

CONTAMINATED
LAND SECTION

31 MAY 2000



STAGE 1 AND STAGE 2
SITE CONTAMINATION
ASSESSMENT - LOT 1
ON PLAN SL 5997
PART OF
SPRINGFIELD ESTATE

DRAFT

PREPARED FOR
PM AUSTRALIA PTY LTD

JUNE 1995
Project No. A32\00073\0001
Document No. R001-A.WP5

Woodward-Clyde



15 June, 1995
Project No. A32\00073\0001

Springfield Management Pty Ltd
C/- PM Australia Pty Ltd
Post Office Box 93
BOND UNIVERSITY QLD 4229

Attention: Mr Rob Ball

Dear Sir

**RE: STAGE 1 AND 2 SITE CONTAMINATION ASSESSMENT
LOT 1 ON PLAN SL 5997**

Please find enclosed one (1) copy of our draft report regarding the above.

Please call Nick Kennedy, should you have any queries.

Yours faithfully
WOODWARD-CLYDE

NICK KENNEDY
Senior Environmental Consultant

ALLAN BOASE
Principal Waste Management Services

A3200073\0001\R001-A.WP5\15 MAY 1995\PMcG:ll

DRAFT

TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
EXECUTIVE SUMMARY	ES-1
1.0 INTRODUCTION AND PURPOSE OF WORK	1-1
2.0 SCOPE OF WORK	2-1
3.0 SITE BACKGROUND REVIEW	3-1
3.1 SITE LOCATION AND DESCRIPTION	3-1
3.2 AVAILABLE INFORMATION	3-2
3.3 SITE HISTORY AND LAND USE	3-3
3.4 TOPOGRAPHY AND HYDROLOGY	3-4
3.5 GEOLOGY	3-4
4.0 SITE INVESTIGATION PROGRAM	4-1
4.1 SOIL SAMPLING PROGRAM	4-1
4.2 SAMPLING AND LABORATORY ANALYSIS PROCEDURES	4-1
5.0 RESULTS	5-1
5.1 DISCUSSION	5-9
5.1.1 Dump Area	5-9
5.1.2 Cattle Dip	5-9
6.0 SITE REMEDIATION PLAN	6-1
6.1 PROJECT PLANNING AND PRELIMINARY REGULATORY APPROVALS	6-2
6.2 CONTAMINATED MATERIALS EXCAVATION, STORAGE, SAMPLING AND ANALYSIS	6-2
6.3 VALIDATION SURVEY	6-3
6.4 TRANSPORT AND DISPOSAL OF WASTES AND CONTAMINATED MATERIALS	6-3
6.5 FINAL REPORT	6-3
7.0 CONCLUSIONS	7-1
8.0 REFERENCES	8-1

TABLE OF CONTENTS (Continued)

<u>Section</u>	<u>Page</u>
9.0 LIMITATION	9-1

LIST OF TABLES

TABLE 1 Details of Aerial Photographs	3-2
TABLE 2 Details of Soil Samples Collected - Dump Site	4-2
TABLE 3 Details of Soil Samples Collected - Dip Site	4-4
TABLE 4 Summary of Laboratory Analytical Results (Soils) - Dump Site	5-3
TABLE 5 Summary of Laboratory Analytical Results (Soils) - Dip Site	5-5
TABLE 6 Summary of Laboratory Analytical Results (TCLP) - Dip Site	5-8

LIST OF PLATES

PLATE 1 Existing Structure of Cattle Dip
PLATE 2 View of Cattle Dip Looking South
PLATE 3 Area Surrounding Cattle Dip Looking North
PLATE 4 Remainder of Drainage Platform
PLATE 5 Western Side of Dip, Showing Corrugated Surface
PLATE 6 Eastern Side of Dip
PLATE 7 View of Dump Site Looking North
PLATE 8 Dump Site, Adjacent to Mountain Creek

LIST OF FIGURES

FIGURE 1	Location Map.
FIGURE 2	Auger Hole Locations - Dump Site
FIGURE 3	Auger Hole Locations - Dip Site

LIST OF APPENDICES

APPENDIX A	Property Titles Information
APPENDIX B	Current DEH Investigation Threshold Levels for Some Contaminants in Soils
APPENDIX C	Laboratory Reports

EXECUTIVE SUMMARY

AGC Woodward-Clyde Pty Limited (Woodward-Clyde) was commissioned by PM Australia (for Springfield Management Pty Ltd) to undertake a Stage 1 (Preliminary) and Stage 2 (Further Investigation) site contamination assessment of a land parcel part of the proposed Springfield Estate.

The purpose of the work was to provide information regarding potential soil contamination on the property, prior to its redevelopment.

The scope of work carried out included the conduct of a detailed background review and a soils sampling and analysis program, based on the results of this review. No sampling or analysis of groundwaters was carried out.

A cattle dip was noted to exist at the site. The dip bath was still in existence, but other structures have been removed. The dip does not appear to still be in use.

A dump site was also noted to exist at the site.

The results obtained from preliminary site contamination assessment work carried out show arsenic and organochlorine pesticide levels in soils from the immediate vicinity of the cattle dip to exceed current Department of Environment and Heritage (DEH) health and environmental threshold levels. The reported levels of other "indicator parameters" tested in soil samples collected from across the site, including the dump site, were either below current DEH investigation threshold levels within typical "background ranges" for the soil types encountered, or below laboratory reporting limits.

INTRODUCTION AND PURPOSE OF WORK

AGC Woodward-Clyde Pty Ltd (Woodward-Clyde) was commissioned by Mr Rob Ball of PM Australia on behalf of Springfield Land Corporation Pty Ltd to undertake a Stage 1 (Preliminary) and Stage 2 (Further Investigation) site contamination assessment on land located within the Springfield Development (refer Reference 1).

The purpose of the work was to provide preliminary information regarding potential soil contamination at the site prior to its redevelopment.

The site assessment included a walk-over inspection of the site, a detailed background review and site history and a soil sampling and analysis program based on the results of this background review. No groundwater sampling and analysis was undertaken in this work program.

RTI DL RELEASE EHP

The scope of work for the preliminary site assessment comprised:

- a review of published topographic, geological and cadastral maps and historical air photos covering the area;
- an historical property title search;
- a site walkover inspection;
- discussion with officers of various Government Departments regarding existing site services, land use and zoning, and site history;
- the conducting of a preliminary soil sampling program at the site, based on the site background information;
- laboratory analysis of selected soil samples for selected chemical parameters, based on the above site background information;
- assessment of results with reference to current DEH investigation threshold levels and other relevant soils contamination standards; and
- reporting.

Sampling and analysis of groundwaters was not carried out as part of preliminary site assessment work.

3.1 SITE LOCATION AND DESCRIPTION

APPLICANT:

Name: PM Australia Pty Ltd
(for Springfield Land Corporation Pty Ltd)

Address: C/- Woodward-Clyde
49 Park Road
MILTON QLD 4064

PROPERTY IDENTIFICATION:

Address: Part of Springfield Estate, Camira

Real Property
Description: Lot 1 on SL5997
Parish of Staplyton
County of Stanley
Total Area: 131.143 ha

Name and Address
of Current Owner(s): Springfield Land Corporation Pty Ltd
C/- Springfield Management Pty Ltd
76 Bowen Street
SPRING HILL QLD 4004

Current Zoning: Rural

Proposed Zoning: Future Urban

Local Authority

Name:

Moreton Shire Council

PROPERTY DESCRIPTION:

The subject site comprises Lot 1 on SL5997 and is located south west of Old Logan Road and south of the suburbs of Camira and Goodna. Redbank Plains is located to the west and the Spring Mountain area to the south. The site is bounded to the east by Opossum Creek and is surrounded by eucalyptus woodland to the north, south and east and by farmland to the west (refer Figure 1).

The site is undulating with numerous small open valleys along the eastern and southern sides of the site. These are predominantly covered with eucalypt woodland.

A cleared area was observed in the central portion of the site where a former homestead existed. The only remaining evidence is an old water tank, several building foundation slabs and the remnants of an old cattle dip (refer Plate 3).

A detailed walkover of the site revealed no apparent surface staining or distressed vegetation. An area surrounding the existing cattle dip had a corrugated surface which appeared consistent with the area being stripped for lawn grass (refer Plate 5).

3.2 AVAILABLE INFORMATION

Table 1 details aerial photographs that were examined as part of this assessment:

TABLE 1
DETAILS OF AERIAL PHOTOGRAPHS

Film Number	Run Number	Date
5040	Ipswich Run 5	2-5-1947
Q543-52	Ipswich Run 5	30-7-1955
Q2258	Ipswich Run 3	17-5-1972
Q4019	Ipswich Run 5	20-5-1982
Q4658	Ipswich Run 5	9-8-1993

The following maps were also examined as part of this assessment:

- Australia 1:100,000 Geological Series, Sheet 9442, Ipswich, First Edition, 1981.
- Queensland 1:25,000 Series Topographic Map, Edition 1, Sheet 9442-12, Spring Mountain

3.3 SITE HISTORY AND LAND USE

Reference to aerial photographs (refer Table 1) indicated the site to be covered with native woodland, with the central section predominantly cleared (presumably for grazing purposes). The aerial photographs indicate the presence of a cattle dip and pens since at least 1947. Furthermore, the aerial photographs indicate that the extent of the woodland vegetation has increased since 1955. Discussions with the present project managers (P.M. Australia) indicated an area had been used as a dump (refer Figure 2). PM Australia report that the dump contains earthworks fill and demolition debris reported to come from the initial development of Springfield Estate (refer Plates 7 and 8).

It is reported that dumping took place between late 1992 up to early 1994 (Craig Welsh, pers comm). This is consistent with aerial photograph observations.

Discussions with prior employee of Kruger and Sons Pty Ltd (owners 1937-1953), Lance Siedofsky, indicated the area was used by Krugers as a beef grazing property (average 400 head). Mr Siedofsky indicated the dip was constructed in early to mid-1940's and ceased use in 1956 when J Johnson acquired the site for logging plantations. He has minimal knowledge of the site from the mid-1960's.

At present, all fencing surrounding the dip has been removed. It is not known when this took place. The dip structure still exists at the site and a concrete pad exists immediately adjacent to the dip (refer Plate 4). The dip structure itself is timber lined and the pit currently contains sheets of corrugated iron and some liquid (refer Plate 1).

It is reported the original Homestead (Eden Park Homestead) was built in the early 1940's.

The homestead and associated sheds appear to have been removed between 1955 and 1972. The 1972 aerial photograph indicated the area was still a cleared grassland.

3.4 TOPOGRAPHY AND HYDROLOGY

The site is located on gently undulating land with elevations ranging from 45 to 70 m above mean sea level. Mountain Creek is a perennial creek and drains the site in a north easterly direction. Numerous channels drain from the southern and western boundaries of the site into Mountain Creek. Mountain Creek intersects Opossum Creek approximately 1 km upstream. Opossum Creek is a tributary of Woogaroo Creek, joining it approximately 3 km upstream.

No records of groundwater bores have been found for the area, however, based on local topography and drainage patterns, the regional groundwater table is considered likely to be in the order of 10 to 20 m below ground level.

3.5 GEOLOGY

Reference to the Geological Survey of Queensland's 1:100,000 Ipswich geological sheet indicates that the site is underlain by Early Jurassic sediments of the Raceview Formation. These include lithic to felspathic, sublabile to Quartzose sandstone, siltstone, shale and coal. Quaternary sediments (undifferentiated floodplain and river terrace, sand, silt, gravel, clay) underlay areas adjacent to Opossum Creek.

RTI DL RELEASE - EHP

SITE INVESTIGATION PROGRAM

4.1 SOIL SAMPLING PROGRAM

Soil sampling locations were determined on the basis of site background and site inspection data.

Seventy auger holes were drilled in the area surrounding the existing structure of the cattle dip (refer Figure 3). These holes were drilled on a ten metre grid and to a depth of 1.2 metres, with samples collected at 0.5 m intervals to identify the extent of contamination.

Five auger holes were drilled in the dump area at the following locations:

- one at each corner of the identified landfill;
- one at the middle of the landfill;

Auger holes were drilled to identify the extent of the dump area and samples collected at depths to establish whether the site represents any potential risk to public health or environmental harm as defined under the Contaminated Land Act 1991. All auger holes were drilled to natural material (refer Figure 2).

4.2 SAMPLING AND LABORATORY ANALYSIS PROCEDURES

Auger holes were drilled using a solid-flight auger. The auger rods were washed with a phosphate-free detergent between sampling locations to reduce the potential for contamination between holes. New (clean) gloves were used at each sample location. Samples of soil were collected in laboratory supplied, glass jars.

All material encountered in the dump area during drilling was logged (refer Table 2). Samples were sent to Australian Laboratory Services Pty Ltd (ALS) at Stafford and analysed for moisture content, heavy metals (arsenic, cadmium, chromium, lead), organochlorine pesticides (OC), petroleum hydrocarbons (TPH), and volatile aromatics (BTEX). These parameters were selected, based on site background and inspection data, as likely "indicators" of potential soil contamination at the site due to landfill material buried on site.

All materials encountered in the cattle dip area during drilling was logged (refer Table 3). Samples were sent to ALS and analysed for moisture content, arsenic, and organochlorine pesticides. These parameters were selected, based on site background inspection data, as likely "indicators" of potential soil contamination at the site due to prior land use.

RTI DL RELEASE - EHP

TABLE 2
DETAILS OF SOIL SAMPLE COLLECTED - DUMP SITE

Site Identification Number	Depth (m)	Sampling Interval (m)	Lithology	Analytical Parameters
D1	0.0-0.6	0.0-0.2	Dark brown sandy LOAM , trace gravel, slightly moist, disturbed surface	OC Pesticides, Moisture Content, Metals (including As, Cd, Cr, Pb), TPH and BTEX
	0.6-1.0	0.9-1.0	Yellow brown silty SAND, moist (natural)	OC Pesticides, Moisture Content, Metals (including As, Cd, Cr, Pb), TPH and BTEX
D2	0.0-0.2	0.0-0.2	Brown silty SAND, slightly moist, some debris, (fill)	OC Pesticides, Moisture Content, Metals (including As, Cd, Cr, Pb), TPH and BTEX
	0.2-1.2	0.9-1.0	Brown SAND, mottled orange brown, sandy, gravelly CLAY, moist, some timber ash, concrete and wood debris, (fill)	OC Pesticides, Moisture Content, Metals (including As, Cd, Cr, Pb), TPH and BTEX
	1.2-2.7	1.9-2.0	Slightly sandier, with mottled red sandy clay patches, moist, (fill)	OC Pesticides, Moisture Content, Metals (including As, Cd, Cr, Pb), TPH and BTEX
	2.4		Water inflow	
	2.7-3.6	2.9-3.0	Dark brown silty SAND, fine - medium grained, moist (natural)	OC Pesticides, Moisture Content, Metals (including As, Cd, Cr, Pb), TPH and BTEX
	3.5-3.6	3.5-3.6	Trace CLAY, slight increase in coarser river sands	OC Pesticides, Moisture Content, Metals (including As, Cd, Cr, Pb), TPH and BTEX
D3	0.0-0.7	0.0-0.2	Mottled brown and light brown gravelly SAND, slightly moist, debris, concrete, bricks	OC Pesticides, Moisture Content, Metals (including As, Cd, Cr, Pb), TPH and BTEX
	0.7-1.4	1.0-1.1	Mottled dark brown and orange gravelly SAND, moist (fill)	OC Pesticides, Moisture Content, Metals (including As, Cd, Cr, Pb), TPH and BTEX
	1.4-2.3	2.0-2.1	Slight water inflow, brown silty SAND, mottled patches, wet, (fill)	OC Pesticides, Moisture Content, Metals (including As, Cd, Cr, Pb), TPH and BTEX
	2.3-2.6		Dark grey silty sandy CLAY, wet (natural)	OC Pesticides, Moisture Content, Metals (including As, Cd, Cr, Pb), TPH and BTEX
	2.6-3.0	2.9-3.0	Brown sandy CLAY (natural)	OC Pesticides, Moisture Content, Metals (including As, Cd, Cr, Pb), TPH and BTEX

TABLE 2 (CONT)
DETAILS OF SOIL SAMPLES COLLECTED - DUMP SITE

Site Identification Number	Depth (m)	Sampling Interval (m)	Lithology	Analytical Parameters
D4	0.0-0.3	0.0-0.2	Mottled brown and orange SAND, slightly moist, debris apparent	OC Pesticides, Moisture Content, Metals (including As, Cd, Cr, Pb), TPH and BTEX
	0.3-0.9		Orange brown sandy CLAY, moist, (fill)	OC Pesticides, Moisture Content, Metals (including As, Cd, Cr, Pb), TPH and BTEX
	0.9-1.8	0.9-1.0	Brown and grey clayey SAND, moist, (fill)	OC Pesticides, Moisture Content, Metals (including As, Cd, Cr, Pb), TPH and BTEX
	1.8-2.0	1.9-2.0	Dark grey sandy CLAY, moist, (natural)	OC Pesticides, Moisture Content, Metals (including As, Cd, Cr, Pb), TPH and BTEX
	2.0-2.4		Dark grey clayey SAND	OC Pesticides, Moisture Content, Metals (including As, Cd, Cr, Pb), TPH and BTEX
	2.4-2.7		Yellow brown SAND, medium grained (river sand)	OC Pesticides, Moisture Content, Metals (including As, Cd, Cr, Pb), TPH and BTEX
D5	0.0-0.1	0.0-0.2	Brown sandy LOAM, slightly moist	OC Pesticides, Moisture Content, Metals (including As, Cd, Cr, Pb), TPH and BTEX
	0.1-1.0	0.9-1.0	Orange brown SAND, very consistent, fine grained, moist (natural)	OC Pesticides, Moisture Content, Metals (including As, Cd, Cr, Pb), TPH and BTEX

TABLE 3
DETAILS OF SOIL SAMPLES COLLECTED - DIP SITE

Site Identification Number	Depth (m)	Sampling Interval (m)	Lithology	Analytical Parameters
B1	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B2	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B3	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, Sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B4	0.0-0.5	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Not Analysed (currently in storage)
	0.5-1.2		Brown-orange brown, sandy CLAY, MP, trace gravel, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B5	0.0-0.5	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.5-1.2		Brown-orange brown, sandy CLAY, MP, trace gravel, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)

TABLE 3 (CONT)
DETAILS OF SOIL SAMPLES COLLECTED - DIP SITE

Site Identification Number	Depth (m)	Sampling Interval (m)	Lithology	Analytical Parameters
B6	0.0-0.5	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.5-1.2		Brown - orange brown, sandy CLAY, MP, trace gravel, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B7	0.0-0.5	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.5-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B8	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B9	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B10	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Not Analysed (currently in storage)
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)

TABLE 3 (CONT)
DETAILS OF SOIL SAMPLES COLLECTED - DIP SITE

Site Identification Number	Depth (m)	Sampling Interval (m)	Lithology	Analytical Parameters
B11	0.0-0.5	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.5-1.2		Brown - orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B12	0.0-0.3	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Not Analysed (currently in storage)
	0.3-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B13	0.0-0.3	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.3-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B14	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Not Analysed (currently in storage)
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B15	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, patches of decomposed sandstone, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)

TABLE 3 (CONT)
DETAILS OF SOIL SAMPLES COLLECTED - DIP SITE

Site Identification Number	Depth (m)	Sampling Interval (m)	Lithology	Analytical Parameters
B16	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown - orange brown, sandy CLAY, MP, patches of decomposed sandstone, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B17	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, patches of decomposed sandstone, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B18	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, patches of decomposed sandstone, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B19	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, patches of decomposed sandstone, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)

TABLE 3 (CONT)
DETAILS OF SOIL SAMPLES COLLECTED - DIP SITE

Site Identification Number	Depth (m)	Sampling Interval (m)	Lithology	Analytical Parameters
B20	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B21	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown - orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B22	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B23	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B24	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)

TABLE 3 (CONT)
DETAILS OF SOIL SAMPLES COLLECTED - DIP SITE

Site Identification Number	Depth (m)	Sampling Interval (m)	Lithology	Analytical Parameters
B25	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B26	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown - orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B27	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B28	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)

TABLE 3 (CONT)
DETAILS OF SOIL SAMPLES COLLECTED - DIP SITE

Site Identification Number	Depth (m)	Sampling Interval (m)	Lithology	Analytical Parameters
B29	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B30	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B31	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown - orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B32	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)

TABLE 3 (CONT)
DETAILS OF SOIL SAMPLES COLLECTED - DIP SITE

Site Identification Number	Depth (m)	Sampling Interval (m)	Lithology	Analytical Parameters
B33	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B34	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B35	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B36	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown - orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)

TABLE 3 (CONT)
DETAILS OF SOIL SAMPLES COLLECTED - DIP SITE

Site Identification Number	Depth (m)	Sampling Interval (m)	Lithology	Analytical Parameters
B37	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B38	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B39	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B40	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)

TABLE 3 (CONT)
DETAILS OF SOIL SAMPLES COLLECTED - DIP SITE

Site Identification Number	Depth (m)	Sampling Interval (m)	Lithology	Analytical Parameters
B41	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown - orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B42	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B43	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B44	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)

TABLE 3 (CONT)
DETAILS OF SOIL SAMPLES COLLECTED - DIP SITE

Site Identification Number	Depth (m)	Sampling Interval (m)	Lithology	Analytical Parameters
B45	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B46	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown - orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B47	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B48	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)

TABLE 3 (CONT)
DETAILS OF SOIL SAMPLES COLLECTED - DIP SITE

Site Identification Number	Depth (m)	Sampling Interval (m)	Lithology	Analytical Parameters
B49	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B50	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B51	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown - orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B52	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)

TABLE 3 (CONT)
DETAILS OF SOIL SAMPLES COLLECTED - DIP SITE

Site Identification Number	Depth (m)	Sampling Interval (m)	Lithology	Analytical Parameters
B53	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B54	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B55	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B56	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown - orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)

TABLE 3 (CONT)
DETAILS OF SOIL SAMPLES COLLECTED - DIP SITE

Site Identification Number	Depth (m)	Sampling Interval (m)	Lithology	Analytical Parameters
B57	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B58	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B59	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B60	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)

TABLE 3 (CONT)
DETAILS OF SOIL SAMPLES COLLECTED - DIP SITE

Site Identification Number	Depth (m)	Sampling Interval (m)	Lithology	Analytical Parameters
B61	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown - orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B62	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B63	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B64	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)

TABLE 3 (CONT)
DETAILS OF SOIL SAMPLES COLLECTED - DIP SITE

Site Identification Number	Depth (m)	Sampling Interval (m)	Lithology	Analytical Parameters
B65	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B66	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown - orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B67	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B68	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)

TABLE 3 (CONT)
DETAILS OF SOIL SAMPLES COLLECTED - DIP SITE

Site Identification Number	Depth (m)	Sampling Interval (m)	Lithology	Analytical Parameters
B69	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)
B70	0.0-0.4	0.0-0.2	Brown - light brown, sandy CLAY, MP, slightly moist	Arsenic, OC Pesticides
		0.5-0.7		Arsenic, OC Pesticides
	0.4-1.2		Brown-orange brown, sandy CLAY, MP, slightly moist	
		1.0-1.2		Not Analysed (currently in storage)

5.0
RESULTS

Soil samples were sent to ALS for laboratory analysis. Reported laboratory analysis results for all soil samples collected are summarised in Tables 4 and 5. Relevant DEH threshold levels for soil contaminants are also included in this table, and are presented in Appendix B.

The toxicity characteristic leaching procedure (TCLP) results on selected samples from the dip site are presented in Table 6.

A copy of all laboratory analysis reports is included in Appendix C.

RTI DL RELEASE - EHP

TABLE 4
SUMMARY OF LABORATORY ANALYTICAL RESULTS (SOILS) - DUMP SITE

Analysis	Units	LQR	DEH Guidelines			D1 (0.0-0.2m)	D1 (0.9-1.0m)	D2 (0.0-0.2m)	D2 (0.9-1.0m)	D2 (1.9-2.0m)	D2 (2.9-3.0m)
			Background	Environmental	Health						
Moisture Content	%	0.1	-	-	-	5.2	5.2	5.8	9.0	12.1	14.7
Total OC Pesticides	mg/kg	0.05	<0.005- <0.5 (Dieldrin)	0.2 (Dieldrin)	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Petroleum Hydrocarbons											
C ₁ - C ₉	mg/kg	2	-	100	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
C ₁₀ - C ₁₄	mg/kg	50	-	100	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
C ₁₅ - C ₂₅	mg/kg	100	-	1000	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
C ₂₆ - C ₃₆	mg/kg	100	-	1000	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
BTEX											
Benzene	mg/kg	0.2	-	-	1	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Toluene	mg/kg	0.2	-	-	30 ²	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Chlorobenzene	mg/kg	0.2	-	-	50 ²	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Ethylbenzene	mg/kg	0.2	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
M- and -P Xylene	mg/kg	0.4	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
O- Xylene	mg/kg	0.2	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Metals:											
Arsenic	mg/kg	1.0	0.2-30	20	100	<1	3	<1	3	3	3
Cadmium	mg/kg	1.0	0.04-2	3	20	<1	1	<1	<1	<1	<1
Chromium	mg/kg	1.0	0.5-110	50	-	<1	2	4	5	5	5
Lead	mg/kg	1.0	<2-200	300	-	<1	7	7	7	7	6

Notes 1 Level of Reporting
 2 Dutch "C" Criteria
 6 All results presented as mg/kg dry weight

 3 Shaded area exceeds Environmental Threshold
 4 Refer Appendix C for analysts reports

TABLE 4 (CONT)
SUMMARY OF LABORATORY ANALYTICAL RESULTS (SOILS) - DUMP SITE

Analysis	Units	LQR	DEH Guidelines			D2 (3.5-3.6m)	D3 (0.0-0.2m)	D3 (1.0-1.1m)	D3 (2.0-2.1)	D3 (2.9-3.0m)	D4 (0.0-0.2m)
			Background	Environmental	Health						
Moisture Content	%	0.1	-	-	-	16.3	4.8	21.7	16.1	17.8	6.2
Total OC Pesticides	mg/kg	0.05	<0.005-<0.5 (Dieldrin)	0.2 (Dieldrin)	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Petroleum Hydrocarbons											
C ₁ - C ₉	mg/kg	2	-	100	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
C ₁₀ - C ₁₄	mg/kg	50	-	100	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
C ₁₅ - C ₂₈	mg/kg	100	-	1000	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
C ₂₉ - C ₃₄	mg/kg	100	-	1000	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
BTEX											
Benzene	mg/kg	0.2	-	-	1	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Toluene	mg/kg	0.2	-	-	30 ²	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Chlorobenzene	mg/kg	0.2	-	-	50 ²	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Ethylbenzene	mg/kg	0.2	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
M- and -P Xylene	mg/kg	0.4	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
O- Xylene	mg/kg	0.2	-	-	-	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Metals:											
Arsenic	mg/kg	1.0	0.2-30	20	100	2	3	9	1	2	1
Cadmium	mg/kg	1.0	0.04-2	3	20	<1	<1	<1	<1	<1	<1
Chromium	mg/kg	1.0	0.5-110	50	-	5	5	37	6	8	5
Lead	mg/kg	1.0	<2-200	300	-	8	7	13	9	10	7

Notes 1 Level of Reporting
 2 Dutch "C" Criteria
 3 Shaded area exceeds Environmental Threshold
 4 Refer Appendix C for analysts reports
 5 All results presented as mg/kg dry weight

TABLE 4 (CONT)
SUMMARY OF LABORATORY ANALYTICAL RESULTS (SOILS) - DUMP SITE

Analysis	Units	LOR ¹	DEH Guidelines			D4 (0.9-1.0m)	D4 (1.9-2.0m)	D5 (0.0-0.2m)	D5 (0.9-1.0m)
			Background	Environmental	Health				
Moisture Content	%	0.1	-	-	-	13.6	32.4	4.2	3.0
Total OC Pesticides	mg/kg	0.05	<0.005-<0.5 (Dieldrin)	0.2 (Dieldrin)	-	<LOR	<LOR	<LOR	<LOR
Petroleum Hydrocarbons									
C ₄ - C ₉	mg/kg	2	-	100	-	<LOR	<LOR	<LOR	<LOR
C ₁₀ - C ₁₄	mg/kg	50	-	100	-	<LOR	<LOR	<LOR	<LOR
C ₁₅ - C ₂₁	mg/kg	100	-	1000	-	<LOR	<LOR	<LOR	<LOR
C ₂₂ - C ₃₄	mg/kg	100	-	1000	-	<LOR	<LOR	<LOR	<LOR
BTEX									
Benzene	mg/kg	0.2	-	-	1	<LOR	<LOR	<LOR	<LOR
Toluene	mg/kg	0.2	-	-	30 ²	<LOR	<LOR	<LOR	<LOR
Chlorobenzene	mg/kg	0.2	-	-	50 ²	<LOR	<LOR	<LOR	<LOR
Ethylbenzene	mg/kg	0.2	-	-	-	<LOR	<LOR	<LOR	<LOR
M- and -P Xylene	mg/kg	0.4	-	-	-	<LOR	<LOR	<LOR	<LOR
O- Xylene	mg/kg	0.2	-	-	-	<LOR	<LOR	<LOR	<LOR
Metals:									
Arsenic	mg/kg	1.0	0.2-30	20	100	3	6	1	1
Cadmium	mg/kg	1.0	0.04-2	3	20	<1	<1	<1	<1
Chromium	mg/kg	1.0	0.5-110	50	-	4	7	4	5
Lead	mg/kg	1.0	2-200	300	-	9	13	7	6

Notes 1 Level of Reporting 3 Shaded area exceeds Environmental Threshold
 2 Dutch "C" Criteria 4 Refer Appendix C for analysts reports
 6 All results presented as mg/kg dry weight

TABLE 5
SUMMARY OF LABORATORY ANALYTICAL RESULTS
(SOILS) - DIP SITE

Analysis	Moisture Content	Arsenic	OC Pesticides
Units	%	mg/kg	mg/kg
Detection Limit	0.1	1	0.05
DEH Guidelines			
Background Levels	-	0.2-30	<0.001-<0.05 (Aldrin) <0.005-<0.05 (Dieldrin) <0.001-0.97 (DDT)
Environmental Threshold	-	20	0.2 (Dieldrin)
Health Based Threshold	-	100	10 ¹
Sample Locations			
B1 (0.0-0.2)	12.8	37	<LOR ²
B1 (0.5-0.7)	15.1	13	<LOR
B2 (0.0-0.2)	12.0	11	0.2
B2 (0.5-0.7)	14.1	89	<LOR
B3 (0.0-0.2)	7.8	268	0.44
B3 (0.5-0.7)	11.2	122	0.17
B4 (0.0-0.2)	10.5	11	<LOR
B5 (0.0-0.2)	6.2	223	0.28
B5 (0.5-0.7)	6.9	28	<LOR
B6 (0.0-0.2)	9.3	137	<LOR
B6 (0.5-0.7)	11.1	2	<LOR
B7 (0.0-0.2)	7.9	30	<LOR
B7 (0.5-0.7)	10.5	2	<LOR
B8 (0.0-0.2)	7.0	96	<LOR
B8(0.5-0.7)	12.6	13	<LOR
B9 (0.0-0.2)	7.0	64	<LOR
B9 (0.5-0.7)	11.3	13	<LOR
B10 (0.0-0.2)	6.6	18	<LOR
B11 (0.0-0.2)	8.2	70	<LOR
B11 (0.5-0.7)	15.3	35	<LOR

TABLE 5 (CONTINUED)
SUMMARY OF LABORATORY ANALYTICAL RESULTS (SOILS) - DIP SITE

Analysis	Moisture Content	Arsenic	OC Pesticides
B12 (0.0-0.2)	8.3	8	<LOR
B13 (0.0-0.2)	7.8	201	0.08
B13 (0.5-0.7)	10.3	4	<LOR
B14 (0.0-0.2)	7.6	8	<LOR
B15 (0.0-0.2)	7.5	9	<LOR
B16 (0.0-0.2)	7.1	18	<LOR
B17 (0.0-0.2)	9.3	6	<LOR
B18 (0.0-0.2)	11.3	6	<LOR
B19 (0.0-0.2)	8.0	7	<LOR
B20 (0.0-0.2)	7.6	5	<LOR
B21 (0.0-0.2)	6.8	10	<LOR
B22 (0.0-0.2)	7.8	7	<LOR
B23 (0.0-0.2)	6.8	5	<LOR
B24 (0.0-0.2)	10.0	2	<LOR
B25 (0.0-0.2)	8.1	3	<LOR
B26 (0.0-0.2)	6.9	11	<LOR
B27 (0.0-0.2)	7.2	16	<LOR
B28 (0.0-0.2)	7.7	14	<LOR
B29 (0.0-0.2)	12.9	22	<LOR
B29 (0.5-0.7)	15.9	14	<LOR
B30 (0.0-0.2)	11.7	22	<LOR
B30 (0.5-0.7)	19.7	7	<LOR
B31 (0.0-0.2)	16.6	16	<LOR
B32 (0.0-0.2)	9.9	8	<LOR
B33 (0.0-0.2)	7.0	3	<LOR
B34 (0.0-0.2)	10.1	174	<LOR
B34 (0.5-0.7)	16.7	91	<LOR
B35 (0.0-0.2)	13.1	177	<LOR
B35 (0.5-0.7)	19.0	9	<LOR
B36 (0.0-0.2)	13.3	88	<LOR
B36 (0.5-0.7)	19.1	4	<LOR

TABLE 5 (CONTINUED)
SUMMARY OF LABORATORY ANALYTICAL RESULTS (SOILS) - DIP SITE

Analysis	Moisture Content	Arsenic	OC Pesticides B37 (0.0-0.2)
B37 (0.0-0.2)	9.9	47	<LOR
B37 (0.5-0.7)	12.4	7	<LOR
B38 (0.0-0.2)	8.0	12	<LOR
B39 (0.0-0.2)	5.7	8	<LOR
B40 (0.0-0.2)	4.6	6	<LOR
B41 (0.0-0.2)	9.5	33	<LOR
B41 (0.5-0.7)	10.7	6	<LOR
B42 (0.0-0.2)	4.5	5	<LOR
B43 (0.0-0.2)	4.8	4	<LOR
B44 (0.0-0.2)	9.7	16	<LOR
B45 (0.0-0.2)	9.8	6	<LOR
B46 (0.0-0.2)	5.3	3	<LOR
B47 (0.0-0.2)	7.1	1	<LOR
B48 (0.0-0.2)	7.7	7	<LOR
B49 (0.0-0.2)	8.1	7	<LOR
B50 (0.0-0.2)	6.7	8	<LOR
B51 (0.0-0.2)	5.1	6	<LOR
B52 (0.0-0.2)	10.1	8	<LOR
B53 (0.0-0.2)	4.9	5	<LOR
B54 (0.0-0.2)	4.7	6	<LOR
B55 (0.0-0.2)	8.3	7	<LOR
B56 (0.0-0.2)	8.2	6	<LOR
B57 (0.0-0.2)	5.0	<1	<LOR
B58 (0.0-0.2)	7.3	1	<LOR
B59 (0.0-0.2)	8.4	<1	<LOR
B60 (0.0-0.2)	6.6	4	<LOR
B61 (0.0-0.2)	8.5	3	<LOR
B62 (0.0-0.2)	11.8	3	<LOR
B63 (0.0-0.2)	6.3	4	<LOR
B64 (0.0-0.2)	7.1	1	<LOR
B65 (0.0-0.2)	5.9	3	<LOR

TABLE 5 (CONTINUED)
SUMMARY OF LABORATORY ANALYTICAL RESULTS (SOILS) - DIP SITE

Analysis	Moisture Content	Arsenic	OC Pesticides (0.0-0.2)
B66 (0.0-0.2)	9.1	6	<LOR
B67 (0.0-0.2)	9.2	4	<LOR
B68 (0.0-0.2)	5.0	3	<LOR
B69 (0.0-0.2)	4.7	<1	<LOR
B70 (0.0-0.2)	5.0	12	<LOR

Notes: 1 Dutch "C" Criteria 3 Shaded values exceed DEH Environmental Threshold Levels
2 Less than level of reporting 4 Laboratory test results are reported on a dry weight basis

TABLE 6
SUMMARY OF LABORATORY ANALYTICAL RESULTS
(TCLP) - DIP SITE

Analysis	Arsenic (TCLP)	OC Pesticides (TCLP)
Units	mg/L	µg/L
Detection Limit	0.1	2
Water Quality Guidelines ¹	0.05	0.014 DDE
B2 (0.0-0.2)	<0.1	<3
B3 (0.0-0.2)	<0.1	<2
B5 (0.0-0.2)	<0.1	<3
B13 (0.0-0.2)	<0.1	<3
B25 (0.0-0.2)	<0.1	<3

Notes 1 Guidelines for the protection of aquatic ecosystems (Fresh Waters) Australia and New Zealand Environment and Conservation Council, Australian Water Quality Guidelines for Fresh and Marine Waters, November 1992 (Reference 2).

5.1 DISCUSSION

5.1.1 Dump Area

The dump is identified as covering an area of approximately 6000 m², and the average depth of fill material varies between 1.5 to 2.0 m. Field observations indicated this fill material consisted of excess earthworks and some concrete, brick and demolition debris. It is reported that this material was sourced from within the springfield development.

The results obtained from the preliminary site contamination assessment work carried out in the previously identified dump area indicate low potential for significant soils contamination at the site. The levels of "indicator parameters" tested in soil samples were either below current Department of Environment and Heritage (DEH) or other relevant investigation thresholds, or below laboratory reporting levels.

5.1.2 Cattle Dip

Site contamination assessment work has indicated soil contamination due to arsenic and organochlorine pesticides at the site.

Figure 3 illustrates the area affected by arsenic and OC pesticide contamination. Surface soils exceeding the DEH health threshold cover an area of approximately 750 m² in the immediate vicinity of the dip. The volume of contaminated material in this area is estimated to be between 500-750 m³.

A TCLP leachate test was carried out on samples obtained from five sample locations (B2, B3, B5, B13 and B25). The results of TCLP tests are presented in Table 6. The result of the leachate testing reported leachate concentrations of below the level of reporting.

As a general guideline, the TCLP results for contaminated material are considered acceptable if the concentration of any contaminant in the test leachate is less than 100 times the relevant water quality standard (Reference 2). The value of 100 times is selected on the grounds that in practice the concentration of the substance in any leachate would be reduced by adsorption onto soil and by dilution with other waters. This 100 times factor has been adopted by the US EPA, the NSW EPA and Victorian EPA and is used in the setting of standards for classifying wastes containing heavy metals.

The water quality standard for application of the 100 times factor is taken from the ANZECC *National Water Quality Management Strategy* (Reference 3). In that document, Table 4.1 entitled "*Summary of Quality Guidelines for Raw Waters for Drinking Purposes Subjected to Coarse Screening*" lists Criteria which are the concentrations of toxicants in raw drinking waters which are considered to protect people who consume untreated water. The Guideline value listed in Table 6 above is derived by multiplying the recommended Guideline levels listed in table 4.1 of the ANZECC document by the 100 times factor).

RTI DL RELEASE UNDER E.O. 14176

SITE REMEDIATION PLAN

The levels of arsenic present in soils surrounding the former dip coupled with the results of the leachability testing indicate that the soils are suitable for disposal to the local Council Tip. The results of this field investigation indicate that approximately 500-750 m³ of contaminated soil exist within the immediate vicinity of the dip and these soils would be suitable for daily cover at a local tip.

It is therefore proposed that the soils in the immediate vicinity of the dip be excavated and transported to the local landfill. The site remediation works program (including the transportation and disposal of contaminated materials) will require the approval of the DEH in accordance with Section 14 of the Contaminated Land Act, 1991.

The scope of work for the remediation of contaminated soils by excavation and removal of the soils to the local tip would comprise the following elements:

- (i) Project planning and obtaining regulatory approvals and costs for contaminated material transport and disposal.
- (ii) Excavation and transportation of contaminated soils.
- (iii) Validation of excavation and excavated soils.
- (iv) Preparation and presentation of final report for submission to the Department of Environment and Heritage (DEH), for review towards the issuing of a Site Contamination Report (SCR).

Details of the project tasks are outlined below:

6.1 PROJECT PLANNING AND PRELIMINARY REGULATORY APPROVALS

Prior to the conduct of site remediation works or waste disposal, it will be necessary to undertake negotiations with relevant regulatory authorities in order to obtain approvals for the conduct of site remedial works and the transport and disposal of contaminated materials.

It is proposed that discussions be held with Moreton Shire Council regarding acceptance of any residually contaminated material at their local landfill.

The site remedial works program (including the transport and disposal of contaminated materials) will also require the approval of the Department of Environment and Heritage (DEH), in accordance with the requirements of the Contaminated Land Act, 1991.

Project initiation includes the preparation of a site specific Health and Safety Plan, in accordance with current regulatory requirements.

6.2 CONTAMINATED MATERIALS EXCAVATION, STORAGE, SAMPLING AND ANALYSIS

Soils exhibiting high levels of arsenic contamination (based on the results of the site assessment work) would be excavated and stockpiled on site. It is proposed that samples of contaminated material be collected for laboratory analysis to characterise contaminant nature and concentration.

Contaminated materials would be stored on site pending the results of laboratory analysis work and subsequent negotiations with local authorities and DEH regarding transport and disposal.

6.3 VALIDATION SURVEY

It is proposed that a validation soil sampling and laboratory analysis program be carried out following removal of contaminated materials, to verify the results of remedial actions. This program would nominally comprise the collection of 50 soil samples from the remediated dip area and analysis for arsenic and OC Pesticides.

This work would provide information for preparation of the final site remediation/validation report.

6.4 TRANSPORT AND DISPOSAL OF WASTES AND CONTAMINATED MATERIALS

It is proposed that following receipt of necessary regulatory approvals, plant and equipment be mobilised for excavation of contaminated material, transport and disposal.

6.5 FINAL REPORT

It is proposed that a final report be prepared following completion of site remediation and validation works and transport/disposal of wastes. A copy of this report would be submitted to the DEH, for review towards the issuing of a Site Contamination Report (SCR) for the property.

CONCLUSIONS

The following conclusions are made based upon the results obtained from the preliminary soils contamination work carried out at this site:

- the site has had several owners since 1868. The site is currently vacant.
- a cattle dip exists in the central part of the site. The dip structure is still present at the site. Laboratory test results indicated the presence of organochlorine pesticides and arsenic in soils adjacent to the dip.
- the levels of "indicator parameters" tested in soil samples from other areas across the site including the dump area were either below current DEH investigation thresholds, within typical "background ranges" for soil types encountered or below laboratory reporting levels. These laboratory test results confirm field observations which did not reveal any indications of surface contamination.
- Approximately 500-750 m³ of contaminated soil is estimated to exist on the site. The depth of contamination is estimated to vary from 0.25 m to 1.5 m across the site, depending on location.
- TCLP testing indicates arsenic contamination in the soil on site is not leachable and the soil is considered suitable for disposal as daily cover in an unlined landfill.

- Field observations and site history reports indicate that some surface stripping of soils and vegetation in the vicinity of the dip have taken place. It is further reported that these soils have been transported to a nature strip adjacent to Old Logan Road. It is recommended that some investigations be carried out in this area to determine the levels and extent of contamination in this area.

RTI DL RELEASE - EHP

REFERENCES

- 1) Chemical Hazards and Emergency Management Unit, Guidelines for Assessment of Contaminated Land in Queensland, January 1992.
- 2) State Pollution Control Commission (New South Wales), *Guidelines for Landfill Disposal of Industrial Wastes in New South Wales*, Environmental Guide WD-3, February 1988.
- 3) Australia and New Zealand Environment and Conservation Council, Australian Water Quality Guidelines for Fresh and Marine Waters, November 1992.

RTI DL RELEASE - EHP

9.0
LIMITATION

We have performed our services for this project in accordance with our current professional standards for preliminary site assessment investigations; no guarantees are either expressed or implied.

The focus of this site assessment program has been on major issues of environmental risk and liability (as identifiable from the information supplied, the field inspections, from discussions with site operations management and the results of sampling and analysis work carried out). As such, this Report does not constitute an exhaustive and detailed consideration of regulatory compliance issues relating to the site.

There is no investigation which is thorough enough to preclude the presence of material which presently, or in the future, may be considered hazardous at the site. Because regulatory evaluation criteria are constantly changing, concentrations of contaminants presently considered low may, in the future, fall under regulatory standards that require investigation/remediation.

This report has been prepared based on data from the indicated information sources, site inspections and sampling/analysis results. Laboratory analyses at sample points may not be representative of all conditions across the site. Inferences about the nature and continuity of conditions arising from the sample points, where made, can not be guaranteed.

Samples were selected within operationally defined homogeneous areas in accordance with current DEH guidelines, based on visual appearance and data of application. This sampling assumes that material composition is similar throughout the homogeneous area. The possibility exists that areas judged to be homogeneous may, with additional sampling, be determined to represent several smaller areas of differing material composition. Even the most comprehensive sampling and testing program, using the best available techniques, may derive inferences from samples that are not truly representative.

Opinions and judgements expressed herein, which are based on our understanding and interpretation of current regulatory standards, should not be construed as legal opinions. This document and the information contained herein have been prepared solely for the use of PM Australia Pty Ltd on behalf of Springfield Land Corporation Pty Ltd and their respective legal counsel. Any reliance on this report by any other third parties shall be at such party's sole risk.

Information obtained from interviews and contained in the documentation has been assumed to be correct and complete. Woodward-Clyde does not accept any liability for misrepresentation of information or for items not visible, accessible, nor able to be inspected at the sites at the time of the site visits.

This report has been prepared for the particular investigation described and no responsibility is accepted for the use of any part of the report in any other context or for any other purpose.

RTI DL RELEASE - EHP

PLATES

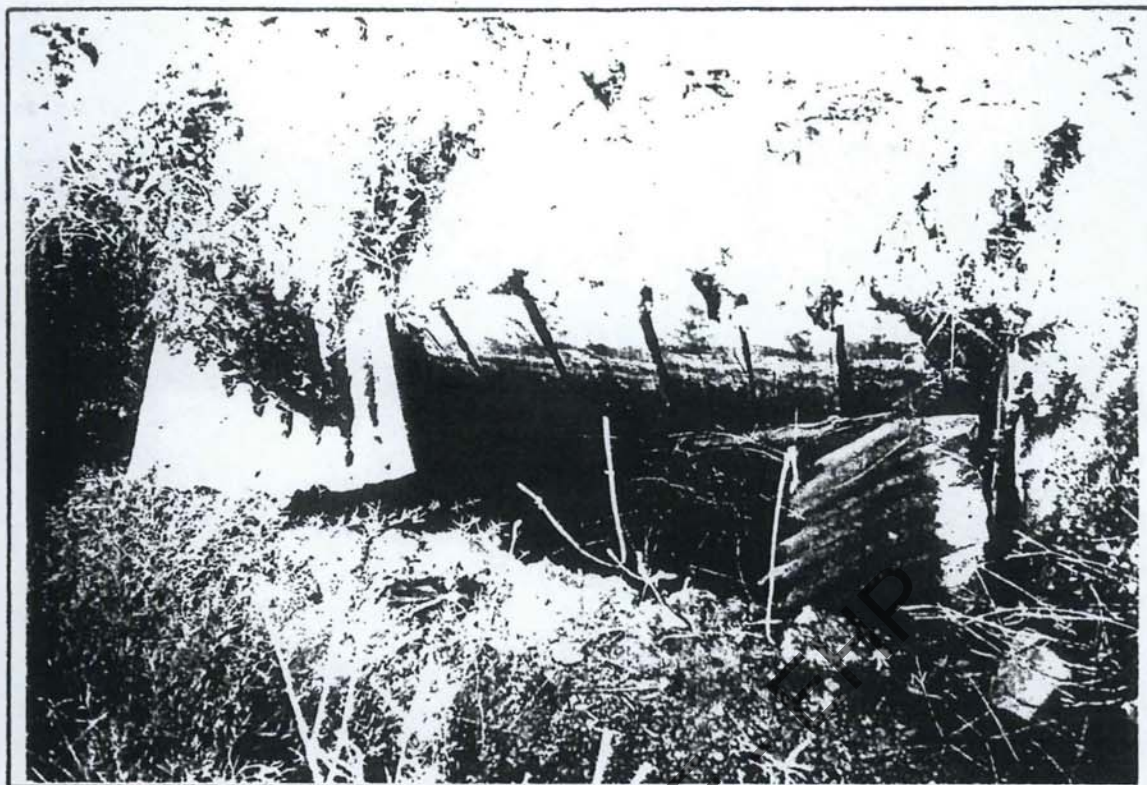


Plate 1: Existing Structure of Cattle Dip.



Plate 2: View of Cattle Dip Looking South.

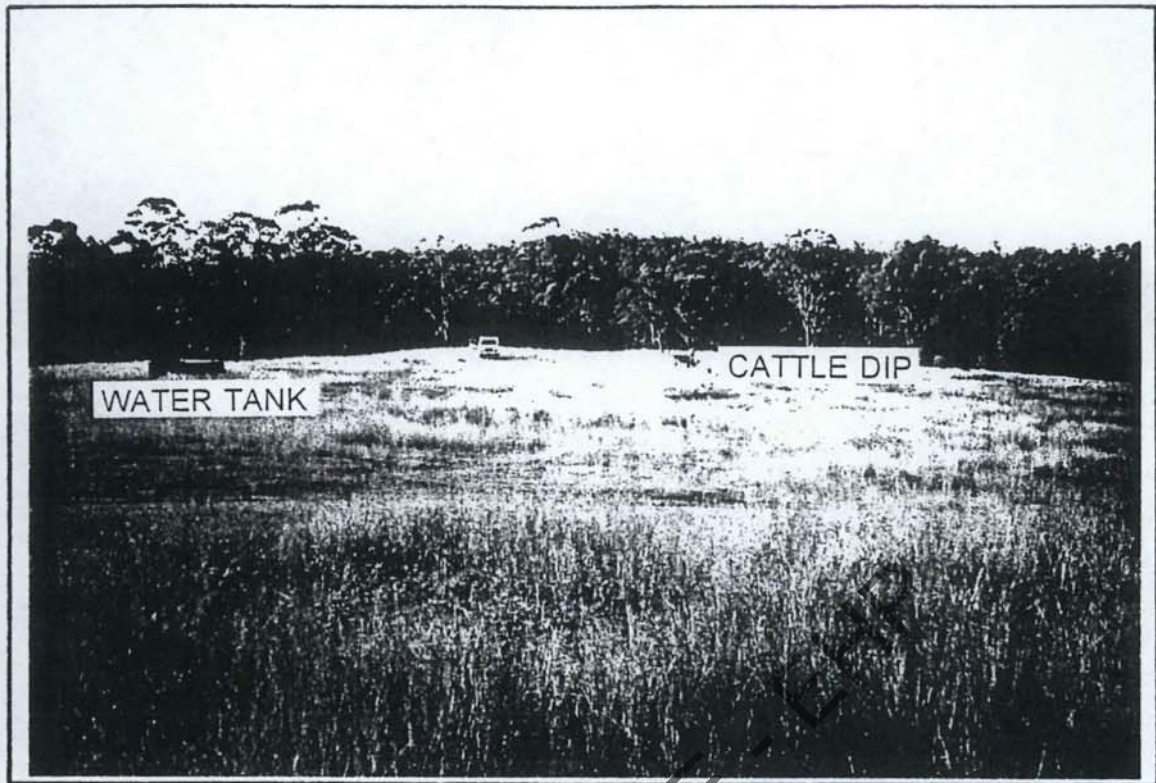


Plate 3: Area Surrounding Cattle Dip Looking North.



Plate 4: Remainder of Drainage Platform.

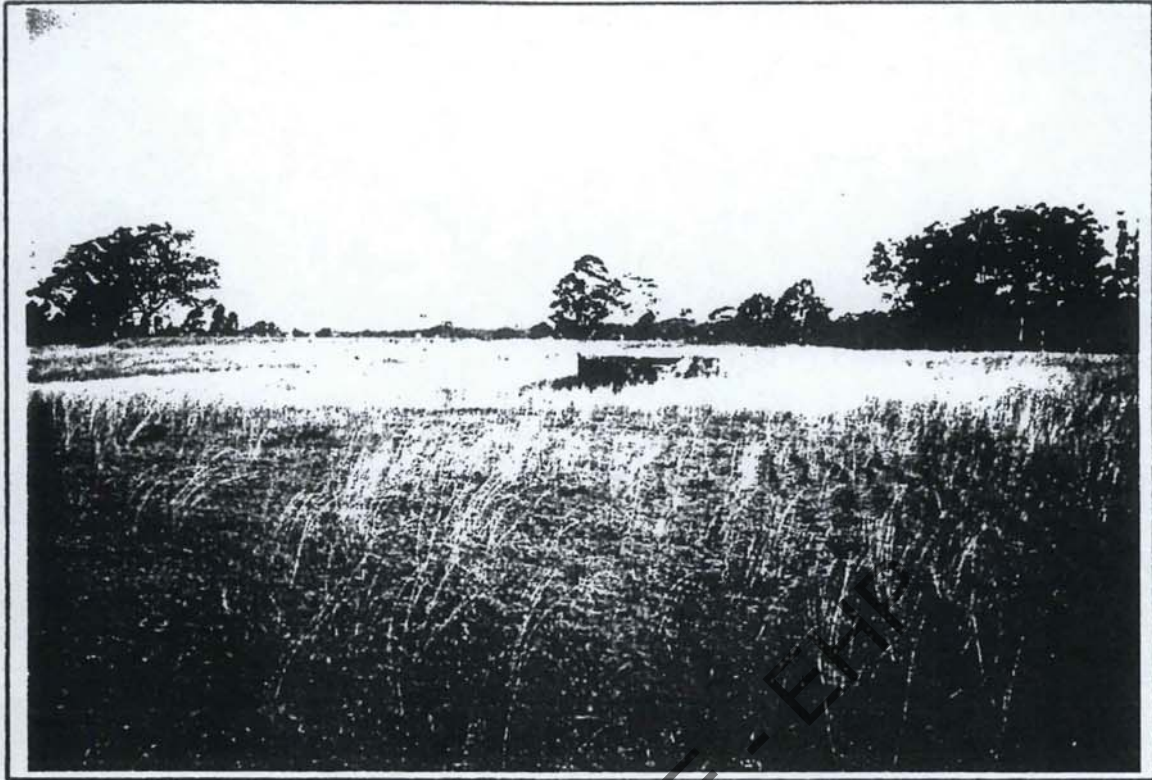


Plate 5: Western Side of Dip Showing Corrugated Surface.

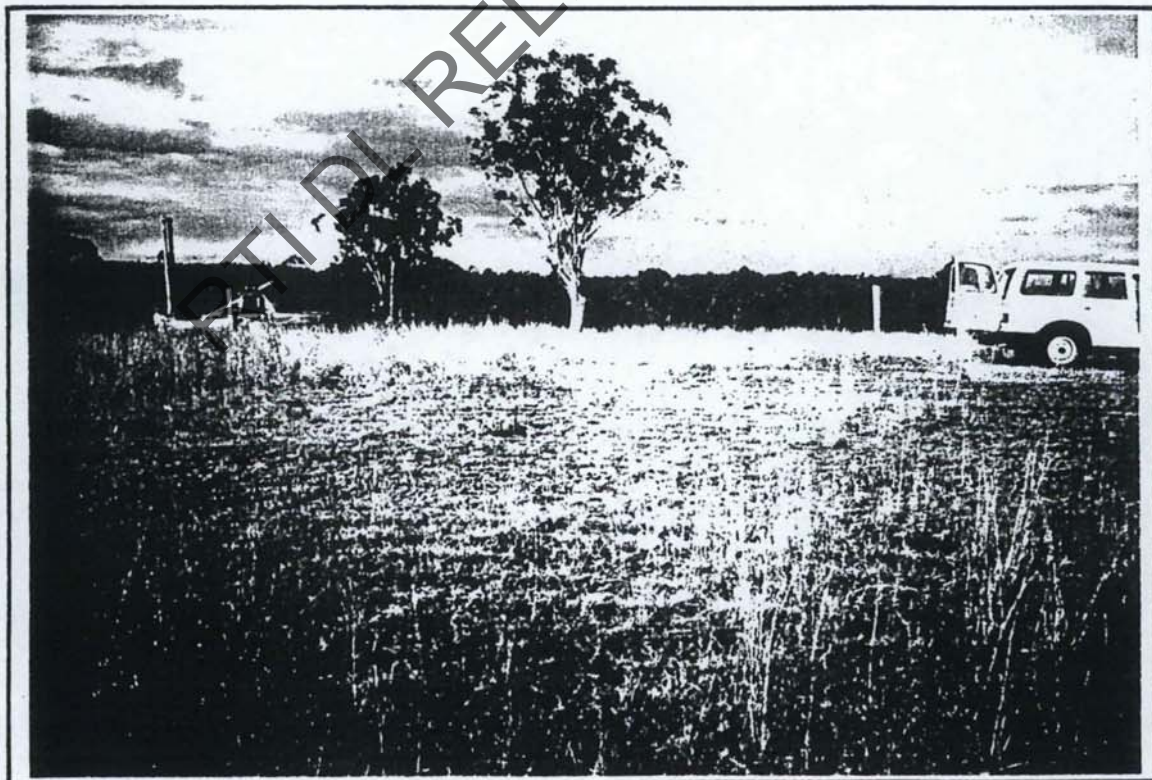


Plate 6: Eastern Side of Dip.



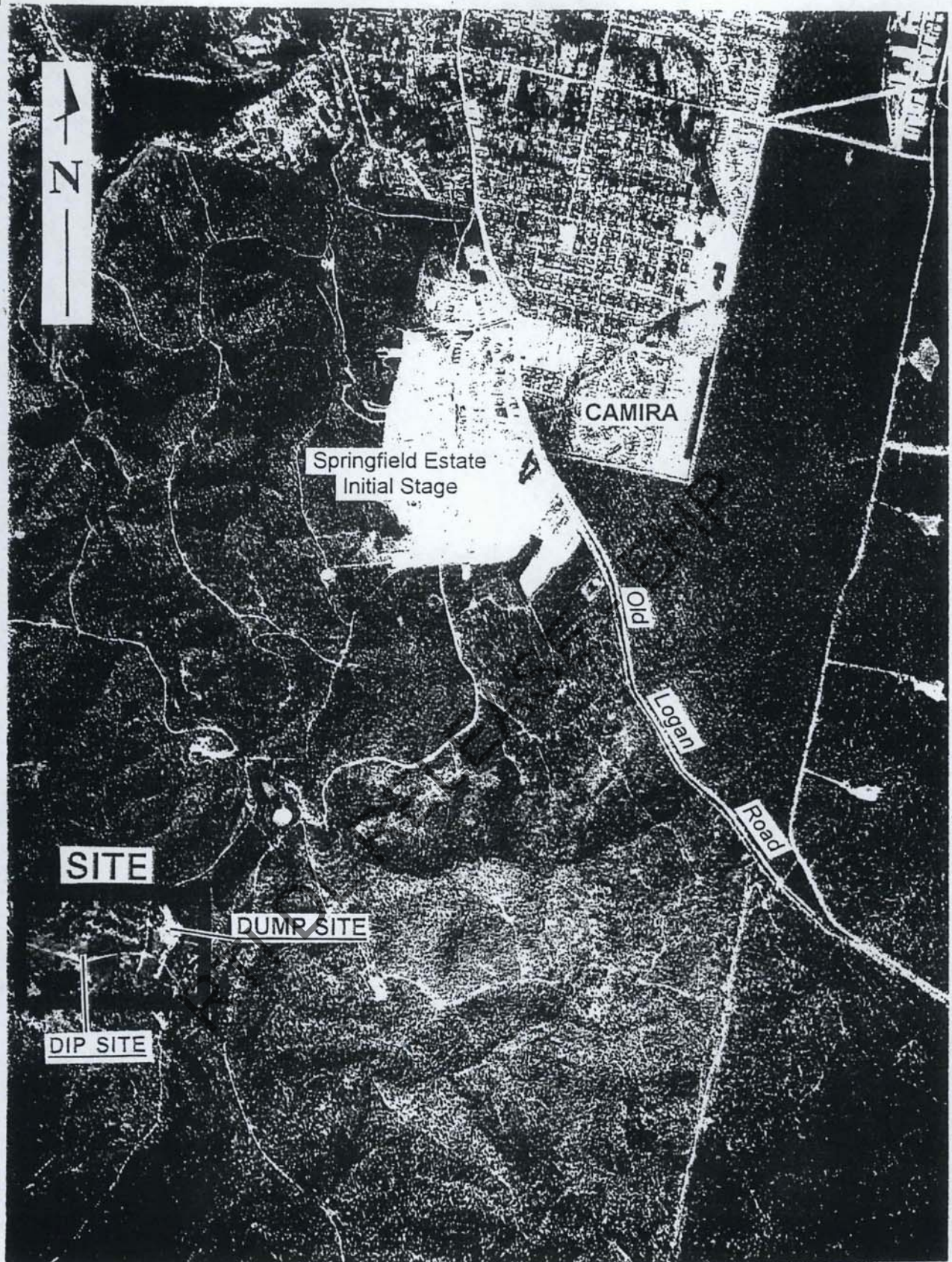
Plate 7: View of Dump Site Looking North



Plate 8: Dump Site Adjacent to Mountain Creek.

FIGURES

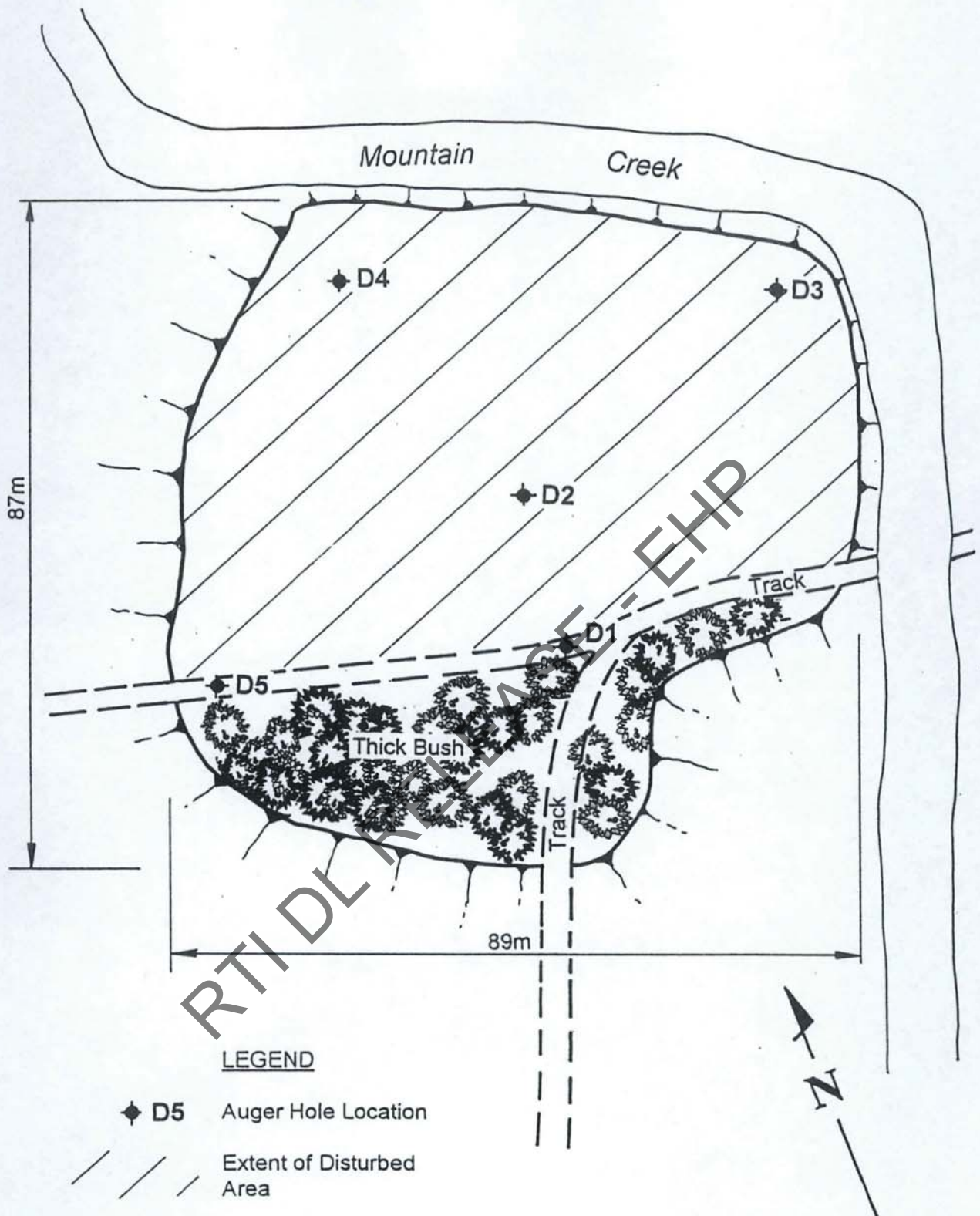
RTI DL RELEASE - EHP



LOCALITY MAP

0 1 km
SCALE

DATE MAY 1995 JOB No A3200073-0001 FIG. No 1



AUGER HOLE LOCATIONS - DUMP SITE

(This plan is a sketch only - positions of site boundaries and site features are approximate).

DATE MAY 1995 JOB No A3200073-0001 FIG. No 2

LEGEND

Area of Surface
Contamination

B55• Auger Hole Location

Concrete Slab from prior Shed



B 24•

B 19•

B 18•

B 17•

B 46•

B 47•

B 64•

B 63•

20m B 67•
N.T.S.

B 25•

B 22•

B 20•

B 16•

B 44•

B 49•

B 62•

B 26•

B 23•

B 21•

B 15•

B 43•

B 50•

20m B 66•
N.T.S.

B 33•

B 27•

B 6•

B 5•

B 14•

B 42•

B 51•

B 60•

Drainage Platform

B 7•

B 4•

5m

B 3•

B 28•

B 8•

B 13•

B 41•

B 52•

20m B 65•
N.T.S.

B 9•

B 2•

B 32•

B 29•

B 10•

B 1•

B 12•

B 40•

B 53•

B 58•

Cattle Dip

B 11•

B 30•

B 34•

B 37•

B 39•

B 54•

B 57•

B 31•

B 35•

B 36•

B 38•

B 55•

B 56•

Water Tank

B 70•

AUGER HOLE LOCATIONS - DIP SITE

(This plan is a sketch only - positions of site
boundaries and site features are approximate).

0 20m
SCALE (Approx)

DATE MAY 1995 JOB No A3200073-0001 FIG. No 3

A3200073-0001-G-003

APPENDIX A

PROPERTY TITLES INFORMATION

(TO BE SUPPLIED)

RTI DL RELEASE - EHP

APPENDIX B

CURRENT DEH INVESTIGATION THRESHOLD LEVELS
FOR SOME CONTAMINANTS IN SOILS

INVESTIGATION THRESHOLDS FOR CONTAMINANTS IN SOILS

BACKGROUND (mg/kg)	THRESHOLDS (mg/kg)	
	Environmental Investigation	Health based Investigation
<u>Heavy Metals</u>		
Antimony Sb 4-44	20	-
Arsenic As 0.2-30	20	100
Barium Ba 20-200	-	-
Cadmium Cd 0.04-2	3	20
Chromium Cr 0.5-110	50	-
Cobalt Co 2-170	-	-
Copper Cu 1-190	60	-
Lead Pb <2-200	300	300
Manganese Mn 4-12,600	500	-
Mercury Hg 0.001-0.1	1	-
Molybdenum Mo <1-20	-	-
Nickel Ni 2-400	60	-
tin Sn 1-25	50	-
Zinc Zn 2-180	200	-
<u>Mineral Pollutants</u>		
Boron B 1-75	-	-
<u>Phenolic Compounds</u>		
Phenols 0.03-0.5	-	-
<u>Monocyclic Aromatic Hydrocarbons (MAH)</u>		
Benzene 0.05-1	1	-
Toluene 0.1-1	-	-
<u>Polycyclic Aromatic Hydrocarbons (PAH)</u>		
PAH (total) 0.95-5	-	20
<u>Chlorinated Hydrocarbons</u>		
PCB (total) 0.02-0.1	1	-
<u>Pesticides</u>		
Aldrin <0.001-<0.05	-	-
Dieldrin <0.005-<0.05	0.2	-
DDT <0.001-0.97	-	-
<u>Other Chemicals</u>		
Sulphate 35-1000	2000	-
H 6-8	-	-

OTHER SUBSTANCES

Unlisted, potentially hazardous chemicals which are suspected, or have been identified on a site, should be referred to the CHEM Unit for assessment.

FOOTNOTES

(1) Site-specific assessments will be made

This table giving investigation thresholds is intended only as an indication of when detailed assessments and remediation are likely to be required. Levels of contaminants above the investigation thresholds will require site-specific assessment and consideration of the level of risk in the particular circumstances.

(2) Investigation Thresholds - If samples show levels below the investigation thresholds, the site may be regarded as uncontaminated and investigations beyond Stage 1 could be unnecessary if adequate sampling has been undertaken.

Source: Draft Australian and New Zealand Guidelines for Assessment and Management of Contaminated Sites, January 1992 (ANZECC/NHMRC).

APPENDIX C

LABORATORY REPORTS

RTI DL RELEASE - EHP



FILE REF:
RECEIVED
FAX / MAIL / COURIER
29 MAY 1995
PROJECT No. DOCUMENT No.
DISTRIBUTION

TO: AGC WOODWARD-CLYDE (QLD)

49 PARK ROAD
MILTON QLD 4064

ATTENTION: MR P MCGURGAN

SUBJECT: Analytical results.

BATCH: EB490-0

DATE: 26/05/95

RTI DL RELEASE - EHP

Spring Laboratory
• (089) 52 6020 Fax (089) 52 6028
Laboratory
(054) 46 1390 Fax (054) 46 1389
Laboratory
• (07) 352 5577 Fax (07) 352 5109

Charlton Towers Laboratory
Phone (077) 87 4155 Fax (077) 87 4220
Kalgoorlie Laboratory
Phone (090) 21 1457 Fax (090) 21 6253
Mt Isa Laboratory
Phone (077) 49 5545 Fax (077) 48 5546

Orange Laboratory
Phone (063) 63 1722 Fax (063) 63 1189
Perth Laboratory
Phone (09) 249 2988 Fax (09) 249 2942
Townsville Laboratory
Phone (077) 79 9155 Fax (077) 79 9729



WOODWARD-CLYDE (QLD)

Attention: MR P MCGURGAN
 Our Order: A32 73-0001
 Sample Type: SOIL
 Project:

ENV BRISBANE

Page-no: 1

Batch-no: 490
 Sub-batch: 0
 No-samples: 17
 Received: 15/05/95
 Checked: 23/05/95

Element Unit Method	Moisture %	As mg/kg
	EA-055	EG-005T
B2	15.1	13
	14.1	89
	11.2	122
	6.9	28
	11.1	2
	10.5	2
BS	12.6	13
B9	11.3	13
al1	15.3	35
3	10.3	4
9	15.9	14
0	19.7	7
334	16.7	91
335	19.0	9
6	19.1	4
7	12.4	7
1	10.7	6

RTI DL RELEASE - EHP

Limit of Detection 0.1 1

Samples as received digested by USEPA method 3051 prior to the
 determination of Arsenic. Results reported on a dry weight basis.

Springs Laboratory
 (089) 52 5020 Fax (089) 52 5028
 Laboratory
 (4) 48 1390 Fax (054) 46 1389
 Laboratory
 (ur) 352 5577 Fax (07) 352 5109

Charters Towers Laboratory
 Phone (077) 87 4155 Fax (077) 87 4220
 Kalgoorlie Laboratory
 Phone (090) 21 1457 Fax (090) 21 8253
 Mt Isa Laboratory
 Phone (077) 49 5545 Fax (077) 48 5546

Orange Laboratory
 Phone (063) 63 1722 Fax (063) 63 1189
 Perth Laboratory
 Phone (09) 249 2988 Fax (09) 249 2942
 Townsville Laboratory
 Phone (077) 79 9155 Fax (077) 79 9729



FILE REF:

RECEIVED

FAX / MAIL / COURIER

23 MAY 1995

PROJECT No. DOCUMENT No.

DISTRIBUTION

TO: AGC WOODWARD-CLYDE (QLD)**49 PARK ROAD
MILTON QLD 4064****ATTENTION: MR P MCGURGAN****SUBJECT: Analytical results.****BATCH: EB490-1****DATE: 22/05/95****RTI DL RELEASE - EHP**

Spring Lake Laboratory
Phone (088) 52 6020 Fax (088) 52 6028
Stirling Laboratory
Phone (054) 46 1390 Fax (054) 46 1389
Tasmania Laboratory
Phone (07) 352 5577 Fax (07) 352 5109

Charles Towers Laboratory
Phone (077) 87 4155 Fax (077) 87 4220
Kalgoorlie Laboratory
Phone (090) 21 1457 Fax (090) 21 6253
Mt Isa Laboratory
Phone (077) 49 5545 Fax (077) 48 5546

Orange Laboratory
Phone (063) 63 1722 Fax (063) 63 1188
Perth Laboratory
Phone (09) 249 2988 Fax (09) 249 2942
Townsville Laboratory
Phone (077) 79 9155 Fax (077) 79 9729



WOODWARD-CLYDE (QLD)

Attention: MR P MCGURGAN
 Order: A32 73-0001
 Sample Type: SOIL
 Project:

Page-no: 1
 ENV BRISBANE
 Batch-no: 490
 Sub-batch: 1
 No-samples: 17
 Received: 15/05/95
 Checked:

Method	Analysis description	Units	LOR	B1	B2	B3
				02/05/95	02/05/95	02/05/95
1-055	Moisture Content (dried @ 103' %		0.1	15.1	14.1	11.2
	067A-SS ORGANOCHLORINE PESTICIDES					
	067A-SS alpha-BHC	mg/kg	0.05	<0.05	<0.05	<0.05
?	067A-SS beta- & gamma-BHC	mg/kg	0.1	<0.1	<0.1	0.1
	067A-SS delta-BHC	mg/kg	0.05	<0.05	<0.05	<0.05
	067A-SS Heptachlor	mg/kg	0.05	<0.05	<0.05	<0.05
	067A-SS Aldrin	mg/kg	0.05	<0.05	<0.05	<0.05
?	067A-SS Heptachlor epoxide	mg/kg	0.05	<0.05	<0.05	<0.05
?	067A-SS Endosulfan 1	mg/kg	0.05	<0.05	<0.05	<0.05
	067A-SS 4.4'-DDE	mg/kg	0.05	<0.05	<0.05	0.07
	067A-SS Dieldrin	mg/kg	0.05	<0.05	<0.05	<0.05
	067A-SS Endrin	mg/kg	0.05	<0.05	<0.05	<0.05
?	067A-SS Endosulfan 2	mg/kg	0.05	<0.05	<0.05	<0.05
?	067A-SS 4.4'-DDD	mg/kg	0.05	<0.05	<0.05	<0.05
	067A-SS Endrin aldehyde	mg/kg	0.05	<0.05	<0.05	<0.05
	067A-SS Endosulfan sulfate	mg/kg	0.05	<0.05	<0.05	<0.05
?	067A-SS 4.4'-DDT	mg/kg	0.2	<0.2	<0.2	<0.2

Samples analysed on an as received basis. Results reported on a dry weight basis. Sample preparation techniques: Semivolatile - Separatory Funnel and Tumbler, Volatile - Purge & Trap. Sample analysis techniques: Semivolatile components - GC/MS; TPH - GC/FID; Volatile components - GC/MS; Pesticides - GC/ECD, GC/MS.

Spring Laboratory
 Phone (089) 52 6020 Fax (089) 52 6028
 Laboratory
 Phone (054) 46 1390 Fax (054) 46 1389
 Laboratory
 Phone (07) 352 5577 Fax (07) 352 5109

Charles Towers Laboratory
 Phone (077) 87 4155 Fax (077) 87 4220
 Kaigoorlie Laboratory
 Phone (080) 21 1457 Fax (080) 21 6253
 Mt Isa Laboratory
 Phone (077) 48 5545 Fax (077) 48 5546

Orange Laboratory
 Phone (063) 63 1722 Fax (063) 63 1189
 Perth Laboratory
 Phone (09) 249 2888 Fax (09) 249 2842
 Townsville Laboratory
 Phone (077) 79 9155 Fax (077) 79 9729



WOODWARD-CLYDE (QLD)

Attention: MR P MCGURGAN
 Order: A32 73-0001
 Sample Type: SOIL
 Subject:

Page-no: 2
 ENV BRISBANE
 Batch-no: 490
 Sub-batch: 1
 No-samples: 17
 Received: 15/05/95
 Checked:

Code	Analysis description	Units	LOR	B5	B6	B7
-055	Moisture Content (dried @ 103° C)	%	0.1	02/05/95 6.9	02/05/95 11.1	02/05/95 10.5
767A-SS	ORGANOCHLORINE PESTICIDES					
767A-SS	alpha-BHC	mg/kg	0.05	<0.05	<0.05	<0.05
767A-SS	beta- & gamma-BHC	mg/kg	0.1	<0.1	<0.1	<0.1
767A-SS	delta-BHC	mg/kg	0.05	<0.05	<0.05	<0.05
767A-SS	Heptachlor	mg/kg	0.05	<0.05	<0.05	<0.05
767A-SS	Aldrin	mg/kg	0.05	<0.05	<0.05	<0.05
767A-SS	Heptachlor epoxide	mg/kg	0.05	<0.05	<0.05	<0.05
767A-SS	Endosulfan 1	mg/kg	0.05	<0.05	<0.05	<0.05
767A-SS	4,4'-DDE	mg/kg	0.05	<0.05	<0.05	<0.05
767A-SS	Dieldrin	mg/kg	0.05	<0.05	<0.05	<0.05
767A-SS	Endrin	mg/kg	0.05	<0.05	<0.05	<0.05
767A-SS	Endosulfan 2	mg/kg	0.05	<0.05	<0.05	<0.05
767A-SS	4,4'-DDD	mg/kg	0.05	<0.05	<0.05	<0.05
767A-SS	Endrin aldehyde	mg/kg	0.05	<0.05	<0.05	<0.05
767A-SS	Endosulfan sulfate	mg/kg	0.05	<0.05	<0.05	<0.05
767A-SS	4,4'-DDT	mg/kg	0.2	<0.2	<0.2	<0.2

RTI DL RELEASE - EHP

Spring Lake Laboratory
 Phone (089) 52 6020 Fax (089) 52 6028
 Perth Laboratory
 Phone (08) 249 2988 Fax (08) 249 2942
 Townsville Laboratory
 Phone (077) 79 9155 Fax (077) 79 9729

Charlton Towers Laboratory
 Phone (077) 87 4155 Fax (077) 87 4220
 Kalgoorlie Laboratory
 Phone (090) 21 1457 Fax (090) 21 6253
 Mt Isa Laboratory
 Phone (077) 48 5545 Fax (077) 48 5546

Orange Laboratory
 Phone (063) 63 1722 Fax (063) 63 1188
 Perth Laboratory
 Phone (08) 249 2988 Fax (08) 249 2942
 Townsville Laboratory
 Phone (077) 79 9155 Fax (077) 79 9729



WOODWARD-CLYDE (QLD)

Attention: MR P MCGURGAN
 Order: A32 73-0001
 Sample Type: SOIL
 Subject:

Page-no: 3
 ENV BRISBANE
 Batch-no: 490
 Sub-batch: 1
 No-samples: 17
 Received: 15/05/95
 Checked:

Method	Analysis description	Units	LOR	B8	B9	B11
1-055	Moisture Content (dried @ 103° %		0.1	02/05/95 12.6	02/05/95 11.3	02/05/95 15.3
1-067A-SS	ORGANOCHLORINE PESTICIDES					
067A-SS	alpha-BHC	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	beta- & gamma-BHC	mg/kg	0.1	<0.1	<0.1	<0.1
067A-SS	delta-BHC	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	Heptachlor	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	Aldrin	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	Heptachlor epoxide	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	Endosulfan 1	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	4,4'-DDE	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	Dieldrin	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	Endrin	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	Endosulfan 2	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	4,4'-DDD	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	Endrin aldehyde	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	Endosulfan sulfate	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	4,4'-DDT	mg/kg	0.2	<0.2	<0.2	<0.2

RTI DL RELEASE - EHP

Spring Laboratory
 Phone (089) 52 6020 Fax (089) 52 6028
 Laboratory
 (054) 46 1390 Fax (054) 46 1383
 Laboratory
 Phone (07) 352 5577 Fax (07) 352 5109

Charlton Towers Laboratory
 Phone (077) 87 4155 Fax (077) 87 4220
 Kalgoorlie Laboratory
 Phone (080) 21 1457 Fax (080) 21 6253
 Mt Isa Laboratory
 Phone (077) 48 5545 Fax (077) 48 5546

Orange Laboratory
 Phone (063) 63 1722 Fax (063) 63 1188
 Perth Laboratory
 Phone (08) 249 2888 Fax (08) 249 2942
 Townsville Laboratory
 Phone (077) 79 9155 Fax (077) 79 9729



WOODWARD-CLYDE (QLD)

Attention: MR P MCGURGAN
 Order: A32 73-0001
 Sample Type: SOIL
 Subject:

Page-no: 4
 ENV BRISBANE
 Batch-no: 490
 Sub-batch: 1
 No-samples: 17
 Received: 15/05/95
 Checked:

Method	Analysis description	Units	LOR	B13	B29	B30
				02/05/95	02/05/95	02/05/95
055	Moisture Content (dried @ 103' %		0.1	10.3	15.9	19.7
067A-SS	ORGANOCHLORINE PESTICIDES					
067A-SS	alpha-BHC	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	beta- & gamma-BHC	mg/kg	0.1	<0.1	<0.1	<0.1
067A-SS	delta-BHC	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	Heptachlor	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	Aldrin	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	Heptachlor epoxide	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	Endosulfan 1	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	4.4'-DDE	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	Dieldrin	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	Endrin	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	Endosulfan 2	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	4.4'-DDD	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	Endrin aldehyde	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	Endosulfan sulfate	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	4.4'-DDT	mg/kg	0.2	<0.2	<0.2	<0.2

RTI DL RELEASE - EHP

Spring Laboratory
 Phone (089) 52 5020 Fax (089) 52 6028
 Perth Laboratory
 Phone (084) 46 1390 Fax (084) 46 1389
 Townsville Laboratory
 Phone (077) 352 5577 Fax (077) 352 5109

Charters Towers Laboratory
 Phone (077) 87 4155 Fax (077) 87 4220
 Kalgoorlie Laboratory
 Phone (090) 21 1457 Fax (090) 21 6253
 Mt Isa Laboratory
 Phone (077) 48 5545 Fax (077) 48 5546

Orange Laboratory
 Phone (063) 63 1722 Fax (063) 63 1188
 Perth Laboratory
 Phone (09) 249 2988 Fax (09) 249 2942
 Townsville Laboratory
 Phone (077) 79 3155 Fax (077) 79 9729

WOODWARD-CLYDE (QLD)

Attention: MR P MCGURGAN

Order: A32 73-0001

Sample Type: SOIL

Subject:

Page-no: 5

ENV BRISBANE

Batch-no: 490

Sub-batch: 1

No-samples: 17

Received: 15/05/95

Checked:

Code	Analysis description	Units	LOR	B34	B35	B36
				02/05/95	02/05/95	02/05/95
-055	Moisture Content (dried @ 103' %		0.1	16.7	19.0	19.1
-067A-SS	ORGANOCHLORINE PESTICIDES					
067A-SS	alpha-BHC	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	beta- & gamma-BHC	mg/kg	0.1	<0.1	<0.1	<0.1
-067A-SS	delta-BHC	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	Heptachlor	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	Aldrin	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	Heptachlor epoxide	mg/kg	0.05	<0.05	<0.05	<0.05
-067A-SS	Endosulfan 1	mg/kg	0.05	<0.05	<0.05	<0.05
-067A-SS	4.4'-DDE	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	Dieldrin	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	Endrin	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	Endosulfan 2	mg/kg	0.05	<0.05	<0.05	<0.05
-067A-SS	4.4'-DDD	mg/kg	0.05	<0.05	<0.05	<0.05
-067A-SS	Endrin aldehyde	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	Endosulfan sulfate	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	4.4'-DDT	mg/kg	0.2	<0.2	<0.2	<0.2

RTI DL RELEASE - EHP

Springs Laboratory

Phone (089) 52 6020 Fax (089) 52 6028

Laboratory

Phone (054) 46 1390 Fax (054) 46 1389

Laboratory

Phone (07) 352 5577 Fax (07) 352 5109

Charlton Towers Laboratory

Phone (077) 87 4155 Fax (077) 87 4220

Kalgoorlie Laboratory

Phone (090) 21 1457 Fax (090) 21 6253

Mt Isa Laboratory

Phone (077) 49 5545 Fax (077) 48 5546

Orange Laboratory

Phone (063) 63 1722 Fax (063) 63 1188

Perth Laboratory

Phone (09) 249 2988 Fax (09) 249 2942

Townsville Laboratory

Phone (077) 79 9155 Fax (077) 79 9729



WOODWARD-CLYDE (QLD)

Attention: MR P MCGURGAN
 Order: A32 73-0001
 Sample Type: SOIL
 Subject:

Page-no: 6
 ENV BRISBANE
 Batch-no: 490
 Sub-batch: 1
 No-samples: 17
 Received: 15/05/95
 Checked:

Code	Analysis description	Units	LOR	B37	B41
055	Moisture Content (dried @ 103° %		0.1	02/05/95 12.4	02/05/95 10.7
067A-SS	ORGANOCHLORINE PESTICIDES				
067A-SS	alpha-BHC	mg/kg	0.05	<0.05	<0.05
067A-SS	beta- & gamma-BHC	mg/kg	0.1	<0.1	<0.1
067A-SS	delta-BHC	mg/kg	0.05	<0.05	<0.05
067A-SS	Heptachlor	mg/kg	0.05	<0.05	<0.05
067A-SS	Aldrin	mg/kg	0.05	<0.05	<0.05
067A-SS	Heptachlor epoxide	mg/kg	0.05	<0.05	<0.05
067A-SS	Endosulfan 1	mg/kg	0.05	<0.05	<0.05
067A-SS	4,4'-DDE	mg/kg	0.05	<0.05	<0.05
067A-SS	Dieldrin	mg/kg	0.05	<0.05	<0.05
067A-SS	Endrin	mg/kg	0.05	<0.05	<0.05
067A-SS	Endosulfan 2	mg/kg	0.05	<0.05	<0.05
067A-SS	4,4'-DDD	mg/kg	0.05	<0.05	<0.05
067A-SS	Endrin aldehyde	mg/kg	0.05	<0.05	<0.05
067A-SS	Endosulfan sulfate	mg/kg	0.05	<0.05	<0.05
067A-SS	4,4'-DDT	mg/kg	0.2	<0.2	<0.2

RTI DL RELEASE - EHP

Springs Laboratory
 Phone (089) 52 6020 Fax (089) 52 6028
 o Laboratory
 (054) 46 1390 Fax (054) 46 1389
 e Laboratory
 (07) 352 5577 Fax (07) 352 5109

Charlton Towers Laboratory
 Phone (077) 87 4155 Fax (077) 87 4220
 Katoomba Laboratory
 Phone (080) 21 1457 Fax (080) 21 8253
 Mt Isa Laboratory
 Phone (077) 49 5545 Fax (077) 48 5546

Orange Laboratory
 Phone (063) 63 1722 Fax (063) 63 1189
 Perth Laboratory
 Phone (08) 249 2988 Fax (08) 249 2942
 Townsville Laboratory
 Phone (077) 79 3155 Fax (077) 79 9729



TO: AGC WOODWARD-CLYDE (QLD)

49 PARK ROAD
MILTON QLD 4064

ATTENTION: MR P MCGURGAN

SUBJECT: Analytical results.

BATCH: EB663-1

DATE: 06/06/95

FILE REF:

RECEIVED

FAX / MAIL / COURIER

- 6 JUN 1995

PROJECT No. DOCUMENT No.

DISTRIBUTION

Spring Lake Laboratory
Phone (089) 52 6020 Fax (089) 52 6028
Perth Laboratory
Phone (089) 46 1390 Fax (089) 46 1389
Melbourne Laboratory
Phone (07) 352 5577 Fax (07) 352 5109

Charlton Towers Laboratory
Phone (077) 87 4155 Fax (077) 87 4220
Kalgoorlie Laboratory
Phone (090) 21 1457 Fax (090) 21 6253
Mile End Laboratory
Phone (077) 49 5545 Fax (077) 48 5546

Orange Laboratory
Phone (063) 63 1722 Fax (063) 63 1189
Perth Laboratory
Phone (08) 249 2988 Fax (08) 249 2942
Townsville Laboratory
Phone (077) 79 9155 Fax (077) 79 9729



WOODWARD-CLYDE (QLD)

Attention: MR P MCGURGAN
 Order: A32 0073-0001
 Sample Type: SOIL
 Project:

Page-no: 1
 ENV BRISBANE
 Batch-no: 663
 Sub-batch: 1
 No-samples: 5
 Received: 30/05/95
 Checked:

Method	Analysis description	Units	LOR	B2 (1.0-1.2) 02/05/95	B3 (1.0-1.2) 02/05/95	B5 (1.0-1.2) 02/05/95
055	Moisture Content (dried @ 103' %		0.1	10.9	10.8	9.5
067A-SS	ORGANOCHLORINE PESTICIDES					
067A-SS	alpha-BHC	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	beta- & gamma-BHC	mg/kg	0.1	<0.1	<0.1	<0.1
067A-SS	delta-BHC	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	Heptachlor	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	Aldrin	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	Heptachlor epoxide	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	Endosulfan 1	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	4,4'-DDE	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	Dieldrin	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	Endrin	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	Endosulfan 2	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	4,4'-DDD	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	Endrin aldehyde	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	Endosulfan sulfate	mg/kg	0.05	<0.05	<0.05	<0.05
067A-SS	4,4'-DDT	mg/kg	0.2	<0.2	<0.2	<0.2

Samples analysed on an as received basis. Results reported on a dry weight basis. Sample preparation techniques: Semivolatile - Separatory Funnel and Tumbler, Volatile - Purge & Trap. Sample analysis techniques: Semivolatile components - GC/MS; TPH - GC/FID; Volatile components - GC/MS; Pesticides - GC/ECD, GC/MS.

Spring Laboratory
 Phone (089) 52 6020 Fax (089) 52 6028
 Perth Laboratory
 Phone (084) 46 1390 Fax (084) 46 1389
 Brisbane Laboratory
 Phone (07) 352 5577 Fax (07) 352 5109

Charters Towers Laboratory
 Phone (077) 87 4155 Fax (077) 87 4220
 Kalgoorlie Laboratory
 Phone (090) 21 1457 Fax (090) 21 6253
 Mt Isa Laboratory
 Phone (077) 48 5545 Fax (077) 48 5546

Orange Laboratory
 Phone (063) 63 1722 Fax (063) 63 1189
 Perth Laboratory
 Phone (09) 249 2988 Fax (09) 249 2942
 Townsville Laboratory
 Phone (077) 79 9155 Fax (077) 79 9729



WOODWARD-CLYDE (QLD)

Attention: MR P MCGURGAN
 Order: A32 0073-0001
 Sample Type: SOIL
 Subject:

Page-no: 2
 ENV BRISBANE
 Batch-no: 663
 Sub-batch: 1
 No-samples: 5
 Received: 30/05/95
 Checked:

Method	Analysis description	Units	LOR	B11 (1.0-1.2) 02/05/95	B24 (1.0-1.2) 02/05/95
A-055	Moisture Content (dried @ 103' %		0.1	12.7	15.5
P-067A-SS	ORGANOCHLORINE PESTICIDES				
	067A-SS alpha-BHC	mg/kg	0.05	<0.05	<0.05
	067A-SS beta- & gamma-BHC	mg/kg	0.1	<0.1	<0.1
P-067A-SS	delta-BHC	mg/kg	0.05	<0.05	<0.05
	067A-SS Heptachlor	mg/kg	0.05	<0.05	<0.05
	067A-SS Aldrin	mg/kg	0.05	<0.05	<0.05
	067A-SS Heptachlor epoxide	mg/kg	0.05	<0.05	<0.05
P-067A-SS	Endosulfan 1	mg/kg	0.05	<0.05	<0.05
P-067A-SS	4.4'-DDE	mg/kg	0.05	<0.05	<0.05
	067A-SS Dieldrin	mg/kg	0.05	<0.05	<0.05
	067A-SS Endrin	mg/kg	0.05	<0.05	<0.05
P-067A-SS	Endosulfan 2	mg/kg	0.05	<0.05	<0.05
P-067A-SS	4.4'-DDD	mg/kg	0.05	<0.05	<0.05
P-067A-SS	Endrin aldehyde	mg/kg	0.05	<0.05	<0.05
	067A-SS Endosulfan sulfate	mg/kg	0.05	<0.05	<0.05
	067A-SS 4.4'-DDT	mg/kg	0.2	<0.2	<0.2

RTI DL RELEASE - EHP

Se Springs Laboratory
 Phone (089) 52 5020 Fax (089) 52 5028
 Jo Laboratory
 Phone (054) 46 1390 Fax (054) 46 1389
 Jane Laboratory
 Phone (07) 352 5577 Fax (07) 352 5109

Charles Towers Laboratory
 Phone (077) 87 4155 Fax (077) 87 4220
 Kaigoorlie Laboratory
 Phone (090) 21 1457 Fax (090) 21 6253
 Mt Isa Laboratory
 Phone (077) 49 5545 Fax (077) 48 5546

Orange Laboratory
 Phone (063) 63 1722 Fax (063) 63 1189
 Perth Laboratory
 Phone (08) 249 2988 Fax (08) 249 2942
 Townsville Laboratory
 Phone (077) 79 9155 Fax (077) 79 9729



TO: AGC WOODWARD-CLYDE (QLD)

49 PARK ROAD
MILTON QLD 4064

ATTENTION: MR P MCGURGAN

SUBJECT: Analytical results.

BATCH: EB663-0

DATE: 02/06/95

RTI DL RELEASE - EHP

Springs Laboratory
Phone (089) 52 6020 Fax (089) 52 6028
Laboratory
Phone (054) 46 1390 Fax (054) 46 1389
Laboratory
Phone (07) 352 5577 Fax (07) 352 5109

Charlton Towers Laboratory
Phone (077) 87 4156 Fax (077) 87 4220
Kalgoorlie Laboratory
Phone (090) 21 1457 Fax (090) 21 5253
Mt Isa Laboratory
Phone (077) 49 5545 Fax (077) 48 5546

Orange Laboratory
Phone (063) 63 1722 Fax (063) 63 1188
Perth Laboratory
Phone (09) 249 2988 Fax (09) 249 2942
Townsville Laboratory
Phone (077) 79 9155 Fax (077) 79 9729

WOODWARD-CLYDE (QLD)

Attention: MR P MCGURGAN
 Order: A32 0073-0001
 Sample Type: SOIL
 Project:

Page-no: 1
 ENV BRISBANE
 Batch-no: 663
 Sub-batch: 0
 No-samples: 5
 Received: 30/05/95
 Checked:

Method	Analysis description	Units	LOR	B2 (1.0-1.2) 02/05/95	B3 (1.0-1.2) 02/05/95	B5 (1.0-1.2) 02/05/95
0055	Moisture Content (dried @ 103° C)	%	0.1	10.9	10.8	9.5
005T	Arsenic - Total	mg/kg	1	6	7	4

RTI DL RELEASE - EHP

Samples as received digested by USEPA method 3051 prior to the determination of Arsenic. Results reported on a dry weight basis.

Springs Laboratory
 Phone (089) 52 6020 Fax (089) 52 6028
 o Laboratory
 (054) 46 1390 Fax (054) 46 1389
 ne Laboratory
 (07) 352 5577 Fax (07) 352 5109

Charters Towers Laboratory
 Phone (077) 87 4155 Fax (077) 87 4220
 Kaigoorlie Laboratory
 Phone (080) 21 1457 Fax (080) 21 6253
 Mt Isa Laboratory
 Phone (077) 49 5545 Fax (077) 48 5546

Orange Laboratory
 Phone (063) 63 1722 Fax (063) 63 1188
 Perth Laboratory
 Phone (08) 249 2988 Fax (08) 249 2942
 Townsville Laboratory
 Phone (077) 79 3155 Fax (077) 79 9729



WOODWARD-CLYDE (QLD)

Attention: MR P MCGURGAN
 Order: A32 0073-0001
 Sample Type: SOIL
 Subject:

Page-no: 2
 ENV BRISBANE
 Batch-no: 663
 Sub-batch: 0
 No-samples: 5
 Received: 30/05/95
 Checked:

Code	Analysis description	Units	LOR	B11 (1.0-1.2) 02/05/95	B34 (1.0-1.2) 02/05/95
-055	Moisture Content (dried @ 103' %		0.1	12.7	15.5
-005T	Arsenic - Total	mg/kg	1	10	15

RTI DL RELEASE - EHP

Spring Lake Laboratory
 Phone (089) 52 6020 Fax (089) 52 6028
 Brisbane Laboratory
 Phone (054) 46 1390 Fax (054) 46 1389
 Brisbane Laboratory
 Phone (07) 352 5577 Fax (07) 352 5109

Charters Towers Laboratory
 Phone (077) 87 4156 Fax (077) 87 4220
 Kalgoorlie Laboratory
 Phone (090) 21 1457 Fax (090) 21 6253
 Mt Isa Laboratory
 Phone (077) 48 5545 Fax (077) 48 5546

Orange Laboratory
 Phone (063) 63 1722 Fax (063) 63 1189
 Perth Laboratory
 Phone (09) 249 2966 Fax (09) 249 2942
 Townsville Laboratory
 Phone (077) 79 8155 Fax (077) 79 9729



ANALYTICAL REPORT

PAGE 1 of 2

CONTACT: MR P MCGURGAN
CLIENT: AGC WOODWARD-CLYDE (QLD)
ADDRESS: 49 PARK ROAD
MILTON QLD 4064

LABORATORY: ENV BRISBANE
BATCH NUMBER: 663
SUB BATCH: 0
No. OF SAMPLES: 5
DATE RECEIVED: 30/05/95
DATE COMPLETED: 07/06/95

ORDER No.: A32 0073-0001 SAMPLE TYPE: SOIL

PROJECT:

Analysis description	Units	LOR	82	83	85	811
			(1.0-1.2) 02/05/95	(1.0-1.2) 02/05/95	(1.0-1.2) 02/05/95	(1.0-1.2) 02/05/95
Moisture Content (dried @ 103°C)	%	0.1	10.9	10.8	9.5	12.7
Arsenic - Total	mg/kg	1	6	7	4	10

RTI DL RELEASE - EHP

REMARKS:

Samples as received digested by USEPA method 3051 prior to the determination of Arsenic. Results reported on a dry weight basis.

This is the Final Report which supersedes any preliminary reports with this batch number.

• Results apply to sample(s) as submitted by client.



Brisbane
Phone: (07) 3243 7222 Fax: (07) 3243 7218
Sydney
Phone: (02) 841 9500 Fax: (02) 841 9530
Melbourne
Phone: (03) 853 5299 Fax: (03) 853 0730
Perth
Phone: (09) 249 2988 Fax: (09) 249 2942

Laboratories also in:
Singapore
Malaysia
Thailand
Hong Kong
New Zealand

This Laboratory is registered by the National Association of Testing Authorities, Australia. The test(s) reported herein have been performed in accordance with its terms of registration. This document shall not be reproduced except in full.





ANALYTICAL REPORT

PAGE 2 of 2

CONTACT: MR P MCGURGAN
CLIENT: AGC WOODWARD-CLYDE (QLD)
ADDRESS: 49 PARK ROAD
MILTON QLD 4064

LABORATORY: ENV BRISBANE
BATCH NUMBER: 663
SUB BATCH: 0
No. OF SAMPLES: 5
DATE RECEIVED: 30/05/95
DATE COMPLETED: 07/06/95

ORDER No.: A32 0073-0001 SAMPLE TYPE: SOIL

PROJECT:

Analysis description	Units	LOR	834 (1.0-1.2) 02/05/95
----------------------	-------	-----	------------------------------

Moisture Content (dried @ 103°C)	%	0.1	15.5
Arsenic - Total	mg/kg	1	15

RTI DL RELEASE - EHP

REMARKS:

This is the Final Report which supersedes any preliminary reports with this batch number.

• Results apply to sample(s) as submitted by client.



Brisbane
Phone: (07) 3243 7222 Fax: (07) 3243 7218
Sydney
Phone: (02) 841 9500 Fax: (02) 841 9530
Melbourne
Phone: (03) 853 5299 Fax: (03) 853 0730
Perth
Phone: (09) 249 2988 Fax: (09) 249 2942

Laboratories also in:
Singapore
Malaysia
Thailand
Hong Kong
New Zealand

This Laboratory is registered by the National Association of Testing Authorities, Australia. The test(s) reported herein have been performed in accordance with its terms of registration. This document shall not be reproduced except in full.





ANALYTICAL REPORT

PAGE 1 of 1

CONTACT: MR P MCGURGAN
CLIENT: AGC WOODWARD-CLYDE (QLD)
ADDRESS: 49 PARK ROAD
MILTON QLD 4064

LABORATORY: ENV BRISBANE
BATCH NUMBER: 663
SUB BATCH: 0
No. OF SAMPLES: 5
DATE RECEIVED: 30/05/95
DATE COMPLETED: 07/06/95

ORDER No.: A32 0073-0001 SAMPLE TYPE: QUALITY CONTROL PROJECT:

I	Analysis description	Units	LOR	82 1.0-1.2	834 1.0-
				%SPK REC 02/05/95	CHK 02/05/95
i	Moisture Content (dried @ 103°C)	%	0.1	----	15.0
1057	Arsenic - Total	mg/kg	1	94.0 %	13

RTI DL RELEASE - EHP

REMARKS:

Results which appear on this report are routine laboratory checks for QUALITY CONTROL purposes.

This is the Final Report which supersedes any preliminary reports with this batch number.

• Results apply to sample(s) as submitted by client.



Brisbane
Phone: (07) 3243 7222 Fax: (07) 3243 7218
Sydney
Phone: (02) 841 9500 Fax: (02) 841 9530
Melbourne
Phone: (03) 853 5299 Fax: (03) 853 0730
Perth
Phone: (09) 249 2988 Fax: (09) 249 2942

Laboratories also in:
Singapore
Malaysia
Thailand
Hong Kong
New Zealand

This Laboratory is registered by the National Association of Testing Authorities, Australia. The test(s) reported herein have been performed in accordance with its terms of registration. This document shall not be reproduced except in full.





ANALYTICAL REPORT

PAGE 1 of 2

CONTACT: MR P MCGURGAN
CLIENT: AGC WOODWARD-CLYDE (QLD)
ADDRESS: 49 PARK ROAD
MILTON QLD 4064

LABORATORY: ENV BRISBANE
BATCH NUMBER: 663
SUB BATCH: 1
No. OF SAMPLES: 5
DATE RECEIVED: 30/05/95
DATE COMPLETED: 07/06/95

ORDER No.: A32 0073-0001 SAMPLE TYPE: SOIL

PROJECT:

Analysis description	Units	LOR	82	83	85	811
			(1.0-1.2) 02/05/95	(1.0-1.2) 02/05/95	(1.0-1.2) 02/05/95	(1.0-1.2) 02/05/95
Moisture Content (dried @ 103°C)	%	0.1	10.9	10.8	9.5	12.7
670 SS ORGANOCHLORINE PESTICIDES						
alpha-BHC	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05
beta- & gamma-BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan 1	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDE	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05
Endrin	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan 2	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDD	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05
4,4'-DDT	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2

COMMENTS:

Samples analysed on an as received basis. Results reported on a dry weight basis. Sample preparation techniques: Semivolatile - Separatory Funnel and Tumbler, Volatile - Purge & Trap. Sample analysis techniques: Semivolatile components - GC/MS; TPH - GC/FID; Volatile components - GC/MS; Pesticides - GC/ECD, GC/MS.

This is the Final Report which supersedes any preliminary reports with this batch number.

• Results apply to sample(s) as submitted by client.



Brisbane
Phone: (07) 3243 7222 Fax: (07) 3243 7218
Sydney
Phone: (02) 841 9500 Fax: (02) 841 9530
Melbourne
Phone: (03) 853 5299 Fax: (03) 853 0730
Perth
Phone: (09) 249 2988 Fax: (09) 249 2942

Laboratories also in:
Singapore
Malaysia
Thailand
Hong Kong
New Zealand

This Laboratory is registered by the National Association of Testing Authorities, Australia. The test(s) reported herein have been performed in accordance with its terms of registration. This document shall not be reproduced except in full.





ANALYTICAL REPORT

PAGE 2 of 2

CONTACT: MR P MCGURGAN
CLIENT: AGC WOODWARD-CLYDE (QLD)
ADDRESS: 49 PARK ROAD
MILTON QLD 4064

LABORATORY: ENV BRISBANE
BATCH NUMBER: 663
SUB BATCH: 1
No. OF SAMPLES: 5
DATE RECEIVED: 30/05/95
DATE COMPLETED: 07/06/95

ORDER No.: A32 0073-0001 SAMPLE TYPE: SOIL

PROJECT:

i Analysis description Units LOR 834
(1.0-1.2)
02/05/95

5 Moisture Content (dried @ 103°C) % 0.1 15.5
ORGANOCHLORINE PESTICIDES
alpha-BHC mg/kg 0.05 <0.05
beta- & gamma-BHC mg/kg 0.1 <0.1
delta-BHC mg/kg 0.05 <0.05
Heptachlor mg/kg 0.05 <0.05
Aldrin mg/kg 0.05 <0.05
Heptachlor epoxide mg/kg 0.05 <0.05
Endosulfan 1 mg/kg 0.05 <0.05
4.4'-DDE mg/kg 0.05 <0.05
Dieldrin mg/kg 0.05 <0.05
Endrin mg/kg 0.05 <0.05
Endosulfan 2 mg/kg 0.05 <0.05
4.4'-DDD mg/kg 0.05 <0.05
Endrin aldehyde mg/kg 0.05 <0.05
Endosulfan sulfate mg/kg 0.05 <0.05
4.4'-DDT mg/kg 0.2 <0.2

REMARKS:

P. Blaw

This is the Final Report which supersedes any preliminary reports with this batch number.

* Results apply to sample(s) as submitted by client.



Brisbane
Phone: (07) 3243 7222 Fax: (07) 3243 7218
Sydney
Phone: (02) 841 9500 Fax: (02) 841 9530
Melbourne
Phone: (03) 853 5299 Fax: (03) 853 0730
Perth
Phone: (09) 249 2988 Fax: (09) 249 2942

Laboratories also in:
Singapore
Malaysia
Thailand
Hong Kong
New Zealand

This Laboratory is registered by the National Association of Testing Authorities, Australia. The test(s) reported herein have been performed in accordance with its terms of registration. This document shall not be reproduced except in full.





ORGANICS QUALITY CONTROL REPORT

BATCH No. : EB663

DATE BATCH RECEIVED : 30/05/95

CLIENT : AGC Woodward-Clyde

DATE BATCH COMPLETED : 06/06/95

Method Code	Test	Matrix	QC Lot Number	Date Samples Extracted	Date Samples Analysed
EP-067	Pesticides	Soil	OCOPS314	31/05/95	31/05/95

ORGFORM(60/0)

AUSTRALIAN LABORATORY SERVICES P/L

A.C.N. 009 936 029

BRISBANE

Phone: (07) 352 5577

15-096 Fax: (07) 352 5109

SYDNEY

Phone: (02) 899 5722

Fax: (02) 899 3200

MELBOURNE

Phone: (03) 853 5299

Fax: (03) 853 0730

PERTH

Phone: (09) 249 2988

Fax: (09) 249 2942

FILE A

85 of 86

ALS EP-067 : PESTICIDES

QC LOT No. : OCOPS314
MATRIX: Soil

ANALYST: L. Sharp

COMPOUND	Blank Conc	Spike Level	SPIKE QC RESULTS				Control Limits		
			SCS Conc	DCS Conc	Average Rec.	RPD	Rec.		RPD
	mg/kg	mg/kg	mg/kg	mg/kg	%	%	Low	High	%
EP-067A : ORGANOCHLORINE PESTICIDES									
alpha-BHC	<LOR	0.20	0.21	0.24	111	12	63	123	20
beta & gamma-BHC	<LOR	0.40	0.42	0.49	114	15	64	129	20
delta-BHC	<LOR	0.20	0.22	0.25	117	10	64	124	20
Heptachlor	<LOR	0.20	0.19	0.22	101	15	51	125	20
Aldrin	<LOR	0.20	0.21	0.23	110	13	63	124	20
Heptachlor epoxide	<LOR	0.20	0.21	0.24	113	13	64	128	20
Endosulfan 1	<LOR	0.20	0.23	0.26	121	13	62	128	20
4,4'-DDE	<LOR	0.20	0.22	0.25	119	13	64	127	20
Dieldrin	<LOR	0.20	0.22	0.25	120	13	65	127	20
Endrin	<LOR	0.20	0.22	0.25	119	12	58	130	20
Endosulfan 2	<LOR	0.20	0.22	0.25	118	12	62	129	20
4,4'-DDD	<LOR	0.20	0.22	0.26	120	14	62	131	20
Endrin aldehyde	<LOR	0.20	0.18	0.21	98	13	43	116	20
Endosulfan sulfate	<LOR	0.20	0.22	0.25	118	14	61	132	20
4,4'-DDT	<LOR	0.20	0.21	0.24	113	14	44	137	20
EP-067B : ORGANOPHOSPHORUS PESTICIDES									
Dichlorvos	<LOR	0.20	0.19	0.22	103	17	69	116	20
Dimethoate	<LOR	0.20	0.20	0.23	108	12	59	123	20
Diazinon	<LOR	0.20	0.21	0.23	110	13	64	124	20
Chlorpyrifos methyl	<LOR	0.20	0.20	0.23	107	13	63	121	20
Malathion	<LOR	0.20	0.20	0.23	109	14	62	124	20
Fenthion	<LOR	0.20	0.21	0.24	111	14	55	122	20
Chlorpyrifos	<LOR	0.20	0.21	0.24	110	14	64	126	20
Pirimiphos ethyl	<LOR	0.20	0.21	0.24	112	14	64	125	20
Bromophos ethyl	<LOR	0.20	0.20	0.23	106	15	64	128	20
Prothiofos	<LOR	0.20	0.22	0.24	116	11	58	131	20
Ethion	<LOR	0.20	0.21	0.24	113	15	56	133	20

COMMENTS :

- 1) The control limits are based on ALS laboratory statistical data (Method QWI-ORG/07)
- 2) * : Recovery or RPD falls outside of the recommended control limits.