLD 4053

GOLDER ASSOCIATES PTY LTD

Unit 1 Dalton Centre

Newspaper Place

Maroochydore Qld 4558

Phone: (07) 54433511

Fax: (07) 54436645

Order No.: MQ.3521 Project No.: 06683002
Project: Hervey Bay
C.O.C. No.: 06683002-tr1 Quotation No.: EN/002/05
Sampled By: JM Contact Name: CTPI 49-S
Email Report to: CTPI@golder.com.au
Prior Storage: ESKY & FRIDGE

SAMPLE ID	Sample Depth (m)	Media	No. of 250 ml Jars	SAMPLE DATE	S-1 Metals (As, Cd, Cr, Cu, Pb, Zn)	S-2 8 Metals (S-1 + Hg)	S-3 13 Metals (+Ba, Be, Ca, Mn, V)	TPH	TEH	S-5 TPH/BTEX/9 Metals	S-6 TPH/BTEX/Lead	S-7 TPH/BTEX/PAH	S-8 TPH/BTEX/PAH/OC/PCB/PCDD	S-9 TPH/VOC (incl.BTEX)	S-10 TPH/OC/PAH	S-12 OC/OP Pesticides	S-14 PAH/Ferrocenes	S-16 TPH/BTEX/PAH/OC/OP/PCB/PCDD Metals	S-16 + Phenols	S-17 TPH/BTEX/PAH/OC/OP	S-19
S1	1	surface	soil	1	19/01/2006																
S2	2	surface	soil	1	19/01/2006																
S3	3	surface	soil	1	19/01/2006																
S4	4	surface	soil	1	19/01/2006																
S5	5	surface	soil	1	19/01/2006																
S6	6	surface	soil	1	19/01/2006																
S7	7	surface	soil	1	19/01/2006																
S8	8	surface	soil	1	19/01/2006																
S9	9	surface	soil	1	19/01/2006																
S10	10	surface	soil	1	19/01/2006																
S11	11	surface	soil	1	19/01/2006																

ALS Environmental
Brisbane
Work Order
EB0600625



Report Version: WOLabel 1.01
Telephone: 61-7-32437222

Checked by: CTPI 49-S
Date Sent from Maroochydore Lab: 20/1/2006

Please Return Signed Copy By Facsimile:
Date Received By ALS: 20/1/

ALS Signature: CTPI 4

File B

Page 170 of 337


QUALITY CONTROL REPORT

Client	: GOLDER ASSOCIATES	Laboratory	: ALS Environmental Brisbane	Page	: 1 of 16
Contact	: CTPI 49-Sch4	Contact	: CTPI 49-Sch4	Work order	: EB0600625
Address	: P O BOX 5569 MAROOCHYDORE SOUTH QLD AUSTRALIA 4558	Address	: 32 Shand Street Stafford QLD Australia 4053	Amendment No.	:
Project	: 06683002 Hervey Bay	Quote number	: EN/002/05	Date received	: 20 Jan 2006
Order number	: MQ3521			Date issued	: 2 Feb 2006
C-O-C number	: 06683002-trl				
Site	: - Not provided -				
E-mail	: CTPI@golder.com.au	E-mail	: CTPI 49-Sch4@alsenviro.com	No. of samples	
Telephone	: 07 5443 3511	Telephone	: 61-7-32437222	Received	: 11
Facsimile	: 07 5443 6645	Facsimile	: 61-7-32437259	Analysed	: 11

This final report for the ALSE work order reference EB0600625 supersedes any previous reports with this reference. Results apply to the samples as submitted. All pages of this report have been checked and approved for release.

This report contains the following information:

- Laboratory Duplicates (DUP); Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Samples (LCS); Recovery and Acceptance Limits
- Matrix Spikes (MS); Recovery and Acceptance Limits

Work order specific comments

EP068: Particular samples required dilution prior to analysis due to matrix interferences. LOR values have been adjusted accordingly.

EP068: Poor matrix spike recovery due to matrix interference. Confirmed by re-extraction and re-analysis.

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Signatory

CTPI 49-Sch4
CTPI 49-Sch4

Department

Organics - NATA 818 (Brisbane)
Inorganics - NATA 818 (Brisbane)

Client : GOLDER ASSOCIATES
Project : 08883002 Hervey Bay

Work Order : EB0600625
ALS Quote Reference : EN/002/05

Page Number : 2 of 16
Issue Date : 2 Feb 2006



Quality Control Report - Laboratory Duplicates (DUP)

The quality control term **Laboratory Duplicate** refers to an intralaboratory split sample randomly selected from the sample batch. Laboratory duplicates provide information on method precision and sample heterogeneity.

- Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot. Abbreviations: LOR = Limit of Reporting, RPD = Relative Percent Difference.

* Indicates failed QC. The permitted ranges for the RPD of Laboratory Duplicates (relative percent deviation) are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting:- Result < 10 times LOR, no limit - Result between 10 and 20 times LOR, 0% - 50% - Result > 20 times LOR, 0% - 20%

Matrix Type: SOIL

Laboratory Duplicates (DUP) Report

Matrix Type: SOIL							
Laboratory Sample ID	Client Sample ID	Analyte name	LOR	Original Result	Duplicate Result	RPD	
EA055: Moisture Content							
EA055: Moisture Content - (QC Lot: 164075)				%	%	%	
EB0600625-003	S3	Moisture Content (dried @ 103°C)	1.0 %	2.0	1.9	5.2	
EB0600625-010	S10	Moisture Content (dried @ 103°C)	1.0 %	1.2	1.2	0.0	
EG005T: Total Metals by ICP-AES							
EG005T: Total Metals by ICP-AES - (QC Lot: 164982)				mg/kg	mg/kg	%	
EB0600614-008	Anonymous	Arsenic	5 mg/kg	5	<5	0.0	
		Cadmium	1 mg/kg	<1	<1	0.0	
		Chromium	2 mg/kg	10	8	17.1	
		Copper	5 mg/kg	14	14	0.0	
		Lead	5 mg/kg	12	14	11.6	
		Nickel	2 mg/kg	8	10	17.3	
		Zinc	5 mg/kg	28	31	11.8	
	EB0600625-003	S3	Arsenic	5 mg/kg	7	8	0.0
			Cadmium	1 mg/kg	<1	<1	0.0
			Chromium	2 mg/kg	14	14	0.0
			Copper	5 mg/kg	13	12	0.0
			Lead	5 mg/kg	<5	<5	0.0
			Nickel	2 mg/kg	39	33	17.0
			Zinc	5 mg/kg	20	18	10.9
EG020T: Total Metals by ICP-MS							
EG020T: Total Metals by ICP-MS - (QC Lot: 164981)				mg/kg	mg/kg	%	
EB0600614-008	Anonymous	Mercury	0.1 mg/kg	<0.1	<0.1	0.0	
EB0600625-003	S3	Mercury	0.1 mg/kg	<0.1	<0.1	0.0	
EP066: Polychlorinated Biphenyls (PCB)							
EP066: Polychlorinated Biphenyls (PCB) - (QC Lot: 164523)				mg/kg	mg/kg	%	
EB0600625-001	S1	Total Polychlorinated biphenyls	0.10 mg/kg	<0.10	<0.10	0.0	

Release

Release



ALS Environmental

Client : GOLDER ASSOCIATES
Project : 06683002 Harvey Bay

Work Order : EB0600625
ALS Quote Reference : EN/002/05

Page Number : 3 of 16
Issue Date : 2 Feb 2006

Matrix Type: SOIL

Laboratory Duplicates (DUP) Report

Laboratory Sample ID	Client Sample ID	Analyte name	LOR	Original Result	Duplicate Result	RPD
EP068A: Organochlorine Pesticides (OC)						
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 164522)				mg/kg	mg/kg	%
EB0600625-001	S1	alpha-BHC	0.05 mg/kg	<0.05	<0.05	0.0
		Hexachlorobenzene (HCB)	0.05 mg/kg	<0.05	<0.05	0.0
		beta-BHC	0.05 mg/kg	<0.05	<0.05	0.0
		gamma-BHC	0.05 mg/kg	<0.05	<0.05	0.0
		delta-BHC	0.05 mg/kg	<0.05	<0.05	0.0
		Heptachlor	0.05 mg/kg	<0.05	<0.05	0.0
		Aldrin	0.05 mg/kg	<0.05	<0.05	0.0
		Heptachlor epoxide	0.05 mg/kg	<0.05	<0.05	0.0
		trans-Chlordane	0.05 mg/kg	<0.05	<0.05	0.0
		alpha-Endosulfan	0.05 mg/kg	<0.05	<0.05	0.0
		cis-Chlordane	0.05 mg/kg	<0.05	<0.05	0.0
		Dieldrin	0.05 mg/kg	<0.05	<0.05	0.0
		4,4'-DDE	0.05 mg/kg	<0.05	<0.05	0.0
		Endrin	0.05 mg/kg	<0.05	<0.05	0.0
		beta-Endosulfan	0.05 mg/kg	<0.05	<0.05	0.0
		4,4'-DDD	0.05 mg/kg	<0.05	<0.05	0.0
		Endrin aldehyde	0.05 mg/kg	<0.05	<0.05	0.0
		Endosulfan sulfate	0.05 mg/kg	<0.05	<0.05	0.0
		4,4'-DDT	0.2 mg/kg	<0.2	<0.2	0.0
		Endrin ketone	0.05 mg/kg	<0.05	<0.05	0.0
		Methoxychlor	0.2 mg/kg	<0.2	<0.2	0.0
EP068B: Organophosphorus Pesticides (OP)						
EP068B: Organophosphorus Pesticides (OP) - (QC Lot: 164522)				mg/kg	mg/kg	%
EB0600625-001	S1	Dichlorvos	0.05 mg/kg	<0.05	<0.05	0.0
		Demeton-S-methyl	0.05 mg/kg	<0.05	<0.05	0.0
		Monocrotophos	0.2 mg/kg	<0.2	<0.2	0.0
		Dimethoate	0.05 mg/kg	<0.05	<0.05	0.0
		Diazinon	0.05 mg/kg	<0.05	<0.05	0.0
		Chlorpyrifos-methyl	0.05 mg/kg	<0.05	<0.05	0.0

Client : GOLDER ASSOCIATES
Project : 06883002 Hervey Bay

Work Order : EB0600625
ALS Quote Reference : EN/002/05

Page Number : 4 of 16
Issue Date : 2 Feb 2006



Matrix Type: SOIL

Laboratory Duplicates (DUP) Report

Matrix Type: SOIL	Laboratory Sample ID	Client Sample ID	Analyte name	LOR	Original Result	Duplicate Result	RPD	
EP068B: Organophosphorus Pesticides (OP) - continued								
EP068B: Organophosphorus Pesticides (OP) - (QC Lot: 164622) - continued					mg/kg	mg/kg	%	
EB0600625-001	S1	Parathion-methyl	0.2 mg/kg	<0.2	<0.2	0.0		
		Malathion	0.05 mg/kg	<0.05	<0.05	0.0		
		Fenthion	0.05 mg/kg	<0.05	<0.05	0.0		
		Chlorpyrifos	0.05 mg/kg	<0.05	<0.05	0.0		
		Parathion	0.2 mg/kg	<0.2	<0.2	0.0		
		Pirimphos-ethyl	0.05 mg/kg	<0.05	<0.05	0.0		
		Chlorfenvinphos	0.05 mg/kg	<0.05	<0.05	0.0		
		Bromophos-ethyl	0.05 mg/kg	<0.05	<0.05	0.0		
		Fenamiphos	0.05 mg/kg	<0.05	<0.05	0.0		
		Prothiofos	0.05 mg/kg	<0.05	<0.05	0.0		
		Ethion	0.05 mg/kg	<0.05	<0.05	0.0		
		Carbophenothion	0.05 mg/kg	<0.05	<0.05	0.0		
		Methyl Azinphos	0.05 mg/kg	<0.05	<0.05	0.0		
		EP075(SIM)A: Phenolic Compounds						
EP075(SIM)A: Phenolic Compounds - (QC Lot: 164619)					mg/kg	mg/kg	%	
EB0600825-001	S1	Phenol	0.5 mg/kg	<0.5	<0.5	0.0		
		2-Chlorophenol	0.5 mg/kg	<0.5	<0.5	0.0		
		2-Methylphenol	0.5 mg/kg	<0.5	<0.5	0.0		
		3- & 4-Methylphenol	1.0 mg/kg	<1.0	<1.0	0.0		
		2-Nitrophenol	0.5 mg/kg	<0.5	<0.5	0.0		
		2,4-Dimethylphenol	0.5 mg/kg	<0.5	<0.5	0.0		
		2,4-Dichlorophenol	0.5 mg/kg	<0.5	<0.5	0.0		
		2,6-Dichlorophenol	0.5 mg/kg	<0.5	<0.5	0.0		
		4-Chloro-3-Methylphenol	0.5 mg/kg	<0.5	<0.5	0.0		
		2,4,6-Trichlorophenol	0.5 mg/kg	<0.5	<0.5	0.0		
		2,4,5-Trichlorophenol	0.5 mg/kg	<0.5	<0.5	0.0		
		Pentachlorophenol	2.0 mg/kg	<2.0	<2.0	0.0		
		EB0600833-001	Anonymous	Phenol	0.5 mg/kg	<0.5	<0.5	0.0
				2-Chlorophenol	0.5 mg/kg	<0.5	<0.5	0.0

Client : GOLDER ASSOCIATES
Project : 08683002 Hervey Bay

Work Order : EB0600625
ALS Quote Reference : EN/002/05

Page Number : 5 of 18
Issue Date : 2 Feb 2006



Matrix Type: SOIL

Laboratory Duplicates (DUP) Report

Laboratory Sample ID	Client Sample ID	Analyte name	LOR	Original Result	Duplicate Result	RPD
EP075(SIM)A: Phenolic Compounds - continued						
EP075(SIM)A: Phenolic Compounds - (QC Lot: 164519) - continued				mg/kg	mg/kg	%
EB0600833-001	Anonymous	2-Methylphenol	0.5 mg/kg	<0.5	<0.5	0.0
		3- & 4-Methylphenol	1.0 mg/kg	<1.0	<1.0	0.0
		2-Nitrophenol	0.5 mg/kg	<0.5	<0.5	0.0
		2,4-Dimethylphenol	0.5 mg/kg	<0.5	<0.5	0.0
		2,4-Dichlorophenol	0.5 mg/kg	<0.5	<0.5	0.0
		2,6-Dichlorophenol	0.5 mg/kg	<0.5	<0.5	0.0
		4-Chloro-3-Methylphenol	0.5 mg/kg	<0.5	<0.5	0.0
		2,4,6-Trichlorophenol	0.5 mg/kg	<0.5	<0.5	0.0
		2,4,5-Trichlorophenol	0.5 mg/kg	<0.5	<0.5	0.0
		Pentachlorophenol	2.0 mg/kg	<2.0	<2.0	0.0
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 164519)				mg/kg	mg/kg	%
EB0600825-001	S1	Naphthalene	0.5 mg/kg	<0.5	<0.5	0.0
		Acenaphthylene	0.5 mg/kg	<0.5	<0.5	0.0
		Acenaphthene	0.5 mg/kg	<0.5	<0.5	0.0
		Fluorene	0.5 mg/kg	<0.5	<0.5	0.0
		Phenanthrene	0.5 mg/kg	<0.5	<0.5	0.0
		Anthracene	0.5 mg/kg	<0.5	<0.5	0.0
		Fluoranthene	0.5 mg/kg	<0.5	<0.5	0.0
		Pyrene	0.5 mg/kg	<0.5	<0.5	0.0
		Benzo(a)anthracene	0.5 mg/kg	<0.5	<0.5	0.0
		Chrysene	0.5 mg/kg	<0.5	<0.5	0.0
		Benzo(b)fluoranthene	0.5 mg/kg	<0.5	<0.5	0.0
		Benzo(k)fluoranthene	0.5 mg/kg	<0.5	<0.5	0.0
		Benzo(a)pyrene	0.5 mg/kg	<0.5	<0.5	0.0
		Indeno(1,2,3,cd)pyrene	0.5 mg/kg	<0.5	<0.5	0.0
		Dibenz(a,h)anthracene	0.5 mg/kg	<0.5	<0.5	0.0
		Benzo(g,h,i)perylene	0.5 mg/kg	<0.5	<0.5	0.0
		EB0600833-001	Anonymous	Naphthalene	0.5 mg/kg	<0.5

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Client : GOLDER ASSOCIATES
Project : 06683002 Hervey Bay

Work Order : EB0600625
ALS Quote Reference : EN/002/05

Page Number : 6 of 16
Issue Date : 2 Feb 2006



Matrix Type: SOIL

Laboratory Duplicates (DUP) Report

Laboratory Sample ID	Client Sample ID	Analyte name	LOR	Original Result	Duplicate Result	RPD
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - continued						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 164519) - continued				mg/kg	mg/kg	%
EB0600833-001	Anonymous	Acenaphthylene	0.5 mg/kg	<0.5	<0.5	0.0
		Acenaphthene	0.5 mg/kg	<0.5	<0.5	0.0
		Fluorene	0.5 mg/kg	<0.5	<0.5	0.0
		Phenanthrene	0.5 mg/kg	<0.5	<0.5	0.0
		Anthracene	0.5 mg/kg	<0.5	<0.5	0.0
		Fluoranthene	0.5 mg/kg	<0.5	<0.5	0.0
		Pyrene	0.5 mg/kg	<0.5	<0.5	0.0
		Benz(a)anthracene	0.5 mg/kg	<0.5	<0.5	0.0
		Chrysene	0.5 mg/kg	<0.5	<0.5	0.0
		Benzo(b)fluoranthene	0.5 mg/kg	<0.5	<0.5	0.0
		Benzo(k)fluoranthene	0.5 mg/kg	<0.5	<0.5	0.0
		Benzo(a)pyrene	0.5 mg/kg	<0.5	<0.5	0.0
		Indeno(1,2,3,cd)pyrene	0.5 mg/kg	<0.5	<0.5	0.0
		Dibenz(a,h)anthracene	0.5 mg/kg	<0.5	<0.5	0.0
		Benzo(g,h,i)perylene	0.5 mg/kg	<0.5	<0.5	0.0
EP080/071: Total Petroleum Hydrocarbons						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 163190)				mg/kg	mg/kg	%
EB0600624-001	Anonymous	C6 - C9 Fraction	2 mg/kg	<2	<2	0.0
EB0600625-002	S2	C6 - C9 Fraction	2 mg/kg	<2	<2	0.0
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 164518)				mg/kg	mg/kg	%
EB0600625-001	S1	C10 - C14 Fraction	50 mg/kg	<50	<50	0.0
		C15 - C28 Fraction	100 mg/kg	<100	<100	0.0
		C29 - C36 Fraction	100 mg/kg	<100	<100	0.0
EB0600833-001	Anonymous	C10 - C14 Fraction	50 mg/kg	<50	<50	0.0
		C15 - C28 Fraction	100 mg/kg	<100	<100	0.0
		C29 - C36 Fraction	100 mg/kg	<100	<100	0.0
EP080: BTEX						
EP080: BTEX - (QC Lot: 163190)				mg/kg	mg/kg	%
EB0600624-001	Anonymous	Benzene	0.2 mg/kg	<0.2	<0.2	0.0

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Client : GOLDER ASSOCIATES
Project : 06683002 Hervey Bay

Work Order : EB0600625
ALS Quote Reference : EN/002/05

Page Number : 7 of 16
Issue Date : 2 Feb 2006

ALS Environmental

Matrix Type: SOIL

Laboratory Duplicates (DUP) Report

Laboratory Sample ID	Client Sample ID	Analyte name	LOR	Original Result	Duplicate Result	RPD
EP080: BTEX - continued						
EP080: BTEX - (QC Lot: 163190) - continued						
EB0600624-001	Anonymous	Toluene	0.2 mg/kg	<0.2	<0.2	0.0
		Ethylbenzene	0.2 mg/kg	<0.2	<0.2	0.0
EB0600625-002	S2	meta- & para-Xylene	0.2 mg/kg	<0.2	<0.2	0.0
		ortho-Xylene	0.2 mg/kg	<0.2	<0.2	0.0
		Benzene	0.2 mg/kg	<0.2	<0.2	0.0
		Toluene	0.2 mg/kg	<0.2	<0.2	0.0
		Ethylbenzene	0.2 mg/kg	<0.2	<0.2	0.0
		meta- & para-Xylene	0.2 mg/kg	<0.2	<0.2	0.0
		ortho-Xylene	0.2 mg/kg	<0.2	<0.2	0.0

Release

Client : GOLDER ASSOCIATES
Project : 06683002 Hervey Bay

Work Order : EB0800625
ALS Quote Reference : EN/002/05

Page Number : 8 of 16
Issue Date : 2 Feb 2008



Quality Control Report - Method Blank (MB) and Laboratory Control Samples (LCS)

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC type is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a known, interference free matrix spiked with target analytes or certified reference material. The purpose of this QC type is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of actual laboratory data. Abbreviations: LOR = Limit of reporting.

Method Blank (MB) and Laboratory Control Samples (LCS) Report

Matrix Type: SOIL

Matrix Type: SOIL		Method blank result	Actual Results		Recovery Limits	
Analyte name	LOR		Spike concentration	Spike Recovery	Dynamic Recovery Limits	
				LCS	Low	High
EG005T: Total Metals by ICP-AES						
EG005T: Total Metals by ICP-AES - (QC Lot: 164982)		mg/kg	mg/kg	%	%	%
Arsenic	5 mg/kg	—	13.8	98.5	70	130
	5 mg/kg	<5	—	—	—	—
Cadmium	1 mg/kg	—	2.82	93.7	70	130
	1 mg/kg	<1	—	—	—	—
Chromium	2 mg/kg	—	61.6	98.7	70	130
	2 mg/kg	<2	—	—	—	—
Copper	5 mg/kg	—	54.7	102	70	130
	5 mg/kg	<5	—	—	—	—
Lead	5 mg/kg	—	55.5	101	70	130
	5 mg/kg	<5	—	—	—	—
Nickel	2 mg/kg	—	55.1	102	70	130
	2 mg/kg	<2	—	—	—	—
Zinc	5 mg/kg	—	105	102	70	130
	5 mg/kg	<5	—	—	—	—
EG020T: Total Metals by ICP-MS						
EG020T: Total Metals by ICP-MS - (QC Lot: 164981)		mg/kg	mg/kg	%	%	%
Mercury	0.1 mg/kg	—	1.34	98.7	70	130
	0.1 mg/kg	<0.1	—	—	—	—
EP066: Polychlorinated Biphenyls (PCB)						
EP066: Polychlorinated Biphenyls (PCB) - (QC Lot: 164523)		mg/kg	mg/kg	%	%	%
Total Polychlorinated biphenyls	0.1 mg/kg	—	0.5	82.3	54	121
	0.10 mg/kg	<0.10	—	—	—	—
EP068A: Organochlorine Pesticides (OC)						
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 164522)		mg/kg	mg/kg	%	%	%

Client : GOLDER ASSOCIATES
Project : 06883002 Hervey Bay

Work Order : EB0600625
ALS Quote Reference : EN/002/05

Page Number : 9 of 16
Issue Date : 2 Feb 2008



ALS Environmental

Matrix Type: SOIL

Method Blank (MB) and Laboratory Control Samples (LCS) Report

Analyte name	LOR	Method blank result	Actual Results		Recovery Limits	
			Spike concentration	Spike Recovery	Dynamic Recovery Limits	
					Low	High
			LCS			
EP068A: Organochlorine Pesticides (OC) - continued						
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 164522) - continued						
		mg/kg	mg/kg	%	%	%
4,4'-DDD	0.025 mg/kg	—	0.25	80.7	61	122
	0.05 mg/kg	<0.05	—	—	—	—
4,4'-DDE	0.025 mg/kg	—	0.25	85.6	63	121
	0.05 mg/kg	<0.05	—	—	—	—
4,4'-DDT	0.025 mg/kg	—	0.25	89.4	40	128
	0.2 mg/kg	<0.2	—	—	—	—
Aldrin	0.025 mg/kg	—	0.25	83.2	73	111
	0.05 mg/kg	<0.05	—	—	—	—
alpha-BHC	0.025 mg/kg	—	0.25	81.2	69	112
	0.05 mg/kg	<0.05	—	—	—	—
alpha-Endosulfan	0.025 mg/kg	—	0.25	85.5	66	120
	0.05 mg/kg	<0.05	—	—	—	—
beta-BHC	0.025 mg/kg	—	0.25	78.0	57	122
	0.05 mg/kg	<0.05	—	—	—	—
beta-Endosulfan	0.025 mg/kg	—	0.25	84.4	60	111
	0.05 mg/kg	<0.05	—	—	—	—
cis-Chlordane	0.025 mg/kg	—	0.25	85.6	71	108
	0.05 mg/kg	<0.05	—	—	—	—
delta-BHC	0.025 mg/kg	—	0.25	81.0	69	108
	0.05 mg/kg	<0.05	—	—	—	—
Dieldrin	0.025 mg/kg	—	0.25	81.6	70	111
	0.05 mg/kg	<0.05	—	—	—	—
Endosulfan sulfate	0.025 mg/kg	—	0.25	84.0	63	112
	0.05 mg/kg	<0.05	—	—	—	—
Endrin	0.025 mg/kg	—	0.25	78.4	63	113
	0.05 mg/kg	<0.05	—	—	—	—
Endrin aldehyde	0.025 mg/kg	—	0.25	69.9	38	126
	0.05 mg/kg	<0.05	—	—	—	—
Endrin ketone	0.025 mg/kg	—	0.25	81.7	72	105
	0.05 mg/kg	<0.05	—	—	—	—

Release



Client : GOLDER ASSOCIATES
Project : 06683002 Hervey Bay

Work Order : EB0600625
ALS Quote Reference : EN/002/05

Page Number : 10 of 18
Issue Date : 2 Feb 2008

ALS Environmental

Matrix Type: SOIL

Method Blank (MB) and Laboratory Control Samples (LCS) Report

Analyte name		LOR	Method blank result	Actual Results		Recovery Limits	
				Spike concentration	Spike Recovery LCS	Dynamic Recovery Limits	
						Low	High
EP068A: Organochlorine Pesticides (OC) - continued							
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 164522) - continued			mg/kg	mg/kg	%	%	%
gamma-BHC	0.025 mg/kg	—	0.25	79.8	70	107	
	0.05 mg/kg	<0.05	—	—	—	—	
Heptachlor	0.025 mg/kg	—	0.25	82.0	67	106	
	0.05 mg/kg	<0.05	—	—	—	—	
Heptachlor epoxide	0.025 mg/kg	—	0.25	89.3	66	115	
	0.05 mg/kg	<0.05	—	—	—	—	
Hexachlorobenzene (HCB)	0.025 mg/kg	—	0.25	82.4	68	117	
	0.05 mg/kg	<0.05	—	—	—	—	
Methoxychlor	0.025 mg/kg	—	0.25	73.7	40	127	
	0.2 mg/kg	<0.2	—	—	—	—	
trans-Chlordane	0.025 mg/kg	—	0.25	87.4	67	115	
	0.05 mg/kg	<0.05	—	—	—	—	
EP068B: Organophosphorus Pesticides (OP)							
EP068B: Organophosphorus Pesticides (OP) - (QC Lot: 164522)			mg/kg	mg/kg	%	%	%
Methyl Azinphos	0.025 mg/kg	—	0.25	57.0	42	123	
	0.05 mg/kg	<0.05	—	—	—	—	
Bromophos-ethyl	0.025 mg/kg	—	0.25	83.0	64	118	
	0.05 mg/kg	<0.05	—	—	—	—	
Carbophenothion	0.025 mg/kg	—	0.25	78.1	61	112	
	0.05 mg/kg	<0.05	—	—	—	—	
Chlorfenvinphos	0.025 mg/kg	—	0.25	81.8	56	129	
	0.05 mg/kg	<0.05	—	—	—	—	
Chlorpyrifos	0.025 mg/kg	—	0.25	85.4	69	114	
	0.05 mg/kg	<0.05	—	—	—	—	
Chlorpyrifos-methyl	0.025 mg/kg	—	0.25	85.2	74	106	
	0.05 mg/kg	<0.05	—	—	—	—	
Demeton-S-methyl	0.025 mg/kg	—	0.25	11.2	52	104	
	0.05 mg/kg	<0.05	—	—	—	—	
Diazinon	0.025 mg/kg	—	0.25	81.5	68	113	
	0.05 mg/kg	<0.05	—	—	—	—	

Release



Client : GOLDER ASSOCIATES
Project : 06683002 Harvey Bay

Work Order : EB0600625
ALS Quote Reference : EN/002/05

Page Number : 11 of 16
Issue Date : 2 Feb 2008

ALS Environmental

Matrix Type: SOIL

Method Blank (MB) and Laboratory Control Samples (LCS) Report

		Method blank result	Actual Results		Recovery Limits	
Analyte name	LOR		Spike concentration	Spike Recovery LCS	Dynamic Recovery Limits	
					Low	High
EP068B: Organophosphorus Pesticides (OP) - continued						
EP068B: Organophosphorus Pesticides (OP) - (QC Lot: 164522) - continued		mg/kg	mg/kg	%	%	%
Dichlorvos	0.025 mg/kg	—	0.3	88.5	46	120
	0.05 mg/kg	<0.05	—	—	—	—
Dimethoate	0.025 mg/kg	—	0.25	72.5	65	112
	0.05 mg/kg	<0.05	—	—	—	—
Ethion	0.025 mg/kg	—	0.25	83.6	69	113
	0.05 mg/kg	<0.05	—	—	—	—
Fenamiphos	0.025 mg/kg	—	0.25	56.5	26	130
	0.05 mg/kg	<0.05	—	—	—	—
Fenthion	0.025 mg/kg	—	0.25	71.2	68	110
	0.05 mg/kg	<0.05	—	—	—	—
Malathion	0.025 mg/kg	—	0.25	81.8	70	112
	0.05 mg/kg	<0.05	—	—	—	—
Monocrotophos	0.025 mg/kg	—	0.25	44.1	23	130
	0.2 mg/kg	<0.2	—	—	—	—
Parathion	0.025 mg/kg	—	0.25	79.8	70	111
	0.2 mg/kg	<0.2	—	—	—	—
Parathion-methyl	0.025 mg/kg	—	0.25	80.0	52	125
	0.2 mg/kg	<0.2	—	—	—	—
Pirimphos-ethyl	0.025 mg/kg	—	0.25	86.4	71	112
	0.05 mg/kg	<0.05	—	—	—	—
Prothiofos	0.025 mg/kg	—	0.25	84.4	68	118
	0.05 mg/kg	<0.05	—	—	—	—
EP076(SIM)A: Phenolic Compounds						
EP076(SIM)A: Phenolic Compounds - (QC Lot: 164519)		mg/kg	mg/kg	%	%	%
2,4,5-Trichlorophenol	0.25 mg/kg	—	5	93.2	66	115
	0.5 mg/kg	<0.5	—	—	—	—
2,4,6-Trichlorophenol	0.25 mg/kg	—	5	88.6	66	121
	0.5 mg/kg	<0.5	—	—	—	—
2,4-Dichlorophenol	0.25 mg/kg	—	5	93.6	54	130
	0.5 mg/kg	<0.5	—	—	—	—

Released

Released



ALS Environmental

Client : GOLDER ASSOCIATES
Project : 08883002 Hervey Bay

Work Order : EB0600625
ALS Quote Reference : EN/002/05

Page Number : 12 of 16
Issue Date : 2 Feb 2008

Matrix Type: SOIL

Method Blank (MB) and Laboratory Control Samples (LCS) Report

Analyte name	LOR	Method blank result	Actual Results		Recovery Limits	
			Spike concentration	Spike Recovery	Dynamic Recovery Limits	
				LCS	Low	High
EP075(SIM)A: Phenolic Compounds - continued						
EP075(SIM)A: Phenolic Compounds - (QC Lot: 164519) - continued						
2,4-Dimethylphenol	0.25 mg/kg	—	5	92.0	78	114
	0.5 mg/kg	<0.5	—	—	—	—
2,6-Dichlorophenol	0.25 mg/kg	—	5	88.6	70	119
	0.5 mg/kg	<0.5	—	—	—	—
2-Chlorophenol	0.25 mg/kg	—	5	92.6	80	130
	0.5 mg/kg	<0.5	—	—	—	—
2-Methylphenol	0.25 mg/kg	—	5	93.0	65	121
	0.5 mg/kg	<0.5	—	—	—	—
2-Nitrophenol	0.25 mg/kg	—	5	89.9	46	130
	0.5 mg/kg	<0.5	—	—	—	—
3- & 4-Methylphenol	0.25 mg/kg	—	10	93.5	72	117
	1.0 mg/kg	<1.0	—	—	—	—
4-Chloro-3-Methylphenol	0.25 mg/kg	—	5	89.7	71	113
	0.5 mg/kg	<0.5	—	—	—	—
Pentachlorophenol	0.25 mg/kg	—	10	80.7	20	122
	2.0 mg/kg	<2.0	—	—	—	—
Phenol	0.25 mg/kg	—	5	92.6	52	129
	0.5 mg/kg	<0.5	—	—	—	—
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 164519)						
Acenaphthene	0.25 mg/kg	—	5	87.4	74	114
	0.5 mg/kg	<0.5	—	—	—	—
Acenaphthylene	0.25 mg/kg	—	5	89.9	72	119
	0.5 mg/kg	<0.5	—	—	—	—
Anthracene	0.25 mg/kg	—	5	91.9	70	128
	0.5 mg/kg	<0.5	—	—	—	—
Benz(a)anthracene	0.25 mg/kg	—	5	93.5	72	119
	0.5 mg/kg	<0.5	—	—	—	—
Benzo(a)pyrene	0.25 mg/kg	—	5	94.1	80	123
	0.5 mg/kg	<0.5	—	—	—	—

Release



Client : GOLDER ASSOCIATES
Project : 08683002 Hervey Bay

Work Order : EB0600625
ALS Quote Reference : EN/002/05

Page Number : 13 of 16
Issue Date : 2 Feb 2006

ALS Environmental

Matrix Type: SOIL

Method Blank (MB) and Laboratory Control Samples (LCS) Report

Analyte name		LOR	Method blank result	Actual Results		Recovery Limits	
				Spike concentration	Spike Recovery	Dynamic Recovery Limits	
						LCS	Low
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - continued							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 164519) - continued			mg/kg	mg/kg	%	%	%
Benzo(b)fluoranthene	0.25 mg/kg	---	5	87.9	69	124	
	0.5 mg/kg	<0.5	---	---	---	---	
Benzo(g,h,i)perylene	0.25 mg/kg	---	5	93.5	69	115	
	0.5 mg/kg	<0.5	---	---	---	---	
Benzo(k)fluoranthene	0.25 mg/kg	---	5	95.1	68	130	
	0.5 mg/kg	<0.5	---	---	---	---	
Chrysene	0.25 mg/kg	---	5	89.8	70	130	
	0.5 mg/kg	<0.5	---	---	---	---	
Dibenz(a,h)anthracene	0.25 mg/kg	---	5	94.3	68	126	
	0.5 mg/kg	<0.5	---	---	---	---	
Fluoranthene	0.25 mg/kg	---	5	92.0	65	124	
	0.5 mg/kg	<0.5	---	---	---	---	
Fluorene	0.25 mg/kg	---	5	88.2	78	112	
	0.5 mg/kg	<0.5	---	---	---	---	
Indeno(1,2,3,cd)pyrene	0.25 mg/kg	---	5	93.8	69	122	
	0.5 mg/kg	<0.5	---	---	---	---	
Naphthalene	0.25 mg/kg	---	5	89.1	77	124	
	0.5 mg/kg	<0.5	---	---	---	---	
Phenanthrene	0.25 mg/kg	---	5	92.4	63	130	
	0.5 mg/kg	<0.5	---	---	---	---	
Pyrene	0.25 mg/kg	---	5	92.0	62	130	
	0.5 mg/kg	<0.5	---	---	---	---	
EP080/071: Total Petroleum Hydrocarbons							
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 163190)			mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	2 mg/kg	---	26	83.9	80	119	
	2 mg/kg	<2	---	---	---	---	
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 164518)			mg/kg	mg/kg	%	%	%
C10 - C14 Fraction	50 mg/kg	---	314	92.5	52	130	
	50 mg/kg	<50	---	---	---	---	

Release

Client : GOLDER ASSOCIATES
Project : 06683002 Hervey Bay

Work Order : EB0600625
ALS Quote Reference : EN/002/05

Page Number : 14 of 16
Issue Date : 2 Feb 2006



ALS Environmental

Matrix Type: SOIL

Method Blank (MB) and Laboratory Control Samples (LCS) Report

		Method blank result	Actual Results		Recovery Limits	
			Spike concentration	Spike Recovery LCS	Dynamic Recovery Limits	
					Low	High
Analyte name	LOR					
EP080/071: Total Petroleum Hydrocarbons - continued						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 164518) - continued		mg/kg	mg/kg	%	%	%
C15 - C28 Fraction	100 mg/kg	—	496	88.8	66	126
	100 mg/kg	<100	—	—	—	—
C29 - C36 Fraction	100 mg/kg	<100	—	—	—	—
EP080: BTEX						
EP080: BTEX - (QC Lot: 163190)		mg/kg	mg/kg	%	%	%
Benzene	0.2 mg/kg	—	1	89.7	84	119
	0.2 mg/kg	<0.2	—	—	—	—
Ethylbenzene	0.2 mg/kg	—	1	88.6	78	119
	0.2 mg/kg	<0.2	—	—	—	—
meta- & para-Xylene	0.2 mg/kg	—	1	91.7	77	123
	0.2 mg/kg	<0.2	—	—	—	—
ortho-Xylene	0.2 mg/kg	—	1	88.4	76	122
	0.2 mg/kg	<0.2	—	—	—	—
Toluene	0.2 mg/kg	—	1	90.0	79	119
	0.2 mg/kg	<0.2	—	—	—	—

Release

Client : GOLDER ASSOCIATES
Project : 06883002 Hervey Bay

Work Order : EB0600625
ALS Quote Reference : EN/002/05

Page Number : 15 of 16
Issue Date : 2 Feb 2008



Quality Control Report - Matrix Spikes (MS)

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC type is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQO's). 'Ideal' recovery ranges stated may be waived in the event of sample matrix interferences. - Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot. Abbreviations: LOR = Limit of Reporting, RPD = Relative Percent Difference.

* Indicates failed QC

Matrix Type: SOIL

Matrix Spike (MS) Report

					Actual Results		Recovery Limits			
			LOR	Spike Concentration	Sample Result	Spike Recovery MS	Static Limits			
							Low	High		
Analyte name	Laboratory Sample ID	Client Sample ID								
EG005T: Total Metals by ICP-AES										
EG005T: Total Metals by ICP-AES - (QC Lot: 164982)				mg/kg	mg/kg	%	%	%		
Arsenic	EB0600625-001	S1	5 mg/kg	50.0	7	96.8	70	130		
Cadmium			1 mg/kg	50.0	<1	102	70	130		
Chromium			2 mg/kg	50.0	12	100	70	130		
Copper			5 mg/kg	50.0	8	112	70	130		
Lead			5 mg/kg	50.0	8	99.3	70	130		
Nickel			2 mg/kg	50.0	24	110	70	130		
Zinc			5 mg/kg	50.0	18	111	70	130		
EG020T: Total Metals by ICP-MS										
EG020T: Total Metals by ICP-MS - (QC Lot: 164981)				mg/kg	mg/kg	%	%	%		
Mercury	EB0600625-001	S1	0.1 mg/kg	10	<0.1	101	70	130		
EP066: Polychlorinated Biphenyls (PCB)										
EP066: Polychlorinated Biphenyls (PCB) - (QC Lot: 164523)				mg/kg	mg/kg	%	%	%		
Total Polychlorinated biphenyls	EB0600625-002	S2	0.1 mg/kg	0.5	<0.10	84.7	70	130		
EP068A: Organochlorine Pesticides (OC)										
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 164522)				mg/kg	mg/kg	%	%	%		
gamma-BHC	EB0600625-002	S2	0.05 mg/kg	0.25	<0.05	69.5	70	130		
Heptachlor			0.05 mg/kg	0.25	<0.05	52.0	70	130		
Aldrin			0.05 mg/kg	0.25	<0.05	58.0	70	130		
Dieldrin			0.05 mg/kg	0.25	<0.05	60.6	70	130		
Endrin			0.05 mg/kg	0.25	<0.05	50.4	70	130		
4,4'-DDT			0.2 mg/kg	0.25	<0.2	* Not Determined	70	130		
EP068B: Organophosphorus Pesticides (OP)										
EP068B: Organophosphorus Pesticides (OP) - (QC Lot: 164522)				mg/kg	mg/kg	%	%	%		

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Client : GOLDER ASSOCIATES
Project : 08683002 Hervey Bay

Work Order : EB0600625
ALS Quote Reference : EN/002/05

Page Number : 18 of 18
Issue Date : 2 Feb 2006

ALS Environmental

Matrix Type: SOIL

Matrix Spike (MS) Report

					Actual Results		Recovery Limits	
					Sample Result	Spike Recovery	Static Limits	
						MS	Low	High
Analyte name	Laboratory Sample ID	Client Sample ID	LOR	Spike Concentration				
EP068B: Organophosphorus Pesticides (OP) - continued								
EP068B: Organophosphorus Pesticides (OP) - (QC Lot: 164522) - continued				mg/kg	mg/kg	%	%	%
Diazinon	EB0600625-002	S2	0.05 mg/kg	0.25	<0.05	73.0	70	130
Chlorpyrifos-methyl			0.05 mg/kg	0.25	<0.05	74.7	70	130
Pirimphos-ethyl			0.05 mg/kg	0.25	<0.05	54.2	70	130
Bromophos-ethyl			0.05 mg/kg	0.25	<0.05	52.1	70	130
Prothiofos			0.05 mg/kg	0.25	<0.05	61.5	70	130
EP075(SIM)A: Phenolic Compounds								
EP075(SIM)A: Phenolic Compounds - (QC Lot: 164519)				mg/kg	mg/kg	%	%	%
Phenol	EB0600625-002	S2	0.5 mg/kg	2.5	<0.5	93.8	70	130
2-Chlorophenol			0.5 mg/kg	2.5	<0.5	87.7	70	130
2-Nitrophenol			0.5 mg/kg	2.5	<0.5	74.4	70	130
4-Chloro-3-Methylphenol			0.5 mg/kg	2.5	<0.5	86.3	70	130
Pentachlorophenol			2.0 mg/kg	2.5	<2.0	86.3	40	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 164519)				mg/kg	mg/kg	%	%	%
Acenaphthene	EB0600625-002	S2	0.5 mg/kg	2.5	<0.5	86.4	70	130
Pyrene			0.5 mg/kg	2.5	<0.5	96.5	70	130
EP080/071: Total Petroleum Hydrocarbons								
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 163190)				mg/kg	mg/kg	%	%	%
C8 - C9 Fraction	EB0600624-002	Anonymous	2 mg/kg	28	<2	84.7	70	130
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 164518)				mg/kg	mg/kg	%	%	%
C10 - C14 Fraction	EB0600625-002	S2	50 mg/kg	314	<50	84.4	70	130
C15 - C28 Fraction			100 mg/kg	498	<100	83.2	70	130
EP080: BTEX								
EP080: BTEX - (QC Lot: 163190)				mg/kg	mg/kg	%	%	%
Benzene	EB0600624-002	Anonymous	0.2 mg/kg	2	<0.2	87.0	70	130
Toluene			0.2 mg/kg	2	<0.2	84.5	70	130

Release



ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Client Details

Client : **GOLDER ASSOCIATES**
Contact : **CTPI 49-Sch4**
Address : **P O BOX 5569 MAROOCHYDORE SOUTH
QLD AUSTRALIA 4558**

Project : **06683002 Hervey Bay**
Order number : **MQ3521**
C-O-C Number : **06683002-tr1**
Site : **- Not provided -**
Sampler : **JM**

E-mail : **CTPI 49@golder.com.au**
Telephone : **07 5443 3511**
Facsimile : **07 5443 6645**

Laboratory Details

Laboratory : **ALS Environmental Brisbane**
Manager : **CTPI 49-Sch4**
Address : **32 Shand Street Stafford QLD Australia 4053**

Quote number : **ES20050035**
Work order : **EB0600625**

E-mail : **CTPI 49-Sch4@alsenviro.com**
Telephone : **61-7-32437222**
Facsimile : **61-7-32437259**

Dates

Date Samples Received : **20 Jan 2006**
SRA Issue Date : **23 Jan 2006**
Scheduled Reporting Date : **30 Jan 2006**

Delivery Details

Mode of Delivery : **Carrier.**
No. of coolers/boxes : **1 MEDIUM.**
Security Seal : **Intact.**

Temperature : **16 C - Ice bricks present**
No. of samples - Received : **11**
- Analysed : **11**

Comments

- Samples received in appropriately pretreated and preserved containers.
- Sample(s) have been received within recommended holding times.
- Analytical work for this work order will be conducted at ALSE Brisbane.
- Please direct any queries related to sample condition / numbering / breakages to Charles Allom.
 - Sample Disposal - Aqueous (14 days), Solid (90 days) from date of completion of work order.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- When the sampling time is not supplied on the COC documentation, ALSE defaults the sampling time to that of the COC 'relinquishment' time (if supplied). If this also is not supplied, ALSE defaults the sampling time to the 'time of receipt at Laboratory'.

SAMPLE RECEIPT NOTIFICATION (SRN) - continued

Client : GOLDER ASSOCIATES
Project : 06683002 Hervey Bay

Work Order : EB0600625
ALS Quote Reference : ES20050035



Requested Reports

- CTPI 49-Sch4
 - A4 - Certificate of Analysis - NEPM format
 - A4 - Quality Control Report - NEPM format
 - A4 - Interpretive Quality Control Report - NEPM format
 - GHDNEW Export Format
 - Chain of Custody Acknowledgement
 - A4 - Sample Receipt Notification - Standard format
 - THE ACCOUNTS PAYABLE (MRCHYDRE)
 - Invoice
- Email CTPI 4 @golder.com.au
Email @golder.com.au
Email @golder.com.au
Email @golder.com.au
Email @golder.com.au
Email @golder.com.au
Email @golder.com.au
Email apmaroochydore@golder.com.au

Sample Container(s) / Preservation Non-Compliance Log

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- No sample container / preservation non-compliance exist.

Published on DES Disclosure Log
RTI Act 2009

Appendix D
**Important Information About Your Environmental Site
Assessment**

Release

Important Information About Your

Environmental Site Assessment

These notes have been prepared by Golder Associates Pty Ltd using guidelines prepared by ASFE; The Association of Engineering Firms Practising in the Geosciences, of which Golder Associates Pty Ltd is a member. They are offered to help you in the interpretation of your Environmental Site Assessment (ESA) report.

Reasons For Conducting An ESA

ESA's are typically, though not exclusively carried out in the following circumstances :

- as pre-acquisition assessments, on behalf of either purchaser or vendor, when a property is to be sold;
- as pre-development assessments, when a property or area of land is to be redeveloped or have its use changed, for example, from a factory to a residential subdivision;
- as pre-development assessments of greenfield sites, to establish "baseline" conditions and assess environmental, geological and hydrogeological constraints to the development of, for example, a landfill; and
- as audits of the environmental effects of an ongoing operation.

Each of these circumstances requires a specific approach to the assessment of soil and groundwater contamination. In all cases, however, the objective is to identify and if possible quantify the risks which unrecognised contamination poses to the proposed activity. Such risks may be both financial, for example, clean-up costs or limitations on site use, and physical, for example, health risks to site users or the public.

The Limitations of An ESA

Although the information provided by an ESA can reduce exposure to such risks, no ESA, however diligently carried out, can eliminate them. Even a rigorous professional assessment may fail to detect all contamination on a site. Contaminants may be present in areas that were not surveyed or sampled, or may migrate to areas which showed no signs of contamination when sampled.

An ESA Report Is Based On A Unique Set of Project Specific Factors

Your environmental report should not be used :

- When the nature of the proposed development is changed, for example, if a residential development is proposed instead of a commercial one;

- When the size or configuration of the proposed development is altered;
- when the location or orientation of the proposed structure is modified;
- When there is a change of ownership; or
- For the application to an adjacent site.

To help avoid costly problems, refer to your consultant to determine how any factors which have changed subsequent to the date of the report may affect its recommendations.

ESA "Findings" Are Professional Estimates

Site assessment identifies actual subsurface conditions only at those points where samples are taken, when they are taken. Data derived through sampling and subsequent laboratory testing are interpreted by geologists, engineers or scientists who then render an opinion about overall subsurface conditions, the nature and extent of contamination, its likely impact on the proposed development and appropriate remediation measures. Actual conditions may differ from those inferred to exist, because no professional, no matter how qualified, and no subsurface exploration program, no matter how comprehensive, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than a report indicates. Actual conditions in areas not sampled may differ from predictions. Nothing can be done to prevent the unanticipated, but steps can be taken to help minimise its impact. For this reason, owners should retain the services of their consultants through the development stage, to identify variations, conduct additional tests which may be needed, and to recommend solutions to problems encountered on site.

Subsurface Conditions Can Change

Subsurface conditions are changed by natural processes and the activity of man. Because an ESA report is based on conditions which existed at the time of subsurface exploration, decisions should not be based on an ESA report whose adequacy may have been affected by time. Speak with the consultant to learn if additional tests are advisable.

ESA Services Are Performed For Specific Purposes And Persons

Every study and ESA report is prepared in response to a specific Brief to meet the specific needs of specific individuals. A report prepared for a consulting civil engineer may not be adequate for a construction contractor, or even some other consulting civil engineer. A report should not be used by other persons for any purpose, or by the client for a different purpose. No individual other than the client should apply a report even apparently for its intended purpose without first conferring with the consultant. No person should apply a report for any purpose other than that originally contemplated without first conferring with the consultant.

An ESA Report Is Subject To Misinterpretation

Costly problems can occur when design professionals develop their plans based on misinterpretations of an ESA. To help avoid these problems, the environmental consultant should be retained to work with appropriate design professionals to explain relevant findings and to review the adequacy of their plans and specifications relative to contamination issues.

Logs Should Not Be Separated From The Engineering Report

Final borehole or test pit logs are developed by environmental scientists, engineers or geologists based upon their interpretation of field logs (assembled by site personnel) and laboratory evaluation of field samples.

Only final logs are customarily included in our reports. These logs should no under any circumstances be redrawn for inclusion in site remediation or other design drawings, because drafters may commit errors or omissions in the transfer process. Although photographic reproduction eliminates this problem, it does nothing to minimise the possibility of contractors misinterpreting the logs during bid preparation. When this occurs, delays, disputes and unanticipated costs are the all-too-frequent result.

To reduce the likelihood of boring log misinterpretation, the complete report must be available to persons or organisations involved in the project, such as contractors, for their use. Those who do not provide such access may proceed under the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing all the available information to persons and organisations such as contractors helps prevent costly construction problems and the adversarial attitudes which may aggravate them to disproportionate scale.

Read Responsibility Clauses Closely

Because an ESA is based extensively on judgement and opinion, it is necessarily less exact than other disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, model clauses have been developed for use in written transmittals. These are not exculpatory clauses designed to foist liabilities onto some other party. Rather, they are definitive clauses which identify where your consultant's responsibilities begin and end. Their use helps all parties involved recognise their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your ESA report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

Releas

Hervey

Bu



Queensland
Government

Enquiries
Telephone
Your reference
Our reference

Tess Dobinson
(07) 322 77258 fax (07) 3247 3278
9437

Environmental Protection Agency

Incorporating the
Queensland Parks and Wildlife Service

6 November 2002

Ms Janet Campbell
Property Manager
Hervey Bay City Council
PO Box 5045
TORQUAY QLD 4655

Dear Ms Campbell

RE: Lot 2 on RP230596 (now Lots 2 & 10 on SP136512) – Drury Lane, Pialba.

Thank you for your letter dated 5 November 2002 regarding the above properties. With regards to the sale of Lot 2, it is a requirement of section 421 of the *Environmental Protection Act 1994* that the owner of a site that is listed on the Environmental Management Register (EMR) must give written notice to the buyer advising them of the site's listing.

If you wish to have this site removed from the EMR, it will need to be investigated by a suitably qualified person, as described in Section 381 of the *Environmental Protection Act 1994*. A site investigation report is prepared by this person and submitted to this Agency for examination by our scientific advisors. The fee for consideration of a site investigation report in relation to land that is listed on the EMR is \$900.00 per lot. A decision is then made as to whether the site can be removed from the EMR, or whether it should remain listed as a Managed site with an appropriate Site Management Plan (SMP). The SMP will set out conditions and restrictions in relation to the use of the land; these conditions address residual levels of contamination remaining on the site and provide guidelines on acceptable usage.

Please do not hesitate to contact me on the above telephone number if you have any queries regarding this matter.

Yours sincerely

CTPI 49-Sch4

Tess Dobinson
Registrar
Contaminated Land Unit

✓ checked
20/11/02
Tess Dobinson

CTPI 49-Sch4



STR2002/8655

Enquiries: Janet Campbell
Phone: (07) 4197 4358
Your Reference:
Our Reference: P-S-136512-2

JC:jac

PO Box 5045
TORQUAY
QLD 4655

5 November 2002

Contaminated Land Unit
Environmental Protection Agency
GPO Box 2771
BRISBANE QLD 4001

Dear Sir/Madam

CONTAMINATED LAND - DRURY LANE PIALBA

Council recently investigated the possibility of selling one of its surplus properties which has been used for dumping purposes. The investigation revealed that the property, formally described as Lot 2 on RP 230596, had in fact been listed on the Contaminated Land Register. Unfortunately, this information was not recorded on Council's file for the property at the time of the listing.

Accordingly, the listing remained unknown to Council officers when the property was subdivided a couple of years ago. The subdivision, which was not referred to the EPA for comment, has since been registered with two new properties, Lots 2 and 10 on SP 136512, being created. Lot 10 is held by Council for drainage purposes and Lot 2 was held until recently as a possible site for the relocation of Council's depot. However, as the site is no longer required for this purpose, the investigation into whether it could be sold was undertaken.

Therefore, your advice is sought in relation to what requirements the EPA would have if Council was to further investigate the possibility of selling Lot 2 to a private landowner.

Please contact me on ☎ 4197 4358 or Mr Andy Gaze on ☎ 4197 4325 if you require any further details prior to responding.

Yours faithfully

CTPI 49-Sch4

JANET CAMPBELL
PROPERTY MANAGER



77 Tavistock St
HERVEY BAY

Telephone: 07 4197 4444
Facsimile: 19-295 4197 4455

www.herveybay.qld.gov.au

File B

Page 193 of 337

13 JUN 1996

Notification of contaminated site

- The following information should be supplied by people providing notification to the Queensland Department of Environment and Heritage of contaminated land or land used for a prescribed purpose under the Contaminated Land Act 1991 and the Contaminated Land Regulation 1991.

Essential information

- Please complete all information.
- Please complete one form per lot.

Local Authority area

Hervey Bay City Council

Information provided by

Name

Jim HoweContact phone no. (07) 250 334

Organisation

Hervey Bay City Council

Address

P.O. Box 45TorquayPostcode 4655

Name by which the property is known locally

Location

Street address

Dundowran Road

Town/suburb

DundowranPostcode 4655

Council area

Hervey Bay City Council

Lot-on-Plan description of parcel of land

Lot 2 on RP 230596

Land titles register volume and folio number

V 7478 F 158Name and postal
address of owner

Name

Hervey Bay City Council (Engineering Services)

Address

P.O. Box 45TorquayPostcode 4655

Description of the source of the suspected contamination or the prescribed purpose for which the land is or has been used (a short description of the land or cause of contamination will be sufficient. A separate attachment can be made if space is insufficient)

Sanitary landfill RP 431

Area of parcel in square metres (this information is used as a cross-check on the land description details)

14.85 ha.

Current local authority zoning of the land

Rural B

The processing of this information would be greatly assisted by the inclusion of a map or locality plan.

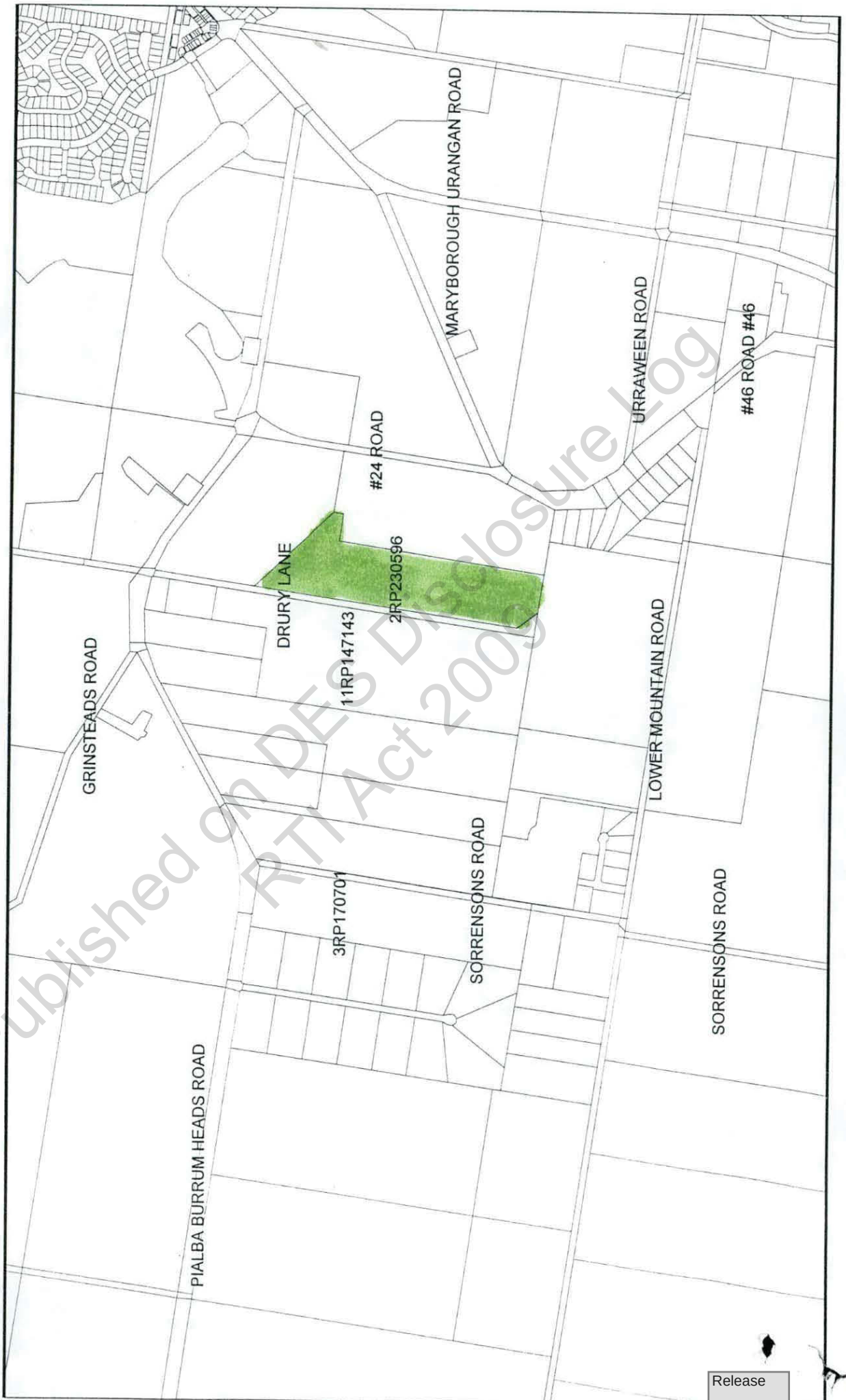
If further information is required please contact:

Queensland Department of Environment and Heritage
Contaminated Sites Section
PO Box 155
BRISBANE ALBERT STREET QLD 4002
(07) 227 7370 • Fax (07) 227 7369

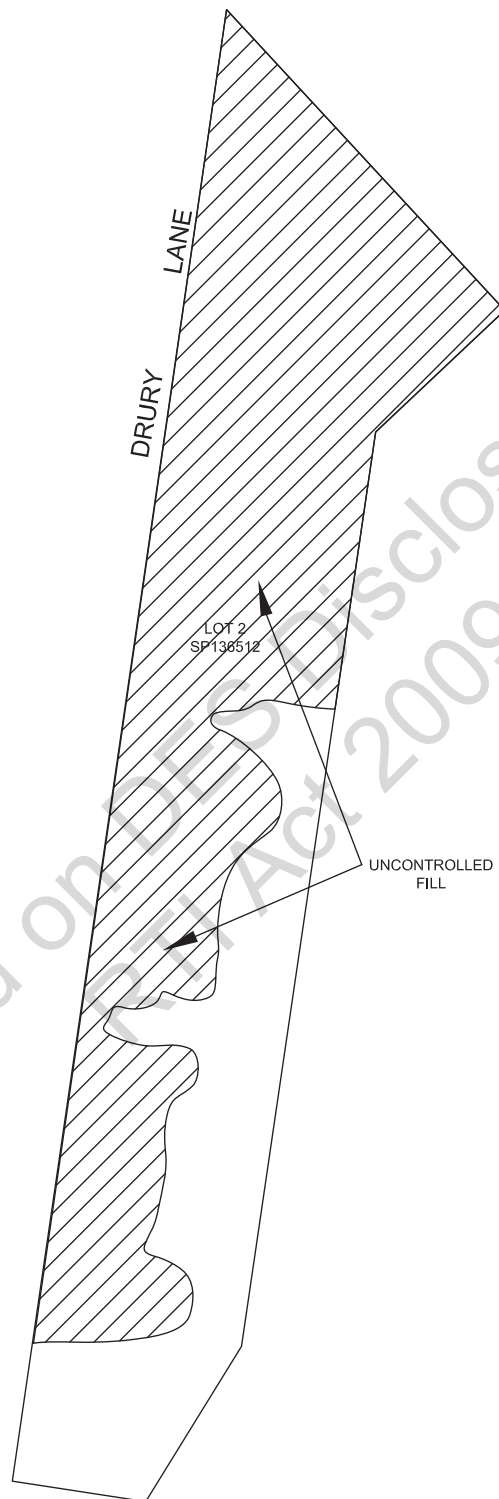
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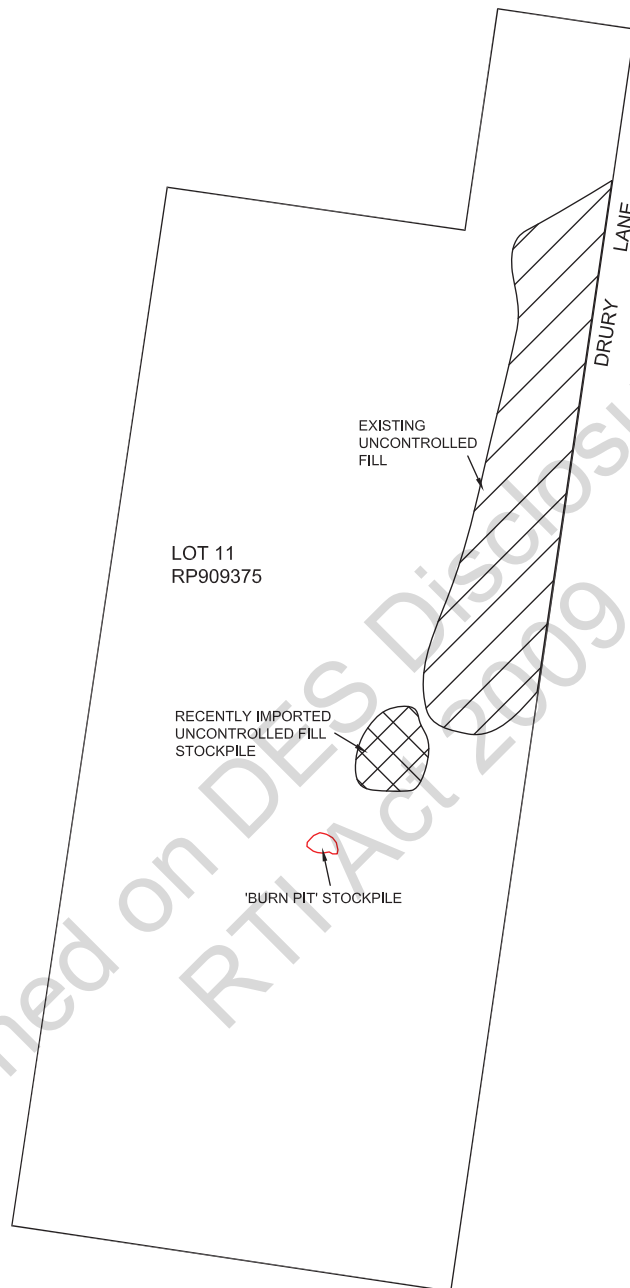
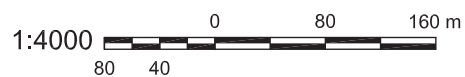
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RTI Act 2009



Release





1.0 SUMMARY OF CONTAMINATION

The site, located at Lot 2 Drury Lane, Dundowran, QLD, was originally a sand extraction operation. The majority of the extraction area was subsequently filled in a relatively uncontrolled manner. The placement of uncontrolled fill over the site has resulted in the listing of the site on the Environmental Management Register for the Notifiable Activity – Landfill.

The filled areas of Lot 2 are shown on attached Figure 1 and contain materials including:

Building rubble (including large pieces of concrete greater than 300mm diameter), steel, bitumen, timber, bricks, iron, tyres, car parts, animal carcasses, wire, gravel, plastic, PVC pipe, cobbles, sandstone and uncontrolled soil fill.

Metals impacted soils (above HILA) – Maximum concentrations of contamination in soil exceeding the HIL 'A' are described below:

<u>Analyte</u>	<u>Maximum Concentration (mg/kg)</u>
Arsenic	111

The strategy by which these materials will be removed and/or managed to enable removal of the site from the Environmental Management Register (EMR) is contained in the Remediation Action Plan (RAP) attached as Appendix 1.

2.0 OBJECTIVES OF THE SMP

The purpose of this SMP is to manage identified contamination on the site in a manner that protects human health and the environment.

3.0 ACHIEVEMENT AND MAINTENANCE OF OBJECTIVES

3.1 Responsibility. The owner of the land (as defined in the *Environmental Protection Act 1994*) is to ensure that this SMP and any variations approved or required by the administering authority are complied with. The obligations and conditions set out in this SMP bind the owner, from time to time, of the land.

3.2 Site Use. The site is currently a landfill site and is proposed to be redeveloped and subdivided into an industrial estate. Prior to commencement of this new land use, remedial works will be conducted with the primarily intent removing the site from the EMR. All remediation and validation works for this site are to be carried out in accordance with Appendix 1 - Remediation Action Plan (RAP).

3.3 Third Party Reviewer (TPR) A Third Party Reviewer (TPR) approved by the DERM and operating in accordance with the DERM's Terms of Reference for TPR (February 2008) must be appointed for the duration of the site assessment and remediation activities.

3.4 Provision of SMP to appropriate persons. The owner must provide all persons involved in building design and planning and all contractors and lessees conducting building and/or excavation works with a copy of the SMP prior to

commencement of site works. All persons occupying or working on the site must comply with the requirements of the SMP.

3.5 Surface capping and protective barriers. Existing surface cover across filled areas shall be maintained until such time as remediation works occur.

3.6 Service Trenches. All underground services must be constructed in either uncontaminated material or in trenches in which the services are surrounded by a minimum of 0.3m of uncontaminated fill for minor services (< 100 mm in diameter), and 0.5m of uncontaminated fill for services greater than 100 mm in diameter.

3.7 Soil Excavation & Removal. Uncontrolled fills must not be removed from site without suitable characterisation sampling and analysis. Representative characterisation sampling and analysis of any uncontrolled fill materials excavated from the site must be managed by a suitably qualified and experienced person in accordance with Section 381 of the *Environmental Protection Act 1994* (EP Act). Contaminated soil must not be removed off-site without a disposal permit in accordance with Section 424 of the EP Act.

3.8 Unexpected Contamination. If during any site earthworks or excavation, offensive or noxious odours and/or evidence of gross contamination not previously detected are observed, site works are to cease in that area and action taken to immediately abate the environmental harm. The administering authority is to be notified in writing within 2 business days of detection and advised of appropriate remedial action.

Any remedial action is to be developed by an appropriately qualified and experienced person in accordance with Section 381 of the EP Act.

3.9 General Environmental Protection. All earthworks are to be undertaken in accordance with general environmental protection measures to avoid unwanted migration and deposition of soil. These measures include the control of dust, noise, stormwater runoff, sediment, erosion, spillage from haulage trucks and odour releases involving the handling or movement of contaminated material.

3.10 Workplace Health and Safety. A Workplace Health and Safety Plan (WH&S plan), which conforms to the requirements of the *Workplace Health and Safety Act 1995* is to be developed for any site excavation works in contaminated areas. The WH&S plan must specifically address contaminants of concern.

4.0 MONITORING AND REPORTING

The owner is to ensure that the following reporting and monitoring is performed to ensure compliance with the SMP:

Until remediation commences:

Records are to be kept of all inspections, any soil excavation in contaminated areas, disposal permits and site management plan compliance for review by the administering authority from time to time. A biennial inspection is to be undertaken to ensure that capping and protective barriers remain in sound condition at all times in accordance with Section 3.5.

The biennial period is to commence from the effective date of this plan.

Once remediation commences:

Monitoring and reporting is to be conducted as required in Appendix 1 - Remediation Action Plan (RAP).

In addition to the reporting required in the RAP, within 45 days from the completion of site development a report is to be submitted to the TPR documenting details of remediation activities, the results of any sampling undertaken during remediation, records of any site inspections and details of Site Management Plan compliance. The report is to be prepared by a suitably qualified and experienced person in accordance with Section 381 of the *Environmental Protection Act 1994* (EP Act).

This Site Management Plan (SMP) has been developed to manage site contamination risks present at the issue date. Subsequent uses of the site may result in the need to review the plan.

This SMP makes reference to a plan attachment that is available from the Administering Authority if required.

This SMP makes reference to a Remediation Action Plan attachment that is available from the Administering Authority if required.

APPENDIX 1

REMEDIATION ACTION PLAN

LOT: 2 **PLAN: SP136512**

FILE REF:

PRINTED: / /2010

DATE OF EFFECT: / /2010

1.0 INTRODUCTION

This Remediation Action Plan (RAP) has been prepared for remediation of the uncontrolled fill on Lot 2 on SP136512, located at Lot 2 Drury Lane, Dundowran, QLD. The remediation works are required to remove materials that may pose a risk to the health of future site users or the environment. The works required include excavation of all fill materials, separation of recyclables, stained/odorous materials and characterisation of remaining materials for reuse or offsite disposal.

1.1 Purpose of the RAP

This document has been prepared to describe remediation strategies and control measures aimed at achieving removal of the site from the Environmental Management Register (EMR).

1.2 Remediation Objective

The primary objective of the remediation works is to obtain a Site Suitability Statement to support future redevelopment of the site.

1.3 Third Party Reviewer

A Third Party Reviewer (TPR) must be appointed for the duration of investigation and remediation works. The site work and subsequent reporting is to be certified by a DERM approved Third Party Reviewer (TPR). All validation requirements must first have consent from the TPR and any clarification issues will be referred to the TPR prior to the DERM. The TPR will approve the proposed validation methodology, pre-validation sampling results, Disposal Permit applications and the final report.

The role of the TPR is to review all relevant documentation associated with the proposed RAP, to accept the proposed remediation strategy and certify that the site is suitable for any land use or specific land uses (as required) in accordance with DERM Terms of Reference for Third Party Review dated February 2008.

2.0 BACKGROUND

2.1 Site History

The subject site is identified as Lot 2 SP136512 and is approximately 9.174 ha in area. The site history indicates that Lot 2 SP136512 was historically used for sand extraction. Following sand extraction, filling was undertaken across the majority of the site to return it to about its original level. The uncontrolled filling of the site resulted in Lot 2 SP136512 been listed on the EMR for Notifiable Activity No.20: Landfill – disposing of waste.

2.2 Topography

The regional topography is generally low and flat comprising large tracts of Wallum heath and ti-tree swamps. The nearest creek is approximately 2 km north (Eli Creek) and the ocean is approximately 500m beyond Eli Creek. A manmade lake is located approximately 300m to the east of the site.

At the time of the investigation, the site showed the effects of past sand extraction work and filling. The central portion of the site was about 2 m to 3 m higher than the northern and southern portions of the site. Much of the site is variable in slope, with elevated areas of fill materials. It appears that the majority of the site has been filled. At the time of the investigation, the south-eastern portion of the site was low lying and inundated with water. During the 2006 investigation the site was covered in thick grass and scattered shrubs. However, during the 2007 investigation most of the site was covered in bare earth with minimal grass cover due to recent excavation works.

Surface drainage generally follows the contours towards the low lying areas in the eastern and southern boundaries of the site. The site is generally well drained, with storm water run-off expected to be shed as sheet flow.

2.3 Geology

Available geological information (1:250,000 Geological Map, MARYBOROUGH, Sheet SG 56-6 Part 9544, Department of Resource Industries, 1992) indicates that the site is underlain by Quaternary (Holocene) age "beach ridges: sand, shelly sand, minor gravel", possibly overlying slightly older (Pleistocene) sediments of "Undifferentiated coastal plains: sand, silt, mud". The Quaternary sediments are underlain at depth by the early Cretaceous age Maryborough Formation containing "mudstone, siltstone, shale, sandstone". Over most of the site, the upper sand appears to have been removed as part of previous sand extraction work. A total of 60 test pit locations have been investigated across the site. These investigations revealed the presence of uncontrolled fill materials to depths ranging from surface to 5.5 m. The uncontrolled fill encountered generally comprised sandy clay containing varying amounts of building rubble (including large pieces of concrete greater than 300mm diameter), steel, bitumen fragments (old road surfaces), timber, bricks, iron, tyres, car parts, animal carcasses, wire, gravel, plastic, PVC pipe, cobbles, and sandstone. The fill materials overlie natural clayey sands.

2.4 Hydrogeology

Groundwater was recorded at depths of 0.7 m to 3.7 m in the monitoring wells, which were installed as part of the acid sulfate soils investigation. Based on the ground levels, the variation in groundwater depths measured in the wells, and the fact that only minor water seepage was observed in the test pits excavated to depths of up to 6 m below existing ground level, the groundwater encountered is considered to be "perched" water located within limited zones within the fill.

This is further evidenced by the adjacent site (Lot 11), where ground levels are approximately 3 m lower. It should be noted that groundwater inflows into monitoring wells were very slow and the resulting yields are not considered to represent a viable source of potable water or other extractive groundwater use.

2.5 Information Sources

Previous investigation reports considered in the preparing this RAP include:

Stage 1 Preliminary Site Investigation, Lot 2 SP136512, Drury Lane, Dundowran, [ref. Golder Associates 077683504(AI) dated November 2007].

Stage 2 Detailed Site Investigation, Lot 2 SP136512, Drury Lane, Dundowran, [ref. Golder Associates 077683504(AG) dated November 2007].

2.6 Historical Data

The historical data identified the following potential sources of contamination at this site:

Potential Contamination Source
Uncontrolled fill

Potential Contaminant
Hydrocarbons (TPH & BTEX),
PAH Phenols, PCB, Metals (As, Cd,
Cr, Cu, Pb, Ni, Hg, Zn),
organochlorine and organophosphorous
pesticides and asbestos

2.7 Soil Contamination

2.7.1 General

The available data indicated that there are broadly two main types of contamination that need to be addressed in the remediation strategy. These comprise deleterious materials (including oversize concrete) and arsenic impact within the fills

It is estimated that about 250,000 m³ (insitu) of fill material has been disposed of across the site (refer to the attached Figure 1).

2.7.2 Deleterious Materials

Building rubble (including large pieces of concrete greater than 300mm diameter), steel, bitumen, timber, bricks, iron, tyres, car parts, animal carcasses, wire, gravel, plastic, PVC pipe, cobbles, and sandstone were observed within the uncontrolled fill. No visual evidence of fibre board sheeting fragments was observed within the uncontrolled fill exposed during test pit investigations. Department of Environment and Resource Management (DERM) C&D waste Operational Policy indicates that where C&D waste is separated into its constituent parts, the inert parts may be used as clean fill. The Operational Policy indicates that the following materials are considered to be inert:

- bricks/pavers/ceramics;
- concrete (including embedded steel reinforcing rods), pulverised to a maximum 300mm nominal size; and
- clean earthen fill.

Deleterious materials other than the above inert materials will need to be segregated and removed from site during remediation works.

2.7.3 Metals Impacted Fill

Limited testing of the uncontrolled fill materials confirmed the presence of some metals (arsenic, chromium, nickel, and zinc) impacted soils with concentrations exceeding environmental assessment criteria. Arsenic was detected exceeding the Health-based Investigation Levels for use in a “standard” residential setting. In the absence of more detailed characterization of fill materials, it has been assumed that zones of metals impact occur within the uncontrolled fill materials.

2.7.4 Groundwater

Field tests on groundwater samples from site well locations indicated acidic groundwater ranging from pH 5.2 to pH 5.6. Electrical Conductivity ranged between 0.56 mS/cm and 0.77 mS/cm, which indicate freshwater conditions. No free phase product, sheens, discolouration or odours (that may indicate the presence of possible contamination) were observed within the groundwater. Analytical results on groundwater samples collected from the three site wells did not detect concentrations of potential contaminants (arsenic, cadmium, chromium, copper, nickel, lead, zinc, mercury, TPH, BTEX, PAH and organochlorine and organophosphorus pesticides) that are considered to represent an environmental risk.

The investigation results suggest that there will not be a need for large scale dewatering operations during excavation of uncontrolled fill materials. If

dewatering is required during remediation works, waters can be disposed to the ground surface or reused for onsite for dust suppression.

3.0 ENVIRONMENTAL GUIDELINES

The remedial activities undertaken at the site must be performed in accordance with the following documents:

- *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland*, May 1998;
- *Draft Hydrocarbon Guidelines*, Contaminated Land Unit, Queensland EPA, January 1999;
- *Guidelines issued under Schedule B of the National Environment Protection (Assessment of Site Contamination) Measure (NEPM)*, National Environment Protection Council, December 1999;
- *Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites* (ANZECC guidelines) published by the Australian and New Zealand Environment and Conservation Council/National Health and Medical Research Council, January 1992;
- Australian Standard AS4482.1-2005 *Guide to the sampling and investigation of potentially contaminated soil Part 1 – Non volatile and semi volatile compounds*; and
- Australian Standard AS4482.2-2005 *Guide to the sampling and investigation of potentially contaminated soil Part 1 – Volatile and semi volatile compounds*

4.0 REMEDIAL GOALS AND VALIDATION CRITERIA

4.1 General

Remediation and acceptance criteria for soils contained in the following sections are based redevelopment of the site for unrestricted land use. The criteria consider a range of issues including human health risk, environmental risk and aesthetic considerations such as odour and discoloration.

Criteria should be applied to the 95% Upper Confidence Level (UCL) on the mean of data for each domain of interest, with no hot-spot concentrations greater than 2.5 times the relevant criteria value. The domains of interest at this Site will be each individual stockpile of excavated soil. Sufficient samples must be collected within each domain of interest to ensure that statistical analysis is valid. The nominated criteria are based on various national and international standards.

4.2 Characterisation of Soils for Reuse

Soil acceptance criteria for reuse on site are listed below.

Parameter	EMR Removal & “Clean” Fill
<u>Petroleum Hydrocarbons</u>	
TPH (C ₆ – C ₉)	100 mg/kg ⁽¹⁾
TPH (C ₁₀ – C ₁₄)	100 mg/kg ⁽¹⁾
TPH (C ₁₅ – C ₂₈)	1000 mg/kg ⁽¹⁾
TPH (C ₂₉ - C ₃₆)	1000 mg/kg ⁽¹⁾
<u>Monocyclic Aromatic Hydrocarbons</u>	
Benzene	1 mg/kg ⁽¹⁾
Toluene	
Ethyl Benzene	Total BTEX = 7 mg/kg ⁽¹⁾
Xylene	
<u>Polycyclic Aromatic Hydrocarbons</u>	
Benzo(a)pyrene	1 mg/kg ⁽²⁾
Total PAH	20 mg/kg ⁽²⁾

Inorganics

Arsenic	100 mg/kg ⁽²⁾
Cadmium	3 mg/kg ⁽³⁾
Chromium VI	100 mg/kg ⁽²⁾
Copper	200 mg/kg ⁽⁵⁾
Lead	300 mg/kg ⁽²⁾
Nickel	60 mg/kg ⁽³⁾
Mercury	1 mg/kg ⁽³⁾
Zinc	400 mg/kg ⁽⁵⁾

Organochlorine Pesticides

Aldrin + Dieldrin	10 ⁽²⁾
Chlordane	50 ⁽²⁾
DDT & Derivatives	200 ⁽²⁾
Heptachlor	10 ⁽²⁾

Other

Polychlorinated biphenyls	10 ⁽²⁾
---------------------------	-------------------

Physical Criteria

Odour	- No detectable hydrocarbon odour
Staining	- No visible hydrocarbon staining
Domestic and Garden Refuse	- No visible municipal waste materials
Construction and Demolition Waste	- Concrete (including embedded steel reinforcing rods), pulverised to a maximum 300mm nominal size ⁽⁴⁾
	- No visible timber or other deleterious materials
Asbestos	- No detectable asbestos fibres or fragments ⁽⁶⁾

Notes:

- (1) Draft Hydrocarbon Guidelines – QLD DERM 1999
- (2) Health Based Investigation Levels for Exposure Setting “A” (‘Standard’ Residential with garden/accessible soil) – Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland, Queensland Department of Environmental 1998.
- (3) Environmental Investigation Levels – Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland, Queensland Department of Environmental 1998.
- (4) Inert Waste Policy, EPA
- (5) Elevated Environmental Investigation Level for Low Phytotoxicity Setting
- (6) Western Australia Department of Health *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*, May 2009.

These criteria may be amended, subject to approval by the TPR, or TPR and DERM where it can be demonstrated that alternative concentrations are protective of human health, the environment and aesthetic considerations. In addition, these criteria may be amended to environmental investigation levels (as listed in *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland*, Queensland Department of Environment May 1998) should sensitive environmental receptors be identified at or in close proximity to the site. Criteria for other additional parameters, if required, must be approved by the TPR.

4.3 Groundwater

Samples of groundwater entering excavations during the remediation works shall be collected to allow assessment of potential risk to the surrounding environment and groundwater users. The following acceptance criteria shall be applied to groundwater results:

Parameter	Acceptance Levels
<u>Petroleum Hydrocarbons</u>	
TPH (C ₆ – C ₉)	0.15 mg/L ⁽¹⁾
TPH (C ₁₀ – C ₃₆)	0.6 mg/L ⁽²⁾
<u>Inorganics</u>	
Arsenic	
Cadmium	
Chromium (total)	
Copper	< ANZECC Water Quality
Lead	Guidelines 2000, Trigger Values for
Nickel	Fresh Waters 95% Level of Protection
Mercury	
Zinc	
<u>Monocyclic Aromatic</u>	
<u>Hydrocarbons</u>	
Benzene	
Toluene	
Ethyl Benzene	
Xylene	
<u>Organochlorine & Organophosphorus</u>	
<u>Pesticides</u>	

Notes:

- (1) Dutch C - Netherlands Soil Clean-up Guideline, 1983
- (2) Dutch Intervention Value - Environmental Quality Objectives in the Netherlands, 1994
- (3) No specific criteria or guidelines have been published in Queensland or Australia for the assessment of TPH contamination in groundwater. In the absence of State or National guidelines, intervention values for hydrocarbons contained in Dutch Guidelines have been adopted for assessment of environmental risk from TPH. TPH concentrations exceeding these guideline criteria may represent a threat to the environment and require specific assessment of risk.

These criteria may be amended, subject to approval by the TPR, or TPR and DERM where it can be demonstrated that alternative concentrations are protective of human health, the environment and aesthetic considerations. Criteria for other additional parameters, if required, must be approved by the TPR.

Where concentrations are detected exceeding the above criteria, further assessment of the risk will be required. This assessment may include more detailed groundwater investigations to evaluate “background” groundwater quality/conditions and identification of potential receptors and exposure routes. A qualitative risk assessment should be conducted on the basis of the above. Where unacceptable risk is indicated the a quantitative risk assessment and/or remedial works will be required. The scope and methodology of any further groundwater investigation/assessment shall be agreed with the TPR, prior to commencement of such works.

4.4 Imported Fill Materials

Imported fill materials (if required) to backfill the site up final development levels shall be from a registered quarry

Materials from alternative sources may be accepted in consultation with the TPR where it can be demonstrated that the material are not impacted by contamination.

4.5 Sampling Frequency and Quality Assurance / Quality Control

4.5.1 Soils

Characterisation sampling of soils for reuse or removal from site will be required at a frequency of at least 1 sample per 50m³ for individual stockpiles of similar soil types. If mixed soil types are noted in stockpiles then characterisation samples must be collected of each material types present at a rate of at least 1 sample per 50m³. A minimum of 9 samples must be collected within each stockpile where statistical assessment of result is proposed for validation purposes.

A quality assurance/quality control program shall be conducted during characterization sampling. This program shall include collection and analysis of:

- Blind replicate samples at a frequency of 1 for every 20 samples collected.

- Split samples at a frequency of 1 for every 20 samples collected.

- Equipment rinsate samples for each day where sampling is conducted.

4.5.2 Groundwater

At least two rounds of groundwater samples shall be collected from excavation sumps following completion of excavations.

A quality assurance/quality control program shall be conducted during groundwater sampling. This program shall include collection and analysis of:

- A blind replicate sample during each sampling round.

- A split sample during each sampling round.

- An equipment rinsate sample during each sampling round.

4.6 Sampling & Reporting

Characterisation sampling shall be conducted under the direction of a suitably qualified and experienced person in accordance with Section 381 of the Environmental Protection Act 1994 (EP Act). Standard procedures that include sample equipment decontamination, sample handling, sample storage and documentation shall be applied.

At the completion of remediation works a Validation Report must be prepared by the suitably qualified and experienced person that documents the works undertaken and compliance with the agreed remediation works. This report shall be submitted to the TPR for certification and subsequent submission to DERM.

4.7 Analytical Testing

Analytical testing for the characterization/validation program should be conducted by a NATA accredited laboratory. If the laboratory is not NATA accredited, at least 10% of the samples under investigation must be submitted to a NATA accredited laboratory as a quality check. Please note that asbestos sampling and analysis should be undertaken in accordance with the Western Australia Department of Health *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*, May 2009.

Analysis of collected characterization samples shall be undertaken as follows:

- Metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn) All soil samples.

Petroleum Hydrocarbons	All soil samples with visual or olfactory impacts, otherwise 10% of soil samples.
Monocyclic Aromatic Hydrocarbons	All soil samples with visual or olfactory impacts, otherwise 10% of soil samples.
Polycyclic Aromatic Hydrocarbons	All soil samples with visual or olfactory impacts, otherwise 10% of soil samples.
Organochlorine /Organophosphorus Pesticides	All soil samples.
Asbestos	In Accordance with Western Australia Department of Health <i>Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia</i> , May 2009

These criteria may be amended, subject to approval by the TPR, where it can be demonstrated that alternative concentrations are protective of human health, the environment and aesthetic considerations. Criteria for other additional parameters, if required, must be approved by the TPR.

5.0 REMEDIATION STRATEGY

The remediation strategy for this site comprises the following:

- Excavation of all uncontrolled fill materials.
- Segregation of soil materials from deleterious materials.
- Characterization of separated soil materials for either reuse on site as “clean” fill or for offsite disposal.
- Pulverisation/crushing of bricks and concrete (> 300 mm diameter) to enable reuse as inert site fill.
- Offsite disposal of remaining deleterious materials

Detailed management procedures for this strategy are provided in the following sections. These procedures may be amended, subject to approval by the TPR, where it can be demonstrated that alternative procedures are protective of human health, the environment and aesthetic considerations.

6.0 REMEDIATION PROGRAM

6.1 Excavation and Segregation of Materials

Approximately 250,000 m³ (insitu volume) of uncontrolled fill will need to be excavated and segregated. Excavations shall be continued both laterally and vertically until all uncontrolled fill materials have been removed.

A suitably qualified and experienced person pursuant to s381 and 395 must monitor all excavation works and screen excavated materials using a photo-ionisation detector (PID). Excavations shall be conducted in a manner which targets removal and stockpiling of visually similar materials. Daily photographic and written records of inspection and monitoring shall be kept.

Any materials observed to contain building rubble and other deleterious materials will be segregated from soils and separately stockpiled. Where hydrocarbon odours, staining, elevated PID readings or other indicators of suspected impact are noted, these materials shall be segregated from other material and separately stockpiled for characterisation.

Groundwater encountered during the excavation of overburden shall be collected from a sump excavated in the low point of the excavation. Reuse or disposal of groundwater is discussed in Section 5.5.

An area of approximately 25,000 m² of land is available on an adjacent lot (Lot 11), which is also owned by the client and listed on the EMR for the same reason (land filling), for the stockpiling of excavated materials. Operational controls to be adopted during the excavation, onsite transportation and stockpiling of excavated materials are discussed in Section 6.0.

Movement and stockpiling of excavated materials shall be conducted under a materials tracking plan approved by the TPR.

6.2 Soil Characterisation Stockpiles

Stockpiles of soil materials shall be sampled and analysed in accordance with Section 3.4.

Stockpiles found to be in compliance with the validation criteria shall be reused to backfill excavations. Stockpiles found not to be in compliance with the validation criteria shall be removed from site. An offsite disposal permit shall be obtained through the TPR prior to removal of these soils from site. Disposal to landfill shall only occur under an approved Disposal Permit issued by DERM

6.3 Suspected Contaminated Material Stockpiles

Segregated stockpiles of materials with odours, staining, elevated PID readings or other indicators of suspected contamination impact (such as bitumen) shall be sampled and analysed to evaluate their contamination status and the need for pre-treatment prior to landfill disposal. An offsite disposal permit shall be obtained through the TPR prior to removal of contaminated soils from this site. Disposal to landfill shall only occur under an approved Disposal Permit issued by DERM.

6.4 Deleterious Materials Stockpiles

Deleterious materials shall be further segregated in separate stockpiles and managed as follows:

- Bricks and concrete – where practical shall be pulverized or crushed to a size of less than 75mm diameter to enable reuse on site as inert fill.

- Materials not meeting this criteria shall be removed from site for disposal at appropriately licensed landfill.

- Metal (including wire, steel, iron, and car parts) - shall be removed from site for recycling.

- Domestic and Greenwastes (including animal carcasses) - shall removed from site for disposal at an appropriate landfill.

- Other demolition materials (including timber, plastic and PVC pipes) - shall removed from site for disposal at an appropriately landfill.

- Asbestos – where asbestos sheeting or fragments are identified, this material shall be placed directly into lined containers and managed in accordance with asbestos workplace health and safety regulations. This will be conducted by a suitably licensed asbestos removal contractor.

6.5 Water Treatment & Disposal

Groundwater seepage into excavations may be collected and used for dust suppression within excavation areas or in stockpile areas where suitable control measures are in place to prevent runoff from discharging into external waterways.

Groundwater testing from across the site has indicated that the groundwater is generally of a quality which represents a low environmental risk. However, permission from DERM and the local Council would be required prior to discharge to water ways. Discharges to surface waters shall comply with all conditions in issued permits (including any pretreatment required to remove sediments). Alternatively, water from the site shall be collected and disposed of by a licensed tradewaste contractor.

7.0 OPERATION CONTROL

7.1 Construction Environment Management Plan

A Construction Environmental Management Plan (CEMP) for the Site shall be prepared incorporating detailed elements covering environmental management of the Site to ensure environmental effects of the remediation work are kept to a minimum and in compliance with all relevant Acts of Parliament and Environmental Regulations.

The CEMP must be approved by the TPR prior to commencement of works on site.

The CEMP shall contain management approaches for, but not limited to, the following areas:

Land Disturbance

Erosion and sediment control devices;
Management of stormwater;
Management of excavated materials and stockpiles;
Dust control;

Noise and Vibration

Operating hours;
Vehicles and equipment;
Traffic;
Noise abatement;
Vibration.

Other

Litter;
Storage of chemicals and fuel;
Road cleaning and truck wash;
Development of the details within each of these segments of the CEMP shall incorporate the general management approach, the environmental criteria to be met and specific engineering controls to be used.
Requirements in the following sections shall also be considered and addressed as part of the CEMP.

7.2 Stormwater Management

A site-specific stormwater management plan is required to be developed prior to the commencement of site works. Stormwater management works are to include controls for construction activities and soil conservation measures such as diversion drains, silt traps, sediment traps, litter traps and bank stabilization. Specific control measures are required to:

- Contain stormwater runoff generated within excavations and stockpile areas; and
- Prevent discharge to external waterways.

Control measures to be adopted may include:

Use of bunds and spoon drains to isolate working areas from the remainder of the site catchment and to direct surface water from the working area into open excavations.

Formation of a collection sump at the lowest corner of the remedial excavations to collect stormwater entering the excavations and allow for dewatering of the excavation.

Inspection of the bunds, drains and sumps regularly during site remediation works to check their integrity and repair any faults as soon as practicable.

7.3 Soil and Sediment Control

A site-specific erosion and sediment control plan (ESCP) must be developed in accordance with local Council guidelines prior to the commencement of remediation works.

7.4 Noise Control

Site works shall be carried out between 6.30am and 6.30pm Monday to Saturday, or other alternative timeframes approved by local Council.

7.5 Dust Control

Potential for dust generation from excavation works and/or stockpiles shall be managed on an as required basis by spraying from water trucks, or other TPR approved method.

7.6 Community Relations

Prior to the commencement of site works, neighbouring properties shall be consulted to inform of the commencement and expected timing of the works. Concerns and complaints raised by the community (or other parties) during the remedial works will be noted and a register must be maintained to record the following information:

1. **Contact details:** Name, address and phone number of party raising concern.
2. **Nature of concern:** Details of issue/incident.
3. **Action taken or required:** Details of action proposed or undertaken to address the concern, including time and date.
4. **Response to Action:** Was the party raising the concern satisfied with the outcome, if not, what else needs to be done, or is it outside the scope of the development works.
5. **Prevention of re-occurrence:** If the concern relates directly to an operational problem, what action has been taken to ensure the problem will not occur again.

The register must be available to DERM or TPR at request.

All complaints must be responded to within two business days of the complaint being raised.

7.8 Site Access and Signage

Fencing shall be provided to restrict public access to the site. Fencing shall be to a standard that meets Workplace Health and Safety requirements and prevents unauthorised access by the public. Warning and safety signs (as required under workplace legislation) shall be placed at site access points.

8.0 DECONTAMINATION PROCEDURES

The contractor shall reduce the potential for material to be tracked off the site by the tyres of vehicles as far as practical. This could include a restriction on off-site vehicle movement during wet conditions, the manual cleaning of vehicle wheels prior to vehicles leaving the site, the use of a wheel wash or other measures.

Details of the system to be implemented shall be provided in the CEMP.

9.0 HEALTH AND SAFETY

A *Health and Safety Plan* must be prepared for the activities to be performed on the site where employees may be exposed to toxic or other hazardous compounds and elements. Specific requirements relating to dermal contact and inhalation as well as public safety, vehicle decontamination, protective clothing, equipment and appropriate safety controls must be addressed. Personnel working on the site during remediation works must be inducted and sign relevant forms stating that the induction has been carried out.

Works will be according to the *Workplace Health and Safety Act (1995)* and *Workplace Health and Safety Regulations (2008)*.

10.0 REPORTING

The progress of the works will be reported to the TPR on a regular basis. Fill characterisation and validation sampling results will be supplied to the TPR in the form of reports as the data becomes available.

Within 60 days of the completion of all remediation and validation works, a report detailing works must be prepared by a suitable qualified person in accordance with Section 4.6 and submitted to the TPR for certification prior to submission to the DERM. The report submitted should be in accordance with Chapter 7, Part 8 of the EP Act and the *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland* May (1998) and NEPM requirements.

The report shall include but not be limited to documentation of the remediation and characterisation program activities (including photographic records and daily site diaries detailing volumes of soil moved), records of all offsite disposal, analysis of characterisation results and an evaluation of the results against the validation criteria.

The report shall also include the results of the QA/QC program, Chain of Custody documentation and Sample Receipt Advices for all samples collected and copies of documentation validating the appropriate handling, disposal and treatment of any contaminated soil, materials and water in accordance with DERM requirements.

RADWAY PTY LTD

24 February 2010

Att: Kim Barry
Contaminated Lands Unit
Department of Environment and Resource Management
Po Box 15155
City East 4002

Dear Kim

Re: SMP/RAP Lot 2 Drury Lane, Dundowran

We are in receipt of the reviewed Site Management Plan and Remediation Action Plan for Lot 2 on SP136512 which we consent to by initialling and date recording every page.

Regards /

CTPI 49-Sch4

CTPI 49-Sch4

Director
Radway Pty Ltd

DRAFT SITE MANAGEMENT PLAN

RPD LOT 2 on SP136512

DERM FILE REF:

1.0 SUMMARY OF CONTAMINATION

The site, located at Lot 2 Drury Lane, Dundowran, QLD, was originally a sand extraction operation. The majority of the extraction area was subsequently filled in a relatively uncontrolled manner. The placement of uncontrolled fill over the site has resulted in the listing of the site on the Environmental Management Register for the Notifiable Activity – Landfill.

The filled areas of Lot 2 are shown on attached Figure 1 and contain materials including:

Building rubble (including large pieces of concrete greater than 300mm diameter), steel, bitumen, timber, bricks, iron, tyres, car parts, animal carcasses, wire, gravel, plastic, PVC pipe, cobbles, sandstone and uncontrolled soil fill.

Metals impacted soils (above HILA) – Maximum concentrations of contamination in soil exceeding the HIL 'A' are described below:

<u>Analyte</u>	<u>Maximum Concentration (mg/kg)</u>
Arsenic	111

The strategy by which these materials will be removed and/or managed to enable removal of the site from the Environmental Management Register (EMR) is contained in the Remediation Action Plan (RAP) attached as Appendix 1.

2.0 OBJECTIVES OF THE SMP

The purpose of this SMP is to manage identified contamination on the site in a manner that protects human health and the environment.

3.0 ACHIEVEMENT AND MAINTENANCE OF OBJECTIVES

3.1 Responsibility. The owner of the land (as defined in the *Environmental Protection Act 1994*) is to ensure that this SMP and any variations approved or required by the administering authority are complied with. The obligations and conditions set out in this SMP bind the owner, from time to time, of the land.

3.2 Site Use. The site is currently a landfill site and is proposed to be redeveloped and subdivided into an industrial estate. Prior to commencement of this new land use, remedial works will be conducted with the primary intent removing the site from the EMR. All remediation and validation works for this site are to be carried out in accordance with Appendix 1 - Remediation Action Plan (RAP).

3.3 Third Party Reviewer (TPR) A Third Party Reviewer (TPR) approved by the DERM and operating in accordance with the DERM's Terms of Reference for TPR (February 2008) must be appointed for the duration of the site assessment and remediation activities.

3.4 Provision of SMP to appropriate persons. The owner must provide all persons involved in building design and planning and all contractors and lessees conducting building and/or excavation works with a copy of the SMP prior to

CTPI 49-Sc

commencement of site works. All persons occupying or working on the site must comply with the requirements of the SMP.

3.5 Surface capping and protective barriers. Existing surface cover across filled areas shall be maintained until such time as remediation works occur.

3.6 Service Trenches. All underground services must be constructed in either uncontaminated material or in trenches in which the services are surrounded by a minimum of 0.3m of uncontaminated fill for minor services (< 100 mm in diameter), and 0.5m of uncontaminated fill for services greater than 100 mm in diameter.

3.7 Soil Excavation & Removal. Uncontrolled fills must not be removed from site without suitable characterisation sampling and analysis. Representative characterisation sampling and analysis of any uncontrolled fill materials excavated from the site must be managed by a suitably qualified and experienced person in accordance with Section 381 of the *Environmental Protection Act 1994* (EP Act). Contaminated soil must not be removed off-site without a disposal permit in accordance with Section 424 of the EP Act.

3.8 Unexpected Contamination. If during any site earthworks or excavation, offensive or noxious odours and/or evidence of gross contamination not previously detected are observed, site works are to cease in that area and action taken to immediately abate the environmental harm. The administering authority is to be notified in writing within 2 business days of detection and advised of appropriate remedial action.

Any remedial action is to be developed by an appropriately qualified and experienced person in accordance with Section 381 of the EP Act.

3.9 General Environmental Protection. All earthworks are to be undertaken in accordance with general environmental protection measures to avoid unwanted migration and deposition of soil. These measures include the control of dust, noise, stormwater runoff, sediment, erosion, spillage from haulage trucks and odour releases involving the handling or movement of contaminated material.

3.10 Workplace Health and Safety. A Workplace Health and Safety Plan (WH&S plan), which conforms to the requirements of the *Workplace Health and Safety Act 1995* is to be developed for any site excavation works in contaminated areas. The WH&S plan must specifically address contaminants of concern.

4.0 MONITORING AND REPORTING

The owner is to ensure that the following reporting and monitoring is performed to ensure compliance with the SMP:

Until remediation commences:

Records are to be kept of all inspections, any soil excavation in contaminated areas, disposal permits and site management plan compliance for review by the administering authority from time to time. A biennial inspection is to be undertaken to ensure that capping and protective barriers remain in sound condition at all times in accordance with Section 3.5.

The biennial period is to commence from the effective date of this plan.

Once remediation commences:

Monitoring and reporting is to be conducted as required in Appendix 1 - Remediation Action Plan (RAP).

In addition to the reporting required in the RAP, within 45 days from the completion of site development a report is to be submitted to the TPR documenting details of remediation activities, the results of any sampling undertaken during remediation, records of any site inspections and details of Site Management Plan compliance. The report is to be prepared by a suitably qualified and experienced person in accordance with Section 381 of the *Environmental Protection Act 1994* (EP Act).

This Site Management Plan (SMP) has been developed to manage site contamination risks present at the issue date. Subsequent uses of the site may result in the need to review the plan.

This SMP makes reference to a plan attachment that is available from the Administering Authority if required.

This SMP makes reference to a Remediation Action Plan attachment that is available from the Administering Authority if required.

APPENDIX 1

REMEDIATION ACTION PLAN

LOT: 2

PLAN: SP136512

FILE REF:

PRINTED: / /2010

DATE OF EFFECT: / /2010

1.0 INTRODUCTION

This Remediation Action Plan (RAP) has been prepared for remediation of the uncontrolled fill on Lot 2 on SP136512, located at Lot 2 Drury Lane, Dundowran, QLD. The remediation works are required to remove materials that may pose a risk to the health of future site users or the environment. The works required include excavation of all fill materials, separation of recyclables, stained/odorous materials and characterisation of remaining materials for reuse or offsite disposal.

1.1 Purpose of the RAP

This document has been prepared to describe remediation strategies and control measures aimed at achieving removal of the site from the Environmental Management Register (EMR).

1.2 Remediation Objective

The primary objective of the remediation works is to obtain a Site Suitability Statement to support future redevelopment of the site.

1.3 Third Party Reviewer

A Third Party Reviewer (TPR) must be appointed for the duration of investigation and remediation works. The site work and subsequent reporting is to be certified by a DERM approved Third Party Reviewer (TPR). All validation requirements must first have consent from the TPR and any clarification issues will be referred to the TPR prior to the DERM. The TPR will approve the proposed validation methodology, pre-validation sampling results, Disposal Permit applications and the final report.

The role of the TPR is to review all relevant documentation associated with the proposed RAP, to accept the proposed remediation strategy and certify that the site is suitable for any land use or specific land uses (as required) in accordance with DERM Terms of Reference for Third Party Review dated February 2008.

2.0 BACKGROUND

2.1 Site History

The subject site is identified as Lot 2 SP136512 and is approximately 9.174 ha in area. The site history indicates that Lot 2 SP136512 was historically used for sand extraction. Following sand extraction, filling was undertaken across the majority of the site to return it to about its original level. The uncontrolled filling of the site resulted in Lot 2 SP136512 been listed on the EMR for Notifiable Activity No.20: Landfill – disposing of waste.

2.2 Topography

The regional topography is generally low and flat comprising large tracts of Wallum heath and ti-tree swamps. The nearest creek is approximately 2 km north (Eli Creek) and the ocean is approximately 500m beyond Eli Creek. A manmade lake is located approximately 300m to the east of the site.

At the time of the investigation, the site showed the effects of past sand extraction work and filling. The central portion of the site was about 2 m to 3 m higher than the northern and southern portions of the site. Much of the site is variable in slope, with elevated areas of fill materials. It appears that the majority of the site has been filled. At the time of the investigation, the south-eastern portion of the site was low lying and inundated with water. During the 2006 investigation the site was covered in thick grass and scattered shrubs. However, during the 2007 investigation most of the site was covered in bare earth with minimal grass cover due to recent excavation works. Surface drainage generally follows the contours towards the low lying areas in the eastern and southern boundaries of the site. The site is generally well drained, with storm water run-off expected to be shed as sheet flow.

2.3 Geology

Available geological information (1:250,000 Geological Map, MARYBOROUGH, Sheet SG 56-6 Part 9544, Department of Resource Industries, 1992) indicates that the site is underlain by Quaternary (Holocene) age "beach ridges: sand, shelly sand, minor gravel", possibly overlying slightly older (Pleistocene) sediments of "Undifferentiated coastal plains: sand, silt, mud". The Quaternary sediments are underlain at depth by the early Cretaceous age Maryborough Formation containing "mudstone, siltstone, shale, sandstone". Over most of the site, the upper sand appears to have been removed as part of previous sand extraction work. A total of 60 test pit locations have been investigated across the site. These investigations revealed the presence of uncontrolled fill materials to depths ranging from surface to 5.5 m. The uncontrolled fill encountered generally comprised sandy clay containing varying amounts of building rubble (including large pieces of concrete greater than 300mm diameter), steel, bitumen fragments (old road surfaces), timber, bricks, iron, tyres, car parts, animal carcasses, wire, gravel, plastic, PVC pipe, cobbles, and sandstone. The fill materials overlie natural clayey sands.

2.4 Hydrogeology

Groundwater was recorded at depths of 0.7 m to 3.7 m in the monitoring wells, which were installed as part of the acid sulfate soils investigation. Based on the ground levels, the variation in groundwater depths measured in the wells, and the fact that only minor water seepage was observed in the test pits excavated to depths of up to 6 m below existing ground level, the groundwater encountered is considered to be "perched" water located within limited zones within the fill.

This is further evidenced by the adjacent site (Lot 11), where ground levels are approximately 3 m lower. It should be noted that groundwater inflows into monitoring wells were very slow and the resulting yields are not considered to represent a viable source of potable water or other extractive groundwater use.

2.5 Information Sources

Previous investigation reports considered in the preparing this RAP include:

Stage 1 Preliminary Site Investigation, Lot 2 SP136512, Drury Lane, Dundowran, [ref. Golder Associates 077683504(AI) dated November 2007].

Stage 2 Detailed Site Investigation, Lot 2 SP136512, Drury Lane, Dundowran, [ref. Golder Associates 077683504(AG) dated November 2007].

2.6 Historical Data

The historical data identified the following potential sources of contamination at this site:

Potential Contamination Source
Uncontrolled fill

Potential Contaminant
Hydrocarbons (TPH & BTEX),
PAH Phenols, PCB, Metals (As, Cd,
Cr, Cu, Pb, Ni, Hg, Zn),
organochlorine and organophosphorous
pesticides and asbestos

2.7 Soil Contamination

2.7.1 General

The available data indicated that there are broadly two main types of contamination that need to be addressed in the remediation strategy. These comprise deleterious materials (including oversize concrete) and arsenic impact within the fills

It is estimated that about 250,000 m³ (insitu) of fill material has been disposed of across the site (refer to the attached Figure 1).

2.7.2 Deleterious Materials

Building rubble (including large pieces of concrete greater than 300mm diameter), steel, bitumen, timber, bricks, iron, tyres, car parts, animal carcasses, wire, gravel, plastic, PVC pipe, cobbles, and sandstone were observed within the uncontrolled fill. No visual evidence of fibre board sheeting fragments was observed within the uncontrolled fill exposed during test pit investigations. Department of Environment and Resource Management (DERM) C&D waste Operational Policy indicates that where C&D waste is separated into its constituent parts, the inert parts may be used as clean fill. The Operational Policy indicates that the following materials are considered to be inert:

- bricks/pavers/ceramics;
- concrete (including embedded steel reinforcing rods), pulverised to a maximum 300mm nominal size; and
- clean earthen fill.

Deleterious materials other than the above inert materials will need to be segregated and removed from site during remediation works.

2.7.3 Metals Impacted Fill

Limited testing of the uncontrolled fill materials confirmed the presence of some metals (arsenic, chromium, nickel, and zinc) impacted soils with concentrations exceeding environmental assessment criteria. Arsenic was detected exceeding the Health-based Investigation Levels for use in a "standard" residential setting. In the absence of more detailed characterization of fill materials, it has been assumed that zones of metals impact occur within the uncontrolled fill materials.

2.7.4 Groundwater

Field tests on groundwater samples from site well locations indicated acidic groundwater ranging from pH 5.2 to pH 5.6. Electrical Conductivity ranged between 0.56 mS/cm and 0.77 mS/cm, which indicate freshwater conditions. No free phase product, sheens, discolouration or odours (that may indicate the presence of possible contamination) were observed within the groundwater. Analytical results on groundwater samples collected from the three site wells did not detect concentrations of potential contaminants (arsenic, cadmium, chromium, copper, nickel, lead, zinc, mercury, TPH, BTEX, PAH and organochlorine and organophosphorus pesticides) that are considered to represent an environmental risk.

The investigation results suggest that there will not be a need for large scale dewatering operations during excavation of uncontrolled fill materials. If

dewatering is required during remediation works, waters can be disposed to the ground surface or reused for onsite for dust suppression.

3.0 ENVIRONMENTAL GUIDELINES

The remedial activities undertaken at the site must be performed in accordance with the following documents:

- *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland*, May 1998;
- *Draft Hydrocarbon Guidelines*, Contaminated Land Unit, Queensland EPA, January 1999;
- *Guidelines issued under Schedule B of the National Environment Protection (Assessment of Site Contamination) Measure (NEPM)*, National Environment Protection Council, December 1999;
- *Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites* (ANZECC guidelines) published by the Australian and New Zealand Environment and Conservation Council/National Health and Medical Research Council, January 1992;
- Australian Standard AS4482.1-2005 *Guide to the sampling and investigation of potentially contaminated soil Part 1 – Non volatile and semi volatile compounds*; and
- Australian Standard AS4482.2-2005 *Guide to the sampling and investigation of potentially contaminated soil Part 1 – Volatile and semi volatile compounds*

4.0 REMEDIAL GOALS AND VALIDATION CRITERIA

4.1 General

Remediation and acceptance criteria for soils contained in the following sections are based redevelopment of the site for unrestricted land use. The criteria consider a range of issues including human health risk, environmental risk and aesthetic considerations such as odour and discoloration.

Criteria should be applied to the 95% Upper Confidence Level (UCL) on the mean of data for each domain of interest, with no hot-spot concentrations greater than 2.5 times the relevant criteria value. The domains of interest at this Site will be each individual stockpile of excavated soil. Sufficient samples must be collected within each domain of interest to ensure that statistical analysis is valid. The nominated criteria are based on various national and international standards.

4.2 Characterisation of Soils for Reuse

Soil acceptance criteria for reuse on site are listed below.

Parameter	EMR Removal & "Clean" Fill
<u>Petroleum Hydrocarbons</u>	
TPH (C ₆ – C ₉)	100 mg/kg ⁽¹⁾
TPH (C ₁₀ – C ₁₄)	100 mg/kg ⁽¹⁾
TPH (C ₁₅ – C ₂₈)	1000 mg/kg ⁽¹⁾
TPH (C ₂₉ – C ₃₆)	1000 mg/kg ⁽¹⁾
<u>Monocyclic Aromatic Hydrocarbons</u>	
Benzene	1 mg/kg ⁽¹⁾
Toluene	
Ethyl Benzene	Total BTEX = 7 mg/kg ⁽¹⁾
Xylene	
<u>Polycyclic Aromatic Hydrocarbons</u>	
Benzo(a)pyrene	1 mg/kg ⁽²⁾
Total PAH	20 mg/kg ⁽²⁾

Inorganics

Arsenic	100 mg/kg ⁽²⁾
Cadmium	3 mg/kg ⁽³⁾
Chromium VI	100 mg/kg ⁽²⁾
Copper	200 mg/kg ⁽⁵⁾
Lead	300 mg/kg ⁽²⁾
Nickel	60 mg/kg ⁽³⁾
Mercury	1 mg/kg ⁽³⁾
Zinc	400 mg/kg ⁽⁵⁾

Organochlorine Pesticides

Aldrin + Dieldrin	10 ⁽²⁾
Chlordane	50 ⁽²⁾
DDT & Derivatives	200 ⁽²⁾
Heptachlor	10 ⁽²⁾

Other

Polychlorinated biphenyls	10 ⁽²⁾
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Physical Criteria

Odour	- No detectable hydrocarbon odour
Staining	- No visible hydrocarbon staining
Domestic and Garden Refuse	- No visible municipal waste materials
Construction and Demolition Waste	- Concrete (including embedded steel reinforcing rods), pulverised to a maximum 300mm nominal size ⁽⁴⁾
	- No visible timber or other deleterious materials
Asbestos	- No detectable asbestos fibres or fragments ⁽⁶⁾

Notes:

- (1) Draft Hydrocarbon Guidelines – QLD DERM 1999
- (2) Health Based Investigation Levels for Exposure Setting "A" ('Standard' Residential with garden/accessible soil) – Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland, Queensland Department of Environmental 1998.
- (3) Environmental Investigation Levels – Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland, Queensland Department of Environmental 1998.
- (4) Inert Waste Policy, EPA
- (5) Elevated Environmental Investigation Level for Low Phytotoxicity Setting
- (6) Western Australia Department of Health *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*, May 2009.

These criteria may be amended, subject to approval by the TPR, or TPR and DERM where it can be demonstrated that alternative concentrations are protective of human health, the environment and aesthetic considerations. In addition, these criteria may be amended to environmental investigation levels (as listed in *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland*, Queensland Department of Environment May 1998) should sensitive environmental receptors be identified at or in close proximity to the site. Criteria for other additional parameters, if required, must be approved by the TPR.

4.3 Groundwater

Samples of groundwater entering excavations during the remediation works shall be collected to allow assessment of potential risk to the surrounding environment and groundwater users. The following acceptance criteria shall be applied to groundwater results:

Parameter	Acceptance Levels
<u>Petroleum Hydrocarbons</u>	
TPH (C ₆ – C ₉)	0.15 mg/L ⁽¹⁾
TPH (C ₁₀ – C ₃₆)	0.6 mg/L ⁽²⁾
<u>Inorganics</u>	
Arsenic	
Cadmium	
Chromium (total)	
Copper	< ANZECC Water Quality
Lead	Guidelines 2000, Trigger Values for
Nickel	Fresh Waters 95% Level of Protection
Mercury	
Zinc	
<u>Monocyclic Aromatic</u>	
<u>Hydrocarbons</u>	
Benzene	
Toluene	
Ethyl Benzene	
Xylene	
<u>Organochlorine & Organophosphorus</u>	
<u>Pesticides</u>	

Notes:

- (1) Dutch C - Netherlands Soil Clean-up Guideline, 1983
- (2) Dutch Intervention Value - Environmental Quality Objectives in the Netherlands, 1994
- (3) No specific criteria or guidelines have been published in Queensland or Australia for the assessment of TPH contamination in groundwater. In the absence of State or National guidelines, intervention values for hydrocarbons contained in Dutch Guidelines have been adopted for assessment of environmental risk from TPH. TPH concentrations exceeding these guideline criteria may represent a threat to the environment and require specific assessment of risk.

These criteria may be amended, subject to approval by the TPR, or TPR and DERM where it can be demonstrated that alternative concentrations are protective of human health, the environment and aesthetic considerations. Criteria for other additional parameters, if required, must be approved by the TPR.

Where concentrations are detected exceeding the above criteria, further assessment of the risk will be required. This assessment may include more detailed groundwater investigations to evaluate "background" groundwater quality/conditions and identification of potential receptors and exposure routes. A qualitative risk assessment should be conducted on the basis of the above. Where unacceptable risk is indicated the a quantitative risk assessment and/or remedial works will be required. The scope and methodology of any further groundwater investigation/assessment shall be agreed with the TPR, prior to commencement of such works.

4.4 Imported Fill Materials

Imported fill materials (if required) to backfill the site up final development levels shall be from a registered quarry

Materials from alternative sources may be accepted in consultation with the TPR where it can be demonstrated that the material are not impacted by contamination.

4.5 Sampling Frequency and Quality Assurance / Quality Control

4.5.1 Soils

Characterisation sampling of soils for reuse or removal from site will be required at a frequency of at least 1 sample per 50m³ for individual stockpiles of similar soil types. If mixed soil types are noted in stockpiles then characterisation samples must be collected of each material types present at a rate of at least 1 sample per 50m³. A minimum of 9 samples must be collected within each stockpile where statistical assessment of result is proposed for validation purposes.

A quality assurance/quality control program shall be conducted during characterization sampling. This program shall include collection and analysis of:

Blind replicate samples at a frequency of 1 for every 20 samples collected.

Split samples at a frequency of 1 for every 20 samples collected.

Equipment rinsate samples for each day where sampling is conducted.

4.5.2 Groundwater

At least two rounds of groundwater samples shall be collected from excavation sumps following completion of excavations.

A quality assurance/quality control program shall be conducted during groundwater sampling. This program shall include collection and analysis of:

A blind replicate sample during each sampling round.

A split sample during each sampling round.

An equipment rinsate sample during each sampling round.

4.6 Sampling & Reporting

Characterisation sampling shall be conducted under the direction of a suitably qualified and experienced person in accordance with Section 381 of the Environmental Protection Act 1994 (EP Act). Standard procedures that include sample equipment decontamination, sample handling, sample storage and documentation shall be applied.

At the completion of remediation works a Validation Report must be prepared by the suitably qualified and experienced person that documents the works undertaken and compliance with the agreed remediation works. This report shall be submitted to the TPR for certification and subsequent submission to DERM.

4.7 Analytical Testing

Analytical testing for the characterization/validation program should be conducted by a NATA accredited laboratory. If the laboratory is not NATA accredited, at least 10% of the samples under investigation must be submitted to a NATA accredited laboratory as a quality check. Please note that asbestos sampling and analysis should be undertaken in accordance with the Western Australia Department of Health *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*, May 2009. Analysis of collected characterization samples shall be undertaken as follows:

Metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn) All soil samples.

Petroleum Hydrocarbons	All soil samples with visual or olfactory impacts, otherwise 10% of soil samples.
Monocyclic Aromatic Hydrocarbons	All soil samples with visual or olfactory impacts, otherwise 10% of soil samples.
Polycyclic Aromatic Hydrocarbons	All soil samples with visual or olfactory impacts, otherwise 10% of soil samples.
Organochlorine /Organophosphorus Pesticides	All soil samples.
Asbestos	In Accordance with Western Australia Department of Health <i>Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia</i> , May 2009

These criteria may be amended, subject to approval by the TPR, where it can be demonstrated that alternative concentrations are protective of human health, the environment and aesthetic considerations. Criteria for other additional parameters, if required, must be approved by the TPR.

5.0 REMEDIATION STRATEGY

The remediation strategy for this site comprises the following:

- Excavation of all uncontrolled fill materials.
- Segregation of soil materials from deleterious materials.
- Characterization of separated soil materials for either reuse on site as "clean" fill or for offsite disposal.
- Pulverisation/crushing of bricks and concrete (> 300 mm diameter) to enable reuse as inert site fill.
- Offsite disposal of remaining deleterious materials

Detailed management procedures for this strategy are provided in the following sections. These procedures may be amended, subject to approval by the TPR, where it can be demonstrated that alternative procedures are protective of human health, the environment and aesthetic considerations.

6.0 REMEDIATION PROGRAM

6.1 Excavation and Segregation of Materials

Approximately 250,000 m³ (insitu volume) of uncontrolled fill will need to be excavated and segregated. Excavations shall be continued both laterally and vertically until all uncontrolled fill materials have been removed.

A suitably qualified and experienced person pursuant to s381 and 395 must monitor all excavation works and screen excavated materials using a photo-ionisation detector (PID). Excavations shall be conducted in a manner which targets removal and stockpiling of visually similar materials. Daily photographic and written records of inspection and monitoring shall be kept.

Any materials observed to contain building rubble and other deleterious materials will be segregated from soils and separately stockpiled. Where hydrocarbon odours, staining, elevated PID readings or other indicators of suspected impact are noted, these materials shall be segregated from other material and separately stockpiled for characterisation.

Groundwater encountered during the excavation of overburden shall be collected from a sump excavated in the low point of the excavation. Reuse or disposal of groundwater is discussed in Section 5.5.

An area of approximately 25,000 m² of land is available on an adjacent lot (Lot 11), which is also owned by the client and listed on the EMR for the same reason (land filling), for the stockpiling of excavated materials. Operational controls to be adopted during the excavation, onsite transportation and stockpiling of excavated materials are discussed in Section 6.0.

Movement and stockpiling of excavated materials shall be conducted under a materials tracking plan approved by the TPR.

6.2 Soil Characterisation Stockpiles

Stockpiles of soil materials shall be sampled and analysed in accordance with Section 3.4.

Stockpiles found to be in compliance with the validation criteria shall be reused to backfill excavations. Stockpiles found not to be in compliance with the validation criteria shall be removed from site. An offsite disposal permit shall be obtained through the TPR prior to removal of these soils from site. Disposal to landfill shall only occur under an approved Disposal Permit issued by DERM

6.3 Suspected Contaminated Material Stockpiles

Segregated stockpiles of materials with odours, staining, elevated PID readings or other indicators of suspected contamination impact (such as bitumen) shall be sampled and analysed to evaluate their contamination status and the need for pre-treatment prior to landfill disposal. An offsite disposal permit shall be obtained through the TPR prior to removal of contaminated soils from this site. Disposal to landfill shall only occur under an approved Disposal Permit issued by DERM.

6.4 Deleterious Materials Stockpiles

Deleterious materials shall be further segregated in separate stockpiles and managed as follows:

Bricks and concrete – where practical shall be pulverized or crushed to a size of less than 75mm diameter to enable reuse on site as inert fill.

Materials not meeting this criteria shall be removed from site for disposal at appropriately licensed landfill.

Metal (including wire, steel, iron, and car parts) - shall be removed from site for recycling.

Domestic and Greenwastes (including animal carcasses) - shall removed from site for disposal at an appropriate landfill.

Other demolition materials (including timber, plastic and PVC pipes) - shall removed from site for disposal at an appropriately landfill.

Asbestos – where asbestos sheeting or fragments are identified, this material shall be placed directly into lined containers and managed in accordance with asbestos workplace health and safety regulations. This will be conducted by a suitably licensed asbestos removal contractor.

6.5 Water Treatment & Disposal

Groundwater seepage into excavations may be collected and used for dust suppression within excavation areas or in stockpile areas where suitable control measures are in place to prevent runoff from discharging into external waterways.

Groundwater testing from across the site has indicated that the groundwater is generally of a quality which represents a low environmental risk. However, permission from DERM and the local Council would be required prior to discharge to water ways. Discharges to surface waters shall comply with all conditions in issued permits (including any pretreatment required to remove sediments). Alternatively, water from the site shall be collected and disposed of by a licensed tradewaste contractor.

7.0 OPERATION CONTROL

7.1 Construction Environment Management Plan

A Construction Environmental Management Plan (CEMP) for the Site shall be prepared incorporating detailed elements covering environmental management of the Site to ensure environmental effects of the remediation work are kept to a minimum and in compliance with all relevant Acts of Parliament and Environmental Regulations.

The CEMP must be approved by the TPR prior to commencement of works on site.

The CEMP shall contain management approaches for, but not limited to, the following areas:

Land Disturbance

Erosion and sediment control devices;
Management of stormwater;
Management of excavated materials and stockpiles;
Dust control;

Noise and Vibration

Operating hours;
Vehicles and equipment;
Traffic;
Noise abatement;
Vibration.

Other

Litter;
Storage of chemicals and fuel;
Road cleaning and truck wash;

Development of the details within each of these segments of the CEMP shall incorporate the general management approach, the environmental criteria to be met and specific engineering controls to be used.

Requirements in the following sections shall also be considered and addressed as part of the CEMP.

7.2 Stormwater Management

A site-specific stormwater management plan is required to be developed prior to the commencement of site works. Stormwater management works are to include controls for construction activities and soil conservation measures such as diversion drains, silt traps, sediment traps, litter traps and bank stabilization. Specific control measures are required to:

Contain stormwater runoff generated within excavations and stockpile areas; and

Prevent discharge to external waterways.

Control measures to be adopted may include:

Use of bunds and spoon drains to isolate working areas from the remainder of the site catchment and to direct surface water from the working area into open excavations.

Formation of a collection sump at the lowest corner of the remedial excavations to collect stormwater entering the excavations and allow for dewatering of the excavation.

Inspection of the bunds, drains and sumps regularly during site remediation works to check their integrity and repair any faults as soon as practicable.

7.3 Soil and Sediment Control

A site-specific erosion and sediment control plan (ESCP) must be developed in accordance with local Council guidelines prior to the commencement of remediation works.

7.4 Noise Control

Site works shall be carried out between 6.30am and 6.30pm Monday to Saturday, or other alternative timeframes approved by local Council.

7.5 Dust Control

Potential for dust generation from excavation works and/or stockpiles shall be managed on an as required basis by spraying from water trucks, or other TPR approved method.

7.6 Community Relations

Prior to the commencement of site works, neighbouring properties shall be consulted to inform of the commencement and expected timing of the works. Concerns and complaints raised by the community (or other parties) during the remedial works will be noted and a register must be maintained to record the following information:

1. **Contact details:** Name, address and phone number of party raising concern.
2. **Nature of concern:** Details of issue/incident.
3. **Action taken or required:** Details of action proposed or undertaken to address the concern, including time and date.
4. **Response to Action:** Was the party raising the concern satisfied with the outcome, if not, what else needs to be done, or is it outside the scope of the development works.
5. **Prevention of re-occurrence:** If the concern relates directly to an operational problem, what action has been taken to ensure the problem will not occur again.

The register must be available to DERM or TPR at request.

All complaints must be responded to within two business days of the complaint being raised.

7.8 Site Access and Signage

Fencing shall be provided to restrict public access to the site. Fencing shall be to a standard that meets Workplace Health and Safety requirements and prevents unauthorised access by the public. Warning and safety signs (as required under workplace legislation) shall be placed at site access points.

8.0 DECONTAMINATION PROCEDURES

The contractor shall reduce the potential for material to be tracked off the site by the tyres of vehicles as far as practical. This could include a restriction on off-site vehicle movement during wet conditions, the manual cleaning of vehicle wheels prior to vehicles leaving the site, the use of a wheel wash or other measures. Details of the system to be implemented shall be provided in the CEMP.

9.0 HEALTH AND SAFETY

A *Health and Safety Plan* must be prepared for the activities to be performed on the site where employees may be exposed to toxic or other hazardous compounds and elements. Specific requirements relating to dermal contact and inhalation as well as public safety, vehicle decontamination, protective clothing, equipment and appropriate safety controls must be addressed. Personnel working on the site during remediation works must be inducted and sign relevant forms stating that the induction has been carried out.

Works will be according to the *Workplace Health and Safety Act (1995)* and *Workplace Health and Safety Regulations (2008)*.

10.0 REPORTING

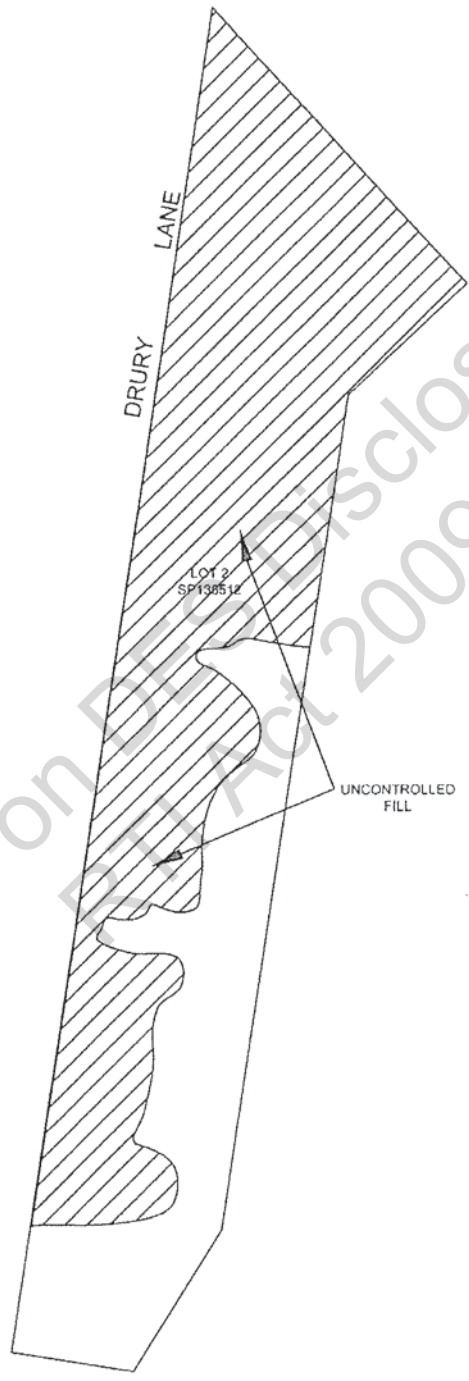
The progress of the works will be reported to the TPR on a regular basis. Fill characterisation and validation sampling results will be supplied to the TPR in the form of reports as the data becomes available.

Within 60 days of the completion of all remediation and validation works, a report detailing works must be prepared by a suitable qualified person in accordance with Section 4.6 and submitted to the TPR for certification prior to submission to the DERM. The report submitted should be in accordance with Chapter 7, Part 8 of the EP Act and the *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland* May (1998) and NEPM requirements.

The report shall include but not be limited to documentation of the remediation and characterisation program activities (including photographic records and daily site diaries detailing volumes of soil moved), records of all offsite disposal, analysis of characterisation results and an evaluation of the results against the validation criteria.

The report shall also include the results of the QA/QC program, Chain of Custody documentation and Sample Receipt Advices for all samples collected and copies of documentation validating the appropriate handling, disposal and treatment of any contaminated soil, materials and water in accordance with DERM requirements.

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2009



CTPI 49-S			
24/2/10			
SCALE 1:3000	FIGURE NO. 1	DATE 25/11/09	A3

1.0 SUMMARY OF CONTAMINATION

A sand extraction operation operated historically on the site located at Lot 11 Drury Lane, Dundowran, QLD. A portion of the extraction area along Drury Lane was subsequently filled in an uncontrolled manner. The placement of uncontrolled fill over a portion of the site (refer attached Figure 1) resulted in the listing of the site on the Environmental Management Register for the Notifiable Activity – Landfill.

Investigation of the uncontrolled fill material revealed predominantly sandy clay soils with a variable amount of deleterious materials including:

Building rubble (including large pieces of concrete greater than 300mm diameter), steel, bitumen, timber, bricks, iron, tyres, car parts, animal carcasses, wire, gravel, plastic, PVC pipe, cobbles, and sandstone.

In addition to the filled portion of Lot 11, two stockpiles (“burn pit” materials and recently imported uncontrolled fill) were also identified in the southern portion of the site (refer Figure 1). Materials identified in these stockpile included:

Burn Pit Stockpile

Broken asbestos sheeting fragments

Lead impacted soil (above HIL ‘A’) - Maximum concentration of contamination in soil exceeding the HIL ‘A’ is described below:

<u>Analyte</u>	<u>Maximum Concentration (mg/kg)</u>
Lead	1,420

Recently Imported Uncontrolled Fill Stockpile

Arsenic impacted soil (above HIL ‘A’) - Maximum concentration of contamination in soil exceeding the HIL ‘A’ is described below:

<u>Analyte</u>	<u>Maximum Concentration (mg/kg)</u>
Arsenic	133

The strategy by which these materials will be removed and/or managed to enable removal of the site from the Environmental Management Register (EMR) is contained in the Remediation Action Plan (RAP) attached as Appendix 1.

2.0 OBJECTIVES OF THE SMP

The purpose of this SMP is to manage identified contamination on the site in a manner that protects human health and the environment.

3.0 ACHIEVEMENT AND MAINTENANCE OF OBJECTIVES

3.1 Responsibility. The owner of the land (as defined in the Environmental Protection Act 1994) is to ensure that this SMP and any variations approved or

required by the administering authority are complied with. The obligations and conditions set out in this SMP bind the owner, from time to time, of the land.

3.2 Site Use. The site is currently vacant site and is proposed to be redeveloped and subdivided into an industrial estate. Prior to commencement of this new land use, remedial works will be conducted with the primarily intent removing the site from the EMR. All remediation and validation works for this site are to be carried out in accordance with Appendix 1 - Remediation Action Plan (RAP).

3.3 Third Party Reviewer (TPR) A Third Party Reviewer (TPR) approved by the DERM and operating in accordance with the DERM's Terms of Reference for TPR (February 2008) must be appointed for the duration of the site assessment and remediation activities.

3.4 Provision of SMP to appropriate persons. The owner must provide all persons involved in building design and planning and all contractors and lessees conducting building and/or excavation works with a copy of the SMP prior to commencement of site works. All persons occupying or working on the site must comply with the requirements of the SMP.

3.5 Surface capping and protective barriers. Existing surface cover across filled areas shall be maintained until such time as remediation works occur.

3.6 Service Trenches. All underground services must be constructed in either uncontaminated material or in trenches in which the services are surrounded by a minimum of 0.3m of uncontaminated fill for minor services (< 100 mm in diameter), and 0.5m of uncontaminated fill for services greater than 100 mm in diameter.

3.7 Soil Excavation & Removal. Uncontrolled fills must not be removed from site without suitable characterisation sampling and analysis. Representative characterisation sampling and analysis of any uncontrolled fill materials excavated from the site must be managed by a suitably qualified and experienced person in accordance with Section 381 of the Environmental Protection Act 1994 (EP Act). Contaminated soil must not be removed off-site without a disposal permit in accordance with Section 424 of the EP Act.

3.8 Unexpected Contamination. If during any site earthworks or excavation, offensive or noxious odours and/or evidence of gross contamination not previously detected are observed, site works are to cease in that area and action taken to immediately abate the environmental harm. The administering authority is to be notified in writing within 2 business days of detection and advised of appropriate remedial action.

Any remedial action is to be developed by an appropriately qualified and experienced person in accordance with Section 381 of the EP Act.

3.9 General Environmental Protection. All earthworks are to be undertaken in accordance with general environmental protection measures to avoid unwanted migration and deposition of soil. These measures include the control of dust, noise, stormwater runoff, sediment, erosion, spillage from haulage trucks and odour releases involving the handling or movement of contaminated material.

3.10 Workplace Health and Safety. A Workplace Health and Safety Plan (WH&S plan), which conforms to the requirements of the Workplace Health and

Safety Act 1995 is to be developed for any site excavation works in contaminated areas. The WH&S plan must specifically address contaminants of concern.

4.0 MONITORING AND REPORTING

The owner is to ensure that the following reporting and monitoring is performed to ensure compliance with the SMP:

Until remediation commences:

Records are to be kept of all inspections, any soil excavation in contaminated areas, disposal permits and site management plan compliance for review by the administering authority from time to time. A biennial inspection is to be undertaken to ensure that capping and protective barriers remain in sound condition at all times in accordance with Section 3.5.

The biennial period is to commence from the effective date of this plan.

Once remediation commences:

Monitoring and reporting is to be conducted as required in Appendix 1 - Remediation Action Plan (RAP).

In addition to the reporting required in the RAP, within 60 days from the completion of site development, a report is to be submitted to the TPR documenting details of remediation activities, the results of any sampling undertaken during remediation, records of any site inspections and details of Site Management Plan compliance. The report is to be prepared by a suitably qualified and experienced person in accordance with Section 381 of the *Environmental Protection Act 1994* (EP Act).

This Site Management Plan (SMP) has been developed to manage site contamination risks present at the issue date. Subsequent uses of the site may result in the need to review the plan.

This SMP makes reference to a plan attachment that is available from the Administering Authority if required.

This SMP makes reference to a Remediation Action Plan attachment that is available from the Administering Authority if required.

APPENDIX 1

REMEDIATION ACTION PLAN

LOT: 11

PLAN: RP909375

FILE REF:

PRINTED: / /2010

DATE OF EFFECT: / /2010

1.0 INTRODUCTION

This Remediation Action Plan (RAP) has been prepared for remediation of uncontrolled filling activities on Lot 11 on RP909375, located at Lot 11 Drury Lane, Dundowran, QLD. Historical filling has occurred at three locations on site as shown on Figure 1 – uncontrolled filling backfilling of an old sand pit (along part of the eastern boundary), a “burn pit” stockpile, and a recently imported uncontrolled fill stockpile. The remediation works are required to remove materials that may pose a risk to the health of future site users or the environment. The works required include:

Excavation of all uncontrolled fill materials, separation of recyclables, stained/odorous materials and characterisation of remaining materials for reuse or offsite disposal.

Removal of asbestos sheeting fragments and lead impacted soil identified in the “burn pit” stockpile.

Further characterisation of recently imported uncontrolled fill stockpile materials for reuse or offsite disposal.

1.1 Purpose of the RAP

This document has been prepared to describe remediation strategies and control measures aimed at achieving removal of the site from the Environmental Management Register (EMR).

1.2 Remediation Objective

The primary objective of the remediation works is to obtain a Site Suitability Statement to support future redevelopment of the site.

1.3 Third Party Reviewer

A Third Party Reviewer (TPR) must be appointed for the duration of this project. The site work and subsequent reporting is to be certified by a Department of Environment and Resource Management (DERM) approved Third Party

Reviewer (TPR). All validation requirements must first have consent from the TPR and any clarification issues will be referred to the TPR prior to the DERM. The TPR will approve the proposed validation methodology, pre-validation sampling results, Disposal Permit applications and the final report.

The role of the TPR is to review all relevant documentation associated with the proposed RAP, to accept the proposed remediation strategy and certify that the site is suitable for any land use or specific land uses (as required) in accordance with DERM Terms of Reference for Third Party Review dated February 2008.

2.0 BACKGROUND

2.1 Site History

The subject site is identified as Lot 11 RP909375 and is approximately 26.04 ha in area. The site history indicates that Lot 11 RP909375 was historically used for sand extraction. Following sand extraction, filling was undertaken over an area of approximately 2.5 ha to return this area to about its original level. The uncontrolled filling of this area resulted in Lot 11 RP909375 been listed on the EMR for Notifiable Activity No.20: Landfill – disposing of waste.

2.2 Topography

The regional topography is generally low and flat comprising large tracts of Wallum heath and ti-tree swamps. The nearest creek is approximately 2 km north (Eli Creek) and the ocean is approximately 500m beyond Eli Creek. A manmade lake is located approximately 300m to the east of the site.

At the time of the investigation, the site showed the effects of past sand extraction work. The eastern boundary of the site was about 2 m to 3 m higher than the lower land at the base of the sand extraction area. Both the higher and lower land was generally flat.

Surface drainage generally follows the contours towards two low lying areas in the north west and south west corners of the site. The site is generally well drained, with stormwater run-off expected to be shed as sheet flow.

2.3 Geology

Available geological information (1:250,000 Geological Map, MARYBOROUGH, Sheet SG 56-6 Part 9544, Department of Resource Industries, 1992) indicates that the site is underlain by Quaternary (Holocene) age “*beach ridges: sand, shelly sand, minor gravel*”, possibly overlying slightly older (Pleistocene) sediments of “*Undifferentiated coastal plains: sand, silt, mud*”. The Quaternary sediments are underlain at depth by the early Cretaceous age Maryborough Formation containing “*mudstone, siltstone, shale, sandstone*”.

Subsurface conditions encountered during investigations intersected a relatively consistent subsurface profile across the site comprising natural sand and silty sand, then stiff (or stiffer) clay. On the high side of the site, towards the north east, an extensive area of uncontrolled fill was encountered.

The uncontrolled fill encountered (ranging from 1.0 m to 4.4 m in depth) was generally sandy clay containing varying amounts of building rubble (including large pieces of concrete greater than 300mm diameter), steel, bitumen, timber, bricks, iron, tyres, car parts, animal carcasses, wire, gravel, plastic, PVC pipe, cobbles, and sandstone. The natural stiff (or stiffer) clay underlying fill and natural sand may be residual soil formed by weathering of the underlying parent rock (Maryborough Formation).

For most of the site, the upper sand appears to have been removed as part of the sand extraction work. Remnants of this material are present in the higher section of the south-east and north east corners of the site where excavations have not been conducted. This area comprises mostly sand overlying coffee rock.

Much of the exposed ground surface in the area where sand extraction works have been undertaken comprises medium dense to dense sandy soils (including dense indurated silty sand), to depths of about 0.2m to 0.8m and overlying stiff (or stiffer) clay.

2.4 Hydrogeology

Groundwater was recorded at depths of 0.5 m (excavated areas) to 2.4 m (excavated areas where fill has been placed) in the monitoring wells, which were installed as part of the acid sulfate soils investigation. It should be noted that groundwater was not encountered in test pits excavated in fill materials. The direction of groundwater flow is expected to be to the west. Groundwater inflows into monitoring wells were very slow and the resulting yields are not considered to represent a viable source of potable water or other extractive groundwater use.

2.5 Information Sources

Previous investigation reports considered in the preparing this RAP include:

Stage 1 Preliminary Site Investigation, Lot 11 RP909375, Drury Lane, Dundowran, [ref. Golder Associates 077683505(AA) dated August 2007].

Stage 2 Detailed Site Investigation, Lot 11 RP909375, Drury Lane, Dundowran, [ref. Golder Associates 077683505(AG) dated November 2007].

Additional Filed Investigations – Supplementary Report, Lot 11 RP909375, Drury Lane, Dundowran, [ref. Golder Associates 077683505(AS) dated November 2009].

2.6 Historical Data

The historical data identified the following potential sources of contamination at this site:

Potential Contamination Source	Potential Contaminant
Existing Uncontrolled Fill (former sand extraction area)	Hydrocarbons (TPH & BTEX), PAH, Phenols, PCB, Metals (As, Cd, Cr, Cu, Pb, Ni, Hg, Zn), organochlorine and organophosphorous pesticides and asbestos
Recently Imported Uncontrolled Fill	(TPH & BTEX) Metals (As, Cd, Cr, Cu, Pb, Ni, Hg, Zn), organochlorine and organophosphorous pesticides and asbestos
Former Burn Pit Stockpile	PAH, metals and asbestos

2.7 Soil Contamination

2.7.1 General

Three identified fill areas (refer Figure 1) need to be addressed in the remediation strategy. These comprise:

Uncontrolled fill materials used to backfill the former sand pit (along the eastern boundary). These fills contain deleterious materials (including oversize concrete).

Recently imported uncontrolled fill stockpile.

The 'burn pit' stockpile.

2.7.2 Uncontrolled Fill (former sand pit area)

It is estimated that about 80,000 m³ (insitu) of fill material has been placed along the eastern boundary of Lot 11. This fill has been placed across an area of about 25,000 m² and to depths ranging from about 1.0 m to 4.4 m.

This fill is predominantly comprised of sandy clay soils with variable amounts of deleterious materials including - building rubble (including large pieces of concrete greater than 300mm diameter), steel, bitumen, timber, bricks, iron, tyres, car parts, animal carcasses, wire, gravel, plastic, PVC pipe, cobbles, and sandstone. No visual evidence of fibreboard sheeting fragments was observed within the existing uncontrolled fill exposed during test pit investigations.

Department of Environment and Resource Management (DERM) C&D waste Operational Policy indicates that where C&D waste is separated into its constituent parts, the inert parts may be used as clean fill. The Operational Policy indicates that the following materials are considered to be inert:

bricks/pavers/ceramics;

concrete (including embedded steel reinforcing rods), pulverised to a maximum 300mm nominal size; and

clean earthen fill.

Deleterious materials other than the above inert materials will need to be segregated and removed from site during remediation works.

The uncontrolled fill materials have presently been characterized by sampling and analysis for contaminants of concern at a frequency of about 1 sample per 1500m³ of fill. The results of this preliminary characterization sampling did not identify concentrations of the contaminants of concern that are considered to indicate a risk to human health or the environment. However, a higher density of characterization sampling would be required to validate these materials as suitable for unrestricted reuse on site.

2.7.3 Recently Imported Fill Stockpile

It is estimated that about 2,000 m³ of fill material is present in this stockpile. No deleterious material has been observed during investigation of this stockpile.

Limited characterization sampling and analysis of the recently imported stockpile of uncontrolled fill was conducted at a frequency of 1 sample per 100m³ of fill. The results of this preliminary characterization sampling identified the presence of arsenic impacted soil with concentration exceeding the Health-based Investigation Levels for use in a “standard” residential setting (maximum concentration of 133 mg/kg). In the absence of more detailed characterization of fill materials, it has been assumed that zones of arsenic impact occur within the uncontrolled fill materials. However, a higher density of characterization sampling may provide a statistical basis evaluating the unrestricted reuse of this on site or the need for offsite disposal.

2.7.4 Burn Pit Stockpile

An estimated 50m³ (insitu) of materials are present in the “burn pit” stockpile. Fragments of broken asbestos sheeting were observed in this stockpile. This material was confirmed as containing chrysotile and amosite asbestos.

Concentrations of lead impacted soil exceeding the Health-based Investigation Levels for use in a “standard” residential setting (maximum concentration of 1420 mg/kg) were also detected in the burn pit stockpile.

Removal and offsite disposal of this material will be required during remedial works.

2.8 Groundwater

Field tests on groundwater samples from site well locations indicated slightly acidic groundwater ranging from pH 5.5 to pH 6.6. Electrical Conductivity ranged between 0.3 mS/cm and 2.3 mS/cm, which indicates freshwater to brackish conditions. No free phase product, sheens, discolouration or odours (that may indicate the presence of possible contamination) were observed within groundwater samples.

Water samples collected from GA3 on 4 August 2007 revealed concentrations of TPH in the C₁₀-C₃₆ hydrocarbon fractions exceeding the environmental assessment criterion. Minor TPH concentrations were also detected in water samples from the two other wells but at concentrations below the environmental assessment criterion. The wells were redeveloped on 7 November 2007 and later re-sampled. The concentrations of TPH detected in GA3 again marginally exceeded the environmental assessment criterion for the C₁₀-C₃₆ hydrocarbon fractions. These results suggest that the source of this limited groundwater impact may be “pocket(s)” of hydrocarbon impacted uncontrolled fill. The presence of hydrocarbon impacted fill was not identified during the characterization sampling completed to date. The relatively low levels of heavy end (generally C₁₅-C₃₆) hydrocarbon fractions detected in groundwater samples from GA3 is considered to represent a low risk to surface water environmental ecosystems given that:

TPH concentration in GA3 is marginally elevated and from a limited source within the uncontrolled fill (not the result of ongoing leakage from a tank or pipeline);

Nearest surface water ecosystem receptors are more than 500 m from the site; and

Factors such as natural attenuation, dispersion and dilution will occur before groundwater from beneath the site could discharge to surface waters. it is not considered a risk to nearby environmental receptors.

Source removal (pockets of impacted uncontrolled fill) and confirmation of TPH concentrations in groundwater samples is required during remedial works.

A groundwater sample collected from GA6 revealed a concentration of arsenic (0.02mg/L) and copper (0.004mg/L) marginally exceeding the environmental assessment criteria. Given the absence of significant arsenic or copper impact detected in soil samples of uncontrolled fills, these concentrations in groundwater are not considered to represent a risk to the environment.

Water samples collected from GA3, GA6, and GA11 revealed concentrations of zinc (0.019mg/L, 0.043mg/L, and 0.041 respectively) exceeding the environmental assessment criterion. Given the absence of significant zinc impact detected in soil samples of uncontrolled fills, these concentrations in groundwater are not considered to represent a risk to the environment.

Water samples collected from GA3, GA6, and GA11 revealed concentrations of organochlorine and organophosphorus pesticides below the laboratory limit of reporting. However, the laboratory limits of reporting were above all adopted environmental assessment criteria. Given the lack of organochlorine and organophosphorus pesticides detection in the soil samples during Stage 1 investigations, the risk of organochlorine or organophosphorus pesticides impact to groundwater is considered to be low. Confirmation of pesticide concentrations in groundwater samples is required during remedial works.

The investigation results suggest that there will not be a need for large scale dewatering operations during excavation of uncontrolled fill materials.

3.0 ENVIRONMENTAL GUIDELINES

The remedial activities undertaken at the site must be performed in accordance with the following documents:

- *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland*, May 1998;
- *Draft Hydrocarbon Guidelines*, Contaminated Land Unit, Queensland EPA, January 1999;
- *Guidelines issued under Schedule B of the National Environment Protection (Assessment of Site Contamination) Measure (NEPM)*, National Environment Protection Council, December 1999;
- *Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites* (ANZECC guidelines) published by the Australian and New Zealand Environment and Conservation Council/National Health and Medical Research Council, January 1992;
- Australian Standard AS4482.1-2005 *Guide to the sampling and investigation of potentially contaminated soil Part 1 – Non volatile and semi volatile compounds*; and
- Australian Standard AS4482.2-2005 *Guide to the sampling and investigation of potentially contaminated soil Part 1 – Volatile and semi volatile compounds*

4.0 REMEDIAL GOALS AND VALIDATION CRITERIA

4.1 General

Remediation and acceptance criteria for soils contained in the following sections are based on redevelopment of the site for unrestricted land use. The criteria consider a range of issues including human health risk, environmental risk and aesthetic considerations such as odour and discoloration.\

Criteria should be applied to the 95% Upper Confidence Level (UCL) on the mean of data for each domain of interest, with no hot-spot concentrations greater than 2.5 times the relevant criteria value. The domains of interest at this Site will be each individual stockpile of excavated soil. Sufficient samples must be collected within each domain of interest to ensure that statistical analysis is valid.

The nominated criteria are based on various national and international standards.

4.2 Characterisation of Soils for Reuse

Soil acceptance criteria for reuse on site are listed below.

Parameter	EMR Removal & “Clean” Fill
<u>Petroleum Hydrocarbons</u>	
TPH (C ₆ – C ₉)	100 mg/kg ⁽¹⁾
TPH (C ₁₀ – C ₁₄)	100 mg/kg ⁽¹⁾
TPH (C ₁₅ – C ₂₈)	1000 mg/kg ⁽¹⁾
TPH (C ₂₉ - C ₃₆)	1000 mg/kg ⁽¹⁾
<u>Monocyclic Aromatic Hydrocarbons</u>	
Benzene	1 mg/kg ⁽¹⁾
Toluene	Total BTEX = 7 mg/kg ⁽¹⁾
Ethyl Benzene	
Xylene	
<u>Polycyclic Aromatic Hydrocarbons</u>	
Benzo(a)pyrene	1 mg/kg ⁽²⁾
Total PAH	20 mg/kg ⁽²⁾
<u>Inorganics</u>	
Arsenic	100 mg/kg ⁽²⁾
Cadmium	3 mg/kg ⁽³⁾
Chromium VI	100 mg/kg ⁽²⁾
Copper	200 mg/kg ⁽⁵⁾
Lead	300 mg/kg ⁽²⁾
Nickel	60 mg/kg ⁽³⁾
Mercury	1 mg/kg ⁽³⁾
Zinc	400 mg/kg ⁽⁵⁾
<u>Organochlorine Pesticides</u>	
Aldrin + Dieldrin	10 ⁽²⁾
Chlordane	50 ⁽²⁾
DDT & Derivatives	200 ⁽²⁾
Heptachlor	10 ⁽²⁾
<u>Other</u>	
Polychlorinated biphenyls	10 ⁽²⁾
<u>Physical Criteria</u>	
Odour	- No detectable hydrocarbon odour
Staining	- No visible hydrocarbon staining
Domestic and Garden Refuse	- No visible municipal waste materials
Construction and Demolition Waste	- Concrete (including embedded steel reinforcing rods), pulverised to a maximum 300mm nominal size ⁽⁴⁾
	- No visible timber or other deleterious materials
Asbestos	- No detectable asbestos fibres or fragments ⁽⁷⁾

Notes:

- (1) Draft Hydrocarbon Guidelines – QLD DERM 1999
- (2) Health Based Investigation Levels for Exposure Setting “A” (‘Standard’ Residential with garden/accessible soil) – Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland, Queensland Department of Environmental 1998.
- (3) Environmental Investigation Levels – Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland, Queensland Department of Environmental 1998.
- (4) Inert Waste Policy, EPA

- (5) Elevated Environmental Investigation Level for Low Phytotoxicity Setting
- (6) Should environmentally sensitive receptors be identified at/in proximity to the site, then Environmental Investigation criteria will be applied.
- (7) Western Australia Department of Health Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia, May 2009.

These criteria may be amended, subject to approval by the TPR, where it can be demonstrated that alternative concentrations are protective of human health, the environment and aesthetic considerations. In addition, these criteria may be amended to environmental investigation levels (as listed in *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland*, Queensland Department of Environmental 1998) should sensitive environmental receptors be identified at or in close proximity to the site. Criteria for other additional parameters, if required, must be approved by the TPR.

4.3 Groundwater

On completion of remedial earthworks, the following groundwater acceptance criteria shall be applied:

Parameter	Acceptance Levels
<u>Petroleum Hydrocarbons</u>	
TPH (C ₆ – C ₉)	0.15 mg/L ⁽¹⁾
TPH (C ₁₀ – C ₃₆)	0.6 mg/L ⁽²⁾
<u>Inorganics</u>	
Arsenic	
Cadmium	
Chromium (total)	
Copper	< ANZECC Water Quality
Lead	Guidelines 2000, Trigger Values for
Nickel	Fresh Waters 95% Level of Protection
Mercury	
Zinc	
<u>Monocyclic Aromatic Hydrocarbons</u>	
Benzene	
Toluene	
Ethyl Benzene	
Xylene	
<u>Organochlorine & Organophosphorus Pesticides</u>	

Notes:

- (1) Dutch C - Netherlands Soil Clean-up Guideline, 1983
- (2) Dutch Intervention Value - Environmental Quality Objectives in the Netherlands, 1994
- (3) No specific criteria or guidelines have been published in Queensland or Australia for the assessment of TPH contamination in groundwater. In the absence of State or National guidelines, intervention values for hydrocarbons contained in Dutch Guidelines have been adopted for assessment of environmental risk from TPH. TPH concentrations exceeding these guideline criteria may represent a threat to the environment and require specific assessment of risk.

These criteria may be amended, subject to approval by the TPR, where it can be demonstrated that alternative concentrations are protective of human health, the environment and aesthetic considerations. Criteria for other additional parameters, if required, must be approved by the TPR.

Where concentrations are detected exceeding the above criteria, further assessment of the risk will be required. This assessment may include more detailed groundwater investigations to evaluate “background” groundwater quality/conditions and identification of potential receptors and exposure routes. A qualitative risk assessment should be conducted on the basis of the above.

Where unacceptable risk is indicated the a quantitative risk assessment and/or remedial works will be required. The scope and methodology of any further groundwater investigation/assessment shall be agreed with the TPR, prior to commencement of such works.

4.4 Imported Fill Materials

Imported fill materials (if required) to backfill the site to final development levels shall be from a registered quarry.

Materials from alternative sources may be accepted in consultation with the TPR where it can be demonstrated that the material are not impacted by contamination.

4.5 Sampling Frequency and Quality Assurance / Quality Control

4.5.1 Soil

Characterisation sampling of soils for reuse or removal from site will be required at a frequency of at least 1 sample per 50m³ for individual stockpiles of similar soil types. If mixed soil types are noted in stockpiles then characterisation samples must be collected of each material types present at a rate of at least 1 sample per 50m³. A minimum of 9 samples must be collected within each stockpile where statistical assessment of result is proposed for validation purposes.

A quality assurance/quality control program shall be conducted during characterization sampling. This program shall include collection and analysis of:

Blind replicate samples at a frequency of 1 for every 20 samples collected.

Split samples at a frequency of 1 for every 20 samples collected.

Equipment rinsate samples for each day where sampling is conducted.

4.5.2 Groundwater

At least two rounds of groundwater samples shall be collected from excavation sumps following completion of excavations.

A quality assurance/quality control program shall be conducted during groundwater sampling. This program shall include collection and analysis of:

A blind replicate sample during each sampling round.

A split sample during each sampling round.

An equipment rinsate sample during each sampling round.

4.6 Sampling & Reporting

Characterisation sampling shall be conducted under the direction of a suitably qualified and experienced person in accordance with Section 381 of the Environmental Protection Act 1994 (EP Act). Standard procedures that include sample equipment decontamination, sample handling, sample storage and documentation shall be applied.

At the completion of remediation works a Validation Report shall be prepared by the suitably qualified and experienced person that documents the works undertaken and compliance with the agreed remediation works. This report shall be submitted to the TPR for approval.

4.7 Analytical Testing

Analytical testing for the characterization/validation program should be conducted by a NATA accredited laboratory. If the laboratory is not NATA accredited, at least 10% of the samples under investigation must be submitted to a NATA accredited laboratory as a quality check. Please note that asbestos sampling and analysis should be undertaken in accordance with the Western Australia Department of Health *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*, May 2009.

Analysis of collected characterization samples shall be undertaken as follows:

Metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn)	All soil samples.
Petroleum Hydrocarbons	All soil samples
Monocyclic Aromatic Hydrocarbons	All soil samples with visual or olfactory impacts, otherwise 10% of soil samples.
Polycyclic Aromatic Hydrocarbons	All soil samples with visual or olfactory impacts, otherwise 10% of soil samples.

Organochlorine /Organophosphorus

Pesticides

All soil samples.

Asbestos

All validation samples from the burn pit area and In Accordance with Western Australia Department of Health *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*, May 2009

These criteria may be amended, subject to approval by the TPR, where it can be demonstrated that alternative concentrations are protective of human health, the environment and aesthetic considerations. Criteria for other additional parameters, if required, must be approved by the TPR.

5.0 REMEDIATION STRATEGY

The remediation strategy for this site comprises the following:

Excavation of all uncontrolled fill materials.

Segregation of soil materials from deleterious materials.

Characterization of separated soil materials for either reuse on site as “clean” fill or for offsite disposal.

Pulverisation/crushing of bricks and concrete (> 300 mm diameter) to enable reuse as inert site fill.

Offsite disposal of remaining deleterious materials.

Further characterisation of recently imported uncontrolled fill for either reuse on site as “clean” fill or for offsite disposal.

Removal and offsite disposal of the entire ‘burn pit’ stockpile

Detailed management procedures for this strategy are provided in the following sections. These procedures may be amended, subject to approval by the TPR, where it can be demonstrated that alternative procedures are protective of human health, the environment and aesthetic considerations.

6.0 REMEDIATION PROGRAM

6.1 Existing Uncontrolled Fill Area

6.6.1 Excavation and Segregation of Materials

Approximately 80,000 m³ (insitu volume) of existing uncontrolled fill will need to be excavated and segregated. Excavations shall be continued both laterally and vertically until all existing uncontrolled fill materials have been removed.

A suitably qualified and experienced person shall monitor all excavation works and screen excavated materials using a photo-ionisation detector (PID). Excavations shall be conducted in a manner which targets removal and stockpiling

of visually similar materials. Daily photographic and written records of inspection and monitoring shall be kept.

Any materials observed to contain building rubble and other deleterious materials will be segregated from soils and separately stockpiled. Where hydrocarbon odours, staining, elevated PID readings or other indicators of suspected impact are noted, these materials shall be segregated from other material and separately stockpiled for characterisation.

Groundwater encountered during the excavation of overburden shall be collected from a sump excavated in the low point of the excavation. Reuse or disposal of groundwater is discussed in Section 6.1.5.

An area of approximately 5 ha of non-filled land is available at the site for the stockpiling of excavated materials. Operational controls to be adopted during the excavation, onsite transportation and stockpiling of excavated materials are discussed in Section 7.0.

Movement and stockpiling of excavated materials shall be conducted under a materials tracking plan approved by the TPR.

6.1.2 Soil Characterisation Stockpiles

Stockpiles of soil materials shall be sampled and analysed in accordance with Section 4.0.

Stockpiles found to be in compliance with the validation criteria shall be reused to backfill excavations. Stockpiles found not to be in compliance with the validation criteria shall be removed from site. An offsite disposal permit shall be obtained through the TPR prior to removal of these soils from site. Disposal to landfill shall only occur under an approved Disposal Permit issued by DERM.

6.1.3 Suspected Contaminated Material Stockpiles

Segregated stockpiles of materials with odours, staining, elevated PID readings or other indicators of suspected contamination impact (such as bitumen) shall be sampled and analysed to evaluate their contamination status and the need for pre-treatment prior to landfill disposal. An offsite disposal permit shall be obtained through the TPR prior to removal of contaminated soils from this site. Disposal to landfill shall only occur under an approved Disposal Permit issued by DERM.

6.1.4 Deleterious Materials Stockpiles

Deleterious materials shall be further segregated in separate stockpiles and managed as follows:

Bricks and concrete – where practical shall be pulverized or crushed to a size of less than 75mm diameter to enable reuse on site as inert fill.

Materials not meeting this criteria shall be removed from site for disposal at appropriately licensed landfill.

Metal (including wire, steel, iron, and car parts) - shall be removed from site for recycling.

Domestic and Greenwastes (including animal carcasses) - shall removed from site for disposal at an appropriate landfill.

Other demolition materials (including timber, plastic and PVC pipes) - shall removed from site for disposal at an appropriately landfill.

Asbestos – where asbestos sheeting or fragments are identified, this material shall be placed directly into lined containers and managed in accordance with asbestos workplace health and safety regulations. This will be conducted by a suitably licensed asbestos removal contractor.

6.1.5 Water Treatment & Disposal

Groundwater seepage (if encountered) into excavations shall be collected and used for dust suppression within excavation areas or in stockpile areas where suitable control measures are in place to prevent runoff from discharging into external waterways.

Alternatively, groundwater seepage may be collected and disposed of by an appropriately licensed liquid waste contractor.

It should be noted that permission from DERM and the local Council would be required prior to discharge to water ways. Discharges to surface waters shall comply with all conditions in issued permits (including any pretreatment required to remove sediments and contaminants).

6.2 Recently Imported Uncontrolled Fill Area

Further characterisation sampling of the recently imported uncontrolled fill for reuse or removal from site will be carried out to achieve an overall frequency of 1 sample per 50m³ of fill.

If the materials are found to be in compliance with the validation criteria they can be reused to backfill excavations. If the materials are found not to be in compliance with the validation criteria they shall be removed from site. An offsite disposal permit shall be obtained through the TPR prior to removal of these soils from site. Disposal to landfill shall only occur under an approved Disposal Permit issued by DERM.

6.3 Burn Pit Stockpile

The burn pit stockpile shall be excavated and removed from site.

Due to the presence of asbestos fragments, excavation and removal off-site shall be conducted by a suitably licensed asbestos contractor.

7.0 OPERATION CONTROL

7.1 Construction Environment Management Plan

A Construction Environmental Management Plan (CEMP) for the Site shall be prepared incorporating detailed elements covering environmental management of the Site to ensure environmental effects of the remediation work are kept to a minimum and in compliance with all relevant Acts of Parliament and Environmental Regulations.

The CEMP must be approved by the TPR prior to commencement of works on site.

The CEMP shall contain management approaches for, but not limited to, the following areas:

Land Disturbance

Erosion and sediment control devices;

Management of stormwater;

Management of excavated materials and stockpiles;

Dust control;

Noise and Vibration

Operating hours;

Vehicles and equipment;

Traffic;

Noise abatement;

Vibration.

Other

Litter;

Storage of chemicals and fuel;

Road cleaning and truck wash;

Asbestos handling and management

Development of the details within each of these segments of the CEMP shall incorporate the general management approach, the environmental criteria to be met and specific engineering controls to be used.

Requirements in the following sections shall also be considered and addressed as part of the CEMP.

7.2 Stormwater Management

A site-specific stormwater management plan is required to be developed prior to the commencement of site works. Stormwater management works are to include controls for construction activities and soil conservation measures such as diversion drains, silt traps, sediment traps, litter traps and bank stabilisation

Specific control measures are required to:

Contain stormwater runoff generated within excavations and stockpile areas;
and

Prevent discharge to external waterways.

Control measures to be adopted may include:

Use of bunds and spoon drains to isolate working areas from the remainder of the site catchment and to direct surface water from the working area into open excavations.

Formation of a collection sump at the lowest corner of the remedial excavations to collect stormwater entering the excavations and allow for dewatering of the excavation.

Inspection of the bunds, drains and sumps regularly during site remediation works to check their integrity and repair any faults as soon as practicable.

7.3 Soil and Sediment Control

A site-specific erosion and sediment control plan (ESCP) must be developed in accordance with local Council guidelines prior to the commencement of remediation works.

7.4 Noise Control

Site works shall be carried out between 6.30am and 6.30pm Monday to Saturday, or other alternative timeframes approved by local Council.

7.5 Dust Control

Potential for dust generation from excavation works and/or stockpiles shall be managed on an as required basis by spraying from water trucks, or other TPR approved method.

7.6 Community Relations

Prior to the commencement of site works, neighbouring properties shall be consulted to inform of the commencement and expected timing of the works.

Concerns and complaints raised by the community (or other parties) during the remedial works will be noted and a register must be maintained to record the following information:

1. **Contact details:** Name, address and phone number of party raising concern.
2. **Nature of concern:** Details of issue/incident.
3. **Action taken or required:** Details of action proposed or undertaken to address the concern, including time and date.
4. **Response to Action:** Was the party raising the concern satisfied with the outcome, if not, what else needs to be done, or is it outside the scope of the development works.
5. **Prevention of re-occurrence:** If the concern relates directly to an operational problem, what action has been taken to ensure the problem will not occur again.

The register must be available to DERM or TPR at request.

All complaints must be responded to with two business days of the complaint being raised.

7.8 Site Access and Signage

Fencing shall be provided to restrict public access to the site. Fencing shall be to a standard that meets Workplace Health and Safety requirements and prevents unauthorised access by the public. Warning and safety signs (as required under workplace legislation) shall be placed at site access points.

8.0 VALIDATION PROGRAM

8.1 Characterisation/Validation of Uncontrolled Fills

Characterisation sampling of soils for reuse or removal from site will be required at a frequency of at least 1 sample per 50m³ for individual stockpiles of similar soil types. If mixed soil types are noted in stockpiles then characterisation samples must be collected of each material types present at a rate of at least 1 sample per 50m³. A minimum of 9 samples must be collected within each stockpile where statistical assessment of result is proposed for validation purposes.

8.2 Validation Under Stockpiles

Following removal of stockpiles, validation samples shall be collected on a 2.5m by 2.5m grid across the excavated stockpile footprint. A minimum of three samples shall be collected from each stockpile location.

Validation samples from the burn pit stockpile area will be analysed for asbestos and metals (including lead).

Validation samples from the recent imported fill stockpile area will be analysed for metals (including arsenic).

8.3 Groundwater Validation

Following remediation of fill materials groundwater samples will be collected from three locations across the site. Groundwater samples will be analysed for TPH and organochlorine pesticides and organophosphorus pesticides.

9.0 DECONTAMINATION PROCEDURES

The contractor shall reduce the potential for material to be tracked off the site by the tyres of vehicles as far as practical. This could include a restriction on off-site vehicle movement during wet conditions, the manual cleaning of vehicle wheels prior to vehicles leaving the site, the use of a wheel wash or other measures. Details of the system to be implemented shall be provided in the CEMP.

10.0 HEALTH AND SAFETY

A *Health and Safety Plan* must be prepared for the activities to be performed on the site where employees may be exposed to toxic or other hazardous compounds and elements. Specific requirements relating to dermal contact and inhalation as well as public safety, vehicle decontamination, protective clothing, equipment and appropriate safety controls must be addressed. Personnel working on the site during remediation works must be inducted and sign relevant forms stating that the induction has been carried out.

Works will be according to the *Workplace Health and Safety Act (1995)* and *Workplace Health and Safety Regulations (2008)*.

11.0 REPORTING

The progress of the works will be reported to the TPR on a regular basis. Fill characterisation and validation sampling results will be supplied to the TPR in the form of reports as the data becomes available.

Within 60 days of the completion of all remediation and validation works, a report detailing works must be prepared by a suitable qualified person in accordance with Section 4.6 and submitted to the TPR for certification prior to submission to the DERM. The report submitted should be in accordance with Chapter 7, Part 8 of the EP Act and the *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland* May (1998) and NEPM requirements.

The report shall include but not be limited to documentation of the remediation and characterisation program activities (including photographic records and daily site diaries detailing volumes of soil moved), records of all offsite disposal, analysis of characterisation results and an evaluation of the results against the validation criteria.

The report shall also include the results of the QA/QC program, Chain of Custody documentation and Sample Receipt Advices for all samples collected and copies

of documentation validating the appropriate handling, disposal and treatment of any contaminated soil, materials and water in accordance with DERM requirements.

Published on DES Disclosure Log
RTI Act 2009



24 February 2010

Att: Kim Barry
Contaminated Lands Unit
Department of Environment and Resource Management
Po Box 15155
City East 4002

Dear Kim

Re: SMP/RAP Lot 11 Drury Lane, Dundowran

We are in receipt of the reviewed Site Management Plan and Remediation Action Plan for Lot 11 on RP909375 which we consent to by initialling and date recording every page.

Records
CTPI 49-Sch4
CTPI 49-Sch4
Managing Director
AHC Limited

DRAFT SITE MANAGEMENT PLAN

RPD LOT 11 on RP909375

DERM FILE REF:

1.0 SUMMARY OF CONTAMINATION

A sand extraction operation operated historically on the site located at Lot 11 Drury Lane, Dundowran, QLD. A portion of the extraction area along Drury Lane was subsequently filled in an uncontrolled manner. The placement of uncontrolled fill over a portion of the site (refer attached Figure 1) resulted in the listing of the site on the Environmental Management Register for the Notifiable Activity – Landfill.

Investigation of the uncontrolled fill material revealed predominantly sandy clay soils with a variable amount of deleterious materials including:

Building rubble (including large pieces of concrete greater than 300mm diameter), steel, bitumen, timber, bricks, iron, tyres, car parts, animal carcasses, wire, gravel, plastic, PVC pipe, cobbles, and sandstone.

In addition to the filled portion of Lot 11, two stockpiles ("burn pit" materials and recently imported uncontrolled fill) were also identified in the southern portion of the site (refer Figure 1). Materials identified in these stockpile included:

Burn Pit Stockpile

Broken asbestos sheeting fragments
Lead impacted soil (above HIL 'A') - Maximum concentration of contamination in soil exceeding the HIL 'A' is described below:

<u>Analyte</u>	<u>Maximum Concentration (mg/kg)</u>
Lead	1,420

Recently Imported Uncontrolled Fill Stockpile

Arsenic impacted soil (above HIL 'A') - Maximum concentration of contamination in soil exceeding the HIL 'A' is described below:

<u>Analyte</u>	<u>Maximum Concentration (mg/kg)</u>
Arsenic	133

The strategy by which these materials will be removed and/or managed to enable removal of the site from the Environmental Management Register (EMR) is contained in the Remediation Action Plan (RAP) attached as Appendix 1.

2.0 OBJECTIVES OF THE SMP

The purpose of this SMP is to manage identified contamination on the site in a manner that protects human health and the environment.

3.0 ACHIEVEMENT AND MAINTENANCE OF OBJECTIVES

3.1 Responsibility. The owner of the land (as defined in the Environmental Protection Act 1994) is to ensure that this SMP and any variations approved or

CTPI 49-Sch4

required by the administering authority are complied with. The obligations and conditions set out in this SMP bind the owner, from time to time, of the land.

3.2 Site Use. The site is currently vacant site and is proposed to be redeveloped and subdivided into an industrial estate. Prior to commencement of this new land use, remedial works will be conducted with the primarily intent removing the site from the EMR. All remediation and validation works for this site are to be carried out in accordance with Appendix 1 - Remediation Action Plan (RAP).

3.3 Third Party Reviewer (TPR) A Third Party Reviewer (TPR) approved by the DERM and operating in accordance with the DERM's Terms of Reference for TPR (February 2008) must be appointed for the duration of the site assessment and remediation activities.

3.4 Provision of SMP to appropriate persons. The owner must provide all persons involved in building design and planning and all contractors and lessees conducting building and/or excavation works with a copy of the SMP prior to commencement of site works. All persons occupying or working on the site must comply with the requirements of the SMP.

3.5 Surface capping and protective barriers. Existing surface cover across filled areas shall be maintained until such time as remediation works occur.

3.6 Service Trenches. All underground services must be constructed in either uncontaminated material or in trenches in which the services are surrounded by a minimum of 0.3m of uncontaminated fill for minor services (< 100 mm in diameter), and 0.5m of uncontaminated fill for services greater than 100 mm in diameter.

3.7 Soil Excavation & Removal. Uncontrolled fills must not be removed from site without suitable characterisation sampling and analysis. Representative characterisation sampling and analysis of any uncontrolled fill materials excavated from the site must be managed by a suitably qualified and experienced person in accordance with Section 381 of the Environmental Protection Act 1994 (EP Act). Contaminated soil must not be removed off-site without a disposal permit in accordance with Section 424 of the EP Act.

3.8 Unexpected Contamination. If during any site earthworks or excavation, offensive or noxious odours and/or evidence of gross contamination not previously detected are observed, site works are to cease in that area and action taken to immediately abate the environmental harm. The administering authority is to be notified in writing within 2 business days of detection and advised of appropriate remedial action.

Any remedial action is to be developed by an appropriately qualified and experienced person in accordance with Section 381 of the EP Act.

3.9 General Environmental Protection. All earthworks are to be undertaken in accordance with general environmental protection measures to avoid unwanted migration and deposition of soil. These measures include the control of dust, noise, stormwater runoff, sediment, erosion, spillage from haulage trucks and odour releases involving the handling or movement of contaminated material.

3.10 Workplace Health and Safety. A Workplace Health and Safety Plan (WH&S plan), which conforms to the requirements of the Workplace Health and

CTPI 49-Sch4

Safety Act 1995 is to be developed for any site excavation works in contaminated areas. The WH&S plan must specifically address contaminants of concern.

4.0 MONITORING AND REPORTING

The owner is to ensure that the following reporting and monitoring is performed to ensure compliance with the SMP:

Until remediation commences:

Records are to be kept of all inspections, any soil excavation in contaminated areas, disposal permits and site management plan compliance for review by the administering authority from time to time. A biennial inspection is to be undertaken to ensure that capping and protective barriers remain in sound condition at all times in accordance with Section 3.5.

The biennial period is to commence from the effective date of this plan.

Once remediation commences:

Monitoring and reporting is to be conducted as required in Appendix 1 - Remediation Action Plan (RAP).

In addition to the reporting required in the RAP, within 60 days from the completion of site development, a report is to be submitted to the TPR documenting details of remediation activities, the results of any sampling undertaken during remediation, records of any site inspections and details of Site Management Plan compliance. The report is to be prepared by a suitably qualified and experienced person in accordance with Section 381 of the *Environmental Protection Act 1994* (EP Act).

This Site Management Plan (SMP) has been developed to manage site contamination risks present at the issue date. Subsequent uses of the site may result in the need to review the plan.

This SMP makes reference to a plan attachment that is available from the Administering Authority if required.

This SMP makes reference to a Remediation Action Plan attachment that is available from the Administering Authority if required.

APPENDIX 1

REMEDIATION ACTION PLAN

LOT: 11 PLAN: RP909375

FILE REF: PRINTED: / /2010

DATE OF EFFECT: / /2010

1.0 INTRODUCTION

This Remediation Action Plan (RAP) has been prepared for remediation of uncontrolled filling activities on Lot 11 on RP909375, located at Lot 11 Drury Lane, Dundowran, QLD. Historical filling has occurred at three locations on site as shown on Figure 1 – uncontrolled filling backfilling of an old sand pit (along part of the eastern boundary), a “burn pit” stockpile, and a recently imported uncontrolled fill stockpile. The remediation works are required to remove materials that may pose a risk to the health of future site users or the environment. The works required include:

Excavation of all uncontrolled fill materials, separation of recyclables, stained/odorous materials and characterisation of remaining materials for reuse or offsite disposal.

Removal of asbestos sheeting fragments and lead impacted soil identified in the “burn pit” stockpile.

Further characterisation of recently imported uncontrolled fill stockpile materials for reuse or offsite disposal.

1.1 Purpose of the RAP

This document has been prepared to describe remediation strategies and control measures aimed at achieving removal of the site from the Environmental Management Register (EMR).

1.2 Remediation Objective

The primary objective of the remediation works is to obtain a Site Suitability Statement to support future redevelopment of the site.

1.3 Third Party Reviewer

A Third Party Reviewer (TPR) must be appointed for the duration of this project. The site work and subsequent reporting is to be certified by a Department of Environment and Resource Management (DERM) approved Third Party

CTPI 49-S

24/2/10

Reviewer (TPR). All validation requirements must first have consent from the TPR and any clarification issues will be referred to the TPR prior to the DERM. The TPR will approve the proposed validation methodology, pre-validation sampling results, Disposal Permit applications and the final report.

The role of the TPR is to review all relevant documentation associated with the proposed RAP, to accept the proposed remediation strategy and certify that the site is suitable for any land use or specific land uses (as required) in accordance with DERM Terms of Reference for Third Party Review dated February 2008.

2.0 BACKGROUND

2.1 Site History

The subject site is identified as Lot 11 RP909375 and is approximately 26.04 ha in area. The site history indicates that Lot 11 RP909375 was historically used for sand extraction. Following sand extraction, filling was undertaken over an area of approximately 2.5 ha to return this area to about its original level. The uncontrolled filling of this area resulted in Lot 11 RP909375 been listed on the EMR for Notifiable Activity No.20: Landfill – disposing of waste.

2.2 Topography

The regional topography is generally low and flat comprising large tracts of Wallum heath and ti-tree swamps. The nearest creek is approximately 2 km north (Eli Creek) and the ocean is approximately 500m beyond Eli Creek. A manmade lake is located approximately 300m to the east of the site.

At the time of the investigation, the site showed the effects of past sand extraction work. The eastern boundary of the site was about 2 m to 3 m higher than the lower land at the base of the sand extraction area. Both the higher and lower land was generally flat.

Surface drainage generally follows the contours towards two low lying areas in the north west and south west corners of the site. The site is generally well drained, with stormwater run-off expected to be shed as sheet flow.

2.3 Geology

Available geological information (1:250,000 Geological Map, MARYBOROUGH, Sheet SG 56-6 Part 9544, Department of Resource Industries, 1992) indicates that the site is underlain by Quaternary (Holocene) age "*beach ridges: sand, shelly sand, minor gravel*", possibly overlying slightly older (Pleistocene) sediments of "*Undifferentiated coastal plains: sand, silt, mud*". The Quaternary sediments are underlain at depth by the early Cretaceous age Maryborough Formation containing "*mudstone, siltstone, shale, sandstone*".

Subsurface conditions encountered during investigations intersected a relatively consistent subsurface profile across the site comprising natural sand and silty sand, then stiff (or stiffer) clay. On the high side of the site, towards the north east, an extensive area of uncontrolled fill was encountered.

The uncontrolled fill encountered (ranging from 1.0 m to 4.4 m in depth) was generally sandy clay containing varying amounts of building rubble (including large pieces of concrete greater than 300mm diameter), steel, bitumen, timber, bricks, iron, tyres, car parts, animal carcasses, wire, gravel, plastic, PVC pipe, cobbles, and sandstone. The natural stiff (or stiffer) clay underlying fill and natural sand may be residual soil formed by weathering of the underlying parent rock (Maryborough Formation).

For most of the site, the upper sand appears to have been removed as part of the sand extraction work. Remnants of this material are present in the higher section of the south-east and north east corners of the site where excavations have not been conducted. This area comprises mostly sand overlying coffee rock.

Much of the exposed ground surface in the area where sand extraction works have been undertaken comprises medium dense to dense sandy soils (including dense indurated silty sand), to depths of about 0.2m to 0.8m and overlying stiff (or stiffer) clay.

2.4 Hydrogeology

Groundwater was recorded at depths of 0.5 m (excavated areas) to 2.4 m (excavated areas where fill has been placed) in the monitoring wells, which were installed as part of the acid sulfate soils investigation. It should be noted that groundwater was not encountered in test pits excavated in fill materials. The direction of groundwater flow is expected to be to the west. Groundwater inflows into monitoring wells were very slow and the resulting yields are not considered to represent a viable source of potable water or other extractive groundwater use.

2.5 Information Sources

Previous investigation reports considered in the preparing this RAP include:

Stage 1 Preliminary Site Investigation, Lot 11 RP909375, Drury Lane, Dundowran, [ref. Golder Associates 077683505(AA) dated August 2007].

Stage 2 Detailed Site Investigation, Lot 11 RP909375, Drury Lane, Dundowran, [ref. Golder Associates 077683505(AG) dated November 2007].

Additional Filed Investigations – Supplementary Report, Lot 11 RP909375, Drury Lane, Dundowran, [ref. Golder Associates 077683505(AS) dated November 2009].

2.6 Historical Data

The historical data identified the following potential sources of contamination at this site:

Potential Contamination Source	Potential Contaminant
Existing Uncontrolled Fill (former sand extraction area)	Hydrocarbons (TPH & BTEX), PAH, Phenols, PCB, Metals (As, Cd, Cr, Cu, Pb, Ni, Hg, Zn), organochlorine and organophosphorous pesticides and asbestos
Recently Imported Uncontrolled Fill	(TPH & BTEX) Metals (As, Cd, Cr, Cu, Pb, Ni, Hg, Zn), organochlorine and organophosphorous pesticides and asbestos
Former Burn Pit Stockpile	PAH, metals and asbestos

2.7 Soil Contamination

2.7.1 General

Three identified fill areas (refer Figure 1) need to be addressed in the remediation strategy. These comprise:

Uncontrolled fill materials used to backfill the former sand pit (along the eastern boundary). These fills contain deleterious materials (including oversize concrete).

Recently imported uncontrolled fill stockpile.

The 'burn pit' stockpile.

2.7.2 Uncontrolled Fill (former sand pit area)

It is estimated that about 80,000 m³ (insitu) of fill material has been placed along the eastern boundary of Lot 11. This fill has been placed across an area of about 25,000 m² and to depths ranging from about 1.0 m to 4.4 m.

This fill is predominantly comprised of sandy clay soils with variable amounts of deleterious materials including - building rubble (including large pieces of concrete greater than 300mm diameter), steel, bitumen, timber, bricks, iron, tyres, car parts, animal carcasses, wire, gravel, plastic, PVC pipe, cobbles, and sandstone. No visual evidence of fibreboard sheeting fragments was observed within the existing uncontrolled fill exposed during test pit investigations.

Department of Environment and Resource Management (DERM) C&D waste Operational Policy indicates that where C&D waste is separated into its constituent parts, the inert parts may be used as clean fill. The Operational Policy indicates that the following materials are considered to be inert:

bricks/pavers/ceramics;

concrete (including embedded steel reinforcing rods), pulverised to a maximum 300mm nominal size; and

clean earthen fill.

Deleterious materials other than the above inert materials will need to be segregated and removed from site during remediation works.

The uncontrolled fill materials have presently been characterized by sampling and analysis for contaminants of concern at a frequency of about 1 sample per 1500m³ of fill. The results of this preliminary characterization sampling did not identify concentrations of the contaminants of concern that are considered to indicate a risk to human health or the environment. However, a higher density of characterization sampling would be required to validate these materials as suitable for unrestricted reuse on site.

2.7.3 Recently Imported Fill Stockpile

It is estimated that about 2,000 m³ of fill material is present in this stockpile. No deleterious material has been observed during investigation of this stockpile.

Limited characterization sampling and analysis of the recently imported stockpile of uncontrolled fill was conducted at a frequency of 1 sample per 100m³ of fill. The results of this preliminary characterization sampling identified the presence of arsenic impacted soil with concentration exceeding the Health-based Investigation Levels for use in a "standard" residential setting (maximum concentration of 133 mg/kg). In the absence of more detailed characterization of fill materials, it has been assumed that zones of arsenic impact occur within the uncontrolled fill materials. However, a higher density of characterization sampling may provide a statistical basis evaluating the unrestricted reuse of this on site or the need for offsite disposal.

2.7.4 Burn Pit Stockpile

An estimated 50m³ (insitu) of materials are present in the "burn pit" stockpile. Fragments of broken asbestos sheeting were observed in this stockpile. This material was confirmed as containing chrysotile and amosite asbestos.

Concentrations of lead impacted soil exceeding the Health-based Investigation Levels for use in a "standard" residential setting (maximum concentration of 1420 mg/kg) were also detected in the burn pit stockpile.

Removal and offsite disposal of this material will be required during remedial works.

2.8 Groundwater

Field tests on groundwater samples from site well locations indicated slightly acidic groundwater ranging from pH 5.5 to pH 6.6. Electrical Conductivity ranged between 0.3 mS/cm and 2.3 mS/cm, which indicates freshwater to brackish conditions. No free phase product, sheens, discolouration or odours (that may indicate the presence of possible contamination) were observed within groundwater samples.

Water samples collected from GA3 on 4 August 2007 revealed concentrations of TPH in the C₁₀-C₃₆ hydrocarbon fractions exceeding the environmental assessment criterion. Minor TPH concentrations were also detected in water samples from the two other wells but at concentrations below the environmental assessment criterion. The wells were redeveloped on 7 November 2007 and later re-sampled. The concentrations of TPH detected in GA3 again marginally exceeded the environmental assessment criterion for the C₁₀-C₃₆ hydrocarbon fractions. These results suggest that the source of this limited groundwater impact may be "pocket(s)" of hydrocarbon impacted uncontrolled fill. The presence of hydrocarbon impacted fill was not identified during the characterization sampling completed to date. The relatively low levels of heavy end (generally C₁₅-C₃₆) hydrocarbon fractions detected in groundwater samples from GA3 is considered to represent a low risk to surface water environmental ecosystems given that:

TPH concentration in GA3 is marginally elevated and from a limited source within the uncontrolled fill (not the result of ongoing leakage from a tank or pipeline);

Nearest surface water ecosystem receptors are more than 500 m from the site; and

Factors such as natural attenuation, dispersion and dilution will occur before groundwater from beneath the site could discharge to surface waters. it is not considered a risk to nearby environmental receptors.

Source removal (pockets of impacted uncontrolled fill) and confirmation of TPH concentrations in groundwater samples is required during remedial works.

A groundwater sample collected from GA6 revealed a concentration of arsenic (0.02mg/L) and copper (0.004mg/L) marginally exceeding the environmental assessment criteria. Given the absence of significant arsenic or copper impact detected in soil samples of uncontrolled fills, these concentrations in groundwater are not considered to represent a risk to the environment.

Water samples collected from GA3, GA6, and GA11 revealed concentrations of zinc (0.019mg/L, 0.043mg/L, and 0.041 respectively) exceeding the environmental assessment criterion. Given the absence of significant zinc impact detected in soil samples of uncontrolled fills, these concentrations in groundwater are not considered to represent a risk to the environment.

Water samples collected from GA3, GA6, and GA11 revealed concentrations of organochlorine and organophosphorus pesticides below the laboratory limit of reporting. However, the laboratory limits of reporting were above all adopted environmental assessment criteria. Given the lack of organochlorine and organophosphorus pesticides detection in the soil samples during Stage 1 investigations, the risk of organochlorine or organophosphorus pesticides impact to groundwater is considered to be low. Confirmation of pesticide concentrations in groundwater samples is required during remedial works.

The investigation results suggest that there will not be a need for large scale dewatering operations during excavation of uncontrolled fill materials.

3.0 ENVIRONMENTAL GUIDELINES

The remedial activities undertaken at the site must be performed in accordance with the following documents:

- *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland*, May 1998;
- *Draft Hydrocarbon Guidelines*, Contaminated Land Unit, Queensland EPA, January 1999;
- *Guidelines issued under Schedule B of the National Environment Protection (Assessment of Site Contamination) Measure* (NEPM), National Environment Protection Council, December 1999;
- *Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites* (ANZECC guidelines) published by the Australian and New Zealand Environment and Conservation Council/National Health and Medical Research Council, January 1992;
- Australian Standard AS4482.1-2005 *Guide to the sampling and investigation of potentially contaminated soil Part 1 – Non volatile and semi volatile compounds*; and
- Australian Standard AS4482.2-2005 *Guide to the sampling and investigation of potentially contaminated soil Part 1 – Volatile and semi volatile compounds*

4.0 REMEDIAL GOALS AND VALIDATION CRITERIA

4.1 General

Remediation and acceptance criteria for soils contained in the following sections are based on redevelopment of the site for unrestricted land use. The criteria consider a range of issues including human health risk, environmental risk and aesthetic considerations such as odour and discoloration.\

Criteria should be applied to the 95% Upper Confidence Level (UCL) on the mean of data for each domain of interest, with no hot-spot concentrations greater than 2.5 times the relevant criteria value. The domains of interest at this Site will be each individual stockpile of excavated soil. Sufficient samples must be collected within each domain of interest to ensure that statistical analysis is valid.

The nominated criteria are based on various national and international standards.

4.2 Characterisation of Soils for Reuse

Soil acceptance criteria for reuse on site are listed below.

Parameter	EMR Removal & "Clean" Fill
<u>Petroleum Hydrocarbons</u>	
TPH (C ₆ – C ₉)	100 mg/kg ⁽¹⁾
TPH (C ₁₀ – C ₁₄)	100 mg/kg ⁽¹⁾
TPH (C ₁₅ – C ₂₈)	1000 mg/kg ⁽¹⁾
TPH (C ₂₉ – C ₃₆)	1000 mg/kg ⁽¹⁾
<u>Monocyclic Aromatic Hydrocarbons</u>	
Benzene	1 mg/kg ⁽¹⁾
Toluene	
Ethyl Benzene	Total BTEX = 7 mg/kg ⁽¹⁾
Xylene	
<u>Polycyclic Aromatic Hydrocarbons</u>	
Benzo(a)pyrene	1 mg/kg ⁽²⁾
Total PAH	20 mg/kg ⁽²⁾
<u>Inorganics</u>	
Arsenic	100 mg/kg ⁽²⁾
Cadmium	3 mg/kg ⁽³⁾
Chromium VI	100 mg/kg ⁽²⁾
Copper	200 mg/kg ⁽⁵⁾
Lead	300 mg/kg ⁽²⁾
Nickel	60 mg/kg ⁽³⁾
Mercury	1 mg/kg ⁽³⁾
Zinc	400 mg/kg ⁽⁵⁾
<u>Organochlorine Pesticides</u>	
Aldrin + Dieldrin	10 ⁽²⁾
Chlordane	50 ⁽²⁾
DDT & Derivatives	200 ⁽²⁾
Heptachlor	10 ⁽²⁾
<u>Other</u>	
Polychlorinated biphenyls	10 ⁽²⁾
<u>Physical Criteria</u>	
Odour	- No detectable hydrocarbon odour
Staining	- No visible hydrocarbon staining
Domestic and Garden Refuse	- No visible municipal waste materials
Construction and Demolition Waste	- Concrete (including embedded steel reinforcing rods), pulverised to a maximum 300mm nominal size ⁽⁴⁾
	- No visible timber or other deleterious materials
Asbestos	- No detectable asbestos fibres or fragments ⁽⁷⁾

Notes:

- (1) Draft Hydrocarbon Guidelines – QLD DERM 1999
- (2) Health Based Investigation Levels for Exposure Setting "A" ('Standard' Residential with garden/accessible soil) – Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland, Queensland Department of Environmental 1998.
- (3) Environmental Investigation Levels – Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland, Queensland Department of Environmental 1998.
- (4) Inert Waste Policy, EPA

CTPI 49-

- (5) Elevated Environmental Investigation Level for Low Phytotoxicity Setting
- (6) Should environmentally sensitive receptors be identified at/in proximity to the site, then Environmental Investigation criteria will be applied.
- (7) Western Australia Department of Health Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia, May 2009.

These criteria may be amended, subject to approval by the TPR, where it can be demonstrated that alternative concentrations are protective of human health, the environment and aesthetic considerations. In addition, these criteria may be amended to environmental investigation levels (as listed in *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland*, Queensland Department of Environmental 1998) should sensitive environmental receptors be identified at or in close proximity to the site. Criteria for other additional parameters, if required, must be approved by the TPR.

4.3 Groundwater

On completion of remedial earthworks, the following groundwater acceptance criteria shall be applied:

Parameter	Acceptance Levels
<u>Petroleum Hydrocarbons</u>	
TPH (C ₆ – C ₉)	0.15 mg/L ⁽¹⁾
TPH (C ₁₀ – C ₃₆)	0.6 mg/L ⁽²⁾
<u>Inorganics</u>	
Arsenic	< ANZECC Water Quality Guidelines 2000, Trigger Values for Fresh Waters 95% Level of Protection
Cadmium	
Chromium (total)	
Copper	
Lead	
Nickel	
Mercury	
Zinc	
<u>Monocyclic Aromatic Hydrocarbons</u>	
Benzene	
Toluene	
Ethyl Benzene	
Xylene	
<u>Organochlorine & Organophosphorus Pesticides</u>	

Notes:

- (1) Dutch C - Netherlands Soil Clean-up Guideline, 1983
- (2) Dutch Intervention Value - Environmental Quality Objectives in the Netherlands, 1994
- (3) No specific criteria or guidelines have been published in Queensland or Australia for the assessment of TPH contamination in groundwater. In the absence of State or National guidelines, intervention values for hydrocarbons contained in Dutch Guidelines have been adopted for assessment of environmental risk from TPH. TPH concentrations exceeding these guideline criteria may represent a threat to the environment and require specific assessment of risk.

These criteria may be amended, subject to approval by the TPR, where it can be demonstrated that alternative concentrations are protective of human health, the environment and aesthetic considerations. Criteria for other additional parameters, if required, must be approved by the TPR.

Where concentrations are detected exceeding the above criteria, further assessment of the risk will be required. This assessment may include more detailed groundwater investigations to evaluate "background" groundwater quality/conditions and identification of potential receptors and exposure routes. A qualitative risk assessment should be conducted on the basis of the above. Where unacceptable risk is indicated the a quantitative risk assessment and/or remedial works will be required. The scope and methodology of any further groundwater investigation/assessment shall be agreed with the TPR, prior to commencement of such works.

4.4 Imported Fill Materials

Imported fill materials (if required) to backfill the site to final development levels shall be from a registered quarry.

Materials from alternative sources may be accepted in consultation with the TPR where it can be demonstrated that the material are not impacted by contamination.

4.5 Sampling Frequency and Quality Assurance / Quality Control

4.5.1 Soil

Characterisation sampling of soils for reuse or removal from site will be required at a frequency of at least 1 sample per 50m³ for individual stockpiles of similar soil types. If mixed soil types are noted in stockpiles then characterisation samples must be collected of each material types present at a rate of at least 1 sample per 50m³. A minimum of 9 samples must be collected within each stockpile where statistical assessment of result is proposed for validation purposes.

A quality assurance/quality control program shall be conducted during characterization sampling. This program shall include collection and analysis of:

Blind replicate samples at a frequency of 1 for every 20 samples collected.

Split samples at a frequency of 1 for every 20 samples collected.

Equipment rinsate samples for each day where sampling is conducted.

4.5.2 Groundwater

At least two rounds of groundwater samples shall be collected from excavation sumps following completion of excavations.

A quality assurance/quality control program shall be conducted during groundwater sampling. This program shall include collection and analysis of:

A blind replicate sample during each sampling round.

A split sample during each sampling round.

An equipment rinsate sample during each sampling round.

4.6 Sampling & Reporting

Characterisation sampling shall be conducted under the direction of a suitably qualified and experienced person in accordance with Section 381 of the Environmental Protection Act 1994 (EP Act). Standard procedures that include sample equipment decontamination, sample handling, sample storage and documentation shall be applied.

At the completion of remediation works a Validation Report shall be prepared by the suitably qualified and experienced person that documents the works undertaken and compliance with the agreed remediation works. This report shall be submitted to the TPR for approval.

4.7 Analytical Testing

Analytical testing for the characterization/validation program should be conducted by a NATA accredited laboratory. If the laboratory is not NATA accredited, at least 10% of the samples under investigation must be submitted to a NATA accredited laboratory as a quality check. Please note that asbestos sampling and analysis should be undertaken in accordance with the Western Australia Department of Health *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*, May 2009.

Analysis of collected characterization samples shall be undertaken as follows:

Metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn)	All soil samples.
Petroleum Hydrocarbons	All soil samples
Monocyclic Aromatic Hydrocarbons	All soil samples with visual or olfactory impacts, otherwise 10% of soil samples.
Polycyclic Aromatic Hydrocarbons	All soil samples with visual or olfactory impacts, otherwise 10% of soil samples.
Organochlorine /Organophosphorus	

Pesticides

All soil samples.

Asbestos

All validation samples from the burn pit area and In Accordance with Western Australia Department of Health *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*, May 2009

These criteria may be amended, subject to approval by the TPR, where it can be demonstrated that alternative concentrations are protective of human health, the environment and aesthetic considerations. Criteria for other additional parameters, if required, must be approved by the TPR.

5.0 REMEDIATION STRATEGY

The remediation strategy for this site comprises the following:

- Excavation of all uncontrolled fill materials.

- Segregation of soil materials from deleterious materials.

- Characterization of separated soil materials for either reuse on site as "clean" fill or for offsite disposal.

- Pulverisation/crushing of bricks and concrete (> 300 mm diameter) to enable reuse as inert site fill.

- Offsite disposal of remaining deleterious materials.

- Further characterisation of recently imported uncontrolled fill for either reuse on site as "clean" fill or for offsite disposal.

- Removal and offsite disposal of the entire 'burn pit' stockpile

Detailed management procedures for this strategy are provided in the following sections. These procedures may be amended, subject to approval by the TPR, where it can be demonstrated that alternative procedures are protective of human health, the environment and aesthetic considerations.

6.0 REMEDIATION PROGRAM

6.1 Existing Uncontrolled Fill Area

6.6.1 Excavation and Segregation of Materials

Approximately 80,000 m³ (insitu volume) of existing uncontrolled fill will need to be excavated and segregated. Excavations shall be continued both laterally and vertically until all existing uncontrolled fill materials have been removed.

A suitably qualified and experienced person shall monitor all excavation works and screen excavated materials using a photo-ionisation detector (PID). Excavations shall be conducted in a manner which targets removal and stockpiling

of visually similar materials. Daily photographic and written records of inspection and monitoring shall be kept.

Any materials observed to contain building rubble and other deleterious materials will be segregated from soils and separately stockpiled. Where hydrocarbon odours, staining, elevated PID readings or other indicators of suspected impact are noted, these materials shall be segregated from other material and separately stockpiled for characterisation.

Groundwater encountered during the excavation of overburden shall be collected from a sump excavated in the low point of the excavation. Reuse or disposal of groundwater is discussed in Section 6.1.5.

An area of approximately 5 ha of non-filled land is available at the site for the stockpiling of excavated materials. Operational controls to be adopted during the excavation, onsite transportation and stockpiling of excavated materials are discussed in Section 7.0.

Movement and stockpiling of excavated materials shall be conducted under a materials tracking plan approved by the TPR.

6.1.2 Soil Characterisation Stockpiles

Stockpiles of soil materials shall be sampled and analysed in accordance with Section 4.0.

Stockpiles found to be in compliance with the validation criteria shall be reused to backfill excavations. Stockpiles found not to be in compliance with the validation criteria shall be removed from site. An offsite disposal permit shall be obtained through the TPR prior to removal of these soils from site. Disposal to landfill shall only occur under an approved Disposal Permit issued by DERM.

6.1.3 Suspected Contaminated Material Stockpiles

Segregated stockpiles of materials with odours, staining, elevated PID readings or other indicators of suspected contamination impact (such as bitumen) shall be sampled and analysed to evaluate their contamination status and the need for pre-treatment prior to landfill disposal. An offsite disposal permit shall be obtained through the TPR prior to removal of contaminated soils from this site. Disposal to landfill shall only occur under an approved Disposal Permit issued by DERM.

6.1.4 Deleterious Materials Stockpiles

Deleterious materials shall be further segregated in separate stockpiles and managed as follows:

Bricks and concrete – where practical shall be pulverized or crushed to a size of less than 75mm diameter to enable reuse on site as inert fill.

Materials not meeting this criteria shall be removed from site for disposal at appropriately licensed landfill.

Metal (including wire, steel, iron, and car parts) - shall be removed from site for recycling.

Domestic and Greenwastes (including animal carcasses) - shall removed from site for disposal at an appropriate landfill.

Other demolition materials (including timber, plastic and PVC pipes) - shall removed from site for disposal at an appropriate landfill.

Asbestos – where asbestos sheeting or fragments are identified, this material shall be placed directly into lined containers and managed in accordance with asbestos workplace health and safety regulations. This will be conducted by a suitably licensed asbestos removal contractor.

6.1.5 Water Treatment & Disposal

Groundwater seepage (if encountered) into excavations shall be collected and used for dust suppression within excavation areas or in stockpile areas where suitable control measures are in place to prevent runoff from discharging into external waterways.

Alternatively, groundwater seepage may be collected and disposed of by an appropriately licensed liquid waste contractor.

It should be noted that permission from DERM and the local Council would be required prior to discharge to water ways. Discharges to surface waters shall comply with all conditions in issued permits (including any pretreatment required to remove sediments and contaminants).

6.2 Recently Imported Uncontrolled Fill Area

Further characterisation sampling of the recently imported uncontrolled fill for reuse or removal from site will be carried out to achieve an overall frequency of 1 sample per 50m³ of fill.

If the materials are found to be in compliance with the validation criteria they can be reused to backfill excavations. If the materials are found not to be in compliance with the validation criteria they shall be removed from site. An offsite disposal permit shall be obtained through the TPR prior to removal of these soils from site. Disposal to landfill shall only occur under an approved Disposal Permit issued by DERM.

6.3 Burn Pit Stockpile

The burn pit stockpile shall be excavated and removed from site.

Due to the presence of asbestos fragments, excavation and removal off-site shall be conducted by a suitably licensed asbestos contractor.

7.0 OPERATION CONTROL

7.1 Construction Environment Management Plan

A Construction Environmental Management Plan (CEMP) for the Site shall be prepared incorporating detailed elements covering environmental management of the Site to ensure environmental effects of the remediation work are kept to a minimum and in compliance with all relevant Acts of Parliament and Environmental Regulations.

The CEMP must be approved by the TPR prior to commencement of works on site.

The CEMP shall contain management approaches for, but not limited to, the following areas:

Land Disturbance

Erosion and sediment control devices;

Management of stormwater;

Management of excavated materials and stockpiles;

Dust control;

Noise and Vibration

Operating hours;

Vehicles and equipment;

Traffic;

Noise abatement;

Vibration.

Other

Litter;

Storage of chemicals and fuel;

Road cleaning and truck wash;

Asbestos handling and management

Development of the details within each of these segments of the CEMP shall incorporate the general management approach, the environmental criteria to be met and specific engineering controls to be used.

Requirements in the following sections shall also be considered and addressed as part of the CEMP.

7.2 Stormwater Management

A site-specific stormwater management plan is required to be developed prior to the commencement of site works. Stormwater management works are to include controls for construction activities and soil conservation measures such as diversion drains, silt traps, sediment traps, litter traps and bank stabilisation

Specific control measures are required to:

Contain stormwater runoff generated within excavations and stockpile areas;
and

Prevent discharge to external waterways.

Control measures to be adopted may include:

Use of bunds and spoon drains to isolate working areas from the remainder of the site catchment and to direct surface water from the working area into open excavations.

Formation of a collection sump at the lowest corner of the remedial excavations to collect stormwater entering the excavations and allow for dewatering of the excavation.

Inspection of the bunds, drains and sumps regularly during site remediation works to check their integrity and repair any faults as soon as practicable.

7.3 Soil and Sediment Control

A site-specific erosion and sediment control plan (ESCP) must be developed in accordance with local Council guidelines prior to the commencement of remediation works.

7.4 Noise Control

Site works shall be carried out between 6.30am and 6.30pm Monday to Saturday, or other alternative timeframes approved by local Council.

7.5 Dust Control

Potential for dust generation from excavation works and/or stockpiles shall be managed on an as required basis by spraying from water trucks, or other TPR approved method.

7.6 Community Relations

Prior to the commencement of site works, neighbouring properties shall be consulted to inform of the commencement and expected timing of the works.

Concerns and complaints raised by the community (or other parties) during the remedial works will be noted and a register must be maintained to record the following information:

1. **Contact details:** Name, address and phone number of party raising concern.
2. **Nature of concern:** Details of issue/incident.
3. **Action taken or required:** Details of action proposed or undertaken to address the concern, including time and date.
4. **Response to Action:** Was the party raising the concern satisfied with the outcome, if not, what else needs to be done, or is it outside the scope of the development works.
5. **Prevention of re-occurrence:** If the concern relates directly to an operational problem, what action has been taken to ensure the problem will not occur again.

The register must be available to DERM or TPR at request.

All complaints must be responded to within two business days of the complaint being raised.

7.8 Site Access and Signage

Fencing shall be provided to restrict public access to the site. Fencing shall be to a standard that meets Workplace Health and Safety requirements and prevents unauthorised access by the public. Warning and safety signs (as required under workplace legislation) shall be placed at site access points.

8.0 VALIDATION PROGRAM

8.1 Characterisation/Validation of Uncontrolled Fills

Characterisation sampling of soils for reuse or removal from site will be required at a frequency of at least 1 sample per 50m³ for individual stockpiles of similar soil types. If mixed soil types are noted in stockpiles then characterisation samples must be collected of each material types present at a rate of at least 1 sample per 50m³. A minimum of 9 samples must be collected within each stockpile where statistical assessment of result is proposed for validation purposes.

8.2 Validation Under Stockpiles

Following removal of stockpiles, validation samples shall be collected on a 2.5m by 2.5m grid across the excavated stockpile footprint. A minimum of three samples shall be collected from each stockpile location.

Validation samples from the burn pit stockpile area will be analysed for asbestos and metals (including lead).

Validation samples from the recent imported fill stockpile area will be analysed for metals (including arsenic).

8.3 Groundwater Validation

Following remediation of fill materials groundwater samples will be collected from three locations across the site. Groundwater samples will be analysed for TPH and organochlorine pesticides and organophosphorus pesticides.

9.0 DECONTAMINATION PROCEDURES

The contractor shall reduce the potential for material to be tracked off the site by the tyres of vehicles as far as practical. This could include a restriction on off-site vehicle movement during wet conditions, the manual cleaning of vehicle wheels prior to vehicles leaving the site, the use of a wheel wash or other measures. Details of the system to be implemented shall be provided in the CEMP.

10.0 HEALTH AND SAFETY

A *Health and Safety Plan* must be prepared for the activities to be performed on the site where employees may be exposed to toxic or other hazardous compounds and elements. Specific requirements relating to dermal contact and inhalation as well as public safety, vehicle decontamination, protective clothing, equipment and appropriate safety controls must be addressed. Personnel working on the site during remediation works must be inducted and sign relevant forms stating that the induction has been carried out.

Works will be according to the *Workplace Health and Safety Act (1995)* and *Workplace Health and Safety Regulations (2008)*.

11.0 REPORTING

The progress of the works will be reported to the TPR on a regular basis. Fill characterisation and validation sampling results will be supplied to the TPR in the form of reports as the data becomes available.

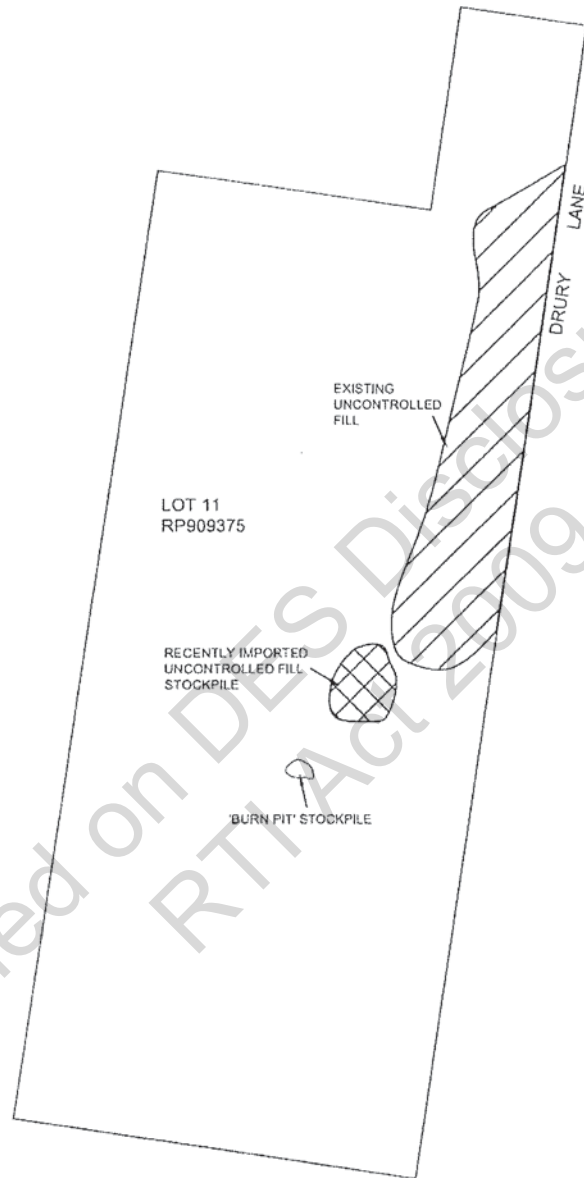
Within 60 days of the completion of all remediation and validation works, a report detailing works must be prepared by a suitable qualified person in accordance with Section 4.6 and submitted to the TPR for certification prior to submission to the DERM. The report submitted should be in accordance with Chapter 7, Part 8 of the EP Act and the *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland May (1998)* and NEPM requirements.

The report shall include but not be limited to documentation of the remediation and characterisation program activities (including photographic records and daily site diaries detailing volumes of soil moved), records of all offsite disposal, analysis of characterisation results and an evaluation of the results against the validation criteria.

The report shall also include the results of the QA/QC program, Chain of Custody documentation and Sample Receipt Advices for all samples collected and copies

of documentation validating the appropriate handling, disposal and treatment of any contaminated soil, materials and water in accordance with DERM requirements.

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RTI Act 2009



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18 March 2010

Site ID: 24356
File Number: BNE35253
Enquiries to: Contaminated Land Unit
Telephone: (07) 3330 5685

AHC LIMITED
PO BOX 34
OXENFORD QLD 4210

CERTIFICATE OF APPROVAL OF A SITE MANAGEMENT PLAN

This document provides written notification that, in accordance with the *Environmental Protection Act 1994 (EP Act)*, a site management plan has been approved for the parcel of land described below, which is recorded on the Environmental Management Register (EMR). A copy of the suitability statement and the site management plan is attached.

Lot: 11 Plan: RP909375
Fraser Coast Regional Council

DRURY LANE
DUNDOWRAN 4655

The owner may apply to the Department of Environment and Resource Management (DERM) to amend the site management plan in accordance with section 418 of the *EP Act*.

Under section 434 of the *EP Act*, a person must not contravene a site management plan.

The owner may apply for a review of, and appeal against, the decision to approve the site management plan within 14 days after receipt of this notice in accordance with sections 521 and 531 of the *EP Act*.

In accordance with the land being recorded on the EMR, the following requirements apply under section 421 of the *EP Act*:

If the owner proposes to dispose of the land to someone else, the owner must, before agreeing to dispose of the land, give written notice to the buyer:
if the particulars of the land are recorded in the EMR - that the particulars are recorded in the register; and
if the land is subject to a site management plan, details of the plan.

Released

Further information regarding this notice may be obtained by contacting the Contaminated Land Unit, Department of Environment and Resource Management on telephone (07) 3330 5685. Further information about contaminated land matters may be obtained by visiting our web-site at: http://www.derm.qld.gov.au/environmental_management/land/contaminated_land/

CTPI 49-Sch4

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Environmental Protection Act 1994

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RTI Act 2009



ANNEXURE 1 - SITE MANAGEMENT PLAN

LOT : 11 PLAN : RP909375 FILE REF : BNE35253 PRINTED: 18/03/2010

DATE OF EFFECT : 16/03/2010

1.0 SUMMARY OF CONTAMINATION

A sand extraction operation operated historically on the site located at Lot 11 Drury Lane, Dundowran, QLD. A portion of the extraction area along Drury Lane was subsequently filled in an uncontrolled manner. The placement of uncontrolled fill over a portion of the site (refer attached Figure 1) resulted in the listing of the site on the Environmental Management Register for the Notifiable Activity - Landfill.

Investigation of the uncontrolled fill material revealed predominantly sandy clay soils with a variable amount of deleterious materials including:

Building rubble (including large pieces of concrete greater than 300mm diameter), steel, bitumen, timber, bricks, iron, tyres, car parts, animal carcasses, wire, gravel, plastic, PVC pipe, cobbles, and sandstone.

In addition to the filled portion of Lot 11, two stockpiles ("burn pit" materials and recently imported uncontrolled fill) were also identified in the southern portion of the site (refer Figure 1). Materials identified in these stockpile included:

Burn Pit Stockpile

Broken asbestos sheeting fragments

Lead impacted soil (above HIL 'A') - Maximum concentration of contamination in soil exceeding the HIL 'A' is described below:

Analyte	Maximum Concentration (mg/kg)
Lead	1,420

Recently Imported Uncontrolled Fill Stockpile

Arsenic impacted soil (above HIL 'A') - Maximum concentration of contamination in soil exceeding the HIL 'A' is described below:

Analyte	Maximum Concentration (mg/kg)
Arsenic	133

The strategy by which these materials will be removed and/or managed to enable removal of the site from the Environmental Management Register (EMR) is contained in the Remediation Action Plan (RAP) attached as Appendix 1.

2.0 OBJECTIVES OF THE SMP

The purpose of this SMP is to manage identified contamination on the site in a manner that protects human health and the environment.

Release

3.0 ACHIEVEMENT AND MAINTENANCE OF OBJECTIVES

3.1 Responsibility. The owner of the land (as defined in the Environmental Protection Act 1994) is to ensure that this SMP and any variations approved or required by the administering authority are complied with. The obligations and conditions set out in this SMP bind the owner, from time to time, of the land.

3.2 *Site Use.* The site is currently vacant site and is proposed to be redeveloped and subdivided into an industrial estate. Prior to commencement of this new land use, remedial works will be conducted with the primarily intent removing the site from the EMR. All remediation and validation works for this site are to be carried out in accordance with Appendix 1 - Remediation Action Plan (RAP).

3.3 *Third Party Reviewer (TPR).* A Third Party Reviewer (TPR) approved by the DERM and operating in accordance with the DERM's Terms of Reference for TPR (February 2008) must be appointed for the duration of the site assessment and remediation activities.

3.4 *Provision of SMP to appropriate persons.* The owner must provide all persons involved in building design and planning and all contractors and lessees conducting building and/or excavation works with a copy of the SMP prior to commencement of site works. All persons occupying or working on the site must comply with the requirements of the SMP.

3.5 *Surface capping and protective barriers.* Existing surface cover across filled areas shall be maintained until such time as remediation works occur.

3.6 *Service Trenches* All underground services must be constructed in either uncontaminated material or in trenches in which the services are surrounded by a minimum of 0.3m of uncontaminated fill for minor services (< 100 mm in diameter), and 0.5m of uncontaminated fill for services greater than 100 mm in diameter.

3.7 *Soil Excavation & Removal.* Uncontrolled fills must not be removed from site without suitable characterisation sampling and analysis. Representative characterisation sampling and analysis of any uncontrolled fill materials excavated from the site must be managed by a suitably qualified and experienced person in accordance with Section 381 of the *Environmental Protection Act 1994* (EP Act). Contaminated soil must not be removed off-site without a disposal permit in accordance with Section 424 of the EP Act.

3.8 *Unexpected Contamination.* If during any site earthworks or excavation, offensive or noxious odours and/or evidence of gross contamination not previously detected are observed, site works are to cease in that area and action taken to immediately abate the environmental harm. The administering authority is to be notified in writing within 2 business days of detection and advised of appropriate remedial action.

Any remedial action is to be developed by an appropriately qualified and experienced person in accordance with Section 381 of the EP Act.

3.9 *General Environmental Protection.* All earthworks are to be undertaken in accordance with general environmental protection measures to avoid unwanted migration and deposition of soil. These measures include the control of dust, noise, stormwater runoff, sediment, erosion, spillage from haulage trucks and odour releases involving the handling or movement of contaminated material.

3.10 *Workplace Health and Safety.* A Workplace Health and Safety Plan (WH&S plan), which

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conforms to the requirements of the *Workplace Health and Safety Act 1995* is to be developed for any site excavation works in contaminated areas. The WH&S plan must specifically address contaminants of concern.

4.0 MONITORING AND REPORTING

The owner is to ensure that the following reporting and monitoring is performed to ensure compliance with the SMP:

Until remediation commences:

Records are to be kept of all inspections, any soil excavation in contaminated areas, disposal permits and site management plan compliance for review by the administering authority from time to time. A biennial inspection is to be undertaken to ensure that capping and protective barriers remain in sound condition at all times in accordance with Section 3.5.

The biennial period is to commence from the effective date of this plan.

Once remediation commences:

Monitoring and reporting is to be conducted as required in Appendix 1 - Remediation Action Plan (RAP).

In addition to the reporting required in the RAP, within 60 days from the completion of site development, a report is to be submitted to the TPR documenting details of remediation activities, the results of any sampling undertaken during remediation, records of any site inspections and details of Site Management Plan compliance. The report is to be prepared by a suitably qualified and experienced person in accordance with Section 381 of the *Environmental Protection Act 1994* (EP Act).

This Site Management Plan (SMP) has been developed to manage site contamination risks present at the issue date. Subsequent uses of the site may result in the need to review the plan.

This SMP makes reference to a plan attachment that is available from the Administering Authority if required.

This SMP makes reference to a Remediation Action Plan attachment that is available from the Administering Authority if required.

Release



SUITABILITY STATEMENT

DATE PRINTED: 18/03/2010

OWNER

AHC LIMITED
PO BOX 34
OXENFORD QLD 4210

DATE OF ISSUE : 16/03/2010

PROPERTY DESCRIPTION

LOT : 11 PLAN : RP909375
DRURY LANE
DUNDOWRAN 4655

Fraser Coast Regional Council
EMR Site ID: 24356 FILE REFERENCE: BNE35253

STUDIES UNDERTAKEN BY APPLICANT OR REQUESTED BY DIRECTOR

Drury Lane, Dundowran, Interim Third Party Review Summary Report, prepared by Lloyd Consulting Pty Ltd, dated 10 December 2009 (Doc No 09-528-8-001)

Additional Field Investigations - Supplementary Report, Lot 11 on RP909375, Drury Lane, Dundowran, prepared by Golder Associates Pty Ltd, dated December 2009 (Doc No AS077683505-8000r)

Stage 2 Detailed Site Investigation, Lot 11 on RP909375, Drury Lane, Dundowran, Queensland, prepared by Golder Associates Pty Ltd, dated November 2007 (Doc No 077683505 (AG))

Stage 1 Preliminary Site Investigation, Lot 11 on RP909375, Drury Lane, Dundowran, Queensland, prepared by Golder Associates Pty Ltd, dated August 2007 (Doc No 077683505(AA))

STATEMENT OF SUITABILITY

On the basis of the information supplied to this Department, the subject site is suitable for the following use(s) providing the site is used and managed as per the Site Management Plan attached as Annexure 1.

Suitable for industrial/commercial use including premises such as shops, offices and industrial buildings (but excluding uses where regular soil access by children is possible).

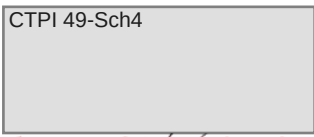
Other specific uses may be suitable for the site, please contact this Department for further advice. The suitability statement provides information on appropriate land uses at the date of effect. Subsequent uses of the site for notifiable activities or for situations where a hazardous contaminant is released into the soil may result in the need to review suitable uses or amend the attached site management plan.

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ENVIRONMENTAL MANAGEMENT REGISTER

LOT : 11 PLAN : RP909375 is recorded on the Environmental Management Register with a Site Management Plan. A copy of the Site Management Plan is attached as Annexure 1.

CTPI 49-Sch4

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Delegate of Administering Authority
Environmental Protection Act 1994

Published on DES Disclosure Log
RTI Act 2009

APPENDIX 1

REMEDIATION ACTION PLAN

LOT: 11

PLAN: RP909375

FILE REF: BNE35253

PRINTED: 16/3/2010

DATE OF EFFECT: 16/3/2010

1.0 INTRODUCTION

This Remediation Action Plan (RAP) has been prepared for remediation of uncontrolled filling activities on Lot 11 on RP909375, located at Lot 11 Drury Lane, Dundowran, QLD. Historical filling has occurred at three locations on site as shown on Figure 1 – uncontrolled filling backfilling of an old sand pit (along part of the eastern boundary), a “burn pit” stockpile, and a recently imported uncontrolled fill stockpile. The remediation works are required to remove materials that may pose a risk to the health of future site users or the environment. The works required include:

Excavation of all uncontrolled fill materials, separation of recyclables, stained/odorous materials and characterisation of remaining materials for reuse or offsite disposal.

Removal of asbestos sheeting fragments and lead impacted soil identified in the “burn pit” stockpile.

Further characterisation of recently imported uncontrolled fill stockpile materials for reuse or offsite disposal.

1.1 Purpose of the RAP

This document has been prepared to describe remediation strategies and control measures aimed at achieving removal of the site from the Environmental Management Register (EMR).

1.2 Remediation Objective

The primary objective of the remediation works is to obtain a Site Suitability Statement to support future redevelopment of the site.

1.3 Third Party Reviewer

A Third Party Reviewer (TPR) must be appointed for the duration of this project. The site work and subsequent reporting is to be certified by a Department of Environment and Resource Management (DERM) approved Third Party Reviewer (TPR). All validation requirements must first have consent from the TPR and any clarification issues will be referred to the TPR prior to the DERM.

The uncontrolled fill encountered (ranging from 1.0 m to 4.4 m in depth) was generally sandy clay containing varying amounts of building rubble (including large pieces of concrete greater than 300mm diameter), steel, bitumen, timber, bricks, iron, tyres, car parts, animal carcasses, wire, gravel, plastic, PVC pipe, cobbles, and sandstone. The natural stiff (or stiffer) clay underlying fill and natural sand may be residual soil formed by weathering of the underlying parent rock (Maryborough Formation).

For most of the site, the upper sand appears to have been removed as part of the sand extraction work. Remnants of this material are present in the higher section of the south-east and north east corners of the site where excavations have not been conducted. This area comprises mostly sand overlying coffee rock.

Much of the exposed ground surface in the area where sand extraction works have been undertaken comprises medium dense to dense sandy soils (including dense indurated silty sand), to depths of about 0.2m to 0.8m and overlying stiff (or stiffer) clay.

2.4 Hydrogeology

Groundwater was recorded at depths of 0.5 m (excavated areas) to 2.4 m (excavated areas where fill has been placed) in the monitoring wells, which were installed as part of the acid sulfate soils investigation. It should be noted that groundwater was not encountered in test pits excavated in fill materials. The direction of groundwater flow is expected to be to the west. Groundwater inflows into monitoring wells were very slow and the resulting yields are not considered to represent a viable source of potable water or other extractive groundwater use.

2.5 Information Sources

Previous investigation reports considered in the preparing this RAP include:

Stage 1 Preliminary Site Investigation, Lot 11 RP909375, Drury Lane, Dundowran, [ref. Golder Associates 077683505(AA) dated August 2007].

Stage 2 Detailed Site Investigation, Lot 11 RP909375, Drury Lane, Dundowran, [ref. Golder Associates 077683505(AG) dated November 2007].

Additional Filed Investigations – Supplementary Report, Lot 11 RP909375, Drury Lane, Dundowran, [ref. Golder Associates 077683505(AS) dated November 2009].

2.6 Historical Data

The historical data identified the following potential sources of contamination at this site:

concrete (including embedded steel reinforcing rods), pulverised to a maximum 300mm nominal size; and

clean earthen fill.

Deleterious materials other than the above inert materials will need to be segregated and removed from site during remediation works.

The uncontrolled fill materials have presently been characterized by sampling and analysis for contaminants of concern at a frequency of about 1 sample per 1500m³ of fill. The results of this preliminary characterization sampling did not identify concentrations of the contaminants of concern that are considered to indicate a risk to human health or the environment. However, a higher density of characterization sampling would be required to validate these materials as suitable for unrestricted reuse on site.

2.7.3 Recently Imported Fill Stockpile

It is estimated that about 2,000 m³ of fill material is present in this stockpile. No deleterious material has been observed during investigation of this stockpile.

Limited characterization sampling and analysis of the recently imported stockpile of uncontrolled fill was conducted at a frequency of 1 sample per 100m³ of fill. The results of this preliminary characterization sampling identified the presence of arsenic impacted soil with concentration exceeding the Health-based Investigation Levels for use in a "standard" residential setting (maximum concentration of 133 mg/kg). In the absence of more detailed characterization of fill materials, it has been assumed that zones of arsenic impact occur within the uncontrolled fill materials. However, a higher density of characterization sampling may provide a statistical basis evaluating the unrestricted reuse of this on site or the need for offsite disposal.

2.7.4 Burn Pit Stockpile

An estimated 50m³ (insitu) of materials are present in the "burn pit" stockpile. Fragments of broken asbestos sheeting were observed in this stockpile. This material was confirmed as containing chrysotile and amosite asbestos.

Concentrations of lead impacted soil exceeding the Health-based Investigation Levels for use in a "standard" residential setting (maximum concentration of 1420 mg/kg) were also detected in the burn pit stockpile.

Removal and offsite disposal of this material will be required during remedial works.

Water samples collected from GA3, GA6, and GA11 revealed concentrations of organochlorine and organophosphorus pesticides below the laboratory limit of reporting. However, the laboratory limits of reporting were above all adopted environmental assessment criteria. Given the lack of organochlorine and organophosphorus pesticides detection in the soil samples during Stage 1 investigations, the risk of organochlorine or organophosphorus pesticides impact to groundwater is considered to be low. Confirmation of pesticide concentrations in groundwater samples is required during remedial works.

The investigation results suggest that there will not be a need for large scale dewatering operations during excavation of uncontrolled fill materials.

3.0 ENVIRONMENTAL GUIDELINES

The remedial activities undertaken at the site must be performed in accordance with the following documents:

- *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland*, May 1998;
- *Draft Hydrocarbon Guidelines*, Contaminated Land Unit, Queensland EPA, January 1999;
- *Guidelines issued under Schedule B of the National Environment Protection (Assessment of Site Contamination) Measure (NEPM)*, National Environment Protection Council, December 1999;
- *Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites* (ANZECC guidelines) published by the Australian and New Zealand Environment and Conservation Council/National Health and Medical Research Council, January 1992;
- Australian Standard AS4482.1-2005 *Guide to the sampling and investigation of potentially contaminated soil Part 1 – Non volatile and semi volatile compounds*; and
- Australian Standard AS4482.2-2005 *Guide to the sampling and investigation of potentially contaminated soil Part 1 – Volatile and semi volatile compounds*

4.0 REMEDIAL GOALS AND VALIDATION CRITERIA

4.1 General

Remediation and acceptance criteria for soils contained in the following sections are based on redevelopment of the site for unrestricted land use. The criteria consider a range of issues including human health risk, environmental risk and aesthetic considerations such as odour and discoloration.\

Criteria should be applied to the 95% Upper Confidence Level (UCL) on the mean of data for each domain of interest, with no hot-spot concentrations greater than 2.5 times the relevant criteria value. The domains of interest at this Site will be each individual stockpile of excavated soil. Sufficient samples must be collected within each domain of interest to ensure that statistical analysis is valid.

Release

- (5) Elevated Environmental Investigation Level for Low Phytotoxicity Setting
- (6) Should environmentally sensitive receptors be identified at/in proximity to the site, then Environmental Investigation criteria will be applied.
- (7) Western Australia Department of Health Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia, May 2009.

These criteria may be amended, subject to approval by the TPR, where it can be demonstrated that alternative concentrations are protective of human health, the environment and aesthetic considerations. In addition, these criteria may be amended to environmental investigation levels (as listed in *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland*, Queensland Department of Environmental 1998) should sensitive environmental receptors be identified at or in close proximity to the site. Criteria for other additional parameters, if required, must be approved by the TPR.

4.3 Groundwater

On completion of remedial earthworks, the following groundwater acceptance criteria shall be applied:

Parameter	Acceptance Levels
<u>Petroleum Hydrocarbons</u>	
TPH (C ₆ – C ₉)	0.15 mg/L ⁽¹⁾
TPH (C ₁₀ – C ₃₆)	0.6 mg/L ⁽²⁾
<u>Inorganics</u>	
Arsenic	
Cadmium	
Chromium (total)	
Copper	< ANZECC Water Quality
Lead	Guidelines 2000, Trigger Values for
Nickel	Fresh Waters 95% Level of Protection
Mercury	
Zinc	
<u>Monocyclic Aromatic Hydrocarbons</u>	
Benzene	
Toluene	
Ethyl Benzene	
Xylene	
<u>Organochlorine & Organophosphorus Pesticides</u>	

Notes:

- (1) Dutch C - Netherlands Soil Clean-up Guideline, 1983
- (2) Dutch Intervention Value - Environmental Quality Objectives in the Netherlands, 1994
- (3) No specific criteria or guidelines have been published in Queensland or Australia for the assessment of TPH contamination in groundwater. In the absence of State or National guidelines, intervention values for hydrocarbons contained in Dutch Guidelines have been adopted for assessment of environmental risk from TPH. TPH concentrations exceeding these guideline criteria may represent a threat to the environment and require specific assessment of risk.

Characterisation sampling of soils for reuse or removal from site will be required at a frequency of at least 1 sample per 50m³ for individual stockpiles of similar soil types. If mixed soil types are noted in stockpiles then characterisation samples must be collected of each material types present at a rate of at least 1 sample per 50m³. A minimum of 9 samples must be collected within each stockpile where statistical assessment of result is proposed for validation purposes.

A quality assurance/quality control program shall be conducted during characterization sampling. This program shall include collection and analysis of:

Blind replicate samples at a frequency of 1 for every 20 samples collected.

Split samples at a frequency of 1 for every 20 samples collected.

Equipment rinsate samples for each day where sampling is conducted.

4.5.2 Groundwater

At least two rounds of groundwater samples shall be collected from excavation sumps following completion of excavations.

A quality assurance/quality control program shall be conducted during groundwater sampling. This program shall include collection and analysis of:

A blind replicate sample during each sampling round.

A split sample during each sampling round.

An equipment rinsate sample during each sampling round.

4.6 Sampling & Reporting

Characterisation sampling shall be conducted under the direction of a suitably qualified and experienced person in accordance with Section 381 of the Environmental Protection Act 1994 (EP Act). Standard procedures that include sample equipment decontamination, sample handling, sample storage and documentation shall be applied.

At the completion of remediation works a Validation Report shall be prepared by the suitably qualified and experienced person that documents the works

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Pulverisation/crushing of bricks and concrete (> 300 mm diameter) to enable reuse as inert site fill.

Offsite disposal of remaining deleterious materials.

Further characterisation of recently imported uncontrolled fill for either reuse on site as "clean" fill or for offsite disposal.

Removal and offsite disposal of the entire 'burn pit' stockpile

Detailed management procedures for this strategy are provided in the following sections. These procedures may be amended, subject to approval by the TPR, where it can be demonstrated that alternative procedures are protective of human health, the environment and aesthetic considerations.

6.0 REMEDIATION PROGRAM

6.1 Existing Uncontrolled Fill Area

6.6.1 Excavation and Segregation of Materials

Approximately 80,000 m³ (insitu volume) of existing uncontrolled fill will need to be excavated and segregated. Excavations shall be continued both laterally and vertically until all existing uncontrolled fill materials have been removed.

A suitably qualified and experienced person shall monitor all excavation works and screen excavated materials using a photo-ionisation detector (PID). Excavations shall be conducted in a manner which targets removal and stockpiling of visually similar materials. Daily photographic and written records of inspection and monitoring shall be kept.

Any materials observed to contain building rubble and other deleterious materials will be segregated from soils and separately stockpiled. Where hydrocarbon odours, staining, elevated PID readings or other indicators of suspected impact are noted, these materials shall be segregated from other material and separately stockpiled for characterisation.

Groundwater encountered during the excavation of overburden shall be collected from a sump excavated in the low point of the excavation. Reuse or disposal of groundwater is discussed in Section 6.1.5.

An area of approximately 5 ha of non-filled land is available at the site for the stockpiling of excavated materials. Operational controls to be adopted during the excavation, onsite transportation and stockpiling of excavated materials are discussed in Section 7.0.

Movement and stockpiling of excavated materials shall be conducted under a materials tracking plan approved by the TPR.

6.1.2 Soil Characterisation Stockpiles

Stockpiles of soil materials shall be sampled and analysed in accordance with Section 4.0.

Release

comply with all conditions in issued permits (including any pretreatment required to remove sediments and contaminants).

6.2 Recently Imported Uncontrolled Fill Area

Further characterisation sampling of the recently imported uncontrolled fill for reuse or removal from site will be carried out to achieve an overall frequency of 1 sample per 50m³ of fill.

If the materials are found to be in compliance with the validation criteria they can be reused to backfill excavations. If the materials are found not to be in compliance with the validation criteria they shall be removed from site. An offsite disposal permit shall be obtained through the TPR prior to removal of these soils from site. Disposal to landfill shall only occur under an approved Disposal Permit issued by DERM.

6.3 Burn Pit Stockpile

The burn pit stockpile shall be excavated and removed from site.

Due to the presence of asbestos fragments, excavation and removal off-site shall be conducted by a suitably licensed asbestos contractor.

7.0 OPERATION CONTROL

7.1 Construction Environment Management Plan

A Construction Environmental Management Plan (CEMP) for the Site shall be prepared incorporating detailed elements covering environmental management of the Site to ensure environmental effects of the remediation work are kept to a minimum and in compliance with all relevant Acts of Parliament and Environmental Regulations.

The CEMP must be approved by the TPR prior to commencement of works on site.

The CEMP shall contain management approaches for, but not limited to, the following areas:

Land Disturbance

Erosion and sediment control devices;

Management of stormwater;

Management of excavated materials and stockpiles;

Dust control;

Release

Inspection of the bunds, drains and sumps regularly during site remediation works to check their integrity and repair any faults as soon as practicable.

7.3 Soil and Sediment Control

A site-specific erosion and sediment control plan (ESCP) must be developed in accordance with local Council guidelines prior to the commencement of remediation works.

7.4 Noise Control

Site works shall be carried out between 6.30am and 6.30pm Monday to Saturday, or other alternative timeframes approved by local Council.

7.5 Dust Control

Potential for dust generation from excavation works and/or stockpiles shall be managed on an as required basis by spraying from water trucks; or other TPR approved method.

7.6 Community Relations

Prior to the commencement of site works, neighbouring properties shall be consulted to inform of the commencement and expected timing of the works.

Concerns and complaints raised by the community (or other parties) during the remedial works will be noted and a register must be maintained to record the following information:

1. **Contact details:** Name, address and phone number of party raising concern.
2. **Nature of concern:** Details of issue/incident.
3. **Action taken or required:** Details of action proposed or undertaken to address the concern, including time and date.
4. **Response to Action:** Was the party raising the concern satisfied with the outcome, if not, what else needs to be done, or is it outside the scope of the development works.
5. **Prevention of re-occurrence:** If the concern relates directly to an operational problem, what action has been taken to ensure the problem will not occur again.

The register must be available to DERM or TPR at request.

All complaints must be responded to with two business days of the complaint being raised.

10.0 HEALTH AND SAFETY

A *Health and Safety Plan* must be prepared for the activities to be performed on the site where employees may be exposed to toxic or other hazardous compounds and elements. Specific requirements relating to dermal contact and inhalation as well as public safety, vehicle decontamination, protective clothing, equipment and appropriate safety controls must be addressed. Personnel working on the site during remediation works must be inducted and sign relevant forms stating that the induction has been carried out.

Works will be according to the *Workplace Health and Safety Act (1995)* and *Workplace Health and Safety Regulations (2008)*.

11.0 REPORTING

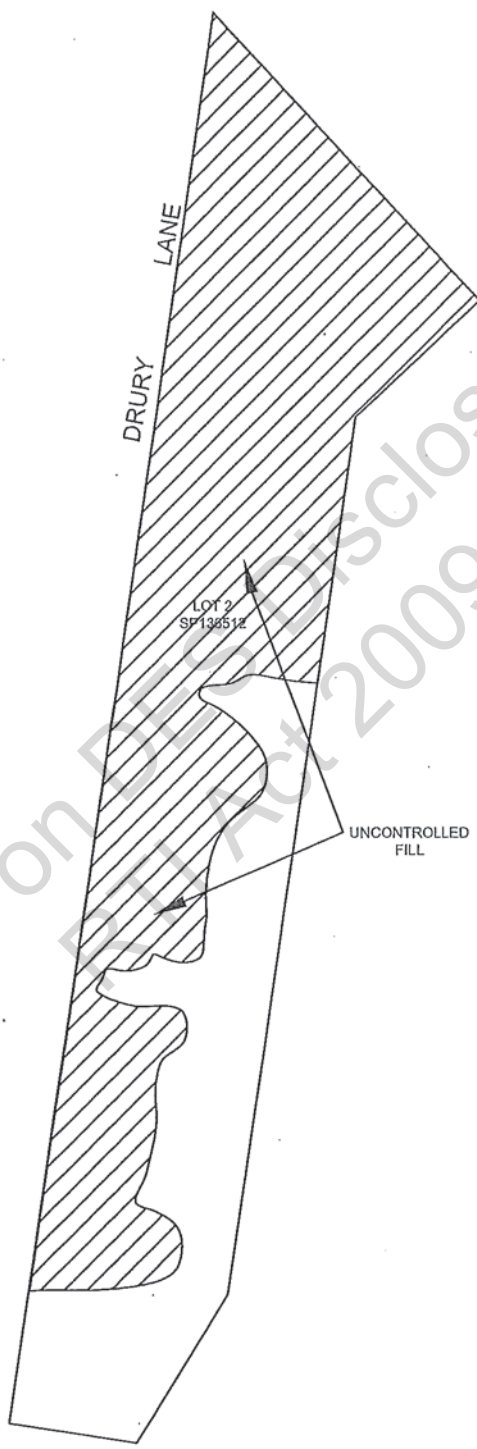
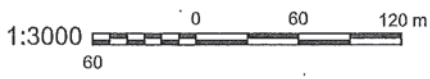
The progress of the works will be reported to the TPR on a regular basis. Fill characterisation and validation sampling results will be supplied to the TPR in the form of reports as the data becomes available.

Within 60 days of the completion of all remediation and validation works, a report detailing works must be prepared by a suitable qualified person in accordance with Section 4.6 and submitted to the TPR for certification prior to submission to the DERM. The report submitted should be in accordance with Chapter 7, Part 8 of the EP Act and the *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland* May (1998) and NEPM requirements.

The report shall include but not be limited to documentation of the remediation and characterisation program activities (including photographic records and daily site diaries detailing volumes of soil moved), records of all offsite disposal, analysis of characterisation results and an evaluation of the results against the validation criteria.

The report shall also include the results of the QA/QC program, Chain of Custody documentation and Sample Receipt Advices for all samples collected and copies of documentation validating the appropriate handling, disposal and treatment of any contaminated soil, materials and water in accordance with DERM requirements.

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Release



18 March 2010

Site ID: 82379
File Number: BNE34771
Enquiries to: Contaminated Land Unit
Telephone: (07) 3330 5685

RADWAY PTY LTD
PO BOX 34
OXENFORD QLD 4210

CERTIFICATE OF APPROVAL OF A SITE MANAGEMENT PLAN

This document provides written notification that, in accordance with the *Environmental Protection Act 1994 (EP Act)*, a site management plan has been approved for the parcel of land described below, which is recorded on the Environmental Management Register (EMR). A copy of the suitability statement and the site management plan is attached.

Lot: 2 Plan: SP200633
Fraser Coast Regional Council

DRURY LANE
DUNDOWRAN 4655

The owner may apply to the Department of Environment and Resource Management (DERM) to amend the site management plan in accordance with section 418 of the *EP Act*.

Under section 434 of the *EP Act*, a person must not contravene a site management plan.

The owner may apply for a review of, and appeal against, the decision to approve the site management plan within 14 days after receipt of this notice in accordance with sections 521 and 531 of the *EP Act*.

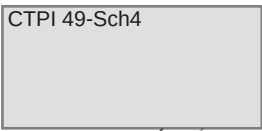
In accordance with the land being recorded on the EMR, the following requirements apply under section 421 of the *EP Act*:

If the owner proposes to dispose of the land to someone else, the owner must, before agreeing to dispose of the land, give written notice to the buyer:
if the particulars of the land are recorded in the EMR - that the particulars are recorded in the register; and
if the land is subject to a site management plan, details of the plan.

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Further information regarding this notice may be obtained by contacting the Contaminated Land Unit, Department of Environment and Resource Management on telephone (07) 3330 5685. Further information about contaminated land matters may be obtained by visiting our web-site at: http://www.derm.qld.gov.au/environmental_management/land/contaminated_land/

CTPI 49-Sch4



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Environmental Protection Act 1994

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ANNEXURE 1 - SITE MANAGEMENT PLAN

LOT : 2 PLAN : SP200633 FILE REF : BNE34771 PRINTED: 18/03/2010

DATE OF EFFECT : 16/03/2010

1.0 SUMMARY OF CONTAMINATION

The site, located at Lot 2 Drury Lane, Dundowran, QLD, was originally a sand extraction operation. The majority of the extraction area was subsequently filled in a relatively uncontrolled manner. The placement of uncontrolled fill over the site has resulted in the listing of the site on the Environmental Management Register for the Notifiable Activity - Landfill.

The filled areas of Lot 2 are shown on attached Figure 1 and contain materials including:

Building rubble (including large pieces of concrete greater than 300mm diameter), steel, bitumen, timber, bricks, iron, tyres, car parts, animal carcasses, wire, gravel, plastic, PVC pipe, cobbles, sandstone and uncontrolled soil fill.

Metals impacted soils (above HILA) - Maximum concentrations of contamination in soil exceeding the HIL 'A' are described below:

Analyte	Maximum Concentration (mg/kg)
Arsenic	111

The strategy by which these materials will be removed and/or managed to enable removal of the site from the Environmental Management Register (EMR) is contained in the Remediation Action Plan (RAP) attached as Appendix 1.

2.0 OBJECTIVES OF THE SMP

The purpose of this SMP is to manage identified contamination on the site in a manner that protects human health and the environment.

3.0 ACHIEVEMENT AND MAINTENANCE OF OBJECTIVES

3.1 Responsibility. The owner of the land (as defined in the *Environmental Protection Act 1994*) is to ensure that this SMP and any variations approved or required by the administering authority are complied with. The obligations and conditions set out in this SMP bind the owner, from time to time, of the land.

3.2 Site Use. The site is currently a landfill site and is proposed to be redeveloped and subdivided into an industrial estate. Prior to commencement of this new land use, remedial works will be conducted with the primarily intent removing the site from the EMR. All remediation and validation works for this site are to be carried out in accordance with Appendix 1 - Remediation Action Plan (RAP).

3.3 Third Party Reviewer (TPR). A Third Party Reviewer (TPR) approved by the DERM and operating in accordance with the DERM's Terms of Reference for TPR (February 2008) must be appointed for the duration of the site assessment and remediation activities.

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3.4 *Provision of SMP to appropriate persons.* The owner must provide all persons involved in building design and planning and all contractors and lessees conducting building and/or excavation works with a copy of the SMP prior to commencement of site works. All persons occupying or working on the site must comply with the requirements of the SMP.

3.5 *Surface capping and protective barriers.* Existing surface cover across filled areas shall be maintained until such time as remediation works occur.

3.6 *Service Trenches.* All underground services must be constructed in either uncontaminated material or in trenches in which the services are surrounded by a minimum of 0.3m of uncontaminated fill for minor services (< 100 mm in diameter), and 0.5m of uncontaminated fill for services greater than 100 mm in diameter.

3.7 *Soil Excavation & Removal.* Uncontrolled fills must not be removed from site without suitable characterisation sampling and analysis. Representative characterisation sampling and analysis of any uncontrolled fill materials excavated from the site must be managed by a suitably qualified and experienced person in accordance with Section 381 of the *Environmental Protection Act 1994* (EP Act). Contaminated soil must not be removed off-site without a disposal permit in accordance with Section 424 of the EP Act.

3.8 *Unexpected Contamination.* If during any site earthworks or excavation, offensive or noxious odours and/or evidence of gross contamination not previously detected are observed, site works are to cease in that area and action taken to immediately abate the environmental harm. The administering authority is to be notified in writing within 2 business days of detection and advised of appropriate remedial action.

Any remedial action is to be developed by an appropriately qualified and experienced person in accordance with Section 381 of the EP Act.

3.9 *General Environmental Protection.* All earthworks are to be undertaken in accordance with general environmental protection measures to avoid unwanted migration and deposition of soil. These measures include the control of dust, noise, stormwater runoff, sediment, erosion, spillage from haulage trucks and odour releases involving the handling or movement of contaminated material.

3.10 *Workplace Health and Safety.* A Workplace Health and Safety Plan (WH&S plan), which conforms to the requirements of the *Workplace Health and Safety Act 1995* is to be developed for any site excavation works in contaminated areas. The WH&S plan must specifically address contaminants of concern.

4.0 MONITORING AND REPORTING

The owner is to ensure that the following reporting and monitoring is performed to ensure compliance with the SMP:

Until remediation commences: Records are to be kept of all inspections, any soil excavation in contaminated areas, disposal permits and site management plan compliance for review by the administering authority from time to time. A biennial inspection is to be undertaken to ensure that capping and protective barriers remain in sound condition at all times in accordance with Section 3.5.

The biennial period is to commence from the effective date of this plan.

Once remediation commences:

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Monitoring and reporting is to be conducted as required in Appendix 1 - Remediation Action Plan (RAP).

In addition to the reporting required in the RAP, within 45 days from the completion of site development a report is to be submitted to the TPR documenting details of remediation activities, the results of any sampling undertaken during remediation, records of any site inspections and details of Site Management Plan compliance. The report is to be prepared by a suitably qualified and experienced person in accordance with Section 381 of the *Environmental Protection Act 1994* (EP Act).

This Site Management Plan (SMP) has been developed to manage site contamination risks present at the issue date. Subsequent uses of the site may result in the need to review the plan.

This SMP makes reference to a plan attachment that is available from the Administering Authority if required.

This SMP makes reference to a Remediation Action Plan attachment that is available from the Administering Authority if required.

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Government**

Level 8, 400 George St • Brisbane, Queensland • GPO Box 2454 • Brisbane QLD 4001 • AUSTRALIA
http://www.derm.qld.gov.au/environmental_management/land/contaminated_land/

SUITABILITY STATEMENT

DATE PRINTED: 18/03/2010

OWNER

RADWAY PTY LTD
PO BOX 34
OXENFORD QLD 4210

DATE OF ISSUE : 16/03/2010

PROPERTY DESCRIPTION

LOT : 2 PLAN : SP200633
DRURY LANE
DUNDOWRAN 4655

Fraser Coast Regional Council
EMR Site ID: 82379 FILE REFERENCE: BNE34771

STUDIES UNDERTAKEN BY APPLICANT OR REQUESTED BY DIRECTOR

Drury Lane, Dundowran, Interim Third Party Review Summary Report, prepared by Lloyd Consulting Pty Ltd, dated 10 December 2009 (Doc No 09-528-8-001)

Addendum Letter for Stage 1 and Stage 2 Reports, Lot 2 SP136512, Drury Lane, Hervey Bay, prepared by Golder Associates Pty Ltd, dated 24 November 2009 (Doc No 077683504(AO))

Stage 2 Detailed Site Investigation, Lot 2 SP136152, Drury Lane, Dundowran, Queensland, prepared by Golder Associates Pty Ltd, dated November 2007 (Doc No 077683504(AG))

Stage 1 Preliminary Site Investigation, Lot 2 on SP136512, Drury Lane, Dundowran, Queensland 4655, prepared by Golder Associates Pty Ltd, dated November 2007 (Doc No 077683504(AI))

STATEMENT OF SUITABILITY

On the basis of the information supplied to this Department, the subject site is suitable for the following use(s) providing the site is used and managed as per the Site Management Plan attached as Annexure 1.

Suitable for industrial/commercial use including premises such as shops, offices and industrial buildings (but excluding uses where regular soil access by children is possible).

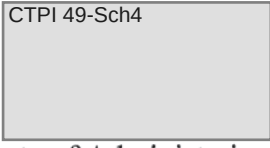
Other specific uses may be suitable for the site, please contact this Department for further advice. The suitability statement provides information on appropriate land uses at the date of effect. Subsequent uses of the site for notifiable activities or for situations where a hazardous contaminant is released into the soil may result in the need to review suitable uses or amend the attached site management plan.

Release

ENVIRONMENTAL MANAGEMENT REGISTER

LOT : 2 PLAN : SP200633 is recorded on the Environmental Management Register with a Site Management Plan. A copy of the Site Management Plan is attached as Annexure 1.

CTPI 49-Sch4

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Delegate of Administering Authority
Environmental Protection Act 1994

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APPENDIX 1

REMEDIATION ACTION PLAN

LOT: 2

PLAN: SP136512

FILE REF: BNE34771

PRINTED: 16/3/2010

DATE OF EFFECT: 16/3/2010

1.0 INTRODUCTION

This Remediation Action Plan (RAP) has been prepared for remediation of the uncontrolled fill on Lot 2 on SP136512, located at Lot 2 Drury Lane, Dundowran, QLD. The remediation works are required to remove materials that may pose a risk to the health of future site users or the environment. The works required include excavation of all fill materials, separation of recyclables, stained/odorous materials and characterisation of remaining materials for reuse or offsite disposal.

1.1 Purpose of the RAP

This document has been prepared to describe remediation strategies and control measures aimed at achieving removal of the site from the Environmental Management Register (EMR).

1.2 Remediation Objective

The primary objective of the remediation works is to obtain a Site Suitability Statement to support future redevelopment of the site.

1.3 Third Party Reviewer

A Third Party Reviewer (TPR) must be appointed for the duration of investigation and remediation works. The site work and subsequent reporting is to be certified by a DERM approved Third Party Reviewer (TPR). All validation requirements must first have consent from the TPR and any clarification issues will be referred to the TPR prior to the DERM. The TPR will approve the proposed validation methodology, pre-validation sampling results, Disposal Permit applications and the final report.

The role of the TPR is to review all relevant documentation associated with the proposed RAP, to accept the proposed remediation strategy and certify that the site is suitable for any land use or specific land uses (as required) in accordance with DERM Terms of Reference for Third Party Review dated February 2008.

2.0 BACKGROUND

2.1 Site History

The subject site is identified as Lot 2 SP136512 and is approximately 9.174 ha in area. The site history indicates that Lot 2 SP136512 was historically used for sand extraction. Following sand extraction, filling was undertaken across the majority of the site to return it to about its original level. The uncontrolled filling of the site resulted in Lot 2 SP136512 been listed on the EMR for Notifiable Activity No.20: Landfill – disposing of waste.

2.2 Topography

The regional topography is generally low and flat comprising large tracts of Wallum heath and ti-tree swamps. The nearest creek is approximately 2 km north (Eli Creek) and the ocean is approximately 500m beyond Eli Creek. A manmade lake is located approximately 300m to the east of the site.

At the time of the investigation, the site showed the effects of past sand extraction work and filling. The central portion of the site was about 2 m to 3 m higher than the northern and southern portions of the site. Much of the site

variable in slope, with elevated areas of fill materials. It appears that the majority of the site has been filled. At the time of the investigation, the south-eastern portion of the site was low lying and inundated with water. During the 2006 investigation the site was covered in thick grass and scattered shrubs. However, during the 2007 investigation most of the site was covered in bare earth with minimal grass cover due to recent excavation works.

Surface drainage generally follows the contours towards the low lying areas in the eastern and southern boundaries of the site. The site is generally well drained, with storm water run-off expected to be shed as sheet flow.

2.3 Geology

Available geological information (1:250,000 Geological Map, MARYBOROUGH, Sheet SG 56-6 Part 9544, Department of Resource Industries, 1992) indicates that the site is underlain by Quaternary (Holocene) age "beach ridges: sand, shelly sand, minor gravel", possibly overlying slightly older (Pleistocene) sediments of "Undifferentiated coastal plains: sand, silt, mud". The Quaternary sediments are underlain at depth by the early Cretaceous age Maryborough Formation containing "mudstone, siltstone, shale, sandstone". Over most of the site, the upper sand appears to have been removed as part of previous sand extraction work. A total of 60 test pit locations have been investigated across the site. These investigations revealed the presence of uncontrolled fill materials to depths ranging from surface to 5.5 m. The uncontrolled fill encountered generally comprised sandy clay containing varying amounts of building rubble (including large pieces of concrete greater than 300mm diameter), steel, bitumen fragments (old road surfaces), timber, bricks, iron, tyres, car parts, animal carcasses, wire, gravel, plastic, PVC pipe, cobbles, and sandstone. The fill materials overlie natural clayey sands.

2.4 Hydrogeology

Groundwater was recorded at depths of 0.7 m to 3.7 m in the monitoring wells, which were installed as part of the acid sulfate soils investigation. Based on the ground levels, the variation in groundwater depths measured in the wells, and the fact that only minor water seepage was observed in the test pits excavated to depths of up to 6 m below existing ground level, the groundwater encountered is considered to be "perched" water located within limited zones within the fill.

This is further evidenced by the adjacent site (Lot 11), where ground levels are approximately 3 m lower. It should be noted that groundwater inflows into monitoring wells were very slow and the resulting yields are not considered to represent a viable source of potable water or other extractive groundwater use.

2.5 Information Sources

Previous investigation reports considered in the preparing this RAP include:

Stage 1 Preliminary Site Investigation, Lot 2 SP136512, Drury Lane, Dundowran, [ref. Golder Associates 077683504(AI) dated November 2007].

Stage 2 Detailed Site Investigation, Lot 2 SP136512, Drury Lane, Dundowran, [ref. Golder Associates 077683504(AG) dated November 2007].

2.6 Historical Data

The historical data identified the following potential sources of contamination at this site:

Potential Contamination Source
Uncontrolled fill

Potential Contaminant
Hydrocarbons (TPH & BTEX),
PAH Phenols, PCB, Metals (As, Cd,
Cr, Cu, Pb, Ni, Hg, Zn),

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2.7 Soil Contamination

2.7.1 General

The available data indicated that there are broadly two main types of contamination that need to be addressed in the remediation strategy. These comprise deleterious materials (including oversize concrete) and arsenic impact within the fills

It is estimated that about 250,000 m³ (insitu) of fill material has been disposed of across the site (refer to the attached Figure 1).

2.7.2 Deleterious Materials

Building rubble (including large pieces of concrete greater than 300mm diameter), steel, bitumen, timber, bricks, iron, tyres, car parts, animal carcasses, wire, gravel, plastic, PVC pipe, cobbles, and sandstone were observed within the uncontrolled fill. No visual evidence of fibre board sheeting fragments was observed within the uncontrolled fill exposed during test pit investigations. Department of Environment and Resource Management (DERM) C&D waste Operational Policy indicates that where C&D waste is separated into its constituent parts, the inert parts may be used as clean fill. The Operational Policy indicates that the following materials are considered to be inert:

- bricks/pavers/ceramics;
- concrete (including embedded steel reinforcing rods), pulverised to a maximum 300mm nominal size; and
- clean earthen fill.

Deleterious materials other than the above inert materials will need to be segregated and removed from site during remediation works.

2.7.3 Metals Impacted Fill

Limited testing of the uncontrolled fill materials confirmed the presence of some metals (arsenic, chromium, nickel, and zinc) impacted soils with concentrations exceeding environmental assessment criteria. Arsenic was detected exceeding the Health-based Investigation Levels for use in a "standard" residential setting. In the absence of more detailed characterization of fill materials, it has been assumed that zones of metals impact occur within the uncontrolled fill materials.

2.7.4 Groundwater

Field tests on groundwater samples from site well locations indicated acidic groundwater ranging from pH 5.2 to pH 5.6. Electrical Conductivity ranged between 0.56 mS/cm and 0.77 mS/cm, which indicate freshwater conditions. No free phase product, sheens, discolouration or odours (that may indicate the presence of possible contamination) were observed within the groundwater. Analytical results on groundwater samples collected from the three site wells did not detect concentrations of potential contaminants (arsenic, cadmium, chromium, copper, nickel, lead, zinc, mercury, TPH, BTEX, PAH and organochlorine and organophosphorus pesticides) that are considered to represent an environmental risk.

The investigation results suggest that there will not be a need for large scale dewatering operations during excavation of uncontrolled fill materials. If dewatering is required during remediation works, waters can be disposed to the ground surface or reused for onsite for dust suppression.

3.0 ENVIRONMENTAL GUIDELINES

The remedial activities undertaken at the site must be performed in accordance with the following documents:

- *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland*, May 1998;
- *Draft Hydrocarbon Guidelines*, Contaminated Land Unit, Queensland EPA, January 1999;
- *Guidelines issued under Schedule B of the National Environment Protection (Assessment of Site Contamination) Measure (NEPM)*, National Environment Protection Council, December 1999;
- *Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites* (ANZECC guidelines) published by the Australian and New Zealand Environment and Conservation Council/National Health and Medical Research Council, January 1992;
- Australian Standard AS4482.1-2005 *Guide to the sampling and investigation of potentially contaminated soil Part 1 – Non volatile and semi volatile compounds*; and
- Australian Standard AS4482.2-2005 *Guide to the sampling and investigation of potentially contaminated soil Part 1 – Volatile and semi volatile compounds*

4.0 REMEDIAL GOALS AND VALIDATION CRITERIA

4.1 General

Remediation and acceptance criteria for soils contained in the following sections are based redevelopment of the site for unrestricted land use. The criteria consider a range of issues including human health risk, environmental risk and aesthetic considerations such as odour and discoloration.

Criteria should be applied to the 95% Upper Confidence Level (UCL) on the mean of data for each domain of interest, with no hot-spot concentrations greater than 2.5 times the relevant criteria value. The domains of interest at this Site will be each individual stockpile of excavated soil. Sufficient samples must be collected within each domain of interest to ensure that statistical analysis is valid. The nominated criteria are based on various national and international standards.

4.2 Characterisation of Soils for Reuse

Soil acceptance criteria for reuse on site are listed below.

Parameter	EMR Removal & "Clean" Fill
<u>Petroleum Hydrocarbons</u>	
TPH (C ₆ – C ₉)	100 mg/kg ⁽¹⁾
TPH (C ₁₀ – C ₁₄)	100 mg/kg ⁽¹⁾
TPH (C ₁₅ – C ₂₈)	1000 mg/kg ⁽¹⁾
TPH (C ₂₉ - C ₃₆)	1000 mg/kg ⁽¹⁾
<u>Monocyclic Aromatic Hydrocarbons</u>	
Benzene	1 mg/kg ⁽¹⁾
Toluene	
Ethyl Benzene	Total BTEX = 7 mg/kg ⁽¹⁾
Xylene	
<u>Polycyclic Aromatic Hydrocarbons</u>	
Benzo(a)pyrene	1 mg/kg ⁽²⁾
Total PAH	20 mg/kg ⁽²⁾

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Inorganics

Arsenic	100 mg/kg ⁽²⁾
Cadmium	3 mg/kg ⁽³⁾
Chromium VI	100 mg/kg ⁽²⁾
Copper	200 mg/kg ⁽⁵⁾
Lead	300 mg/kg ⁽²⁾
Nickel	60 mg/kg ⁽³⁾
Mercury	1 mg/kg ⁽³⁾
Zinc	400 mg/kg ⁽⁵⁾

Organochlorine Pesticides

Aldrin + Dieldrin	10 ⁽²⁾
Chlordane	50 ⁽²⁾
DDT & Derivatives	200 ⁽²⁾
Heptachlor	10 ⁽²⁾

Other

Polychlorinated biphenyls	10 ⁽²⁾
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Physical Criteria

Odour	- No detectable hydrocarbon odour
Staining	- No visible hydrocarbon staining
Domestic and Garden Refuse	- No visible municipal waste materials
Construction and Demolition Waste	- Concrete (including embedded steel reinforcing rods), pulverised to a maximum 300mm nominal size ⁽⁴⁾
	- No visible timber or other deleterious materials
Asbestos	- No detectable asbestos fibres or fragments ⁽⁶⁾

Notes:

- (1) Draft Hydrocarbon Guidelines – QLD DERM 1999
- (2) Health Based Investigation Levels for Exposure Setting “A” (‘Standard’ Residential with garden/accessible soil) – Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland, Queensland Department of Environmental 1998.
- (3) Environmental Investigation Levels – Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland, Queensland Department of Environmental 1998.
- (4) Inert Waste Policy, EPA
- (5) Elevated Environmental Investigation Level for Low Phytotoxicity Setting
- (6) Western Australia Department of Health *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*, May 2009.

These criteria may be amended, subject to approval by the TPR, or TPR and DERM where it can be demonstrated that alternative concentrations are protective of human health, the environment and aesthetic considerations. In addition, these criteria may be amended to environmental investigation levels (as listed in *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland*, Queensland Department of Environment May 1998) should sensitive environmental receptors be identified at or in close proximity to the site. Criteria for other additional parameters, if required, must be approved by the TPR.

4.3 Groundwater

Samples of groundwater entering excavations during the remediation works shall be collected to allow assessment of potential risk to the surrounding environment and groundwater users. The following acceptance criteria shall be applied to groundwater results:

Parameter	Acceptance Levels
<u>Petroleum Hydrocarbons</u>	
TPH (C ₆ – C ₉)	0.15 mg/L ⁽¹⁾
TPH (C ₁₀ – C ₃₆)	0.6 mg/L ⁽²⁾
<u>Inorganics</u>	
Arsenic	
Cadmium	
Chromium (total)	
Copper	< ANZECC Water Quality
Lead	Guidelines 2000, Trigger Values for
Nickel	Fresh Waters 95% Level of Protection
Mercury	
Zinc	
<u>Monocyclic Aromatic</u>	
<u>Hydrocarbons</u>	
Benzene	
Toluene	
Ethyl Benzene	
Xylene	
<u>Organochlorine & Organophosphorus</u>	
<u>Pesticides</u>	

Notes:

- (1) Dutch C - Netherlands Soil Clean-up Guideline, 1983
- (2) Dutch Intervention Value - Environmental Quality Objectives in the Netherlands, 1994
- (3) No specific criteria or guidelines have been published in Queensland or Australia for the assessment of TPH contamination in groundwater. In the absence of State or National guidelines, intervention values for hydrocarbons contained in Dutch Guidelines have been adopted for assessment of environmental risk from TPH. TPH concentrations exceeding these guideline criteria may represent a threat to the environment and require specific assessment of risk.

These criteria may be amended, subject to approval by the TPR, or TPR and DERM where it can be demonstrated that alternative concentrations are protective of human health, the environment and aesthetic considerations. Criteria for other additional parameters, if required, must be approved by the TPR.

Where concentrations are detected exceeding the above criteria, further assessment of the risk will be required. This assessment may include more detailed groundwater investigations to evaluate "background" groundwater quality/conditions and identification of potential receptors and exposure routes. A qualitative risk assessment should be conducted on the basis of the above. Where unacceptable risk is indicated the a quantitative risk assessment and/or remedial works will be required. The scope and methodology of any further groundwater investigation/assessment shall be agreed with the TPR, prior to commencement of such works.

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4.4 Imported Fill Materials

Imported fill materials (if required) to backfill the site up final development levels shall be from a registered quarry

Materials from alternative sources may be accepted in consultation with the TPR where it can be demonstrated that the material are not impacted by contamination.

4.5 Sampling Frequency and Quality Assurance / Quality Control

4.5.1 Soils

Characterisation sampling of soils for reuse or removal from site will be required at a frequency of at least 1 sample per 50m³ for individual stockpiles of similar soil types. If mixed soil types are noted in stockpiles then characterisation samples must be collected of each material types present at a rate of at least 1 sample per 50m³. A minimum of 9 samples must be collected within each stockpile where statistical assessment of result is proposed for validation purposes.

A quality assurance/quality control program shall be conducted during characterization sampling. This program shall include collection and analysis of:

- Blind replicate samples at a frequency of 1 for every 20 samples collected.

- Split samples at a frequency of 1 for every 20 samples collected.

- Equipment rinsate samples for each day where sampling is conducted.

4.5.2 Groundwater

At least two rounds of groundwater samples shall be collected from excavation sumps following completion of excavations.

A quality assurance/quality control program shall be conducted during groundwater sampling. This program shall include collection and analysis of:

- A blind replicate sample during each sampling round.

- A split sample during each sampling round.

- An equipment rinsate sample during each sampling round.

4.6 Sampling & Reporting

Characterisation sampling shall be conducted under the direction of a suitably qualified and experienced person in accordance with Section 381 of the Environmental Protection Act 1994 (EP Act). Standard procedures that include sample equipment decontamination, sample handling, sample storage and documentation shall be applied.

At the completion of remediation works a Validation Report must be prepared by the suitably qualified and experienced person that documents the works undertaken and compliance with the agreed remediation works. This report shall be submitted to the TPR for certification and subsequent submission to DERM.

4.7 Analytical Testing

Analytical testing for the characterization/validation program should be conducted by a NATA accredited laboratory. If the laboratory is not NATA accredited, at least 10% of the samples under investigation must be submitted to a NATA accredited laboratory as a quality check. Please note that asbestos sampling and analysis should be undertaken in accordance with the Western Australia Department of Health *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*, May 2009. Analysis of collected characterization samples shall be undertaken as follows:

Metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn)	All soil samples.
Petroleum Hydrocarbons	All soil samples with visual or olfactory impacts, otherwise 10% of soil samples.
Monocyclic Aromatic Hydrocarbons	All soil samples with visual or olfactory impacts, otherwise 10% of soil samples.
Polycyclic Aromatic Hydrocarbons	All soil samples with visual or olfactory impacts, otherwise 10% of soil samples.
Organochlorine /Organophosphorus	All soil samples.
Pesticides	In Accordance with Western
Asbestos	Australia Department of Health <i>Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia</i> , May 2009

These criteria may be amended, subject to approval by the TPR, where it can be demonstrated that alternative concentrations are protective of human health, the environment and aesthetic considerations. Criteria for other additional parameters, if required, must be approved by the TPR.

5.0 REMEDIATION STRATEGY

The remediation strategy for this site comprises the following:

- Excavation of all uncontrolled fill materials.
- Segregation of soil materials from deleterious materials.
- Characterization of separated soil materials for either reuse on site as "clean" fill or for offsite disposal.
- Pulverisation/crushing of bricks and concrete (> 300 mm diameter) to enable reuse as inert site fill.
- Offsite disposal of remaining deleterious materials

Detailed management procedures for this strategy are provided in the following sections. These procedures may be amended, subject to approval by the TPR, where it can be demonstrated that alternative procedures are protective of human health, the environment and aesthetic considerations.

6.0 REMEDIATION PROGRAM

6.1 Excavation and Segregation of Materials

Approximately 250,000 m³ (insitu volume) of uncontrolled fill will need to be excavated and segregated. Excavations shall be continued both laterally and vertically until all uncontrolled fill materials have been removed.

A suitably qualified and experienced person pursuant to s381 and 395 must monitor all excavation works and screen excavated materials using a photo-ionisation detector (PID). Excavations shall be conducted in a manner which targets removal and stockpiling of visually similar materials. Daily photographic and written records of inspection and monitoring shall be kept.

Any materials observed to contain building rubble and other deleterious materials will be segregated from soils and separately stockpiled. Where hydrocarbon odours, staining, elevated PID readings or other indicators of suspected impact are noted, these materials shall be segregated from other material and separately stockpiled for characterisation.

Groundwater encountered during the excavation of overburden shall be collected from a sump excavated in the low point of the excavation. Reuse or disposal of groundwater is discussed in Section 5.5.

An area of approximately 25,000 m² of land is available on an adjacent lot (Lot 11), which is also owned by the client and listed on the EMR for the same reason (land filling), for the stockpiling of excavated materials. Operational controls to be adopted during the excavation, onsite transportation and stockpiling of excavated materials are discussed in Section 6.0.

Movement and stockpiling of excavated materials shall be conducted under a materials tracking plan approved by the TPR.

6.2 Soil Characterisation Stockpiles

Stockpiles of soil materials shall be sampled and analysed in accordance with Section 3.4.

Stockpiles found to be in compliance with the validation criteria shall be reused to backfill excavations. Stockpiles found not to be in compliance with the validation criteria shall be removed from site. An offsite disposal permit shall be obtained through the TPR prior to removal of these soils from site. Disposal to landfill shall only occur under an approved Disposal Permit issued by DERM.

6.3 Suspected Contaminated Material Stockpiles

Segregated stockpiles of materials with odours, staining, elevated PID readings or other indicators of suspected contamination impact (such as bitumen) shall be sampled and analysed to evaluate their contamination status and the need for pre-treatment prior to landfill disposal. An offsite disposal permit shall be obtained through the TPR prior to removal of contaminated soils from this site. Disposal to landfill shall only occur under an approved Disposal Permit issued by DERM.

6.4 Deleterious Materials Stockpiles

Deleterious materials shall be further segregated in separate stockpiles and managed as follows:

Bricks and concrete – where practical shall be pulverized or crushed to a size of less than 75mm diameter to enable reuse on site as inert fill.

Materials not meeting this criteria shall be removed from site for disposal at appropriately licensed landfill.

Metal (including wire, steel, iron, and car parts) - shall be removed from site for recycling.

Domestic and Greenwastes (including animal carcasses) - shall removed from site for disposal at an appropriate landfill.

Other demolition materials (including timber, plastic and PVC pipes) - shall removed from site for disposal at an appropriately landfill.

Asbestos – where asbestos sheeting or fragments are identified, this material shall be placed directly into lined containers and managed in accordance with asbestos workplace health and safety regulations. This will be conducted by a suitably licensed asbestos removal contractor.

6.5 Water Treatment & Disposal

Groundwater seepage into excavations may be collected and used for dust suppression within excavation areas or in stockpile areas where suitable control measures are in place to prevent runoff from discharging into external waterways.

Groundwater testing from across the site has indicated that the groundwater is generally of a quality which represents a low environmental risk. However, permission from DERM and the local Council would be required prior to discharge to water ways. Discharges to surface waters shall comply with all conditions in issued permits (including any pretreatment required to remove sediments). Alternatively, water from the site shall be collected and disposed of by a licensed tradewaste contractor.

7.0 OPERATION CONTROL

7.1 Construction Environment Management Plan

A Construction Environmental Management Plan (CEMP) for the Site shall be prepared incorporating detailed elements covering environmental management of the Site to ensure environmental effects of the remediation work are kept to a minimum and in compliance with all relevant Acts of Parliament and Environmental Regulations.

The CEMP must be approved by the TPR prior to commencement of works on site.

The CEMP shall contain management approaches for, but not limited to, the following areas:

Land Disturbance

Erosion and sediment control devices;

Management of stormwater;

Management of excavated materials and stockpiles;

Dust control;

Noise and Vibration

Operating hours;
Vehicles and equipment;
Traffic;
Noise abatement;
Vibration.

Other

Litter;
Storage of chemicals and fuel;
Road cleaning and truck wash;
Development of the details within each of these segments of the CEMP shall incorporate the general management approach, the environmental criteria to be met and specific engineering controls to be used.
Requirements in the following sections shall also be considered and addressed as part of the CEMP.

7.2 Stormwater Management

A site-specific stormwater management plan is required to be developed prior to the commencement of site works. Stormwater management works are to include controls for construction activities and soil conservation measures such as diversion drains, silt traps, sediment traps, litter traps and bank stabilization. Specific control measures are required to:

- Contain stormwater runoff generated within excavations and stockpile areas; and
- Prevent discharge to external waterways.

Control measures to be adopted may include:

- Use of bunds and spoon drains to isolate working areas from the remainder of the site catchment and to direct surface water from the working area into open excavations.
- Formation of a collection sump at the lowest corner of the remedial excavations to collect stormwater entering the excavations and allow for dewatering of the excavation.
- Inspection of the bunds, drains and sumps regularly during site remediation works to check their integrity and repair any faults as soon as practicable.

7.3 Soil and Sediment Control

A site-specific erosion and sediment control plan (ESCP) must be developed in accordance with local Council guidelines prior to the commencement of remediation works.

7.4 Noise Control

Site works shall be carried out between 6.30am and 6.30pm Monday to Saturday, or other alternative timeframes approved by local Council.

7.5 Dust Control

Potential for dust generation from excavation works and/or stockpiles shall be managed on an as required basis by spraying from water trucks, or other TPR approved method.

7.6 Community Relations

Prior to the commencement of site works, neighbouring properties shall be consulted to inform of the commencement and expected timing of the works. Concerns and complaints raised by the community (or other parties) during the remedial works will be noted and a register must be maintained to record the following information:

1. **Contact details:** Name, address and phone number of party raising concern.
2. **Nature of concern:** Details of issue/incident.
3. **Action taken or required:** Details of action proposed or undertaken to address the concern, including time and date.
4. **Response to Action:** Was the party raising the concern satisfied with the outcome, if not, what else needs to be done, or is it outside the scope of the development works.
5. **Prevention of re-occurrence:** If the concern relates directly to an operational problem, what action has been taken to ensure the problem will not occur again.

The register must be available to DERM or TPR at request.

All complaints must be responded to with two business days of the complaint being raised.

7.8 Site Access and Signage

Fencing shall be provided to restrict public access to the site. Fencing shall be to a standard that meets Workplace Health and Safety requirements and prevents unauthorised access by the public. Warning and safety signs (as required under workplace legislation) shall be placed at site access points.

8.0 DECONTAMINATION PROCEDURES

The contractor shall reduce the potential for material to be tracked off the site by the tyres of vehicles as far as practical. This could include a restriction on off-site vehicle movement during wet conditions, the manual cleaning of vehicle wheels prior to vehicles leaving the site, the use of a wheel wash or other measures. Details of the system to be implemented shall be provided in the CEMP.

9.0 HEALTH AND SAFETY

A *Health and Safety Plan* must be prepared for the activities to be performed on the site where employees may be exposed to toxic or other hazardous compounds and elements. Specific requirements relating to dermal contact and inhalation as well as public safety, vehicle decontamination, protective clothing, equipment and appropriate safety controls must be addressed. Personnel working on the site during remediation works must be inducted and sign relevant forms stating that the induction has been carried out.

Works will be according to the *Workplace Health and Safety Act (1995)* and *Workplace Health and Safety Regulations (2008)*.

10.0 REPORTING

The progress of the works will be reported to the TPR on a regular basis. Fill characterisation and validation sampling results will be supplied to the TPR in the form of reports as the data becomes available.

Within 60 days of the completion of all remediation and validation works, a report detailing works must be prepared by a suitable qualified person in accordance with Section 4.6 and submitted to the TPR for certification prior to submission to the DERM. The report submitted should be in accordance with Chapter 7, Part 8 of the EP Act and the *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland* May (1998) and NEPM requirements.

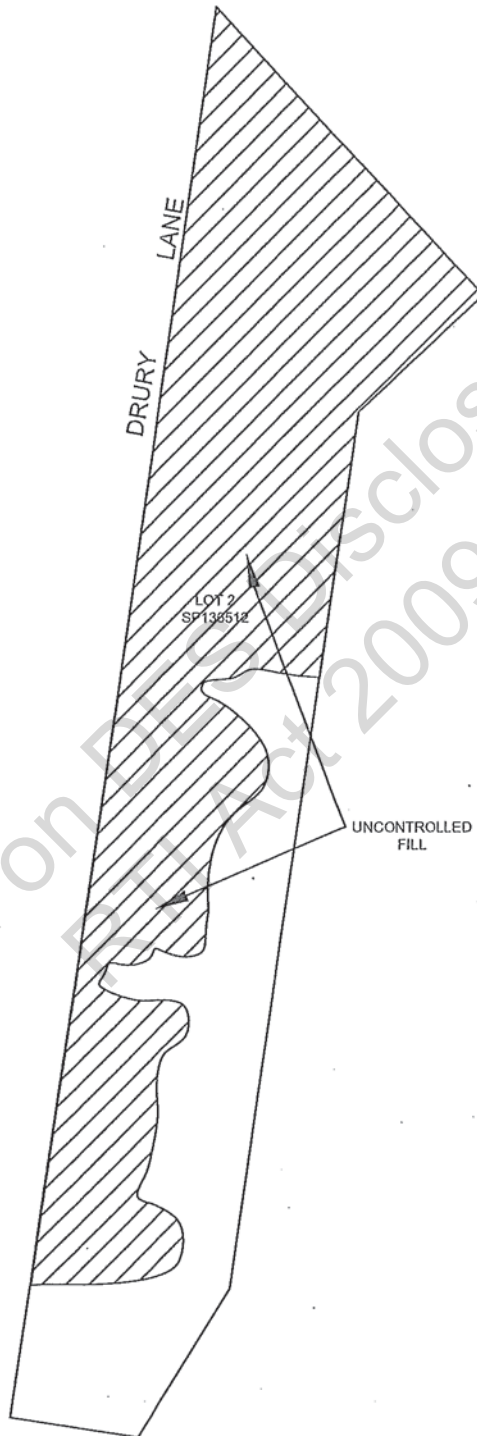
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The report shall include but not be limited to documentation of the remediation and characterisation program activities (including photographic records and daily site diaries detailing volumes of soil moved), records of all offsite disposal, analysis of characterisation results and an evaluation of the results against the validation criteria.

The report shall also include the results of the QA/QC program, Chain of Custody documentation and Sample Receipt Advices for all samples collected and copies of documentation validating the appropriate handling, disposal and treatment of any contaminated soil, materials and water in accordance with DERM requirements.

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Act 2009



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10 May 2010

Site ID: 82380
File Number: BNE35253
Enquiries to: Contaminated Land Unit
Telephone: (07) 3330 5685

FRASER COAST REGIONAL COUNCIL
RESERVE FOR DRAINAGE
PO BOX 1943
HERVEY BAY QLD 4655

CERTIFICATE OF APPROVAL OF A SITE MANAGEMENT PLAN

This document provides written notification that, in accordance with the *Environmental Protection Act 1994 (EP Act)*, a site management plan has been approved for the parcel of land described below, which is recorded on the Environmental Management Register (EMR). A copy of the suitability statement and the site management plan is attached.

Lot: 3 Plan: SP200633
Fraser Coast Regional Council

DRURY LANE
DUNDOWRAN 4655

The owner may apply to the Department of Environment and Resource Management (DERM) to amend the site management plan in accordance with section 418 of the *EP Act*.

Under section 434 of the *EP Act*, a person must not contravene a site management plan.

The owner may apply for a review of, and appeal against, the decision to approve the site management plan within 14 days after receipt of this notice in accordance with sections 521 and 531 of the *EP Act*.

In accordance with the land being recorded on the EMR, the following requirements apply under section 421 of the *EP Act*:

If the owner proposes to dispose of the land to someone else, the owner must, before agreeing to dispose of the land, give written notice to the buyer:
if the particulars of the land are recorded in the EMR - that the particulars are recorded in the register; and
if the land is subject to a site management plan, details of the plan.

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Further information regarding this notice may be obtained by contacting the Contaminated Land Unit, Department of Environment and Resource Management on telephone (07) 3330 5685. Further information about contaminated land matters may be obtained by visiting our web-site at: http://www.derm.qld.gov.au/environmental_management/land/contaminated_land/

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ANNEXURE 1 - SITE MANAGEMENT PLAN

LOT : 3 PLAN : SP200633 FILE REF : BNE35253 PRINTED: 10/05/2010

DATE OF EFFECT : 16/03/2010

1.0 SUMMARY OF CONTAMINATION

The site, located at Lot 2 Drury Lane, Dundowran, QLD, was originally a sand extraction operation. The majority of the extraction area was subsequently filled in a relatively uncontrolled manner. The placement of uncontrolled fill over the site has resulted in the listing of the site on the Environmental Management Register for the Notifiable Activity - Landfill.

The filled areas of Lot 2 are shown on attached Figure 1 and contain materials including:

Building rubble (including large pieces of concrete greater than 300mm diameter), steel, bitumen, timber, bricks, iron, tyres, car parts, animal carcasses, wire, gravel, plastic, PVC pipe, cobbles, sandstone and uncontrolled soil fill.

Metals impacted soils (above HILA) - Maximum concentrations of contamination in soil exceeding the HIL 'A' are described below:

Analyte	Maximum Concentration (mg/kg)
Arsenic	111

The strategy by which these materials will be removed and/or managed to enable removal of the site from the Environmental Management Register (EMR) is contained in the Remediation Action Plan (RAP) attached as Appendix 1.

2.0 OBJECTIVES OF THE SMP

The purpose of this SMP is to manage identified contamination on the site in a manner that protects human health and the environment.

3.0 ACHIEVEMENT AND MAINTENANCE OF OBJECTIVES

3.1 Responsibility. The owner of the land (as defined in the *Environmental Protection Act 1994*) is to ensure that this SMP and any variations approved or required by the administering authority are complied with. The obligations and conditions set out in this SMP bind the owner, from time to time, of the land.

3.2 Site Use. The site is currently a landfill site and is proposed to be redeveloped and subdivided into an industrial estate. Prior to commencement of this new land use, remedial works will be conducted with the primarily intent removing the site from the EMR. All remediation and validation works for this site are to be carried out in accordance with Appendix 1 - Remediation Action Plan (RAP).

3.3 Third Party Reviewer (TPR). A Third Party Reviewer (TPR) approved by the DERM and operating in accordance with the DERM's Terms of Reference for TPR (February 2008) must be appointed for the duration of the site assessment and remediation activities.

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3.4 *Provision of SMP to appropriate persons.* The owner must provide all persons involved in building design and planning and all contractors and lessees conducting building and/or excavation works with a copy of the SMP prior to commencement of site works. All persons occupying or working on the site must comply with the requirements of the SMP.

3.5 *Surface capping and protective barriers.* Existing surface cover across filled areas shall be maintained until such time as remediation works occur.

3.6 *Service Trenches.* All underground services must be constructed in either uncontaminated material or in trenches in which the services are surrounded by a minimum of 0.3m of uncontaminated fill for minor services (< 100 mm in diameter), and 0.5m of uncontaminated fill for services greater than 100 mm in diameter.

3.7 *Soil Excavation & Removal.* Uncontrolled fills must not be removed from site without suitable characterisation sampling and analysis. Representative characterisation sampling and analysis of any uncontrolled fill materials excavated from the site must be managed by a suitably qualified and experienced person in accordance with Section 381 of the *Environmental Protection Act 1994* (EP Act). Contaminated soil must not be removed off-site without a disposal permit in accordance with Section 424 of the EP Act.

3.8 *Unexpected Contamination.* If during any site earthworks or excavation, offensive or noxious odours and/or evidence of gross contamination not previously detected are observed, site works are to cease in that area and action taken to immediately abate the environmental harm. The administering authority is to be notified in writing within 2 business days of detection and advised of appropriate remedial action.

Any remedial action is to be developed by an appropriately qualified and experienced person in accordance with Section 381 of the EP Act.

3.9 *General Environmental Protection.* All earthworks are to be undertaken in accordance with general environmental protection measures to avoid unwanted migration and deposition of soil. These measures include the control of dust, noise, stormwater runoff, sediment, erosion, spillage from haulage trucks and odour releases involving the handling or movement of contaminated material.

3.10 *Workplace Health and Safety.* A Workplace Health and Safety Plan (WH&S plan), which conforms to the requirements of the *Workplace Health and Safety Act 1995* is to be developed for any site excavation works in contaminated areas. The WH&S plan must specifically address contaminants of concern.

4.0 MONITORING AND REPORTING

The owner is to ensure that the following reporting and monitoring is performed to ensure compliance with the SMP:

Until remediation commences: Records are to be kept of all inspections, any soil excavation in contaminated areas, disposal permits and site management plan compliance for review by the administering authority from time to time. A biennial inspection is to be undertaken to ensure that capping and protective barriers remain in sound condition at all times in accordance with Section 3.5.

The biennial period is to commence from the effective date of this plan.

Once remediation commences:

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Monitoring and reporting is to be conducted as required in Appendix 1 - Remediation Action Plan (RAP).

In addition to the reporting required in the RAP, within 45 days from the completion of site development a report is to be submitted to the TPR documenting details of remediation activities, the results of any sampling undertaken during remediation, records of any site inspections and details of Site Management Plan compliance. The report is to be prepared by a suitably qualified and experienced person in accordance with Section 381 of the *Environmental Protection Act 1994* (EP Act).

This Site Management Plan (SMP) has been developed to manage site contamination risks present at the issue date. Subsequent uses of the site may result in the need to review the plan.

This SMP makes reference to a plan attachment that is available from the Administering Authority if required.

This SMP makes reference to a Remediation Action Plan attachment that is available from the Administering Authority if required.

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SUITABILITY STATEMENT

DATE PRINTED: 10/05/2010

OWNER

FRASER COAST REGIONAL COUNCIL
RESERVE FOR DRAINAGE
PO BOX 1943
HERVEY BAY QLD 4655

DATE OF ISSUE : 16/03/2010

PROPERTY DESCRIPTION

LOT : 3 PLAN : SP200633
DRURY LANE
DUNDOWRAN 4655

Fraser Coast Regional Council
EMR Site ID: 82380 . FILE REFERENCE: BNE35253

STUDIES UNDERTAKEN BY APPLICANT OR REQUESTED BY DIRECTOR

Report on Geotechnical Investigation, proposed industrial subdivision, Lot 11 Drury Lane, Hervey Bay, Queensland, prepared by Golder Associates Pty Ltd, dated July 2007, (Doc No. 077683505 (AB)).

Stage 2 Detailed Site Investigation, Lot 11 on RP909375, Drury Lane, Dundowran, Queensland, prepared by Golder Associates Pty Ltd, dated November 2007 (Doc No 077683505 (AG))

Stage 1 Preliminary Site Investigation, Lot 11 on RP909375, Drury Lane, Dundowran, Queensland, prepared by Golder Associates Pty Ltd, dated August 2007 (Doc No 077683505(AA))

Report on Acid Sulfate Soil Investigation, Proposed Industrial Subdivision, Lot 11 Drury Lane, Dundowran, Queensland, prepared by Golder Associates Pty Ltd, dated August 2007,(Doc No. 077683505 (AE)).

Interim Third Party Review Summary Report for Drury Lane, Dundowran, Queensland, prepared by Lloyd Consulting Pty Ltd, dated December 2009, (Doc No. 09-528-R-001).

Additional Field Investigations - Supplementary Report, Lot 11 on RP909375, Drury Lane, Dundowran, prepared by Golder Associates Pty Ltd, dated December 2009 (Doc No AS077683505-8000r)

STATEMENT OF SUITABILITY

On the basis of the information supplied to this Department, the subject site is suitable for the following use(s) providing the site is used and managed as per the Site Management Plan attached as Annexure 1.

Suitable for industrial/commercial use including premises such as shops, offices and industrial buildings (but excluding uses where regular soil access by children is possible).

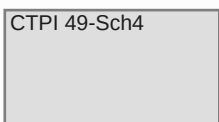
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Other specific uses may be suitable for the site, please contact this Department for further advice. The suitability statement provides information on appropriate land uses at the date of effect. Subsequent uses of the site for notifiable activities or for situations where a hazardous contaminant is released into the soil may result in the need to review suitable uses or amend the attached site management plan.

ENVIRONMENTAL MANAGEMENT REGISTER

LOT : 3 PLAN : SP200633 is recorded on the Environmental Management Register with a Site Management Plan. A copy of the Site Management Plan is attached as Annexure 1.

CTPI 49-Sch4

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Delegate of Administering Authority
Environmental Protection Act 1994

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APPENDIX 1
REMEDIATION ACTION PLAN
LOT: 2 **PLAN: SP136512**
FILE REF: BNE35253
DATE OF EFFECT: 18 / 03 / 2010

1.0 INTRODUCTION

This Remediation Action Plan (RAP) has been prepared for remediation of the uncontrolled fill on Lot 2 on SP136512, located at Lot 2 Drury Lane, Dundowran, QLD. The remediation works are required to remove materials that may pose a risk to the health of future site users or the environment. The works required include excavation of all fill materials, separation of recyclables, stained/odorous materials and characterisation of remaining materials for reuse or offsite disposal.

1.1 Purpose of the RAP

This document has been prepared to describe remediation strategies and control measures aimed at achieving removal of the site from the Environmental Management Register (EMR).

1.2 Remediation Objective

The primary objective of the remediation works is to obtain a Site Suitability Statement to support future redevelopment of the site.

1.3 Third Party Reviewer

A Third Party Reviewer (TPR) must be appointed for the duration of investigation and remediation works. The site work and subsequent reporting is to be certified by a DERM approved Third Party Reviewer (TPR). All validation requirements must first have consent from the TPR and any clarification issues will be referred to the TPR prior to the DERM. The TPR will approve the proposed validation methodology, pre-validation sampling results, Disposal Permit applications and the final report.

The role of the TPR is to review all relevant documentation associated with the proposed RAP, to accept the proposed remediation strategy and certify that the site is suitable for any land use or specific land uses (as required) in accordance with DERM Terms of Reference for Third Party Review dated February 2008.

2.0 BACKGROUND

2.1 Site History

The subject site is identified as Lot 2 SP136512 and is approximately 9.174 ha in area. The site history indicates that Lot 2 SP136512 was historically used for sand extraction. Following sand extraction, filling was undertaken across the majority of the site to return it to about its original level. The uncontrolled filling of the site resulted in Lot 2 SP136512 been listed on the EMR for Notifiable Activity No.20: Landfill – disposing of waste.

2.2 Topography

The regional topography is generally low and flat comprising large tracts of Wallum heath and ti-tree swamps. The nearest creek is approximately 2 km north (Eli Creek) and the ocean is approximately 500m beyond Eli Creek. A manmade lake is located approximately 300m to the east of the site.

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At the time of the investigation, the site showed the effects of past sand extraction work and filling. The central portion of the site was about 2 m to 3 m higher than the northern and southern portions of the site. Much of the site is variable in slope, with elevated areas of fill materials. It appears that the majority of the site has been filled. At the time of the investigation, the south-eastern portion of the site was low lying and inundated with water. During the 2006 investigation the site was covered in thick grass and scattered shrubs. However, during the 2007 investigation most of the site was covered in bare earth with minimal grass cover due to recent excavation works.

Surface drainage generally follows the contours towards the low lying areas in the eastern and southern boundaries of the site. The site is generally well drained, with storm water run-off expected to be shed as sheet flow.

2.3 Geology

Available geological information (1:250,000 Geological Map, MARYBOROUGH, Sheet SG 56-6 Part 9544, Department of Resource Industries, 1992) indicates that the site is underlain by Quaternary (Holocene) age "beach ridges: sand, shelly sand, minor gravel", possibly overlying slightly older (Pleistocene) sediments of "Undifferentiated coastal plains: sand, silt, mud". The Quaternary sediments are underlain at depth by the early Cretaceous age Maryborough Formation containing "mudstone, siltstone, shale, sandstone". Over most of the site, the upper sand appears to have been removed as part of previous sand extraction work. A total of 60 test pit locations have been investigated across the site. These investigations revealed the presence of uncontrolled fill materials to depths ranging from surface to 5.5 m. The uncontrolled fill encountered generally comprised sandy clay containing varying amounts of building rubble (including large pieces of concrete greater than 300mm diameter), steel, bitumen fragments (old road surfaces), timber, bricks, iron, tyres, car parts, animal carcasses, wire, gravel, plastic, PVC pipe, cobbles, and sandstone. The fill materials overlie natural clayey sands.

2.4 Hydrogeology

Groundwater was recorded at depths of 0.7 m to 3.7 m in the monitoring wells, which were installed as part of the acid sulfate soils investigation. Based on the ground levels, the variation in groundwater depths measured in the wells, and the fact that only minor water seepage was observed in the test pits excavated to depths of up to 6 m below existing ground level, the groundwater encountered is considered to be "perched" water located within limited zones within the fill.

This is further evidenced by the adjacent site (Lot 11), where ground levels are approximately 3 m lower. It should be noted that groundwater inflows into monitoring wells were very slow and the resulting yields are not considered to represent a viable source of potable water or other extractive groundwater use.

2.5 Information Sources

Previous investigation reports considered in the preparing this RAP include:

Stage 1 Preliminary Site Investigation, Lot 2 SP136512, Drury Lane, Dundowran, [ref. Golder Associates 077683504(AI) dated November 2007].

Stage 2 Detailed Site Investigation, Lot 2 SP136512, Drury Lane, Dundowran, [ref. Golder Associates 077683504(AG) dated November 2007].

2.6 Historical Data

The historical data identified the following potential sources of contamination at this site:

Potential Contamination Source
Uncontrolled fill

Potential Contaminant
Hydrocarbons (TPH & BTEX),
PAH Phenols, PCB, Metals (As, Cd,
Cr, Cu, Pb, Ni, Hg, Zn),
organochlorine and organophosphorous
pesticides and asbestos

2.7 Soil Contamination

2.7.1 General

The available data indicated that there are broadly two main types of contamination that need to be addressed in the remediation strategy. These comprise deleterious materials (including oversize concrete) and arsenic impact within the fills

It is estimated that about 250,000 m³ (insitu) of fill material has been disposed of across the site (refer to the attached Figure 1).

2.7.2 Deleterious Materials

Building rubble (including large pieces of concrete greater than 300mm diameter), steel, bitumen, timber, bricks, iron, tyres, car parts, animal carcasses, wire, gravel, plastic, PVC pipe, cobbles, and sandstone were observed within the uncontrolled fill. No visual evidence of fibre board sheeting fragments was observed within the uncontrolled fill exposed during test pit investigations. Department of Environment and Resource Management (DERM) C&D waste Operational Policy indicates that where C&D waste is separated into its constituent parts, the inert parts may be used as clean fill. The Operational Policy indicates that the following materials are considered to be inert:

- bricks/pavers/ceramics;
- concrete (including embedded steel reinforcing rods), pulverised to a maximum 300mm nominal size; and
- clean earthen fill.

Deleterious materials other than the above inert materials will need to be segregated and removed from site during remediation works.

2.7.3 Metals Impacted Fill

Limited testing of the uncontrolled fill materials confirmed the presence of some metals (arsenic, chromium, nickel, and zinc) impacted soils with concentrations exceeding environmental assessment criteria. Arsenic was detected exceeding the Health-based Investigation Levels for use in a "standard" residential setting. In the absence of more detailed characterization of fill materials, it has been assumed that zones of metals impact occur within the uncontrolled fill materials.

2.7.4 Groundwater

Field tests on groundwater samples from site well locations indicated acidic groundwater ranging from pH 5.2 to pH 5.6. Electrical Conductivity ranged between 0.56 mS/cm and 0.77 mS/cm, which indicate freshwater conditions. No free phase product, sheens, discolouration or odours (that may indicate the presence of possible contamination) were observed within the groundwater. Analytical results on groundwater samples collected from the three site wells did not detect concentrations of potential contaminants (arsenic, cadmium, chromium, copper, nickel, lead, zinc, mercury, TPH, BTEX, PAH and organochlorine and organophosphorus pesticides) that are considered to represent an environmental risk.

The investigation results suggest that there will not be a need for large scale dewatering operations during excavation of uncontrolled fill materials. If

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dewatering is required during remediation works, waters can be disposed to the ground surface or reused for onsite for dust suppression.

3.0 ENVIRONMENTAL GUIDELINES

The remedial activities undertaken at the site must be performed in accordance with the following documents:

- *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland*, May 1998;
- *Draft Hydrocarbon Guidelines*, Contaminated Land Unit, Queensland EPA, January 1999;
- *Guidelines issued under Schedule B of the National Environment Protection (Assessment of Site Contamination) Measure* (NEPM), National Environment Protection Council, December 1999;
- *Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites* (ANZECC guidelines) published by the Australian and New Zealand Environment and Conservation Council/National Health and Medical Research Council, January 1992;
- Australian Standard AS4482.1-2005 *Guide to the sampling and investigation of potentially contaminated soil Part 1 – Non volatile and semi volatile compounds*; and
- Australian Standard AS4482.2-2005 *Guide to the sampling and investigation of potentially contaminated soil Part 1 – Volatile and semi volatile compounds*

4.0 REMEDIAL GOALS AND VALIDATION CRITERIA

4.1 General

Remediation and acceptance criteria for soils contained in the following sections are based redevelopment of the site for unrestricted land use. The criteria consider a range of issues including human health risk, environmental risk and aesthetic considerations such as odour and discoloration.

Criteria should be applied to the 95% Upper Confidence Level (UCL) on the mean of data for each domain of interest, with no hot-spot concentrations greater than 2.5 times the relevant criteria value. The domains of interest at this Site will be each individual stockpile of excavated soil. Sufficient samples must be collected within each domain of interest to ensure that statistical analysis is valid. The nominated criteria are based on various national and international standards.

4.2 Characterisation of Soils for Reuse

Soil acceptance criteria for reuse on site are listed below.

Parameter	EMR Removal & "Clean" Fill
<u>Petroleum Hydrocarbons</u>	
TPH (C ₆ – C ₉)	100 mg/kg ⁽¹⁾
TPH (C ₁₀ – C ₁₄)	100 mg/kg ⁽¹⁾
TPH (C ₁₅ – C ₂₈)	1000 mg/kg ⁽¹⁾
TPH (C ₂₉ - C ₃₆)	1000 mg/kg ⁽¹⁾
<u>Monocyclic Aromatic Hydrocarbons</u>	
Benzene	1 mg/kg ⁽¹⁾
Toluene	
Ethyl Benzene	Total BTEX = 7 mg/kg ⁽¹⁾
Xylene	
<u>Polycyclic Aromatic Hydrocarbons</u>	
Benzo(a)pyrene	1 mg/kg ⁽²⁾
Total PAH	20 mg/kg ⁽²⁾

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Inorganics

Arsenic	100 mg/kg ⁽²⁾
Cadmium	3 mg/kg ⁽³⁾
Chromium VI	100 mg/kg ⁽²⁾
Copper	200 mg/kg ⁽⁵⁾
Lead	300 mg/kg ⁽²⁾
Nickel	60 mg/kg ⁽³⁾
Mercury	1 mg/kg ⁽³⁾
Zinc	400 mg/kg ⁽⁵⁾

Organochlorine Pesticides

Aldrin + Dieldrin	10 ⁽²⁾
Chlordane	50 ⁽²⁾
DDT & Derivatives	200 ⁽²⁾
Heptachlor	10 ⁽²⁾

Other

Polychlorinated biphenyls	10 ⁽²⁾
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Physical Criteria

Odour	- No detectable hydrocarbon odour
Staining	- No visible hydrocarbon staining
Domestic and Garden Refuse	- No visible municipal waste materials
Construction and Demolition Waste	- Concrete (including embedded steel reinforcing rods), pulverised to a maximum 300mm nominal size ⁽⁴⁾
	- No visible timber or other deleterious materials
Asbestos	- No detectable asbestos fibres or fragments ⁽⁶⁾

Notes:

- (1) Draft Hydrocarbon Guidelines – QLD DERM 1999
- (2) Health Based Investigation Levels for Exposure Setting “A” (‘Standard’ Residential with garden/accessible soil) – Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland, Queensland Department of Environmental 1998.
- (3) Environmental Investigation Levels – Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland, Queensland Department of Environmental 1998.
- (4) Inert Waste Policy, EPA
- (5) Elevated Environmental Investigation Level for Low Phytotoxicity Setting
- (6) Western Australia Department of Health *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*, May 2009.

These criteria may be amended, subject to approval by the TPR, or TPR and DERM where it can be demonstrated that alternative concentrations are protective of human health, the environment and aesthetic considerations. In addition, these criteria may be amended to environmental investigation levels (as listed in *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland*, Queensland Department of Environment May 1998) should sensitive environmental receptors be identified at or in close proximity to the site. Criteria for other additional parameters, if required, must be approved by the TPR.

4.3 Groundwater

Samples of groundwater entering excavations during the remediation works shall be collected to allow assessment of potential risk to the surrounding environment and groundwater users. The following acceptance criteria shall be applied to groundwater results:

Parameter	Acceptance Levels
<u>Petroleum Hydrocarbons</u>	
TPH (C ₆ – C ₉)	0.15 mg/L ⁽¹⁾
TPH (C ₁₀ – C ₃₆)	0.6 mg/L ⁽²⁾
<u>Inorganics</u>	
Arsenic	< ANZECC Water Quality Guidelines 2000, Trigger Values for Fresh Waters 95% Level of Protection
Cadmium	
Chromium (total)	
Copper	
Lead	
Nickel	
Mercury	
Zinc	
<u>Monocyclic Aromatic</u>	
<u>Hydrocarbons</u>	
Benzene	
Toluene	
Ethyl Benzene	
Xylene	
<u>Organochlorine & Organophosphorus</u>	
<u>Pesticides</u>	

Notes:

- (1) Dutch C - Netherlands Soil Clean-up Guideline, 1983
- (2) Dutch Intervention Value - Environmental Quality Objectives in the Netherlands, 1994
- (3) No specific criteria or guidelines have been published in Queensland or Australia for the assessment of TPH contamination in groundwater. In the absence of State or National guidelines, intervention values for hydrocarbons contained in Dutch Guidelines have been adopted for assessment of environmental risk from TPH. TPH concentrations exceeding these guideline criteria may represent a threat to the environment and require specific assessment of risk.

These criteria may be amended, subject to approval by the TPR, or TPR and DERM where it can be demonstrated that alternative concentrations are protective of human health, the environment and aesthetic considerations. Criteria for other additional parameters, if required, must be approved by the TPR.

Where concentrations are detected exceeding the above criteria, further assessment of the risk will be required. This assessment may include more detailed groundwater investigations to evaluate "background" groundwater quality/conditions and identification of potential receptors and exposure routes. A qualitative risk assessment should be conducted on the basis of the above. Where unacceptable risk is indicated the a quantitative risk assessment and/or remedial works will be required. The scope and methodology of any further groundwater investigation/assessment shall be agreed with the TPR, prior to commencement of such works.

Release

4.4 Imported Fill Materials

Imported fill materials (if required) to backfill the site up final development levels shall be from a registered quarry

Materials from alternative sources may be accepted in consultation with the TPR where it can be demonstrated that the material are not impacted by contamination.

4.5 Sampling Frequency and Quality Assurance / Quality Control

4.5.1 Soils

Characterisation sampling of soils for reuse or removal from site will be required at a frequency of at least 1 sample per 50m³ for individual stockpiles of similar soil types. If mixed soil types are noted in stockpiles then characterisation samples must be collected of each material types present at a rate of at least 1 sample per 50m³. A minimum of 9 samples must be collected within each stockpile where statistical assessment of result is proposed for validation purposes.

A quality assurance/quality control program shall be conducted during characterization sampling. This program shall include collection and analysis of:

- Blind replicate samples at a frequency of 1 for every 20 samples collected.

- Split samples at a frequency of 1 for every 20 samples collected.

- Equipment rinsate samples for each day where sampling is conducted.

4.5.2 Groundwater

At least two rounds of groundwater samples shall be collected from excavation sumps following completion of excavations.

A quality assurance/quality control program shall be conducted during groundwater sampling. This program shall include collection and analysis of:

- A blind replicate sample during each sampling round.

- A split sample during each sampling round.

- An equipment rinsate sample during each sampling round.

4.6 Sampling & Reporting

Characterisation sampling shall be conducted under the direction of a suitably qualified and experienced person in accordance with Section 381 of the Environmental Protection Act 1994 (EP Act). Standard procedures that include sample equipment decontamination, sample handling, sample storage and documentation shall be applied.

At the completion of remediation works a Validation Report must be prepared by the suitably qualified and experienced person that documents the works undertaken and compliance with the agreed remediation works. This report shall be submitted to the TPR for certification and subsequent submission to DERM.

4.7 Analytical Testing

Analytical testing for the characterization/validation program should be conducted by a NATA accredited laboratory. If the laboratory is not NATA accredited, at least 10% of the samples under investigation must be submitted to a NATA accredited laboratory as a quality check. Please note that asbestos sampling and analysis should be undertaken in accordance with the Western Australia Department of Health *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*, May 2009. Analysis of collected characterization samples shall be undertaken as follows:

- Metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn) All soil samples.

Release

Petroleum Hydrocarbons	All soil samples with visual or olfactory impacts, otherwise 10% of soil samples.
Monocyclic Aromatic Hydrocarbons	All soil samples with visual or olfactory impacts, otherwise 10% of soil samples.
Polycyclic Aromatic Hydrocarbons	All soil samples with visual or olfactory impacts, otherwise 10% of soil samples.
Organochlorine /Organophosphorus Pesticides	All soil samples.
Asbestos	In Accordance with Western Australia Department of Health <i>Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia</i> , May 2009

These criteria may be amended, subject to approval by the TPR, where it can be demonstrated that alternative concentrations are protective of human health, the environment and aesthetic considerations. Criteria for other additional parameters, if required, must be approved by the TPR.

5.0 REMEDIATION STRATEGY

The remediation strategy for this site comprises the following:

- Excavation of all uncontrolled fill materials.
- Segregation of soil materials from deleterious materials.
- Characterization of separated soil materials for either reuse on site as "clean" fill or for offsite disposal.
- Pulverisation/crushing of bricks and concrete (> 300 mm diameter) to enable reuse as inert site fill.
- Offsite disposal of remaining deleterious materials

Detailed management procedures for this strategy are provided in the following sections. These procedures may be amended, subject to approval by the TPR, where it can be demonstrated that alternative procedures are protective of human health, the environment and aesthetic considerations.

6.0 REMEDIATION PROGRAM

6.1 Excavation and Segregation of Materials

Approximately 250,000 m³ (insitu volume) of uncontrolled fill will need to be excavated and segregated. Excavations shall be continued both laterally and vertically until all uncontrolled fill materials have been removed.

A suitably qualified and experienced person pursuant to s381 and 395 must monitor all excavation works and screen excavated materials using a photo-ionisation detector (PID). Excavations shall be conducted in a manner which targets removal and stockpiling of visually similar materials. Daily photographic and written records of inspection and monitoring shall be kept.

Any materials observed to contain building rubble and other deleterious materials will be segregated from soils and separately stockpiled. Where hydrocarbon odours, staining, elevated PID readings or other indicators of suspected impact are noted, these materials shall be segregated from other material and separately stockpiled for characterisation.

Release

Groundwater encountered during the excavation of overburden shall be collected from a sump excavated in the low point of the excavation. Reuse or disposal of groundwater is discussed in Section 5.5.

An area of approximately 25,000 m² of land is available on an adjacent lot (Lot 11), which is also owned by the client and listed on the EMR for the same reason (land filling), for the stockpiling of excavated materials. Operational controls to be adopted during the excavation, onsite transportation and stockpiling of excavated materials are discussed in Section 6.0.

Movement and stockpiling of excavated materials shall be conducted under a materials tracking plan approved by the TPR.

6.2 Soil Characterisation Stockpiles

Stockpiles of soil materials shall be sampled and analysed in accordance with Section 3.4.

Stockpiles found to be in compliance with the validation criteria shall be reused to backfill excavations. Stockpiles found not to be in compliance with the validation criteria shall be removed from site. An offsite disposal permit shall be obtained through the TPR prior to removal of these soils from site. Disposal to landfill shall only occur under an approved Disposal Permit issued by DERM.

6.3 Suspected Contaminated Material Stockpiles

Segregated stockpiles of materials with odours, staining, elevated PID readings or other indicators of suspected contamination impact (such as bitumen) shall be sampled and analysed to evaluate their contamination status and the need for pre-treatment prior to landfill disposal. An offsite disposal permit shall be obtained through the TPR prior to removal of contaminated soils from this site. Disposal to landfill shall only occur under an approved Disposal Permit issued by DERM.

6.4 Deleterious Materials Stockpiles

Deleterious materials shall be further segregated in separate stockpiles and managed as follows:

- Bricks and concrete – where practical shall be pulverized or crushed to a size of less than 75mm diameter to enable reuse on site as inert fill.

- Materials not meeting this criteria shall be removed from site for disposal at appropriately licensed landfill.

- Metal (including wire, steel, iron, and car parts) - shall be removed from site for recycling.

- Domestic and Greenwastes (including animal carcasses) - shall be removed from site for disposal at an appropriate landfill.

- Other demolition materials (including timber, plastic and PVC pipes) - shall be removed from site for disposal at an appropriate landfill.

- Asbestos – where asbestos sheeting or fragments are identified, this material shall be placed directly into lined containers and managed in accordance with asbestos workplace health and safety regulations. This will be conducted by a suitably licensed asbestos removal contractor.

6.5 Water Treatment & Disposal

Groundwater seepage into excavations may be collected and used for dust suppression within excavation areas or in stockpile areas where suitable control measures are in place to prevent runoff from discharging into external waterways.

Groundwater testing from across the site has indicated that the groundwater is generally of a quality which represents a low environmental risk. However, permission from DERM and the local Council would be required prior to discharge to water ways. Discharges to surface waters shall comply with all conditions in issued permits (including any pretreatment required to remove sediments). Alternatively, water from the site shall be collected and disposed of by a licensed tradewaste contractor.

7.0 OPERATION CONTROL

7.1 Construction Environment Management Plan

A Construction Environmental Management Plan (CEMP) for the Site shall be prepared incorporating detailed elements covering environmental management of the Site to ensure environmental effects of the remediation work are kept to a minimum and in compliance with all relevant Acts of Parliament and Environmental Regulations.

The CEMP must be approved by the TPR prior to commencement of works on site.

The CEMP shall contain management approaches for, but not limited to, the following areas:

Land Disturbance

Erosion and sediment control devices;

Management of stormwater;

Management of excavated materials and stockpiles;

Dust control;

Noise and Vibration

Operating hours;

Vehicles and equipment;

Traffic;

Noise abatement;

Vibration.

Other

Litter;

Storage of chemicals and fuel;

Road cleaning and truck wash;

Development of the details within each of these segments of the CEMP shall incorporate the general management approach, the environmental criteria to be met and specific engineering controls to be used.

Requirements in the following sections shall also be considered and addressed as part of the CEMP.

7.2 Stormwater Management

A site-specific stormwater management plan is required to be developed prior to the commencement of site works. Stormwater management works are to include controls for construction activities and soil conservation measures such as diversion drains, silt traps, sediment traps, litter traps and bank stabilization. Specific control measures are required to:

Contain stormwater runoff generated within excavations and stockpile areas; and

Prevent discharge to external waterways.

Control measures to be adopted may include:

Release

Use of bunds and spoon drains to isolate working areas from the remainder of the site catchment and to direct surface water from the working area into open excavations.

Formation of a collection sump at the lowest corner of the remedial excavations to collect stormwater entering the excavations and allow for dewatering of the excavation.

Inspection of the bunds, drains and sumps regularly during site remediation works to check their integrity and repair any faults as soon as practicable.

7.3 Soil and Sediment Control

A site-specific erosion and sediment control plan (ESCP) must be developed in accordance with local Council guidelines prior to the commencement of remediation works.

7.4 Noise Control

Site works shall be carried out between 6.30am and 6.30pm Monday to Saturday, or other alternative timeframes approved by local Council.

7.5 Dust Control

Potential for dust generation from excavation works and/or stockpiles shall be managed on an as required basis by spraying from water trucks, or other TPR approved method.

7.6 Community Relations

Prior to the commencement of site works, neighbouring properties shall be consulted to inform of the commencement and expected timing of the works. Concerns and complaints raised by the community (or other parties) during the remedial works will be noted and a register must be maintained to record the following information:

1. **Contact details:** Name, address and phone number of party raising concern.
2. **Nature of concern:** Details of issue/incident.
3. **Action taken or required:** Details of action proposed or undertaken to address the concern, including time and date.
4. **Response to Action:** Was the party raising the concern satisfied with the outcome, if not, what else needs to be done, or is it outside the scope of the development works.
5. **Prevention of re-occurrence:** If the concern relates directly to an operational problem, what action has been taken to ensure the problem will not occur again.

The register must be available to DERM or TPR at request.

All complaints must be responded to with two business days of the complaint being raised.

7.8 Site Access and Signage

Fencing shall be provided to restrict public access to the site. Fencing shall be to a standard that meets Workplace Health and Safety requirements and prevents unauthorised access by the public. Warning and safety signs (as required under workplace legislation) shall be placed at site access points.

8.0 DECONTAMINATION PROCEDURES

The contractor shall reduce the potential for material to be tracked off the site by the tyres of vehicles as far as practical. This could include a restriction on off-site vehicle movement during wet conditions, the manual cleaning of vehicle wheels prior to vehicles leaving the site, the use of a wheel wash or other measures.

Details of the system to be implemented shall be provided in the CEMP.

Release

9.0 HEALTH AND SAFETY

A *Health and Safety Plan* must be prepared for the activities to be performed on the site where employees may be exposed to toxic or other hazardous compounds and elements. Specific requirements relating to dermal contact and inhalation as well as public safety, vehicle decontamination, protective clothing, equipment and appropriate safety controls must be addressed. Personnel working on the site during remediation works must be inducted and sign relevant forms stating that the induction has been carried out.

Works will be according to the *Workplace Health and Safety Act (1995)* and *Workplace Health and Safety Regulations (2008)*.

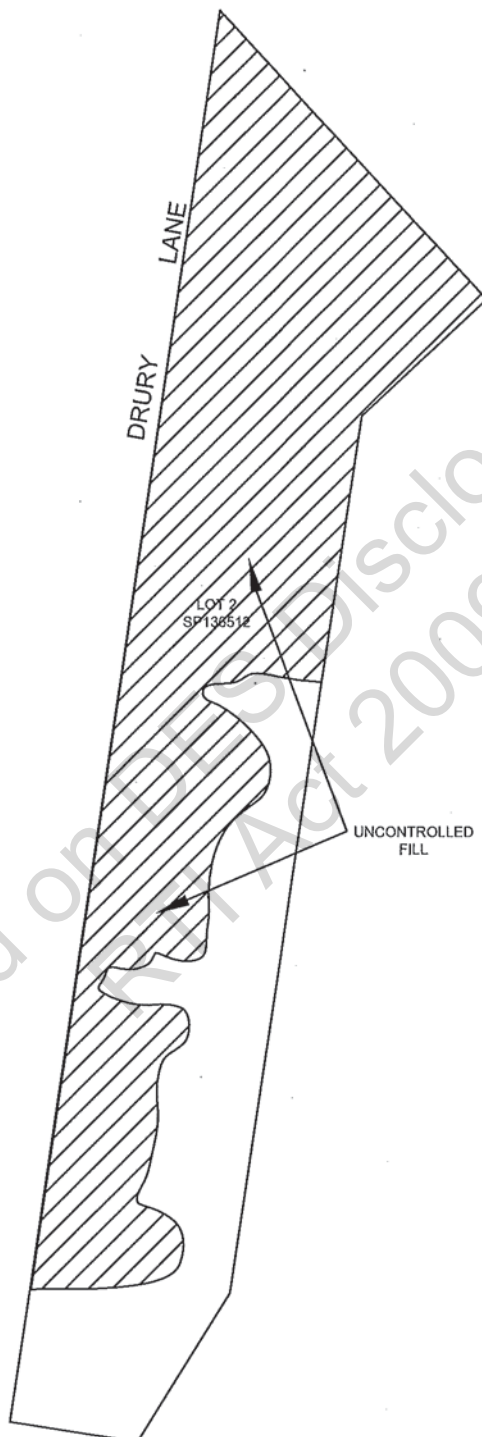
10.0 REPORTING

The progress of the works will be reported to the TPR on a regular basis. Fill characterisation and validation sampling results will be supplied to the TPR in the form of reports as the data becomes available.

Within 60 days of the completion of all remediation and validation works, a report detailing works must be prepared by a suitable qualified person in accordance with Section 4.6 and submitted to the TPR for certification prior to submission to the DERM. The report submitted should be in accordance with Chapter 7, Part 8 of the EP Act and the *Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland* May (1998) and NEPM requirements.

The report shall include but not be limited to documentation of the remediation and characterisation program activities (including photographic records and daily site diaries detailing volumes of soil moved), records of all offsite disposal, analysis of characterisation results and an evaluation of the results against the validation criteria.

The report shall also include the results of the QA/QC program, Chain of Custody documentation and Sample Receipt Advices for all samples collected and copies of documentation validating the appropriate handling, disposal and treatment of any contaminated soil, materials and water in accordance with DERM requirements.



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Release

26th March 2010

Dear Registrar,

Please recategorise Lot 2 & 3 SP200633 and Lot 11 RP909375 as managed on the EMR.

Note : Lot 2 SP136512 has been subdivided and is now known as Lot 2 & 3 SP200633.

OWNER: Lot 11 RP909375
AHC LIMITED
PO BOX 34
OXENFORD QLD 4210

OWNER: Lot 2 SP200633
RADWAY PTY LTD
PO BOX 34
OXENFORD QLD 4210

OWNER: Lot 3 SP200633
FRASER COAST REGIONAL COUNCIL
RESERVE FOR DRAINAGE
PO BOX 1943
HERVEY BAY QLD 4655

APPLICANT:

CTPI 49-Sch4

GOLDER ASSOCIATES PTY LTD
PO BOX 5569
MAROOCHYDORE BC QLD 4558

TPR:

CTPI 49-Sch4

LLOYD CONSULTING PTY LTD
PO BOX 320
WILSTON QLD 4051

Studies:

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Report on Geotechnical Investigation, proposed industrial subdivision, Lot 11 Drury Lane, Hervey Bay, Queensland, prepared by Golder Associates Pty Ltd, dated July 2007, (Doc No. 077683505 (AB)).

\line\line

Stage 2 Detailed Site Investigation, Lot 11 on RP909375, Drury Lane, Dundowran, Queensland, prepared by Golder Associates Pty Ltd, dated November 2007 (Doc No 077683505 (AG))

\line\line

Stage 1 Preliminary Site Investigation, Lot 11 on RP909375, Drury Lane, Dundowran, Queensland, prepared by Golder Associates Pty Ltd, dated August 2007 (Doc No 077683505(AA))

Task	Tick	Initial & Date
Check owner		
Check site address (QVAS)		
Check applicant		
Queue officer signed off on Stat dec.		
Update blue sheet		
Fill out SMP audit Folders		
Make green/blue copies		
Sign blue sheet		

\line\line

Report on Acid Sulfate Soil Investigation, Proposed Industrial Subdivision, Lot 11 Drury Lane, Dundowran, Queensland, prepared by Golder Associates Pty Ltd, dated August 2007, (Doc No. 077683505 (AE)).

\line\line

Interim Third Party Review Summary Report for Drury Lane, Dundowran, Queensland, prepared by Lloyd Consulting Pty Ltd, dated December 2009, (Doc No. 09-528-R-001).

\line\line

Additional Field Investigations – Supplementary Report, Lot 11 on RP909375, Drury Lane, Dundowran, prepared by Golder Associates Pty Ltd, dated December 2009 (Doc No AS077683505-8000r)

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Thanks,

Kim Barry

This document can be found at H:/drive / Contaminated Land / Studies / BNE35253