Prepared for

Rail Corporation NSW

Delineation & Characterisation Sampling and Review of Remedial Options

Former Macdonaldtown Gasworks – Burren Street, Erskineville, NSW





Final Report

March 2007

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CH2MHILL

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Executive Summary

Introduction and Objectives

In July 2006 Rail Corporation NSW (RailCorp) engaged CH2M HILL Australia Pty Ltd (CH2M HILL) to undertake a delineation and characterisation soil sampling investigation at the Former Macdonaldtown Gasworks site located at Burren Street, Erskineville (the Site). Refer to **Figure 1** for site location.

The objectives of the project were to fill in data gaps and characterise the Site sufficiently to:

- determine areas, volumes, types of contaminants requiring remediation to meet RailCorp's long term objectives, which include removing the Significant Risk of Harm declaration, removing health risks to future site users and providing beneficial reuse for rail related activities;
- screen available remedial options and recommend appropriate options to allow long term land use objectives to be met; and
- provide indicative remedial cost estimates to implement an appropriate remedial strategy, to be provided in a separate letter to this investigation report.

Site History

The historical use of the Site has primarily been for the manufacturing of gas for use as lighting for train carriages and station lamps. The gasworks operations began in the early 1890's and ceased operations around the 1970's. Subsequent to this time, the Site has remained vacant and unused. Refer to **Figure 2** for current and historical site layout.

Scope of Work

The scope of work entailed a review of existing Site information, preparation of fieldwork safety plans, development of a Sampling, Analysis and Quality Plan (SAQP), conducting a field sampling program, analytical testing of samples and preparing an investigation report. Refer to **Figure 3** for stratified site areas and sampling locations and **Figure 4** for locations of analytical results of impacted areas. The field sampling program included the following sample locations and specific sample types:

Site Area/ Sample Type	August 2006	October 2006	February 2007	Total
Gasholder	5	7	0	12
Retort	7	5	0	12
Gas Purifier	1	2	0	3
Northeast	7	2	0	9
South Central	3	0	0	3
Southwest	4	0	0	4
Retaining Wall	3	0	0	3
Western Lot	2	0	0	2
Surface Water	6	0	0	6
Leachate	8	3	0	11
Tar (dioxin)	0	0	1	1
Total	**46**	**19**	**1**	**66**

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Contamination Delineation

The following table details the vertical and lateral extent of impacted fill and soil materials that require remediation. Refer to **Figure 7** for remediation areas and excavation depth estimates.

Area	Contamination Impacts	Vertical Extent	Lateral Extent shown on Figure 7
Tar Wells/ Northern Gasholder/ Free Tar Impacts under Gas Purifier (BHE & BHF)	Tar Sources and Free Tar Impacts	8 – 10m	Pink shaded area
Former Gasworks Areas	Tarry Impacted Soils	up to 4m	Orange shaded area
Northern Gasholder	Demolition/ Asbestos	6m	Shaded blue inside buried annulus
Entire Site Surface	Ash/ Coke Fill	0.5	Yellow and orange shaded areas (excluding the Gasholders and Tar Well structures and the Retaining Wall)
Retaining Wall	Fill and Demolition	Entire thickness (approx. 1.5m)	Shaded blue along northern boundary
Contamination Hotspots	Free Tar or impacted fill	1 – 2m	Shaded green area
Underground Pipework	Residual tar	Varying over Site	Known locations identified on Figure 7

Remediation Volume Estimates

The following table details the remediation volume estimates of impacted fill and soil material. These estimates are based on the findings of vertical and lateral extent of impact provided in the table above.

Remediation Area	Impacted Area	Estimated Volume (m3)	Waste Material	Likely Waste Classification
Tar Wells		1,000	Tar	Hazardous
Northern Gasholder	Base annulus and immediate area	2,100	Tar	Hazardous
Northern Gasholder	Buried wastes inside annulus	1,900	Demolition	Asbestos/Industrial
Tar Impacted Soils	Shallow	9,225	Fill and natural clays	Industrial(a)
	Deeper	2,375	Natural clays and weathered shales	Industrial(a)
	TP16 Hotspot	115	Fill and natural clays	Industrial(a)
Site Surfaces		2,950	Ash and Coke Gravels	Solid(a)
Retaining Wall		1,765	Gravel Sand and Demolition Wastes	Solid
Hotspots	BH14	100	Fill and natural clays	Solid
	MW13s	140	Fill (southwest site area)	Solid
	MW04s	100	Fill and natural clays	Solid
Pipework	Varying across site	unknown	Tar/ scrap metal	Hazardous/ Solid

(a) assumed after treatment and applying the appropriate NSW DEC general approval of immobilisation.

Suitable Remedial Options

The investigation has identified the following available remedial options for site remediation:

- No Action;
- Institutional Controls including a Site Management Plan (SMP) and site access restrictions;

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- Insitu Physical/Chemical Treatment including chemical oxidation and soil vapour extraction (SVE);
- Insitu Thermal Treatment;
- Exsitu Biological Treatment including biopiles, composting and landfarming;
- Exsitu Physical/Chemical Treatment including solidification/ stabilisation/ immobilisation and chemical extraction;
- Exsitu Thermal Treatment including incineration/co-burning and thermal desorption;
- Containment including capping and containment;
- Off site Disposal; and
- Reuse and Recycle.

Conclusions and Recommendations

The investigation has identified that remediation of the contamination sources will adequately reduce the risks associated with this Site by:

- Preventing leaching and inturn controlling/minimising ongoing groundwater contamination;
- Controlling the generation of vapours from impacted soils;
- Controlling the generation of vapours from impacted groundwater;
- Preventing exposure of onsite workers to impacted soils and vapours;
- Preventing exposure of employees and residents of adjoining properties to impacted dusts and vapours; and
- Improving the groundwater quality migrating from the Site and inturn controlling exposure of users of extracted groundwater down gradient of the Site, controlling exposure of hypogean ecosystems to toxic groundwater and controlling exposure of receiving waters to poor quality groundwater.

To assess the effectiveness of site remediation in reducing these risks, ongoing groundwater monitoring will be required, utilising the network of monitoring wells already established on and off site, or new wells installed post remediation to monitor site boundary conditions.

Ongoing groundwater monitoring will monitor the status of natural attenuation (monitored natural attenuation – MNA) of the contamination plume on and off site in both the shallow groundwater and deeper bedrock groundwater systems.

CH2M HILL recommends that RailCorp proceed with a Remedial Action Plan (RAP) to enable a full assessment of the remedial requirements of the Site, based on the findings of this investigation.

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Table of Contents

1 Introduction 1

1.1 Background and Project Objectives 1
1.1.1 Background 1
1.1.2 Project Objectives 2
1.1.3 RailCorp Long Term Objectives 2
1.2 Site Identification 2
1.3 Areas of the Site 3
1.4 Previous Site Investigations 4
1.5 Limitations 4

2 Site History 6

2.1 Land Title and Previous Land Use 6
2.2 Site Operations 6
2.3 Aerial Photographs 7
2.4 Site Heritage 7

3 Site Description 8

3.1 Existing Site Condition 8
3.1.1 Surrounding Land Use 8
3.2 Topography and Drainage 9
3.2.1 Site Topography 9
3.2.2 Surface Water Drainage 9
3.3 Geology 9
3.3.1 Soil/Fill Types 10
3.4 Hydrogeology 10
3.4.1 Groundwater Flow 11
3.5 Geological and Hydrogeological Overview 11

4 Data Quality Objectives and Scope of Work 14

4.1 Data Quality Objectives 14
4.2 Scope of Work 16
4.2.1 Existing Data Review and SAQP 16
4.2.2 Preparation of Pre Site Work Plans 17
4.2.3 Soil Investigation Program 17
4.2.4 Surface Water Investigation Program 19
4.2.5 Leachate Analysis 19
4.2.6 Dioxin Analysis 19
4.2.7 Reporting 19

5 Review of Previous Investigations 20

5.1.1 RSA, Nov 1999 20
5.1.2 CH2M HILL Australia, June 2000 21
5.1.3 CH2M HILL Australia, November 2000 22

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5.1.4 CH2M HILL Australia, December 2001 23
5.1.5 ARHS, June 2003 24
5.1.6 Banksia Heritage, April 2004 25
5.1.7 GHD, September 2005 25
5.1.8 SKM, April 2006 26
5.2 Assessment of Previous Data 28

6 Development of the Site Investigation Criteria 29
6.1 Contaminants of Concern in Soils 29
6.2 Investigation Criteria 30
6.2.1 Soil Investigation Levels 30
6.2.2 Water Investigation Levels 32
6.2.3 Comparison of Soil Analytical Results to the Soil Investigation Levels 33

7 Fieldwork Methodology 34
7.1 Overview 34
7.1.1 Scope of Fieldwork 34
7.1.2 Sampling Program 34
7.2 Soil Investigation 35
7.2.1 Intrusive Work 35
7.2.2 Soil Sample Collection 35
7.2.3 Field Screening 36
7.2.4 Soil Sample Storage and Transport 37
7.2.5 Soil Sampling Equipment Decontamination 37
7.3 Surface Water Investigation 37
7.3.1 Sampling Locations 37
7.3.2 Surface Water Sampling 37
7.3.3 Surface Water Sample Storage and Transport 38
7.3.4 Surface Water Sampling Equipment Decontamination 38
7.4 Analytical Program 38

8 Investigation Results 40
8.1 Subsurface Conditions 40
8.1.1 Additional Subsurface Findings 40
8.2 Geological Observations 43
8.2.1 Fill Material 43
8.2.2 Natural Soil 43
8.2.3 Tar and Tar Impacted Soil 44
8.3 Stratified Area Soil Analytical Results 45
8.3.1 PID Field Screening Results 45
8.3.2 Gasholder Area 45
8.3.3 Retort Area 48
8.3.4 Gas Purifier Area 50
8.3.5 Northeast Area 50
8.3.6 South Central Area 51
8.3.7 Southwest Area 51
8.3.8 Retaining Wall Area 52
8.3.9 Western Lot Area 53

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8.3.10 Tar Samples 53
8.3.11 Asbestos 54
8.4 Results and Assessment of All Soil Data 55
8.4.1 Summary of Soil Data 55
8.5 Leachate Analytical Results 59
8.5.1 TCLP Fill and Natural Soil Results 59
8.5.2 Preliminary Waste Classifications 60
8.5.3 Neutral Leach Natural Soil Results 62
8.6 Surface Water Analytical Results 63

9 Assessment for Unsuitable Materials and Areas 65

9.1 Statistical Results 66
9.1.1 Ash and Coke Gravels 67
9.1.2 Reworked Clays 67
9.1.3 Silty Clays 67
9.1.4 Gravel, Sand and Demolition Wastes 67
9.1.5 Sands and Gravels 68
9.1.6 Gravel, Sand and Clay with Minor Ash 68
9.1.7 Red/Grey Clays 68
9.1.8 Weathered Shales 68

10 Data Quality Assessment 69

11 Conceptual Site Model 70

11.1 Sources 70
11.2 Impacted Media 70
11.3 Contaminants 71
11.4 Transport Mechanisms and Exposure Pathways 71
11.5 Receptors 72
11.6 Rationale for Site Remediation 72

12 Delineation and Characterisation of Contamination 73

12.1 Site Areas and Material Types 73
12.1.1 Former Gasworks Area 73
12.1.2 Northeast 77
12.1.3 South Central 78
12.1.4 Southwest 78
12.1.5 Retaining Wall 79
12.1.6 Western Lot 79
12.2 Remediation Volume Estimates 80
12.2.1 Uncertainty of Estimates 80
12.2.2 Contamination Source Areas 80
12.2.3 Tarry Impacted Materials 82
12.2.4 Other Materials 82
12.2.5 Summary of Volume Estimates 84

13 Remedial Option Screening 85

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13.1 Remedial Objective and Evaluation Criteria 85
13.1.1 Remediation Objectives 85
13.1.2 Evaluation Criteria 85
13.2 Long List Remedial Options 85
13.3 Potentially Suitable Remedial Options 86
13.3.1 No Action 86
13.3.2 Institutional Controls 86
13.3.3 Insitu Physical/Chemical Treatment 86
13.3.4 Insitu Thermal Treatment 87
13.3.5 Exsitu Biological Treatment 87
13.3.6 Exsitu Physical/Chemical Treatment 87
13.3.7 Exsitu Thermal Treatment 88
13.3.8 Containment 88
13.3.9 Disposal 88
13.3.10 Reuse and Recycle 88
13.4 Management During Remediation 88
13.4.1 Groundwater and Surface Water 89
13.4.2 Odours 89
13.4.3 Archaeological and Heritage Matters 89

14 Conclusions 90
14.1 DQOs 90
14.2 Remediation Requirements and Recommendations 92

15 References 94

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List of Figures

Figure 1 - Site Location

Figure 2 - Current Site Layout and Historical Layout

Figure 3 - Stratified Site Areas, Sampling Locations and Cross Section Transects

Figure 4 - Sample Locations Exceeding Site Criteria

Figure 5 - Cross Section Plan No. 1

Figure 6 - Cross Section Plan No. 2

Figure 7 - Remedial Excavation Areas

List of Tables

Table 1 – Soil Analytical Results – Gasholder Area

Table 2 – Soil Analytical Results – Retort Area

Table 3 – Soil Analytical Results – Gas Purifier Area

Table 4 – Soil Analytical Results – Northeast Area

Table 5 – Soil Analytical Results – South Central Area

Table 6 – Soil Analytical Results – Southwest Area

Table 7 – Soil Analytical Results – Retaining Wall Area

Table 8 – Soil Analytical Results – Western Lot Area

Table 9 – Soil Analytical Results – Coal Tar

Table 10 – Soil Analytical Results – Asbestos

Table 11 – Summary of All Data for Fill & Silty Clay Material

Table 12 – Summary of All Data for Natural Soil Material

Table 13 – TCLP Analytical Results

Table 14 – Neutral Leach Analytical Results

Table 15 – Surface Water Analytical Results

Table 16 – Statistical Analysis Results – Ash and Coke Gravels

Table 17 – Statistical Analysis Results – Reworked Clays

Table 18 – Statistical Analysis Results – Silty Clays

Table 19 – Statistical Analysis Results – Gravel, Sand & Demolition Wastes

Table 20 – Statistical Analysis Results – Sands and Gravels

Table 21 – Statistical Analysis Results – Gravel, Sand and Clay with Minor Ash

Table 22 – Statistical Analysis Results – Red and Grey Clays

Table 23 – Statistical Analysis Results – Weathered Shales

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List of Appendices

Appendix A – Site Photographs

Appendix B – QA/QC Assessment

Appendix C – CH2M HILL Bore Logs

Appendix D – Conceptual Site Model

Appendix E – Calibration Certificate and Records

Appendix F – Remedial Options Screening

Appendix G – Laboratory Analytical Reports

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1 Introduction

In July 2006, Rail Corporation NSW (RailCorp), engaged CH2M HILL Australia Pty Ltd (CH2M HILL) to conduct delineation and characterisation soil sampling at the Former Macdonaldtown Gasworks site located at Burren Street, Erskineville (the Site). The engagement also included a review of appropriate remedial options for the Site. For ease of reference, the assessment work documented in this report will be referred to as the "Delineation Investigation".

This Delineation Investigation focused on reducing uncertainty associated with the characterisation of impacts to Site stratigraphy from historical contamination sources, therefore enabling estimates of the depth, lateral extent and leachability of contaminated material in soil in an attempt to evaluate the suitability and feasibility of appropriate remedial strategies.

1.1 Background and Project Objectives

1.1.1 Background

The Site has been declared by the NSW Environment Protection Authority (EPA)[1] to pose a Significant Risk of Harm (SRoH) to human health and the environment. The declaration was made in consideration of the concentrations of contaminants in the soil and groundwater reported in previous site investigations. RailCorp wish to remediate the Site such that the SRoH declaration can be removed, and to allow beneficial use of the Site for rail related activities.

The following is a chronological list of dates relevant to the SRoH determination made by the NSW EPA:

- StateRail (now RailCorp) notified the NSW EPA of potential SRoH on the Gasworks site on 30 June 2000;
- NSW EPA declared that the Site poses a SRoH on 14 August 2000;
- StateRail provided the NSW EPA with a draft Voluntary Investigation Agreement (VIA) for the Gasworks site on 13 March 2001;
- NSW EPA provided the StateRail with a final VIA (#19009) for the Gasworks site on 22 October 2001;
- StateRail provided NSW EPA with a copy of a site investigation report (CH2M HILL, June 2000) on 14 December 2001;
- NSW EPA confirmed that the VIA #19009 had been adequately completed on 28 May 2002.

It is understood that the Site is likely to be utilised in the future for rail-related activities, and therefore remedial works are required to remove the health risk to site users and to remove the potential for contaminated groundwater to migrate from land owned by RailCorp. The Investigation was undertaken in response to RailCorp's requirement to understand the existing environmental contamination status at the Site in preparation for site remediation planning and implementation.

[1] *The EPA is incorporated into the NSW Department of Environment and Conservation (DEC).*

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RailCorp consider this Delineation Investigation to be the definitive step in collecting site data prior to developing remediation options and cost estimates.

1.1.2 Project Objectives

The objectives of the project are to fill in data gaps and characterise the Site sufficiently to:

- determine areas, volumes, types of contaminants requiring remediation to meet RailCorp's long term objectives;
- screen available remedial options and recommend appropriate options to allow long term land use objectives to be met; and
- provide indicative remedial cost estimates to implement an appropriate remedial strategy, to be provided in a separate letter to this investigation report.

The Delineation Investigation incorporates a detailed review of previous investigations, focusing on appraising spatial contamination data uncertainties with respect to historical site operations, and development of a preliminary conceptual site contamination model (PCSM) to interpret information and data gaps. Intrusive ground investigations followed, including the excavation of test pits and trenches, in order to ground truth the PCSM and determine the current environmental condition of the Site.

This investigation consolidates available previous site data with additional new data in order to characterise the site contamination and develop remedial options for the Site. The reliability of data collected during the current investigation has been assessed according to the Sampling, Analysis and Quality Plan (SAQP, CH2M HILL 2006) procedures. The reliability of previous data will also be assessed by collecting additional data in an attempt to lower uncertainties associated with contamination impacts.

1.1.3 RailCorp Long Term Objectives

The objectives and purpose identified above will enable RailCorp to meet their long term objectives for the Site, which include:

- Removing the SRoH declaration;
- Removing health risks to future site users; and
- Beneficial reuse of the Site for rail related activities.

1.2 Site Identification

The Site is located approximately 3km south west of the Sydney Central Business District (CBD) (**Figure 1 – Site Location**) and encompasses an area of 7,732m^2. The Site is roughly triangular in shape, and is bound to the north by rail land, to the south and east by a rail corridor, and to the west by a row of residences on Burren Street (**Figure 2 – Current Site Layout and Historical Layout**).

Site identification information is presented in **Table 1-1** below.

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Table 1-1 Site Identification	
Street Address	Burren Street, Erskineville NSW 2043
Lot and DP Number	Part Lot 50 in DP1001467
Site Area	7,732m^2
Geographical Coordinates	624700N; 343200E
Owner	RailCorp
Zoning	Zone No. 5 – Special Uses (Railway)
Current/Proposed Land Use	Vacant/Commercial-Industrial
Local Government Area	City of Sydney
Parish	Petersham
County	Cumberland

1.3 Areas of the Site

For the purpose of this Delineation Investigation, the Site has been separated into eight "stratified" Areas, as shown on **Figure 3 – Stratified Site Areas, Sampling Locations and Cross Sectional Transects**. Stratifying the Site into Areas was primarily based on the Site history and layout of historical operations; and soil/fill contaminant characteristics provided in previous investigations. A stratified site provided an easier method to target investigations of potentially contaminated areas and manage collected data.

A description and summary of the Areas is provided below.

- **Gasholder:** encompasses both existing Gas Holder structures adjoining the western boundary. The southern Gas Holder remains intact with the superstructure standing approximately 12 metres above the ground surface. The northern Gas Holder has been demolished, however the annulus structure remains buried beneath the ground.
- **Retort:** encompasses the footprint of the former Retort House, Tar Wells, Condensers, Coal and Shale Storage areas and other building structures associated with the gasworks operations (office, amenities, etc). These buildings and structures have been demolished and associated structures are no longer visible above the ground surface, however underground structures remain in place; including the two Tar Wells, pipe work, brick foundations and concrete slabs.
- **Gas Purifier:** encompasses the footprint of the former Purifier Beds, Scrubbers and Gas Meters. Similar to the Retort Area, structures only remain buried below the ground surface.
- **Northeast:** includes the majority of the northeast section of the Site.
- **South Central:** includes the expanse along the central southeast boundary.
- **Southwest:** includes the majority of the southern area of the Site.
- **Retaining Wall:** includes the filled area north of the Retort.

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- **Western Lot:** includes the section of land that extends west to Burren Street from the northwest corner of the main area of the Site.

A summary of the historical uses of each of these Areas is provided in **Section 2**.

1.4 Previous Site Investigations

The environmental contamination and/or archaeological and heritage investigations carried out on the Site between 1999 and 2006 are listed below.

- Rail Services Australia "Eveleigh Gasworks - Site History" November 1999 (RSA, Nov 1999).
- CH2M HILL Australia "Phase I & II Environmental Site Assessments" June 2000 (CH2M HILL, June 2000).
- CH2M HILL Australia "Vegetable, Soil and Sediment Sampling – Letter Report" November 2000 (CH2M HILL, Nov 2000).
- CH2M HILL Australia "Soil & Groundwater Investigations of the Former Gasworks Area and Offsite" December 2001 (CH2M HILL, Dec 2001).
- Australian Railway Historical Society "A Brief History of NSW Railway Gasworks" June 2003 (ARHS, June 2003).
- Banksia Heritage & Archaeology "Macdonaldtown Station Works - Archaeological Assessment" April 2004 (Banksia Heritage, April 2004).
- GHD "Macdonaldtown Triangle (Former Cleaning Sheds) - Delineation and Classification Sampling" September 2005 (GHD, Sept 2005).
- Sinclair Knight Merz "Macdonaldtown Triangle (Former Gasworks Site) - Human Health and Ecological Risk Assessment" April 2006 (SKM, April 2006).

The information obtained from the previous investigations is summarised in **Section 5**.

Furthermore, the following archaeological assessment was completed concurrently with this Delineation Investigation:

- Heritage Concepts "Archaeological Assessment and Remediation Management Strategy" November 2006 – Draft Report (Heritage Concepts, November 2006).

1.5 Limitations

The advice tendered in this report is based on information obtained from the field investigation locations, test points and sample points and is not warranted in respect to the conditions that may be encountered across the Site at other than these locations. It is emphasized that the actual characteristics of the sub-surface and surface materials may vary between adjacent test points and sample intervals and at locations other than where observations, explorations and investigations have been made. Sub-surface conditions and contaminant concentrations can change in a limited space and

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time. However, it is our opinion that the test points chosen are representative of conditions on the Site areas of concern.

Changed or unanticipated sub-surface conditions may occur that could affect the outcomes of an investigation, because of the inherent uncertainties in sub-surface evaluations. Any opinions or recommendations presented herein apply to site conditions existing when services were performed. CH2M HILL is unable to report on or accurately predict events that may change the site conditions after the described services are performed, whether occurring naturally or caused by external forces.

An understanding of the Site conditions depends on the integration of many pieces of information; some regional, some site specific, some structure-specific and some experienced-based. This report should not be altered, amended or abbreviated, issued in part or issued incomplete in any way without prior checking and approval by CH2M HILL. CH2M HILL accepts no responsibility for any circumstances that arise from the issue of the report which has been modified in any way as outlined above.

This report has not been prepared for the purposes of assessing the suitability of soil and fill on the Site for building or pavement foundations or the establishment of gardens.

CH2M HILL assumes no responsibility for conditions we were not authorised to investigate or conditions not generally recognised as environmentally unacceptable when the services were performed.

This report has been prepared for the exclusive use of RailCorp ("Client") relating to the property as described in the report. No warranty, expressed or implied, is made. There are no beneficiaries to this report other than the Client, and no other person or entity is entitled to rely upon this report without the written consent of CH2M HILL, and a written agreement limiting CH2M HILL's liability.

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2 Site History

The Site history is based on information from previous investigations including RSA (Nov 1999) and CH2M HILL (June 2000). The following is a summary of the information gathered from these previous investigations. The historical Site layout is shown in **Figure 2**.

2.1 Land Title and Previous Land Use

The Site was originally part of the land title granted to Nicholas Devine in 1794. Subsequent title transfers continued through the 1800's until the land was transferred to the Commissioner for Railways (now RailCorp) in 1888. Although it is known that the gasworks operation began in the early 1890's, the land use prior to this time was not identified or documented on previous land title records.

2.2 Site Operations

The Site was acquired in 1888 and has been owned by the railways department to the present day, and none of the original parcel of land has been sold.

The Site operated as a Manufactured Gas Plant (MGP) between 1892 and 1958. Gas was produced from coal and shale raw products and stored in two gas holders. Operations included raw product storage, gas production, waste disposal, filling and storage of liquor wastes. To facilitate these operations, site structures and buildings included a Retort House, an Exhauster, a Boiler, Condensers, Purifier Beds, a Scrubber, two tar wells, above ground tar tanks, a Gas Meter, two Gasholders, service pipework, raw store areas for coal and shale, and other buildings likely to be offices, washrooms and compressors.

The MGP consisted of two separate but parallel works for coal and shale processing. Gas produced from coal was stored in the larger (southern) Gasholder, with a capacity of 100,000 cubic feet (approx. 3,000m^3), while gas produced from shale was stored in the smaller capacity (northern) Gasholder, at 50,000 cubic feet (approx. 1,500m^3).

The following gives the chronology of the Site, pre and post operation:

- 1891:- Design plans approved;
- 1892:- Construction completed. The detailed layout of the various components of the operation are slightly different to the design plans;
- 1942:- The use and location of two tar wells is documented on plans;
- 1950's:- The use of inferior coal during the coal strike of the 1950's causes damage to the plant machinery and as a consequence the MGP ceased operations. The two Gasholders are used to store gas that was manufactured and piped from the Mortlake operations;
- 1958:- The MGP is demolished, with the exception of the southern Gasholder, which remains extant;
- 1970's:- During the mid 1970's the Site closed down and is no longer used for storing and pumping gas product;

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- Present:- The Site remains as vacant railway land. The only structure remaining is the southern Gasholder.

The MGP was adjoined by a railway corridor that ran the length of the MGP along its southeast border. The corridor consisted of three rail lines in a siding that divided from the Illawarra Main Line and terminated at the southern corner of the Site. A fourth siding divided from the Illawarra Main Line and ran the length of the northern boundary of the MGP area, terminating at the northwest corner of the Site in the vicinity of the northern Gasholder. The alignment of these rail sidings is only approximate, as the actual locations are unknown.

2.3 Aerial Photographs

Aerial photographs from the years 1951, 1961, 1970, 1978, 1986 and 1999 were included in the review, and the findings are summarised below.

1951:- Major site structures are identified in this photo including the two gas holders at the western boundary, the retort house and coal/shale storage areas at the north boundary and the gas purifier building (orientated northeast-southwest in the centre of the Site). Rail lines are noted running the length and inside the southeast boundary. The land to the north shows the large Cleaning Shed being present, while surrounding lands include the residential properties and Erskineville neighbourhood along the western boundary and rail corridor along the southeast boundary.

1961:- The land and structures appear unchanged from 1951.

1970:- All building structures appear to have been demolished, with the exception of the southern gas holder. Surrounding lands appear to be unchanged.

1978:- The land and structures appear unchanged from 1970.

1986:- The land and structures appear unchanged from 1978. The large Cleaning Shed building at the north of the Site has been demolished, with rail tracks and concrete slabs only remaining.

1999:- The rail lines inside the southeast boundary have been removed, while the remained of the Site and surrounds remain unchanged from 1986.

Currently the Site appears much like it did in 1999. A description of current site conditions is given in Section 3.4.

2.4 Site Heritage

The Southern Gasholder is listed on the State Heritage Register and the Sydney Regional Environment Plan 26 (SREP 26) as part of the Eveleigh Railway Workshops. This structure is the only item from the gasworks site to be listed on the register. Other site structures have been assessed for historic and archaeological significance in the report prepared by Banksia Heritage, April 2004, which is summarised in **Section 5.1.6**. Further archaeological assessment of the Site was conducted and assessed in the report prepared by Heritage Concepts, November 2006.

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3 Site Description

This section describes the setting of the Site in its current condition. Refer to **Appendix A – Site Photographs** which provides a photographic record of the Site features.

3.1 Existing Site Condition

The Site is generally a triangle shape that is somewhat irregular and completely secured with a perimeter fence (Photo 1). A narrow rectangular area extends west from the northwest corner of the 'triangle' to Burren Street. The Site area is vacant land that has tall trees growing along the western and northern boundaries.

Access to the Site is from a gate located on the southwest perimeter fence. This gate enters from an access road (used for the construction activities on the adjoining northern property), which follows the rail corridor south to the entry gate on Swanson Street, Erskineville.

The Southern Gasholder is a prominent relic of the past gasworks operations that stands against the western boundary and reaches approximately 12m from the ground surface (Photo 2). This is the main structure that is extant on the Site. Other minor structures include:

- brickwork at ground level, associated with the former northern Gasholder (Photo 6);
- the inground Tar Wells located north of the Southern Gasholder that appear as two circular concrete lids at the ground surface (Photo 3);
- a small shed located in the Southwest Area (Photo 4);
- retaining walls/embankments along the northern boundary (Photo 5) including the small rectangular portion of the Site adjoining Burren Street; and
- a concrete service trench located along the western boundary.

The ground surface appears hard and gravelly in the main central sections of the Site and overgrown with grasses and shrubs in the outer perimeter areas along fence lines. The health of existing vegetation appears to be generally in good condition, given the overgrown state of grasses and shrubs. No dead or dieing vegetation was observed or signs of vegetative stress.

No odorous materials were noted at the ground surface of the Site or as background observations.

Other features of the Site include minor stockpiles of materials such as ballast, decaying vegetation (tree stumps) and spent car tyres. The stockpiles are relatively small.

3.1.1 Surrounding Land Use

A parcel of land that is not part of the Site area and is also owned by RailCorp adjoins the northern boundary (**Figure 2**). This land is currently being developed to accommodate rail carriage stabling and cleaning operations for RailCorp.

The land use of the areas surrounding the Site is as follows:

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North:	Land owned by RailCorp, currently in the stages of being redeveloped for railway use.
East and South:	Land owned by RailCorp and used for the suburban railway network (Illawarra Railway Line).
West:	Residential properties of the Erskineville neighbourhood.

3.2 Topography and Drainage

3.2.1 Site Topography

Surface contour gradients are illustrated on the survey diagram presented on **Figure 2**.

The Site is generally flat with a gentle grade that falls toward the south east. The north east corner slopes down toward the southwest then down again to the south east within the general area. Along the western boundary that adjoins residential properties, the ground level falls off sharply to the backyards of the residential homes, particularly in the southern corner where there is a surface level difference of approximately four metres (Photo 4).

The ground surface of the adjoining northern property (Cleaning Sheds) extends into the Site, up to five metres in some places, where an old retaining wall was constructed. The difference between the ground surface levels is approximately two metres (Photo 5).

3.2.2 Surface Water Drainage

Surface water is expected to follow the surface gradients and generally flow southeast. Surface water pooling was observed between sample locations TP11 and TP16 (refer **Figure 3**). A concrete lined open drain runs the length of the western boundary at the rear of the residential properties (Photo 4). The drain has been installed at the level of the residential backyards and receives minor surface water flows from the western side of the embankment.

3.3 Geology

Details of the geological conditions observed at the Site are presented in **Section 8.2**. The following gives a description of the localised geological formations based on current literature.

The Sydney Geological Series Sheet 9130 (C. Herbert, 1999) indicates that the geological formation underlying the Site is the Wianamatta Group Ashfield Shale comprising black to dark-grey shale and laminite.

Shale bedrock was encountered at the Site between approximately 7m to 11mbgs during previous investigations.

Figure 5 and **Figure 6** provide representations of the lithology of the Site.

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3.3.1 Soil/Fill Types

The Sydney Soil Landscape Series Sheet 9130 (G. A. Chapman et. Al, 1999) indicates that the Site soils are of the Residual Blacktown Grouping, consisting of:

> *Landscape – gently undulating rises on Wianamatta Group shales and Hawkesbury shale. Local relief to 30m, slopes are usually <5%. Broad rounded crests and ridges with gently inclined slopes. Cleared woodland and tall open-forest.*
>
> *Soils – shallow to moderately deep (<100cm) Red and Brown Podzolic Soils (Dr3.21, Dr3.11, Db2.11) on crests, upper slopes and well-drained areas; deep (150-300cm) Yellow Podzolic soils and Soloths (Dy2.11, Dy3.11) on lower slopes and areas of poor drainage.*
>
> *Limitations – moderately reactive highly plastic subsoil, low soil fertility, poor soil drainage.*

3.4 Hydrogeology

Previous investigations (CH2M HILL, 2000) reviewed the regional hydrogeological conditions and determined that there were 35 registered groundwater bores within a 3km radius of the Site. The nearest bore was located approximately 2km due southeast, where the majority of the bores were situated in the Botany Sands geological formation of Quaternary Sediments.

Previous investigations (CH2M HILL, 2000 and 2001; SKM, 2006) identified two groundwater systems existing at the Site; a shallow groundwater system and a deep bedrock system. The shallow groundwater exists within fill materials above the natural plastic clay (as shallow as 1m below ground surface), and the deeper groundwater exists within the Ashfield Shale bedrock (at approximately 9.5m depth, and under semi-confined conditions).

Elevated concentrations of inorganic and organic contaminants were identified during previous investigations in the majority of groundwater samples collected from the network of monitoring wells. Concentrations of dissolved PAHs, TPH (predominantly C_{10}-C_{36}), metals, phenols and BTEX exceeded the ANZECC (2000) guidelines in both groundwater systems. The concentration of TPH in the C_6-C_9 range also exceeded the solubility in water in MW03D, MW04D and MW07D; however no light-non-aqueous-phase-liquids (LNAPL) have been encountered in any wells. There has also been no identification of dense-non-aqueous-phase-liquid (DNAPL).

Benzene and ethylbenzene exceedences were measured in MW03D, MW04D, MW07D and MW12D, which appears indicative of tarry wastes.

Concentrations in the shallow groundwater are lower compared to the deeper groundwater, indicating that the source of contamination is likely tarry wastes at depth possibly in waste tar pits and the gasholders annuli. The plastic natural clay underlying the fill materials appears to provide an aquitard layer, where interconnectivity between the two groundwater systems is limited.

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The plume of dissolved TPH (C_{10}-C_{36}) contamination in the shallow groundwater extends 75m to the south and 50m to the east of the remaining southern gasholder, whilst the deep groundwater plume extends 160m to the south and 50m to the east.

The background water quality at the site is also impacted by some heavy metals, including cadmium, copper, nickel and zinc.

The following table is a summary of the groundwater impacts based on previous data.

Table 3.1 – Summary of Groundwater Contamination (all concentrations in µg/L)

	Criteria	Shallow Groundwater		Deep Groundwater	
Analyte	ANZECC 2000	Concentration Range	Highest Conc. Location	Concentration Range	Highest Conc. Location
As	24 (AsIII)	nd - 12	MW42s	nd - 20	MW42d
Cd	0.2	nd - 2.6	MW13s	nd - 1.5	MW06d
Cr(total)	-	nd - 15	MW04s	nd - 7	MW04d
Cu	1.4	nd - 220	MW42s	0.001 - 208	MW42d
Pb	3.4	nd - 174	MW42s	nd - 140	MW03d
Hg	0.06	nd	-	nd - 0.0003	MW03d
Ni	11	nd - 10	MW04s	nd - 92	MW36d
Zn	8	0.033 - 1,570	MW13s	0.015 - 869	MW42d
Cyanide (total)	7	0.02 - 0.479	MW20s	nd - 14.9	MW03d
Benzene	950	nd - 704	MW07s	nd - 14,000	MW03d
Toluene	-	nd - 117	MW07s	nd - 792	MW03d
Ethylbenzene	-	nd - 213	MW07s	nd - 317	MW03d
Total Xylenes	550 (o & p)	nd - 417	MW07s	nd - 5,010	MW03d
TPH (C6 - C9)	-	nd - 2,170	MW07s	nd - 28,800	MW03d
TPH (C10 - C36)	-	nd - 9,495	MW07s	nd - 18,220	MW07d
Total PAHs	16 (naphthalene)	nd - 1,677 (naphthalene 1,460)	MW07s	nd - 4,208 (naphthalene 3,840)	MW07d

Note: "nd" is 'Non Detect', or less than the laboratory Limit of Reporting (<LOR).

3.4.1 Groundwater Flow

The groundwater flow gradient was determined in previous investigations (CH2M HILL, 2000 and 2001; SKM, 2006) to be toward the south/southeast for both shallow and deep groundwater systems, however flows are likely to be influenced by underground structures, including the gasholders annuli and underground waste pits and services associated with gasworks sites.. It is possible there may be some interconnectivity given the similar direction of flow gradient.

Flow velocities within the shallow groundwater are estimated to be 6.2 – 13.7m/year, while within the deep groundwater are 12.2 – 36.5m/year (SKM, 2006).

3.5 Geological and Hydrogeological Overview

In its broadest context, the Ashfield Shale formation comprises fresh unweathered bedrock material (a regional 'aquifer' formation) overlain by a sequence of transitional materials from completely unweathered rock into fully weathered rock, typically clay residuum, over which a soil horizon typically develops (hosting one or

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more perched aquifer layers). These materials, and their behaviour as 'aquifers' and media for transport of contaminants, are discussed in more detail below:

(1) Bedrock Shale – the Regional 'Aquifer' - Site investigations undertaken confirm the presence of the regional aquifer described above, namely, the bedrock shales of the Ashfield shale.

The bedrock shales are typically consolidated and have limited primary porosity (the intergranular pore spaces are largely filled with mineral cement) in the Sydney Basin. However, structural deformation has resulted in an overprint of secondary porosities, associated with rock fracturing, faulting, jointing and bedding plane slip. The secondary porosity conduits created by these structural defects in the rock provide the rock mass with its, albeit very limited, transmissive characteristics.

Vertical groundwater flow is facilitated by the sub-vertically orientated fracture network which penetrates through the entire profile.

The bedding plane permeability is the dominant structurally induced hydraulic porosity and is inferred to control the groundwater flow mechanism within the shallow bedrock exposed during the Site works.

Groundwater flow through the bedrock sequence is therefore largely restricted to the secondary porosities provided by the structure overprint (horizontal and vertical planar conduits) and is variable through the profile depending on the bedrock lithology. The typical hydraulic conductivity (K) values for these unweathered bedrock types range from 10^{-8} to 10^{-4} m/day. The storativity of these, generally semi-confined aquifers, is inferred to be low (i.e. fracture density is low) by comparison to the overlying shallow perched aquifer zones (which have a higher intergranular porosity).

(2) Perched Aquifer/s - The Site works have also revealed that the various hydrogeological interfaces (between the soil/fill and the residual clayey soils, the residual clay, weathered shale and the transitional zone into the fresh bedrock mass) are capable of supporting perched groundwater systems. These perched water tables are variable in extent, spatially distributed within the top 2.0m (approximately) of the surface profile across the Site, thin in vertical extent and generally contain fresh quality water (readily recharged by rainfall). They are inferred to be local, with low flow (carry negligible total flow) and poor hydraulic interconnection.

The hydraulic interconnection between the shallow perched and the bedrock aquifer units is limited and patchy, by virtue of their contrasting hydraulic conductivity characteristics. But groundwater recharge to the deeper region aquifer is sustained by the slow infiltration, primarily by the residual structural features (joints, fractures and bedding planes) which persist from the fresh bedrock into the weathered rock and soil zones.

The hydraulic conductivity of the surficial soil/fill and weathered bedrock profile is anticipated to have highly variable hydraulic conductivities. Based on the general soil descriptions obtained from the previous reports and current literature, and the location of the groundwater aquifer in the weathered (fractured) shale, the estimated porosity of the natural soils/fill underlying the site would be expected to range between 5 to 20 percent. Groundwater flow (volumetric and velocity) within these perched systems is expected to be highly variable as a consequence.

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(4) Contaminant Fate and Transport – Contaminant concentrations, arising for Site activities, located within the surface soils and subsurface materials, would dissolve (to varying degrees based on their physical and chemical properties) and become leached by infiltrating rain water to the perched groundwater and bedrock groundwater systems described above. The dominance of Kh (horizontal conductivity) over Kv (vertical conductivity) means that these contaminants spread laterally in preference to vertically, exploiting the horizontal bedding and structural conduits to migrate away (outward) from their point source areas. The less prominent vertical components of groundwater seepage will take any dissolved (or phase separated) contaminants downward, deeper into the residual and bedrock sequence/s.

As the contaminant load migrates within (or on) the groundwater flows (vertical and horizontal), attenuation processes cause the contaminant concentrations to decline with distance (and time) from the contaminant point source/s. These attenuation processes include (in order of likely effectiveness) dispersion, dilution, adsorption, biodegradation and absorption. Matrix diffusion and adsorption effects enhance the persistence of secondary contaminant sources.

Previous investigations (SKM, 2006) have concluded that the contaminated groundwater plumes migrating from the Site are limited to RailCorp owned land.

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4 Data Quality Objectives and Scope of Work

4.1 Data Quality Objectives

In developing the objectives of this Delineation Investigation, CH2M HILL has undertaken the seven step Data Quality Objectives (DQO) process outlined in the US EPA *Data Quality Process for Hazardous Waste Site Investigations* (QA/G-4HW) (2000), as summarised below. The DQO process was established in the Sampling, Analysis and Quality Plan (SAQP) prepared by CH2M HILL for the fieldwork program (SAQP, CH2M HILL July 2006). The SAQP is outlined in **Section 4.2**.

State the Problem

The investigation was designed to address the following issues:

1. Insufficient information was available to estimate the depth and lateral extent of contaminated fill and natural soils;
2. Insufficient information was available on the contamination characteristics and leachability of the different soil/fill types identified on Site; and
3. Insufficient information was available to allow an assessment of potentially suitable and technically feasible remediation strategies that may be appropriate for contaminated materials at the Site, and to enable development of a Remedial Action Plan.

Identify the Decisions

The decisions arising from the Delineation Investigation data are:

1. Is there sufficient information on the distribution and characteristics of soil and fill requiring remediation and/or management to allow remedial planning to progress?
2. Do the findings of the investigation provide a higher level of understanding and certainty on contamination source zones and spatial area?
3. Do the findings of the investigation provide sufficient data that will enable an assessment of remedial screening options for contaminated soils and fills requiring management?
4. Is there sufficient and definitive Site data to enable remedial cost estimates to be developed?

Identify Inputs to the Decisions

The inputs required to make the above decisions are:

- Geological data and information relevant to subsurface structures;
- Existing hydrogeological data;
- Concentrations of chemicals in different fill/soil types;
- Observation data for free product, staining, odours and discolouration of the soil media;
- Distribution of impacts both lateral and vertical;

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- Contamination impacts below permanent structures, including the Heritage listed Gasholder.

Define the Study Boundaries

Spatial Boundaries

The investigation boundary is limited to the Site area comprising Part Lot 50 in DP 1001467. The Site area is approximately 7,732m^2.

The Site has been 'stratified' to establish areas of historical importance and significant contamination source zones.

Each stratified area is likely to contain particular fill or waste associated with the historical activity of that area. A spatial boundary may apply to a particular depth of fill and impact by a certain contaminant, i.e. spatial boundaries maybe horizontal layers vertically down the profile.

Temporal Boundaries

All soil data collected from the Site from 2000 to 2006 will enable a robust assessment and delineation of the contaminant distributions at the Site.

Constraints

The following issues presented minor limitations upon the sampling strategy, although these logistical issues did not affect the technical aspects of the project:

1. Live services (underground) traversing the Site. Intrusive locations were repositioned in a nearby location;
2. Items and potential items of archaeological and historic significance presented limitations to delineation of the area near the existing Gasholder and the area identified as the former Retort House.

Develop Decision Rules

The decision rules for this investigation are as follows:

1. **If** a review of the data obtained from this and previous investigations indicate a degree of uncertainty on contamination delineation and distribution, **then** appropriate remedial strategies will be considered to provide management of those uncertainties and limitations;
2. **If** it is determined that additional information is required to further reduce the uncertainties associated with the distribution and characteristics of soil and fill requiring remediation and/or management, **then** appropriate recommendations for further technical assessment or investigation will be provided.

Specify Limits on Decision Errors

A list of Data Quality Indicators (DQIs) for this sampling program is provided in **Appendix B** of this report. These DQIs are based on PARCC parameters (Precision, Accuracy, Representativeness, Comparability and Completeness).

Significant decision errors were minimised by:

- Completing a robust QA/QC program, an assessment of which is detailed in **Appendix B** and a summary of this assessment is provided in **Section 10**;

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- Completing a high sampling and analytical density, to enable a high level of certainty of the spatial impact of historical activities.

Optimise the Design for Obtaining Data

The above information was considered during the design of the site investigation program, which is summarised in the scope of work section below and described in more detail in **Section 7**.

4.2 Scope of Work

4.2.1 Existing Data Review and SAQP

An initial phase of review was necessary to appraise relevant background information and develop a preliminary conceptual site contamination model, identifying Site areas where there are gaps in site contamination data and which present a concern to the environmental integrity of the Site. These areas, together with the areas where adequate data appears to have been obtained, combine to provide a stratified data history across the Site. Once the preliminary review was completed, the information obtained was used to develop the SAQP (CH2M HILL, July 2006) using the DQO process.

The scope of work in developing the SAQP included:

- A review of tender documents supplied by RailCorp, including summarised analytical data;
- an initial site visit (pretender meeting) on 22nd May 2006;
- a review of all relevant information from previous site investigations;
- development of a preliminary conceptual site model focusing on identified data gaps; and
- consultation with the NSW EPA Accredited Site Auditor was performed.

Site Groundwater Issues

It was considered that no further investigation of groundwater conditions was necessary under this scope of work, for the following reasons:

- groundwater conditions have been adequately assessed under previous site investigations;
- existing groundwater data concludes that the contaminated groundwater plumes are limited to land owned by RailCorp, which are used for industrial land purposes, therefore there is currently no off site migration;
- adjoining residential properties (along Burren Street) have not been impacted by contaminated groundwater, considering that migration is toward the south west away from these properties;
- no sensitive receptors of groundwater are present in the area down gradient of the Site (i.e. on RailCorp industrial land);

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- the Groundwater Embargo area (Zone 2) established by the Department of Natural Resources is located immediately down gradient of RailCorp land, which bans the extraction of groundwater for domestic purposes;
- it is considered that groundwater quality will be improved subsequent to removal of contamination sources and contaminated fill and soil materials. The removal of these source materials will mitigate ongoing groundwater contamination; and
- it is therefore considered that active groundwater remediation is not be required as part of site remediation, however ongoing management (including monitoring) of groundwater is likely to be a requirement of future site management.

4.2.2 Preparation of Pre Site Work Plans

Prior to any fieldwork being undertaken, site specific OH&S plans were developed to ensure a safe working environment and ensure appropriate safeguards were in place to mitigate impacts to the local environment.

4.2.3 Soil Investigation Program

The investigation entailed two fieldwork programs. One was undertaken in August 2006, which included trenching and test pit excavations, and the other was undertaken in October 2006 and included bore hole drilling.

While the objectives of the August 2006 fieldwork component were chiefly met, a level of uncertainty remained on the vertical and lateral extent of impact in some areas of Site that were further investigated in October 2006 The following limitations gave rise to the October 2006 fieldwork being undertaken:

- Excavation Sidewall Cave-In:- Gravelly fill, tarry soil and silt layers in the fill materials to a depth of two metres below the ground surface (2m bgs) became unstable when excavating trenches and test pits, causing considerable excavation sidewall cave-in. Re-excavation of cave-in material resulted in significant widening of the excavation area and limited the depth to which samples could be collected. The maximum sampling depth possible given these constraints was 5m bgs in natural clay. Deeper samples were unattainable without significant intrusive excavation work (width and length), vertical mixing of fill/soil layers, emission of odours, and in some locations damage to potential heritage structures.
- Shallow Groundwater in Northern Gasholder: - Shallow groundwater flowed into the open pits excavated inside the annulus of the demolished (northern) gas holder. Although the materials used to backfill the demolished gas holder; consisting of brick, concrete rubble and building demolition waste were able to be excavated (and sampled) without difficulty, the rate of water inflow caused substantial sidewall collapse of trenches, similar to that described above. A dewatering pump was employed to arrest this problem and remove the accumulated water, however the inflow became greater than the capacity of the pump and excavations could not be continued past 1.5m bgs.

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- Spatial Misalignment of Previous Locations:- Previous sampling locations that required additional depth sampling (for vertical delineation) were estimated in the field using site plans, existing site structures and other site features. It became evident after preparing a survey drawing on completion of the fieldwork in August 2006 that in two areas the additional sampling locations did not accurately represent the previous sampling position. Therefore further sampling to target these locations was undertaken in October 2006.
- Spatial Misalignment of Historical Site Layout:- Sampling locations proposed to investigate areas of historic operations also involve some inaccuracy, similar to the circumstances above. Further sampling to target these locations was undertaken in October 2006.
- Potential Items of Heritage and Archaeological Importance:- Limitations on excavation work and sampling were imposed in areas were potential items of historical or archaeological importance were uncovered. Some areas were therefore not fully investigated (laterally and vertically) because further intrusive work would compromise the condition of the uncovered structure.
- Existing Gas Holder Heritage Item:- A buffer zone of 5m around the existing southern gas holder was established by the Heritage Council, in an attempt to mitigate potential damage to the structure during investigation work with heavy plant machinery. This limitation restricted collection of soil data from within this area, resulting in some uncertainty in the immediate area surrounding the gas holder.

The soil sampling locations are provided on **Figure 3** and a summary of these locations is provided in **Table 4.1**.

Table 4-1 Soil Sampling Locations

Area	August 2006 (trenching and Test pits)	October 2006 (bore holes)	Total
Gasholder	5	7	12
Retort	7	5	12
Gas Purifier	1	2	3
Northeast	7	2	9
South Central	3	0	3
Southwest	4	0[A]	4
Retaining Wall	3	0	3
Western Lot	2	0	2
Total	32	16	48

Notes:

[A] Boreholes BHA, BHA1 and BHA2 target the base of the Southern Gasholder and were not used to assess contamination in the Southwest Area. These bore holes (and corresponding samples) were used to assess underneath the Gasholders, therefore are included as sample locations in the Gasholder Area.

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4.2.4 Surface Water Investigation Program

The investigation into surface water contamination involved the collection of 6 samples from areas of the Site. The term 'surface water' in this report is relative to water that had accumulated inside existing structures, in particular the Gasholders, the Tar Wells and the Retention Pit. The term does not include water that has accumulated at the ground surface. The location of the samples is provided in **Section 8.6.**

4.2.5 Leachate Analysis

Analysis was performed on selected samples to understand the leachability of particular contaminants under acidic (landfill) conditions, to understand the potential waste classification of certain materials to aid assessment of remedial options. Other leachate tests were conducted under neutral conditions to understand the potential leaching of contaminants occurring naturally at the Site in the deep weathered shale layers.

4.2.6 Dioxin Analysis

Analysis was performed on one sample of tar material to determine if the tar contained concentrations of polychlorinated dibenzo dioxins and polychlorinated dibenzo furans (PCDD/Fs). This determination would then enable a decision to be made on the appropriate remedial treatment options to manage the tar material.

4.2.7 Reporting

The findings of the investigation program are documented in this report, and focus on the project objectives, providing information required to develop conclusive statements and recommendations. Specifically:

- The reliability of data from previous and current investigations;
- Intergration of previous investigation results;
- Plans and cross-sections presenting relevant data/information; and
- Inclusion of remedial options screening to incorporate heritage issues and long-term site management requirements, as appropriate.

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5 Review of Previous Investigations

5.1.1 RSA, Nov 1999

Rail Services Australia (RSA) undertook a site history appraisal in an attempt to identify past and present potentially contaminating activities, and to provide a basis for a more detailed site investigation.

The report provides a chronological list of events that occurred on the Site between 1891 (gasworks design plans approved) to the mid 1970's (site closed down) to the current period (vacant land). The report also includes an "as-built' plan of the gasworks site in 1892 that details the layout of the gasworks plant. This plan is included as **Figure 2** as an overlay of the current Site layout, giving the approximate locations of former gasworks structures. Other plans of physical structures and their position on the Site were also provided.

RSA provide details on potential contaminant sources to include areas of fill around the works (boiler ash), coal and shale raw material stockpile areas, the retort house, the scrubbers, the condensers, the tar wells, the tar tanks, the purifier boxes, buried pipework and the gas-holders.

RSA provided a summary of the gas manufacturing process, as follows:

> *"The gasworks consisted of two separate but parallel works. One works produced gas from coal for lighting nearby stations and signals, and the other works produced a much richer gas from shale for carriage lighting."*

Of note were two articles provided in Appendix D of the RSA, Nov 1999 report that provided detailed information including descriptions of the gasworks operations. The information included:

- The dimensions of the Retort House was 80ft x 60ft (24m x 18m);
- The gas holders were both 60ft (18m) in diameter;
- There were two gas holders located on the Site, one had a capacity of 100,000 cubic feet (approx. 3,000m^3) for storage of gas manufactured from coal, while the other had a capacity of 50,000 cubic feet (approx. 1,500m^3) for storage of gas manufactured from shale;
- The larger gas holder is reported to be 40ft (12m) deep and the smaller gas holder was reported to be 20ft (6m) deep. It is unclear if this refers to depth below the ground surface.

Based on the historical appraisal work, RSA provided the following conclusions:

- a railway gasworks operated on the Site between 1892 and about 1958;
- the gasworks site is likely to have been contaminated by both organic and inorganic residuals;
- residual chemicals and wastes should be addressed in a Stage 2 Detailed Site Investigation; and

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- the remaining gas holder is listed as *"gasometer at McDonaldtown end"* as an item within the Eveleigh Railway Workshops Precinct on the SRA Section 170 Heritage and Conservation Register.

5.1.2 CH2M HILL Australia, June 2000

CH2M HILL was commissioned by SRA to conduct a combined preliminary and detailed site investigation (Phase I and II) of an area incorporating the former gasworks site and the adjoining stabling yards (Cleaning Sheds). The investigation was undertaken for purposes of due diligence associated with redevelopment of the stabling yard (Cleaning Sheds) area. The investigation included an assessment of the soil and groundwater conditions.

The objectives were to:

- delineate and define any contamination;
- determine the suitability of the Site for the commercial/industrial land use (i.e. fit for purpose);
- assess whether the Site may pose a significant risk of harm to human health or the environment; and
- obtain information of sufficient standard to enable preparation of a Remedial Action Plan (RAP).

For the soil assessment of the former gasworks area, CH2M HILL concluded there was widespread occurrence of fill material, varying from 0.1m – 3.2m in depth and widespread occurrence of contamination throughout the fill material, but not the underlying soils. Contaminants identified were TPH, PAH and BTEX.

The groundwater assessment was designed to investigate impacts on two groundwater systems. Both a surficial aquifer and an Ashfield Shale bedrock aquifer were identified in the former gasworks area.

CH2M HILL concluded that there was evidence of adverse impacts on the quality of the surficial aquifer, indicated by elevated concentrations of PAH, TPH (C_{10}-C_{36}), heavy metals, phenols and BTEX above ANZECC, 1992[2] guidelines. Shallow groundwater was expected to flow toward the south/southeast, however localised influences around the gas holder structures, foundations, tar wells and pipework were expected to affect flow direction.

CH2M HILL concluded that concentrations of PAH, benzene, heavy metals and phenols were elevated above ANZECC, 1992 guidelines in the Ashfield Shale bedrock aquifer. In the vicinity of the former gasworks site the general bedrock aquifer flow was expected to be toward the south/southeast.

CH2M HILL identified the following receptors of contamination:

- On site workers exposed to impacted fill/soil and the surficial aquifer during excavation activities;

[2] *Australian and New Zealand Environment and Conservation Council, Guidelines for the Protection of Fresh water Ecosystems, 1992.*

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- Residents of the residential dwellings adjoining the south western boundary being exposed to dusts, impacted soil and migrating groundwater;
- The local environment may be exposed to migrating groundwater, dusts and surface water/sediment run-off; and
- Users of groundwater down gradient of the Site, particularly unregistered users.

CH2M HILL also concluded that there were no identifiable sensitive receptors within the immediate vicinity of the Site and no groundwater usage had been identified within a 2km radius.

In consideration of the types, concentrations and distribution of soil and groundwater contamination, CH2M HILL concluded that the Site may pose a significant risk of harm to human health and the environment.

The recommendations CH2M HILL provided included:

- Notification to the NSW EPA of the potential for the Site to pose a significant risk of harm;
- Cease all activities on the former gasworks site and secure the Site to prevent access from rail workers and the general public;
- Development of an RAP;
- Additional assessment of soil gas, soils and groundwater to determine potential impacts in the adjoining residential properties along the southwest boundary;
- Additional sampling to assess impacts to the vegetable garden plots established by local residents; and
- Detailed assessment of the groundwater quality of both the surficial and the bedrock aquifers.

5.1.3 CH2M HILL Australia, November 2000

During the Phase I & II investigation undertaken by CH2M HILL in June 2000, vegetable gardens were observed to have been established on the former gasworks site. Two were located at the narrow southern end and one was located on the section of land extending from the northwest corner of the Site to Burren Street. CH2M HILL was commissioned by SRA to conduct further environmental work to assess the health risk associated with the consumption of vegetables grown on the Site and to assess the potential for offsite migration of contamination via a western boundary surface drain.

The objectives of this work were to determine if the inorganic and organic contaminants identified in fill materials of the former gasworks were present in the vegetable gardens and in the foliage of vegetables, and to determine whether the same contaminants were present in the sediments of the open drain located along the western boundary.

CH2M HILL concluded that the vegetable plot soils were impacted with lead, TPH (C_{10}-C_{36}), and PAHs including benzo(a)pyrene (B(a)P), and the soil is likely to be

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made up, in part, from fill material of the former gasworks. Assessment of the vegetable foliage indicated that the contaminants had not been taken up by the plants, except for lead which was reported at a level above the adopted Maximum Permissible Concentration (MPC) and the levels in a control sample. Assessment of the sediments in the drain indicated that similar contaminants were impacting drain sediments and likely to be migrating off site through run-off.

5.1.4 CH2M HILL Australia, December 2001

CH2M HILL was commissioned by SRA to conduct a targeted soil and groundwater investigation as part of a Voluntary Investigation Agreement with the NSW EPA. The investigation was undertaken to delineate the groundwater quality and soil contamination in the western portion of the former gasworks site and off site in the adjoining residential properties along the western boundary. The objectives were to:

- Better define the extent of groundwater impacts in both the surficial and bedrock groundwater and refine the flow regime to understand migration characteristics;
- Further assess the potential risks to human health and the environment; and
- Provide land management options and determine the need for further assessment.

The investigation provided sample data from the off site residential properties and the western portion of the former gasworks site.

Off Site Residential Properties

CH2M HILL concluded that there existed fill material up to 1.3m in depth in the residential yards backing onto the former gasworks site. Analytical testing indicated concentrations of some contaminants, including lead, TPH, PAH and B(a)P, that exceeded sensitive land use criteria. Contamination impacts were not reported in the underlying natural clay.

Shallow groundwater existed at approximately 1m below the ground surface in the residential yards. Deeper bedrock groundwater showed a higher potentiometric surface than the shallow wells, indicating semi-confinement characteristics. The flow direction of both groundwater systems was toward the southeast, therefore CH2M HILL concluded that neither shallow nor deep groundwater migrates from the former gasworks site to the residential properties. Analytical results supported this statement, showing no concentrations of contaminants exceeding the assessment criteria in the groundwater beneath the residential properties.

Western Portion of the Former Gasworks Site

CH2M HILL concluded there was the occurrence of fill material, varying from 0.3m to 4.4m in depth that appeared not to be representative of expected gasworks type waste such as ash and coke. Fill materials were underlain by a natural Ashfield Shale lithological profile including (in depth profile) silty clay (red/grey), clay/weathered shale and Shale bedrock at depth. Analytical tests of the fill indicated concentrations of TPH, PAH and B(a)P that exceed the commercial/industrial investigation criteria.

CH2M HILL also found that similar to off site areas, the deeper bedrock groundwater appeared under semi confinement, and both shallow and deep groundwater migrated toward the south east, away from the residential properties. However, the

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inground gas holder structure showed a localised influence on the shallow groundwater flow direction. This was also the case for the open drain that runs along the western boundary. This drain was likely to provide a preferential pathway for migrating shallow groundwater and also collect surface water run-off and groundwater seepage from deep fill material that may be impacted. CH2M HILL identified Alexandra Canal as a sensitive receptor of the drainage line. It was concluded that any potential contaminants in the migrating surface water would be unlikely to present a risk to human health or the environment of the Canal considering the distance to the Canal (over 1km) and the effect of dilution on contaminants.

Groundwater flux rates were estimated by CH2M HILL to be in the order of 1,000m^3 for shallow groundwater and 200m^3 for semi-confined bedrock groundwater.

The analytical results of groundwater monitoring of wells installed during this investigation reported similar impacts above groundwater assessment criteria from contaminants identified in CH2M HILL, 2000 (i.e. PAH, TPH (C_{10}-C_{36}), heavy metals, phenols and BTEX), albeit at lower concentrations. A similar scenario was reported for the deeper bedrock monitoring wells.

The recommendations CH2M HILL provided included:

- Preparation of an RAP and Environmental and Health & Safety Plans for future development work on the former gasworks site;
- Additional site investigation work to lower uncertainties associated with identified environmental issues, which were:
    - Further characterisation of the fill materials of the residential properties along the western boundary;
    - An evaluation of the open drain along the western boundary for water quality, flow regime and receptors of off site migration;
    - An evaluation of groundwater quality down gradient and off site and assess potential receptors/exposure pathways of groundwater to define risk in off site locations; and
    - Ongoing groundwater monitoring.

5.1.5 ARHS, June 2003

The Australian Railway Historical Society (ARHS) presented an overview of the NSW railway gasworks operations in their Bulletin of June 2003. The overview builds on and confirms much of the information presented in RSA, November 1999, including location and plant layout; and dates of design approval (1891), commencement of operations (1892), cessation of manufacturing (early 1950's), demolition (1958) and eventual site redundancy (mid 1970's). In particular, this overview provides a summary of the information provided in Appendix D of RSA, November 1999.

The overview provides a summary of the '*coal carbonisation*' process for the manufacturing of gas, which will not be presented in this report. It was stated that by 1898 the plant was producing 22,000,000 cubic feet (approx. 6,000,000m^3) of gas per annum.

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5.1.6 Banksia Heritage, April 2004

Banksia Heritage & Archaeology were engaged by SRA to prepare an archaeological assessment of the former gasworks site. The purpose was to assess the occurrence and significance of any archaeological remains, and to determine what statutory provisions apply prior to any contamination assessment work to be carried out.

Banksia Heritage recommended that the remaining gas holder should be avoided during contamination assessment work and that further recording take place of selected items of significant value. It was confirmed that the vast majority of the Site is no longer of significant archaeological heritage as a result of earlier demolition of structures.

It was concluded that the gas holder present on the Site was the only single surviving example of its type in NSW. The gas holder is already recognised as being of State heritage significance.

Banksia Heritage made the following notable recommendations:

- Avoid undertaking any work inside a 5m fenced buffer area around the existing gasholder;
- No further archaeological assessment was required for any others structures remaining on the Site;
- If work uncovers in situ intact structural remains, work is to cease until an assessment can be made on the items archaeological importance.

5.1.7 GHD, September 2005

GHD was commissioned by RailCorp to undertake additional investigations within the former Cleaning Sheds site that adjoins the north boundary of the former gasworks site. The purpose was to delineate lateral and vertical extent and classify (for off site disposal) contaminated soil previously identified in CH2M HILL, June 2000. This was to be conducted to enable a sufficient remedial response to the contaminated area, prior to the redevelopment proposed for the Cleaning Sheds site. The additional investigations were to target a BTEX/PAH contamination hotspot previously identified at sample location TP44. This location is presented on **Figure 3** in the area identified as the Retaining Wall.

GHD indicated that part of the contaminated area to be delineated was in fact on the former gasworks site, separated from the Cleaning Sheds site by a chain wire fence. Therefore part of their assessment area would encroach on the gasworks site. Only information relevant to the gasworks site will be summarised here from the GHD report.

Fill materials on the gasworks site consisted of ash, slag, coal and coke and indicated elevated concentrations of BTEX, PAH and TPH that exceed the adopted commercial/industrial assessment criteria. The material was classified as Hazardous Waste, however a classification of Industrial Waste was given based on ash being the source of PAH contamination, enabling application of the NSW EPA *General Approval of the Immobilisation of Contaminants in Waste* (1999/05). Particular volumes and area of the impacted material was not given, other than the lateral and vertical extent could not be confirmed.

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5.1.8 SKM, April 2006

SKM were engaged by RailCorp to undertake a human health and ecological risk assessment of the former gasworks site. The purpose of the risk assessment was to identify potential issues that should be addressed in respect to contamination.

SKM made the following conclusions:

Contamination

Soil in the fill material was mainly contaminated with high levels of PAHs and TPH (C_{10}-C_{36}) distributed over much of the Site. Hotspots were identified in the fill that was contaminated by benzene and xylenes, as well as PAHs and TPH (C_{10}-C_{36}). Higher impacts were identified to be near to the historical operations of the tar tanks, gas holders, retort house and scrubber. Natural soil was contaminated with similar contaminants as the fill material, but generally at lower concentrations and in similar historical areas.

Concentrations of volatile contaminants in the soil-gas were expected to be highly variable and generated from the unsaturated soil zone and the shallow groundwater. The soil-gas model indicated much higher concentrations were likely to be present than those measured in the field, and therefore there was potential for elevated levels of vapours to be emitted from the soil and ground surface of the Site. The source of BTEX in soil-gas was likely to be the shallow groundwater, while the source of six targeted PAHs in the soil-gas was likely to be the unsaturated shallow soils.

Groundwater in the location of the gasworks, gas holders and tar tanks on the former gasworks site was contaminated by TPH (C_6-C_9), BTEX and lighter fraction PAHs (naphthalene, acenaphthalene, fluorene, pyrene). There also existed widespread concentrations of heavy metals that exceeded the adopted freshwater trigger values.

Health Risks

There was potential for on-site construction maintenance workers to be exposed to a high risk to health based on available contamination data for PAH and TPH in shallow soils and groundwater. A hazard quotient of 6.6 was calculated, compared to the acceptance criteria of 1. It was recommended to mitigate the risks by employing specific work procedures that minimise dermal contact with soils and groundwater, dust generation and avoid work that requires high levels of hygiene and decontamination. Monitoring the environment was recommended during construction/maintenance work, or consideration should be given for a remedial strategy (i.e. capping the contaminated soils).

There was potential for long term site workers to be exposed to an unacceptable risk to health based on available contamination data for PAH and TPH (C_{10}-C_{36}) in fill materials near the tar tanks/gas holder area. A hazard quotient of 2.95 was calculated, compared to the acceptance criteria of 1. Similar recommendations were given for long term site workers to mitigate exposure and/or implement a capping strategy for the contaminated site areas.

Nearby residents faced a low health risk posed by contamination on the former gasworks site provided public access was restricted and groundwater extraction did not occur in the area. Similarly, off site construction workers also faced a low risk to health if working in deep excavations on the nearby residential sites. No restrictions on managing these works were considered necessary.

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Phytotoxic Impacts on Future Landscaping

Plants used in landscaping faced a risk to health given heavy metals concentrations in the surface fill materials. An imported growing medium was recommended for use in landscaped areas (between 1-2m thick) as well as the use of native plants with tolerance to heavy metals.

Aesthetics

There was a low risk of aesthetic issues provided the Site continues to be used as commercial/industrial land and subsurface materials were managed appropriately. Given these provisions, a long term management plan was recommended to be prepared to address these issues should they arise.

Remediation

Contamination at the Site presented an unacceptable health risk to short term construction/maintenance workers and long term site users and a program of remedial works was recommended to appropriately manage the contamination.

Recommendations

- Continue to restrict access to the Site;
- Implement a program of remedial works for future use of the Site as commercial/industrial land;
- Remediation should include a program of removal of upper 0.5m of material over the entire Site or install a capping mechanism. Consideration should be given to removal of the ongoing sources of groundwater contamination including the Tar Wells and sludges at the base of Gas Holders;
- A long term management plan should be prepared to not only address and manage contamination during any proposed remedial works but also to address ongoing issues including:
    - a prohibition on groundwater extraction and reuse from the Site;
    - a prohibition on the construction of basement areas of future development s that intersect groundwater;
    - any earthworks are to be conducted under an appropriate occupational health and safety plan;
    - controls on access to the Site;
    - management of any groundwater encountered during future construction/maintenance is to be undertaken on site;
    - landscaped areas should be formed on 1-2m deep layer of clean plant growing medium materials;
    - use of native plants should be preferred in landscaped areas, particularly ones with a tolerance to heavy metals; and
    - aesthetics issues should be appropriately managed during activities associated with sub surface materials.

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5.2 Assessment of Previous Data

An assessment of previous data collecting programs was undertaken to assess the quiality and validity of the data. An evaluation of this data is provided in **Appendix B – QA/QC Assessment.**

In summary, it was noted that there are a few minor discrepancies contained within the QA/QC of the past investigations, such as reporting of certain aspects of sampling procedures and occasional field duplicate RPDs not meeting the adopted DQIs, however the data as a whole is considered to be reliable and useable.

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6 Development of the Site Investigation Criteria

6.1 Contaminants of Concern in Soils

The following contaminants of concern are based on historic site operations and the contaminants detected in fill and soils during the previous site investigations listed in **Section 1.4**:

- Metals including arsenic (As), cadmium (Cd), chromium (Cr), copper (Cu), mercury (Hg), lead (Pb), nickel (Ni) and zinc (Zn);
- Total Petroleum Hydrocarbons (TPHs);
- Benzene, Ethylbenzene, Toluene and Xylenes (BTEX);
- Polycyclic aromatic hydrocarbons (PAHs);
- Organochlorine Pesticides (OCPs);
- Organophosphorus Pesticides (OPPs);
- Phenolic Compounds (Phenols);
- Cyanides (totals);
- Polychlorinated Biphenyls (PCBs);
- Asbestos.

Although not indicated as contaminants of concern in NSW DEC and other guidance relating to former gasworks sites, recent literature and research has linked PCDD/Fs with oil shale material, which was used a raw material as part of the gas production at the Site, subsequently Polychlorinated Dioxins/Polychlorinated Furans (PCDD/F) were also included as contaminants of potential concern.

Based on the historical operations and previous soil data, the Site has been stratified into delineation areas (refer to **Section 1.3** and **Figure 3**). A summary of the environmental issues and potential sources of soil contamination are described in the table below.

Table 6.1 - Areas of Concern/Contamination Sources

Stratified Delineation Area	Description	Contaminants of Concern in Soil
Gasholders	Former gas storage units.	TPH PAH Phenolics
Retort	Raw gas generation. By products included coke and tar.	TPH/BTEX/PAH/Phenolics PCDD/F[3]
Gas Purifiers	Oxides used to purify gas.	TPH/BTEX/PAH/Metals/ Cyanides/Phenolics
Northeast	Formerly old rail spur from main Illawarra line and coal storage area.	TPH/BTEX/PAH/Metals
South Central	Continuations of former rail spur from main Illawarra line.	TPH/BTEX/PAH/Metals

[3] *Contaminants of potential concern.*

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Stratified Delineation Area	Description	Contaminants of Concern in Soil
Southwest	Continuations of former rail spur from main Illawarra line. Deep filling likely from waste disposal.	TPH/BTEX/PAH/Metals
Retaining Wall	Filled area behind retaining wall.	TPH/BTEX/PAH
Western Lot	Unknown historical operations, minor filling.	TPH/BTEX/PAH/Metals/ Cyanides/Phenolics
General fill and surfaces	Coverage over all of Site surfaces/Pesticide application/Building demolition.	TPH/BTEX/PAH/Metals/Cyanides/ Phenolics/OCP/OPP/Asbestos/PCB

Additional information from the NSW Department of Environment and Conservation (DEC) *Information for the assessment of former gasworks sites*, 2005, was also considered.

6.2 Investigation Criteria

Investigation criteria have been adopted from the following guidance documents:

- NSW DEC, *Contaminated Sites: Guidelines for the NSW Site Auditor Scheme (2nd Edition)*, 2006 (NSW DEC, 2006)
- NSW EPA, *Contaminated Sites: Guidelines for Assessing Service Station Sites*, 1994 (NSW EPA, 1994); and
- National Environment Protection Council (NEPC) *National Environment Protection (Assessment of Site Contamination) Measure* (NEPM) 1999 (NEPC 1999).

6.2.1 Soil Investigation Levels

Soil criteria for this site assessment were obtained from Health Investigation Levels (HILs) listed in the NSW DEC *Contaminated Sites: Guidelines for the NSW Site Auditor Scheme*, (2nd Edition), 2006 (DEC, 2006).

These guidelines provide a range of HILs for soils considered to be appropriate for a range of generic land uses in Australia. These HILs have been endorsed by the NSW Department of Environment and Conservation (DEC) (formerly the NSW EPA). Due to the proposed future rail-related use of the Site, CH2M HILL has compared the laboratory results of the soil samples from across the Site to the following land use scenario and criteria:

> *Commercial or Industrial Health Investigation Levels (HILs) in Column 4 of Appendix II in NSW DEC (2006), referred to as NEHF F, or HIL F.*

In addition, the NSW EPA, *Contaminated Sites: Guidelines for Assessing Service Station Sites*, 1994 (NSW EPA, 1994), guidance document has been used to provide threshold TPH and BTEX concentrations. Although these criteria are for sensitive land use scenarios, they are the only currently endorsed criteria when considering environmental impacts from TPH and BTEX compounds.

The Site is currently being considered by RailCorp for continued commercial/industrial land use, therefore provisional phytotoxicity-based

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Investigation Levels (PBILs) will not be used to assess the suitability of the Site soils. This is based on the decision process for assessing urban redevelopment sites outlined in NSW DEC, 2006, which does not require that PBILs be considered for industrial/commercial land uses.

There are no published guidance levels or criterion for PCDD/Fs in NSW. The inclusion of PCDD/Fs in the investigation was not to assess human health or environmental risks for PCDD/Fs, rather to determine remedial options available to manage these types of contaminants if they persist at the Site. For the purposes of comparison, remediation criteria adopted from USEPA Approach for Addressing Dioxin in Soil at CERCLA and RCRA Sites, 1998 are provided here. This document recommends a Preliminary Remediation Goal (PRG) of 5 – 20ng/g (5,000 – 20,000pg/g) for the clean up of surface soils for commercial/industrial sites.

Soil HIL criteria and threshold concentration guidance levels for this site investigation are presented in **Table 6.2**.

Table 6.2 – Soil Criteria (in mg/kg)

Analyte	DEC, 2006 – HIL F	NSW EPA, 1994
Metals		
As	500	-
Cd	100	-
Cr (III)	600,000	
Cr (VI)[1]	500	-
Cu	5,000	-
Hg (inorganic)	75	-
Ni	3,000	-
Pb	1,500	-
Zn	35,000	-
Total Petroleum Hydrocarbons (TPH)		
TPH (C6-C9)	-	65
TPH (C10-C36)	-	1,000
BTEX		
Benzene	-	1
Toluene	-	130
Ethylbenzene	-	50
Xylenes	-	25
Polycyclic Aromatic Hydrocarbons (PAHs)		
PAH – total	100	-
Benz(a)pyrene	5	-
Organochlorine Pesticides		
Aldrin + Dieldrin	50	-
Chlordane	250	-
DDT + DDD + DDE	1,000	-
Heptachlor	50	-

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Analyte	DEC, 2006 – HIL F	NSW EPA, 1994
Phenol	42,500	-
Cyanide (total)	2,500	-
PCBs	50	-
PCDD/Fs	5,000 to 20,000 pg/g[2]	-
Asbestos[3]	No detection of fibres in the surface soils. No visible fragments in the surface soils.	-

[1] This value is used as a conservative concentration and used as a preliminary screening value for Chromium.
[2] USEPA Approach for Addressing Dioxin in Soil at CERCLA and RCRA Sites, 1998, Preliminary Remediation Goal (PRG) for the clean up of surface soils for commercial/industrial sites .
[3] Australian Contaminated Land Consultants Association, Asbestos in Soils – Code of Practice, 2002 – Tier 1 HIL Guideline. No detection refers to 95% probability that there are no fibres in surface soils (less than 5 fibres detected).

6.2.2 Water Investigation Levels

Surface Water results can be compared to a set of trigger values published by the Australian and New Zealand Environment and Conservation Council (ANZECC) and the Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) in *The Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC, 2000).

Selection of appropriate trigger values is dependant on the receiving water body of migratory waters. The receiving water body is expected to be the head waters of Alexandra Canal and this system is not under tidal influence, therefore the receiving water body should be a freshwater environment. Criteria for Site water are provided below.

Table 6.3 – Water Criteria (µg/L)

Analyte	Slightly – Moderately Disturbed Systems Trigger Values (µg /l)	Reliability of Trigger Value
Arsenic (AsIII)	24	High
Cadmium	0.2	High
Copper	1.4	High
Lead	3.4	High
Mercury (inorganic)	0.06	High
Nickel	11	High
Zinc	8	High
Cyanide (un-ionised)	7	High
Phenol	320	High
Benzene	950	High
Xylenes (o-xylene)	350	High
Xylenes (p-xylene)	200	High
PAHs (naphthalene)	16	High

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Analyte	Slightly – Moderately Disturbed Systems Trigger Values (µg /l)	Reliability of Trigger Value
OCP (chlordane)	0.03	High
OCP (DDT)	0.006	High
OCP (endosulfan)	0.03	High
OCP (endrin)	0.01	High
OCP (heptachlor)	0.01	High
TPH	-[1]	-

1 No recommended value. Analytical testing Limit of Reporting (LOR) will be used as an initial screen to evaluate the protection of environmental values at the site. The LOR for TPH will be 100µg/L.

6.2.3 Comparison of Soil Analytical Results to the Soil Investigation Levels

The usual statistical methodology used for comparison of the soil data to criteria is based on the methods referred to in the NSW EPA *Sampling Design Guidelines* (1995) and NEPM (1999), namely:

- comparison of the 95% upper confidence limit of the arithmetic mean concentration (95% UCL values) of each contaminant to the investigation criteria (HIL F);
- comparison of individual analytical results to 250% of the investigation criteria (HIL F) to identify contamination 'hotspots'; and
- comparison of calculated standard deviations to a value of 50% of the investigation criteria.

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7 Fieldwork Methodology

7.1 Overview

7.1.1 Scope of Fieldwork

The scope of the field work undertaken at the Site entailed:

1. An underground service clearance, obtaining necessary work permits;
2. Sampling (soil and water) at nominated areas; and
3. Survey of specific surface infrastructure and sampling locations.

7.1.2 Sampling Program

The sampling program was undertaken in two stages. The reasoning behind the fieldwork being completed in two stages is provided in **Section4.2.3.**

The first stage used heavy machinery to conduct trenching and test pit excavations. This approach enabled the collection of soil/fill samples and provided a better understanding of the subsurface conditions, especially underground structures associated with the MGP. The second stage used a push tube rig to collect undisturbed samples from deep soil layers, and to bore angled holes to target the bases of the Gasholders.

CH2M HILL site personnel followed Standard Operating Procedures (SOPs) for conducting site work. The SOPs follow specific standards in industry guideline documents and are used as a training tool for site personnel. Consistency is maintained as a result of site personnel following the same methodology.

In order to assess the distribution of the chemical compounds analysed, CH2M HILL used a combination of a stratified and judgmental sampling strategy, defined in the NSW EPA *Contaminated Sites, Sampling Design Guidelines* (1995), as follows:

- **Stratified Sampling:** involves the separation of a site into sub-areas and each sub-area sampled as an individual site; and
- **Judgmental Sampling:** is where the location of sampling points is selected based on the investigators knowledge of the Site and previous site activities.

The number of soil sample locations in each area is summarised in **Table 4.1**. The locations of the soil sampling locations are in **Figure 3**.

The methodology employed in determining the location of the soil sampling locations was as follows:

- Nominate the proposed soil sampling locations on a site plan required to meet the data quality objectives outlined in **Section 4.1**;
- Actual sample locations were moved in the field as required due to the presence of underground or above ground structures or services. A professional cable locator was employed to clear areas of uncertainty and service diagrams were obtained from RailCorp and utility companies; and

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- All sample locations were recorded by a professional surveyor.

7.2 Soil Investigation

7.2.1 Intrusive Work

Online Contracting Pty Ltd (Online) was subcontracted to carry out trenching and test pit excavations, while Macquarie Drilling was engaged to carry out bore drilling operations.

The bore drilling technique employed consisted of a push tube rig, known as a Geoprobe. This machine uses a percussion technique to drive hollow rods into the ground to collect undisturbed soil core samples in disposable (i.e. single use) plastic tubing.

The depth of sampling was determined based on:

- depth to fill and natural soil;
- depth to groundwater;
- depth to bedrock; and/or
- the origin of potential contaminants (i.e. from surface spills or subsurface release).

7.2.2 Soil Sample Collection

Soil samples were collected in accordance with NEPM (1999), the site-specific Sampling Analysis and Quality Plan (SAQP) (CH2M HILL, July 2006) and CH2M HILL Standard Operating Procedures (SOPs). Soil samples from excavated trenches and test pit holes were collected directly from the machine bucket in the undisturbed bulk of material. Soil samples collected with the Geoprobe were collected from the undisturbed inner core of the push rod.

Soil profiles were logged to the depth of the hole or to refusal. Each sampling location was identified and described on a bore log, which are provided in **Appendix C**.

Collection of field data quality samples was undertaken as appropriate in accordance with NEPM, 1999 and AS 4482.1 – 1997, as per the SAQP.

To support analytical assessment of samples, visual assessment was conducted in the field to positively identify wastes that are specific to gasworks sites. **Table 7.1** below describes the basis for visual assessment of gasworks wastes and other materials undertaken in the field during sampling activities.

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Table 7.1 – Visual Assessment of Waste Types

Waste Types	Visual Appearance	Likely Contaminants
Coal Tar & Tar Oils	• Dark Brown to black discolouration • Odorous (aromatic-sweet & hydrocarbon)	PAHs, TPHs, BTEX & Phenolics
Spent Oxides (including cyanides)	• Prussian Blue colouring (oxidised) • Grey/green colouring (reduced) • Iron staining (orange/red)	Metals, Cyanide (complex & free)
Coke, coke breeze, ash, clinker	Light grey to black colour • Black powder (coke breeze) • Granular glassy material (clinker)	PAHs & metals
Drip Oils/Light oils	• Odorous (oily) • Oily sheen	TPHs & BTEX
Asbestos Containing Materials	• Fibrous/powdery texture • Coloured (grey-white, blue, green) • Fragments	Asbestos (Amosite, Chrysotile, Crocidolite)

7.2.3 Field Screening

All soil samples were screened in the field during sample collection for Volatile Organic Compounds (VOCs) with a calibrated Photo-ionization Detector (PID). The PID is a hand held device used in the field to screen the sample headspace for potential volatile contaminants. This type of screening provides on-site assessment of samples likely to contain volatile compounds. However, the PID measurements are indicative only and should not be substituted for sound laboratory testing methods.

The PID used during this assessment was a MiniRae and was calibrated prior to the commencement of each day of field activities using a zero gas calibration and 100 ppm concentration isobutylene gas in accordance with the manufacturer's specifications. The PID was regularly checked throughout the day and recorded.

When screening soil samples, a sub-sample was placed in a sealable plastic bag and labelled with the same identifier as the original sample. The sample was agitated and left to develop in the shade. After sufficient development, the PID hose tip was then placed through the top of the bag and lowered to the top of the sample. The hose tip remained in place until a maximum concentration (ppm) of volatile organic compounds recorded by the PID was noted. Between each reading the PID was allowed to return to a zero reading.

PID field screening along with visual assessment of gasworks wastes provided a good basis with added professional judgement in selecting samples for analysis that would represent site conditions accurately.

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The PID results for each sample are provided on the bore logs in **Appendix C**. The initial calibration from the rental supplier calibration and record sheets are presented in **Appendix E.**

7.2.4 Soil Sample Storage and Transport

Each sample was labelled with an alphabetical and numerical identifier consisting of the date, sample location, depth of sample and samplers initials. Soil samples were placed directly into 250mL laboratory prepared and supplied jars.

Samples were not mixed or homogenized during the assessment in order to minimize loss of volatiles. Samples were placed directly into an ice-cooled esky following collection and transported to the laboratory under CH2M HILL chain-of-custody (COC).

7.2.5 Soil Sampling Equipment Decontamination

At each new sample location a new set of disposable nitrile gloves was used to directly collect soil samples and place the samples into the laboratory prepared clean glass sample jars. Between each sample, the machine bucket and Geoprobe rods were washed with a high pressure hose to remove all traces of visible soil material.

At the end of each sampling day, the push tube shoe was decontaminated using a scrubbing brush and a solution of Decon 90 and tap water followed by a rinse in tap water to remove soil material. An equipment rinsate blank was collected at the end of each day from this piece of sampling equipment. No rinsate samples were collected from the machine bucket.

7.3 Surface Water Investigation

7.3.1 Sampling Locations

Samples were collected to understand potential impacts to surface water contained in former gasworks structures from MGP waste materials. The locations are described in **Section 8.6**. In preparation for Site remediation, a better understanding of impacts to the water in structures would enable a better management strategy to be applied.

7.3.2 Surface Water Sampling

Samples were collected using a disposable teflon bailer or directly into the sample bottles. A sample of the water at the bottom of the Southern Gasholder was collected using a footvalve mechanism to ensure water from the bottom of the structure was collected.

Non-Aqueous Phase Liquids (NAPLs) were noted at one location in the Tar Well #2 sample.

Collection of field data quality samples was undertaken as appropriate in accordance with NEPM, 1999 and AS 4482.1 – 1997.

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7.3.3 Surface Water Sample Storage and Transport

Water samples were transferred directly from the disposable bailer into laboratory prepared and supplied bottles appropriate for the analysis required. Samples were labelled with a unique alphabetical and numerical identifier consisting of the date, sample location and samplers initials.

Duplicate samples were collected by alternatively filling the primary then duplicate bottles. Samples were placed directly into an ice-cooled esky following collection and were transported to the laboratory under CH2M HILL chain-of-custody (COC).

7.3.4 Surface Water Sampling Equipment Decontamination

Decontamination was not required and new nitrile gloves were used at each sample location.

7.4 Analytical Program

The majority of soil and water samples were analysed for the same contaminants of concern. The analyses listed in **Table 7.2** were performed using NATA accredited methods. The majority of the project analytical work was performed by ALS Pty Ltd (Sydney). The Quality Assurance (QA) laboratory was Labmark Pty Ltd (Sydney) used to analyse the inter-laboratory duplicate samples. The laboratory used to analyse for asbestos was ASET Pty Ltd. All three laboratories are accredited by the National Association of Testing Authorities (NATA).

The analytical suite conducted by the laboratories for the investigation is summarised in **Table 7.2**. The analysis of metals in groundwater was based on metals in a dissolved state. Soils were analysed for total metals.

Table 7.2 – Analytical Methods

Analytical Parameters	Detection Limit Soil (mg/kg)/water (µg/L)	Holding Time	Analytical Technique
Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg)	0.1-5 / 0.1-5	6 months / 28 days -Hg	ICP/MS/FIMS
TPH	10-100 / 50-200	14 days (7 days water)	PT-GC/PID/FID/MS
BTEX	0.2-1/ 1-2	14 days	PT-GC/PID/FID/MS
PAHs	0.5-1/ 1-2	14 days (7 days water)	GC/MS
OCPs	0.05/ 0.2	14 days (7 days water)	GC/ Dual ECD
OPPs	0.05/ 0.2	14 days (7 days water)	GC/ Dual ECD
Phenolics	0.5-1/ 1-2	14 days (7 days water)	GC/MS
Total Cyanide	1	14 days	APHA 4500
Asbestos	-	-	PLM in dispersion staining

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Analytical Parameters	**Detection Limit** **Soil (mg/kg)/water (µg/L)**	**Holding Time**	**Analytical Technique**
PCBs	0.5/ 5	14 days (7 days water)	GC/ Dual ECD
PCDD/Fs	<0.0409 pg/g	1 year	Isotope Dilution

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8 Investigation Results

The following sections present the results of this Delineation Investigation undertaken by CH2M HILL, while **Section 8.4** incorporates the data from all previous soil investigation programs.

Section 12 presents the delineation and characterisation of site contamination, which incorporates all relevant previous data from those investigations listed in **Section 1.4.1**.

8.1 Subsurface Conditions

The trenches, test pits and bore holes completed during the investigation provided a better understanding of the subsurface conditions of the Site than what had previously been reported. This section provides a detailed account of the general Site and subsurface conditions encountered during the investigation. A photographic record of the investigation is provided in **Appendix A.**

8.1.1 Additional Subsurface Findings

Northern Gasholder

A backhoe was used to scrape across the ground surface and uncover the top of the buried brick annulus of the Northern Gasholder (Photo 6). The circumference of the Gasholder annulus was surveyed and determined to be the same as the Southern Gasholder (approximately 20m). The sidewall of the annulus was exposed while trenching at sample location MG05 (Photo 7). Tar/oil was observed to be seeping from the brickwork at approximately 2 metres below ground level (mbgl).

Two test pits were completed inside the annulus of the Northern Gasholder (MG03 and MG04). The material excavated was building demolition and waste materials that included brick, fibro cement sheeting, pipes, wood, scrap metal, tiles and sandstone blocks (Photo 8). The fibro cement sheeting was tested and indicated a presence of asbestos (refer **Section 8.3.11** and **Table 10**).

It was observed that the inside of the Northern Gasholder is acting as a reservoir, similar to a surface water body. The brick annulus acts as a low permeable wall, effectively creating an inground pool (Photo 9). The relatively fast infiltration of surface water coupled with slow permeation through the annulus brickwork results in a positive head of water inside the Gasholder. Compared to groundwater levels outside the annulus (MW06s – approximately 2mbgl), the water level inside the annulus is significantly raised and standing water is at approximately 0.4mbgl. The positive head provides a source of recharge to the shallow groundwater system.

Tar Impacts

Sample locations BHC, BHC1 and BHD were bored at an angle of 17 degrees from the vertical toward the Northern Gasholder. BHC intersected the base of the annulus at 6mbgl. This was an important find, given it was previously expected that the Gasholder was constructed to approximately 3mbgl based on historical data and anecdotal evidence. The sample collected at this depth from the base of the annulus appeared as a tarry oily material and brick (Photo 10). Sample location BHD also showed the presence of similar tarry oily material at approximately 6.0mbgl.

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The tarry oily material underneath the northern gasholder exists as a relatively fluid black ooze. The term "free tar" is used to describe this material.

Southern Gasholder

Similar to the Northern Gasholder, the Southern Gasholder was completely full of water and acts as a reservoir. It would also provide a positive head and a source of recharge to the shallow groundwater system.

A groundwater gauging meter was used to measure the depth to the base of the Southern Gasholder through a central hole in the metal lid and at the outside edge. The outside edge was measured at 5m below the top of the brick annulus, while the centre was measured at 3.5m below the metal lid. This gives the impression that the base of the Gasholder is likely to be convex.

Tar Impacts

Sample locations BHA, BHA1 and BHB were bored at an angle of 17 degrees from the vertical to target material below the Southern Gasholder (Photo 11). The bore holes were positioned to clear the base of the Gasholder annulus at 6.5mbgl. This confirmed reports that the Southern Gasholder was no greater than 6.5m deep.

Samples collected and observations made from near the base and underneath the gasholder at BHA, BHA1 and BHB showed the presence of dark stained material within the natural pores and fractures, which was highly odorous (Photo 24). This was observed at approximately 6mbgl to the depth of refusal 10mbgl.

This dark stained material, whether it is tar that has leaked from the Southern Gasholder or migrated from other tar source areas, is different in nature to the free tar below the Northern Gasholder. It is not fluid, but discolours the surface of vertical fractures. The term "dark stained impacts" is used to describe this material. These dark stained materials were only observed underneath the Southern Gasholder.

The terminology of "free tar" and "dark stained impacts" will be used to categorise the tarry materials at the Site.

Retention Pit

A backhoe was used to excavate adjacent to a brick pit located on the southern side of the Southern Gasholder (Photo 15). The pit (referred to as the Retention Pit) was built to approximately 2mbgl and connected to two pipes, which both contained water and an oily/tarry material. The position of the pit adjacent to the Gasholder indicates it was likely constructed to capture tar condensate from the Gasholder. The presence of tar in the interconnected pipes would also indicate this assessment. The pipes were broken during excavation of this pit and the pit was flooded with water. A sample of residual material was collected from one of the pipes for chemical analysis. The results of this sample are presented in **Section 8.3.10**.

Tar Wells

Two Tar Wells are located 5m northeast of the Northern Gasholder. An excavator was used to remove the concrete lids and uncover the contents of the two tar wells. The diameter of each well is approximately 4.0m. Both Tar Wells contained water (Photo 12). A long pole was used to estimate the depth to the base of Tar Well #2, which appeared to be approximately 1.5m deep to the base. However, upon forcing the pole down it appeared to push through a crust and slide to a depth of approximately 3m deep. Once the pole was removed a black free phase product

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floated to the surface. It was then considered that the well was likely to contain a free tar material and the excavator was used to collect a sample of this material. The material removed from the base of the well was black, highly odorous and a mixture of free tar and gravels (Photo 13). A sample of this material was collected from the excavator bucket for chemical analysis. The results of this sample are presented in **Section 8.3.10**.

Sample location MG06 was excavated along side Tar Well #2, which showed free tar seepage from the Tar Well into the adjoining soil material (Photo 14), indicating this Tar Well is likely to be a significant contamination source zone. No sampling trench was excavated adjacent to Tar Well #1 as it was considered, given their close proximity and historical use, the conditions would be similar for both wells.

Adjacent to the Tar wells, free tar was observed at sample location BHG in the soil pores and fractured shales up to depths of 7.0mbgl.

Retort Brickwork

An excavator was used to complete trenches across the footprint area of the former Retort House location. The trench work uncovered an incomplete brick-base floor consisting of a layer of bricks (Photo 16). The brickwork was considered an item of potential heritage significance; therefore excavation work was limited to preserve the insitu brickwork. The lateral extent of the brick work was determined as follows:

- Northern extent of brickwork was not determined – the brickwork continues below the Retaining Wall and is evident at sample location TP12.
- Southern extent of the brick work was at the southern end of sample location MG09B.
- Eastern extent of the brick work was likely to be the mid point of sample location MG08 – the brickwork was discontinuous in this area and difficult to delineate.
- Western extent of the brickwork was at the western end of sample location MG09C.

The lateral extent and size of the brickwork is generally in alignment with the former historical layout of the Retort location presented on **Figure 2**.

Sample location TP15 was selected to penetrate through a discontinuous area of brickwork to allow the collection of delineation samples at depth. A brick footing was observed at this sample location. Both the brick footing and the surrounding soil materials were observed to be impacted with free tar. It should be considered that there is a high possibility that similar footings exist across the expanse of the Retort area.

Tar Pipe and Other Gasworks Pipework

A significant number of old gasworks pipework and service lines were uncovered during the sampling program. The majority of these pipes contained residues of black, highly odorous, sticky tar. One pipe was uncovered at sample location MG02, which appeared to have significantly impacted (i.e. observed as free tar) the surrounding soils. Another was uncovered at MG09B, where a sample was collected from the tarry residues (Photo 17). The results of this sample are presented in **Section 8.3.10**.

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8.2 Geological Observations

For the following sections, reference is made to **Figure 3** for the location of Site areas and cross sectional transects. **Figures 5** and **Figure 6** present cross sections that indicate fill and natural soil horizons across areas of the Site.

Each sample location was logged on a soil bore log. Bore hole logs are presented in **Appendix C.**

8.2.1 Fill Material

The fill materials identified at the Site can be grouped as follows:

- Ash and Coke Gravels – observed in surface and near surface layers from ground level to approximately 0.5mbgl. A representation of this material is shown in Photo 18. This material was observed at the surface in the majority of Site Areas, particularly as deeper subsurface layers in the North East, South Central, Retort and Western Lot areas of the Site.
- Reworked Clays – observed in subsurface layers from 0.5mbgl to approximately 1.5mbgl. This material was observed in the majority of Site areas as general filling.
- Sands and Gravels – observed in subsurface layers from 0.5mbgl to approximately 1.5mbgl. This material was observed in the North East, South Central and Gas Purifier areas of the Site.
- Gravely Sand and Clay with Minor Ash – observed in surface and subsurface layers from ground level to approximately 3.5mbgl. This material was predominantly observed in the South West area of the Site as general filling. A representation of this material and the stratification of the fill is shown in Photo 19.
- Gravel, Sand and Demolition Wastes – observed in fill embankment areas along the northern boundary (Retaining Wall area) and inside the annulus of the Northern Gasholder (Photo 8). A representation of the fill embankment material is shown in Photo 20 and Photo 21. This material was observed to mainly consist of sandy gravels and some ash gravels. It also consisted of demolition wastes and rubble including bricks, metal pipes, tiles, fibro-cement sheeting and Asbestos Containing Materials (ACMs) and other building rubble in a gravely sand matrix.

Generally the deepest filling was encountered in the South West area to depths of approximately 3.5mbgl. Depth of filling in this area is also indicated by the steep embankment formed above the backyard ground surface of the adjoining residential properties (see photo 4). Fill thickness generally becomes shallower in other areas, forming a wedge of fill in the South West area. The original topography is likely to have been a steeper gradient down in a southerly direction, compared to the current generally level surface.

8.2.2 Natural Soil

The natural soil materials identified at the Site can be grouped as follows:

- Silty Clay – observed generally from 1.5mbgl to approximately 2.5mbgl. This material exists across the majority of Site areas. The material is consistent with

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the original surface soils, indicated by the abrupt profile horizon from the overlying fill materials, the gradational horizon into the underlying plastic clays and the high silt and organic matter content (i.e. roots and rootlets). The thickness of this horizon is possibly the result of tilling practices for crop growing in the area during early settlement. However, this information was not confirmed in previous site history reviews. The Silty Clay horizon was predominantly a saturated soil horizon, which sustained the perched groundwater system, overlying the moderately/highly plastic red/grey mottled clays.

- Red/Grey Mottled Clay – observed generally from 2.5mbgl to approximately 4.0-6.0mbgl. The soil profile horizon is gradational from the Silty Clay above and the soil is consistent with a red podzolic, being moderately to highly plastic, stiff to very stiff, moist and mottled red/grey. This material was observed in filled areas of the Site as reworked clay, probably sourced from excavations on site to accommodate inground structures such as the gasholders, tar wells and building footings.
- Weathered Shale – observed underlying the natural clay and the horizon is generally gradational through this profile. This material grades from extremely weathered to moderately weathered at depths of up to 10mbgl. At depths beyond 6mbgl, fracturing of the material is common, giving rise to prominent iron stone gravels and iron staining.

8.2.3 Tar and Tar Impacted Soil

A number of areas of fill/soil materials were observed to be impacted by Tar. The tar material has been categorised as follows:

- Free Tar – consisting of a black, low viscosity, highly odorous material; and
- Dark Stained Impacts – this material was observed as dark brown to black staining in the deep soils and Weathered Shale within the soil pores and shale fractures zones underneath the Southern Gasholder. This material was also highly odorous.

Representations of these materials are shown in Photo 22 and Photo 23 (free tar in deep natural soils) and Photo 24 (dark staining).

Free Tar was predominately associated with former structures including:

- Tar Wells – shallow subsurface and deep natural soils surrounding and underlying these structures;
- Northern Gasholder – deep natural soils surrounding and underlying the brick base annulus;
- Retort – fill and deep soil across the majority of this area;
- Gas Purifier – Sandy fill and deeper soils;
- Old Pipework – generally observed inside the pipes and in immediately surrounding fill/natural soils; and
- Localised impacted fill – observed in one localised pocket in the Northeast Area.

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Dark stained impacts were associated with:

- Below the Southern Gasholder.

The primary source of tar at the Site is the free tar sources, whereas the dark stained impacts are likely to be secondary sources within the strata in localised areas associated with the Southern Gasholder.

8.3 Stratified Area Soil Analytical Results

Soil samples were submitted to the laboratory for analysis of inorganic contaminants including metals (As, Cd, Cr(total), Cu, Hg, Ni, Pb, Zn) and cyanide (total)); and organic contaminants including TPH, BTEX, PAH, phenolics, OCPs, OPPs and PCBs. Selected soil samples and building material debris samples were also submitted for asbestos analysis.

Samples were selected for analysis based on either field observations (such as odours, discolorations and visual identification of tar and other wastes) or on historical information of site operative/waste disposal area.

As outlined in **Section 6**, soil analytical results have been compared to the NSW DEC (2006) HIL F investigation levels for commercial/industrial sites. The method for comparison of the soil analytical results to the investigation levels is described in **Section 6.2.3**.

Laboratory Certificates of Analysis and chain of custody forms are provided in **Appendix G.**

A summary of the soil analytical results obtained from each of the Areas (as shown on **Figure 3)** during the Delineation Investigation are presented and discussed below.

8.3.1 PID Field Screening Results

The PID readings at each sample location appear to correlate well to the analytical results for contaminants. Elevated PID readings were identified in samples exhibiting elevated concentrations of contaminants (particularly BTEX and light fraction TPH), while low PID readings correspond to lower concentrations. On this basis, the PID field screening tool worked effectively in identifying the location and depth of samples that were likely to be impacted. This may also be a useful tool during remedial excavation work in determining extent of excavations and limits to chasing-out contaminated areas.

8.3.2 Gasholder Area

A total of 24 samples were analysed from 7 fill and 17 natural soil samples. Of these samples:

- 5 of the 7 (70%) fill samples contained concentrations of one or more contaminants above the investigation criteria; and
- 8 of the 17 (47%) natural soil samples contained concentrations of one or more contaminants above the investigation criteria.

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Summary soil results for the Gasholder Area are presented in **Table 1.** The contaminants that exceed the investigation criteria (and hotspot criteria) in the Gasholder Area are presented below in **Table 8.1.** These sample locations and contamination hotspots are presented on **Figure 4.**

Contamination hotspots were identified in both fill and natural soils. In particular, hotspot locations were identified at:

- MG02 (at 0.2m and 1.8m) for B(a)P, PAHs, TPH (C_6-C_9), TPH (C_{10}-C_{36}), benzene and xylenes;
- MG03 (0.1m) for TPH (C_{10}-C_{36});
- MG05 (at 0.5m and 1.8m) for PAHs, TPH (C_{10}-C_{36}) and xylenes;
- BHC (at 6.0m) for B(a)P, PAHs, TPH (C_6-C_9), TPH (C_{10}-C_{36}), benzene and xylenes; and
- BHD (at 7.0m and 8.4m) for benzene.

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Table 8.1 – Gasholder Area - Exceeding Concentrations

				MG02/0.2	MG02/1.8	MG03/0.1	MG04/0.5	MG05/0.5	MG05/1.8	MG05/5.0	BHA1/10.2	BHA1/7.0	BHB/6.0	BHC/6.0	BHD/7.0	BHD/8.4
				Fill and Silty Clay Samples					Natural Soil Samples							
Analyte	**NSW EPA, 1994**	**NSW DEC HIL F**	**Hotspot**													
Benzo(a)pyrene	-	5	12.5	<0.5	**178**	**10.4**	**6**	-	2.2	<0.5	<0.5	<0.5	<0.5	**17.6**	<0.5	<0.5
PAHs total	-	100	250	**149.5**	**5,301.9**	**115.3**	62.8	-	**289**	68.1	8	8	13.4	**1,906.4**	8	8
Lead	-	1,500	3,750	-	93	648	**2,140**	325	24	-	-	-	-	-	-	-
TPH C6 - C9	65	-	162.5	**72**	**189**	<2	<2	<2	**118**	**92**	<2	<2	4	**559**	8	9
TPH C10 - C36	1,000	-	2,500	490	**36,140**	**2,750**	**1,860**	**13,340**	**3,140**	**1,420**	<250	<250	<250	**8,760**	<250	<250
Benzene	1	-	2.5	**4.2**	**3**	<0.2	<0.2	<0.2	<1	<0.2	**1.4**	**1.6**	**2**	**6.4**	**5.4**	**7.5**
Xylene Total	25	-	62.5	**29.6**	**165.8**	<0.4	<0.4	<0.4	**80.4**	**35.0**	<0.4	<0.4	0.9	**246.7**	1.6	0.8

Notes:

Bold – Exceeds investigation criteria.

Bold – Exceeds contamination hotspot criteria.

All values in mg/kg.

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8.3.3 Retort Area

A total of 31 samples were analysed from 11 fill and 20 natural soil samples. Of these samples:

- 7 of the 11 (63%) fill samples contained concentrations of one or more contaminants above the investigation criteria; and
- 6 of the 20 (30%) natural soil samples contained concentrations of one or more contaminants above the investigation criteria.

Summary soil results for the Retort Area are presented in **Table 2.** The contaminants that exceed the investigation criteria (and hotspot criteria) in the Retort Area are presented below in **Table 8.2.** These sample locations and contamination hotspots are presented on **Figure 4.**

Contamination hotspots were identified in both fill and natural soils. In particular, hotspot locations were identified at:

- MG08 (at 1.5m and 2.1m) for B(a)P, PAHs and TPH (C_{10}-C_{36});
- MG09A1 (at 0.7m) for PAHs and TPH (C_{10}-C_{36});
- MG09B (at 0.3m) for TPH (C_{10}-C_{36});
- MG10A (at 0.7m and 2.8m) for B(a)P, PAHs and TPH (C_{10}-C_{36});
- BH12A (at 4.2m) for B(a)P, PAHs, TPH (C_6-C_9), TPH (C_{10}-C_{36}), benzene and xylenes; and
- TP15 (at 2.8m and 4.1m) for PAHs and benzene.

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Table 8.2 – Retort Area – Exceeding Concentrations

				MG06/ 1.0	MG08/1.5	MG08/2.1	MG09A1/0.7	MG09B/0.3	MG09C/0.3	MG10A/0.7	BH12A/ 4.2	BHG/6.0	MG06/ 2.0	MG10A/ 2.8	TP15/2.8	TP15/ 4.1
				Fill and Silty Clay Samples							Natural Soil Samples					
Analyte	**NSW EPA, 1994**	**NSW DEC HIL F**	**Hotspot**													
Benzo(a)pyrene		5	12.5	2	**444**	**6.9**	**8.2**	-	**5**	**339**	**13.9**	1	0.8	**6.3**	**10.8**	0.5
PAHs total		100	250	**135.5**	**15,237.6**	**321.2**	**416.6**	-	51	**4,758.2**	**515.6**	76.6	**103.5**	**206.9**	**426.2**	21.6
TPH C6 - C9	65		162.5	18	51	**97**	39	12	<2	<2	**228**	24	41	56	**107**	**65**
TPH C10 - C36	1,000		2,500	**1,370**	**435,100**	**2,790**	**3,520**	**20,700**	**1,200**	**234,950**	**5,350**	480	**1,700**	**4,070**	**2,090**	<250
Benzene	1		2.5	0.2	0.2	0.3	**1.7**	0.5	<0.2	<0.2	**20**	**2.4**	<0.2	**1.1**	**1.8**	**2.7**
Xylene Total	25		62.5	9.50	10.60	6.00	21.00	4.00	<0.4	<0.4	**94.90**	8.70	22.70	18.90	**56.20**	24.80

Notes:

Bold – Exceeds investigation criteria.

Bold – Exceeds contamination hotspot criteria.

All values in mg/kg.

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8.3.4 Gas Purifier Area

A total of 10 samples were analysed from 4 fill and 6 natural soil samples. Of these samples:

- 4 of the 4 (100%) fill samples contained concentrations of one or more contaminants above the investigation criteria; and
- 2 of the 6 (33%) natural soil samples contained concentrations of one or more contaminants above the investigation criteria.

Summary soil results for the Gas Purifier Area are presented in **Table 3.** The contaminants that exceed the investigation criteria in the Gas Purifier Area are presented below in **Table 8.3.** These sample locations and contamination hotspots are presented on **Figure 4.**

Contamination hotspots were identified only in fill material. In particular, the hotspot location was identified at:

- MG11 (at 0.2m and 2.0m) for B(a)P, PAHs and TPH (C_{10}-C_{36}).

There were no contamination hotspots identified in natural soils.

Table 8.3 – Gas Purifier Area – Exceeding Concentrations

				MG11/0.2	MG11/2.0	BHE/2.2	BHF/1.0	BHE/8.4	BHF/8.5
				Fill Samples				Natural Soil Samples	
Analyte	**NSW EPA, 1994**	**NSW DEC HIL F**	**Hotspot**						
Benzo(a)pyrene		5	12.5	**42**	**48.8**	<0.5	**6.4**	<0.5	1.1
PAHs total		100	250	**696.6**	**728.8**	32.1	89.5	9.4	**134.6**
TPH C6 - C9	65		162.5	<2	10	**155**	<2	2	22
TPH C10 - C36	1,000		2,500	**6,210**	**7,750**	460	**1,150**	<250	**1,260**
Benzene	1		2.5	<0.2	<0.2	0.4	<0.2	**1.6**	0.8

Notes:
Bold – Exceeds investigation criteria.
Bold – Exceeds contamination hotspot criteria.
All values in mg/kg.

8.3.5 Northeast Area

A total of 26 samples were analysed from 18 fill and 8 natural soil samples. Of these samples:

- 7 of the 18 (39%) fill samples contained concentrations of one or more contaminants above the investigation criteria; and
- none of the 8 (0%) natural soil samples contained concentrations of contaminants above the investigation criteria.

Summary soil results for the Northeast Area are presented in **Table 4.** The contaminants that exceed the investigation criteria in the Northeast Area are presented below in **Table 8.4.** These sample locations and contamination hotspots are presented on **Figure 4.**

Contamination hotspots were identified only in fill materials. In particular, hotspot locations were identified at:

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- TP05 (at 0.25m) for B(a)P and PAHs;
- TP06 (at 0.25m) for B(a)P and PAHs; and
- TP16 (at 1.0m) for B(a)P, PAHs, TPH (C_6-C_9), TPH (C_{10}-C_{36}), benzene and xylenes.

There were no contamination hotspots identified in natural soils.

Table 8.4 – Northeast Area – Exceeding Concentrations

				MG10/0.2	TP05/0.25	TP06/0.25	TP08/0.25	TP09/0.5	TP16/0.3	TP16/1.0
Analyte	**NSW EPA, 1994**	**NSW DEC HIL F**	**Hotspot**	Fill Samples						
Benzo(a)pyrene		5	12.5	1.8	**158**	**55**	**8.2**	**5.4**	**6.9**	**39.4**
PAHs total		100	250	26.2	**4,300.9**	**690.2**	79.4	68.5	56.2	**425.1**
TPH C6 - C9	65		162.5	<2	-	-	-	<2	13	**166**
TPH C10 - C36	1,000		2,500	**1,940**	-	-	-	520	**1,280**	**7,640**
Benzene	1		2.5	<0.2	-	-	-	<0.2	**1.2**	**3.1**
Xylene Total	25		62.5	<0.4	-	-	-	<0.4	5.60	**61.20**

Notes:
Bold – Exceeds investigation criteria.
Bold – Exceeds contamination hotspot criteria.
All values in mg/kg.

8.3.6 South Central Area

A total of 10 samples were analysed from 6 fill and 4 natural soil samples. Of these samples:

- 1 of the 6 (17%) fill samples contained concentrations of one or more contaminants above the investigation criteria; and
- none of the 4 (0%) natural soil samples contained concentrations of contaminants above the investigation criteria.

Summary soil results for the South Central Area are presented in **Table 5.** The contaminants that exceed the investigation criteria in the South Central Area are presented below in **Table 8.5.** These sample locations and contamination hotspots are presented on **Figure 4.**

There were no identified contamination hotspots in either fill or natural samples.

Table 8.5 – South Central Area – Exceeding Concentrations

			TP11/0.2
Analyte	**NSW EPA, 1994**	**NSW DEC HIL F**	Fill Sample
Benzo(a)pyrene		5	**6.2**
TPH C10 - C36	1,000		**1,410**

Notes:
Bold – Exceeds investigation criteria.
All values in mg/kg.

8.3.7 Southwest Area

A total of 13 samples were analysed from 9 fill and 4 natural soil samples. Of these samples:

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- 1 of the 9 (11%) fill samples contained concentrations of one or more contaminants above the investigation criteria; and
- none of the 4 (0%) natural soil samples contained concentrations of contaminants above the investigation criteria.

Summary soil results for the South West area are presented in **Table 6.** The contaminants that exceed the investigation criteria in the South West area are presented below in **Table 8.6.** These sample locations and contamination hotspots are presented on **Figure 4.**

A contamination hotspot at sample location RP/2.0 was identified for B(a)P in fill materials. There were no contamination hotspots identified in natural soils.

Table 8.6 – Southwest Area – Exceeding Concentrations

				RP/2.0
Analyte	**NSW EPA, 1994**	**NSW DEC HIL F**	**Hotspot**	Fill Sample
Benzo(a)pyrene		5	12.5	**12.8**
PAHs total		100	250	**118.2**
TPH C10 - C36	1,000		2,500	**1,730**

Notes:
Bold – Exceeds investigation criteria.
Bold – Exceeds contamination hotspot criteria.
All values in mg/kg.

8.3.8 Retaining Wall Area

A total of 8 samples were analysed from 5 fill and 3 natural soil samples. Of these samples:

- 1 of the 5 (20%) fill samples contained concentrations of one or more contaminants above the investigation criteria; and
- none of the 3 (0%) natural soil samples contained concentrations of contaminants above the investigation criteria.

Summary soil results for the Retaining Wall Area are presented in **Table 7.** The contaminants that exceed the investigation criteria in the Retaining Wall Area are presented below in **Table 8.7.** These sample locations and contamination hotspots are presented on **Figure 4.**

There were no identified contamination hotspots in either fill or natural samples.

Table 8.7 – Retaining Wall Area – Exceeding Concentrations

			TP12/0.25
Analyte	**NSW EPA, 1994**	**NSW DEC HIL F**	Fill Sample
Benzo(a) pyrene		5	**9.6**
PAHs (Sum of total)		100	**117.4**
TPH_C10 - C36 (Sum of total)	1,000		**2,320**

Notes:
Bold – Exceeds investigation criteria.
All values in mg/kg.

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8.3.9 Western Lot Area

A total of 7 samples were analysed from 3 fill and 4 natural soil samples. Of these samples:

- 2 of the 3 (67%) fill samples contained concentrations of one or more contaminants above the investigation criteria; and
- none of the 4 (0%) natural soil samples contained concentrations of contaminants above the investigation criteria.

Summary soil results for the Western Lot Area are presented in **Table 8.** The contaminants that exceed the investigation criteria in the Western Lot Area are presented below in **Table 8.8.** These sample locations and contamination hotspots are presented on **Figure 4.**

Contamination hotspots were identified only in fill materials. In particular, hotspot locations were identified at:

- TP13 (at 0.25m) for B(a)P, PAHs and TPH (C_{10}-C_{36}); and
- TP14 (at 0.25m) for TPH (C_{10}-C_{36}).

There were no contamination hotspots identified in natural soils.

Table 8.8 – Western Lot Area – Exceeding Concentrations

				TP13/0.25	TP14/0.25
Analyte	**NSW EPA, 1994**	**NEPM HIL F**	**Hotspot**	Fill Samples	
Benzo(a)pyrene		5	12.5	**45.5**	**7.4**
PAHs total		100	250	**512**	95.2
TPH C10 - C36	1,000		2,500	**8,870**	**3,500**

Notes:
Bold – Exceeds investigation criteria.
Bold – Exceeds contamination hotspot criteria.
All values in mg/kg.

8.3.10 Tar Samples

A total of 3 tar samples were collected from the contents of one of the Tar Wells and two buried pipes at different locations across the Site area.

Summary soil results for the tar samples are presented in **Table 9.** The contaminants that exceed the investigation criteria in the tar samples are presented below in **Table 8.9.** The majority of concentrations exceed the contamination hotspot criteria.

The sample collected from the Retention Pit (RP) Pipe indicates that volatile compounds have a lower concentration in this sample compared to the MG09B and Tar Well samples. The concentration of TPH (C_{10} – C_{36}) in the MG09B sample is greater than 100% of the sample mass (i.e. greater than 1 million mg/kg). This result is considered an anomaly, and the sample may be considered as pure tar (i.e. 100% tar).

A brief assessment of these samples indicates that the likely percentage mass of other compounds in the tar material would be:

- B(a)P – between 0.02% and 0.06%;
- PAHs – between 2.1% and 2.7%;
- TPH (C_6 – C_9) – between 0% and 0.7%;

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- TPH (C_{10} – C_{36}) – between 2.5% and 118% (taken as 100%);
- Benzene – between 0% and 0.08%;
- Ethylbenzene – between 0% and 0.03%;
- Toluene – between 0% and 0.17%; and
- Xylenes – between 0% and 0.3%.

Table 8.9 – Tar Samples – Exceeding Concentrations

			MG09B/PIPE	RP/PIPE	TAR WELL #2
Analyte	**NSW EPA, 1994**	**NEPM HIL F**			
Benzo(a)pyrene		5	**595**	**491**	**164**
PAHs total		100	**26,805.3**	**20,889.8**	**25,557.6**
TPH C6 - C9	65		**3,770**	**70**	**6,690**
TPH C10 - C36	1,000		**1,180,000**	**24,660**	**98,700**
Benzene	1		**576**	**2**	**814**
Ethylbenzene	50		**156**	1.1	**254**
Toluene	130		**1,210**	3.6	**1,680**
Xylene Total	25		**1,516**	**47.40**	**3,170**

Notes:
Bold – Exceeds investigation criteria.
Bold – Exceeds contamination hotspot criteria.
All values in mg/kg.

Dioxins/Furans

The tar sample from the Site that was analysed for PCDD/F reported a concentration of 1.1pg/g. This concentration is marginally above the laboratory detection limit (0.0409pg/g). This value is also well below the lower comparison criterion (USEPA, 1998) of 5,000 – 20,000pg/g.

8.3.11 Asbestos

A total of 20 soil samples and 3 fibro-cement sheeting fragments were collected at different locations across the Site area.

Summary results of the asbestos analysis are presented in **Table 10.** Samples that indicated a positive identification of asbestos are presented below in **Table 8.10.**

All fibro cement fragment samples collected indicated the presence of asbestos, as either amosite, chrysotile or crocidolite. Fill samples collected from the Gasholder Area (MG04 – inside annulus of the northern gasholder) and the Retaining Wall (TP12) indicated the presence of chrysotile and crocidolite asbestos and chrysotile and asbestos, respectively, in the fill materials at these locations.

Analytical results report these samples to include soil, stones, plant matter, fragments of plaster, fragments of fibre cement and brick. Considering the sample descriptions, the asbestos present in these samples is likely to relate to a bonded matrix. However, the age and condition of these materials may generate asbestos fibre material (i.e. friable) at these locations. The definition given by WorkCover (2003) states that friable asbestos includes inappropriately buried asbestos containing material (ACM), in this instance the buried asbestos cement (AC) fragments. Also, any ACM that is weathered or damaged by actions, including mechanical, is classified as friable.

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Table 8.10 – Asbestos Analysis Samples – Positive Identification

	MG01/0.2	MG04/1.5	MG04/1.5	MG09B	TP12/0.25
Asbestos Type	Chrysotile & amosite	Chrysotile & amosite	Chrysotile & Crocidolite	Chrysotile	Chrysotile
Sample Matrix	Fibro fragment	Fibro fragment	Fill material	Fibro fragment	Fill material

8.4 Results and Assessment of All Soil Data

This section summarises the soil results of previous investigations and the new environmental data collected during this Delineation Investigation.

A summary of all data that exceeds the Site criteria for the proposed land use is presented on **Figure 4.**

Fill and natural soil sample results for all data have been summarised in **Table 11** and **Table 12**, respectively.

For ease of assessing the data set for soil results, Silty Clay material was grouped with Fill materials for the following reasons:

- The material appeared as a discontinuous layer over the Site;
- it was likely to be impacted by leaching contaminants from the overlying fill;
- it is the more permeable soil horizon that is likely to be providing a preferential pathway that sustains the perched groundwater; and
- based on field observations of discolouration and strong odour, the Silty Clay layer appeared impacted by contaminants migrating with the shallow groundwater.

The summary data was grouped according to the stratified areas established in **Section 1.3**. The summary tables (**Table 11** and **Table 12**) present soil data for Fill and Silty Clay material and Natural Soil material.

8.4.1 Summary of Soil Data

Table 8.11 and **Table 8.12** below summarise all soil data from across the Site.

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Table 8.11 – Summary of Fill and Silty Clay Material

	Contaminants of Concern															
	BaP	**Total PAH**	**TPH (C6-C9)**	**Total C10-C36**	**Benzene**	**Toluene**	**Ethylbenzene**	**Total Xylenes**	**Metals**	**Cyanide (Total)**	**VOCs**	**Total Phenols**	**OCPs**	**OPPs**	**Asbestos**	**PCBs**
Total Samples Analysed	137	137	107	112	133	128	128	128	113	40	9	76	26	22	23	24
Minimum (mg/kg)	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	nd
Maximum (mg/kg)	595	26,805	6,690	1,180,000	814	1,680	254	3,170	24	67	4	9,872	6	5	-	7
Detects above criteria	56	40	8	42	12	0	1	9	3	0	0	0	0	0	5	0
% Exceedances	41	29	7	38	9	0	1	7	3	0	0	0	0	0	22	0

Notes:
Nd refers to not detected.

Table 8.12 – Summary of Natural Soil Material

	Contaminants of Concern														
	BaP	**Total PAH**	**TPH (C6-C9)**	**Total C10-C36**	**Benzene**	**Toluene**	**Ethylbenzene**	**Total Xylenes**	**Metals**	**Cyanide (Total)**	**VOCs**	**Total Phenols**	**OCPs**	**OPPs**	**PCBs**
Total Samples Analysed	71	71	67	67	70	70	70	70	24	19	0	41	7	7	4
Minimum (mg/kg)	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Maximum (mg/kg)	21	1,906	559	8,760	35	53	41	247	7	9	0	34	4	4	2
Detects above criteria	5	8	6	8	13	0	0	5	0	0	0	0	0	0	0
% Exceedances	7	11	9	12	19	0	0	7	0	0	0	0	0	0	0

Notes:
Nd refers to not detected.

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Fill/Silty Clay

The results indicate a significant number of Fill/Silty Clay samples that report exceedances of the Site criteria. In particular, the following contaminants reported high numbers of exceedances including:

- Benzo(a)Pyrene;
- Total PAHs;
- TPH (C_{10}-C_{36});
- Benzene; and
- Xylenes

The remainder of the contaminants analysed for Fill/Silty Clay samples reported relatively low concentrations that met the Site criteria.

Natural Soil

Natural Soil samples indicated similar exceedances of contaminants listed above in the fill materials, although at a lower ratio, with the exception of volatile compounds including benzene, xylenes and TPH (C_6-C_9) which showed equal or higher ratios of exceedances.

The possible reasons behind volatile compounds showing a higher ratio of exceedances include a combination of:

- Leakage of tarry wastes from deep subsurface storage areas, especially tar wells and the gasholders;
- Vertical fracturing of clays and weathered shales, which provide a preferential pathway into deeper soils;
- Higher solubility rates of benzene, xylene and shorter chained hydrocarbons like TPH (C_6-C_9); and
- Volatilisation of these compounds from shallower fill materials.

Free Tar – Fill/Silty Clays

The following table (**Table 8.13**) provides a summary of the contaminant concentrations reported for free tar materials identified in Fill/Silty Clay materials that exceed the Site criteria or report elevated concentrations.

Table 8.13 – Free Tar Impacts – Fill/Silty Clays

Sample Location	Site Area	Sample Depth (m)	Contaminants of Concern - Concentrations in mg/kg						
			BaP	Total PAH	TPH (C6-C9)	Total C10-C36	Benzene	Ethylbenzene	Total Xylenes
MG02	Gasholder	1.8	**178**	**5,301.9**	**189**	**36,140**	**3**	30.2	**165.8**
BH07	Retort	1.4-1.5	**26**	**1,144.8**	-	-	nd	8	**32**
TPA	Retort	1.6	**8.4**	**536.9**	**100**	**3,200**	**1.6**	7	**65**
TPC	Retort	1	**8.4**	**750.6**	-	-	nd	9	**48**
MG06	Retort	1.0	2	**135.00**	18	**1270**	0.2	3	9.5
MG08	Retort	1.5	**444**	**15,237.60**	51	**435,100**	0.2	3.6	10.6
MG08	Retort	2.1	**6.9**	**321.20**	**97**	**2,790**	0.3	12.3	6
MG09A1	Retort	0.7	**8.2**	**416.6**	39	**3,520**	**1.7**	2.4	21

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Sample Location	Site Area	Sample Depth (m)	Contaminants of Concern - Concentrations in mg/kg						
			BaP	Total PAH	TPH (C6-C9)	Total C10-C36	Benzene	Ethylbenzene	Total Xylenes
BH18	Gas Purifier	1.7-1.8	**28**	**2,160.8**	-	-	**7**	**80**	**210**
MG11	Gas Purifier	2.0	**48.8**	**728.80**	10	**7,750**	nd	nd	nd
TP16	Northeast	1.0	**39.4**	**425.10**	**166**	**7,640**	**3.1**	6.4	**61.2**

Notes:
Bold – Exceeds investigation criteria.
Bold – Exceeds contamination hotspot criteria.

The Site areas were these samples were collected indicate the structures and areas identified in **Section 8.2.3** are providing a source of gross contamination in fill materials at those sample locations shown in the table above. These locations appear to be hotspot areas for one or more contaminants, with the exception of MG06. Sample location TP16 is a localised impact in the Northeast Area of the Site.

Free Tar – Natural Soils

The following table (**Table 8.14**) provides a summary of the contaminant concentrations reported for free tar identified in Natural Soil materials that exceed the Site criteria or report elevated concentrations.

Table 8.14 – Free Tar Impacts – Natural Soils

Sample Location	Site Area	Sample Depth (m)	Contaminants of Concern - Concentrations in mg/kg					
			BaP	Total PAH	TPH (C6-C9)	Total C10-C36	Benzene	Total Xylenes
BHC	Gasholder	6.0	**17.6**	**1,906.4**	**559**	**8,760**	**6.4**	**246.7**
BHD	Gasholder	7.0	nd	nd	8	nd	**5.4**	1.6
BH12A	Retort	4.2	**13.9**	**515.6**	**228**	**5,350**	**20**	**94.9**
MG06	Retort	2.0	0.8	**101.50**	41	**1,600**	nd	22.7
TP15	Retort	2.8	**10.8**	**426.20**	**107**	**2,090**	**1.8**	**56.2**
TP15	Retort	4.1	0.5	18.10	**65**	nd	**2.7**	24.8
TP15A	Retort	6.0	nd	0.8 (naphthalene)	nd	nd	nd	nd
BHG	Retort	6.0	1	76.6	24	380	**2.4**	8.7
BHF	Gas Purifier	7.0	nd	0.8 (naphthalene)	7	nd	0.8	1
BHF	Gas Purifier	8.5	1.1	**134.6**	22	**1260**	0.8	9.8

Notes:
Bold – Exceeds investigation criteria.
Bold – Exceeds contamination hotspot criteria.

The Site areas were these samples were collected are similar to those identified in the impacted fill areas, and considered to be providing a source of gross contamination in Natural Soils at those sample locations in the table above. These locations appear to be all contamination hotspot areas for one or more contaminants, with the exception of TP15A and BHF (at 7.0mbgl only).

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Dark Stained Impacts – Natural Soils

The following table (**Table 8.15**) provides a summary of the contaminant concentrations reported for dark stained impacts identified in Natural Soil materials (Weathered Shale Fractured zone) below the Southern Gasholder that exceed the Site criteria or report elevated concentrations.

Table 8.15 – Dark Staining – Natural Soils

Sample Location	Sample Depth (m)	Contaminants of Concern - Concentrations in mg/kg
		Benzene
BHA	7.0	0.4
BHA	10.2	0.3
BHA1	7.0	**1.6**
BHA1	10.2	**1.4**
BHA2	10.2	0.9
BHB	6.0	**2**

Notes:
Bold – Exceeds investigation criteria.

The Site area where these samples were collected is specific to the Southern Gasholder. Benzene is the only contaminant that indicates elevated or concentrations marginally exceeding the Site criteria at the depths indicated. BHA, BHA1 and BHB were angled bore holes that targeted below the Gasholder.

The impacts observed underneath the Southern Gasholder appear minor in comparison to those identified underneath the Northern Gasholder.

8.5 Leachate Analytical Results

8.5.1 TCLP Fill and Natural Soil Results

Toxicity Characteristic Leaching Procedure (TCLP) analysis was conducted on the samples indicated in **Table 8.16**. In all, 11 samples were selected to provide indicative results and concentrations of leachate as a preliminary step in the waste classification process for incorporation into remedial options screening.

Table 8.16 – Samples Selected for TCLP Analysis

Fill/Silty Clay Materials		
Sample	Depth (mbgl)	Material Description/Site Area
MG01	1.8	Fill/Southwest
MG02	1.8	Silty Clay (with free tar)/Gasholders
TP10	2.0	Fill/Retaining Wall
TP06	0.25	Fill (ash and coke)/Northeast
MG04	0.5	Fill/Inside Nth Gasholder
MG10A	0.7	Fill (ash and coke)/Retort
MG11	2.0	Fill (free tar)/Gas Purifier
Red/Grey Mottled Clays		
MG06	2.0	Natural Soil (with free tar)/Retort (adjacent to Tar Wells)

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Weathered Shales		
BHA	7.0	Natural Soil – Weathered Shale (dark staining)/Gasholders (southern)
BHD	8.4	Natural Soil – Weathered Shale (dark staining)/Gasholders (northern)
BHF	8.5	Natural Soil – Weathered Shale (free tar)/Gas Purifier

The results presented in **Table 13** report non detectable leachable concentrations of inorganic contaminants in the Fill/Silty Clay samples and the Natural Clay sample (MG06), with the exception of MG04, which reported moderately high leachate concentrations for Lead. These samples also reported non-detectable concentrations for B(a)P, while other organic contaminants were not analysed.

It is important to note that the fill material inside the Northern Gasholder at sample location MG04 included large quantities of demolition wastes, which were not observed to the same degree in other areas of the Site.

The results for Weathered Shale materials indicate relatively moderate leachable concentrations for organic contaminants, including:

- BHD - Benzene (0.012mg/L) and Xylenes (0.009mg/L) at 8.4mbgl;
- BHF – Benzene (0.001mg/L), Toluene (0.002mg/L), Ethylbenzene (0.106mg/L) and Xylenes (0.648mg/L) at 8.5mbgl;
- BHF – TPH (C_6-C_9) (0.6mg/L), TPH (C_{10}-C_{14}) (4.1mg/L) and TPH (C_{15}-C_{28}) (0.5mg/L) at 8.5mbgl;
- BHF – a range of PAHs, with Naphthalene (0.1018mg/L) reporting the highest concentration at 8.5mbgl.

Weathered Shale samples did not report B(a)P above the laboratory limit of reporting (LOR).

8.5.2 Preliminary Waste Classifications

The TCLP results summary tables in **Table 13** provide a preliminary waste classification of the materials listed in **Table 8.16** above. Based on the total concentrations and the TCLP concentrations, the materials are preliminarily classified as follows in **Table 8.17**. Indicative waste classifications are also provided in the table below that takes into account guidance in general EPA immobilisation approvals, as discussed below.

Table 8.17 – Waste Classifications

Sample		**Preliminary Waste Classification**	**Indicative Waste Classification[A]**
MG01	Fill – ash and shale mixture with coke gravels.	Solid	NA
MG02	Silty Clay (with free tar)	Hazardous	Industrial
TP10	Fill – sandy gravel, shale	Inert	NA
TP06	Fill (with ash and coke)	Hazardous	Solid
MG04	Fill – gravely sand	Industrial	NA

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Sample		Preliminary Waste Classification	Indicative Waste Classification[A]
MG10A	Fill (with ash and coke)	Hazardous	Solid
MG11	Fill (with free tar)	Hazardous	Solid
MG06	Fill (with free tar)	Inert	NA
BHA1	Natural Soil - Weathered Shale (with dark staining)	Inert	NA
BHD	Natural Soil – Weathered Shale (with dark staining)	Inert	NA
BHF	Natural Soil – Weathered Shale (with free tar)	Solid	NA

Notes:
[A] – This classification can only be applied after following specific guidance in the general approval for immobilisation for each particular waste stream.

NSW DEC General Approvals of Immobilisation

The NSW DEC provide general approvals of immobilisation for specific contaminants of concern. Two general approvals can be applied to the waste materials at the Site. These are:

- Ash, ash-contaminated natural excavated materials or coal-contaminated natural excavated materials (Approval # 1999/05); and
- Coal tar contaminated soil from former gasworks sites, which has been treated (Approval # 2005/14).

When applied appropriately, the general approval mechanism has a significant impact on the preliminary waste classification, only for those materials impacted by ash/coke or tar. An indicative waste classification is given in **Table 8.17** using the general approvals mechanism. The indicative waste classifications provided for the materials with free tar would only be appropriate following treatment of the materials.

The general approval for ashy materials can be applied directly. However, an assumption must be made for tar impacted material, that the material will undergo treatment prior to applying the general approval mechanism. The approval for coal tar specifically calls for treatment by stabilisation with calcium or magnesium based cement. Other specifics of the coal tar general approval preclude materials impacted with:

- PAHs exceeding 13,000mg/kg;
- B(a)P exceeding 500mg/kg;
- Non-halogenated phenol exceeding 2,000mg/kg; and
- Total Cyanide exceeding 4,000mg/kg.

A comparison of the above approval limits to the concentrations in tar samples from the tar wells and the pipework (as reported in **Table 8.9**) shows exceedances of the limits for B(a)P and PAHs. Therefore the general approval may not be applied appropriately to these materials. However, the concentrations of these contaminants in the fill/soils impacted by free tar (as reported in **Table 8.13** and **Table 8.14)**

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indicate that the general approval is likely to be applicable. This may indicate that the tar within the tar wells and pipework contains a more pure type of tar.

It is noted that the concentration of PAH in sample MG08 at 1.5mbgl also indicates concentrations that exceed the general approval limits, suggesting a more pure type of tar at this location also.

It should be noted that the presence of asbestos materials will have an impact on the classification of these materials. The asbestos impacts appear localised and linked to site areas where demolition wastes have been buried. In particular, the materials inside the Northern Gasholder, given the presence of large quantities of asbestos fibro sheeting, would be automatically classified as Industrial waste, following the NSW DEC waste classification guidelines (1999).

8.5.3 Neutral Leach Natural Soil Results

Neutral leach analysis was conducted on the natural soil samples indicated in **Table 8.18**. In all, 3 samples were selected and analysed to provide indicative results and concentrations of contaminants that are potentially leaching (via 'neutral' water infiltration) through fractures in the deep weathered shale zones. This procedure was undertaken to emulate the leaching process under the existing site contamination status and natural conditions, to give a representation of the potential ongoing impacts to groundwater from source zones (such as the Gasholders and Tar Wells). Site groundwater was not considered appropriate for this test given the existing high impacts in the groundwater.

Table 8.18 – Neutral Leach Analysis

Weathered Shales		
Sample	Depth (mbgl)	Material Description/Site Area
BHA1	7.0	Natural Soil – Weathered Shale (dark staining) underneath the Southern Gasholder
BHD	8.4	Natural Soil – Weathered Shale underneath the Northern Gasholder
BHF	8.5	Natural Soil – Weathered Shale (free tar) underneath the former Gas Purifier area

The results presented in **Table 14** for Weathered Shale materials indicate relatively moderate leachable concentrations for organic contaminants for materials underneath the Northern Gasholder and the fractures shale at sample location BHF. The results were compared against ANZECC 2000 trigger values at 95% protection levels. Also, the neutral leach results were compared against the TCLP results for the same samples. Although no results exceed the ANZECC 2000 criteria, neutral leach results showed a similar leaching capacity to the TCLP analysis. However, the neutral leach results showed a higher propensity to leach TPHs and PAHs than the TCLP analysis. This can be said for:

- BHF – TPH (C_{10}-C_{14}) (6.99mg/L) and Naphthalene (3.13mg/L) at 8.5mbgl.

These findings indicate that the infiltration of rainwater and migrating groundwater into these fill/soil types have the potential to leach organic compounds at concentrations that may result in impacts to groundwater.

The results for the material underneath the Southern Gasholder (represented by sample BHA1/7.0m) indicate that this material is unlikely to leach or have a low

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propensity to leach as a worst case scenario. If this is the case, then the dark staining identified underneath the Southern Gasholder is unlikely to be providing a contamination source that adds to the contamination load of the deeper groundwater system. The impacts are more likely to originate from the source areas underneath the Northern Gasholder and areas were free tar was observed, including deep weather shale areas (i.e. at sample location BHF).

8.6 Surface Water Analytical Results

A total of 6 surface water samples were collected to assess contamination impacts of water contained in buried structures that may be subject to remediation for future Site redevelopment. The water would need to be removed from these structures prior to remediation, therefore it was important to understand the degree of impact and understand appropriate management options to deal with the water. The samples were collected from the following locations:

- Sample W01 – water that had accumulated in sampling trench MG04 located inside the brick annulus of the Northern Gasholder. The annulus of this Gasholder is providing a low permeable barrier and therefore any rain falling on the unsealed ground inside the annulus is retained. This has the effect of a much shallower groundwater (0.5mbgl) compared to levels outside the annulus (approximately 2.0 – 2.5mbgl at MW06). Effectively the annulus acts like an inground pool
- Sample W02 – water that had accumulated in Tar Well #1 (western tar well).
- Sample W03 – water that had accumulated in Tar Well #2 (eastern tar well). This sample was collected after disturbing the tarry materials that were contained in the base of the well, which produced a free phase product that floated on top of the water in this Tar Well.
- Sample W04 – water that had accumulated in the Retention Pit at the southern side of the Southern Gasholder.
- Sample W05 – water that had accumulated in the brick annulus of the Southern Gasholder.
- Sample W06 – water collected from the base of the Southern Gasholder.

Surface water sample results were assessed for quality against the ANZECC 2000 Freshwater trigger value criteria for 95% protection of species.

Table 15 presents a summary of the surface water samples. A summary of results that exceed the ANZECC (2000) trigger values adopted for this investigation is presented in **Table 8.19** below.

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Table 8.19 – Surface Water – Exceeding Concentrations

		W01	W02	W03	W04	W05	W06
	Location/structure	Nth Gasholder	Tar Well #1	Tar Well #2	Retention Pit	Sth Gasholder	Sth Gasholder
Analyte	**ANZECC 2000 95%**						
Naphthalene	16	**38.5**	**230**	**20,900**	<1	<1	<1
Cadmium	0.2	-	-	-	**1**	<0.1	**1**
Copper	1.4	-	-	-	**43**	<1	**7**
Lead	3.4	-	-	-	**87**	3	**107**
Nickel	11	-	-	-	**16**	<1	4
Zinc	8	-	-	-	**302**	**16**	**277**
Benzene	950	12	<5	**1,360**	<1	<1	<1
o-xylene	350	2	29	**723**	<2	<2	<2

Notes:
Bold – Exceeds investigation criteria.
All values in .µg/L.

Generally, surface water samples collected from the Northern Gasholder and the Tar Wells showed higher impacts of organic compounds to those collected from the Retention Pit or the Southern Gasholder from which reported concentrations below the LOR.

Sample W03 (from Tar Well #2) indicates a higher impact of organic compounds compared to other samples. This is likely due to the free phase product originating from the disturbed tarry materials, while other samples did not contain this product. Sample W03 significantly exceeds the investigation criteria for naphthalene (20,900µg/L), benzene (1,360µg/L) and o-xylene (723µg/L).

The samples collected from the Retention Pit and the Southern Gasholder indicate moderate impacts by inorganics. In particular, lead and zinc report concentrations one to two orders of magnitude above the trigger value criteria. The sample collected from the brick annulus of the Southern Gasholder indicates that the quality is of a higher standard compared with other samples, based on the analytes tested. This may be the result of recharging of fresh water (from rain) at the surface compared to water at the base of the gasholder that would not be readily recharged with fresh rain water.

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9 Assessment for Unsuitable Materials and Areas

All existing soil data was used to statistically assess the different types of materials identified at the Site. This was conducted to identify which materials and areas were unsuitable and required remediation/management and inturn identified which materials were suitable for the proposed land use.

The material types identified at the Site follow those listed in **Section 8.2** including:

1. Ash and Coke Gravels (Fill);
2. Reworked Clays (Fill);
3. Sands and Gravels (Fill);
4. Gravel, Sand and Demolition Wastes (Fill);
5. Gravely Sand and Clay with Minor Ash (Fill);
6. Silty Clays; (Fill)
7. Red/Grey Clays (Natural); and
8. Weathered Shales (Natural).

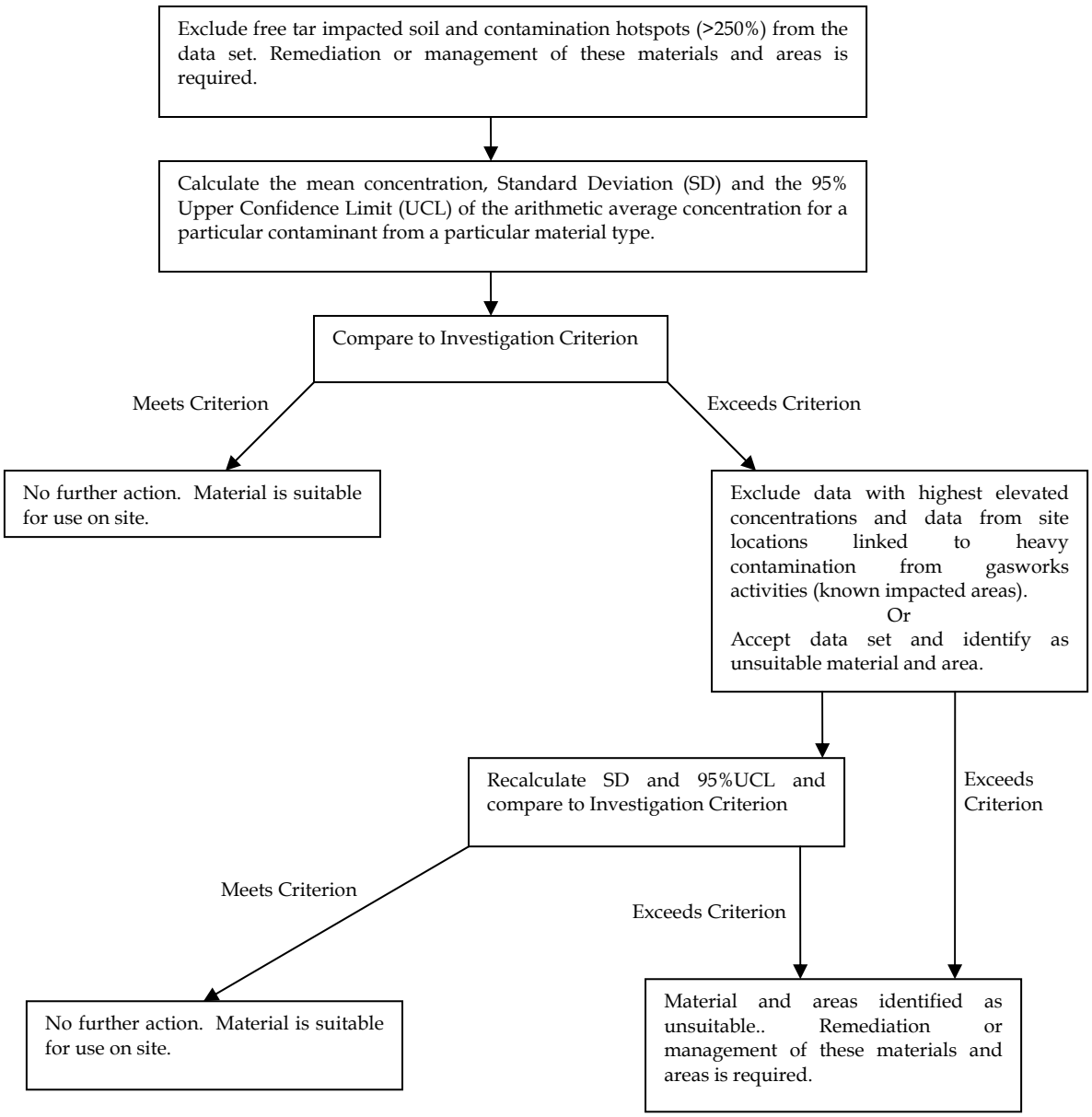
Each material type underwent statistical analysis for each contaminant that reported exceedances of the Site criteria or was determined to be a contamination hotspot. Statistical analysis was undertaken in a stepped approach following the flow chart developed for this investigation and presented as **Diagram A** below.

The co-efficient of variation calculation was used to determine the distributions of data sets, which is outlined in NSW EPA (1995) Sampling Design Guidelines. Calculating the 95%UCL for data sets of either normal or log normal distribution was based on Procedure D or Procedure G of the same guidance document.

Results of the statistical analysis were compared against the investigation criteria as outlined in **Section 6.2.3.**

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Diagram A – Identification of Unsuitable Materials and Areas - Decision Flow Chart



9.1 Statistical Results

This section presents the results of the statistical analysis of all material types. From a human health risk perspective, the contaminants of concern that present the greatest risks to human health are considered to be B(a)P and benzene, as these compounds are known carcinogens. Therefore statistical analysis of data and assessment against land use criteria was generally driven by these two contaminants.

Specific contaminants that were not statistically assessed showed either no exceedances of the Site criteria or met the Site criteria subject to removal of free tar and contamination hotspots for other chemicals. This was generally the case for TPH (C_6-C_9) and xylenes.

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It is noted that asbestos impacts should be factored into the assessment of the fill/soil materials. However asbestos impacts have not been used in this process of statistical analysis. Materials impacted with asbestos would require remediation/management in any case, and any remaining materials with likely asbestos impacts would be subject to a long term site management plan.

Statistical analysis results for all materials are presented in **Table 16** to **Table 23**.

9.1.1 Ash and Coke Gravels

The statistical results for B(a)P indicate that this material would be unsuitable for use at the Site. Statistical results for the Standard Deviation and the 95%UCL indicate that even after removal of all contamination hotspots the material remains unsuitable.

The statistical results for benzene indicate that this material would be suitable for use at the Site subject to removal of the contamination hotspot at MG02/0.2m. However, given that the B(a)P results discussed above suggest it would be unsuitable for the entire Site, this approach cannot be applied.

9.1.2 Reworked Clays

The statistical results for B(a)P indicate that this material would be suitable for use at the Site subject to removal of all free tar soil impacts and the contamination hotspot at BH06/0.4m.

The statistical results for benzene indicate that this material would be suitable for use at the Site subject to removal of all free tar soil impacts and the contamination hotspot at BH14/1.0m.

The statistical results for total PAH indicate that this material would be suitable for use at the Site subject to removal of all free tar soil impacts.

The statistical results for TPH (C_{10}-C_{36}) indicate that this material would be suitable for use at the Site subject to removal of all free tar soil impacts and the contamination hotspot at MG05/0.5m.

9.1.3 Silty Clays

The statistical results for B(a)P indicate that this material would be suitable for use at the Site subject to removal of all free tar soil impacts and all elevated concentrations at BH08 (1.1m and 1.7m).

The statistical results for benzene indicate that this material would be suitable for use at the Site subject to removal of all free tar soil impacts and the contamination hotspot at MW04s/2.1m.

The statistical results for total PAH indicate that this material would be suitable for use at the Site subject to removal of all free tar soil impacts.

9.1.4 Gravel, Sand and Demolition Wastes

The statistical results for B(a)P indicate that this material would be unsuitable for use at the Site, even after removal of ashy material contamination hotspots.

The statistical results for TPH (C_{10}-C_{36}) indicate that this material would be unsuitable for use at the Site, even after removal of ashy material contamination hotspots.

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The statistical results for benzene indicate that this material would be suitable for use at the Site subject to removal of ashy material contamination hotspot at TP44/0.3m and TP3/0.3m. However, given that B(a)P and TPH (C_{10}-C_{36}) would be unsuitable for the entire Site, as discussed above, this approach cannot be applied.

9.1.5 Sands and Gravels

The statistical results for B(a)P indicate that this material would be suitable for use at the Site subject to removal of all free tar soil impacts and the contamination hotspot and all surface material at TP16 (0.3m and 1.0m).

The statistical results for benzene indicate that this material would be suitable for use at the Site subject to removal of all free tar soil impacts.

The statistical results for TPH (C_{10}-C_{36}) indicate that this material would be suitable for use at the Site subject to removal of all free tar soil impacts.

9.1.6 Gravel, Sand and Clay with Minor Ash

The statistical results for B(a)P, total PAHs and TPH (C_{10}-C_{36}) indicate that this material would be suitable for use at the Site subject to removal of the contamination hotspots at RP/2.0m and MW13s/1.0m.

9.1.7 Red/Grey Clays

The statistical results for B(a)P and benzene indicate that this material would be suitable for use at the Site subject to removal of all free tar soil impacts.

The statistical results for total PAH indicate that this material would be suitable for use at the Site subject to removal of all free tar soil impacts, the contamination hotspot at MG05/1.8m and all impacted material at MG05, and the elevated concentrations at locations BH12/4.5m and MG10A/2.8m.

The statistical results for TPH (C_6-C_9) and TPH (C_{10}-C_{36}) indicate that this material would be suitable for use at the Site subject to removal of all free tar soil impacts and all impacted material at MG05.

9.1.8 Weathered Shales

The statistical results for B(a)P indicate that this material would be suitable for use at the Site without further action.

The statistical results for total PAH indicate that this material would be suitable for use at the Site subject to removal of all free tar soil impacts.

The statistical results for benzene indicate that this material would be suitable for use at the Site subject to removal of all free tar soil impacts, the contamination hotspot at BHD/8.4m and the dark stained materials at BHA1 (7.0m and 10.2m) and BHB (6.0m). To remove the dark stained impacts at BHA1 and BHB would require excavation beneath the Southern Gasholder. This may not be feasible given the heritage status of the gasholder. Retaining this material indicates that the 95%UCL meets the site criterion for benzene, although the standard deviation is greater than half of the criterion (refer to **Table 23**). It may be more appropriate to remediate accessible areas and retain marginally impacted materials beneath the Southern Gasholder and manage the materials in respect of ongoing groundwater impacts and other receptors. Further discussion on this approach is provided in **Section 12.1.1**.

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10 Data Quality Assessment

Data Quality Indicators (DQIs) were developed as part of the DQO process to provide goals for the quality of data required to achieve the objectives of the site investigation program. Details on the DQIs and data validation assessment are provided in **Appendix B**.

An assessment of the quality of the environmental data against these DQIs indicated that although there were a small number of non-conformances, the vast majority of the DQIs were achieved. Based on the conclusions of the quality review, CH2M HILL considers that the data supplied for the Site meets the objectives of the Precision, Accuracy, Representativeness, Completeness and Comparability (PARCC) criteria. Therefore, CH2M HILL considers that the data set is of acceptable quality to meet the objectives of this site investigation program.

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11 Conceptual Site Model

The conceptual site model (CSM) has been developed based on consideration of the Site's history, the existing Site data and the proposed land use for the Site.

11.1 Sources

Fill material and natural soil have been impacted by the historical operation of the Site as a Manufactured Gas Plant (MGP). The structures associated with this are shown on **Figure 2.** The contamination sources at the Site include:

- Tar in the Tar Wells;
- Tar residues in the network of underground pipework;
- Tar residues in the base annulus of the Northern Gasholder;
- Tar in soil pores and soil fractures in former MGP areas;
- Potential tar residues in the base annulus of the Southern Gasholder (although not a major source, this area should be identified as a secondary source given the historical use and the marginally elevated concentrations (benzene 2.0mg/kg, naphthalene 5.9mg/kg) in the analytical data collected from underneath the gasholder);
- Demolition wastes containing asbestos sheeting; and
- Ash and Coke Fill materials across the majority of the Site in the surface and shallow subsurface layers

11.2 Impacted Media

The environmental media of concern include:

- Shallow fill material, generally to a depth of between 0.5m to 1.0m over the entire Site area (refer to **Figure 5** and **Figure 6** for indication of soil profile);
- Deeper fill deposits in Southwest area, generally to a depth of between 3.0m to 4.0m (**Figure 5**);
- Natural soil material, including Silty Clays overlying Red/Grey Mottled Clays overlying extremely to moderately weathered shale bedrock. The impacts are particularly in the vicinity of the former gasworks area (refer to **Figure 2**), generally to depths up to approximately 4.0m, however in areas around subsurface structures, including the gasholders and tar wells, impacts are likely to extend to depths up to approximately 8 – 10m below the ground surface;
- Perched groundwater in fill and natural Silty Clay materials;
- Deep groundwater within natural shale bedrock;
- Soil pore gas in source zone areas and overlying impacted groundwater areas (i.e. down gradient of source zones); and
- Surface water although not persistent at the Site, may be impacted from surface materials after rain periods.

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With respect to groundwater impacts, existing groundwater data (from previous investigations) concludes that the contaminated groundwater plumes are limited to land owned by RailCorp. Therefore, although the plume is likely to be migrating beyond the Site boundary, it is considered that groundwater is unlikely to be migrating from RailCorp land. The hydrogeological regime and groundwater plume details are provided in **Section 3.4**.

11.3 Contaminants

The contaminants of concern for soil media include:

- Total Petroleum Hydrocarbons (TPHs) (C_6-C_9) and (C_{10}-C_{36});
- Monocyclic Aromatic Hydrocarbons (Benzene, Toluene, Ethylbenzene & Xylenes (BTEX));
- Polycyclic Aromatic Hydrocarbons (PAHs);
- Phenolic compounds;
- Heavy metals (localised); and
- Asbestos.

The contaminants of concern for water media include those contaminants for soil above (excluding asbestos) and also may include:

- Cyanides;
- Nitrates; and
- Ammonia.

The contaminants of concern for soil pore gas would include those volatile compounds of the above including:

- TPH (C_6-C_9); and
- BTEX.

11.4 Transport Mechanisms and Exposure Pathways

The following transport mechanisms have been identified for all contaminants on Site:

- Surface run-off;
- Wind borne dusts (asbestos fibres);
- Volatilisation;
- Water infiltration;
- Leaching; and
- Groundwater migration (hydraulic gradient – refer to Section 3.4 for additional details).

The exposure pathways considered associated with the CSM include:

- Onsite – Dermal contact, Ingestion and Inhalation for soil, water and gas impacted media; and

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- Offsite – Dermal contact and Ingestion for water impacted media.

11.5 Receptors

The Site will be retained for RailCorp operations under a commercial/industrial land use scenario. Potential receptors of impacted medium include:

- Construction/maintenance/long term RailCorp employees and contractors may be receptors to impacted soil (including dusts), water and gases/vapours;
- Employees of surrounding properties may be receptors to impacted dusts, water and gases/vapours;
- Residents of the adjoining Burren Street community may be receptors to impacted dusts and gases/vapours;
- Users of extracted groundwater down gradient of the Site may be receptors to impacted waters, although these areas are now included in the Groundwater Embargo area (Zone 2) for domestic use, declared by the Department of Natural Resources;
- Hypogean ecosystems may be receptors to impacted waters; and
- Receiving waters ecosystem (Alexandra Canal) may be receptors to impacted waters.

A diagram representing the CSM is presented in **Appendix D**.

11.6 Rationale for Site Remediation

Given the details of the CSM above, it is apparent that site remediation will be required to meet RailCorp's long term objectives for the Site (**Section 1.1.3**). Site remediation should address the contamination source areas in an attempt to meet these objectives and reduce or eliminate exposure pathways to site users and environmental receptors, by focusing on source removal or a reduction in mass contamination. The contaminants that drive the significant health risks are benzene and B(a)P, which are known carcinogens, as well as free tar. Remediation of the sources will mitigate the risks these contaminants pose on the receptors.

Remediation of the source areas will control or remove the exposure pathway of those receptors to the site contamination and protect the environmental values of the site groundwater. This approach will mitigate the significant risk to site users and environmental receptors and enable RailCorp to continue use of the Site without a continuing issue of health risks for workers. Remediation will manage the risks to those receptors by minimising or preventing future leaching of contaminants to groundwater, preventing run-off impacts, restricting direct exposure and restricting generation of vapours.

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12 Delineation and Characterisation of Contamination

12.1 Site Areas and Material Types

The identification of those impacted sample locations below are based on the data gathered during this investigation. It should be acknowledged that there exists the probability that the impacted areas (i.e. nominated for remediation) will not be confined to one identified impacted area or a defined hotspot. Moreover, the impacted area would be better defined to be based on the equidistant space between an impacted location and an acceptable adjacent location.

12.1.1 Former Gasworks Area

This area includes the stratified areas of the Gasholders, the Retort and the Gas Purifiers (refer to **Figure 3**).

The impacts in the former gasworks area are extensive and consist of high concentrations of PAHs, B(a)P, TPHs, benzene and xylenes in the fill materials and natural soils. Impacts are particularly prominent in the areas of former infrastructure including the sources listed in **Section 11.1**.

Gasholders

The Gasholder Area shows impacts at the surface and shallow subsurface layers, particularly in areas of pipework, considering the extensive network in this area. Free tar impacted soil was observed and analysed in the Silty Clay at one location (MG02/1.8mbgl), but was not prominent in locations away from pipework. The vertical extent of impacts from surface and near-surface activities is approximately 4.0mbgl (vertical extent identified at sample location MG02 and MG07). The lateral extent of impact from surface and near-surface activities is highly dependent on the network of underground pipes, the full extent of which is currently unknown. Soil impacts from leaking pipes are assumed to be localised around and immediately below the pipework.

The base of the Northern Gasholder (i.e. at 6.0mbgl) is significantly impacted with free tar. Also, tarry material was observed seeping from the brick annulus wall in trench MG05 and the opposite trench wall, suggesting lateral movement of free tar adjacent to the Gasholder. There was no free tar observed underneath the Southern Gasholder.

The vertical extent of impact below the Northern Gasholder is generally limited to between 8 – 10mbgl. This is based on minor benzene impacts identified at sample location BHD (8.4mbgl). The vertical extent of impact below the Southern Gasholder can also be limited to between 8 – 10mbgl (based on reported marginal benzene detection at sample location BHA1 at 10.2mbgl).

The impacts observed underneath the Southern Gasholder appear minor in comparison to those identified underneath the Northern Gasholder, being only marginally elevated benzene concentrations and no free tar observed. Also, the benzene impacts beneath the Southern Gasholder do not appear to leach, whereas the benzene and others contaminants beneath the Northern Gasholder have a propensity to leach.

The mechanisms that have resulted in the differing impacts underneath each gasholder are not fully understood. However throughout the life of the gasworks

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operation, the brick annulus and metal lining of the gasholders may have provided an effective seal to prevent leakage of tar residues from the base. The operation and maintenance of the gasworks may have included regular cleaning of the gasholders to prevent accumulation of tarry waste at the base, therefore reducing the likelihood of tar leakage into the underlying soils. Although this may have been the case, residual tarry wastes may have been dumped inside the Northern Gasholder during plant shut down and demolition of this structure and other gasworks structures on the Site, thereby providing a tar source in the Northern Gasholder regardless of historical operation and maintenance procedures.

It is known that the Southern Gasholder was retained for temporary storage of gas that was produced at the AGL Mortlake site. For this to occur, there may have been regular cleaning and maintenance to maintain this structure in good condition, therefore tarry residues may also have been removed for this purpose.

On the basis of the current conditions of the Southern Gasholder, and its heritage status, it is unlikely that the Southern Gasholder area would require remediation. Any remediation in this area is unlikely to have a significant impact on reducing sources or mass contamination.

Infiltrating water and migrating groundwater has the potential to leach benzene and other relatively soluble organic compounds, such as naphthalene, from free tar source zones beneath the Northern Gasholder. The leachate tests results confirm that this is a likely scenario. This has the potential to cause an ongoing groundwater impact without implementing a management strategy such as source removal to the extent practicable.

It should be considered that the lateral extent of impact may be dependent on the base construction and permeability of the Gasholder annuli. The gasholder annuli may be effectively creating a seal. This is likely to be the cause of the positive head of groundwater observed in the Gasholders (i.e. water level stands above the common shallow groundwater on the outside of the annulus) discussed in **Section 8.1**.

Considering the soil profile surrounding the Gasholders, the following observations can be made:

- Impacts appear to extend up to 5m laterally from the annuli given that there were no observed contamination (odours or discolouration) at depth at the nearest deep sample locations MW06D, MW07D and MW18D, but may extend to at least 15m laterally based on identified deep impacts at location BHF at 8.4mbgl.

The latter is possible considering the gas product was stored under pressure inside the Gasholders and tarry residues may have been forced out through soil pores and weathered shale fractures to impact a greater radial area away from the Gasholder. This again is dependent on the permeability of the annulus of the Gasholder.

The Northern Gasholder has been infilled with Gravely Sands and Demolition Wastes, which appears to be a burial area for demolished Site structures. The depth of this Gasholder is approximately 6mbgl, which appears to be the vertical extent of this material based on drilling results and historical information. At this depth free tar is likely to be impacting this material inside the Gasholder annulus.

The lateral and vertical extent of impacts is defined by the stratified area outlined on **Figure 7 – Remediation Areas and Excavation Depth Estimates.**

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Remediation/Management

Remediation of the surface layers of Ash and Coke Gravel fill material is required.

Areas impacted with free tar requiring remediation include:

- MG02/1.8m – tar pipe in Silty Clays;
- BHC/6.0m – brick annulus of Northern Gasholder in Red/Grey Clays; and
- BHD/7.0m – fractured weathered shale below Northern Gasholder.

Remediation of the contamination hotspots BH06/0.4m (B(a)P) and MG05/0.5m (TPH (C_{10}-C_{36})) in Reworked Clay material is required.

Remediation of the entire area at sample location MG05 (i.e. PAH, TPH and xylenes hotspots at 1.8mbgl and remaining materials to 5.0mbgl) in Red/Grey Clay materials is required.

Remediation of the contamination hotspot at sample location BHD/8.4 (benzene) in Weathered Shale materials is required.

Remediation of the Gravely Sands and Demolition Waste materials inside the Northern Gasholder is required.

Retort

Apart from the surficial layers of Ash and Coke fill, free tar is the principal source of contamination in this area. Free tar is visible in some surface fill materials, but prominent in subsurface fill layers of Reworked Clays and Silty Clays underlying the Retort Area. Free tar is also prominent in the soil pores of Red/Grey Clays underlying the Retort Area to a depth of approximately 6.0mbgl (TP15A and BHG), however the vertical migration of tar becomes increasingly impeded by the stiff Red/Grey Clays at depths beyond 4.5mbgl where the majority of sample results indicate a lesser degree of impact or indicate no detection of contaminants.

The Tar Wells are key structures and contamination sources within the Retort Area, constructed to at least 3mbgl (possibly 4mbgl). At least one of the Tar Wells contains a considerable amount of tar, while it is assumed the other holds similar amounts. Tar was observed to be seeping from the sidewall of one of the Tar Wells during sampling at MG06. Free tar impacts are prominent in the Red/Grey Clays underlying the immediate area of the Tar Wells to a depth of 6.0m. At 7.2mbgl contaminants are at concentrations below the investigation criteria, while at 8.1m contaminants are non-detectable.

Other structures that appear coupled with the presence of free tar are brick footings and underground pipework. Delineation of this area was limited due to the presence of a potential heritage item in the form of a brickwork layer, likely to be the floor of the former Retort. Given the data obtained for this area, the following statements can be made:

- The vertical extent of free tar impact in the Retort Area is expected to be approximately 4.0mbgl, although there may be localised pockets of impacted material that extends to a depth of 5.0 – 6.0mbgl. Below the Tar Wells this depth is expected to extend to at least 8.0 - 10mbgl.

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- The lateral and vertical extent of free tar impacts is broadly defined by the stratified area outlined on **Figure 7.** This area is effectively the footprint area of the former Retort House.
- The lateral extent of impact may be affected or increased based on the extensive underground tar laidened pipework system present in this area, and suspected leakage of those pipes.
- Impacts may extend laterally to the north below the Retaining Wall area, but it is expected that this may only be up to approximately 5.0m (i.e. to the Site Boundary).

Remediation/Management
Remediation of the surface layers of Ash and Coke Gravel fill material is required.

Areas impacted with free tar requiring remediation include:

- BH07/1.5m;
- TPC/1.0m;
- MG06/1.0m;
- MG06/2.0m;
- MG08/1.5m;
- MG08/2.1m;
- MG09A1/0.7m;
- BH12A/4.2m;
- BHG/6.0m;
- TP15/2.8m;
- TP15/4.1m; and
- TP15A/6.0m.

Remediation of the elevated concentrations of B(a)P at sample location BH08 (1.1m and 1.7m) in Silty Clay materials is required.

Remediation of the elevated concentrations of PAH at sample locations BH12/4.5m and MG10A/2.8m in Red/Grey Clay materials is required.

Gas Purifiers
This area shows significant impacts of free tar in the Sand and Gravel fill material to depths of 2.0mbgl and in the deeper layers of weathered shales at 8.5mbgl. There are no prominent structures in this area and no significant contamination sources other than residual free tar in fill materials and soil pores.

Deep impacts were identified at sample location BHF at a sampling depth of 8.5m in Weathered Shale at refusal. However a vertical limit can be estimated to be between 8 – 10mbgl given similar limits applied beneath the gasholders.

The depth impact identified in this area may not be from surface activities. The impacts may be from a prominent vertical fracture that enabled movement of tars down the profile more readily than in other areas or may be from the lateral leakage

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of tars from subsurface storage of gas in the gasholders (i.e. pressure inside the gasholder has forced tars laterally outwards).

Other sample locations indicate no detection of contaminants beyond 4.0mbgl (BH18 and MG11). Therefore based on the data for this area:

- The vertical extent of free tar impacts from surface activities (i.e. gas purifying) are unlikely to extend beyond 4.0mbgl, although soil pores and vertical fractures may have provided a preferential path for contaminants to migrate vertically down to impact much deeper soil horizons to a depth of at least 10mbgl.
- The lateral and vertical extent of free tar impacts from surface activities and deeper tar impacts in this area is broadly defined by the stratified area outlined on **Figure 7**.

Remediation/Management
Remediation of the surface layers of Ash and Coke Gravel fill material is required.

Areas impacted with free tar requiring remediation include:

- BH18/1.8m;
- MG11/2.0m;
- BHF/7.0m; and
- BHF/8.5m.

12.1.2 Northeast

The main source of contamination in this area is the surface layer of Ash and Coke Gravels. There is also a localised free tar impact at TP16 and a localised benzene impact at BH14.

The vertical extent of contamination is approximately 0.5m - 1.0mbgl in Reworked Clay material over the entire area. The overlying ash fill does not appear to have leached and impacted the underlying fill clay. This was also confirmed by leachate tests, which showed B(a)P has a relatively low propensity to leach under acid conditions. Therefore it can be said that under neutral conditions (that is infiltrating surface water), contaminants, particularly B(a)P, would not leach.

The vertical extent of the benzene hotspot at BH14 was limited to a depth of the underlying Silty Clay. The free tar impact at TP16 was limited to a depth of the underlying Red/Grey Natural Clay. Both of these hotspot areas are localised and it is expected that the diameter of the hotspot (lateral extent) would be limited to the point equidistant to the nearest location that was not impacted.

The lateral and vertical extent of impact in this area is broadly defined by the stratified area outlined on **Figure 7.**

Remediation/Management
Remediation of the surface layers of Ash and Coke Gravel fill material is required.

Areas impacted with free tar requiring remediation include:

- TP16/1.0m.

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Remediation of the contamination hotspot at sample locations BH14/1.0m (benzene) is required.

Remediation of the contamination hotspot and all surface materials at sample locations TP16 (0.3m and 1.0m) for B(a)P is required.

Given the highly heterogenous nature of the subsurface conditions, this approach may only address the known areas of visible free tar impacts and contamination hotspots the Northeast Area. It should be acknowledged that the distribution of contamination in this area, and other areas such as South Central and the South West, would be irregular.

12.1.3 South Central

The main source of contamination in this area is the surface layer of Ash and Coke Gravels. There is also a localised benzene impact at MW04s in Silty Clay material. No other significant impacts were identified in this area.

Similarly to the Northeast Area, the vertical extent of contamination is approximately 0.5m - 1.0mbgl in Reworked Clay material. Based on analysis results no leaching of contaminants has occurred.

The lateral extent of impact in this area would be limited to the point equidistant to the nearest location that was not impacted, which is broadly defined by the stratified area outlined on **Figure 7.**

Remediation/Management

Remediation of the surface layers of Ash and Coke Gravel fill material is required.

Remediation of the contamination hotspot at sample locations MW04s/2.1m (benzene) is required.

12.1.4 Southwest

Significant filling has occurred in this area, particularly toward the southern extremity. Filling materials consisted of low levels of contaminants that predominantly meet the investigation criteria. The main source of contamination in this area is the surface layer of Ash and Coke Gravels. There is also a localised contamination hotspot for total PAH, B(a)P and TPH at sample location MW13s/1.0m and another for B(a)P at sample location RP (Retention Pit).

The vertical extent of impact from Ash and Coke materials at the surface across this area is approximately 0.5mbgl.

The lateral and vertical extent of the hotspot at MW13s is considered localised based on the recent data collected at sample locations TP01 and TP02, where no impacts were identified. Considering this, then the lateral extent of impact in this area would be limited to the point equidistant to the nearest location that was not impacted**.**

The extent of impact at sample location RP is reliant on the depth of the Retention Pit and connecting pipework. This information could not be established, given the limitations set for items of potential heritage significance. Deeper sampling at this location was not undertaken due to a potential damage to the structure. The extent of impact at this location is not critical given it adjoins the heritage listed Southern Gasholder and the limitations set for excavations occurring within its vicinity.

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Vertical impacts in the vicinity of the Retention Pit are expected to be limited by the underlying stiff Red/Grey Clays at 4mbgl (based on data from surrounding sample locations) and the lateral extent appears restricted to an approximately 2m radius, given the impact is likely from a leaking tar laidened pipes.

The lateral and vertical extent of impact in this area is broadly defined by the stratified area outlined on **Figure 7.**

Remediation/Management
Remediation of the surface layers of Ash and Coke Gravel fill material is required.

Remediation of the contamination hotspot for B(a)P, total PAHs and TPH (C_{10}-C_{36}) at sample locations MW13s/1.0m and RP/2.0m is required.

12.1.5 Retaining Wall

The material used in the Retaining Wall are sandy gravely fills with a component of building demolition wastes. The material was similar in nature to that identified inside the Northern Gasholder, although did not contain the quantities of demolition wastes. For this reason the materials were assessed as one material.

There were two benzene hotspots (TP44 & TP3 on **Figure 4)** identified in previous investigations associated with ashy fill material at the surface of the retaining wall, adjacent to the former Retort House. The materials were also contaminated with asbestos sheeting fragments.

No significant source of contamination appears to be impacting these materials, other than the free tar at the base of the Northern Gasholder (refer to **Section 12.1.1**).

The lateral extent of the Retaining Wall is approximately 3.0 -5.0m along the entire length of the northern boundary and approximately 170m long. No impacts were identified in natural soils below the Retaining Wall at sample locations TP10 and TP18, therefore the vertical impact is expected only to be the thickness of the Retaining Wall (i.e. the thickness is approximately 1.5m).

The materials inside the Northern Gasholder are laterally confined to the annulus (i.e. 21m diameter). The vertical extent, before being impacted by free tar at the base of the Gasholder is unknown, but is expected to be at approximately 4.0mbgl.

Remediation/Management
The material consisting of the Retaining Wall Area is unsuitable for use at the Site and requires remediation or management. This consists of all fill material along the retaining wall (northern boundary 3.0 – 5.0m wide by 170m long and 1.5m thick). This should also consist of the material inside the Northern Gasholder.

12.1.6 Western Lot

No contamination sources exist in this area, other than the surface Ash and Coke material. No impacts were identified beyond 0.5mbgl, suggesting no leaching of contaminants from the Ash material. The lateral and vertical extent of surface impacts is broadly defined by the stratified area outlined on **Figure 7.**

Remediation/Management
Remediation of the surface layers of Ash and Coke Gravel fill material is required.

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12.2 Remediation Volume Estimates

Considering the majority of remediation will be driven by the removal of free tar impacted fill and natural soil, remediation of this material will provide a basis to establishing remedial volume estimates. This approach will remove those source areas and reduce the mass contamination, enabling the long term objectives for the Site to be met, as discussed in **Section 11.6**. This forms the basis for determining the extent of remediation to ensure that any remaining materials do not pose an unacceptable risk to the identified receptors.

Free tar impacted fill/soil material includes those samples, and corresponding areas, listed in **Table 8.13** and **Table 8.14**. The majority of site contamination requiring remediation is located in the former gasworks areas in the vicinity of the Gasholders, the Retort and the Gas Purifier Areas.

Removal of the key source material (and structures, where appropriate) will also provide a basis to establishing volume estimates. Primary contamination source areas include the:

- Tar Wells;
- Underground pipework; and
- Base annulus of the Northern Gasholder.

The depth of soil requiring remediation and/or management during the remedial works is dependant on the end land use and whether fill material that is suitable for industrial land use can be separated during remedial excavations from fill material that is not suitable for industrial land use.

A representation of the required remediation areas is presented on **Figure 7.** While cross sectional areas of the Site are represented on **Figures 5** and **6**.

12.2.1 Uncertainty of Estimates

There is uncertainty in the volume estimates, given the highly heterogeneous nature of filling materials and the irregular distribution of contaminants; these are inherent uncertainties for any contamination site investigation and remediation program. However, confidence can be given to lowering the uncertainty and remediating the Site to a level that meets RailCorps long term objectives by using visible free tar impacts as an indicator for remediation.

Considering the good correlation between PID screening measurements and detection of organic contaminants in analytical samples, the PID will be a valuable screening technique to lower volume uncertainty during remedial excavation and also provide an effective measure in determining chase-out quantities.

12.2.2 Contamination Source Areas

Considering the contamination source areas first, it is expected that the immediate surrounding material (both fill and soil) would be impacted from seepage of tar from the source area, similar to what is shown in Photo 14 (tar seeping from the Tar Well). The following nominal measurements have been used to determine volumes of source areas.

Tar Wells

- Each Tar Well is 4m in diameter with an approximate 2m gap between them.

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- Lateral impact from Tar Wells is taken as 2.0m – based on midway point between Tar Well and BH08 (that indicates no observed free tar impacts).
- Vertical impact from Tar Wells taken as 10.0mbgl – based on contaminant concentrations likely to meet investigation criteria.
- The estimated volume is 1,120m^3, and removing the volume of tar liquid within the Tar Wells (approximately **100m^3**) gives an estimated volume of **1,000m^3** of **Free Tar Impacts**.
- The NSW DEC general approval of immobilisation for coal tars is unlikely to apply to this material.

Northern Gasholder

- The inground volume of the Gasholder is estimated at 1,900m^3. The extent of tar material accumulated at the base of the Gasholder is unknown. For estimating purposes, the bottom 2.0m of the Gasholder has been taken as impacted with tar. That is from 4.0mbgl to 6.0mbgl.
- The volume of demolition waste would therefore be **1,900m^3** of material that likely to be classified as **Asbestos Waste/Industrial Waste**.
- An assumption has been made that the demolition waste has a porosity of approximately 50%, giving approximately 950m^3 of liquids inside the gasholder. If the bottom third is assumed to be tar, this gives an estimate of **640m^3** of impacted water and **320m^3** of tar at the base of the gasholder.
- The vertical impact from the base annulus can be approximated at 4m below the base, giving the depth of impact to be from 4mbgl to 10mbgl.
- Although the lateral impact is highly dependent on the permeability of the base of the brick annulus, for estimating purposes, the lateral impact from the base has been taken as 2.0m from the outside edge of the annulus. This is based on no observed impact at depth at sample locations MG07 (4.0m) and BH06 (3.0m), which were positioned approximately 2.0m from the outside edge of the brick annulus;
- Therefore the estimated volume is 2,700m^3, removing the volume of bottom third of the inside volume of the gasholder (i.e. the tar liquid accumulated at the base and the volume of demolition wastes at approximately 600m^3) gives an estimated volume of **2,100m^3** of **Free Tar Impacts**.
- The NSW DEC general approval of immobilisation for coal tars is unlikely to apply to this material.

Southern Gasholder

- Given the conditions of the Southern Gasholder presented in **Section 12.1**, and its heritage significance, it is unlikely that remedial work would be required, therefore no volume estimates have been provided.

Pipework

An estimation of the volume of source material inside and immediately surrounding the gasworks pipework is not possible without a higher level of certainty on the location and extent of the network of old pipes. It is considered that this volume may only be a portion of that from the Tar Wells or the Northern Gasholder. Nevertheless,

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the volume would be directly related to the extensiveness of the pipe network, especially those pipes used to transport tar materials. An estimate of 50 tonne of pipework has been provided.

12.2.3 Tarry Impacted Materials

For the purpose of assessing the Site's suitability for the proposed land use, consideration must be given to the presence of tarry impacts in the Site's fill and soils. Typically, given the extent of tar impact in the area of the former gasworks plant, the soils are currently regarded as unacceptable for any land uses (including commercial/industrial).

The statistical analysis of existing data suggests the removal (remediation) of a number of contamination hotspot areas and other areas of elevated contaminants is required to enable soil/fill materials to be considered suitable for the proposed land use. However, in a practical sense, and given the highly heterogenous nature of the subsurface conditions, this approach may only address the known areas of visible free tar impacts in the former gasworks area and outlier areas, such as the Northeast Area.

For the purposes of estimating remedial volumes in the former gasworks area (that is the Gasholder, Retort and Gas Purifier Areas) a nominal depth of at least 4.0m was assumed as the depth of impact from the surface operations over this area, based on the average vertical extent of impact using existing data. Targeting the spatial distribution of free tar addresses the need to remove particular hotspots or areas of elevated concentrations as indicated by the statistical analyses.

- The following volume estimates takes into account removal of the surface ash/coke layers (i.e. 0.5m).
- The spatial area indicated by the orange shading (**Figure 7**) is 2,635m^2. Therefore the estimated volume is **9,225m^3** (based on a depth of 3.5m)**.**
- The deeper impacts in the vicinity of BHF/BHE are estimated to be approximately **2,375m^3** (with the area being 250m^2 to a depth of 9.5m).

Free tar was observed in material at sample location TP16. This location is regarded as being locally impacted by tar material as there was no other free tar observed within its proximity.

- The estimated volume of material impacted in this area is **115m^3**, based on the green shaded extent shown on **Figure 7** to a depth of 1.5m (i.e. with surface ash/coke removed).

Based on the above estimates, the volume of material estimated to be impacted with tarry material is approximately **11, 715m^3**, which is likely to be classified as **Industrial Waste** after treatment and applying the NSW DEC general approval of immobilisation for coal tar impacted soil.

12.2.4 Other Materials

Ash and Coke Gravels

These surface materials exist over the entire Site to a nominal depth of 0.5mbgl. The estimated volume of this material is approximately **2,950m^3**, which is likely to be classified as **Solid Waste** after applying the NSW DEC general approval of immobilisation for ash. This estimate is based on the Site Area (7,732m^2) and the

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depth of material (0.5m), removing the areas of the Retaining Wall, the Northern and Southern Gasholders and the Tar Wells.

Gravel, Sand and Demolition Wastes

This material includes the material comprising the Retaining Wall and the backfill material inside the Northern Gasholder.

The volume estimate of the Retaining Wall material is **1,765m³**, which is likely to be classified as **Solid Waste**, however may be classified as Asbestos Waste/Industrial Waste (similar to the material inside the Northern Gasholder) if asbestos containing materials are encountered throughout this material. These estimates are based on the Retaining Wall material area shaded in blue (**Figure 7)** as 1,175m² and an average depth of 1.5m.

The volume of the backfill material inside the Northern Gasholder was estimated above to be approximately 1,900m³.

Reworked Clays

Removal of free tar impacted materials within the former gasworks area would effectively address contamination impacts associated with this material. One area remains impacted by benzene after the free tar removal work and should be addressed during site remediation.

The location requiring management is at sample location BH14. The estimated volume of material requiring remediation is approximately **100m³**, based on a lateral extent as shown on **Figure 7** (shaded green) and a vertical impact of 0.5m (after surface ash/coke removal). This material is likely to be classified as **Solid Waste**.

Gravelly Sand and Clay with Minor Ash

This material exists only in the Southwest Area, where two contamination hotspots exist associated with the fill materials (sampling locations MW13s and RP). Statistical assessment indicates that removal of the two hotspots would result in the rest of this material being suitable for the Site, therefore these two hotspot areas should be addressed during Site remediation.

The estimated volume of impacted material at sample location MW13s is approximately **140m³**, based on a lateral extent as shown on **Figure 7** (shaded green) and a vertical impact of 1.0m (after surface ash/coke removal). This material is likely to be classified as **Solid Waste**.

The estimates for the area impacted at sample location RP has been taken into account for estimating the free tar impacted materials above.

Silty Clays

A contamination hotspot for benzene exists in the South Central Area that should be addressed during site remediation. This area is sample location MW04s.

The estimated volume of material at this location is approximately **100m³**, based on a lateral extent as shown on **Figure 7** (shaded green) and a vertical impact of 1.0m (after surface ash/coke removal). This material is likely to be classified as **Solid Waste**.

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12.2.5 Summary of Volume Estimates

A summary of the areas, volume estimates and waste types is provided in **Table 12.1** below.

Table 12.1 – Summary Volume Estimates

Remediation Area	Impacted Area	Estimated Volume (m^3)	Waste Material	Likely Waste Classification
Tar Wells	Base annulus and immediate area	1,000	Free Tar Impacts	Hazardous
	Tar Well contents	100	Tar	Hazardous (Liquid)
Northern Gasholder	Base annulus and immediate area	2,100	Free Tar Impacts	Hazardous
	Gasholder contents	640	Impacted water	Hazardous (Liquid)
		320	Tar	Hazardous (Liquid)
	Buried wastes inside annulus	1,900	Demolition	Asbestos/Industrial
Tar Impacted Soils	Shallow	9,225	Fill and natural clays	Industrial[(a)]
	Deeper	2,375	Natural clays and weathered shales	Industrial[(a)]
	TP16 Hotspot	115	Fill and natural clays	Industrial[(a)]
Site Surfaces		2,950	Ash and Coke Gravels	Solid[(a)]
Retaining Wall		1,765	Gravel Sand and Demolition Wastes	Solid
Hotspots	BH14	100	Fill and natural clays	Solid
	MW13s	140	Fill (southwest site area)	Solid
	MW04s	100	Fill and natural clays	Solid
Pipework	Varying across site	unknown	Tar/ scrap metal	Hazardous/ Solid

(a) assumed after treatment and applying the appropriate NSW DEC general approval of immobilisation.

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13 Remedial Option Screening

This section presents details of the remedial options screening undertaken for the contaminated materials (excluding groundwater) requiring remediation at the former gasworks site.

13.1 Remedial Objective and Evaluation Criteria

13.1.1 Remediation Objectives

The remediation objectives outlining the desired outcomes for remediation of the Site are as follows:

- Remediation to a standard suitable for proposed commercial/industrial land use;
- Remediation to a level that mitigates risks to human health and the environment to an acceptable level; and
- Remediation of the contamination sources on the Site to the extent where the SRoH declaration can be removed.

13.1.2 Evaluation Criteria

Evaluation criteria were developed to assess each of the remedial options to nominate preferred remedial strategies on a sound and factual basis. The evaluation criteria related to the:

- Effectiveness of the remediation option to reduce the human health and environmental risk, either by reducing the risk posed by the source, by disrupting the potential exposure pathways to the potential receptors, or by reducing the volume of contaminated material at the Site;
- Timeframe required to achieve the required outcome;
- Likelihood of regulatory and community acceptance;
- Compatibility of the remedial option with other aspects of the proposed site redevelopment and the flexibility of the option to allow for potential changes during the proposed site redevelopment;
- Compatibility of the option with the proposed groundwater management strategy;
- Compatibility of the option with reuse, or potential future reuse of the contaminated materials;
- Indicative cost of implementing the option; and
- Ongoing maintenance requirements associated with the remediation option.

13.2 Long List Remedial Options

As part of the scope of this assessment, CH2M HILL prepared a long-list of potential remedial options for the soil and waste materials at the Site, based on commercially available technologies.

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A fatal flaw analysis was then undertaken on the long list remedial options to assess which of the technologies could be applicable to the remediation of the Site. Options identified as having a fatal flaw or were unlikely to meet the remediation objectives were rejected and eliminated from further consideration. The long list of remedial options and the outcomes of the fatal flaw analysis are summarised in **Appendix F.**

13.3 Potentially Suitable Remedial Options

The specific remedial options that were considered as being potentially applicable to the Site were consolidated into a "short-list" of options, as summarised below.

13.3.1 No Action

The application of this option at the Site does not address SRoH issues nor would it be aligned with future land use aspirations. It would also not address the human health and ecological risks associated with existing Site contamination. Consideration may be given to the Southern Gasholder (given its heritage significance), however this area would still require a management plan and access restrictions, as outlined below.

13.3.2 Institutional Controls

Site Management Plan (SMP) - This strategy should be applicable as a component of the remedial strategy where there may be residual contamination risks that need to be managed after remediation. This may include contained/capped areas, management of heritage items where contamination could not be remediated, including impacted groundwater involving ongoing groundwater monitoring. This option is likely to be applicable to the area defined by the Southern Gasholder. This structure has been identified as a state heritage item and registered as part of the Eveleigh Railway Workshops. It is envisaged that this area will be excluded from the Site remediation process given its heritage significance and sensitivity.

Site Access Restrictions - Applicable for ongoing rail use, to protect heritage items, restricting public access & implementation of the SMP.

13.3.3 Insitu Physical/Chemical Treatment

In-Situ Chemical Oxidation - This technology would only be suitable for application after removal or pre-treatment of source materials. This can be used to treat residual BTEX impacted materials in deep soil layers, where depth excavation of materials may be limited by machinery capabilities or considered uneconomical to excavate. This may also be applied as a treatment of BTEX compounds at the base and beneath the Southern Gasholder, given there is unlikely to be excavation of this area. This option could also address groundwater impacts in the deep bedrock groundwater over the long term by treating leaching BTEX compounds. The effectiveness of this option may be impeded by other sources of oxidant-consuming material such as organic matter, in the form of coke and coaly material often associated with MGP sites that may limit reaction process and/or make the process less effective by consuming large quantities of the oxidant.

In-situ Soil Vapour Extraction (SVE) - This technology would only be suitable for application after removal or pre-treatment of source materials. This can be used to treat residual BTEX impacted materials in deep soil layers, where depth excavation of materials may be limited by machinery capabilities or considered uneconomical to

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excavate. Pilot tests are recommended and the application has Operation and Maintenance (O&M) requirements and capital.

13.3.4 Insitu Thermal Treatment

This option is suitable for application in combination with SVE to enhance the volatile extraction in a shorter time period. Alone this option would not be appropriate. This option would be applicable after source removal on soils/fractured shale at the limit of excavation depth or in the vicinity beneath the retained Southern Gasholder. The groundwater level in the deeper bedrock layers may limit the effectiveness of this option.

13.3.5 Exsitu Biological Treatment

Biopiles - This option can be used to remediate some organic contaminants and could be an appropriate option, however, historically it has not been particularly effective in reducing the multi-ring (4 and greater) PAH compounds such as benzo(a)pyrene, to acceptable human health levels, but can be effective in reducing the more volatile constituents such as naphthalene and BTEX constituents is a valid objective for onsite re-use at depth. This option would require an alternate treatment site considering restricted available land area on the Site for the treatment process, and the sensitivity and proximity of the adjoining residential neighbourhood and off gases that are produced. This option is not suitable for grossly impacted materials such as free tars. Pre-treatment is usually required to improve handling and transport of the materials. Treatment trials are recommended to assess effectiveness of this option.

Composting – This option results in high fugitive emissions that would require management, and bulking agents used would substantially increase material volume, requiring an alternate treatment site. Semi-volatile and multi-ring PAHs would take a substantial time to degrade.

Landfarming - This option results in high fugitive emissions that would require management, requiring an alternate site for treatment and farming of the contaminated material. Semi-volatile and multi-ring PAHs would take a substantial time to degrade.

13.3.6 Exsitu Physical/Chemical Treatment

Solidification/Stabilisation/Immobilization – This option is appropriate using organic stabilisation processes on material containing tar and moderate concentrations and potentially free tar (gross contaminants). This option can be used in combination with the NSW DEC general approval for immobilisation of coal tar wastes from former gasworks sites (#2005/14), subject to the material being treated initially with calcium or magnesium based cement. This process enables off site disposal of source material and high PAH concentration materials, classified on TCLP alone. Treatment trials are required to determine the effectiveness of this method. Where the PAH contamination can be demonstrated to be present and immobile within ash and coke without treatment, then it may qualify for general immobilisation approval for ash from the NSW DEC (#1999/05). This treatment also has the potential to be applicable to ash/coke impacted material that may be retained on site in combination with a physical separation barrier and a long term management plan.

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Chemical Extraction - This option would only be suitable for old service lines and pipes associated with the gasworks operation that contain residual tar. This option would require treatment of the resulting solution containing the contaminants, as well as treatment and disposal of the chemically treated pipework.

13.3.7 Exsitu Thermal Treatment

Incineration and Co-burning - This option would be applicable for high organic content materials such as free tar wastes. Materials can be pre-treated to improve handling and transport. The materials can also be stabilised or subject to other off site treatments to reduce the mass of soil material and oversize materials (segregation). There may be issues gaining regulatory approval and limited available facilities other than through co-burning at a power station or cement kiln.

Thermal Desorption - This option would be applicable for high organic content materials such as free tar wastes, but can have issues with high energy tarry materials. An alternate treatment site would be required, and there are potential issues relating to the availability, transport, set up and commissioning of treatment units.

13.3.8 Containment

Insitu Capping – This option could be applicable considering the Site conditions of relatively shallow impacts of non-leaching material, or materials that meet land use criteria with minimal contamination hotspot removal. The areas of the Site this applies to are the Northeast, South Central, Southwest, Western Lot and sections of the Retaining Wall Areas. A long term management plan would also be required in conjunction with this option.

Containment Area - Similar to the above, this option would be applicable in combination with designated site areas and a long term management plan.

13.3.9 Disposal

This option would only be applicable in combination with other technologies such as stabilisation/immobilisation. Alone this option would preclude highly impacted materials being accepted by licensed landfill facilities, based on the indicative waste classification of some materials being hazardous wastes.

13.3.10 Reuse and Recycle

This option could be used for oversize materials and fill materials meeting land use criteria and/or that are approved for immobilisation under general DEC immobilisation approvals. This option could be used after treatment on an alternate treatment site. This may be applied to the demolition waste materials inside the Northern Gasholder and the Retaining Wall Area, where materials are screened and oversize materials removed off site to a recycling facility, or fill materials may be used to backfill excavated sections of the Site. Consideration must be given to the presence of asbestos containing materials for this option to be applicable.

13.4 Management During Remediation

A number of items will require management during the remedial phase of the Site rehabilitation. The following sections briefly describe the items that should be considered when planning for and implementing remediation.

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13.4.1 Groundwater and Surface Water

Considering the expected depth required for source removal, there will be a significant quantity of water, both inground and as surface water contained in structures, requiring management and potential treatment and/or off site disposal. In it's present state groundwater and surface water are impacted by both inorganic and organic contaminants that are likely to preclude the waters from disposal into the stormwater or sewage systems without some form of pre-treatment.

13.4.2 Odours

The adjoining residences and sensitive land use of Burren Street would require protection from potential exposure to vapours emitted during site remediation, especially when excavation and material handling at surface is undertaken. Pre remedial work would be necessary to provide controls of vapour into the atmosphere, and which would need to be documented in an Environmental Management Plan. Management procedures may include capturing and treating vapours and/or odour masking agents.

13.4.3 Archaeological and Heritage Matters

A recent report prepared by Heritage Concepts Pty Ltd[4] documents the items of archaeological and heritage importance at the Site, and also presents recommendations to manage these items during site remediation. In particular, the remedial works should consider:

- The Southern Gasholder being retained insitu and preserved;
- Archival photographic record should be undertaken for all existing items prior to remediation;
- Archaeological monitoring and recording should be undertaken during remediation to monitor unknown items of potential heritage significance;
- Any significant elements of the gasworks should be retained insitu, which should undergo assessment of heritage significance and degree of contamination;
- Retaining items of archaeological significance uncovered during site remediation should be protected and interpreted with appropriate signage post remediation; and
- The protection and interpretation of all remaining gasworks elements (including signage) should be incorporated into the final design of the Site.

The considerations above are subject to the degree of contamination and potential human health risks associated with the item, evaluated against the heritage significance of the item.

[4] Heritage Concepts Pty Ltd *Archaeological Assessment and Remediation Management Strategy – Former Macdonaldtown Gasworks*, November 2006.

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14 Conclusions

The conclusions provided below are based on the four 'decisions' identified in Step 2 of the Data Quality Objectives (DQO) assessment provided in **Section 4.1** of this report.

14.1 DQOs

Decision 1: Is there sufficient information on the distribution and characteristics of soil and fill requiring remediation and/or management to allow remedial planning to progress?

The information obtained from the delineation investigation is considered sufficient to understand the degree of site contamination and distribution of contaminants.

The existing soil data is sufficient as a basis for sound remedial objective decisions and to progress remedial planning. The findings of the Delineation Investigation enable a robust and definitive Remedial Action Plan to be developed for site remediation. The RAP should build on the suitable remedial options provided in this report and assess options for technical and economical feasibility.

Decision 2: Do the findings of the investigation provide a higher level of understanding and certainty on contamination source zones and spatial area?

A higher level of understanding of the subsurface conditions has been established based on the information obtained in the Delineation Investigation.

The Delineation Investigation was sufficient to identify and characterise different fill and natural soil material types enabling appropriate statistical analysis to be undertaken to assess material suitability for the proposed land use. Material types and statistical analysis of these materials is presented in **Section 9.0.**

The vertical extent of contamination was delineated in all Stratified Site Areas. It is considered that selection of a suitable remedial option and an assessment of its feasibility in a Remedial Action Plan will provide appropriate management of areas that show minor impacts in the deep weathered zones of the bedrock shales, particular once source zones have been remediated. The outcome of an appropriate remedial option for these areas should consider the long term impact on groundwater.

The lateral extent of contamination was delineated by a high density of sample locations and a high level of understanding of the historical site layout. The improved density of sample locations enabled identification and lateral delineation of source zones including:

- The Tar Wells;
- The Underground pipework;
- The base annulus of the Northern Gasholder; and
- The base annulus of the Southern Gasholder.

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Soil data gaps were filled to remove uncertainty in source zone areas; in particular, the angled bores drilled underneath the Gasholders removed substantial uncertainty in these source areas.

Additional significant findings relative to Site contamination included:

- The depth of construction of the Northern Gasholder being 6.0mbgl and the backfilled contents;
- The tarry material at the base of the Northern Gasholder;
- The depth and tarry contents of the Tar Wells;
- The extensive impact of free tar in natural soils in the area of the former gasworks;
- The extensive impact of soluble organic compounds (benzene and naphthalene) in deep shale fractures;
- The extensive network of underground pipes containing tarry residues;
- The relatively high ash/coke surface materials over the entire Site; and
- The relatively low impacts in natural soils in areas other than the former gasworks area.

Decision 3: Do the findings of the investigation provide sufficient data that will enable an assessment of remedial screening options for contaminated soils and fills requiring management?

The findings have obtained sufficient information to enable a robust assessment of appropriate remedial options. The findings included pertinent information for the screening to be diligent, which included:

- Identification of different material types;
- Better understanding of geological and hydrogeological conditions;
- Better understanding of extent of depth of contamination impact;
- Contaminant concentrations; and
- Acidic and neutral leaching characteristics.

The screening of applicable remedial options identified a number of options that have potential application at the Site. These are outlined in **Section 13.3.**

Decision 4: Is there sufficient and definitive Site data to enable remedial cost estimates to be developed?

The findings of the Delineation Investigation provide a high level of understanding of contaminant distribution, both laterally and vertically, and of subsurface conditions, particularly subsurface structures and contents remaining at the Site. This enabled relatively sound remedial volumes to be estimated based on information obtained for:

- source materials;

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- free tar impacted materials; and
- other material types.

The information obtained from this investigation for volume estimates can be used to develop remedial cost estimates for separate reporting to RailCorp.

14.2 Remediation Requirements and Recommendations

The investigation has identified the following as contamination sources:

- the Tar Wells;
- the network of underground pipework;
- the base annulus of the Northern Gasholder;
- the tar in soil pores and soil fractures;
- the base annulus of the Southern Gasholder (although not a major source, this area should be identified as a secondary source);
- the demolition wastes containing asbestos sheeting; and
- Ash and coke fill materials across the majority of the Site in the surface and shallow subsurface layers.

The investigation has identified the following exposure scenarios:

- Construction/maintenance/long term RailCorp employees and contractors may be exposed to impacted soil (including dusts), water and vapours;
- Employees and residents of surrounding properties may be exposed to impacted dusts, water and vapours;
- Users of extracted groundwater down gradient of the Site may be exposed to impacted waters;
- Hypogean ecosystems may be exposed to impacted waters; and
- Receiving waters ecosystem (Alexandra Canal) may be exposed to impacted waters.

The investigation has identified the following available remedial options for site remediation:

- No Action;
- Institutional Controls including a Site Management Plan (SMP) and site access restrictions;
- Insitu Physical/Chemical Treatment including chemical oxidation and soil vapour extraction;
- Insitu Thermal Treatment;
- Exsitu Biological Treatment including biopiles, composting and landfarming;
- Exsitu Physical/Chemical Treament including solidification/ stabilisation/ immobilisation and chemical extraction;

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- Exsitu Thermal Treatment including incineration/co-burning and thermal desorption;
- Containment including capping and containment;
- Off site Disposal; and
- Reuse and Recycle.

The investigation has identified that remediation of the contamination sources will adequately reduce the risks associated with this Site by:

- Preventing leaching and inturn controlling/minimising ongoing groundwater contamination;
- Controlling the generation of vapours from impacted soils;
- Controlling the generation of vapours from impacted groundwater;
- Preventing exposure of onsite workers to impacted soils and vapours;
- Preventing exposure of employees and residents of adjoining properties to impacted dusts and vapours; and
- Improving the groundwater quality migrating from the Site and inturn controlling exposure of users of extracted groundwater down gradient of the Site, controlling exposure of hypogean ecosytems to toxic groundwater and controlling exposure of receiving waters to poor quality groundwater.

To assess the effectiveness of site remediation in reducing these risks, ongoing groundwater monitoring will be required, utilising the network of monitoring wells already established on and off site, or new wells installed post remediation to monitor site boundary conditions. Ongoing groundwater monitoring will monitor the status of natural attentuation (monitored natural attenuation – MNA) of the contamination plume on and off site in both the shallow groundwater and deeper bedrock groundwater systems.

CH2M HILL recommend that RailCorp proceed with a Remedial Action Plan (RAP) to enable a full assessment of the remedial requirements of the Site, based on the findings of this investiagtion.

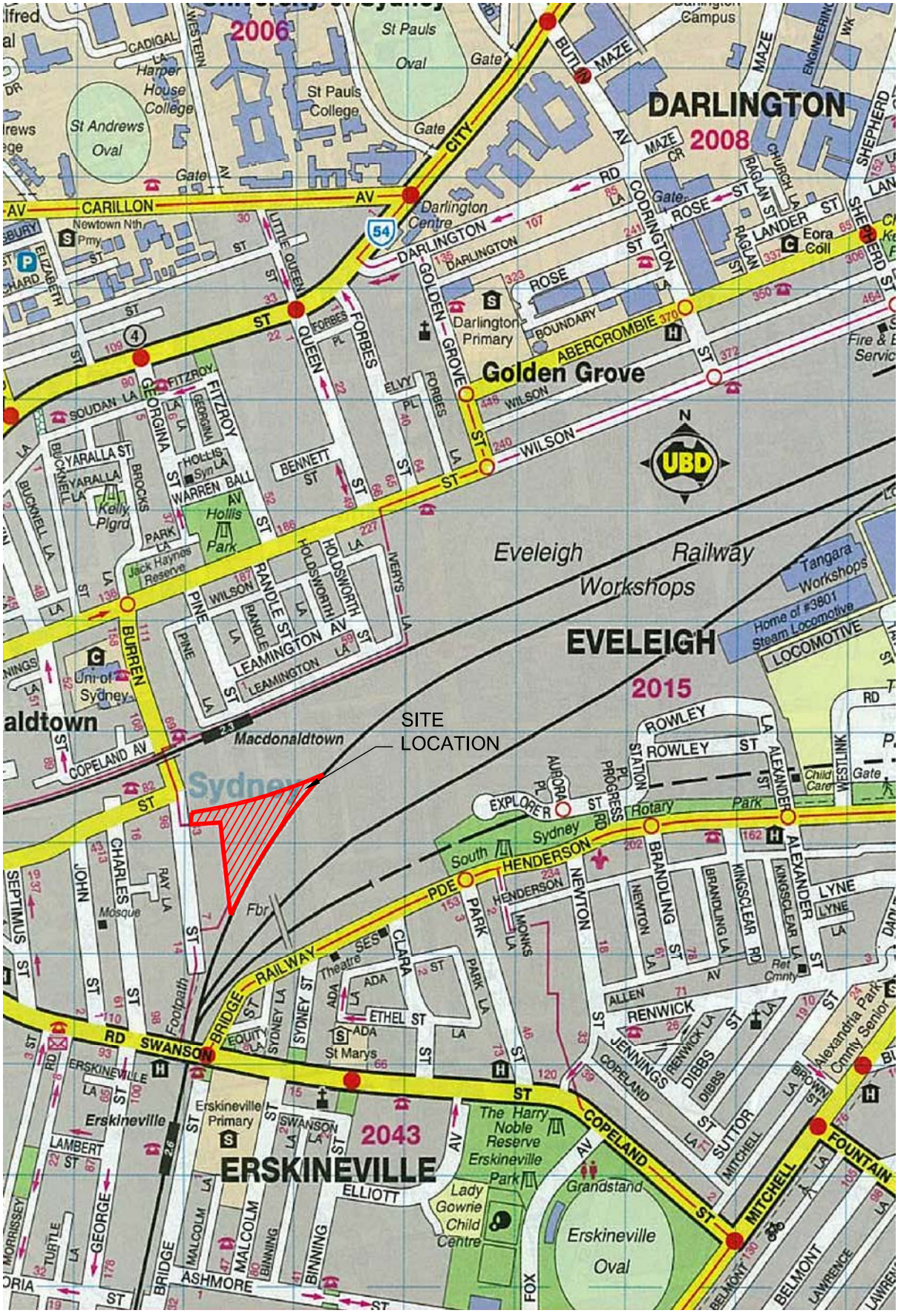
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Figures



SOURCE WITH PERMISSION: 2006 UBD SYDNEY STREET DIRECTORY (42nd EDITION)

Figure 1
Site Location

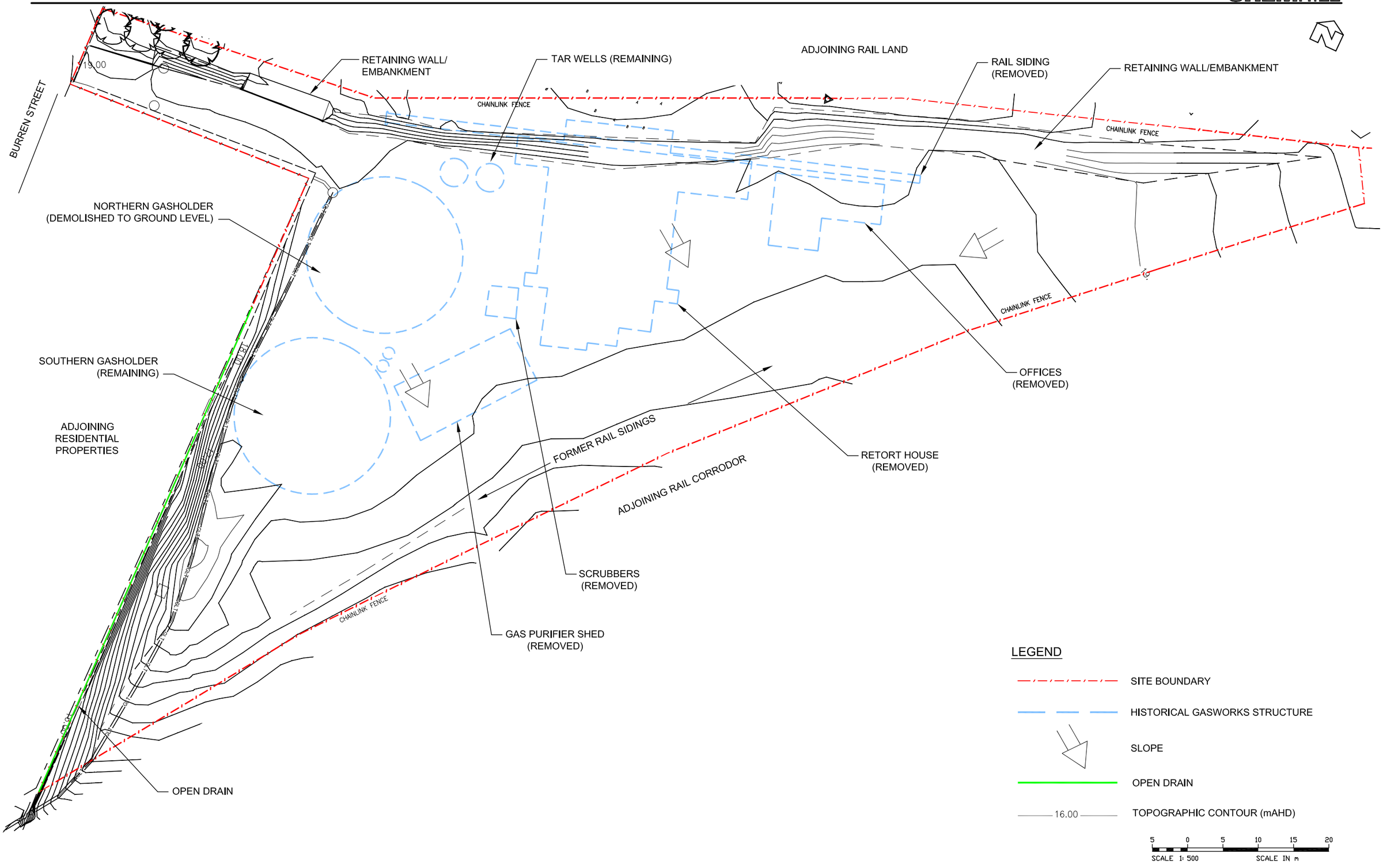
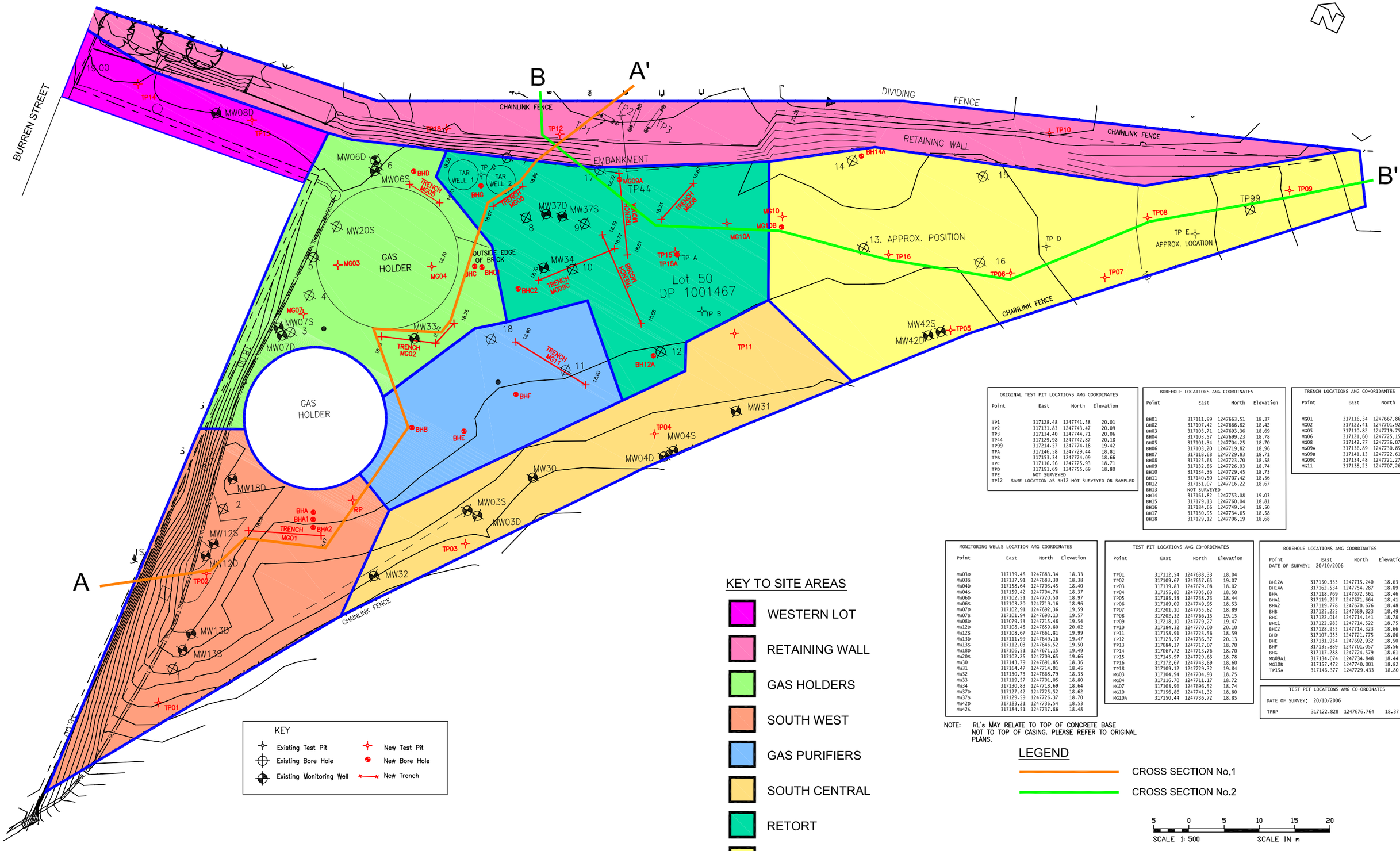


Figure 2
Current & Historical Site Layout



KEY

Existing Test Pit	New Test Pit
Existing Bore Hole	New Bore Hole
Existing Monitoring Well	New Trench

KEY TO SITE AREAS

- WESTERN LOT
- RETAINING WALL
- GAS HOLDERS
- SOUTH WEST
- GAS PURIFIERS
- SOUTH CENTRAL
- RETORT
- NORTH WEST

ORIGINAL TEST PIT LOCATIONS AMG COORDINATES

Point	East	North	Elevation
TP1	317128.48	1247741.58	20.01
TP2	317131.83	1247743.47	20.09
TP3	317134.40	1247744.71	20.06
TP44	317129.98	1247742.87	20.18
TP99	317214.57	1247774.18	19.42
TPA	317146.58	1247729.44	18.81
TPB	317153.34	1247724.09	18.66
TPC	317116.56	1247725.93	18.71
TPD	317191.69	1247755.69	18.80
TPE	NOT SURVEYED		
TP12	SAME LOCATION AS BH12 NOT SURVEYED OR SAMPLED		

BOREHOLE LOCATIONS AMG COORDINATES

Point	East	North	Elevation
BH01	317111.99	1247663.51	18.37
BH02	317107.42	1247666.82	18.42
BH03	317103.71	1247693.36	18.69
BH04	317103.57	1247699.23	18.78
BH05	317101.34	1247704.25	18.70
BH06	317103.20	1247719.82	18.96
BH07	317118.68	1247729.83	18.71
BH08	317125.68	1247723.70	18.58
BH09	317132.86	1247726.93	18.74
BH10	317134.36	1247729.45	18.73
BH11	317140.50	1247707.42	18.56
BH12	317151.07	1247716.22	18.67
BH13	NOT SURVEYED		
BH14	317161.82	1247753.08	19.03
BH15	317179.13	1247760.04	18.81
BH16	317184.66	1247749.14	18.50
BH17	317130.95	1247734.65	18.58
BH18	317129.12	1247706.19	18.68

TRENCH LOCATIONS AMG CO-ORIDANTES

Point	East	North
MG01	317116.34	1247667.86
MG02	317122.41	1247701.92
MG05	317110.82	1247719.75
MG06	317121.60	1247725.15
MG08	317142.77	1247736.07
MG09A	317136.89	1247730.85
MG09B	317141.13	1247722.61
MG09C	317134.48	1247721.27
MG11	317138.23	1247707.26

MONITORING WELLS LOCATION AMG COORDINATES

Point	East	North	Elevation
MW03D	317139.48	1247683.34	18.33
MW03S	317137.91	1247683.30	18.38
MW04D	317158.64	1247703.45	18.40
MW04S	317159.42	1247704.76	18.37
MW06D	317102.51	1247720.50	18.97
MW06S	317103.20	1247719.16	18.96
MW07D	317102.91	1247692.36	19.59
MW07S	317101.94	1247693.13	19.57
MW08D	317079.53	1247715.48	19.54
MW12D	317108.48	1247659.80	20.02
MW12S	317108.67	1247661.81	19.99
MW13D	317111.99	1247649.16	19.47
MW13S	317112.03	1247646.52	19.50
MW18D	317106.51	1247671.15	19.49
MW20S	317102.25	1247709.65	19.66
MW30	317143.79	1247691.85	18.36
MW31	317164.47	1247714.01	18.45
MW32	317130.73	1247668.79	18.33
MW33	317119.57	1247701.05	18.80
MW34	317130.83	1247718.69	18.64
MW37D	317127.42	1247725.52	18.62
MW37S	317129.59	1247726.37	18.70
MW42D	317183.21	1247736.54	18.53
MW42S	317184.51	1247737.86	18.48

TEST PIT LOCATIONS AMG CO-ORDINATES

Point	East	North	Elevation
TP01	317112.54	1247638.33	18.04
TP02	317109.67	1247657.65	19.07
TP03	317139.83	1247679.08	18.02
TP04	317155.80	1247705.63	18.50
TP05	317185.53	1247738.73	18.44
TP06	317189.09	1247749.95	18.53
TP07	317201.10	1247755.82	18.89
TP08	317202.32	1247766.15	19.15
TP09	317218.10	1247779.27	19.47
TP10	317184.32	1247770.00	20.10
TP11	317158.91	1247723.56	18.59
TP12	317123.57	1247736.37	20.13
TP13	317084.37	1247717.07	18.70
TP14	317067.72	1247713.76	18.70
TP15	317145.97	1247729.63	18.78
TP16	317172.67	1247743.89	18.60
TP18	317109.12	1247729.32	19.84
MG03	317104.94	1247704.93	18.75
MG04	317116.70	1247711.17	18.72
MG07	317103.96	1247696.52	18.74
MG10	317156.86	1247741.32	18.80
MG10A	317150.44	1247736.72	18.85

BOREHOLE LOCATIONS AMG COORDINATES

Point	East	North	Elevation
DATE OF SURVEY: 20/10/2006			
BH12A	317150.333	1247715.240	18.63
BH14A	317162.534	1247754.287	18.89
BHA	317118.769	1247672.561	18.46
BHA1	317119.227	1247671.664	18.41
BHA2	317119.778	1247670.676	18.48
BHB	317125.223	1247689.823	18.49
BHC	317122.014	1247714.141	18.78
BHC1	317122.083	1247714.522	18.75
BHC2	317128.955	1247714.323	18.66
BHD	317107.953	1247721.775	18.86
BHE	317131.954	1247692.932	18.50
BHF	317135.889	1247701.057	18.56
BHG	317117.288	1247724.579	18.61
MG09A1	317134.074	1247734.848	18.44
MG10B	317157.472	1247740.001	18.82
TP15A	317146.377	1247729.433	18.80

TEST PIT LOCATIONS AMG CO-ORDINATES

DATE OF SURVEY: 20/10/2006			
TPRP	317122.828	1247676.764	18.37

NOTE: RL's MAY RELATE TO TOP OF CONCRETE BASE NOT TO TOP OF CASING. PLEASE REFER TO ORIGINAL PLANS.

LEGEND

- CROSS SECTION No.1
- CROSS SECTION No.2

5 0 5 10 15 20

SCALE 1: 500 SCALE IN m

Figure 3
Stratified Site Areas, Sampling Locations & Cross Section Transects

BHG	
mbgl	Bz
6.00	2.4

BH06			
mbgl	BaP	PAH	C10-C36
0.30	190.0	2,374.0	20,000.0
0.40	30.0	137.3	-

TP44			
mbgl	BaP	PAH	Bz
0.30	150.0	2,472.4	15.0

MG09A1				
mbgl	BaP	PAH	C10-C36	Bz
0.70	8.2	416.60	3,520.0	1.7

MG10A				
mbgl	BaP	PAH	C10-C36	Xy
0.70	339	4,758.2	234,950.0	-
2.80	6.3	206.9	4,070.0	1.1

TP14		
mbgl	BaP	C10 - C36
0.25	7.4	3,500.0

TPC				
mbgl	BaP	PAH	Xy	
1.00	8.4	750.6	48.0	

TP1				
mbgl	BaP	PAH	C10-C36	
0.30	67.0	898.1	9,390.0	

TP3					
mbgl	C6-C9	C10-C36	Bz	Xy	
0.30	150.0	1,100.0	3.2	1.7	

MG10	
mbgl	C10 - C36
0.20	1,940.0

BH14			
mbgl	BaP	Bz	Xy
0-0.1	5.0	-	-
0.9-1.0	nd	4.6	48.0

BH07			
mbgl	BaP	PAH	C10-C36
0.10	200.0	2,078.0	14,400.0
1.50	26.0	1,144.8	-

MG06		
mbgl	PAH	C10 - C36
1.00	135.5	1,370.0
2.00	103.5	1,700.0

BH08	
mbgl	BaP
1.10	8.4
1.70	5.4

MG08				
mbgl	BaP	PAH	C6 - C9	C10 - C36
1.50	444	15,237.6	-	435,100.0
2.10	6.9	321.2	97	2,790.0

TP12				
mbgl	BaP	PAH	C10 - C36	ACM
0.25	9.6	117.4	2,320.0	fragment

TPA						
mbgl	BaP	PAH	C6-C9	C10-C36	Bz	Xy
1.60	8.4	536.9	100.0	3,200.0	1.6	65.0

BH13					
mbgl	BaP	PAH	C10-C36	Bz	
0.30	39.0	413.2	7,100.0	1.6	

BH15			
mbgl	BaP	PAH	C10-C36
0-0.1	16.0	-	-
0.2-0.3	58.0	377.8	4,390.0

BHD	
mbgl	Bz
7.00	5.4
8.40	7.5

TP13			
mbgl	BaP	PAH	C10 - C36
0.25	45.5	512	8,870.0

MG04					
mbgl	BaP	Pb	C10-C36	ACM	
0.50	6	2,140.00	1,860.00	-	
1.50	-	-	-	fragment	

MW20S	
mbgl	BaP
0.30	6.1

MG03			
mbgl	BaP	PAH	C10 - C36
0.10	10.4	115.3	2,750.0

MG02							
mbgl	BaP	PAH	C6 - C9	C10 - C36	Bz	Xy	
0.20	-	149.5	72	-	4.2	29.6	
1.80	178	5,301.9	189	36,140.0	3	165.8	

MW33	
mbgl	C16-C35 (aromatic)
0.95	2,124.0

BH04			
mbgl	BaP	PAH	C10-C36
0.80	140.0	1,697.0	12,100.0

BH03			
mbgl	BaP	PAH	C10-C36
0.10	27.0	294.8	5,020.0

MG05				
mbgl	PAH	C6 - C9	C10 - C36	Xy
0.50	-	-	13,340.0	-
1.80	289	118	3,140.0	80.4
5.00	-	92	1,420.0	35.0

BHA1	
mbgl	Bz
7.00	1.6
10.20	1.4

BH02		
mbgl	BaP	PAH
0.10	14.0	141.8
0.30	35.00	203.4

MW12D	
mbgl	BaP
1.50	7.7

MG01	
mbgl	ACM
0.20	Fragment

MG11			
mbgl	BaP	PAH	C10 - C36
0.20	42	696.6	6,210.0
2.00	48.8	728.8	7,750.0

BH18						
mbgl	BaP	PAH	C10-C36	Bz	Ebz	Xy
0.30	220.0	3,953.0	38,400.0	-	-	
1.80	28.0	2,160.8	-	7.0	80.0	210.0

BHF			
mbgl	BaP	PAH	C10 - C36
1.00	6.4	-	1,150.0
8.50	-	134.6	1,260.0

BHB	
mbgl	BaP
6.00	2

BHE		
mbgl	C6 - C9	Bz
2.20	155	-
8.40	-	1.6

BHC						
mbgl	BaP	PAH	C6 - C9	C10 - C36	Bz	Xy
6.00	17.6	1,906.4	559	8,760.0	6.4	246.7

RP			
mbgl	BaP	PAH	C10-C36
2.00	12.8	118.2	1,730.0

VP01					
mbgl	BaP	PAH	C10-C36	Pb	
Surface	5.9	-	-	-	
	10.0	137.7	1,685.0	-	
	7.1	104.3	1,995.0	-	
	15.0	219.4	2055.0	-	
	-	-	1725.0	-	
	10.0	134.1	3125.0	2140.0	

MW13S			
mbgl	BaP	PAH	C10-C36
1.00	34.9	346.0	6,444.0

VP02					
mbgl	BaP	PAH	C10-C36	Pb	
Surface	-	-	1,245.0	-	
	12.0	258.3	2,625.0	1,510.0	
	12.0	236.6	2,525.0	-	

MG09B		
mbgl	C10 - C36	ACM
0.30	20,700.0	fragment

BH10		
mbgl	BaP	PAH
0.10	11.0	112.0

TP11		
mbgl	BaP	C10 - C36
0.20	6.2	1,410.0

BH12			
mbgl	BaP	PAH	Bz
0.10	5.8	-	-
4.50	8.4	224.4	1.0

BH12A						
mbgl	BaP	PAH	C6 - C9	C10 - C36	Bz	Xy
4.20	13.9	515.6	228	5,350.0	20	94.9

MG09C		
mbgl	BaP	C10 - C36
0.30	5	1,200.0

MW04S	
mbgl	Bz
2.10	4.0

TPD	
mbgl	BaP
0.20	6.2

TP09	
mbgl	BaP
0.50	5.4

TP06		
mbgl	BaP	PAH
0.25	55	690.2

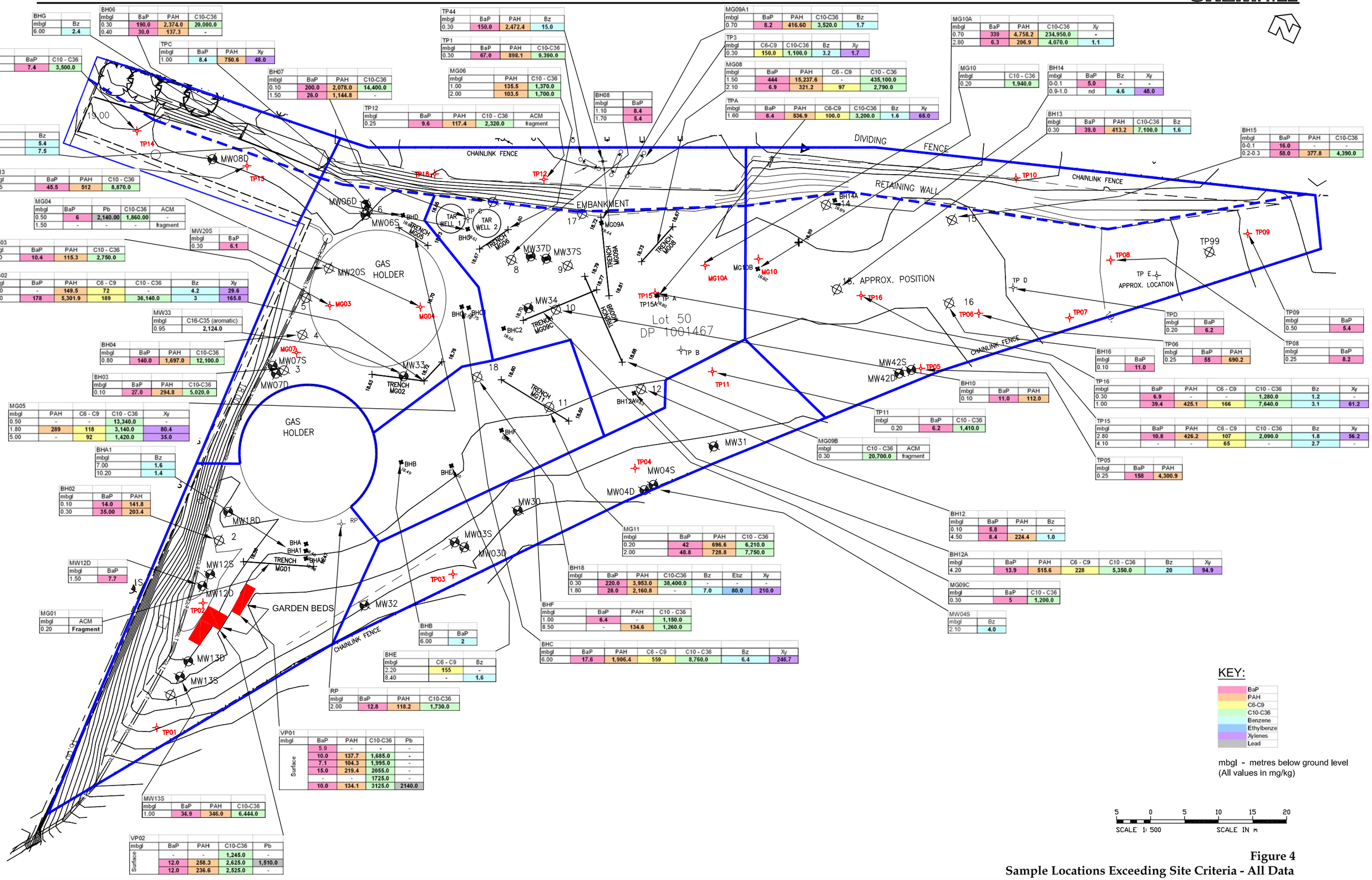
TP08	
mbgl	BaP
0.25	8.2

BH16	
mbgl	BaP
0.10	11.0

TP16						
mbgl	BaP	PAH	C6 - C9	C10 - C36	Bz	Xy
0.30	6.9	-	-	1,280.0	1.2	-
1.00	39.4	425.1	166	7,640.0	3.1	61.2

TP15						
mbgl	BaP	PAH	C6 - C9	C10 - C36	Bz	Xy
2.80	10.8	426.2	107	2,090.0	1.8	56.2
4.10	-	-	65	-	2.7	-

TP05		
mbgl	BaP	PAH
0.25	158	4,300.9



KEY:

- BaP
- PAH
- C6-C9
- C10-C36
- Benzene
- Ethylbenze
- Xylenes
- Lead

mbgl - metres below ground level
(All values in mg/kg)

SCALE 1: 500 — SCALE IN m (5 0 5 10 15 20)

Figure 4
Sample Locations Exceeding Site Criteria - All Data

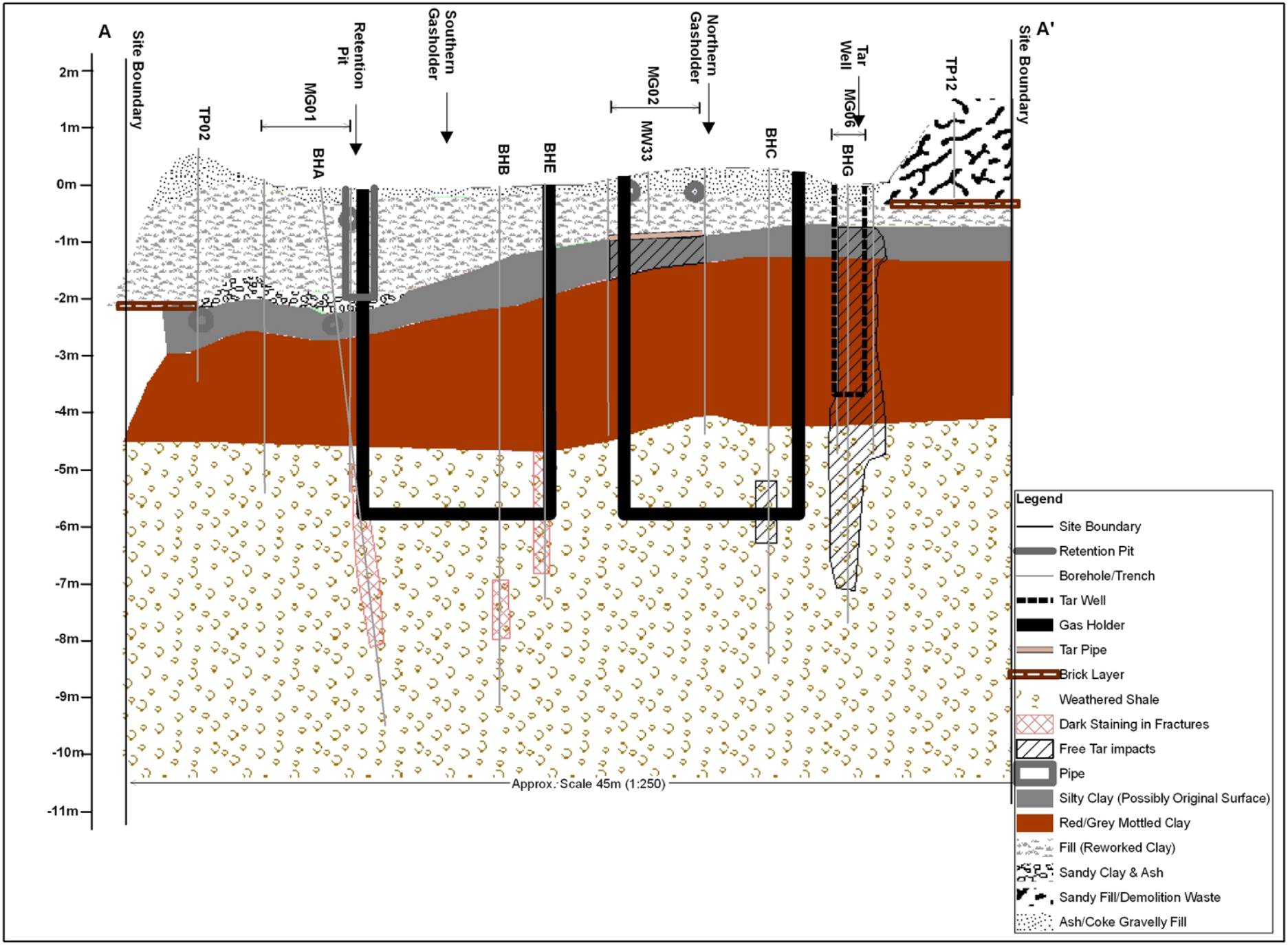


Figure 5 Cross Section Plan No. 1

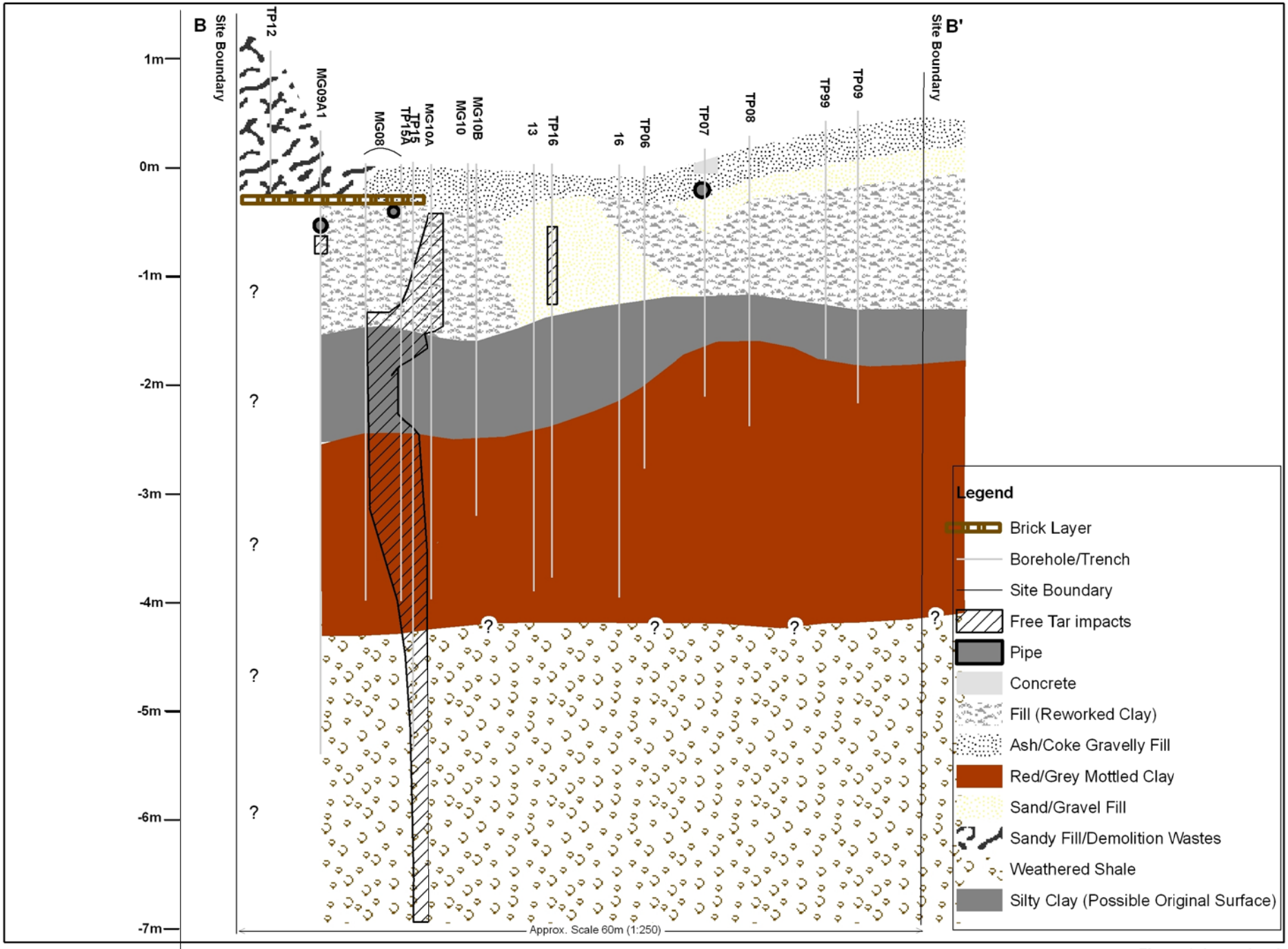
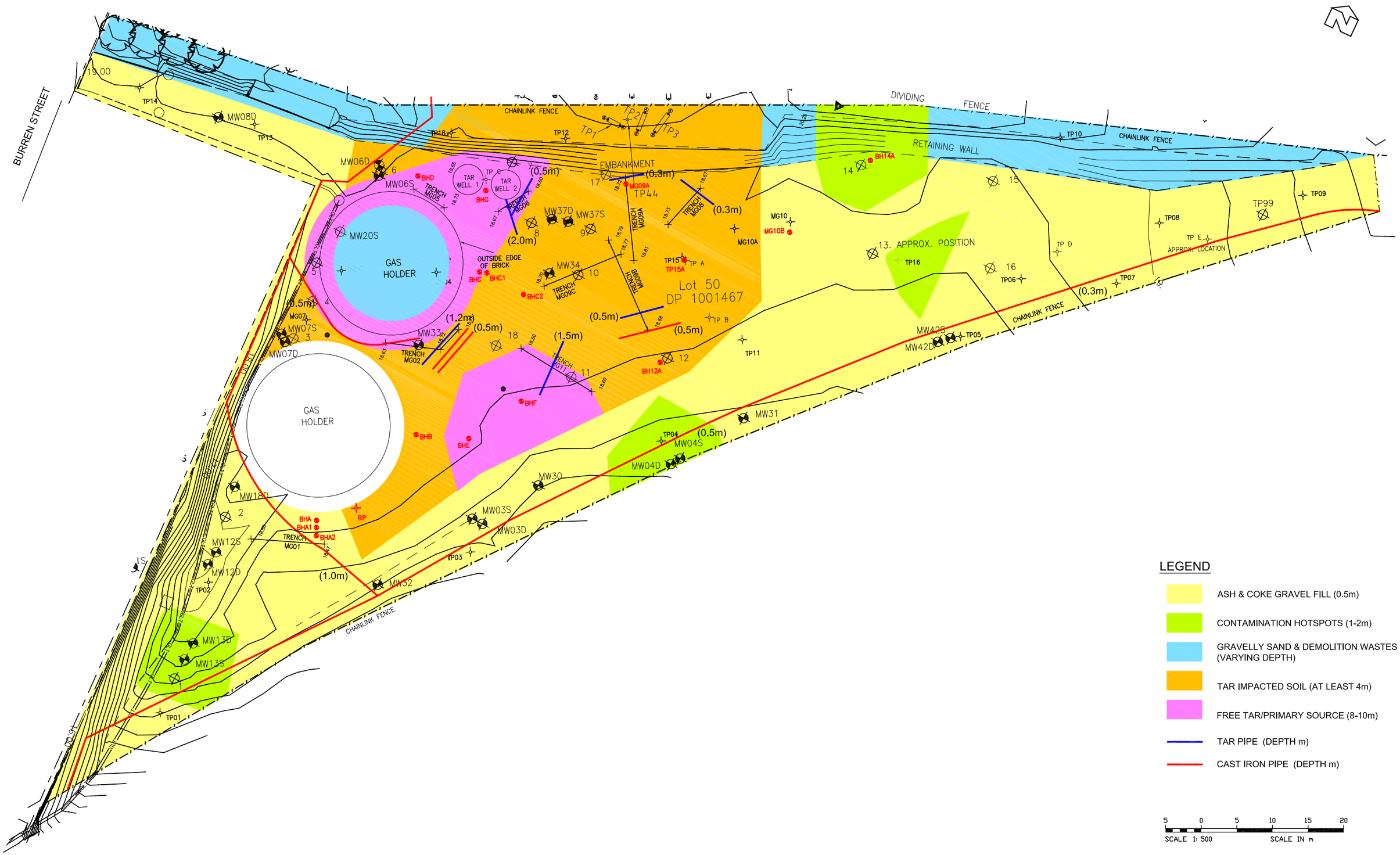


Figure 6 Cross Section Plan No. 2



LEGEND

- ASH & COKE GRAVEL FILL (0.5m)
- CONTAMINATION HOTSPOTS (1-2m)
- GRAVELLY SAND & DEMOLITION WASTES (VARYING DEPTH)
- TAR IMPACTED SOIL (AT LEAST 4m)
- FREE TAR/PRIMARY SOURCE (8-10m)
- TAR PIPE (DEPTH m)
- CAST IRON PIPE (DEPTH m)

5 0 5 10 15 20
SCALE 1: 500 SCALE IN m

Figure 7
Remediation Areas
& Excavation Depth Estimates

Tables

Table 1 - Soil Analytical Results - Gasholder Area

Analyte	Unit	LOR	NSW EPA, 1994	NEPM HIL F	MG02/0.2	MG02/1.8	MG03/0.1	MG04/0.5	MG04/1.5	MG05/0.5	MG07/1.0	MG02/4.7	MG05/1.8	MG05/3.4	MG05/5.0	MG07/4.0	BHA/7.0	BHA/10.2	BHA1/10.2	BHA1/7.0	BHA2/10.2	BHA2/7.0	BHB/6.0	BHB/9.0	BHC/6.0	BHC1/8.0	BHD/7.0	BHD/8.4
					Fill and Silty Clay Samples							Natural Soil Samples																	
2,4,5-trichlorophenol	mg/kg	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	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-trichlorophenol	mg/kg	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	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-dichlorophenol	mg/kg	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	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-dimethylphenol	mg/kg	0.5			1.3	1.8	<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	5	<0.5	<0.5	2.4
2,6-dichlorophenol	mg/kg	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	<0.5	<0.5	<0.5	<0.5	<0.5
2-chlorophenol	mg/kg	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	<0.5	<0.5	<0.5	<0.5	<0.5
2-methylphenol	mg/kg	0.5			<0.5	0.6	<0.5	-	<0.5	-	<0.5	-	<0.5	<0.5	-	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.5	<0.5	0.6	3.9
2-nitrophenol	mg/kg	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	<0.5	<0.5	<0.5	<0.5	<0.5
3-&4-methylphenol	mg/kg	1			<1	4.3	<1	-	<1	-	<1	-	<1	<1	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	2.6	<1	<1	5.8
4-chloro-3-methylphenol	mg/kg	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	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	mg/kg	2			<2	<2	<2	-	<2	-	<2	-	<2	<2	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Phenol	mg/kg	0.5		42,500	<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	2.3	<0.5	<0.5	11.4
Acenaphthene	mg/kg	0.5			<0.5	70.8	<0.5	<0.5	<0.5	-	<0.5	<0.5	9.6	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	17.5	<0.5	<0.5	<0.5
Acenaphthylene	mg/kg	0.5			<0.5	125	3.8	0.5	<0.5	-	<0.5	<0.5	10.2	2.2	2.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	69.7	<0.5	<0.5	<0.5
Anthracene	mg/kg	0.5			<0.5	208	3.7	1.7	0.5	-	<0.5	<0.5	4.4	0.8	1.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	32.1	<0.5	<0.5	<0.5
Benz(a)anthracene	mg/kg	0.5			<0.5	202	10.8	5.1	1.3	-	<0.5	<0.5	2.8	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	21.6	<0.5	<0.5	<0.5
Benzo(a) pyrene	mg/kg	0.5		5	<0.5	**178**	**10.4**	**6**	1.3	-	<0.5	<0.5	2.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**17.6**	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	mg/kg	0.5			<0.5	193	12.4	4.3	1	-	<0.5	<0.5	1.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	12.8	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	mg/kg	0.5			<0.5	122	6.6	4.2	0.7	-	<0.5	<0.5	0.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	9	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	mg/kg	0.5			<0.5	28.3	2.4	5.2	1	-	<0.5	<0.5	1.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	9.1	<0.5	<0.5	<0.5
Chrysene	mg/kg	0.5			<0.5	158	9.2	4.8	1.4	-	<0.5	<0.5	2.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	17.8	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	mg/kg	0.5			<0.5	98.2	1.6	1.4	<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	1.9	<0.5	<0.5	<0.5
Fluoranthene	mg/kg	0.5			<0.5	590	15.3	9.9	2.7	-	<0.5	<0.5	6.3	1.2	1.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	45.9	<0.5	<0.5	<0.5
Fluorene	mg/kg	0.5			<0.5	275	1.1	<0.5	<0.5	-	<0.5	<0.5	7.1	1.4	1.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	54.4	<0.5	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5			<0.5	76.6	4.2	3.4	0.6	-	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	6.6	<0.5	<0.5	<0.5
Naphthalene	mg/kg	0.5			142	1130	1.7	<0.5	0.5	-	<0.5	1.2	218	34	50.5	<0.5	3.5	<0.5	<0.5	<0.5	<0.5	<0.5	5.9	<0.5	1420	<0.5	<0.5	<0.5
Phenanthrene	mg/kg	0.5			<0.5	961	10.4	5.5	1.7	-	<0.5	<0.5	13.8	2.8	3.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	113	<0.5	<0.5	<0.5
Pyrene	mg/kg	0.5			<0.5	886	21.2	9.3	2.6	-	<0.5	<0.5	7.5	1.4	1.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	57.4	<0.5	<0.5	<0.5
PAHs (Sum of total)	mg/kg			100	**149.5**	**5301.9**	**115.3**	62.8	17.3	-	8	8.7	**289**	48.3	68.1	8	11	8	8	8	8	8	13.4	8	**1906.4**	8	8	8
4,4-DDE	mg/kg	0.05			-	<0.25	<0.05	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-
a-BHC	mg/kg	0.05			-	<0.25	<0.05	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-
Aldrin	mg/kg	0.05			-	<0.25	<0.05	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-
b-BHC	mg/kg	0.05			-	<0.25	<0.05	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-
cis-Chlordane	mg/kg	0.05			-	<0.25	<0.05	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-
d-BHC	mg/kg	0.05			-	<0.25	<0.05	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-
DDD	mg/kg	0.05			-	<0.25	<0.05	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-
DDT	mg/kg	0.2			-	<0.2	<0.2	-	<0.2	-	-	-	<0.2	-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-
Dieldrin	mg/kg	0.05			-	<0.25	<0.05	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan I	mg/kg	0.05			-	<0.25	<0.05	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan II	mg/kg	0.05			-	<0.25	<0.05	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan sulphate	mg/kg	0.05			-	<0.25	<0.05	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-
Endrin	mg/kg	0.05			-	<0.25	<0.05	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-
Endrin aldehyde	mg/kg	0.05			-	<0.25	<0.05	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-
Endrin ketone	mg/kg	0.05			-	<0.25	<0.05	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-
g-BHC (Lindane)	mg/kg	0.05			-	<0.25	<0.05	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-
Heptachlor	mg/kg	0.05		50	-	<0.25	<0.05	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-
Heptachlor epoxide	mg/kg	0.05			-	<0.25	<0.05	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.05			-	<0.25	<0.05	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-
Methoxychlor	mg/kg	0.2			-	<0.2	<0.2	-	<0.2	-	-	-	<0.2	-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-
trans-chlordane	mg/kg	0.05			-	<0.25	<0.05	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-
Aldrin + Dieldrin	mg/kg			50	-	0.5	0.1	-	0.1	-	-	-	0.1	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-
DDT+DDE+DDD	mg/kg			1,000	-	0.7	0.3	-	0.3	-	-	-	0.3	-	-	0.3	-	-	-	-	-	-	-	-	-	-	-	-
chlordane (total)	mg/kg			250	-	0.5	0.1	-	0.1	-	-	-	0.1	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-
Azinophos methyl	mg/kg	0.05			-	<0.25	<0.05	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-
Bromophos-ethyl	mg/kg	0.05			-	<0.25	<0.05	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-
Carbophenothion	mg/kg	0.05			-	<0.25	<0.05	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-
Chlorfenvinphos	mg/kg	0.05			-	<0.25	<0.05	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-
Chlorpyrifos	mg/kg	0.05			-	<0.25	<0.05	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-
Chlorpyrifos-methyl	mg/kg	0.05			-	<0.25	<0.05	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-
Demeton-S-methyl	mg/kg	0.05			-	<0.25	<0.05	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-
Diazinon	mg/kg	0.05			-	<0.25	<0.05	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-
Dichlorvos	mg/kg	0.05			-	<0.25	<0.05	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-
Dimethoate	mg/kg	0.05			-	<0.25	<0.05	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-
Ethion	mg/kg	0.05			-	<0.25	<0.05	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-
Fenamiphos	mg/kg	0.05			-	<0.25	<0.05	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-
Fenthion	mg/kg	0.05			-	<0.25	<0.05	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-
Malathion	mg/kg	0.05			-	<0.25	<0.05	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-
Methyl parathion	mg/kg	0.2			-	<0.2	<0.2	-	<0.2	-	-	-	<0.2	-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-
Monocrotophos	mg/kg	0.2			-	<0.2	<0.2	-	<0.2	-	-	-	<0.2	-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-
Parathion	mg/kg	0.2			-	<0.2	<0.2	-	<0.2	-	-	-	<0.2	-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-
Pirimphos-ethyl	mg/kg	0.05			-	<0.25	<0.05	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-
Prothiofos	mg/kg	0.05			-	<0.25	<0.05	-	<0.05	-	-	-	<0.05	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-
PCBs (Sum of total)	mg/kg	0.1		50	-	<0.5	<0.1	-	<0.1	-	-	-	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic	mg/kg	5		500	-	8	49	13	6	11	5	-	6	-	-	<5	-	-	-	-	-	-	-	-	-	-	-	-
Cadmium	mg/kg	1		100	-	<1	<1	<1	<1	<1	<1	-	<1	-	-	<1	-	-	-	-	-	-	-	-	-	-	-	-
Chromium	mg/kg	2		500	-	28	17	11	10	32	22	-	21	-	-	27	-	-	-	-	-	-	-	-	-	-	-	-
Copper	mg/kg	5		5,000	-	22	202	195	110	117	13	-	<5	-	-	<5	-	-	-	-	-	-	-	-	-	-	-	-
Lead	mg/kg	5		1,500	-	93	648	**2140**	744	325	26	-	24	-	-	20	-	-	-	-	-	-	-	-	-	-	-	-
Nickel	mg/kg	2		3,000	-	6	16	17	6	41	<2	-	<2	-	-	<2	-	-	-	-	-	-	-	-	-	-	-	-
Mercury	mg/kg	0.1		75	-	<0.1	0.9	0.3	0.7	0.7	<0.1	-	<0.1	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-
Zinc	mg/kg	5		35,000	-	156	315	342	180	311	61	-	<5	-	-	<5	-	-	-	-	-	-	-	-	-	-	-	-
TPH C 6 - C 9 Fraction	mg/kg	2	65		**72**	**189**	<2	<2	<2	<2	<2	4	**118**	-	**92**	<2	<2	<2	<2	<2	<2	<2	4	<2	**559**	<2	8	9
TPH C10 - C14 Fraction	mg/kg	50			290	10300	100	<50	<50	280	<50	<50	2100	-	580	<50	<50	<50	<50	<50	<50	<50	<50	<50	5440	<50	<50	<50
TPH C15-C28 Fraction	mg/kg	100			<100	21400	1800	1340	240	10800	<100	<100	940	-	740	<100	<100	<100	<100	<100	<100	<100	<100	<100	2610	<100	<100	<100
TPH C29-C36 Fraction	mg/kg	100			<100	4440	850	470	<100	2260	<100	<100	<100	-	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	710	<100	<100	<100
TPH_C10 - C36 (Sum of total)	mg/kg		1,000		490	**36140**	**2750**	**1860**	390	**13340**	<250	<250	**3140**	-	**1420**	<250	<250	<250	<250	<250	<250	<250	<250	<250	**8760**	<250	<250	<250
Benzene	mg/kg	0.2	1		**4.2**	**3**	<0.2	<0.2	<0.2	<0.2	<0.2	0.3	<1	-	<0.2	<0.2	0.4	0.3	**1.4**	**1.6**	0.9	<0.2	**2**	<0.2	**6.4**	<0.2	**5.4**	**7.5**
Ethylbenzene	mg/kg	0.2	50		22.1	30.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	15	-	3.9	<0.2	<0.2	<0.2	<0.2	0.2	<0.2	<0.2	0.5	<0.2	40.8	<0.2	0.7	<0.2
Toluene	mg/kg	0.2	130		5.8	4.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	5.6	-	7.3	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	38.7	<0.2	0.2	0.9
m- & p-xylene	mg/kg	0.2			15.2	93.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	53.3	-	22.7	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.4	<0.2	164	<0.2	1	0.5
o-xylene	mg/kg	0.2			14.4	72.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	27.1	-	12.3	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.5	<0.2	82.7	<0.2	0.6	0.3
Xylene Total	mg/kg		25		**29.6**	**165.8**	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	**80.4**	-	**35.0**	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	0.9	<0.4	**246.7**	<0.4	1.6	0.8

Notes:
(-) refers to analyte not tested.
BOLD refers to exceeds guideline criteria

Table 2 - Soil Analytical Results - Retort Area

Analyte	Unit	LOR	NSW EPA, 1994	NEPM HIL F	MG06/1.0	MG08/0.3	MG08/1.5	MG08/2.1	MG09A1/0.7	MG09B/0.3	MG09B/0.6	MG09C/0.3	MG09C/1.9	MG10A/0.7	TP15/0.3	BH12A/4.2	BH12A/6.0	BHC2/6.0	BHC2/8.0	BHG/6.0	BHG/7.2	BHG/8.1	MG06/2.0	MG06/4.7	MG08/4.0	MG09A1/3.6	MG09A1/4.8	MG09B/2.5	MG09C/3.8	MG10A/2.8	MG10A/4.0	TP15/2.8	TP15/4.1	TP15A/6.0	TP15A/7.0
					Fill and Silty Clay Samples											Natural Soil Samples																					
2,4,5-trichlorophenol	mg/kg	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	<0.5	-	-	<0.5	<0.5
2,4,6-trichlorophenol	mg/kg	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	<0.5	-	-	<0.5	<0.5
2,4-dichlorophenol	mg/kg	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	<0.5	-	-	<0.5	<0.5
2,4-dimethylphenol	mg/kg	0.5			-	-	14	-	4	-	<0.5	-	-	17.4	-	16.2	<0.5	<0.5	<0.5	4.1	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	-	-	<0.5	<0.5	-	-	<0.5	<0.5
2,6-dichlorophenol	mg/kg	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	<0.5	-	-	<0.5	<0.5
2-chlorophenol	mg/kg	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	<0.5	-	-	<0.5	<0.5
2-methylphenol	mg/kg	0.5			-	-	6.8	-	1.8	-	<0.5	-	-	11	-	8.1	<0.5	<0.5	<0.5	3.8	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	-	-	<0.5	<0.5	-	-	<0.5	<0.5
2-nitrophenol	mg/kg	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	<0.5	-	-	<0.5	<0.5
3-&4-methylphenol	mg/kg	1			-	-	12.2	-	3.2	-	<1	-	-	31.5	-	12.7	<1	<1	<1	5.4	<1	<1	<1	-	-	<1	<1	-	-	<1	<1	-	-	<1	<1
4-chloro-3-methylphenol	mg/kg	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	<0.5	-	-	<0.5	<0.5
Pentachlorophenol	mg/kg	2			-	-	<2	-	<2	-	<2	-	-	<2	-	<2	<2	<2	<2	<2	<2	<2	<2	-	-	<2	<2	-	-	<2	<2	-	-	<2	<2
Phenol	mg/kg	0.5		42,500	-	-	6	-	2	-	<0.5	-	-	16.6	-	6.9	<0.5	<0.5	<0.5	7.4	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	-	-	<0.5	<0.5	-	-	<0.5	<0.5
Acenaphthene	mg/kg	0.5			5.8	-	1100	14.3	6.8	-	<0.5	<0.5	8.3	26.8	<0.5	8.1	<0.5	<0.5	<0.5	1.1	<0.5	<0.5	3.6	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	3.7	<0.5	8	<0.5	<0.5	<0.5
Acenaphthylene	mg/kg	0.5			3.1	-	479	8.1	27.5	-	<0.5	0.8	5.9	154	0.5	12.1	<0.5	<0.5	<0.5	1.5	<0.5	<0.5	2.4	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	7.4	<0.5	19.4	<0.5	<0.5	<0.5
Anthracene	mg/kg	0.5			3.8	-	650	11.8	22.5	-	<0.5	1	3.6	214	<0.5	32.2	<0.5	<0.5	<0.5	3.2	0.6	<0.5	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	10.3	<0.5	19.7	0.8	<0.5	<0.5
Benz(a)anthracene	mg/kg	0.5			2.8	-	534	8.2	12.2	-	<0.5	4.4	2.5	426	1.8	22.5	<0.5	<0.5	<0.5	1.7	<0.5	<0.5	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	7.4	<0.5	16	0.7	<0.5	<0.5
Benzo(a) pyrene	mg/kg	0.5		5	2	-	**444**	**6.9**	**8.2**	-	<0.5	**5**	2.1	**339**	2.2	**13.9**	<0.5	<0.5	<0.5	1	<0.5	<0.5	0.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**6.3**	<0.5	**10.8**	0.5	<0.5	<0.5
Benzo(b)fluoranthene	mg/kg	0.5			1	-	276	3.2	8.7	-	<0.5	4.1	1.2	253	1.6	13.9	<0.5	<0.5	<0.5	1.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	3.4	<0.5	7.1	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	mg/kg	0.5			0.8	-	257	3.5	3.4	-	<0.5	3.9	1.3	182	1.7	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	2.9	<0.5	4.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	mg/kg	0.5			1.4	-	304	4.4	2.5	-	<0.5	3.9	1.6	280	1.7	9.4	<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	4.5	<0.5	9.3	<0.5	<0.5	<0.5
Chrysene	mg/kg	0.5			2.4	-	447	7.2	9.8	-	<0.5	4.3	2.3	351	1.7	16.5	<0.5	<0.5	<0.5	1.5	<0.5	<0.5	1.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	6	<0.5	12.7	0.6	<0.5	<0.5
Dibenz(a,h)anthracene	mg/kg	0.5			<0.5	-	59.6	0.6	0.8	-	<0.5	1.3	<0.5	71.4	0.6	1.6	<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	0.8	<0.5	1.6	<0.5	<0.5	<0.5
Fluoranthene	mg/kg	0.5			7	-	1180	20.2	24.4	-	<0.5	6.8	6.9	694	2.5	49.8	<0.5	<0.5	<0.5	5	1.1	<0.5	3	0.6	0.8	<0.5	<0.5	<0.5	<0.5	15.8	<0.5	35.6	1.6	<0.5	<0.5
Fluorene	mg/kg	0.5			6.1	-	849	17.5	26	-	<0.5	<0.5	7.6	160	<0.5	42.3	<0.5	<0.5	<0.5	4.2	0.7	<0.5	2.6	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	12.7	<0.5	25.1	0.9	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5			0.6	-	198	2.2	2.9	-	<0.5	3.2	1	155	1.4	4.9	<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	2.2	<0.5	4.1	<0.5	<0.5	<0.5
Naphthalene	mg/kg	0.5			74.8	-	4820	128	182	-	<0.5	0.6	4.5	179	<0.5	166	<0.5	<0.5	<0.5	38.1	1.5	<0.5	73.7	3	3.4	<0.5	<0.5	0.7	<0.5	73.7	0.7	164	7.8	0.8	<0.5
Phenanthrene	mg/kg	0.5			14.2	-	2250	50.3	54.3	-	<0.5	2.9	15.4	478	1.2	78.6	<0.5	<0.5	<0.5	10.7	2.1	<0.5	6.6	1.2	1.9	<0.5	<0.5	<0.5	<0.5	31	<0.5	57.3	3.3	<0.5	<0.5
Pyrene	mg/kg	0.5			9.2	-	1390	34.8	24.6	-	<0.5	7.8	9.4	795	2.9	38.8	<0.5	<0.5	<0.5	5.5	1.3	<0.5	4	0.8	1.1	<0.5	<0.5	<0.5	<0.5	18.8	<0.5	31	1.9	<0.5	<0.5
PAHs (Sum of total)	mg/kg			100	**135.5**	-	**15237.6**	**321.2**	**416.6**	-	8	51	74.1	**4758.2**	21.8	**515.6**	8	8	8	76.6	12.3	8	**103.5**	11.6	13.4	8	8	8.2	8	**206.9**	8.2	**426.2**	21.6	8.3	8
4,4-DDE	mg/kg	0.05			-	-	<1.25	-	-	-	<0.05	-	-	<0.12	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	<0.05	-	<0.12	<0.05	-	-
a-BHC	mg/kg	0.05			-	-	<1.25	-	-	-	<0.05	-	-	<0.12	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	<0.05	-	<0.12	<0.05	-	-
Aldrin	mg/kg	0.05			-	-	<1.25	-	-	-	<0.05	-	-	<0.12	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	<0.05	-	<0.12	<0.05	-	-
b-BHC	mg/kg	0.05			-	-	<1.25	-	-	-	<0.05	-	-	<0.12	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	<0.05	-	<0.12	<0.05	-	-
cis-Chlordane	mg/kg	0.05			-	-	<1.25	-	-	-	<0.05	-	-	<0.12	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	<0.05	-	<0.12	<0.05	-	-
d-BHC	mg/kg	0.05			-	-	<1.25	-	-	-	<0.05	-	-	<0.12	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	<0.05	-	<0.12	<0.05	-	-
DDD	mg/kg	0.05			-	-	<1.25	-	-	-	<0.05	-	-	<0.12	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	<0.05	-	<0.12	<0.05	-	-
DDT	mg/kg	0.2			-	-	<1.2	-	-	-	<0.2	-	-	<0.2	-	-	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	<0.2	-	<0.2	<0.2	-	-
Dieldrin	mg/kg	0.05			-	-	<1.25	-	-	-	<0.05	-	-	<0.12	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	<0.05	-	<0.12	<0.05	-	-
Endosulfan I	mg/kg	0.05			-	-	<1.25	-	-	-	<0.05	-	-	<0.12	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	<0.05	-	<0.12	<0.05	-	-
Endosulfan II	mg/kg	0.05			-	-	<1.25	-	-	-	<0.05	-	-	<0.12	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	<0.05	-	<0.12	<0.05	-	-
Endosulfan sulphate	mg/kg	0.05			-	-	<1.25	-	-	-	<0.05	-	-	<0.12	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	<0.05	-	<0.12	<0.05	-	-
Endrin	mg/kg	0.05			-	-	<1.25	-	-	-	<0.05	-	-	<0.12	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	<0.05	-	<0.12	<0.05	-	-
Endrin aldehyde	mg/kg	0.05			-	-	<1.25	-	-	-	<0.05	-	-	<0.12	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	<0.05	-	<0.12	<0.05	-	-
Endrin ketone	mg/kg	0.05			-	-	<1.25	-	-	-	<0.05	-	-	<0.12	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	<0.05	-	<0.12	<0.05	-	-
g-BHC (Lindane)	mg/kg	0.05			-	-	<1.25	-	-	-	<0.05	-	-	<0.12	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	<0.05	-	<0.12	<0.05	-	-
Heptachlor	mg/kg	0.05		50	-	-	<1.25	-	-	-	<0.05	-	-	<0.12	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	<0.05	-	<0.12	<0.05	-	-
Heptachlor epoxide	mg/kg	0.05			-	-	<1.25	-	-	-	<0.05	-	-	<0.12	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	<0.05	-	<0.12	<0.05	-	-
Hexachlorobenzene	mg/kg	0.05			-	-	<1.25	-	-	-	<0.05	-	-	<0.12	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	<0.05	-	<0.12	<0.05	-	-
Methoxychlor	mg/kg	0.2			-	-	<1.2	-	-	-	<0.2	-	-	<0.2	-	-	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	<0.2	-	<0.2	<0.2	-	-
trans-chlordane	mg/kg	0.05			-	-	<1.25	-	-	-	<0.05	-	-	<0.12	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	<0.05	-	<0.12	<0.05	-	-
Aldrin + Dieldrin	mg/kg			50	-	-	2.5	-	-	-	0.1	-	-	0.24	-	-	-	-	-	-	-	-	0.1	-	-	-	-	-	-	0.1	-	0.24	0.1	-	-
DDT+DDE+DDD	mg/kg			1,000	-	-	3.7	-	-	-	0.3	-	-	0.44	-	-	-	-	-	-	-	-	0.3	-	-	-	-	-	-	0.3	-	0.44	0.3	-	-
chlordane (total)	mg/kg			250	-	-	2.5	-	-	-	0.1	-	-	0.24	-	-	-	-	-	-	-	-	0.1	-	-	-	-	-	-	0.1	-	0.24	0.1	-	-
Azinophos methyl	mg/kg	0.05			-	-	<1.25	-	-	-	<0.05	-	-	<0.12	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	<0.05	-	<0.12	<0.05	-	-
Bromophos-ethyl	mg/kg	0.05			-	-	<1.25	-	-	-	<0.05	-	-	<0.12	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	<0.05	-	<0.12	<0.05	-	-
Carbophenothion	mg/kg	0.05			-	-	<1.25	-	-	-	<0.05	-	-	<0.12	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	<0.05	-	<0.12	<0.05	-	-
Chlorfenvinphos	mg/kg	0.05			-	-	<1.25	-	-	-	<0.05	-	-	<0.12	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	<0.05	-	<0.12	<0.05	-	-
Chlorpyrifos	mg/kg	0.05			-	-	<1.25	-	-	-	<0.05	-	-	<0.12	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	<0.05	-	<0.12	<0.05	-	-
Chlorpyrifos-methyl	mg/kg	0.05			-	-	<1.25	-	-	-	<0.05	-	-	<0.12	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	<0.05	-	<0.12	<0.05	-	-
Demeton-S-methyl	mg/kg	0.05			-	-	<1.25	-	-	-	<0.05	-	-	<0.12	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	<0.05	-	<0.12	<0.05	-	-
Diazinon	mg/kg	0.05			-	-	<1.25	-	-	-	<0.05	-	-	<0.12	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	<0.05	-	<0.12	<0.05	-	-
Dichlorvos	mg/kg	0.05			-	-	<1.25	-	-	-	<0.05	-	-	<0.12	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	<0.05	-	<0.12	<0.05	-	-
Dimethoate	mg/kg	0.05			-	-	<1.25	-	-	-	<0.05	-	-	<0.12	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	<0.05	-	<0.12	<0.05	-	-
Ethion	mg/kg	0.05			-	-	<1.25	-	-	-	<0.05	-	-	<0.12	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	<0.05	-	<0.12	<0.05	-	-
Fenamiphos	mg/kg	0.05			-	-	<1.25	-	-	-	<0.05	-	-	<0.12	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	<0.05	-	<0.12	<0.05	-	-
Fenthion	mg/kg	0.05			-	-	<1.25	-	-	-	<0.05	-	-	<0.12	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	<0.05	-	<0.12	<0.05	-	-
Malathion	mg/kg	0.05			-	-	<1.25	-	-	-	<0.05	-	-	<0.12	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	<0.05	-	<0.12	<0.05	-	-
Methyl parathion	mg/kg	0.2			-	-	<1.2	-	-	-	<0.2	-	-	<0.2	-	-	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	<0.2	-	<0.2	<0.2	-	-
Monocrotophos	mg/kg	0.2			-	-	<1.2	-	-	-	<0.2	-	-	<0.2	-	-	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	<0.2	-	<0.2	<0.2	-	-
Parathion	mg/kg	0.2			-	-	<1.2	-	-	-	<0.2	-	-	<0.2	-	-	-	-	-	-	-	-	<0.2	-	-	-	-	-	-	<0.2	-	<0.2	<0.2	-	-
Pirimphos-ethyl	mg/kg	0.05			-	-	<1.25	-	-	-	<0.05	-	-	<0.12	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	<0.05	-	<0.12	<0.05	-	-
Prothiofos	mg/kg	0.05			-	-	<1.25	-	-	-	<0.05	-	-	<0.12	-	-	-	-	-	-	-	-	<0.05	-	-	-	-	-	-	<0.05	-	<0.12	<0.05	-	-
PCBs (Sum of total)	mg/kg	0.1		50	-	-	<0.25	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	<0.1	-	-	-	-	-
Cyanide Total	mg/kg	1		2,500	-	-	-	-	23.6	-	-	-	-	-	-	4.6	-	-	-	<1	-	-	-	-	-	<1	<1	-	-	-	-	-	-	<1	<1
Arsenic	mg/kg	5		500	<5	7	<5	-	-	11	<5	12	<5	17	-	-	-	-	-	-	-	-	6	<5	-	-	-	-	8	26	<5	5	6	-	-
Cadmium	mg/kg	1		100	<1	1	<1	-	-	<1	<1	<1	<1	3	-	-	-	-	-	-	-	-	<1	<1	-	-	-	-	<1	<1	<1	<1	<1	-	-
Chromium	mg/kg	2		500	9	8	12	-	-	15	26	15	14	20	-	-	-	-	-	-	-	-	25	18	-	-	-	-	32	34	7	20	15	-	-
Copper	mg/kg	5		5,000	<5	125	<5	-	-	28	<5	135	<5	103	-	-	-	-	-	-	-	-	<5	<5	-	-	-	-	<5	<5	6	<5	<5	-	-
Lead	mg/kg	5		1,500	21	643	7	-	-	311	11	106	18	426	-	-	-	-	-	-	-	-	21	23	-	-	-	-	11	18	19	5	26	-	-
Nickel	mg/kg	2		3,000	2	19	<2	-	-	11	<2	19	3	19	-	-	-	-	-	-	-	-	<2	<2	-	-	-	-	<2	<2	<2	<2	<2	-	-
Mercury	mg/kg	0.1		75	<0.1	0.4	<0.1	-	-	0.1	<0.1	0.2	<0.1	1.1	-	-	-	-	-	-	-	-	<0.1	<0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	-	-
Zinc	mg/kg	5		35,000	<5	1100	<5	-	-	100	9	241	<5	472	-	-	-	-	-	-	-	-	<5	<5	-	-	-	-	<5	<5	<5	<5	<5	-	-
TPH C 6 - C 9 Fraction	mg/kg	2	65		18	-	51	**97**	39	12	<2	<2	18	<2	<2	**228**	<2	<2	<2	24	8	<2	41	6	<2	<2	<2	<2	<2	56	<2	**107**	**65**	<2	<2
TPH C10 - C14 Fraction	mg/kg	50			660	-	99100	740	850	790	<50	<50	300	9650	<50	1190	<50	<50	<50	160	<50	<50	620	<50	<50	<50	<50	<50	<50	760	<50	450	<50	<50	<50
TPH C15-C28 Fraction	mg/kg	100			610	-	310000	1620	2110	13800	<100	630	360	200000	230	3350	<100	<100	<100	220	<100	<100	980	<100	<100	<100	<100	<100	<100	3060	<100	1400	<100	<100	<100
TPH C29-C36 Fraction	mg/kg	100			<100	-	26000	430	560	6110	<100	520	<100	25300	150	810	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	250	<100	240	<100	<100	<100
TPH_C10 - C36 (Sum of t	mg/kg		1000		**1370**	-	**435100**	**2790**	**3520**	**20700**	<250	**1200**	760	**234950**	430	**5350**	<250	<250	<250	480	<250	<250	**1700**	<250	<250	<250	<250	<250	<250	**4070**	<250	**2090**	<250	<250	<250
Benzene	mg/kg	0.2	1		0.2	-	0.2	0.3	**1.7**	0.5	<0.2	<0.2	<0.2	<0.2	<0.2	**20**	0.2	<0.2	<0.2	**2.4**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	**1.1**	<0.2	**1.8**	**2.7**	<0.2	<0.2
Ethylbenzene	mg/kg	0.2	50		3	-	3.6	12.3	2.4	0.3	<0.2	<0.2	0.5	<0.2	<0.2	8.3	<0.2	<0.2	<0.2	1.3	0.4	<0.2	6.9	0.5	<0.2	<0.2	<0.2	<0.2	<0.2	6.3	<0.2	17.5	4.9	<0.2	<0.2
Toluene	mg/kg	0.2	130		0.8	-	0.5	0.4	6.6	1.1	<0.2	<0.2	0.4	<0.2	<0.2	53	<0.2	<0.2	<0.2	4.1	<0.2	<0.2	2.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	1.9	<0.2	10.9	10.6	<0.2	<0.2
m- & p-xylene	mg/kg	0.2			5	-	4.7	5	14.5	2.4	<0.2	<0.2	0.4	<0.2	<0.2	68.7	<0.2	<0.2	<0.2	5.5	0.6	<0.2	13.9	0.8	<0.2	<0.2	<0.2	<0.2	<0.2	10.5	<0.2	38.7	15.5	<0.2	<0.2
o-xylene	mg/kg	0.2			4.5	-	5.9	1	6.5	1.6	<0.2	<0.2	0.2	<0.2	<0.2	26.2	<0.2	<0.2	<0.2	3.2	1	<0.2	8.8	0.6	<0.2	<0.2	<0.2	<0.2	<0.2	8.4	<0.2	17.5	9.3	<0.2	<0.2
Xylene Total	mg/kg			25	9.50	-	10.60	6.00	21.00	4.00	<0.4	<0.4	0.60	<0.4	<0.4	**94.90**	<0.4	<0.4	<0.4	8.70	1.60	<0.4	22.70	1.40	<0.4	<0.4	<0.4	<0.4	<0.4	18.90	<0.4	**56.20**	24.80	<0.4	<0.4

Notes:
(-) refers to analyte not tested.
BOLD refers to exceeds guideline criteria

Table 3 - Soil Analytical Results - Gas Purifier Area

Analyte	Unit	LOR	NSW EPA, 1994	NEPM HIL F	MG11/0.2	MG11/2.0	BHE/2.2	BHF/1.0	MG11/4.0	BHE/3.5	BHE/8.4	BHF/3.6	BHF/7.0	BHF/8.5
					Fill Samples				Natural Soil Samples					
2,4,5-trichlorophenol	mg/kg	0.5			-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-trichlorophenol	mg/kg	0.5			-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-dichlorophenol	mg/kg	0.5			-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-dimethylphenol	mg/kg	0.5			-	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,6-dichlorophenol	mg/kg	0.5			-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2-chlorophenol	mg/kg	0.5			-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2-methylphenol	mg/kg	0.5			-	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2-nitrophenol	mg/kg	0.5			-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
3-&4-methylphenol	mg/kg	1			-	<1	<1	<1	<1	<1	<1	<1	<1	<1
4-chloro-3-methylphenol	mg/kg	0.5			-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	mg/kg	2			-	<2	<2	<2	<2	<2	<2	<2	<2	<2
Phenol	mg/kg	0.5		42500	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	mg/kg	0.5			1.4	6.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.4
Acenaphthylene	mg/kg	0.5			14.8	25.4	<0.5	2.1	<0.5	<0.5	<0.5	<0.5	<0.5	4.2
Anthracene	mg/kg	0.5			26	47.8	<0.5	4	<0.5	<0.5	<0.5	<0.5	<0.5	2.4
Benz(a)anthracene	mg/kg	0.5			49.8	47.6	<0.5	7.8	<0.5	<0.5	<0.5	<0.5	<0.5	1.5
Benzo(a) pyrene	mg/kg	0.5		5	**42**	**48.8**	<0.5	**6.4**	<0.5	<0.5	<0.5	<0.5	<0.5	1.1
Benzo(b)fluoranthene	mg/kg	0.5			45.1	40.1	<0.5	7	<0.5	<0.5	<0.5	<0.5	<0.5	1.1
Benzo(g,h,i)perylene	mg/kg	0.5			22.5	21.7	<0.5	4.2	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
Benzo(k)fluoranthene	mg/kg	0.5			16.9	13.8	<0.5	3.7	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
Chrysene	mg/kg	0.5			39.4	33.3	<0.5	7.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.2
Dibenz(a,h)anthracene	mg/kg	0.5			6.4	4.9	<0.5	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	mg/kg	0.5			141	94.7	<0.5	12.9	<0.5	<0.5	<0.5	<0.5	<0.5	3.8
Fluorene	mg/kg	0.5			4.9	48.2	<0.5	0.9	<0.5	<0.5	<0.5	<0.5	<0.5	4.8
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5			19.6	15.6	<0.5	3.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	mg/kg	0.5			9.8	2.6	24.6	2.5	<0.5	<0.5	1.9	<0.5	0.8	99.8
Phenanthrene	mg/kg	0.5			110	157	<0.5	11.9	<0.5	<0.5	<0.5	<0.5	<0.5	7.6
Pyrene	mg/kg	0.5			147	121	<0.5	13.5	<0.5	<0.5	<0.5	<0.5	<0.5	3.7
PAHs (Sum of total)	mg/kg			100	**696.6**	**728.8**	32.1	89.5	8	8	9.4	8	8.3	**134.6**
4,4-DDE	mg/kg	0.05			-	<0.12	-	-	-	-	-	-	-	-
a-BHC	mg/kg	0.05			-	<0.12	-	-	-	-	-	-	-	-
Aldrin	mg/kg	0.05			-	<0.12	-	-	-	-	-	-	-	-
b-BHC	mg/kg	0.05			-	<0.12	-	-	-	-	-	-	-	-
cis-Chlordane	mg/kg	0.05			-	<0.12	-	-	-	-	-	-	-	-
d-BHC	mg/kg	0.05			-	<0.12	-	-	-	-	-	-	-	-
DDD	mg/kg	0.05			-	<0.12	-	-	-	-	-	-	-	-
DDT	mg/kg	0.2			-	<0.2	-	-	-	-	-	-	-	-
Dieldrin	mg/kg	0.05			-	<0.12	-	-	-	-	-	-	-	-
Endosulfan I	mg/kg	0.05			-	<0.12	-	-	-	-	-	-	-	-
Endosulfan II	mg/kg	0.05			-	<0.12	-	-	-	-	-	-	-	-
Endosulfan sulphate	mg/kg	0.05			-	<0.12	-	-	-	-	-	-	-	-
Endrin	mg/kg	0.05			-	<0.12	-	-	-	-	-	-	-	-
Endrin aldehyde	mg/kg	0.05			-	<0.12	-	-	-	-	-	-	-	-
Endrin ketone	mg/kg	0.05			-	<0.12	-	-	-	-	-	-	-	-
g-BHC (Lindane)	mg/kg	0.05			-	<0.12	-	-	-	-	-	-	-	-
Heptachlor	mg/kg	0.05		50	-	<0.12	-	-	-	-	-	-	-	-
Heptachlor epoxide	mg/kg	0.05			-	<0.12	-	-	-	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.05			-	<0.12	-	-	-	-	-	-	-	-
Methoxychlor	mg/kg	0.2			-	<0.2	-	-	-	-	-	-	-	-
trans-chlordane	mg/kg	0.05			-	<0.12	-	-	-	-	-	-	-	-
Aldrin + Dieldrin	mg/kg			50	-	0.24	-	-	-	-	-	-	-	-
DDT+DDE+DDD	mg/kg			1000	-	0.44	-	-	-	-	-	-	-	-
chlordane (total)	mg/kg			250	-	0.24	-	-	-	-	-	-	-	-
Azinophos methyl	mg/kg	0.05			-	<0.12	-	-	-	-	-	-	-	-
Bromophos-ethyl	mg/kg	0.05			-	<0.12	-	-	-	-	-	-	-	-
Carbophenothion	mg/kg	0.05			-	<0.12	-	-	-	-	-	-	-	-
Chlorfenvinphos	mg/kg	0.05			-	<0.12	-	-	-	-	-	-	-	-
Chlorpyrifos	mg/kg	0.05			-	<0.12	-	-	-	-	-	-	-	-
Chlorpyrifos-methyl	mg/kg	0.05			-	<0.12	-	-	-	-	-	-	-	-
Demeton-S-methyl	mg/kg	0.05			-	<0.12	-	-	-	-	-	-	-	-
Diazinon	mg/kg	0.05			-	<0.12	-	-	-	-	-	-	-	-
Dichlorvos	mg/kg	0.05			-	<0.12	-	-	-	-	-	-	-	-
Dimethoate	mg/kg	0.05			-	<0.12	-	-	-	-	-	-	-	-
Ethion	mg/kg	0.05			-	<0.12	-	-	-	-	-	-	-	-
Fenamiphos	mg/kg	0.05			-	<0.12	-	-	-	-	-	-	-	-
Fenthion	mg/kg	0.05			-	<0.12	-	-	-	-	-	-	-	-
Malathion	mg/kg	0.05			-	<0.12	-	-	-	-	-	-	-	-
Methyl parathion	mg/kg	0.2			-	<0.2	-	-	-	-	-	-	-	-
Monocrotophos	mg/kg	0.2			-	<0.2	-	-	-	-	-	-	-	-
Parathion	mg/kg	0.2			-	<0.2	-	-	-	-	-	-	-	-
Pirimphos-ethyl	mg/kg	0.05			-	<0.12	-	-	-	-	-	-	-	-
Prothiofos	mg/kg	0.05			-	<0.12	-	-	-	-	-	-	-	-
PCBs (Sum of total)	mg/kg	0.1		50	-	<0.25	-	-	-	-	-	-	-	-
Cyanide Total	mg/kg	1		1250	-	-	<1	5.3	-	1.6	<1	<1	<1	<1
Arsenic	mg/kg	5		500	38	<5	-	-	7	-	-	-	-	-
Cadmium	mg/kg	1		100	<1	<1	-	-	<1	-	-	-	-	-
Chromium	mg/kg	2		500	18	10	-	-	26	-	-	-	-	-
Copper	mg/kg	5		5000	94	6	-	-	<5	-	-	-	-	-
Lead	mg/kg	5		1500	174	25	-	-	13	-	-	-	-	-
Nickel	mg/kg	2		3000	11	<2	-	-	<2	-	-	-	-	-
Mercury	mg/kg	0.1		75	0.2	<0.1	-	-	<0.1	-	-	-	-	-
Zinc	mg/kg	5		35000	143	17	-	-	<5	-	-	-	-	-
TPH C 6 - C 9 Fraction	mg/kg	2	65		<2	10	**155**	<2	<2	<2	2	<2	7	22
TPH C10 - C14 Fraction	mg/kg	50			290	330	170	90	<50	<50	<50	<50	<50	650
TPH C15-C28 Fraction	mg/kg	100			4720	5760	190	740	<100	<100	<100	<100	<100	510
TPH C29-C36 Fraction	mg/kg	100			1200	1660	<100	320	<100	<100	<100	<100	<100	100
TPH_C10 - C36 (Sum of to	mg/kg		1000		**6210**	**7750**	460	**1150**	<250	<250	<250	<250	<250	**1260**
Benzene	mg/kg	0.2	1		<0.2	<0.2	0.4	<0.2	<0.2	<0.2	**1.6**	<0.2	0.8	0.8
Ethylbenzene	mg/kg	0.2	50		<0.2	<0.2	16.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	1.9
Toluene	mg/kg	0.2	130		<0.2	<0.2	0.4	<0.2	<0.2	<0.2	0.2	<0.2	0.4	<0.2
m- & p-xylene	mg/kg	0.2			<0.2	<0.2	6.5	<0.2	<0.2	<0.2	0.2	<0.2	0.6	4.6
o-xylene	mg/kg	0.2			<0.2	<0.2	10.5	<0.2	<0.2	<0.2	0.2	<0.2	0.4	5.2
Xylene Total	mg/kg		25		<0.4	<0.4	17.00	<0.4	<0.4	<0.4	<0.4	<0.4	1.00	9.80

Notes:
(-) refers to analyte not tested.
BOLD refers to exceeds guideline criteria

Table 4 - Soil Analytical Results - Northeast Area

Analyte	Unit	LOR	NSW EPA, 1994	NEPM HIL F	MG10/0.2	TP05/0.25	TP05/0.5	TP05/1.5	TP06/0.25	TP06/0.5	TP06/1.0	TP07/0.5	TP07/1.5	TP08/0.25	TP08/0.5	TP08/1.0	TP09/0.5	TP09/1.0	TP16/0.3	TP16/1.0	BH14A/1.4	MG10B/1.8	TP05/2.0	TP06/2.5	TP07/2.0	TP08/2.0	TP09/2.5	TP16/3.5	BH14A/2.4	MG10B/3.0
					Fill and Silty Clay Samples																		Natural Soil Samples							
2,4,5-trichlorophenol	mg/kg	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
2,4,6-trichlorophenol	mg/kg	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
2,4-dichlorophenol	mg/kg	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
2,4-dimethylphenol	mg/kg	0.5			<0.5	1.7	<0.5	-	3.1	-	<0.5	-	-	<0.5	<0.5	<0.5	-	<0.5	-	0.6	<0.5	<0.5	-	-	-	-	-	<0.5	<0.5	<0.5
2,6-dichlorophenol	mg/kg	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
2-chlorophenol	mg/kg	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
2-methylphenol	mg/kg	0.5			<0.5	2.4	<0.5	-	3	-	<0.5	-	-	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5	-	-	-	-	-	<0.5	<0.5	<0.5
2-nitrophenol	mg/kg	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
3-&4-methylphenol	mg/kg	1			<1	4	<1	-	7.8	-	<1	-	-	<1	<1	<1	-	<1	-	<1	<1	<1	-	-	-	-	-	<1	<1	<1
4-chloro-3-methylphenol	mg/kg	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
Pentachlorophenol	mg/kg	2			<2	<2	<2	-	<2	-	<2	-	-	<2	<2	<2	-	<2	-	<2	<2	<2	-	-	-	-	-	<2	<2	<2
Phenol	mg/kg	0.5		42500	<0.5	<0.5	<0.5	-	6.6	-	<0.5	-	-	<0.5	<0.5	<0.5	-	<0.5	-	<0.5	<0.5	<0.5	-	-	-	-	-	<0.5	<0.5	<0.5
Acenaphthene	mg/kg	0.5			<0.5	72.1	<0.5	<0.5	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	9.8	<0.5	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	mg/kg	0.5			1	114	<0.5	<0.5	18.3	<0.5	<0.5	<0.5	<0.5	1.1	<0.5	<0.5	0.9	<0.5	1.1	11	<0.5	1.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	mg/kg	0.5			0.9	206	<0.5	<0.5	30.2	<0.5	<0.5	<0.5	<0.5	2	<0.5	<0.5	2.1	<0.5	1.4	17.9	<0.5	2.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	mg/kg	0.5			2.1	188	<0.5	0.7	69.8	<0.5	0.8	<0.5	<0.5	7.5	<0.5	<0.5	6	<0.5	5	23.8	<0.5	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a) pyrene	mg/kg	0.5		5	1.8	**158**	<0.5	<0.5	**55**	<0.5	0.7	<0.5	<0.5	**8.2**	<0.5	<0.5	**5.4**	<0.5	**6.9**	**39.4**	<0.5	1.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	mg/kg	0.5			1.5	87.6	<0.5	<0.5	70.6	<0.5	<0.5	<0.5	<0.5	5.4	<0.5	<0.5	3.7	<0.5	7.7	37.1	<0.5	1.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	mg/kg	0.5			1.2	103	<0.5	<0.5	29.7	<0.5	<0.5	<0.5	<0.5	5.8	<0.5	<0.5	3.3	<0.5	5.2	19.2	<0.5	0.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	mg/kg	0.5			1.6	27.1	<0.5	<0.5	17.4	<0.5	0.6	<0.5	<0.5	6.7	<0.5	<0.5	4.2	<0.5	2.3	9.3	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	mg/kg	0.5			2.1	154	<0.5	0.6	51.7	<0.5	0.8	<0.5	<0.5	7	<0.5	<0.5	5.2	<0.5	4.4	21.2	<0.5	1.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	mg/kg	0.5			<0.5	25.9	<0.5	<0.5	10.6	<0.5	<0.5	<0.5	<0.5	1.9	<0.5	<0.5	0.9	<0.5	1.4	4.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	mg/kg	0.5			3.7	459	<0.5	1.2	106	<0.5	1.4	<0.5	<0.5	10.1	<0.5	<0.5	12.6	<0.5	5.4	50	<0.5	4.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	mg/kg	0.5			<0.5	196	<0.5	<0.5	8.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	<0.5	14	<0.5	3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5			1	69.2	<0.5	<0.5	26.8	<0.5	<0.5	<0.5	<0.5	4.6	<0.5	<0.5	2.8	<0.5	4	13.9	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	mg/kg	0.5			0.8	965	<0.5	<0.5	5.4	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	0.6	<0.5	1	38.7	0.7	3.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	mg/kg	0.5			2.8	792	<0.5	0.9	70.8	<0.5	<0.5	<0.5	<0.5	4.7	<0.5	<0.5	6.5	<0.5	2.3	42.8	<0.5	7.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	mg/kg	0.5			4.2	684	<0.5	1.1	117	<0.5	1.7	<0.5	<0.5	12.8	<0.5	<0.5	13.1	<0.5	7.1	72.3	<0.5	5.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
PAHs (Sum of total)	mg/kg			100	26.2	**4300.9**	8	10	**690.2**	8	11	8	8	79.4	8	8	68.5	8	56.2	**425.1**	8.2	38.4	8	8	8	8	8	8	8	8
4,4-DDE	mg/kg	0.05			<0.05	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-
a-BHC	mg/kg	0.05			<0.05	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-
Aldrin	mg/kg	0.05			<0.05	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-
b-BHC	mg/kg	0.05			<0.05	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-
cis-Chlordane	mg/kg	0.05			<0.05	-	0.06	-	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-
d-BHC	mg/kg	0.05			<0.05	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-
DDD	mg/kg	0.05			<0.05	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-
DDT	mg/kg	0.2			<0.2	-	<0.2	-	-	-	<0.2	-	-	-	<0.2	-	-	-	-	<0.2	-	-	-	-	-	-	-	-	-	-
Dieldrin	mg/kg	0.05			<0.05	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-
Endosulfan I	mg/kg	0.05			<0.05	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-
Endosulfan II	mg/kg	0.05			<0.05	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-
Endosulfan sulphate	mg/kg	0.05			<0.05	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-
Endrin	mg/kg	0.05			<0.05	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-
Endrin aldehyde	mg/kg	0.05			<0.05	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-
Endrin ketone	mg/kg	0.05			<0.05	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-
g-BHC (Lindane)	mg/kg	0.05			<0.05	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-
Heptachlor	mg/kg	0.05		50	<0.05	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-
Heptachlor epoxide	mg/kg	0.05			<0.05	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.05			<0.05	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-
Methoxychlor	mg/kg	0.2			<0.2	-	<0.2	-	-	-	<0.2	-	-	-	<0.2	-	-	-	-	<0.2	-	-	-	-	-	-	-	-	-	-
trans-chlordane	mg/kg	0.05			<0.05	-	0.08	-	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-
Aldrin + Dieldrin	mg/kg			50	0.1	-	0.1	-	-	-	0.1	-	-	-	0.1	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-
DDT+DDE+DDD	mg/kg			1000	0.3	-	0.3	-	-	-	0.3	-	-	-	0.3	-	-	-	-	0.3	-	-	-	-	-	-	-	-	-	-
chlordane (total)	mg/kg			250	0.1	-	0.14	-	-	-	0.1	-	-	-	0.1	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-
Azinophos methyl	mg/kg	0.05			<0.05	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-
Bromophos-ethyl	mg/kg	0.05			<0.05	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-
Carbophenothion	mg/kg	0.05			<0.05	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-
Chlorfenvinphos	mg/kg	0.05			<0.05	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-
Chlorpyrifos	mg/kg	0.05			<0.05	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-
Chlorpyrifos-methyl	mg/kg	0.05			<0.05	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-
Demeton-S-methyl	mg/kg	0.05			<0.05	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-
Diazinon	mg/kg	0.05			<0.05	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-
Dichlorvos	mg/kg	0.05			<0.05	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-
Dimethoate	mg/kg	0.05			<0.05	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-
Ethion	mg/kg	0.05			<0.05	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-
Fenamiphos	mg/kg	0.05			<0.05	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-
Fenthion	mg/kg	0.05			<0.05	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-
Malathion	mg/kg	0.05			<0.05	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-
Methyl parathion	mg/kg	0.2			<0.2	-	<0.2	-	-	-	<0.2	-	-	-	<0.2	-	-	-	-	<0.2	-	-	-	-	-	-	-	-	-	-
Monocrotophos	mg/kg	0.2			<0.2	-	<0.2	-	-	-	<0.2	-	-	-	<0.2	-	-	-	-	<0.2	-	-	-	-	-	-	-	-	-	-
Parathion	mg/kg	0.2			<0.2	-	<0.2	-	-	-	<0.2	-	-	-	<0.2	-	-	-	-	<0.2	-	-	-	-	-	-	-	-	-	-
Pirimphos-ethyl	mg/kg	0.05			<0.05	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-
Prothiofos	mg/kg	0.05			<0.05	-	<0.05	-	-	-	<0.05	-	-	-	<0.05	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-
PCBs (Sum of total)	mg/kg	0.1		50	<0.1	-	<0.1	-	-	-	<0.1	-	-	-	<0.1	-	-	-	-	<0.1	-	-	-	-	-	-	-	-	-	-
Cyanide Total	mg/kg	1		1250	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic	mg/kg	5		500	275	-	<5	6	-	-	<5	13	-	-	<5	8	-	5	11	<5	-	-	-	-	-	6	<5	7	-	-
Cadmium	mg/kg	1		100	1	-	<1	<1	-	-	<1	<1	-	-	<1	<1	-	<1	<1	<1	-	-	-	-	-	<1	<1	<1	-	-
Chromium	mg/kg	2		500	17	-	<2	5	-	-	5	5	-	-	16	26	-	7	7	3	-	-	-	-	-	22	13	14	-	-
Copper	mg/kg	5		5000	273	-	15	29	-	-	<5	60	-	-	<5	<5	-	27	273	25	-	-	-	-	-	5	6	14	-	-
Lead	mg/kg	5		1500	251	-	6	172	-	-	10	28	-	-	8	14	-	22	175	18	-	-	-	-	-	17	17	23	-	-
Nickel	mg/kg	2		3000	19	-	<2	10	-	-	<2	2	-	-	<2	<2	-	<2	11	4	-	-	-	-	-	<2	<2	<2	-	-
Mercury	mg/kg	0.1		75	0.2	-	<0.1	0.3	-	-	<0.1	0.2	-	-	<0.1	<0.1	-	<0.1	3.3	<0.1	-	-	-	-	-	<0.1	<0.1	<0.1	-	-
Zinc	mg/kg	5		35000	217	-	28	147	-	-	6	11	-	-	5	<5	-	<5	74	58	-	-	-	-	-	<5	<5	<5	-	-
TPH C 6 - C 9 Fraction	mg/kg	2	65		<2	-	<2	<2	-	<2	<2	<2	<2	-	<2	<2	<2	<2	13	**166**	9	<2	<2	<2	<2	<2	<2	<2	<2	<2
TPH C10 - C14 Fraction	mg/kg	50			<50	-	<50	<50	-	<50	<50	<50	<50	-	<50	<50	<50	<50	60	320	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
TPH C15-C28 Fraction	mg/kg	100			1390	-	<100	<100	-	<100	<100	<100	<100	-	<100	<100	290	<100	760	5120	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
TPH C29-C36 Fraction	mg/kg	100			500	-	<100	<100	-	<100	<100	<100	<100	-	<100	<100	180	<100	460	2200	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
TPH_C10 - C36 (Sum of total)	mg/kg		1000		**1940**	-	<250	<250	-	<250	<250	<250	<250	-	<250	<250	520	<250	**1280**	**7640**	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250	<250
Benzene	mg/kg	0.2	1		<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	**1.2**	**3.1**	0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	mg/kg	0.2	50		<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	0.3	6.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	0.2	130		<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	2.8	3.7	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
m- & p-xylene	mg/kg	0.2			<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	3.5	53.8	0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.2			<0.2	-	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	2.1	7.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Xylene Total	mg/kg			25	<0.4	-	<0.4	<0.4	-	<0.4	<0.4	<0.4	<0.4	-	<0.4	<0.4	<0.4	<0.4	5.60	**61.20**	0.60	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4

Notes:
(-) refers to analyte not tested.
BOLD refers to exceeds guideline criteria

Table 5 - Soil Analytical Results - South Central Area

Analyte	Unit	LOR	NSW EPA, 1994	NEPM HIL F	TP03/0.5	TP03/1.0	TP04/0.5	TP04/0.7	TP11/0.2	TP11/1.0	TP03/2.0	TP03/4.0	TP04/3.0	TP11/3.5
					Fill and Silty Clay Samples						Natural Soil Samples			
2,4,5-trichlorophenol	mg/kg	0.5			-	<0.5	-	-	-	<0.5	-	-	-	-
2,4,6-trichlorophenol	mg/kg	0.5			-	<0.5	-	-	-	<0.5	-	-	-	-
2,4-dichlorophenol	mg/kg	0.5			-	<0.5	-	-	-	<0.5	-	-	-	-
2,4-dimethylphenol	mg/kg	0.5			-	<0.5	-	-	-	<0.5	-	-	-	-
2,6-dichlorophenol	mg/kg	0.5			-	<0.5	-	-	-	<0.5	-	-	-	-
2-chlorophenol	mg/kg	0.5			-	<0.5	-	-	-	<0.5	-	-	-	-
2-methylphenol	mg/kg	0.5			-	<0.5	-	-	-	<0.5	-	-	-	-
2-nitrophenol	mg/kg	0.5			-	<0.5	-	-	-	<0.5	-	-	-	-
3-&4-methylphenol	mg/kg	1			-	<1	-	-	-	<1	-	-	-	-
4-chloro-3-methylphenol	mg/kg	0.5			-	<0.5	-	-	-	<0.5	-	-	-	-
Pentachlorophenol	mg/kg	2			-	<2	-	-	-	<2	-	-	-	-
Phenol	mg/kg	0.5		42500	-	<0.5	-	-	-	<0.5	-	-	-	-
Acenaphthene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	1.4	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	2	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	6.1	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a) pyrene	mg/kg	0.5		5	<0.5	<0.5	<0.5	<0.5	**6.2**	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	6.9	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	3.6	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	2.3	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	5.1	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	1.1	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	mg/kg	0.5			0.6	<0.5	<0.5	<0.5	9	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	2.9	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	mg/kg	0.5			<0.5	<0.5	<0.5	1.3	0.8	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	4.9	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	mg/kg	0.5			0.6	<0.5	<0.5	<0.5	10.5	<0.5	<0.5	<0.5	<0.5	<0.5
PAHs (Sum of total)	mg/kg			100	8.2	8	8	8.8	63.8	8	8	8	8	8
4,4-DDE	mg/kg	0.05			-	<0.05	-	<0.05	-	<0.05	-	-	-	-
a-BHC	mg/kg	0.05			-	<0.05	-	<0.05	-	<0.05	-	-	-	-
Aldrin	mg/kg	0.05			-	<0.05	-	<0.05	-	<0.05	-	-	-	-
b-BHC	mg/kg	0.05			-	<0.05	-	<0.05	-	<0.05	-	-	-	-
cis-Chlordane	mg/kg	0.05			-	<0.05	-	<0.05	-	<0.05	-	-	-	-
d-BHC	mg/kg	0.05			-	<0.05	-	<0.05	-	<0.05	-	-	-	-
DDD	mg/kg	0.05			-	<0.05	-	<0.05	-	<0.05	-	-	-	-
DDT	mg/kg	0.2			-	<0.2	-	<0.2	-	<0.2	-	-	-	-
Dieldrin	mg/kg	0.05			-	<0.05	-	<0.05	-	<0.05	-	-	-	-
Endosulfan I	mg/kg	0.05			-	<0.05	-	<0.05	-	<0.05	-	-	-	-
Endosulfan II	mg/kg	0.05			-	<0.05	-	<0.05	-	<0.05	-	-	-	-
Endosulfan sulphate	mg/kg	0.05			-	<0.05	-	<0.05	-	<0.05	-	-	-	-
Endrin	mg/kg	0.05			-	<0.05	-	<0.05	-	<0.05	-	-	-	-
Endrin aldehyde	mg/kg	0.05			-	<0.05	-	<0.05	-	<0.05	-	-	-	-
Endrin ketone	mg/kg	0.05			-	<0.05	-	<0.05	-	<0.05	-	-	-	-
g-BHC (Lindane)	mg/kg	0.05			-	<0.05	-	<0.05	-	<0.05	-	-	-	-
Heptachlor	mg/kg	0.05		50	-	<0.05	-	<0.05	-	<0.05	-	-	-	-
Heptachlor epoxide	mg/kg	0.05			-	<0.05	-	<0.05	-	<0.05	-	-	-	-
Hexachlorobenzene	mg/kg	0.05			-	<0.05	-	<0.05	-	<0.05	-	-	-	-
Methoxychlor	mg/kg	0.2			-	<0.2	-	<0.2	-	<0.2	-	-	-	-
trans-chlordane	mg/kg	0.05			-	<0.05	-	<0.05	-	<0.05	-	-	-	-
Aldrin + Dieldrin	mg/kg			50	-	0.1	-	0.1	-	0.1	-	-	-	-
DDT+DDE+DDD	mg/kg			1000	-	0.3	-	0.3	-	0.3	-	-	-	-
chlordane (total)	mg/kg			250	-	0.1	-	0.1	-	0.1	-	-	-	-
Azinophos methyl	mg/kg	0.05			-	<0.05	-	<0.05	-	<0.05	-	-	-	-
Bromophos-ethyl	mg/kg	0.05			-	<0.05	-	<0.05	-	<0.05	-	-	-	-
Carbophenothion	mg/kg	0.05			-	<0.05	-	<0.05	-	<0.05	-	-	-	-
Chlorfenvinphos	mg/kg	0.05			-	<0.05	-	<0.05	-	<0.05	-	-	-	-
Chlorpyrifos	mg/kg	0.05			-	<0.05	-	<0.05	-	<0.05	-	-	-	-
Chlorpyrifos-methyl	mg/kg	0.05			-	<0.05	-	<0.05	-	<0.05	-	-	-	-
Demeton-S-methyl	mg/kg	0.05			-	<0.05	-	<0.05	-	<0.05	-	-	-	-
Diazinon	mg/kg	0.05			-	<0.05	-	<0.05	-	<0.05	-	-	-	-
Dichlorvos	mg/kg	0.05			-	<0.05	-	<0.05	-	<0.05	-	-	-	-
Dimethoate	mg/kg	0.05			-	<0.05	-	<0.05	-	<0.05	-	-	-	-
Ethion	mg/kg	0.05			-	<0.05	-	<0.05	-	<0.05	-	-	-	-
Fenamiphos	mg/kg	0.05			-	<0.05	-	<0.05	-	<0.05	-	-	-	-
Fenthion	mg/kg	0.05			-	<0.05	-	<0.05	-	<0.05	-	-	-	-
Malathion	mg/kg	0.05			-	<0.05	-	<0.05	-	<0.05	-	-	-	-
Methyl parathion	mg/kg	0.2			-	<0.2	-	<0.2	-	<0.2	-	-	-	-
Monocrotophos	mg/kg	0.2			-	<0.2	-	<0.2	-	<0.2	-	-	-	-
Parathion	mg/kg	0.2			-	<0.2	-	<0.2	-	<0.2	-	-	-	-
Pirimphos-ethyl	mg/kg	0.05			-	<0.05	-	<0.05	-	<0.05	-	-	-	-
Prothiofos	mg/kg	0.05			-	<0.05	-	<0.05	-	<0.05	-	-	-	-
PCBs (Sum of total)	mg/kg	0.1		50	-	<0.1	-	-	-	<0.1	-	-	-	-
Cyanide Total	mg/kg	1		1250	-	-	-	-	-	-	-	-	-	-
Arsenic	mg/kg	5		500	-	<5	-	15	26	<5	-	-	-	-
Cadmium	mg/kg	1		100	-	<1	-	<1	<1	<1	-	-	-	-
Chromium	mg/kg	2		500	-	6	-	11	19	12	-	-	-	-
Copper	mg/kg	5		5000	-	17	-	16	176	<5	-	-	-	-
Lead	mg/kg	5		1500	-	30	-	47	344	<5	-	-	-	-
Nickel	mg/kg	2		3000	-	25	-	<2	23	<2	-	-	-	-
Mercury	mg/kg	0.1		75	-	0.1	-	0.1	0.3	<0.1	-	-	-	-
Zinc	mg/kg	5		35000	-	161	-	17	205	32	-	-	-	-
TPH C 6 - C 9 Fraction	mg/kg	2	65		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
TPH C10 - C14 Fraction	mg/kg	50			<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
TPH C15-C28 Fraction	mg/kg	100			<100	<100	<100	<100	850	<100	<100	<100	<100	<100
TPH C29-C36 Fraction	mg/kg	100			<100	<100	<100	<100	510	<100	<100	<100	<100	<100
TPH_C10 - C36 (Sum of total)	mg/kg		1000		<250	<250	<250	<250	**1410**	<250	<250	<250	<250	<250
Benzene	mg/kg	0.2	1		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	mg/kg	0.2	50		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	0.2	130		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
m- & p-xylene	mg/kg	0.2			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.2			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Xylene Total	mg/kg		25		<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4

Notes:
(-) refers to analyte not tested.
BOLD refers to exceeds guideline criteria

Table 6 - Soil Analytical Results - Southwest Area

Analyte	Unit	LOR	NSW EPA, 1994	NEPM HIL F	MG01/1.8	MG01/2.8	RP/2.0	TP01/0.25	TP01/1.0	TP01/1.5	TP01/3.0	TP02/1.0	TP02/3.0	MG01/5	TP02/4.5	TP02/4.5	BHA/5.0
					Fill Samples									Natural Soil Samples			
2,4,5-trichlorophenol	mg/kg	0.5			<0.5	-	<0.5	-	-	<0.5	-	-	-	-	-	-	<0.5
2,4,6-trichlorophenol	mg/kg	0.5			<0.5	-	<0.5	-	-	<0.5	-	-	-	-	-	-	<0.5
2,4-dichlorophenol	mg/kg	0.5			<0.5	-	<0.5	-	-	<0.5	-	-	-	-	-	-	<0.5
2,4-dimethylphenol	mg/kg	0.5			<0.5	-	<0.5	-	-	<0.5	-	-	-	-	-	-	<0.5
2,6-dichlorophenol	mg/kg	0.5			<0.5	-	<0.5	-	-	<0.5	-	-	-	-	-	-	<0.5
2-chlorophenol	mg/kg	0.5			<0.5	-	<0.5	-	-	<0.5	-	-	-	-	-	-	<0.5
2-methylphenol	mg/kg	0.5			<0.5	-	<0.5	-	-	<0.5	-	-	-	-	-	-	<0.5
2-nitrophenol	mg/kg	0.5			<0.5	-	<0.5	-	-	<0.5	-	-	-	-	-	-	<0.5
3-&4-methylphenol	mg/kg	1			<1	-	<1	-	-	<1	-	-	-	-	-	-	<1
4-chloro-3-methylphenol	mg/kg	0.5			<0.5	-	<0.5	-	-	<0.5	-	-	-	-	-	-	<0.5
Pentachlorophenol	mg/kg	2			<2	-	<2	-	-	<2	-	-	-	-	-	-	<2
Phenol	mg/kg	0.5		42500	<0.5	-	<0.5	-	-	<0.5	-	-	-	-	-	-	<0.5
Acenaphthene	mg/kg	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
Acenaphthylene	mg/kg	0.5			1.4	<0.5	7.5	1.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	mg/kg	0.5			<0.5	<0.5	3.6	0.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	mg/kg	0.5			0.7	<0.5	10	3.2	<0.5	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a) pyrene	mg/kg	0.5		5	0.6	<0.5	**12.8**	3.5	<0.5	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	mg/kg	0.5			1	<0.5	13.1	2.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	mg/kg	0.5			0.8	<0.5	9.8	3.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	mg/kg	0.5			1.2	<0.5	5.6	3.2	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	mg/kg	0.5			0.9	<0.5	9.4	3.3	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	mg/kg	0.5			<0.5	<0.5	2	0.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	mg/kg	0.5			1.3	<0.5	10.8	4.6	<0.5	<0.5	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	mg/kg	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
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5			0.7	<0.5	6.5	2.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	mg/kg	0.5			0.6	<0.5	3.3	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	mg/kg	0.5			1.3	<0.5	5.3	1.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	mg/kg	0.5			1.1	<0.5	17.5	7	<0.5	<0.5	1.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
PAHs (Sum of total)	mg/kg			100	13.6	8	**118.2**	39.2	8	8	10.4	8	8	8	8	8	8
4,4-DDE	mg/kg	0.05			<0.05	-	<0.05	-	-	<0.05	-	-	-	-	-	<0.05	-
a-BHC	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	-
b-BHC	mg/kg	0.05			<0.05	-	<0.05	-	-	<0.05	-	-	-	-	-	<0.05	-
cis-Chlordane	mg/kg	0.05			<0.05	-	<0.05	-	-	<0.05	-	-	-	-	-	<0.05	-
d-BHC	mg/kg	0.05			<0.05	-	<0.05	-	-	<0.05	-	-	-	-	-	<0.05	-
DDD	mg/kg	0.05			<0.05	-	<0.05	-	-	<0.05	-	-	-	-	-	<0.05	-
DDT	mg/kg	0.2			<0.2	-	<0.2	-	-	<0.2	-	-	-	-	-	<0.2	-
Dieldrin	mg/kg	0.05			<0.05	-	<0.05	-	-	<0.05	-	-	-	-	-	<0.05	-
Endosulfan I	mg/kg	0.05			<0.05	-	<0.05	-	-	<0.05	-	-	-	-	-	<0.05	-
Endosulfan II	mg/kg	0.05			<0.05	-	<0.05	-	-	<0.05	-	-	-	-	-	<0.05	-
Endosulfan sulphate	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	-
Endrin aldehyde	mg/kg	0.05			<0.05	-	<0.05	-	-	<0.05	-	-	-	-	-	<0.05	-
Endrin ketone	mg/kg	0.05			<0.05	-	<0.05	-	-	<0.05	-	-	-	-	-	<0.05	-
g-BHC (Lindane)	mg/kg	0.05			<0.05	-	<0.05	-	-	<0.05	-	-	-	-	-	<0.05	-
Heptachlor	mg/kg	0.05		50	<0.05	-	<0.05	-	-	<0.05	-	-	-	-	-	<0.05	-
Heptachlor epoxide	mg/kg	0.05			<0.05	-	<0.05	-	-	<0.05	-	-	-	-	-	<0.05	-
Hexachlorobenzene	mg/kg	0.05			<0.05	-	<0.05	-	-	<0.05	-	-	-	-	-	<0.05	-
Methoxychlor	mg/kg	0.2			<0.2	-	<0.2	-	-	<0.2	-	-	-	-	-	<0.2	-
trans-chlordane	mg/kg	0.05			<0.05	-	<0.05	-	-	<0.05	-	-	-	-	-	<0.05	-
Aldrin + Dieldrin	mg/kg			50	0.1	-	0.1	-	-	0.1	-	-	-	-	-	0.1	-
DDT+DDE+DDD	mg/kg			1000	0.3	-	0.3	-	-	0.3	-	-	-	-	-	0.3	-
chlordane (total)	mg/kg			250	0.1	-	0.1	-	-	0.1	-	-	-	-	-	0.1	-
Azinophos methyl	mg/kg	0.05			<0.05	-	<0.05	-	-	<0.05	-	-	-	-	-	<0.05	-
Bromophos-ethyl	mg/kg	0.05			<0.05	-	<0.05	-	-	<0.05	-	-	-	-	-	<0.05	-
Carbophenothion	mg/kg	0.05			<0.05	-	<0.05	-	-	<0.05	-	-	-	-	-	<0.05	-
Chlorfenvinphos	mg/kg	0.05			<0.05	-	<0.05	-	-	<0.05	-	-	-	-	-	<0.05	-
Chlorpyrifos	mg/kg	0.05			<0.05	-	<0.05	-	-	<0.05	-	-	-	-	-	<0.05	-
Chlorpyrifos-methyl	mg/kg	0.05			<0.05	-	<0.05	-	-	<0.05	-	-	-	-	-	<0.05	-
Demeton-S-methyl	mg/kg	0.05			<0.05	-	<0.05	-	-	<0.05	-	-	-	-	-	<0.05	-
Diazinon	mg/kg	0.05			<0.05	-	<0.05	-	-	<0.05	-	-	-	-	-	<0.05	-
Dichlorvos	mg/kg	0.05			<0.05	-	<0.05	-	-	<0.05	-	-	-	-	-	<0.05	-
Dimethoate	mg/kg	0.05			<0.05	-	<0.05	-	-	<0.05	-	-	-	-	-	<0.05	-
Ethion	mg/kg	0.05			<0.05	-	<0.05	-	-	<0.05	-	-	-	-	-	<0.05	-
Fenamiphos	mg/kg	0.05			<0.05	-	<0.05	-	-	<0.05	-	-	-	-	-	<0.05	-
Fenthion	mg/kg	0.05			<0.05	-	<0.05	-	-	<0.05	-	-	-	-	-	<0.05	-
Malathion	mg/kg	0.05			<0.05	-	<0.05	-	-	<0.05	-	-	-	-	-	<0.05	-
Methyl parathion	mg/kg	0.2			<0.2	-	<0.2	-	-	<0.2	-	-	-	-	-	<0.2	-
Monocrotophos	mg/kg	0.2			<0.2	-	<0.2	-	-	<0.2	-	-	-	-	-	<0.2	-
Parathion	mg/kg	0.2			<0.2	-	<0.2	-	-	<0.2	-	-	-	-	-	<0.2	-
Pirimphos-ethyl	mg/kg	0.05			<0.05	-	<0.05	-	-	<0.05	-	-	-	-	-	<0.05	-
Prothiofos	mg/kg	0.05			<0.05	-	<0.05	-	-	<0.05	-	-	-	-	-	<0.05	-
PCBs (Sum of total)	mg/kg	0.1		50	<0.1	-	<0.1	-	-	<0.1	-	-	-	-	-	-	-
Cyanide Total	mg/kg	1		1250	<1	-	-	-	-	-	-	-	-	-	-	-	-
Arsenic	mg/kg	5		500	<5	-	6	-	-	<5	-	-	-	-	-	7	-
Cadmium	mg/kg	1		100	<1	-	<1	-	-	<1	-	-	-	-	-	<1	-
Chromium	mg/kg	2		500	4	-	20	-	-	<2	-	-	-	-	-	22	-
Copper	mg/kg	5		5000	140	-	28	-	-	14	-	-	-	-	-	<5	-
Lead	mg/kg	5		1500	65	-	93	-	-	10	-	-	-	-	-	16	-
Nickel	mg/kg	2		3000	2	-	4	-	-	<2	-	-	-	-	-	<2	-
Mercury	mg/kg	0.1		75	<0.1	-	0.1	-	-	<0.1	-	-	-	-	-	<0.1	-
Zinc	mg/kg	5		35000	12	-	34	-	-	<5	-	-	-	-	-	<5	-
TPH C 6 - C 9 Fraction	mg/kg	2	65		<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
TPH C10 - C14 Fraction	mg/kg	50			<50	<50	120	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
TPH C15-C28 Fraction	mg/kg	100			<100	<100	930	250	<100	<100	<100	<100	<100	<100	<100	<100	<100
TPH C29-C36 Fraction	mg/kg	100			<100	<100	680	220	<100	<100	<100	<100	<100	<100	<100	<100	<100
TPH_C10 - C36 (Sum of total)	mg/kg		1000		<250	<250	**1730**	520	<250	<250	<250	<250	<250	<250	<250	<250	<250
Benzene	mg/kg	0.2	1		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	mg/kg	0.2	50		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	0.2	130		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
m- & p-xylene	mg/kg	0.2			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.2			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Xylene Total	mg/kg		25		<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4

Notes:
(-) refers to analyte not tested.
BOLD refers to exceeds guideline criteria

Table 7 - Soil Analytical Results - Retaining Wall Area

Analyte	Unit	LOR	NSW EPA, 1994	NEPM HIL F	TP10/1.0	TP10/2.0	TP12/0.25	TP12/0.5	TP18/1.2	TP10/4.0	TP18/3.2	TP18/4.4
					Fill Samples					Natural Soil Samples		
2,4,5-trichlorophenol	mg/kg	0.5			<0.5	-	<0.5	<0.5	<0.5	-	-	-
2,4,6-trichlorophenol	mg/kg	0.5			<0.5	-	<0.5	<0.5	<0.5	-	-	-
2,4-dichlorophenol	mg/kg	0.5			<0.5	-	<0.5	<0.5	<0.5	-	-	-
2,4-dimethylphenol	mg/kg	0.5			<0.5	-	<0.5	<0.5	<0.5	-	-	-
2,6-dichlorophenol	mg/kg	0.5			<0.5	-	<0.5	<0.5	<0.5	-	-	-
2-chlorophenol	mg/kg	0.5			<0.5	-	<0.5	<0.5	<0.5	-	-	-
2-methylphenol	mg/kg	0.5			<0.5	-	<0.5	<0.5	<0.5	-	-	-
2-nitrophenol	mg/kg	0.5			<0.5	-	<0.5	<0.5	<0.5	-	-	-
3-&4-methylphenol	mg/kg	1			<1	-	<1	<1	<1	-	-	-
4-chloro-3-methylphenol	mg/kg	0.5			<0.5	-	<0.5	<0.5	<0.5	-	-	-
Pentachlorophenol	mg/kg	2			<2	-	<2	<2	<2	-	-	-
Phenol	mg/kg	0.5		42500	<0.5	-	<0.5	<0.5	<0.5	-	-	-
Acenaphthene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	mg/kg	0.5			<0.5	<0.5	4	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	mg/kg	0.5			<0.5	0.7	3	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	mg/kg	0.5			<0.5	1.4	9.3	1	<0.5	<0.5	<0.5	<0.5
Benzo(a) pyrene	mg/kg	0.5		5	<0.5	1	**9.6**	1	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	mg/kg	0.5			<0.5	0.8	8.2	0.8	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	mg/kg	0.5			<0.5	0.6	11.1	1	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	mg/kg	0.5			<0.5	1.2	8.5	0.9	<0.5	<0.5	<0.5	<0.5
Chrysene	mg/kg	0.5			<0.5	1.2	9.4	1	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	mg/kg	0.5			<0.5	<0.5	2.8	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	mg/kg	0.5			<0.5	2.8	15	2	<0.5	<0.5	<0.5	<0.5
Fluorene	mg/kg	0.5			<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5			<0.5	0.5	7.4	0.7	<0.5	<0.5	<0.5	<0.5
Naphthalene	mg/kg	0.5			<0.5	<0.5	1.8	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	mg/kg	0.5			<0.5	1.8	7.1	1	<0.5	<0.5	<0.5	<0.5
Pyrene	mg/kg	0.5			<0.5	2.5	19.2	2	<0.5	<0.5	<0.5	<0.5
PAHs (Sum of total)	mg/kg			100	8	17	**117.4**	14.4	8	8	8	8
4,4-DDE	mg/kg	0.05			<0.05	-	-	<0.05	<0.05	-	-	-
a-BHC	mg/kg	0.05			<0.05	-	-	<0.05	<0.05	-	-	-
Aldrin	mg/kg	0.05			<0.05	-	-	<0.05	<0.05	-	-	-
b-BHC	mg/kg	0.05			<0.05	-	-	<0.05	<0.05	-	-	-
cis-Chlordane	mg/kg	0.05			<0.05	-	-	<0.05	<0.05	-	-	-
d-BHC	mg/kg	0.05			<0.05	-	-	<0.05	<0.05	-	-	-
DDD	mg/kg	0.05			<0.05	-	-	<0.05	<0.05	-	-	-
DDT	mg/kg	0.2			<0.2	-	-	<0.2	<0.2	-	-	-
Dieldrin	mg/kg	0.05			<0.05	-	-	<0.05	<0.05	-	-	-
Endosulfan I	mg/kg	0.05			<0.05	-	-	<0.05	<0.05	-	-	-
Endosulfan II	mg/kg	0.05			<0.05	-	-	<0.05	<0.05	-	-	-
Endosulfan sulphate	mg/kg	0.05			<0.05	-	-	<0.05	<0.05	-	-	-
Endrin	mg/kg	0.05			<0.05	-	-	<0.05	<0.05	-	-	-
Endrin aldehyde	mg/kg	0.05			<0.05	-	-	<0.05	<0.05	-	-	-
Endrin ketone	mg/kg	0.05			<0.05	-	-	<0.05	<0.05	-	-	-
g-BHC (Lindane)	mg/kg	0.05			<0.05	-	-	<0.05	<0.05	-	-	-
Heptachlor	mg/kg	0.05		50	<0.05	-	-	<0.05	<0.05	-	-	-
Heptachlor epoxide	mg/kg	0.05			<0.05	-	-	<0.05	<0.05	-	-	-
Hexachlorobenzene	mg/kg	0.05			<0.05	-	-	<0.05	<0.05	-	-	-
Methoxychlor	mg/kg	0.2			<0.2	-	-	<0.2	<0.2	-	-	-
trans-chlordane	mg/kg	0.05			<0.05	-	-	<0.05	<0.05	-	-	-
Aldrin + Dieldrin	mg/kg			50	0.1	-	-	0.1	0.1	-	-	-
DDT+DDE+DDD	mg/kg			1000	0.3	-	-	0.3	0.3	-	-	-
chlordane (total)	mg/kg			250	0.1	-	-	0.1	0.1	-	-	-
Azinophos methyl	mg/kg	0.05			<0.05	-	-	<0.05	<0.05	-	-	-
Bromophos-ethyl	mg/kg	0.05			<0.05	-	-	<0.05	<0.05	-	-	-
Carbophenothion	mg/kg	0.05			<0.05	-	-	<0.05	<0.05	-	-	-
Chlorfenvinphos	mg/kg	0.05			<0.05	-	-	<0.05	<0.05	-	-	-
Chlorpyrifos	mg/kg	0.05			<0.05	-	-	<0.05	<0.05	-	-	-
Chlorpyrifos-methyl	mg/kg	0.05			<0.05	-	-	<0.05	<0.05	-	-	-
Demeton-S-methyl	mg/kg	0.05			<0.05	-	-	<0.05	<0.05	-	-	-
Diazinon	mg/kg	0.05			<0.05	-	-	<0.05	<0.05	-	-	-
Dichlorvos	mg/kg	0.05			<0.05	-	-	<0.05	<0.05	-	-	-
Dimethoate	mg/kg	0.05			<0.05	-	-	<0.05	<0.05	-	-	-
Ethion	mg/kg	0.05			<0.05	-	-	<0.05	<0.05	-	-	-
Fenamiphos	mg/kg	0.05			<0.05	-	-	<0.05	<0.05	-	-	-
Fenthion	mg/kg	0.05			<0.05	-	-	<0.05	<0.05	-	-	-
Malathion	mg/kg	0.05			<0.05	-	-	<0.05	<0.05	-	-	-
Methyl parathion	mg/kg	0.2			<0.2	-	-	<0.2	<0.2	-	-	-
Monocrotophos	mg/kg	0.2			<0.2	-	-	<0.2	<0.2	-	-	-
Parathion	mg/kg	0.2			<0.2	-	-	<0.2	<0.2	-	-	-
Pirimphos-ethyl	mg/kg	0.05			<0.05	-	-	<0.05	<0.05	-	-	-
Prothiofos	mg/kg	0.05			<0.05	-	-	<0.05	<0.05	-	-	-
PCBs (Sum of total)	mg/kg	0.1		50	<0.1	-	-	<0.1	<0.1	-	-	-
Cyanide Total	mg/kg	1		1250	-	-	-	-	-	-	-	-
Arsenic	mg/kg	5		500	<5	7	31	71	7	7	6	6
Cadmium	mg/kg	1		100	<1	1	2	1	<1	<1	<1	<1
Chromium	mg/kg	2		500	2	9	26	18	22	17	25	23
Copper	mg/kg	5		5000	38	44	248	334	16	6	14	<5
Lead	mg/kg	5		1500	25	62	1060	219	73	16	19	13
Nickel	mg/kg	2		3000	2	5	21	11	<2	<2	6	2
Mercury	mg/kg	0.1		75	<0.1	<0.1	0.7	0.2	<0.1	<0.1	<0.1	<0.1
Zinc	mg/kg	5		35000	160	634	1110	362	52	<5	17	<5
TPH C 6 - C 9 Fraction	mg/kg	2	65		<2	<2	<2	<2	<2	<2	<2	<2
TPH C10 - C14 Fraction	mg/kg	50			<50	<50	180	<50	<50	<50	<50	<50
TPH C15-C28 Fraction	mg/kg	100			<100	<100	1420	<100	<100	<100	<100	<100
TPH C29-C36 Fraction	mg/kg	100			<100	<100	720	<100	<100	<100	<100	<100
TPH_C10 - C36 (Sum of total)	mg/kg		1000		<250	<250	**2320**	<250	<250	<250	<250	<250
Benzene	mg/kg	0.2	1		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	mg/kg	0.2	50		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	0.2	130		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
m- & p-xylene	mg/kg	0.2			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.2			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Xylene Total	mg/kg		25		<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4

Notes:
(-) refers to analyte not tested.
BOLD refers to exceeds guideline criteria

Table 8 - Soil Analytical Results - Western Lot Area

Analyte	Unit	LOR	NSW EPA, 1994	NEPM HIL F	TP13/0.25	TP14/0.25	TP14/0.5	TP13/1.0	TP13/1.5	TP14/1.0	TP14/1.5
					Fill Samples			Natural Soil Samples			
2,4,5-trichlorophenol	mg/kg	0.5			<0.5	<0.5	-	-	-	<0.5	-
2,4,6-trichlorophenol	mg/kg	0.5			<0.5	<0.5	-	-	-	<0.5	-
2,4-dichlorophenol	mg/kg	0.5			<0.5	<0.5	-	-	-	<0.5	-
2,4-dimethylphenol	mg/kg	0.5			1.4	<0.5	-	-	-	<0.5	-
2,6-dichlorophenol	mg/kg	0.5			<0.5	<0.5	-	-	-	<0.5	-
2-chlorophenol	mg/kg	0.5			<0.5	<0.5	-	-	-	<0.5	-
2-methylphenol	mg/kg	0.5			1	<0.5	-	-	-	<0.5	-
2-nitrophenol	mg/kg	0.5			<0.5	<0.5	-	-	-	<0.5	-
3-&4-methylphenol	mg/kg	1			2.8	<1	-	-	-	<1	-
4-chloro-3-methylphenol	mg/kg	0.5			<0.5	<0.5	-	-	-	<0.5	-
Pentachlorophenol	mg/kg	2			<2	<2	-	-	-	<2	-
Phenol	mg/kg	0.5		42500	1.5	<0.5	-	-	-	<0.5	-
Acenaphthene	mg/kg	0.5			1.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	mg/kg	0.5			8.6	2.5	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	mg/kg	0.5			14	3.2	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	mg/kg	0.5			47.2	8	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a) pyrene	mg/kg	0.5		5	**45.5**	**7.4**	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	mg/kg	0.5			38.8	5.2	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	mg/kg	0.5			47.4	7.2	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	mg/kg	0.5			41.1	6.6	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	mg/kg	0.5			43.5	7.6	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	mg/kg	0.5			14.4	2.1	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	mg/kg	0.5			66	12.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	mg/kg	0.5			2.2	0.7	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	mg/kg	0.5			36.4	5	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	mg/kg	0.5			3.2	1	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	mg/kg	0.5			32.5	9.2	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	mg/kg	0.5			69.6	16.5	<0.5	<0.5	<0.5	<0.5	<0.5
PAHs (Sum of total)	mg/kg			100	**512**	95.2	8	8	8	8	8
4,4-DDE	mg/kg	0.05			-	-	-	-	-	-	-
a-BHC	mg/kg	0.05			-	-	-	-	-	-	-
Aldrin	mg/kg	0.05			-	-	-	-	-	-	-
b-BHC	mg/kg	0.05			-	-	-	-	-	-	-
cis-Chlordane	mg/kg	0.05			-	-	-	-	-	-	-
d-BHC	mg/kg	0.05			-	-	-	-	-	-	-
DDD	mg/kg	0.05			-	-	-	-	-	-	-
DDT	mg/kg	0.2			-	-	-	-	-	-	-
Dieldrin	mg/kg	0.05			-	-	-	-	-	-	-
Endosulfan I	mg/kg	0.05			-	-	-	-	-	-	-
Endosulfan II	mg/kg	0.05			-	-	-	-	-	-	-
Endosulfan sulphate	mg/kg	0.05			-	-	-	-	-	-	-
Endrin	mg/kg	0.05			-	-	-	-	-	-	-
Endrin aldehyde	mg/kg	0.05			-	-	-	-	-	-	-
Endrin ketone	mg/kg	0.05			-	-	-	-	-	-	-
g-BHC (Lindane)	mg/kg	0.05			-	-	-	-	-	-	-
Heptachlor	mg/kg	0.05		50	-	-	-	-	-	-	-
Heptachlor epoxide	mg/kg	0.05			-	-	-	-	-	-	-
Hexachlorobenzene	mg/kg	0.05			-	-	-	-	-	-	-
Methoxychlor	mg/kg	0.2			-	-	-	-	-	-	-
trans-chlordane	mg/kg	0.05			-	-	-	-	-	-	-
Aldrin + Dieldrin	mg/kg			50	-	-	-	-	-	-	-
DDT+DDE+DDD	mg/kg			1000	-	-	-	-	-	-	-
chlordane (total)	mg/kg			250	-	-	-	-	-	-	-
Azinophos methyl	mg/kg	0.05			-	-	-	-	-	-	-
Bromophos-ethyl	mg/kg	0.05			-	-	-	-	-	-	-
Carbophenothion	mg/kg	0.05			-	-	-	-	-	-	-
Chlorfenvinphos	mg/kg	0.05			-	-	-	-	-	-	-
Chlorpyrifos	mg/kg	0.05			-	-	-	-	-	-	-
Chlorpyrifos-methyl	mg/kg	0.05			-	-	-	-	-	-	-
Demeton-S-methyl	mg/kg	0.05			-	-	-	-	-	-	-
Diazinon	mg/kg	0.05			-	-	-	-	-	-	-
Dichlorvos	mg/kg	0.05			-	-	-	-	-	-	-
Dimethoate	mg/kg	0.05			-	-	-	-	-	-	-
Ethion	mg/kg	0.05			-	-	-	-	-	-	-
Fenamiphos	mg/kg	0.05			-	-	-	-	-	-	-
Fenthion	mg/kg	0.05			-	-	-	-	-	-	-
Malathion	mg/kg	0.05			-	-	-	-	-	-	-
Methyl parathion	mg/kg	0.2			-	-	-	-	-	-	-
Monocrotophos	mg/kg	0.2			-	-	-	-	-	-	-
Parathion	mg/kg	0.2			-	-	-	-	-	-	-
Pirimphos-ethyl	mg/kg	0.05			-	-	-	-	-	-	-
Prothiofos	mg/kg	0.05			-	-	-	-	-	-	-
PCBs (Sum of total)	mg/kg	0.1		50	-	-	-	-	-	-	-
Cyanide Total	mg/kg	1		1250	-	-	-	-	-	-	-
Arsenic	mg/kg	5		500	14	6	-	-	-	8	7
Cadmium	mg/kg	1		100	1	<1	-	-	-	<1	<1
Chromium	mg/kg	2		500	14	45	-	-	-	28	26
Copper	mg/kg	5		5000	172	94	-	-	-	<5	<5
Lead	mg/kg	5		1500	579	209	-	-	-	15	22
Nickel	mg/kg	2		3000	19	58	-	-	-	<2	<2
Mercury	mg/kg	0.1		75	0.3	0.1	-	-	-	<0.1	<0.1
Zinc	mg/kg	5		35000	612	274	-	-	-	10	20
TPH C 6 - C 9 Fraction	mg/kg	2	65		<2	<2	<2	<2	<2	<2	<2
TPH C10 - C14 Fraction	mg/kg	50			190	50	<50	<50	<50	<50	<50
TPH C15-C28 Fraction	mg/kg	100			6010	2770	<100	<100	<100	<100	<100
TPH C29-C36 Fraction	mg/kg	100			2670	680	<100	<100	<100	<100	<100
TPH_C10 - C36 (Sum of tot	mg/kg		1000		**8870**	**3500**	<250	<250	<250	<250	<250
Benzene	mg/kg	0.2	1		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	mg/kg	0.2	50		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	0.2	130		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
m- & p-xylene	mg/kg	0.2			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.2			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Xylene Total	mg/kg		25		<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4

Notes:
(-) refers to analyte not tested.
BOLD refers to exceeds guideline criteria

Table 9 - Soil Analytical Results - Coal Tar

Analyte	Unit	LOR	NSW EPA, 1994	NEPM HIL F	USEPA 1998	MG09B/PIPE 17/08/2006	RP/PIPE 17/08/2006	TAR WELL #2 16/08/2006	Tar 20/02/2007
Benzo(a) pyrene	mg/kg	0.5		5		**595**	**491**	**164**	-
PAHs (Sum of total)	mg/kg			100		**26,805.30**	**20,889.80**	**25,557.60**	-
TPH C 6 - C 9 Fraction	mg/kg	2	65			**3,770.00**	**70**	**6,690.00**	-
TPH_C10 - C36 (Sum of t	mg/kg		1000			**1,180,000.00**	**24,660.00**	**98,700.00**	-
Benzene	mg/kg	0.2	1			**576**	**2**	**814**	-
Ethylbenzene	mg/kg	0.2	50			**156**	1.1	**254**	-
Toluene	mg/kg	0.2	130			**1,210.00**	3.6	**1,680.00**	-
Xylene Total	mg/kg		25			**1,516.00**	**47.40**	**3,170.00**	-
PCDD/F	pg/g	0.0409			5,000 - 20,000	**-**	**-**	**-**	1.1

Notes:
(-) refers to analyte not tested.
BOLD refers to exceeds guideline criteria

Table 10 - Soil Analytical Results - Asbestos

	MG01/0.1	MG01/0.2	MG03/0.1	MG04/1.5	MG04/1.5	MG09B	MG10/0.2	MG10A/0.7	TP01/0.25	TP02/0.25	TP03/0.25	TP04/0.25	TP05/0.25	TP06/0.25	TP07/0.25	TP08/0.25	TP09/0.25	TP10/0.25	TP11/0.2	TP12/0.25	TP13/0.25	TP14/0.25	TP18
ASBESTOS	ND	Chrysotile & amosite	ND	Chrysotile & amosite	Chrysotile & Crocidolite	Chrysotile	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Chrysotile	ND	ND	ND
Matrix	soil mix	fibro fragment	soil mix	fibro fragment	soil mix	fragment	soil mix	soil mix	soil mix	soil mix	soil mix	soil mix	soil mix	soil mix	soil mix	soil mix	soil mix	soil mix	soil mix	soil mix	soil mix	soil mix	soil mix

Notes:
(ND) refers to not detected.

Table 11 - Summary of All Data for Fill & Silty Clay Material - Macdonaldtown Gasworks Site

Sample Location	Easting (AMG)	Northing (AMG)	Elevation (mAHD)	Soil Profile		Sample Depth (m)		Contaminants of Concern - Concentrations in mg/kg															
								BaP	Total PAH	TPH (C6-C9)	TPH (C10-C14)	TPH (C15-C28)	TPH (C29-C36)	Total C10-C36	Benzene	Toluene	Ethylbenzene	Total Xylenes	Metals	Cyanide (Total)	VOCs	Total Phenols	OCPs	OPPs	Asbestos	PCBs
Commercial / Industrial Landuse Guidelines (NEHF F / NSW EPA 1994 Service Station Guidelines)								5	100	65	-	-	-	1000	1	130	50	25	Various	2500	See BTEX	42500 (phenol)	50 (heptaclor) 50 (aldrin+dieldrin) 50 (chlordane) 1000 (DDT+DDE+DDD)			50
Gasholder																									
BH03	317103.713	1247693.358	18.690	Gravelly fil		0-0.1	0-0.1	**27**	**294.8**	nd	120	3300	1600	**5020**	nd	nd	nd	nd	< guidelines	-	-	18.4	-	-	-	-
				Red clay & decomposed shale		0.1-1.5	1.0-1.1	nd	nd	nd	nd	300	260	560	nd	nd	nd	nd	< guidelines	nd	-	-	-	-	-	-
BH04	317103.564	1247699.228	18.780	Gravelly fill		0-0.1	0-0.1	nd	nd	-	-	-	-	-	-	-	-	-	< guidelines	-	-	-	-	-	-	-
				Clay, gravel and shale fi		0.1-0.55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Coal slag fill & coarse sanc		0.55-0.8	0.7-0.8	**140**	**1697**	nd	1000	9700	1400	**12100**	nd	nd	nd	nd	< guidelines	-	-	419	-	-	-	-
				Clay, coal pieces, gravel, rock		0.8-1.5	0.8-0.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Grey silty clay		1.5-2.5	1.5-1.6	nd	nd	-	-	-	-	-	nd	nd	nd	nd	< guidelines	-	-	-	-	-	-	-
BH05	317101.342	1247704.245	18.7	Refusal on Gas Holder at 0.0m		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH06	317103.196	1247719.155	18.960	Bitumen		0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Coke fill, minor sanc		0.1-0.3	0.2-0.3	**190**	**2374**	11	2600	15000	2400	**20000**	nd	nd	nd	3	< guidelines	0.7	-	65	-	-	-	-
				Red clay fill & weathered shal		0.3-1.0	0.3-0.4	**30**	**137.3**	nd	70	580	260	910	nd	nd	nd	nd	< guidelines	-	-	nd	-	-	-	-
				Grey silty clay		1.0-2.2	1.0-1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Grey silty clay			2.0-2.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW06S	317103.196	1247719.155	18.960	Bitumen		0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Coke and sand fill		0.1-0.4	0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Coke and sand fill			0.3-0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Red clay and weathered shale		0.4-1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Silty clay fill		1.0-2.2	1-1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Silty clay fill			2-2.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW06D	317102.514	1247720.496	18.970	Coke and sand fill		0-0.3	0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Clay and weathered shale		0.3-1.1	0.3-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Silty clay		1.0-2.2	1-1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Silty clay			2-2.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW07S	317101.940	1247693.130	19.575	Bitumen		0-0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Sandy clay fill		0.05-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Red plastic clay		0.3-4.0	0.8-1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW07D	317102.910	1247692.360	19.590	Clay fill with HC odour		0-4.0	1.4-1.5	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	<guidelines	-	-	nd	-	-	-	-
MW20S	317102.250	1247709.650	19.660	Sandy clay fill		0-4.0	0.05-0.3	**6.1**	68.9	nd		398		398	nd	nd	nd	nd	<guidelines	-	nd	nd	-	-	-	-
MW33	332293.5328	6247699.5870	18.797	Silty sandy clay fill		0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
						0.1-0.6	0.5-0.95																			
				Sandy silty clay fill, HC odour				-	-	-	-	**2124 (C16-C35 Aromatics) & 217 (Aliphatics)**			nd	nd	nd	nd	-	-	-	-	-	-	-	-
				Silty clay, HC odour		0.6-1.5	0.5-0.95	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MG02	317122.410	1247701.920	18.680	Black ash, coke gravels, clinker fill, high odou		0-0.3	0	nd	**142.0**	**72**	290	nd	nd	290	**4.2**	5.8	22.1	**29.6**	-	-	-	-	1.3	-	-	-	-
				Red/grey mottled moderately plastic clay		0.3-1.0	0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Dark brown low plasticity silty clay fill, black ooze, tar high odo		1.5-1.9	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Dark brown low plasticity silty clay fill, black ooze, tar high odo			1.8	**178**	**5301.9**	**189**	10300	21400	4440	**36140**	**3**	4.4	30.2	**165.8**	<guidelines	23.3	-	6.7	nd	nd	-	nd
MG03	317104.9400	1247704.9300	18.750	Gravelly sandy silt fill with ballast, bricks, scrap metal, sandstone bloci		0-1.0	0.1	**10.4**	**114.8**	nd	100	1800	850	**2750**	nd	nd	nd	nd	<guidelines	-	-	nd	nd	nd	nd	nd
MG04	317116.7000	1247711.1700	18.720	Gravelly sand fill with black and brown brick fragments		0-1.5	0.5	**6**	61.3	nd	nd	1340	470	**1810**	nd	nd	nd	nd	**Pb=2140**	-	-	-	-	-	-	-
				Fibro cement sheet fragment			1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	detected (fragment)	-
				Gravelly sand fill with black and brown brick fragments			1.5	1.3	15.30	nd	nd	240	nd	240	nd	nd	nd	nd	<guidelines	-	-	-	nd	nd	detected	nd
MG05	317110.820	1247701.920	18.730	Bitumen, ash gravels and crushed roc		0-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Brown low plasticity silty clay fill with fine grave		0.3-1.3	0.5	-	-	nd	280	10800	2260	**13340**	nd	nd	nd	nd	<guidelines	-	-	-	-	-	-	-
				Brown low plasticity silty clay fill with fine gravels			1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MG07	317103.960	1247696.520	18.740	Gravelly ash fill and ballast		0-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Red/grey mottled moderate plasticity clay fill with minor bricks		0.3-1.0	1.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	<guidelines	-	-	nd	-	-	-	-
BHC	317122.0140	1247714.1410	18.7800	Gravelly clay, wet, black staining, high odour		2.4-4.4	3.6																			
Total Samples Analysed	-	-	-	-		-	-	15	15	14	-	-	-	15	16	16	16	16	15	3	1	10	3	3	3	3
Detects above criteria	-	-	-	-		-	-	8	7	2	-	-	-	8	2	0	0	2	1	0	0	0	0	0	0	0
Hotspots	-	-	-	-		-	-	5	4	1	-	-	-	6	2	0	0	1	0	0	0	0	0	0	0	0
Retort																										
BH07	317118.681	1247729.832	18.710	Coke fill, minor sanc		0-0.8	0-0.1	**200**	**2078**	nd	1300	11000	2100	**14400**	nd	nd	nd	nd	< guidelines	-	-	50	nd	-	-	-
				Clay, shale and rock fil		0.8-1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Clay, oil, tar, HC odou		1.0-2.0	1.4-1.5	**26**	**1144.8**	-	-	-	-	-	nd	nd	8	**32**	< guidelines	98	some detections	nd	-	-	-	nd
BH08	317125.080	1247723.696	18.580	Gravelly fill		0-0.5	0-0.1	4.6	53.3	-	-	-	-	-	-	-	-	-	< guidelines	-	-	-	-	-	-	-
				Coke and sand fill		0.5-1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Silty clay and coal slag		1.0-1.5	1.0-1.1	**7**	99.3	nd	120	740	120	980	nd	nd	nd	nd	< guidelines	-	-	nd	-	-	-	-
				Grey silty clay		1.5-2.5	1.6-1.7	**5.4**	82	-	-	-	-	-	nd	nd	nd	nd	< guidelines	-	-	-	-	-	-	nd
				Grey silty clay			2.3-2.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH09	317132.858	1247726.929	18.740	Sand and brick fill		0-0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Refusal on brick at 0.2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH10	317134.360	1247720.447	18.730	Ballast & slag fill		0-0.3	0-0.1	**11**	**112**	-	-	-	-	-	-	-	-	-	< guidelines	-	-	nd	-	-	-	-
				Ballast & slag fill			0.3	2.8	28	nd	30	300	140	470	nd	nd	nd	nd	< guidelines	-	-	-	-	-	-	-
				Refusal at 0.3 on concrete slab		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH17	317130.945	1247734.645	18.58	Refusal on foundations at 0.0m		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH12	317151.071	1247716.220	18.670	Gravelly fill		0-0.1	0-0.1	**5.8**	49.3	-	-	-	-	-	-	-	-	-	<guidelines	3.4	-	-	-	-	-	-
				Coarse sand		0.1-2.0	0.9-1.0	nd	nd	-	-	-	-	-	-	-	-	-	<guidelines	3.4	nd	-	-	-	-	-
				Coarse sand			1.3-1.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Clay, shale and coke fill		2.0-2.5	2.0-2.1	nd	0.6	-	-	-	-	-	nd	nd	nd	nd	-	3	-	-	-	-	-	-
				Clay and coke fill (odourous)		2.5-3.1	2.6-2.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP12	(Same location as BH12) Not surveyed or sampled			Ash and coal		0-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Sand with minor odour		0.3-3.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Wet sand with odou		3.0-4.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TPA	317146.580	1247729.442	18.81	Sand and gravel fil		0-1.5	1.6	**8.4**	**536.9**	**100**	1600	1400	200	**3200**	**1.6**	15	7	**65**	<guidelines	5.6	-	nd	-	-	-	-
				Tar migrating from brick seams		1.5-2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Refusal on concrete or brick at 2m		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TPB	317153.335	1247724.094	18.66	Sand and slag fill		0-1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Refusal on pipes and concrete at 1n		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TPC	317116.562	1247725.926	18.71	Bricks, tar, HC odours		0-1.6	1	**8.4**	**750.6**	-	-	-	-	-	nd	5	9	**48**	<guidelines	34	-	nd	-	-	-	-
				Refusal on bricks at 1.6m		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW34	332304.4362	6247717.4350	18.639	Gravelly sandy clay		0-0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Sandy clay		0.2-0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Silty clay, HC odour		0.4-1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Silty clay, oil sheen, odour		1.2-1.5	1.4	-	-	-	-	92 (C16-C35 Aromatics) & nd (Aliphatics)			nd	nd	nd	nd	-	-	-	-	-	-	-	-
MW37S	332303.0680	6247725.0410	18.696	Ballast		0-0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Ash fill		0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Silty clay fill		0.3-2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Silty clay fill with tar		2.0-4.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW37D	332300.9170	6247724.1940	18.615	Silty sandy gravel fill		0-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Slag and brick fill		0.3-1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Silty clay fill, odours		0.3-1.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Silty clay fill		1.3-2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MG06	317121.6000	1247725.1500	18.950	Brown low plasticity silty clay fill with visible tar and oil, HC odours		0-1.2	1.0	2	**135.00**	18	660	610	nd	**1270**	0.2	0.8	3	9.5	<guidelines	2.7	-	-	-	-	-	-
MG08	317142.7700	1247736.0700	18.700	Loose sandy ash and ballast fill with coarse gravels		0-0.3	0.3	-	-	-	-	-	-	-	-	-	-	-	<guidelines	-	-	-	-	-	-	-
				Red/grey moderately plastic gravelly clay fill, HC odours, tar seepa		0.3-1.6	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Red/grey moderately plastic gravelly clay fill with HC odours, tar seepa			1.5	**444**	**15237.60**	51	99100	310000	26000	**435100**	0.2	0.5	3.6	10.6	<guidelines	-	-	39	nd	nd	-	nd
				Brown/green, plastic silty clay fill with high odours and visible tar in pore		1.6-2.5	2.1	**6.9**	**321.20**	**97**	740	1620	430	**2790**	0.3	0.4	12.3	6	-	-	-	-	-	-	-
MG09A1				Sandy clay, free ta		0.7	0.7	**8.2**	**416.6**	39	850	2110	560	**3520**	**1.7**	6.6	2.4	21		23.6		2				
MG09B	317141.1300	1247722.6100	18.735	Sandy gravel fill/Concrete slal		0-0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Ash and clay fil		0.2-0.5	0.3	-	-	12	790	13800	6110	**20700**	0.5	1.1	0.3	4	<guidelines	-	-	-	-	-	-	-
				Gravelly clay fill		0.5-1.6	0.6	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	<guidelines	-	-	nd	nd	nd	-	nd
				Fibro cement sheet fragmen			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	detected (fragment)	-
		Not surveyed		Service pipe		-	PIPE	**595**	**26805.30**	**3770**	402000	654000	124000	**1180000**	**576**	**1210**	**156**	**1516**	<guidelines	-	-	9872.4	nd	nd	-	nd
MG09C	317134.4800	1247721.2700	18.735	Sandy gravel fill/Concrete slab		0-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Ash gravels and sand fill		0.3-0.8	0.3	**5**	50.00	nd	nd	630	520	**1150**	nd	nd	nd	nd	<guidelines	nd	-	-	-	-	-	-
				Red/grey moderately plastic gravelly clay fill with visible pockets of tar		0.7-1.8	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Brown/green silty clay fill over weathered shale, high HC odours		1.8-3.8	1.9	2.1	73.60	18	300	360	nd	660	nd	0.4	0.5	0.6	<guidelines	nd	-	-	-	-	-	-
MG10A	317150.4400	1247736.7200	18.850	Sandy gravel fill and ballas		0-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Black ash and coke gravel fi		0.3-0.8	0.7	**339**	**4758.20**	nd	9650	200000	25300	**234950**	nd	nd	nd	nd	<guidelines	27.1	-	76.5	nd	nd	nd	-
TP15	317145.9700	1247729.6300	18.780	Gravelly sand fill, overlying brickwork layer		0-0.3	0.3	2.2	19.80	nd	nd	230	150	380	nd	nd	nd	nd	-	1.1	-	-	-	-	-	-
				Ash and gravel fill with free tar in brickwork footin		0.3-1.8	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tar Well #2		Not surveyed		Coal Tar and gravels from tar well #		-	Well Contents	**164**	**25558**	**6690**	56700	35800	6200	**98700**	**814**	**1680**	**254**	**3170**	<guidelines	67.1	-	3384.2	-	-	-	-
Total Samples Analysed	-	-	-	-		-	-	22	22	14	-	-	-	15	19	19	19	19	19	12	2	10	5	4	2	5
Detects above criteria	-	-	-	-		-	-	13	10	2	-	-	-	9	2	0	0	3	0	0	0	0	0	0	1	0
Hotspots	-	-	-	-		-	-	6	10	0	-	-	-	7	0	0	0	1	0	0	0	0	0	0	0	0
Gas Purifier																										
BH11	317140.501	1247707.420	18.560	Gravelly fill		0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Coarse sand		0.1-1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Clay and coke fill		1.1-2.3	1.2-1.3	-	-	-	-	-	-	-	-	-	-	-	< guidelines	nd	-	-	-	-	-	-
BH18	317129.119	1247706.185	18.680	Gravelly fil		0-0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 11 - Summary of All Data for Fill & Silty Clay Material - Macdonaldtown Gasworks Site

Sample Location	Easting (AMG)	Northing (AMG)	Elevation (mAHD)	Soil Profile	Sample Depth (m)		Contaminants of Concern - Concentrations in mg/kg															
							BaP	Total PAH	TPH (C6-C9)	TPH (C10-C14)	TPH (C15-C28)	TPH (C29-C36)	Total C10-C36	Benzene	Toluene	Ethylbenzene	Total Xylenes	Metals	Cyanide (Total)	VOCs	Total Phenols	OCPs	OPPs	Asbestos	PCBs
Commercial / Industrial Landuse Guidelines (NEHF F / NSW EPA 1994 Service Station Guidelines)							5	100	65	-	-	-	1000	1	130	50	25	Various	2500	See BTEX	42500 (phenol)	50 (heptaclor) 50 (aldrin+dieldrin) 50 (chlordane) 1000 (DDT+DDE+DDD)			50
				Ash, coke and slag fil	0.2-0.4	0.2-0.3	**220**	**3953**	nd	3400	26000	9000	**38400**	nd	nd	nd	nd	<guidelines	8.8	-	97	-	-	-	-
				Clay and rock fill	0.4-1.0	0.4-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Moist clay with strong odou	1.0-1.5	1.0-1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Fill with oil, tar, strong odou	1.5-1.9	1.7-1.8	**28**	**2160.8**	-	-	-	-	-	**7**	11	**80**	**210**	<guidelines	-	-	nd	-	-	-	-
				Silty clay (odour	1.9-2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MG11	317138.230	1247707.260	18.600	Dark grey very gravelly sand fill with ash, coke and balla	0-0.2	0.2	**42**	**696.60**	nd	290	4720	1200	**6210**	nd	nd	nd	nd	<guidelines	nd	-	-	-	-	-	-
				Orange and red firm clay fil	0.5-1.7	1.5	-	-	-	-	-	-	-	-	-	-	-	-	2.5	-	-	-	-	-	-
				Yellow/orange medium sand fill with black staining and s	1.7-3.2	2.0	**48.8**	**728.80**	10	330	5760	1660	**7750**	nd	nd	nd	nd	<guidelines	3.5	-	1.1	nd	nd	-	nd
BHE	317131.9540	1247692.9320	18.5000	Reworked clay, low/med plast, firm	1.6	1.6																			
				Reworked clay, low/med plast, firm	2.2	2.2	nd	24.6 (naphthalene	**155**	170	190	nd	360	0.4	0.4	16.1	17		n		nd				
BHF	317135.8890	1247701.0570	18.5600	Reworked clay, low/med plast, firm, ash gravels	1	1.0	**6.4**	89.5	nd	90	740	320	**1150**	nd	nd	nd	nd		5.3		nd				
Total Samples Analysed	-	-	-	-	-	-	6	6	5	-	-	-	5	6	6	6	6	5	7	0	5	1	1	0	1
Detects above criteria	-	-	-	-	-	-	5	4	1	-	-	-	4	1	0	1	1	0	0	-	0	0	0	-	0
Hotspots	-	-	-	-	-	-	4	4	0	-	-	-	3	1	0	0	1	0	0	-	0	0	0	-	0
Northeast																									
BH13		Not surveyed		Gravelly fil	0-0.1	0-0.1	4.6	39.2	-	-	-	-	-	-	-	-	-	<guidelines	-	-	-	-	-	-	-
				Coke and sand fil	0.1-0.7	0.2-0.3	**39**	**413.2**	24	400	3400	3300	**7100**	**1.6**	5	nd	9	<guidelines	-	-	nd	-	-	-	-
				Red clay and weathered shale	0.7-1.0	0.9-1.0	nd	0.6	-	-	-	-	-	nd	nd	nd	nd	-	-	nd	-	-	-	-	-
				Silty clay	1.0-1.5	1.2-1.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH14	317161.824	1247753.075	19.030	Gravelly fill	0-0.1	0-0.1	**5**	32.8	-	-	-	-	-	-	-	-	-	<guidelines	-	-	-	-	-	-	nd
				Sand and coke fill	0.1-0.7	0.2-0.3	nd	nd	nd	nd	nd	nd	-	-	-	-	-	<guidelines	nd	-	-	-	-	-	-
				Red clay and weathered shale	0.7-1.5	0.9-1.0	nd	3.8	-	-	-	-	-	**4.6**	nd	26	**48**	<guidelines	-	-	-	-	-	-	-
BH14A	317162.5340	1247754.2870	18.890	Silty clay, strong hydrocarbon odou	1.1-1.5	1.4	nd	0.7 (naphthalene	9	nd	nd	nd	nd	0.4	nd	nd	0.6				nd				
BH15	317179.131	1247760.045	18.810	Gravelly fil	0-0.1	**16**	88.7	-	-	-	-	-	-	-	-	-	-	<guidelines	-	-	-	-	-	-	-
				Sand and coke fil	0.1-0.8	0.2-0.3	**58**	**377.8**	nd	90	2800	1500	**4390**	nd	nd	nd	nd	<guidelines	nd	-	nd	-	-	-	-
				Red clay & weathered shale	0.8-1.0	0.9-1.0	2.4	14.8	-	-	-	-	-	nd	nd	nd	nd	-	-	-	-	-	-	-	-
				Clay and coke fill	1.0-2.0	1.4-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Clay and coke fill		1.9-2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH16	317184.659	1247749.137	18.500	Gravelly fil	0-0.1	**11**	80.6	-	-	-	-	-	-	nd	nd	nd	nd	<guidelines	-	-	-	-	-	-	-
				Sand and rock fill	0.1-1.5	0.9-1.0	nd	nd	-	-	-	-	-	nd	nd	nd	nd	<guidelines	nd	-	-	-	-	-	-
				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TPD	317191.694	1247755.693	18.8	Ash fill	0-0.3	0.2	**6.2**	68.7	-	-	-	-	-	nd	nd	nd	nd	<guidelines	-	-	-	-	-	-	-
				Sands	0.3-1.6	0.6	nd	nd	-	-	-	-	-	nd	nd	nd	nd	<guidelines	nd	-	-	-	-	-	-
TPE		Not surveyed		Ash fill	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP99	317214.570	1247774.179	19.420	Ash and coke fill	0-0.5	0-0.1	nd	nd	-	-	-	-	-	nd	nd	nd	nd	<guidelines	-	-	-	-	-	-	-
				Ash and coke fill		0.2-0.3	1.2	11.8	-	-	-	-	-	nd	nd	nd	nd	<guidelines	-	nd	-	nd	-	-	nd
MW42S	332357.7440	6247737.6530	18.484	Sandy silt	0-0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Silty clayey gravel fill	0.2-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Sandy fill	0.5-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Silt / sand / clay fill	1.5-1.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW42D	332356.4770	6247736.3090	18.529	Sandy silt	0-0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Silty clayey gravel fill	0.2-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Sandy fill	0.5-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Clayey sand fill	1.5-2.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MG10	317156.8600	1247741.3200	18.800	Black ash and ballast fill with sandy material, HC odours	0-0.4	0.2	1.8	24.70	nd	nd	1390	500	**1890**	nd	nd	nd	nd	<guidelines	8	-	nd	nd	nd	nd	nd
				Red/grey mottled highly plastic clay	0.5-0.6	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MG10B	317157.4720	1247740.0010	18.820	Reworked clay, low/med plast, firn	1.1-2.0	1.8	1.6	38.40	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	-	-	nd	-	-	-	-
TP05	317185.5300	1247738.7300	18.440	Gravelly sand and ash, clinker and coke fill, odou	0-0.3	0.25	**158**	**4300.90**	-	-	-	-	-	-	-	-	-	-	-	-	8.1	-	-	nd	-
				Light brown low plasticity sandy clay fill	0.3-0.5	0.5	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	<guidelines	-	-	nd	chlordane 0.14	nd	-	nd
				Yellow medium sand	0.5-1.2	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Dark brown clayey sil	1.2-1.9	1.5	nd	4.50	nd	nd	nd	nd	nd	nd	nd	nd	nd	<guidelines	-	-	-	-	-	-	-
TP06	317189.0900	1247749.9500	18.530	Gravelly sand fill with ash, clinker and coke, dark staining and odo	0-0.3	0.25	**55**	**690.20**	-	-	-	-	-	-	-	-	-	-	-	-	20.5	-	-	nd	-
				Light brown/orange gravelly non plastic sandy clay fill with some clinker	0.3-0.5	0.5	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	nd	-	-	-	-	-	-
				Sandy clayey gravel of sandstone and clinker fill, black stains	0.5-1.4	1.0	0.7	6.00	nd	nd	nd	nd	nd	nd	nd	nd	nd	<guidelines	nd	-	nd	nd	nd	-	nd
				Dark grey/brown clayey silt with slight stain in top 0.2m of stratum	1.4-2.3	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP07	317201.1000	1247755.8200	18.890	Degraded concrete slab	0-0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Black dark/grey gravelly sand fill of predomi-ntly ash, coke and clinker	0.2-0.5	0.25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	nd	-
				Gravelly clayey sand fill with brick fragments, sandstone and shale gravels	0.5-0.9	0.5	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	<guidelines	nd	-	-	-	-	-	-
				Grey/ red mottled sandy gravelly clay fill with sandstone and shale gravels	0.9-1.3	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Soft clayey silt	1.3-1.7	1.5	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	-	-	-	-	-	-	-
TP08	317202.3200	1247766.1500	19.150	Black gravelly fine to coarse sand fill of ash clinker and coke with odour	0-0.4	0.25	**8.2**	78.40	-	-	-	-	-	-	-	-	-	-	-	-	nd	-	-	nd	-
				Light brown very sandy cobbley gravel of sandstone fill with slight odour	0.4-0.6	0.5	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	<guidelines	nd	-	nd	nd	nd	-	nd
				Grey with red mottles sandy gravelly (sandstone) clay fill	0.9-1.4	1.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	<guidelines	nd	-	nd	-	-	-	-
				Soft clayey silt	1.4-1.6	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP09	317218.1000	1247779.2700	19.470	Gravelly sand fill of ash clinker and coke, with odour	0-0.4	0.25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	nd	-
				Gravelly cobbly sand (crushed sandstone) fill, black staining top 0.1m	0.4-0.6	0.5	**5.4**	68.00	nd	nd	290	180	470	nd	nd	nd	nd	-	-	-	-	-	-	-	-
				Grey with orange/red mottles gravelly (shale) sandy clay	0.6-1.9	1.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	<guidelines	nd	-	nd	-	-	-	-
				Grey with orange/red mottles gravelly (shale) sandy clay		1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP16	317172.6700	1247743.8900	18.600	Gravelly (sandstone) cobbly sand fill of fine to coarse sandstor	0.2-0.6	0.3	**6.9**	55.20	13	60	760	460	**1280**	**1.2**	2.8	0.3	5.6	<guidelines	-	-	-	-	-	-	-
				As above but black stain and ta	0.6-1.5	1.0	**39.4**	**425.10**	**166**	320	5120	2200	**7640**	**3.1**	3.7	6.4	**61.2**	<guidelines	nd	-	0.6	nd	nd	-	nd
Total Samples Analysed	-	-	-	-	-	-	33	33	18	-	-	-	18	26	26	26	26	23	12	2	14	6	5	6	7
Detects above criteria	-	-	-	-	-	-	12	5	1	-	-	-	5	4	0	0	2	0	0	0	0	0	0	0	0
Hotspots	-	-	-	-	-	-	6	5	1	-	-	-	3	2	0	0	0	0	0	0	0	0	0	0	0
South Central																									
MW03S	317137.911	1247683.304	18.380	Sand and gravel fill	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Gravelly clay fill	0.5-2.0	1-1.1	1.4	10.9	nd	nd	nd	nd	nd	nd	nd	nd	nd	<guidelines	-	-	-	-	-	-	-
				Sandy clay fill	2-2.5	2-2.1	0.5	2.7	nd	nd	nd	nd	nd	nd	nd	nd	nd	<guidelines	-	-	-	-	-	-	-
				Silty clay	2.5-3.5	3-3.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW03D	317139.485	1247683.339	18.330	Sand and gravel fill	0-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Gravelly clay fill	0.5-2.0	1-1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Sandy clay fill	2-2.5	2-2.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Silty clay	2.5-5.0	3-3.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Silty clay		4-4.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW04S	317159.418	1247704.764	18.400	Sand and gravel fill	0-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Sandy clay fill	0.6-2.0	1-1.1	nd	1.3	nd	nd	nd	nd	nd	nd	nd	nd	nd	<guidelines	-	-	-	-	-	-	-
				Silty clay fill	2-2.5	2-2.1	nd	3.6	nd	nd	nd	nd	nd	**4**	nd	nd	nd	<guidelines	-	-	-	-	-	-	-
				Sandy clay fill	2.5-3.5	3-3.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW04D	317158.641	1247703.451	18.370	Sand and gravel fill	0-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Sandy clay fill	0.6-2.0	1-1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Silty clay fill	2-2.5	2-2.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Sandy clay fill	2.5-5.5	3-3.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW30	332317.9292	6247690.8620	18.363	Topsoil	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Silty sandy clay fill, HC odour	0.1-0.9	0-0.45	-	-	-	-	113 (C16-C35 Aromatics) & 154 (Aliphatics)			nd	nd	nd	nd	-	-	-	-	-	-	-	-
				Plastic clay possible odour	0.9-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW31	332338.1760	6247713.4180	18.446	Topsoil	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Silty sandy clay fill	0.1-0.9	0.5-0.95	-	-	-	-	50 (C16-C35 Aromatics) & 65 (Aliphatics)			nd	nd	nd	nd	-	-	-	-	-	-	-	-
				Gravelly sandy clay fill, odour	0.9-1.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Silty clay	1.4-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW32	332305.3280	6247667.5440	18.331	Clay and gravel, topsoil	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Silty clay fill	0.1-0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Sandstone fill	0.3-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Sandy silty clay fill	0.6-1.5	1.2	-	-	-	-	nd (C16-C35 Aromatics) & nd (Aliphatics)			nd	nd	nd	nd	-	-	-	-	-	-	-	-
TP03	317139.830	1247679.080	18.020	Gravelly sand fill, ash and crushed sandstone with ballast, clinker, odour	0-0.3	0.25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	nd	-
				Gravelly (sandstone) clay with ballast and coke	0.3-1.5	0.5	nd	1.20	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	-	-	-	-	-	-	-
				Gravelly (sandstone) clay with ballast and coke		1.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	<guidelines	-	-	nd	nd	nd	-	nd
				Dark grey non plastic clayey silt fill with strong HC-like odour	1.5-2.8	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Dark grey non plastic clayey silt fill with strong HC-like odour		2.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	-	-	-	-	-	-	-
TP04	317155.800	1247705.630	18.500	Gravelly sand fill with coke, clinker, sandstone gravel and ash	0-0.5	0.25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	nd	-
				Orange/ light brown/ red mottled low plasticity gravelly (shale) clay	0.5-0.7	0.5	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	-	-	-	-	-	-	-
				As above but with black odourous staining	0.7-0.8	0.7	nd	1.30	nd	nd	nd	nd	nd	nd	nd	nd	nd	<guidelines	-	-	-	nd	nd	-	-
TP11	317158.910	1247723.560	18.590	Brown/ black gravelly sand fill predomi-ntly ash and coke	0-0.3	0.2	**6.2**	62.80	nd	nd	850	510	**1360**	nd	nd	nd	nd	<guidelines	-	-	-	-	-	nd	-
				Yellow/orange very clayey sand with layer of dense coke gravel 0.2-0.3m	0.3-1.0	1.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	<guidelines	nd	-	nd	nd	nd	-	nd
Total Samples Analysed	-	-	-	-	-	-	11	11	11	-	-	-	14	14	14	14	14	8	1	0	2	3	3	3	2
Detects above criteria	-	-	-	-	-	-	1	0	0	-	-	-	1	1	0	0	0	0	0	-	0	0	0	0	0
Hotspots	-	-	-	-	-	-	0	0	0	-	-	-	0	1	0	0	0	0	0	-	0	0	0	0	0
Southwest																									
BH01	317111.994	1247643.511	18.370	Gravelly fill	0-0.1	0-0.1	3	21.3	nd	20	340	160	520	nd	nd	nd	nd	< guidelines	-	-	-	nd	-	-	-
				Fine sand / rock fill	0.1-2.9	0.9-1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Silty clay	2.9-3.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Silty clay & coke fill (odourous)	3.2-3.5	3.3-3.4	0.9	31.6	-	-	-	-	-	nd	nd	nd	nd	< guidelines	-	naphthalene = 2	-	-	-	-	-
				Silty clay	3.5-4.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02	317107.419	1247666.818	18.420	Red clay & decomposed shal	0-0.1	0-0.1	**14**	**141.8**	-	-	-	-	-	-	-	-	-	< guidelines	-	-	nd	-	-	-	-
						0-1.5																			

Table 11 - Summary of All Data for Fill & Silty Clay Material - Macdonaldtown Gasworks Site

Sample Location	Easting (AMG)	Northing (AMG)	Elevation (mAHD)	Soil Profile		Sample Depth (m)	Contaminants of Concern - Concentrations in mg/kg																
							BaP	Total PAH	TPH (C6-C9)	TPH (C10-C14)	TPH (C15-C28)	TPH (C29-C36)	Total C10-C36	Benzene	Toluene	Ethylbenzene	Total Xylenes	Metals	Cyanide (Total)	VOCs	Total Phenols	OCPs	OPPs	Asbestos	PCBs
Commercial / Industrial Landuse Guidelines (NEHF F / NSW EPA 1994 Service Station Guidelines)							5	100	65	-	-	-	1000	1	130	50	25	Various	2500	See BTEX	42500 (phenol)	50 (heptaclor) 50 (aldrin+dieldrin) 50 (chlordane) 1000 (DDT+DDE+DDD)			50
				Red clay & decomposed shale		0.2-0.3	**35**	**203.4**	-	-	-	-	-	-	-	-	-	< guidelines	-	-	nd	nd	-	-	-
				Red clay & weathered shale		2.0-2.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Silty clay, rock fragments, HC odour		2.5-2.6	nd	0.9	12	50	nd	nd	50	nd	nd	nd	5	< guidelines	nd	-	-	-	-	-	-
				Plastic clay and gravel (odourous)		3.0-3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Silty clay (odourous)		3.3-3.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VP01_01					-	Surface	**5.9**	93.5	nd	nd	420	550	995	nd	nd	nd	nd	< guidelines	-	-	nd	-	-	-	-
VP01_02					-	Surface	**10**	**137.7**	nd	nd	790	870	**1685**	nd	nd	nd	nd	< guidelines	-	-	nd	-	-	-	-
VP01_03					-	Surface	**7.1**	**104.3**	nd	nd	870	1100	**1995**	nd	nd	nd	nd	< guidelines	-	-	nd	-	-	-	-
VP01_04					-	Surface	**15**	**219.4**	nd	nd	830	1200	**2055**	nd	nd	nd	nd	< guidelines	-	-	nd	-	-	-	-
VP01_05					-	Surface	3.2	45.4	nd	nd	710	990	**1725**	nd	nd	nd	nd	< guidelines	-	-	nd	-	-	-	-
VP01_06	Not surveyed - VP01 & VP02 located 15m directly sout				-	Surface	**10**	**134.1**	nd	nd	1600	1500	**3125**	nd	nd	nd	nd	**Pb=2140**	-	-	nd	-	-	-	-
VP02_01	of remaining gasholder				-	Surface	2.5	44.8	nd	nd	520	700	**1245**	nd	nd	nd	nd	< guidelines	-	-	nd	-	-	-	-
VP02_02					-	Surface	**12**	**258.3**	nd	nd	1500	1100	**2625**	nd	nd	nd	nd	**Pb=1510**	-	-	nd	-	-	-	-
VP02_03					-	Surface	3.3	68.9	nd	nd	420	490	935	nd	nd	nd	nd	< guidelines	-	-	nd	-	-	-	-
VP02_04					-	Surface	**12**	**236.6**	nd	nd	1300	1200	**2525**	nd	nd	nd	nd	< guidelines	-	-	nd	-	-	-	-
VP02_05					-	Surface	3.5	62.9	nd	nd	550	570	**1145**	nd	nd	nd	nd	< guidelines	-	-	nd	-	-	-	-
VP02_06					-	Surface	1.8	22.9	nd	nd	440	450	875	nd	nd	nd	nd	< guidelines	-	-	nd	-	-	-	-
MW12S	317108.660	1247661.840	19.990	Sandy clay fill		0.8-1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW12D	317108.480	1247659.800	20.020	Sandy clay fill		0-1.4	**7.7**	68.2	nd	nd	nd	nd	nd	nd	nd	nd	nd	<guidelines	-	nd	nd	-	-	-	-
				Red plastic clay		1.4-10.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW13S	317112.030	1247646.520	19.500	Sandy clay and gravel fi		0-4.2	**34.9**	**346**	nd		6444		**6444**	nd	nd	nd	nd	<guidelines	-	nd	5.9	-	-	-	-
MW13D	317112.010	1247649.090	19.470	Sandy clay fill		0-1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Sandy clay (friable) fill		1.0-4.4	1.4-1.5	1	8.3	nd	nd	nd	nd	nd	nd	nd	nd	<guidelines	-	nd	nd	-	-	-	-
MW18D	317106.550	1247671.160	19.490	Sandy clay fill		0-1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW18D	317106.550	1247671.160	19.490	Red plastic clay		1.0-10.0	1.4-1.5	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	<guidelines	-	-	nd	-	-	-	-
MG01	317116.340	1247667.860	18.530	Sandy gravel fill and coke		0-0.1	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	nd	-
				Red/grey mottled moderate plasticity clay fill		0.1-0.2	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	detected (fragment)	-
				Brown/ yellow gravelly silty clay fill		0.2-0.7	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Grey/brown moderately plastic clay fill, odours, black ash pockets		1.3-1.5	1.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MG01	317116.340	1247667.860	18.530	Black and white shale with coke gravel fill, HC odour		1.5-2.0	1.8	0.6	12.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	<guidelines	nd	-	nd	nd	nd	-	nd
				Brown, low plasticity silty clay fill, minor HC odours		2.0-2.6	2.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Brown low plasticity silty clay		2.6-3.2	2.8	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	-	-	-	-	-	-
				Brown low plasticity silty clay			3.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP01	317112.540	1247638.330	18.040	Light brown gravelly (sandstone and concrete) sand fill		0-0.3	0.25	3.5	38.20	nd	nd	250	220	470	nd	nd	nd	nd	-	-	-	-	-	nd	-
				Brown/grey/red clayey gravelly (sandst, shale, concrete) sand fill, grey ash		0.3-1.4	1.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	-	-	-	-	-	-
				Yellow, medium grained sandy gravelly clay		1.4-2.2	1.5	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	<guidelines	-	-	nd	nd	nd	-	nd
				Yellow, medium grained sandy gravelly clay			2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Brown very gravelly (sandstone shale) clayey sand		2.2-3.5	3.0	0.7	5.90	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	-	-	-	-	-	-
TP02	317109.670	1247657.650	19.070	Grey/black gravelly sand fill, ash, clinker and coke			0.25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	nd	-
				Grey/black gravelly sand fill, ash, clinker and coke		0.1-1.2	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Grey/black gravelly sand fill, ash, clinker and coke			1.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	-	-	-	-	-	-
				Brown/orange gravelly clayey sand fill with patches of red sandy clay (1.4m)		1.2-1.7	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Brown/dark gravelly sand with sandstone and bricks, clinker and cobbles		1.7-2.8	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Brown/orange very sandy gravelly (coke) clay fill with clay pipe		2.8-3.9	3.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	-	-	-	-	-	-
RP	317122.828	1247676.764	18.370	Gravelly clay, low plast, minor ash and ballast gravels		0-0.7	-																		
				Reworked clay, low/med plast, firm		0.7-1.2	-																		
RP	317122.828	1247676.764	18.370	Sandy clay fill - ceramic piping		1.2-2.0	**12.8**	**118.20**	nd	120	930	680	**1730**	nd	nd	nd	nd	<guidelines	-	-	nd	nd	nd	-	nd
RP		Not surveyed		Coal tar materia		-	PIPE	**491**	**20890**	**70**	4590	15200	4870	**24660**	**2**	3.6	1.1	**47**	<guidelines	-	-	7.6	nd	nd	-	nd
Total Samples Analysed	**-**	**-**	**-**	**-**		**-**	**-**	30	30	27	-	-	-	27	28	28	28	28	24	2	4	21	5	3	4	3
Detects above criteria	**-**	**-**	**-**	**-**		**-**	**-**	12	10	1	-	-	-	11	0	0	0	0	2	0	0	0	0	0	1	0
Hotspots	**-**	**-**	**-**	**-**		**-**	**-**	6	2	0	-	-	-	5	0	0	0	0	0	0	0	0	0	0	0	0
Retaining Wall																									
TP44	317129.984	1247742.866	20.180	Ash fill		0-0.3	0.2-0.3	**150**	**2472.4**	-	-	-	-	-	**15**	16	nd	10	<guidelines	-	-	74	-	-	-	-
				Clay and sandstone fragments		0.3-2.1	2.0-2.1	nd	nd	-	-	-	-	-	nd	nd	nd	nd	<guidelines	-	-	nd	-	-	-	-
TP1	332302.67	6247740.31	20.01	Sandy gravel and topso		0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Gravel, ash, coke, coal fill, odou		0.1-0.4	0.1-0.3	**67**	**898.1**	nd	190	6200	3000	**9390**	nd	nd	nd	nd	<guidelines	-	-	-	-	-	-	-
				Gravelly sand with fine ash, bricks		0.4-0.7	0.5-0.6	1.3	15.6	nd	nd	nd	nd	nd	nd	nd	nd	nd	<guidelines	-	-	-	-	-	-	-
				Plastic clay		0.7-1.9	0.8-0.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP2	332304.83	6247743.68	20.09	Sandy, ash, gravel, coal, coke, bricks		0-0.4	0-0.2	-	-	-	-	-	-	-	nd	nd	nd	nd	-	-	-	-	-	-	-
				Powdery grey ash fill		0.4-0.5	0.4-0.5	-	-	-	-	-	-	-	nd	nd	nd	nd	-	-	-	-	-	-	-
				Plastic clay		0.5-1.7	0.8-1.0	-	-	-	-	-	-	-	nd	nd	nd	nd	-	-	-	-	-	-	-
							1.3-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP3	332307.71	6247745.13	20.06	Sandy gravel fil		0-0.2	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Ash, coal, coke (black and white		0.2-0.4	0.2-0.3	1.4	14.3	**150**	130	760	210	**1100**	**3.2**	10	2.8	**179**	<guidelines	-	-	-	-	-	-	-
				Powdery grey ash fill		0.4-0.7	0.4-0.6	0.4	4.3	nd	nd	nd	nd	nd	nd	1.6	nd	nd	<guidelines	-	-	-	-	-	-	-
				Plastic clay		0.7-1.5	0.8-0.9	-	-	-	-	-	-	-	nd	nd	nd	nd	-	-	-	-	-	-	-
TP10	317184.32	1247770	20.1	Grey/black gravelly sand, ash, coke, coal, bricks, rail rivets and rail sleeper		0-0.8	0.25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	nd	-
				Grey/black gravelly sand, ash, coke, coal, bricks, rail rivets and rail sleeper			0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Yellow medium sand with concrete boulder and some mild grey staining		0.95-1.3	1.0	nd	nd	nd	nd	nd	nd	nd	**nd**	nd	nd	nd	<guidelines	nd	-	nd	nd	nd	-	nd
				Orange with grey mottles gravelly (shale) clay		1.3-1.7	1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Grey sandy gravel (shale)		1.7-2.3	2.0	1	14.50	nd	nd	nd	nd	nd	nd	nd	nd	nd	<guidelines	2.2	-	-	-	-	-	-
				Orange with grey mottles gravelly (shale) clay		2.3-3.2	3.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP12	317123.57	1247736.37	20.13	Gravelly (ash, concrete, sandstone, brick) sand		0-0.6	0.25	**9.6**	**116.40**	nd	180	1420	720	**2320**	nd	nd	nd	nd	<guidelines	-	-	nd	-	-	detected	-
				Gravelly (ash, concrete, sandstone, brick) sand			0.5	1	11.40	nd	nd	nd	nd	nd	nd	nd	nd	nd	<guidelines	-	-	nd	nd	nd	-	nd
				brick,concrete boulders, fibro sheet fragments		0.6-1.7	1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP18	317109.12	1247729.32	19.84	Gravelly (ash, concrete, sandstone, brick) sand, fibro sheet fragments		0-1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	nd	-
				Gravelly (ash, concrete, sandstone, brick) sand, metals, rubber, leather, fibro		0-1.2	1.2	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	<guidelines	3	-	nd	nd	nd	-	nd
				Brown slightly sandy clay		1.5-2.6	1.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Samples Analysed	**-**	**-**	**-**	**-**		**-**	**-**	11	11	9	-	-	-	9	15	10	10	10	11	3	0	6	3	3	3	3
Detects above criteria	**-**	**-**	**-**	**-**		**-**	**-**	3	3	1	-	-	-	3	2	0	0	1	0	0	0	0	0	0	1	0
Hotspots	**-**	**-**	**-**	**-**		**-**	**-**	2	2	0	-	-	-	1	2	0	0	1	0	0	0	0	0	0	0	0
Western Lot																									
MW08D	317079.530	1247715.480	19.540	Sandy clay fill		0-0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VP03_01					-	Surface	nd	nd	nd	nd	180	180	397.5	nd	nd	nd	nd	< guidelines	-	-	nd	-	-	-	-
VP03_02					-	Surface	2	23.3	nd	nd	210	200	447.5	nd	nd	nd	nd	< guidelines	-	-	nd	-	-	-	-
VP03_03	Not surveyed - VP03 located in north western corner,				-	Surface	1.6	19.6	nd	nd	340	230	607.5	nd	nd	nd	nd	< guidelines	-	-	nd	-	-	-	-
VP03_04	adjacent to fenceline of 43 Burren St				-	Surface	nd	8.7	nd	nd	140	140	317.5	nd	nd	nd	nd	< guidelines	-	-	nd	-	-	-	-
VP03_05					-	Surface	1.8	19.5	nd	nd	260	270	567.5	nd	nd	nd	nd	< guidelines	-	-	nd	-	-	-	-
VP03_06					-	Surface	nd	nd	nd	nd	50	50	137.5	nd	nd	nd	nd	< guidelines	-	-	nd	-	-	-	-
TP13	317084.37	1247717.07	18.7	Very gravelly sand fill of ash, clinker, burnt shale, coke, co		0-0.3	0.25	**45.5**	**512.00**	nd	190	6010	2670	**8870**	nd	nd	nd	nd	<guidelines	-	-	6.7	-	-	nd	-
				Brown non plastic friable silty clay with shale grav		0.4-0.6	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14	317067.72	1247713.76	18.7	Dark gravelly sand, ash, visual staining (ash) blac		0-0.25	0.25	**7.4**	94.70	nd	50	2770	680	**3500**	nd	nd	nd	nd	<guidelines	-	-	nd	-	-	nd	-
				Brown/orange low plasticity silty gravelly (shale) clay fill		0.25-0.8	0.5	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	-	-	-	-	-	-
Total Samples Analysed	**-**	**-**	**-**	**-**		**-**	**-**	9	9	9	-	-	-	9	9	9	9	9	8	0	0	8	0	0	2	0
Detects above criteria	**-**	**-**	**-**	**-**		**-**	**-**	2	1	0	-	-	-	2	0	0	0	0	0	-	-	0	-	-	0	-
Hotspots	**-**	**-**	**-**	**-**		**-**	**-**	1	1	0	-	-	-	2	0	0	0	0	0	-	-	0	-	-	0	-
Western Drain Sediments																									
OD01	Not surveyed - In drain behind gasholders				-	Surface	**10**	**125.9**	nd	nd	1500	1700	**3200**	nd	nd	nd	nd	< guidelines	-	-	nd	-	-	-	-
OD02	Not surveyed - drain south of gasholders				-	Surface	**8.2**	91.6	nd	160	700	980	**1840**	nd	nd	nd	nd	< guidelines	-	-	nd	-	-	-	-
OD03	Not surveyed - S extremity of drain				-	Surface	4.8	54.3	nd	400	1600	1400	**3400**	nd	nd	nd	nd	< guidelines	-	-	nd	-	-	-	-

BOLD Concentration exceeds Commercial/Industrial Guidelines
BOLD Hotspot of contamination (conc exceeds criteria by 250%)

Table 12 - Summary of All Data for Natural Soil - Macdonaldtown Gasworks Site

Sample Location	Easting (AMG)	Northing (AMG)	Elevation (mAHD)	Soil Profile	Sample Depth (m)		Contaminants of Concern - Concentrations in mg/kg															
							BaP	Total PAH	TPH (C6-C9)	TPH (C10-C14)	TPH (C15-C28)	TPH (C29-C36)	Total C10-C36	Benzene	Toluene	Ethylbenzene	Total Xylenes	Metals	Cyanide (Total)	VOCs	Total Phenols	OCPs	OPPs	PCBs
Commercial / Industrial Landuse Guidelines (NEHF F / NSW EPA 1994 Service Station Guidelines)							5	100	65	-	-	-	1000	1	130	50	25	Various	2500	See BTEX	42500 (phenol)	50 (heptaclor) 50 (aldrin+dieldrin) 50 (chlordane) 1000 (DDT+DDE+DDD)		50
Gasholders																								
BH03	317103.713	1247693.358	18.690	Grey plastic clay	1.5-2.8	2.4-2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Red/orange clay, weathered shale		2.9-3.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Red/orange clay, weathered shale	2.8-4.0	3.9-4.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04	317103.564	1247699.228	18.780	Red plastic clay, weathered shale	2.5-3.0	2.5-2.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH06	317103.196	1247719.155	18.960	Red clay & weathered shale	2.2-3.1	3.0-3.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW06S	317103.196	1247719.155	18.960	Red clay and weathered shale	2.2-3.5	3-3.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW06D	317102.514	1247720.496	18.970	Red clay and weathered shale	2.2-7.0	3.0-3.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Shale	7.0-15.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW07D	317102.910	1247692.360	19.590	Plastic clay becoming weathered shale	4.0-11.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Shale	11.0-12.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MG02	317122.410	1247701.920	18.680	Red/ yellow mottled, med plastic clay becoming shale, HC odour		2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Red/ yellow mottled, med plastic clay becoming shale, HC odour		2.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Red/ yellow mottled, med plastic clay becoming shale, HC odour		3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Red/ yellow mottled, med plastic clay becoming shale, HC odour		3.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Red/ yellow mottled, med plastic clay becoming shale, HC odour	2.0-4.7	4.7	nd	1.20	4	nd	nd	nd	nd	0.3	nd	nd	nd	-	-	-	-	-	-	-
MG05	317110.820	1247701.920	18.730	Red/grey mottled, stiff, very high HC odour		1.8	2.2	**288.50**	**118**	2100	940	nd	**3040**	nd	5.6	15	**80.4**	<guidelines	-	-	nd	nd	nd	nd
				Red/grey mottled, stiff, very high HC odour		3.4	nd	43.80	-	-	-	-	-	-	-	-	-	-	-	-	nd	-	-	-
				Red/grey mottled, stiff, very high HC odour	1.3-5.0	5.0	nd	65.10	**92**	580	740	nd	**1320**	nd	7.3	3.9	**35**	-	-	-	-	-	-	-
MG07	317103.960	1247696.520	18.740	Red/yellow mottled, low plasticity sandy clay	3.0-4.0	4.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	<guidelines	-	-	nd	nd	nd	nd
BHA	317118.7690	1247672.5610	18.4600	Red/grey mottled weathered shale clay, dark stains, strong HC odour	4.0-6.0	5.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	-	-	-	-	-	-
				Weathered shale with red ironstone gravelly fracturing, dark stains, odours		7.0	nd	nd	nd	nd	nd	nd	nd	0.4	nd	nd	nd	-			nd			
				Weathered shale with red ironstone gravelly fracturing, dark stains, odours	6.0-10.2	10.2	nd	3.5 (naphthalene)	nd	nd	nd	nd	nd	0.3	nd	nd	nd	-			nd			
BHA1	317119.2270	1247671.6640	18.4100	Weathered shale with red ironstone gravelly fracturing, dark stains, odours		7.0	nd	nd	nd	nd	nd	nd	nd	**1.6**	nd	nd	nd	-			nd			
				Weathered shale with red ironstone gravelly fracturing, dark stains, odours	6.0-10.2	10.2	nd	nd	nd	nd	nd	nd	nd	**1.4**	**nd**	nd	nd	-			nd			
BHA2	317119.7780	1247670.6760	18.4800	Weathered shale with red ironstone gravelly fracturing, dark stains, odours		7.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-			nd			
				Weathered shale with red ironstone gravelly fracturing, dark stains, odours	6.0-10.2	10.2	nd	nd	nd	nd	nd	nd	nd	0.9	nd	nd	nd	-			nd			
BHB	317125.2230	1247689.8230	18.4900	Red/grey mottled weathered shale clay, high odour	3.0-6.5	6.0	nd	5.9 (naphthalene)	4	nd	nd	nd	nd	**2**	nd	0.5	0.9	-			nd			
				Weathered shale with red ironstone gravelly fracturing, odours	6.5-9.6	9.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-			nd			
BHC	317122.0140	1247714.1410	18.7800	Brick annulus, free tar, wet, very high odours	5.5- 6.5	6.0	**17.6**	**1906.4**	**559**	5440	2610	710	**8760**	**6.4**	38.7	40.8	**246.7**	-			2.3			
BHC1	317122.9830	1247714.5220	18.7500	Weathered shale with red ironstone gravelly fracturing, dark stains, odours	7.2-8.0	8.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-			nd			
BHD	317107.9530	1247721.7750	18.8600	Red/grey mottled weathered shale clay, wet, HC odour, tar visible	6.5-8	7.0	nd	nd	8	nd	nd	nd	nd	**5.4**	0.2	0.7	1.6	-			nd			
				Weathered shale with red ironstone gravelly fracturing, odours	8.0-8.4	8.4	nd	nd	9	nd	nd	nd	nd	**7.5**	0.9	nd	0.8	-			11.4			
Total Samples Analysed							18	18	17	-	-	-	17	17	17	17	17	2	0	0	15	2	2	2
Detects above criteria							1	2	3	-	-	-	3	6	0	0	3	0	-	-	0	0	0	0
Hotspots							1	2	1	-	-	-	2	3	0	0	2	0	-	-	0	0	0	0
Retort							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH07	317118.681	1247729.832	18.710	Red clay, weather shale (odourous)	2.0-3.0	2.9-3.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH08	317125.080	1247723.696	18.580	Grey compacted clay / shale	2.5-4.0	3.5-3.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW37D	332300.9170	6247724.1940	18.615	Plastic silty clay fill	2.5-9.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Clay and shale	9.0-12.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH12	317151.071	1247716.220	18.670	Red clay and weathered shale	3.1-4.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Plastic clay	4-4.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Compacted clay (slight odour)	4.1-4.5	4.4-4.5	**8.4**	**224.4**	9	300	420	nd	720	**1**	3	nd	4	-	nd	-	34.2	-	-	-
BH12A	317150.333	1247715.24	18.63	Clay red/grey mottled, med plast, stiff - visible tar in pores	3.5-5	4.2	**13.9**	**515.6**	**228**	1190	3350	810	**5350**	**20**	53	8.3	**94.9**	-	4.6		6.9			
				Weathered shale with red ironstone gravelly fracturing	5-9.2	6.0	nd	nd	nd	nd	nd	nd	nd	0.2	nd	nd	nd	-			nd			
MG06	317121.6000	1247725.1500	18.950	Red/green mottled low plasticity clay, high HC odour, tar in pores		2.0	0.8	**101.50**	41	620	980	nd	**1600**	nd	2.5	6.9	22.7	<guidelines	-	-	nd	nd	nd	nd
				Red/green mottled low plasticity clay, high HC odour		3.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Red/green mottled low plasticity clay, high HC odour	2.0-4.7	4.7	nd	6.10	6	nd	nd	nd	nd	nd	nd	0.5	1.4	<guidelines	2.1	-	-	-	-	-
MG08	317142.7700	1247736.0700	18.700	Red/grey mottled highly plastic clay, visible tar in pores	2.5-3.5	3.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Grey/ white moderate plasticity weathered shale clay, faint HC odour	3.5-4.0	4.0	nd	8.40	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	-	-	-	-	-	-
MG09B	317141.1300	1247722.6100	18.735	Red/grey mottled moderate plasticity clay	1.7-2.5	2.5	nd	0.70	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	-	-	-	-	-	-
MG09C	317134.4800	1247721.2700	18.735	Brown/green low plasticity silty clay becoming shale, high HC odour	1.9-3.8	3.8	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	<guidelines	-	-	-	-	-	-
MG10A	317150.4400	1247736.7200	18.850	Red/grey highly plastic clay becoming weathered shale clay		2.8	**6.3**	**206.90**	56	760	3060	250	**4070**	**1.1**	1.9	6.3	18.9	<guidelines	-	-	nd	nd	nd	nd
				Red/grey highly plastic clay becoming weathered shale clay	2.3-4.0	4.0	nd	0.70	nd	nd	nd	nd	nd	nd	nd	nd	nd	<guidelines	-	-	nd	-	-	-
TP15	317145.9700	1247729.6300	18.780	Red/grey mottled moderate plasticity clay, tar in pores		2.8	**10.8**	**426.20**	**107**	450	1400	240	**2090**	**1.8**	10.9	17.5	**56.2**	<guidelines	1.9	-	-	nd	nd	-
				Red/grey mottled moderate plasticity clay to weathered shale, tar in pores	2.5-4.1	4.1	0.5	18.10	**65**	nd	nd	nd	nd	**2.7**	10.6	4.9	24.8	<guidelines	-	-	-	nd	nd	-
TP15A	317146.377	1247729.433	18.8	Weathered shale with red ironstone gravelly fracturing, free tar, odours		6.0	nd	0.8 (naphthalene)	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	nd		nd			
				Weathered shale with red ironstone gravelly fracturing	5.0-8.0	7.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	nd		nd			
BHC2	317128.9550	1247714.3230	18.6600	Weathered shale with red ironstone gravelly fracturing, dark stains, odours		6.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-			nd			
				Weathered shale with red ironstone gravelly fracturing, odours	4.8-8.0	8.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-			nd			
BHG	317117.2880	1247724.5790	18.6100	Red/grey mottled moderate plasticity clay, tar in pores, high odours	4.8-6.0	6.0	1	76.6	24	160	220	nd	380	**2.4**	4.1	1.3	8.7	-	nd		7.4			
				Weathered shale with red ironstone gravelly fracturing, dark stains, odours		7.2	nd	12.3	8	nd	nd	nd	nd	nd	nd	0.4	1.6	-			nd			
				Weathered shale with red ironstone gravelly fracturing, odours	6.0-8.1	8.1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-			nd			
MG09A1	317134.074	1247734.848	18.44	Red/grey mottled weathered shale clay, slight odour		3.6	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	nd		nd			
				Red/grey mottled weathered shale clay, slight odour	2.0-5.0	4.8	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	nd		nd			
Total Samples Analysed							21	21	21	-	-	-	21	21	21	21	21	7	9	0	15	4	4	2
Detects above criteria							4	5	3	-	-	-	4	6	0	0	2	0	0	-	0	0	0	0
Hotspots							1	2	1	-	-	-	2	2	0	0	1	0	0	-	0	0	0	0
Gas Purifier							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH11	317140.501	1247707.420	18.560	Grey clay	2.3-2.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Stiff weathered clay	2.8-3.9	3.0-3.1	-	-	-	-	-	-	-	-	-	-	-	<guidelines	nd	-	-	-	-	-
BH18	317129.119	1247706.185	18.680	Red clay and weathered shale (odour)	2.5-4.0	2.9-3.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Red clay and weathered shale (odour)		3.9-4.0	nd	1.8	-	-	-	-	-	nd	nd	nd	nd	<guidelines	-	-	-	-	-	-
MG11	317138.230	1247707.260	18.600	Red/grey mottled very firm clay	3.2-4.0	4.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	<guidelines	nd	-	nd	-	-	-
BHE	317131.9540	1247692.9320	18.5000	Red/grey mottled weathered shale clay, slight odour	2.5-5.0	3.5	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	1.6		nd			
				Weathered shale with red ironstone gravelly fracturing, odours	5.0-8.4	8.4	nd	1.9 (naphthalene)	nd	nd	nd	nd	nd	1.6	0.2	nd	nd	-	nd		nd			
BHF	317135.8890	1247701.0570	18.5600	Red/grey mottled weathered shale clay, slight odour	2.4-5.5	3.6	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	nd		nd			
				Weathered shale with red ironstone gravelly fracturing, free tar, odours		7.0	nd	0.8 (naphthalene)	7	nd	nd	nd	nd	0.8	0.4	nd	1	-	nd		nd			
				Weathered shale with red ironstone gravelly fracturing, free tar, odours	5.5-9.0	8.5	1.1	**134.6**	22	650	510	100	**1260**	0.8	nd	1.9	9.8	-	nd		nd			
Total Samples Analysed							7	7	6	-	-	-	6	7	7	7	7	3	7	0	6	0	0	0
Detects above criteria							0	1	0	-	-	-	1	1	0	0	0	0	0	-	0	-	-	-
Hotspots							0	0	0	-	-	-	0	0	0	0	0	0	0	-	0	-	-	-
Northeast							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH13		Not surveyed		Clay and weathered shale	1.5-2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Plastic clay	2.0-3.9	3.0-3.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH14	317161.824	1247753.075	19.030	Red clay	1.5-2.5	2.2-2.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Grey plastic clay	2.5-3.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Sandy silty clay, very odorous	3.1-4.1	3.9-4.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				White clayey sand, crumbly	4.1-5.1	4.9-5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH14A						2.4	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-			nd			
BH15	317179.131	1247760.045	18.810	Plastic clay	2.0-2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				White clayey sand, crumbly	2.5-4.2	4.1-4.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH16	317184.659	1247749.137	18.500	Plastic clay and gravel	1.5-2.2	2.0-2.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Plastic clay	2.2-3.1	2.6-2.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Plastic clay		3.0-3.1	nd	nd	-	-	-	-	-	nd	nd	nd	nd	<guidelines	-	-	-	-	-	-
				Weathered shale	3.1-4.1	4.0-4.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP99	317214.570	1247774.179	19.420	Clay	0.5-2.1	2.0-2.1	nd	nd	nd	-	-	-	-	nd	nd	nd	nd	<guidelines	-	-	-	-	-	-
MW42S	332357.7440	6247737.6530	18.484	Silty clay	1.9-4.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW42D	332356.4770	6247736.3090	18.529	Sandy silty clay	2.3-12.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MG10B	317157.4720	1247740.0010	18.820	Red/grey mottled weathered shale clay		3.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd				nd			
TP05	317185.5300	1247738.7300	18.440	Red/brown firm clay	1.9-2.0	2.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	-	-	-	-	-	-
TP06	317189.0900	1247749.9500	18.530	Red/brown with grey mottles higly plastic clay	2.3-2.7	2.5	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	-	-	-	-	-	-
TP07	317201.1000	1247755.8200	18.890	Grey with red/brown mottles firm clay	1.7-2.2	2.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	-	-	-	-	-	-
TP08	317202.3200	1247766.1500	19.150	Grey with red mottles very firm clay	1.9-2.0	2.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	<guidelines	-	-	-	-	-	-
TP09	317218.1000	1247779.2700	19.470	Grey with red mottles very firm clay	2.4-2.6	2.5	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	<guidelines	-	-	-	-	-	-
TP16	317172.6700	1247743.8900	18.600	Red/grey mottled very firm clay	1.5-3.8	3.5	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	<guidelines	nd	-	nd	-	-	-
Total Samples Analysed							10	10	8	-	-	-	8	10	10	10	10	5	1	0	3	0	0	0
Detects above criteria							0	0	0	-	-	-	0	0	0	0	0	0	0	-	0	-	-	-

Table 12 - Summary of All Data for Natural Soil - Macdonaldtown Gasworks Site

Sample Location	Easting (AMG)	Northing (AMG)	Elevation (mAHD)	Soil Profile	Sample Depth (m)		Contaminants of Concern - Concentrations in mg/kg															
							BaP	Total PAH	TPH (C6-C9)	TPH (C10-C14)	TPH (C15-C28)	TPH (C29-C36)	Total C10-C36	Benzene	Toluene	Ethylbenzene	Total Xylenes	Metals	Cyanide (Total)	VOCs	Total Phenols	OCPs	OPPs	PCBs
Commercial / Industrial Landuse Guidelines (NEHF F / NSW EPA 1994 Service Station Guidelines)							5	100	65	-	-	-	1000	1	130	50	25	Various	2500	See BTEX	42500 (phenol)	50 (heptaclor) 50 (aldrin+dieldrin) 50 (chlordane) 1000 (DDT+DDE+DDD)		50
Hotspots							0	0	0	-	-	-	0	0	0	0	0	0	0	-	0	-	-	-
South Central							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW03D	317139.485	1247683.339	18.330	Siltstone	5.0-11.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Shale	11.0-13.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW04D	317158.641	1247703.451	18.370	Siltstone	5.5-10.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Shale	10-11.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP03	317139.830	1247679.080	18.020	Red/brown with grey mottles plastic silty clay, strong HC odour		3.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Red/brown with grey mottles plastic silty clay, strong HC odour	2.8-4.0	4.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	-	-	-	-	-	-
TP04	317155.800	1247705.630	18.500	Wet soft clayey silt, slight odour	2.0-2.9	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Red/ brown grey mottled slightly sandy clay, slight odour	2.9-3.1	3.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	-	-	-	-	-	-
TP11	317158.910	1247723.560	18.590	Grey with red mottles very firm clay	3.2-4.0	3.5	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	-	-	-	-	-	-
Total Samples Analysed							3	3	3	-	-	-	3	3	3	3	3	0	0	0	0	0	0	0
Detects above criteria							0	0	0	-	-	-	0	0	0	0	0	-	-	-	-	-	-	-
Hotspots							0	0	0	-	-	-	0	0	0	0	0	-	-	-	-	-	-	-
Southwest							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH01	317111.994	1247643.511	18.370	Red clay / weathered shale	4.0-4.5	4.0-4.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02	317107.419	1247666.818	18.420	Red clay, compacted, hard	4.0-4.5	4.4-4.5	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	-	-	-	-	-	-
MW12S	317108.660	1247661.840	19.990	Red plastic clay	3.0-5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW12D	317108.480	1247659.800	20.020	Shale	10.0-12.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW13S	317112.030	1247646.520	19.500	Red plastic clay	4.2-5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW13D	317112.010	1247649.090	19.470	Plastic clay	4.4-10.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Shale	10.0-12.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW18D	317106.550	1247671.160	19.490	Shale bedrock	10.0-12.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MG01	317116.340	1247667.860	18.530	Red/ grey mottled highly plastic clay becoming shale, feint HC odour		3.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Red/ grey mottled highly plastic clay becoming shale, feint HC odour	3.3-5.0	5.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	-	-	-	-	-	-
TP02	317109.670	1247657.650	19.070	Light grey with red mottles non-plastic firm clay	3.9-4.3	4.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
				Brown fine to coarse gravelly sand, coke and ash present, strong HC odou		4.5	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	-	-	-	-	-	-
				Brown fine to coarse gravelly sand, coke and ash present, strong HC odou	4.3-4.5	4.5	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	<guidelines	-	-	-	nd	nd	-
Total Samples Analysed							4	4	4	-	-	-	4	4	4	4	4	1	0	0	0	1	1	0
Detects above criteria							0	0	0	-	-	-	0	0	0	0	0	0	-	-	-	0	0	-
Hotspots							0	0	0	-	-	-	0	0	0	0	0	0	-	-	-	0	0	-
Retaining Wall							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP10	317184.32	1247770	20.1	Grey with red mottles very firm clay, shale gravels at top	3.2-4.1	4.0	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	<guidelines	-	-	-	-	-	-
TP18	317109.12	1247729.32	19.84	Red/ grey mottled clay		3.2	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	<guidelines	nd	-	-	-	-	-
				Red/ grey mottled clay	2.6-4.4	4.4	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	<guidelines	-	-	-	-	-	-
Total Samples Analysed							3	3	3	-	-	-	3	3	3	3	3	3	1	0	0	0	0	0
Detects above criteria							0	0	0	-	-	-	0	0	0	0	0	0	0	-	-	-	-	-
Hotspots							0	0	0	-	-	-	0	0	0	0	0	0	0	-	-	-	-	-
Western Lot							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW08D	317079.530	1247715.480	19.540	Red clay becoming weathered shale	0.4-11.0	1.4-1.5	0.7	5.6	nd	nd	nd	nd	nd	nd	nd	nd	nd	<guidelines	-	-	nd	-	-	-
MW08D	317079.530	1247715.480	19.540	Shale	11.0-12.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP13	317084.37	1247717.07	18.7	Orange/yellow red mottled non plastic silty clay	0.6-1.3	1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	-	-	-	-	-	-
				Red/grey mottled very firm clay	1.3-1.7	1.5	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	-	-	-	-	-	-	-
TP14	317067.72	1247713.76	18.7	Orange/brown with red mottles slightly silty clay	0.8-1.2	1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	<guidelines	-	-	nd	-	-	-
				Red/grey mottled slightly silty clay	1.2-1.8	1.5	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	<guidelines	nd	-	-	-	-	-
Total Samples Analysed							5	5	5	-	-	-	5	5	5	5	5	3	1	0	2	0	1	0
Detects above criteria							0	0	0	-	-	-	0	0	0	0	0	0	0	-	0	-	-	-
Hotspots							0	0	0	-	-	-	0	0	0	0	0	0	0	-	0	-	-	-

BOLD Concentration exceeds Commercial/Industrial Guidelines
BOLD Hotspots of contamination (conc exceeds criteria by 250%)

Table 13 - TCLP Analytical Results

Analyte	MG01/1.8		Waste Classification	MG02/1.8		Waste Classification	TP10/2.0		Waste Classification	TP06/0.25		Waste Classification	MG04/0.5		Waste Classification	MG06/2.0		Waste Classification	MG10A/0.7		Waste Classification	MG11/2.0		Waste Classification
	TCLP	SCC		TCLP	SCC		TCLP	SCC		TCLP	SCC		TCLP	SCC		TCLP	SCC		TCLP	SCC		TCLP	SCC	
Arsenic	-	<5	inert	<0.1	8	inert	-	7	inert	-	-	-	-	13	solid	-	6	inert	<0.1	17	inert	-	<5	inert
Cadmium	-	<1	inert	<0.05	<1	inert	-	1	inert	-	-	-	-	<1	inert	-	<1	inert	<0.05	3	inert	-	<1	inert
Lead	-	65	solid	<0.1	93	inert	<0.1	62	inert	-	-	-	5	2,140	industrial	<0.1	21	inert	<0.1	426	inert	<0.1	25	inert
Nickel	-	2	inert	<0.1	6	inert	<0.1	5	inert	-	-	-	<0.1	17	inert	-	<2	inert	<0.1	19	inert	-	<2	inert
Mercury	-	<0.1	inert	-	<0.1	inert	-	<0.1	inert	-	-	-	<0.0010	0.3	inert	-	<0.1	inert	-	1.1	solid	-	<0.1	inert
Benzo(a)pyrene	<0.0005	0.6	inert	<0.0019	178	hazardous	<0.0005	1	inert	<0.0005	55	hazardous	<0.0005	6	solid	<0.0005	0.8	inert	<0.0005	339	hazardous	<0.0005	48.8	hazardous
Total PAH	-	11.6	inert	-	5301.9	hazardous	-	14.5	inert	-	690.2	industrial	-	61.3	inert	-	101.5	inert	-	4758.2	hazardous	-	728.8	industrial
TPH C 6 - C 9	-	<2	inert	-	189	inert	-	<2	inert	-	-	-	-	<2	inert	-	41	inert	-	<2	inert	-	10	inert
Total (C10-C36)	-	<250	inert	-	36140	industrial	-	<250	inert	-	-	-	-	1810	inert	-	1600	inert	-	234950	hazardous	-	7750	solid
Benzene	-	<0.2	inert	-	3	solid	-	<0.2	inert	-	-	-	-	<0.2	inert	-	<0.2	inert	-	<0.2	inert	-	<0.2	inert
Ethylbenzene	-	<0.2	inert	-	30.2	inert	-	<0.2	inert	-	-	-	-	<0.2	inert	-	6.9	inert	-	<0.2	inert	-	<0.2	inert
Toluene	-	<0.2	inert	-	4.4	inert	-	<0.2	inert	-	-	-	-	<0.2	inert	-	2.5	inert	-	<0.2	inert	-	<0.2	inert
Xylenes	-	<0.4	inert	-	165.8	solid	-	<0.4	inert	-	-	-	-	<0.4	inert	-	22.7	inert	-	<0.4	inert	-	<0.4	inert
Cyanide Total	-	<1	inert	-	23.3	inert	-	2.2	inert	-	-	-	-	-	-	-	-	-	-	27.1	inert	-	3.5	inert
Preliminary Waste Classification			solid			hazardous			inert			hazardous			industrial			inert			hazardous			hazardous
With NSW DEC General Approval (i.e. after treatment)			Not Applicable			industrial (total TPH exceeds solid)			Not Applicable			solid			Not Applicable			inert			solid			solid

Analyte	BHA1/7.0		Waste Classification	BHD/8.4		Waste Classification	BHF/8.5		Waste Classification
	TCLP	SCC		TCLP	SCC		TCLP	SCC	
Benzene	<0.001	1.6	inert	0.012	7.5	inert	0.001	0.8	inert
Toluene	<0.002	<0.2	inert	<0.002	0.9	inert	0.002	<0.2	inert
Ethylbenzene	<0.002	0.2	inert	<0.002	<0.2	inert	0.106	1.9	inert
Xylenes	<0.004	<0.4	inert	0.009	0.8	inert	0.648	9.8	inert
TPH (C6-C9)	-	-	-	-	-	-	0.6	22	inert
TPH C10 - C14	-	-	-	-	-	-	4.1	650	-
TPH C15 - C28	-	-	-	-	-	-	0.5	510	-
TPH C29 - C36	-	-	-	-	-	-	<0.05	100	-
Total (C10-C36)	-	-	-	-	-	-	-	1260	inert
Naphthalene	-	-	-	-	-	-	0.1018	99.8	-
Acenaphthylene	-	-	-	-	-	-	<0.0018	4.2	-
Acenaphthene	-	-	-	-	-	-	0.019	1.4	-
Fluorene	-	-	-	-	-	-	0.0299	4.8	-
Phenanthrene	-	-	-	-	-	-	0.0201	7.6	-
Anthracene	-	-	-	-	-	-	0.0044	2.4	-
Fluoranthene	-	-	-	-	-	-	0.0024	3.8	-
Pyrene	-	-	-	-	-	-	0.002	3.7	-
Benz(a)anthracene	-	-	-	-	-	-	<0.0018	1.5	-
Chrysene	-	-	-	-	-	-	<0.0018	1.2	-
Benzo(b)fluoranthene	-	-	-	-	-	-	<0.0018	1.1	-
Benzo(k)fluoranthene	-	-	-	-	-	-	<0.0018	0.5	-
Benzo(a)pyrene	-	-	-	-	-	-	<0.0018	1.1	solid
Indeno(1.2.3.cd)pyrene	-	-	-	-	-	-	<0.0018	<0.5	-
Dibenz(a.h)anthracene	-	-	-	-	-	-	<0.0018	<0.5	-
Benzo(g.h.i)perylene	-	-	-	-	-	-	<0.0018	0.5	-
Total PAH	-	-	-	-	-	-	-	133.6	inert
Preliminary Waste Classification			inert			inert			solid
With NSW DEC General Approval (i.e. after treatment)			inert			inert			solid

Notes:
TCLP in µg/L
SCC in mg/kg

Table 14 - Neutral Leach Analytical Results

Analyte	ANZECC 2000	BHA1/7.0		BHD/8.4		BHF/8.5	
		Neutral	TCLP	Neutral	TCLP	Neutral	TCLP
Benzene	950	<0.001	<0.001	0.01	0.012	-	0.001
Toluene	-	<0.002	<0.002	<0.002	<0.002	-	0.002
Ethylbenzene	-	<0.002	<0.002	<0.002	<0.002	-	0.106
m+p Xylene	-	<0.002	<0.002	0.003	0.006	-	0.265
o xylene	350	<0.002	<0.002	0.002	0.003	-	0.383
TPH (C6-C9)	-	-	-	-	-	-	0.6
TPH C10 - C14	-	-	-	-	-	6.99	4.1
TPH C15 - C28	-	-	-	-	-	0.6	0.5
TPH C29 - C36	-	-	-	-	-	<0.05	<0.05
Naphthalene	16	-	-	-	-	3.13	0.1018
Acenaphthylene	-	-	-	-	-	0.0024	<0.0018
Acenaphthene	-	-	-	-	-	0.0135	0.019
Fluorene	-	-	-	-	-	0.0346	0.0299
Phenanthrene	-	-	-	-	-	0.0213	0.0201
Anthracene	-	-	-	-	-	0.0054	0.0044
Fluoranthene	-	-	-	-	-	0.0025	0.0024
Pyrene	-	-	-	-	-	0.0019	0.002
Benz(a)anthracene	-	-	-	-	-	0.001	<0.0018
Chrysene	-	-	-	-	-	0.001	<0.0018
Benzo(b)fluoranthene	-	-	-	-	-	0.001	<0.0018
Benzo(k)fluoranthene	-	-	-	-	-	0.001	<0.0018
Benzo(a)pyrene	-	-	-	-	-	0.0005	<0.0018
Indeno(1.2.3.cd)pyrene	-	-	-	-	-	0.001	<0.0018
Dibenz(a.h)anthracene	-	-	-	-	-	0.001	<0.0018
Benzo(g.h.i)perylene	-	-	-	-	-	0.001	<0.0018

Notes:
All values in µg/L

Table 15 - Surface Water Analytical Results

Analyte	Unit	LOR	ANZECC 2000 95%	W01 - MG04	W02 - Tar Well#1	W03 - Tar Well#2	W04 - RP	W05 (Sth GH brick annulus)	W06 (Sth GH bottom sample)
2,4-dimethylphenol	ug/L	1		-	-	-	3.8	<1	<1
Phenol	ug/L	1	320	-	-	-	<1	<1	63.5
Acenaphthene	ug/L	1		3.7	5	215	<1	<1	<1
Acenaphthylene	ug/L	1		<1	6.4	1450	2.7	<1	<1
Anthracene	ug/L	1		<1	2.1	482	1.4	<1	<1
Benz(a)anthracene	ug/L	1		<1	2	357	8.4	<1	<1
Benzo(a) pyrene	ug/L	0.5		<0.5	<1.9	277	9.9	<0.5	<0.5
Benzo(b)fluoranthene	ug/L	1		<1	2	259	11.6	<1	<1
Benzo(g,h,i)perylene	ug/L	1		<1	<1.9	124	8	<1	<1
Benzo(k)fluoranthene	ug/L	1		<1	<1.9	77.1	3.3	<1	<1
Chrysene	ug/L	1		<1	<1.9	288	7.1	<1	<1
Dibenz(a,h)anthracene	ug/L	1		<1	<1.9	33.6	2	<1	<1
Fluoranthene	ug/L	1		<1	3.1	622	16.1	<1	<1
Fluorene	ug/L	1		1.3	4.3	750	<1	<1	<1
Indeno(1,2,3-c,d)pyrene	ug/L	1		<1	<1.9	97.9	5.6	<1	<1
Naphthalene	ug/L	1	16	**38.5**	**230**	**20900**	<1	<1	<1
Phenanthrene	ug/L	1		1.2	6.8	1520	1.5	<1	<1
Pyrene	ug/L	1		<1	3.7	651	23.6	<1	<1
Arsenic	ug/L	1		-	-	-	8	<1	1
Cadmium	ug/L	0.1	0.2	-	-	-	**1**	<0.1	**1**
Chromium	ug/L	1		-	-	-	7	<1	8
Copper	ug/L	1	1.4	-	-	-	**43**	<1	**7**
Lead	ug/L	1	3.4	-	-	-	**87**	3	**107**
Nickel	ug/L	1	11	-	-	-	**16**	<1	4
Zinc	ug/L	5	8	-	-	-	**302**	**16**	**277**
TPH C10 - C14 Fraction	ug/L	50		280	2670	153000	200	<50	420
TPH C15-C28 Fraction	ug/L	100		200	800	50800	900	<100	<100
TPH C29-C36 Fraction	ug/L	50		<50	<50	10600	460	<50	<50
TPH C 6 - C 9 Fraction	ug/L	20		40	100	7240	<20	<20	<20
Benzene	ug/L	1	950	12	<5	**1360**	<1	<1	<1
Ethylbenzene	ug/L	2		<2	<5	160	<2	<2	<2
m- & p-xylene	ug/L	2		7	37	1180	<2	<2	<2
o-xylene	ug/L	2	350	2	29	**723**	<2	<2	<2
Toluene	ug/L	2		<2	<5	1260	<2	<2	<2

Notes:
(-) refers to analyte not tested.
BOLD refers to exceeds guideline criteria

Table 16 - Statistical Analysis Results - Ash and Coke Gravels

	Contaminants of Concern - Concentrations in mg/kg	
	BaP	**Benzene**
Criteria	**5**	**1**
	All Data	
No. Samples	57	45
Min	0.50	0.20
Max	339.00	4.20
Mean	31.18	0.24
Std Dev.	**66.00**	**1.90**
95%UCL	**45.80**	0.35
Distribution	**neither**	log-normal
	With Hotspots removed	With MG02/0.2m removed
No. Samples	42	44
Min	0.50	0.20
Max	16.00	1.60
Mean	4.80	0.30
Std Dev.	**4.00**	0.30
95%UCL	**5.80**	0.40
Distribution	**normal**	**normal**

Notes:
BOLD - Exceeds Investigation Criteria

Table 17 - Statistical Analysis Results - Reworked Clays

	Contaminants of Concern - Concentrations in mg/kg			
	BaP	**Total PAH**	**Total C10-C36**	**Benzene**
Criteria	**5**	**100**	**1,000**	**1**
	All Data			
No. of Samples	24	24	22	29
Min	0.50	0.60	250.00	0.20
Max	444.00	15,237.60	435,100.00	4.60
Mean	21.00	674.77	20,895.91	0.25
Std. Dev.	**90.30**	3,103.00	**92,556.00**	**2.00**
95%UCL	**52.60**	**1,760.00**	**54,852.00**	0.70
Distribution	**neither**	**neither**	**neither**	**log-normal**
	With Removal of Free Tar Hotspots			
No. of Samples	21	21	19	26
Min	0.50	0.60	250.00	0.50
Max	30.00	137.00	13,340.00	4.60
Mean	2.40	19.30	1,043.00	0.20
Std. Dev.	**6.50**	33.20	**2,988.00**	**1.87**
95%UCL	4.80	31.80	**2,232.00**	0.40
Distribution	**neither**	**neither**	**neither**	**log-normal**
	With Removal of BH06 Hotspot		With Removal of MG05 Hotspot	With Removal of BH14 Hotspot
No. of Samples	20	20	18	25
Min	0.50	0.60	250.00	0.20
Max	6.40	89.50	1,150.00	0.40
Mean	0.70	13.40	360.00	0.20
Std. Dev.	2.00	19.90	259.00	0.04
95%UCL	1.25	no exceeds	466.00	0.20
Distribution	**log-normal**		**normal**	**normal**

Notes:
BOLD - Exceeds Investigation Criteria

Table 18 - Statistical Analysis Results - Silty Clays

	Contaminants of Concern - Concentrations in mg/kg		
	BaP	**Total PAH**	**Benzene**
Criteria	**5**	**100**	**1**
	All Data		
No. of Samples	12	12	13
Min	0.50	3.60	0.20
Max	178.00	5,301.90	4.00
Mean	19.03	588.58	0.73
Std. Dev.	**50.60**	**1,519.00**	**1.20**
95%UCL	**45.20**	**1,376.00**	**1.40**
Distribution	**neither**	**neither**	**neither**
	With Removal of Free Tar Hotspots		
No. of Samples	9	9	10
Min	0.50	3.60	0.20
Max	7.00	99.30	4.00
Mean	1.90	33.00	0.60
Std. Dev.	**2.50**	39.70	**1.20**
95%UCL	3.50	no exceeds	**1.30**
Distribution	**neither**		**neither**
Silty Clays	Remove all elevated concentrations at BH08		Remove MW04 Hotspot
No. of Samples	7		9
Min	0.50		0.20
Max	2.10		0.40
Mean	0.70		0.20
Std. Dev.	0.60		0.10
95%UCL	1.20		0.30
Distribution	**normal**		**normal**

Notes:
BOLD - Exceeds Investigation Criteria

Table 19 - Statistical Analysis Results - Gravel, Sand & Demolition Wastes

	Contaminants of Concern - Concentrations in mg/kg		
	BaP	**Total C10-C36**	**Benzene**
Criteria	**5**	**1,000**	**1**
	All Data		
No. of Samples	14	12	18
Min	0.40	250.00	0.20
Max	150.00	9,390.00	15.00
Mean	18.26	1,605.67	1.20
Std. Dev.	**41.70**	**2,614.00**	**3.50**
95%UCL	**38.00**	**2,961.00**	**2.60**
Distribution	**neither**	**neither**	**neither**
	With Removal of Ashy Hotspots		
No. of Samples	12	11	16
Min	0.40	250.00	0.20
Max	10.40	2,750.00	0.20
Mean	3.20	898.00	0.20
Std. Dev.	**3.80**	**953.00**	0.00
95%UCL	**5.20**	**1,419.00**	0.20
Distribution	**normal**	**normal**	**normal**

Notes:
BOLD - Exceeds Investigation Criteria

Table 20 - Statistical Analysis Results - Sands and Gravels

	Contaminants of Concern - Concentrations in mg/kg		
	BaP	**Total C10-C36**	**Benzene**
Criteria	**5**	**1,000**	**1**
	All Data		
No. of Samples	13	8	12
Min	0.50	250.00	0.20
Max	48.80	7,750.00	7.00
Mean	10.21	2,267.50	1.09
Std. Dev.	**16.90**	3,368.00	**2.00**
95%UCL	**18.60**	4,524.00	**2.15**
Distribution	**neither**	**neither**	**neither**
	With Removal of Free Tar Hotspots		
No. of Samples	10	6	9
Min	0.50	250.00	0.20
Max	6.90	1,280.00	1.20
Mean	1.70	458.00	0.30
Std. Dev.	2.40	412.00	0.30
95%UCL	3.00	797.00	0.50
Distribution	**neither**	**normal**	**normal**
	Remove all TP16 material		
No. of Samples	9		
Min	0.50		
Max	5.40		
Mean	1.00		
Std. Dev.	2.20		
95%UCL	2.00		
Distribution	**log-normal**		

Notes:
BOLD - Exceeds Investigation Criteria

Table 21 - Statistical Analysis Results - Gravel, Sand & Clay with Minor As

	Contaminants of Concern - Concentrations in mg/kg		
	BaP	**Total PAH**	**Total C10-C36**
Criteria	**5**	**100**	**1,000**
	All Data		
No. of Samples	15	15	14
Min	0.50	0.90	50.00
Max	34.90	346.00	6,444.00
Mean	4.37	45.15	799.57
Std. Dev.	**9.10**	**89.00**	**1,674.00**
95%UCL	**8.50**	85.60	1,591.00
Distribution	**neither**	**neither**	**neither**
	With Removal of Hotspots at MW13s & RP		
No. of Samples	13	13	12
Min	0.50	0.50	50.00
Max	7.70	68.20	470.00
Mean	0.80	16.40	251.00
Std. Dev.	2.40	18.80	90.00
95%UCL	2.30	25.70	298.00
Distribution	**log-normal**	**normal**	**normal**

Notes:
BOLD - Exceeds Investigation Criteria

Table 22 - Statistical Analysis Results - Red and Grey Clays

	Contaminants of Concern - Concentrations in mg/kg				
	BaP	**Total PAH**	**TPH (C6-C9)**	**Total C10-C36**	**Benzene**
Criteria	**5**	**100**	**65**	**1,000**	**1**
	All Data				
No. of Samples	24	24	22	22	23
Min	0.50	0.70	2.00	250.00	0.20
Max	13.90	515.60	228.00	5,350.00	20.00
Mean	2.16	85.38	35.09	1,003.18	1.41
Std. Dev.	**3.70**	**143.00**	**57.00**	**1,422.00**	**4.10**
95%UCL	3.50	**135.00**	56.00	**1,525.00**	**2.90**
Distribution	**neither**	**neither**	**neither**	**neither**	**neither**
	With Removal of Free Tar Hotspots				
No. of Samples	19	19	17		18
Min	0.50	0.70	2.00		0.20
Max	8.40	288.50	118.00		1.10
Mean	0.70	48.00	18.00		0.30
Std. Dev.	2.40	**88.00**	**35.50**		0.30
95%UCL	1.80	83.00	33.10		0.40
Distribution	**log-normal**	**neither**	**neither**		**normal**
		Remove MG05 Hotspot	Remove all MG05		
No. of Samples		18	15	15	
Min		0.70	2.00	250.00	
Max		224.40	56.00	4,070.00	
Mean		34.60	3.10	323.00	
Std. Dev.		**68.00**	2.50	2.12	
95%UCL		62.00	9.20	692.00	
Distribution		**neither**	**log-normal**	**log-normal**	
		Remove Exceedances at BH12 & MG10A & all at MGO5			
No. of Samples		14			
Min		0.70			
Max		8.00			
Mean		5.90			
Std. Dev.		3.20			
95%UCL		7.40			
Distribution		**normal**			

Notes:
BOLD - Exceeds Investigation Criteria

Table 23 - Statistical Analysis Results - Weathered Shales

	Contaminants of Concern - Concentrations in mg/kg		
	BaP	**Total PAH**	**Benzene**
Criteria	**5**	**100**	**1**
	All Data		
No. of Samples	25	25	25
Min	0.50	8.00	0.20
Max	17.60	1,906.40	7.50
Mean	0.60	96.25	1.30
Std. Dev.	2.10	**395.00**	**2.00**
95%UCL	1.20	**238.00**	**2.00**
Distribution	**log-normal**	**neither**	**neither**
	With Removal of Free Tar Hotspots		With Removal of Free Tar & all BHD Hotspots
No. of Samples		17	17
Min		8.00	0.20
Max		12.30	2.00
Mean		8.30	0.60
Std. Dev.		1.00	**0.60**
95%UCL		8.70	0.90
Distribution		**normal**	**normal**
			Remove elevated conc at BHA1 & BHB
No. of Samples			14
Min			0.20
Max			1.60
Mean			0.40
Std. Dev.			0.40
95%UCL			0.60
Distribution			**normal**

Notes:
BOLD - Exceeds Investigation Criteria

Appendix A
Site Photographs



Photo 1 Main Site area facing southwest showing general ground surface. Existing Gasholder structure in the background.

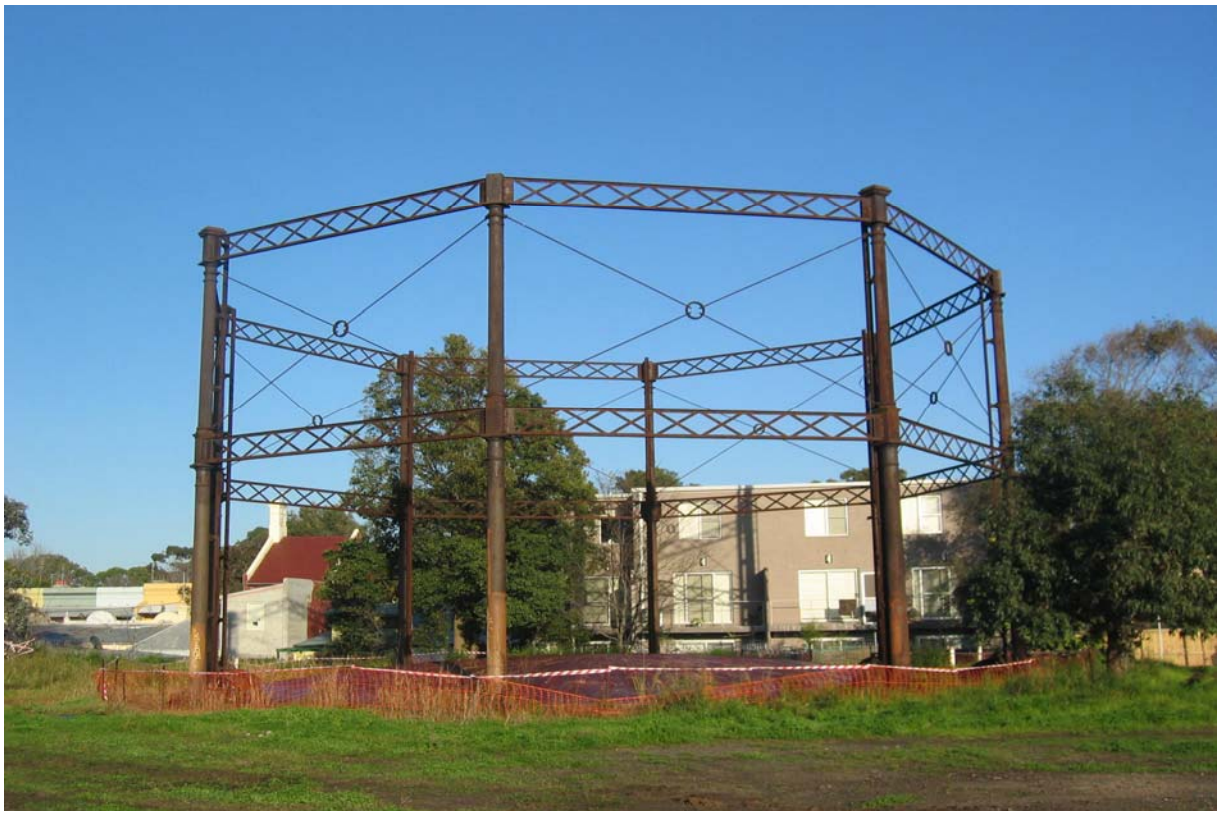


Photo 2 Southern Gasholder facing west. Residential properties behind.



Photo 3 Tar Well concrete lids facing west with Retaining Wall/Embankment behind. Adjoining RailCorp site in the background, with demountable sheds.



Photo 4 Western boundary facing south showing the fill embankment down to adjoining residential properties and open drain along the boundary.



Photo 5 Retaining Wall/Embankment facing east showing adjoining RailCorp site (left) and overgrown grasses and shrubs along the length of this area.



Photo 6 Uncovered brick annulus of the Northern Gasholder.



Photo 7 Exposed brick annulus of the Northern Gasholder at sample location MG05. Tar seeping from brickwork.



Photo 8 Demolition Waste fill material inside annulus of the Northern Gasholder.



Photo 9 Shallow water inside annulus of the Northern Gasholder. On the right of pit is the metal-lined brick work.



Photo 10 Sample collected at BHC at 6.0mbgl showing free tar and brick material.



Photo 11 Facing west toward sample location BHA angled bore.



Photo 12 Tar Well #1 concrete lid removed and showing water contents.



Photo 13 Tar Well #2 showing coal tar and gravel contents.



Photo 14 Facing west toward sample location MG06 at Tar Well #2 showing tar seepage from brickwork.



Photo 15 Facing west toward sample location RP and brick Retention Pit.



Photo 16 Facing south toward former Retort House area showing historic brickwork. Shows sample location MG09A (foreground) and MG09B (background with excavator).



Photo 17 Facing north toward sample location MG09B. Showing tar pipe from which a sample was collected.



Photo 18 Subsurface conditions showing ash and coke surface fill layer. Profile at sample location MG10.

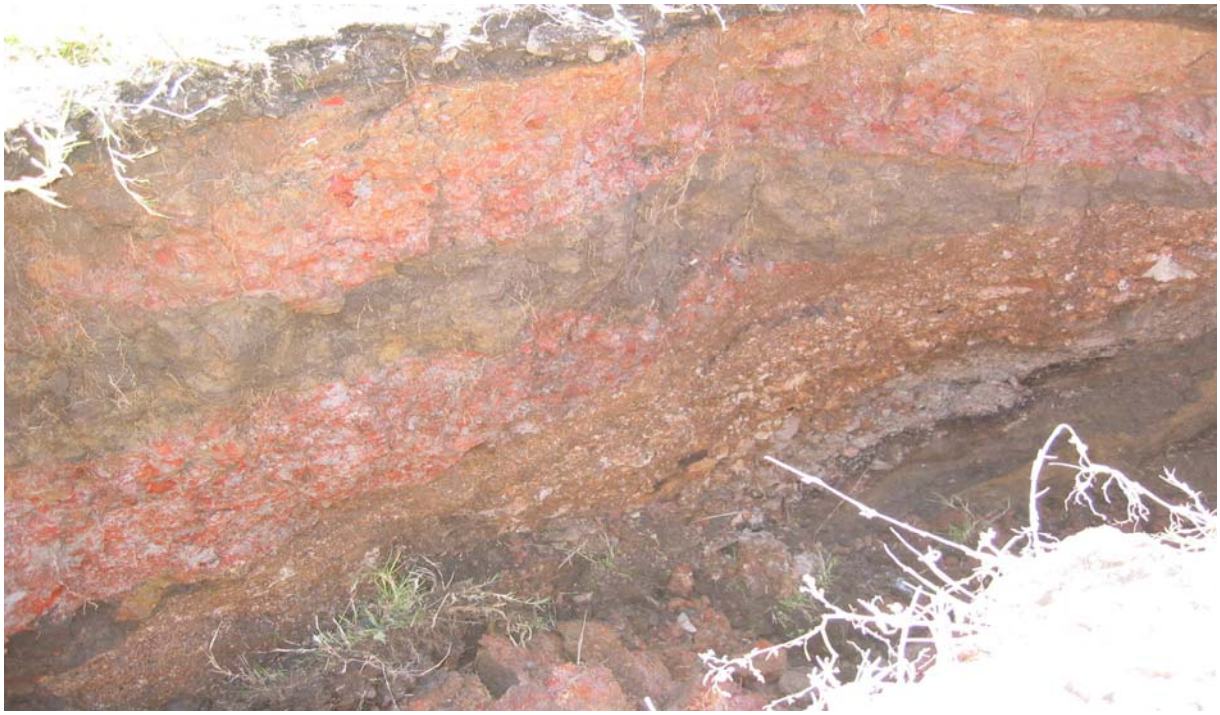


Photo 19 Subsurface conditions showing stratified fill materials at sample location MG01. Indicative material of Gravel, Sand and Clay with Minor Ash across Southwest Area.



Photo 20 Subsurface conditions of Retaining Wall Area at sample location TP18. Indicative material of Gravel, Sand and Demolition Wastes.



Photo 21 Subsurface conditions of Retaining Wall Area at sample location TP12. Indicative material of Gravel, Sand and Demolition Wastes.



Photo 22 Soil core sample showing free tar in natural soil at sample location BHF at 6.2mbgl.



Photo 23 Subsurface conditions showing free tar in deep red/grey natural clays at sample location MG08 at 3.1mbgl.



Photo 24 Subsurface conditions showing dark staining in deep weathered shale fractures at sample location BHA at 7.0mbgl.

Appendix B
QA/QC Assessment

EVALUATION OF QUALITY ASSURANCE AND QUALITY CONTROL OF PAST INVESTIGATIONS – MACDONALDTOWN GASWORKS

The overall quality of the data for past soil investigations at the Macdonaldtown Gasworks has been assessed by review of the information presented in the referenced reports. A summary of the findings are provided in the following tables.

Reports reviewed:

CLR01052: *Macdonaldtown Triangle, Erskineville Phase I and II Environmental Site Assessments* (CH2M HILL 2000)

CLR01053: *Vegetable, soil and sediment sampling from the Former Gasworks Area of the Macdonaldtown Triangle, Erskineville, New South Wales – Letter Report* (CH2M HILL 2000)

CLR01221: *Macdonaldtown Triangle, Erskineville Soil and Groundwater Investigations of the Former Gasworks Area and Offsite* (CH2M HILL 2001)

CLR01707: *Macdonaldtown Triangle (Former Cleaning Sheds) Delineation and Classification Sampling* (GHD 2005)

CLR01905: *Macdonaldtown Triangle (Former Gasworks Site) Human Health & Ecological Risk Assessment (SKM 2006)*

QA/QC Evaluation – Sampling and Analysis Methodology Assessment

Sampling and Analysis Plan and Sampling Methodology	Comments
Sample Collection Method	**CLR01052:** Sampling was stated to be in accordance with the NSW EPA (1995) *"Sampling Design Guidelines"* (EPA 1995). Soil samples were collected either directly from the pushtube, excavator bucket or edge of test pit walls. **CLR01053:** Sample collection method was not specifically discussed, but soil samples were collected from the surfical 10-15cm soil (plant root depth uptake) and sediment samples were from an open drain. **CLR01221:** Samples were collected from a truck mounted auger. The consultant stated that soil samples were collected directly from the last section of the deepest portion of the auger blade. The consultant did not consider push tubes to be necessary, a clear reason for this was not provided however did state in the report that "*the sample returns were generally competent and did not disintegrate prior to collection*". **CLR01707:** Sampling was undertaken by excavating test pits with the aid of a backhoe. The consultant

Sampling and Analysis Plan and Sampling Methodology	Comments
	reported that where possible, samples were collected from the centre of the backhoe bucket or from the sides of the exposed test pit walls. **CLR01905:** Boreholes were drilled with a solid stem auger. Samples were collected as undisturbed samples using a split-tube sampler.
Decontamination Procedures	**CLR01052:** Decontamination of soil sampling equipment included replacement of disposable outer nitrile gloves and/or, an initial rinse and scrub with tap water, a scrub with a detergent of known chemical composition (decon 90), a tap water rinse, a 10 percent nitric acid rinse and a deionised water rinse. A new liner was used for each push of the push-tube. The tip of the push-tubes underwent decontamination by a scrub in a solution containing detergent of a known chemical composition (decon 90). **CLR01053:** All field equipment (trowels, spatula's, etc.) were reported to be decontaminated prior to the use and between samples to prevent cross contamination. Decontamination of equipment involved scrubbing the equipment in clean potable water to remove gross contamination, scrubbing in a solution of 10 percent nitric acid and water, rinsing in distilled water and air dry. **CLR01221:** The consultant did not provide any clear discussion regarding decontamination procedures for soil sampling, for example within Section 11 (Investigation Strategy), Section 12 (Site Work), Section 13 (QA/QC Data Evaluation) or Appendix D (SAQP) of the report. However the consultant did report that the "*field methodology was designed to produce repeatable, high quality results in a scientifically manner*". **CLR01707:** Decontamination procedures reportedly included the use of new disposable gloves for the collection of each sample, decontamination of the sampling equipment between each sampling location if required (using DECON 90 – a phosphate free detergent). Disposable latex gloves were used to collect each sample. **CLR01905:** All field equipment was reported to be decontaminated. This was done in accordance with the summary procedures specified in the relevant Sampling Analysis Program which further details are provided in "SKM Work Instruction WI-CS-11 Decontamination".
Sample handling and containers	**CLR01052:** Samples were placed within an ice filled cooler. No specific discussion regarding sample jar type, such as Teflon lids, laboratory preparation was provided. **CLR01053:** Samples were placed into laboratory supplied containers, within a cooler containing ice and

Sampling and Analysis Plan and Sampling Methodology	Comments
	transported directly to the analytical laboratory. **CLR01221:** The consultant stated that as part of the adopted DQIs, collection of soil samples were to be placed into appropriately pre-treated jars/bottles with Teflon lined lids. All samples were reported to be stored in an esky of ice. **CLR01707:** Consultant reported the use of sampling containers provided by the laboratory. Soil samples were transferred to a "chilled" esky for sample preservation before and during shipment to the laboratory. **CLR01905:** All samples were reported to have been received at the laboratory in appropriately preserved containers, with preservation including packing samples with ice packs in eskies.
Chain of Custody	**CLR01052:** Provided in Appendix F of the report **CLR01053:** Provided in Appendix C of the report **CLR01221:** Provided in Appendix A of the report **CLR01707:** Provided in Appendix C of the report **CLR01905:** All samples were reported to have been logged and transferred under appropriately completed Chain of Custody forms
Detailed description of field screening protocols including calibration	**CLR01052:** Field screening for volatiles was undertaken using a PID, however instrument calibration was not discussed or reported. **CLR01053:** Field screening for volatiles was not undertaken. **CLR01221:** Field screening for volatiles was undertaken using a PID, however instrument calibration was not discussed. **CLR01707:** Field screening for volatiles was undertaken using a PID, calibration certificates provided in Appendix B. **CLR01905:** Field screening for volatiles was undertaken using a PID. The PID was used to obtain head-space concentrations of volatile gases emitted from bagged soil samples. PID sampling results were summarised on the borehole logs provided in Appendix A. All equipment was reported to have been calibrated prior to use in the field.
Sampling Logs	**CLR01052:** Soil logs are provided within the report, indicating sample depth and lithology. PID readings were not recorded on all logs. **CLR01053:** Soil logs were not provided (soil samples were sediment or surface).

Sampling and Analysis Plan and Sampling Methodology	Comments
	CLR01221: Borehole logs are provided in Appendix A. **CLR01707:** Borehole logs are provided in Appendix A. **CLR01905:** Borehole logs are provided in Appendix A.

QA/QC – Field and Lab Quality Assurance and Quality Control

Field and Lab QA/QC	Comments
Field quality control samples and results	**CLR01052:** A trip spike or wash/rinsate blanks were not collected. One trip blank was included. 11 field duplicates were collected where RPDs of 50% & analyte concentrations > 10 times were reported, which were attributed to "*heterogeneous fill material*". **CLR01053:** Soil and sediment field duplicates was collected although results not discussed. The consultant did state though "*the overall quality of the analytical data produced is considered to be of an acceptable standard*". **CLR01221:** Field duplicates, which included inter- and intra-laboratory, trip blanks and trip spikes were all included in the sampling programme. Trip blank concentrations were reported to be < LOR, recoveries of trip spikes were >90% and method blanks contained no detectable concentrations of analytes. The majority of duplicate RPD were <50% or <10xLOR. A couple of metal RPD exceedances were reported for the inter- and intra-lab dups, however analyte concs were less than site criteria. **CLR01707:** The consultant stated that the field soil QC included intra-laboratory (blind), duplicates, trip spike, trip blank. The collection of duplicate samples during the field investigation exceeded the 10% frequency target (3 duplicates for 21 samples analysed), and therefore complied with project DQOs. The RPDs could not be calculated for BTEX in the three duplicate pairs analysed as duplicate pairs reported concentrations below the PQL. The majority of RPDs for metals were below the acceptable RPD of +/-30%. However, RPD exceedances were noted for arsenic, chromium and zinc. Where the RPD's in the duplicate samples exceeded the acceptable criteria of +/-30%, concentrations were generally low or close to the PQL. However, zinc in duplicate pair TP1 0.1-0.3 / DUP1 was detected at elevated concentrations above the PQL and hence the RPD in this instance demonstrates a lack of reproducibility between the primary and duplicate

Field and Lab QA/QC	Comments
	sample. In addition, RPD's for total TPHs and several of the PAH compounds demonstrate poor reproducibility in duplicate pair TP1 0.1-0.3 / DUP1. In most instances, concentrations of contaminants in DUP1 were approximately double that of the primary sample. The consultant stated that it is considered likely that the poor reproducibility may be due to heterogeneity of the fill material and its ashy constituents. The consultant also reported that the poor reproducibility of the data should be taken into account when interpreting the overall data set. Overall, however, the consultant considered that the results of the field QA/QC indicate that the precision of the data was generally acceptable quality upon which to draw conclusions regarding the environmental condition of the site at the time of the investigation. **CLR01905:** Rinsate blanks were collected once every field day. Inter- & intra-laboratory blind field duplicates were collected at a frequency of at least 1 in 20. The majority of RPDs were <50% with one exception for TPH(C_{16-28}). The consultant did not consider the RPD exceedance to be significant because analyte concentrations were close to PQLs
NATA registered laboratory and NATA endorsed analytical methods	**CLR01052:** Analytical work was performed by AMDEL Analytical Laboratories which was reported to be NATA accredited. **CLR01053:** The NATA accredited laboratory AGAL was used. **CLR01221:** The NATA accredited laboratory ALS was used as the primary lab, AMDEL which is also NATA accredited was used as the secondary lab. **CLR01707:** Envirolab Services was used which was reported to be a NATA certified laboratory. **CLR01905:** The NATA accredited laboratories AMDEL and ALS were used. It was noted by the consultant that AMDEL's analysis for speciated TPH (method E1224) was not covered by NATA accreditation.
Holding times	**CLR01052:** Soil samples were collected between 18 and 20 April 2000 with all of the samples received by the laboratory on 20 April 2000. The laboratory reported that samples were received at the laboratory within the holding times and analysis undertaken within the required quality assurance requirements. **CLR01053:** Samples were reported to be analysed within the holding times relevant to the selected analytes. **CLR01221:** The consultant stated that all samples were analysed within their nominated holding times. **CLR01707:** The consultant did not provide discussion regarding holding times. However, lab certificates states samples were received 18/08/05 and chain of custody forms indicated samples were transported to the lab on this date as well.

Field and Lab QA/QC	Comments
	CLR01905: All extraction and analyses were reported by the consultant to be within standard guidelines.
Laboratory quality control samples and results	**CLR01052:** Laboratory quality control samples and results were not discussed by the consultant, however laboratory was NATA accredited (lab reports not included within the report reviewed). **CLR01053:** The consultant did not provide discussion regarding lab QA, however lab control samples were for the majority between 70%-130% and lab control duplicates were less than 50%. **CLR01221:** Laboratory duplicates, surrogate spikes, method blanks and matrix spikes were used by laboratory where the results were reported to have conformed to adopted DQIs. **CLR01707:** The consultant stated that the laboratory undertook internal quality assurance and quality control including the analysis of laboratory control spikes, method blanks, single and duplicate control spikes, surrogate spikes, matrix spikes and matrix duplicate control spikes. The results of these analyses indicated that the laboratory analysis of samples and the methods used were precise, accurate, reliable and reproducible for the sample matrix, and that the laboratory was obtaining results within their control limits for the period during which the samples were analysed. The consultant also stated that the TPH surrogate and matrix spike recoveries fell below the laboratory acceptance limit of 70%, with several TPH surrogates and matrix spikes consistently <70%. This exceedance of the control limits suggests that the laboratory is under extracting some compounds during analysis and hence potentially 'under' reporting concentrators. When this outcome is applied to the data set, the true concentration of TPH compounds may be higher than what is reported. The consultant stated that this should be taken into account when interpreting the data for areas where TPH was detected in soil. The consultant also stated that the meeting of the DQOs for the project in terms of frequency of duplicate sampling and acceptance of laboratory data indicates that the data set generated for the current investigation, with the exception of the above exceedances of the control limit, is generally suitable for use. **CLR01905:** Reagents were reportedly not contaminated, RPDs of lab duplicates were reported to be within the specified criteria of 50%, lab control samples were performed at a frequency of 1 in 20 or at least one per analytical run. Matrix spikes and Matrix spike duplicates were for the majority reported to be between 70%-130% and less than 50%, respectively. A small number of MSD > 50% occurred, however concentrations of analytes were reported to be less than or near PQLs. Lab control limits for phenols were consistently <70% in a range of 50%-60%, however all phenol concentration s were <PQLs.
Data Quality Objectives and Data Evaluation (completeness,	**CLR01052:** The consultant did not define DQOs and did not undertake a formal QA/QC data evaluation against the five category areas. They did, however, conclude that "*The analysis of the soil field duplicate results indicate that the soil data should be considered as indicative, displaying the range of*

Field and Lab QA/QC	Comments
comparability, representativeness, precision, accuracy)	*concentrations that are present in the soil. The analysis of the surrogate recoveries and holding times indicate that the soil analytical results reported are a true and accurate representation of the concentrations of the identified chemicals present in the soil*" . **CLR01053:** The consultant did not define DQOs and did not undertake a formal QA/QC data evaluation against the five category areas. They did, however, conclude that "*overall quality of the analytical data produced is considered to be of an acceptable standard for interpretive use*". **CLR01221:** Predetermined data quality objectives (DQOs) were discussed. There was limited discussion regarding actions required if data do not meet the expected objectives. **CLR01707:** Predetermined data quality objectives (DQOs) were discussed. There was limited discussion regarding actions required if data do not meet the expected objectives. **CLR01905:** Predetermined data quality objectives (DQOs) were set for laboratory analyses including blanks, replicates, duplicates, laboratory control samples, matrix spikes, surrogate spikes and internal standards. There was limited discussion regarding actions required if data do not meet the expected objectives.

In consideration of the above, it is noted that there are a few minor discrepancies contained within the QA/QC of the past investigations, such as reporting of certain aspects sampling procedures and the occasional field duplicate RPDs not meeting the adopted DQIs, the data as a whole is likely to be reliable and useable.

QA/QC Assessment

Laboratory Reports

The primary results and the QAQC results were reported in Australian Laboratory Services (ALS) Certificates of Analysis ES0609995, ES0610062, ES0610135, ES0610221, ES0610613, ES0612955, ES0613014 and ES0613192. The inter-laboratory duplicates were reported in Labmark Certificate of Analysis E028016. The data quality assessment detailed below refers to the data provided in these laboratory reports.

Data Quality Indicators

Data Quality Indicators (DQIs) are typically developed to provide goals for the quality of data required to sufficiently meet the site-specific objectives of Environmental Site Assessments and Validation Assessments. Precision, Accuracy, Representativeness, Comparability and Completeness (PARCC parameters), are all indicators of data quality. The DQIs used to assess the PARCC parameters for this assessment are detailed in **Table 1**.

Table 1 – Summary of Data Quality Indicators

Data Quality Indicator	Data Quality Indicators	Non-conformance Action
Precision		
Field Duplicate RPDs (inter-laboratory and intra-laboratory).	CH2M HILL has developed the following DQIs for field duplicates, given the heterogeneity expected within samples: • Result is <10 times LOR, no limit • Result is between 10-20 times LOR, <50% RPD • Result is >20 times LOR, <50% RPD (inorganic analyte) and <100% RPD (organic analyte).	Assess sample matrix. Request Lab confirmation and if necessary re-analysis.
Laboratory duplicate RPDs	The following DQIs have been adopted for laboratory duplicates (based on ALS documented RPD limits): • Result is <10 times LOR, no limit • Result is between 10-20 times LOR, 0-50% RPD • Result is > 20 times LOR, 0-20% RPD	Request Lab confirmation
Method Blanks	Not detected above Laboratory Limit of Reporting	Request Lab confirmation
Accuracy		
Laboratory Control Samples (inorganics)	70% to 130% recovery for inorganics	Request Lab Confirmation
Single Control Spikes (organics)	Specified by Australian Laboratory Services in the SCS sections of the Organics Quality Control Report attached to the Certificates of analysis. Recovery should be between 70-130%.	Request Lab Confirmation
Matrix Spikes	70% to 130% recovery	Request Lab Confirmation
Matrix Spike Duplicates and Duplicate Control Spikes	<20% RPD (except for MS/MSD for PAHs) <35% RPD for MS/MSD for PAHs	Request Lab Confirmation

Data Quality Indicator	Data Quality Indicators	Non-conformance Action
Surrogate Spikes	Based on US EPA surrogate recovery limits as follows: • Decachlorobiphenyl 10 – 164% • Dibromo-DDE 10 – 136% • Nitrobenzene-D5 23 –120% • 1.2-Dichlorobenzene-D4 32 – 129% • 2-Fluorobiphenyl 25 – 121% • Anthracene-d10 27 – 133% • p-Terphenyl-D14 18 – 137% • 1.2-Dichloroethane-D4 80 – 120% • Toluene-D8 81 – 117% • 4-Bromofluorobenzene 74 – 121% • 2-Fluorophenol 21 – 100% • Phenol-D6 10 – 94% • 2-Chlorophenol-D4 23 – 134% • 2.4.6-Tribromophenol 10 – 123%	Request Lab Confirmation
Representativeness		
Trip Blanks and Rinsates	Not detected above Laboratory Limit of Reporting	Request Lab Confirmation
Trip Spikes and Trip Spike Controls	RPD <50%	Request Lab Confirmation
	All fieldwork including decontamination procedures to be undertaken in accordance with CH2M HILL's SOPs.	
	QA/QC to be conducted in accordance with NEPC (1999).	
	Samples analysed for the analytes requested on the COC	Refer any non-conformances to Lab request explanation
	Sample handling, storage and transport to be in accordance with NEPC (1999).	
	Samples to be extracted and analysed within appropriate holding times	Refer any non-conformances to Lab request explanation
	Samples to be transported under full chain of custody documentation. The laboratory to return a copy of the signed CoC acknowledging the receipt data and time and identity of samples included in the shipment.	
	Include Laboratory Certificates of Analysis which detail any standard and non-standard methods used	
Completeness	100% of results requested for analysis to be reported by Analytical Laboratory	Request Laboratory Confirmation
	– Total representative data set to be >95% complete after data validation procedures	Resample if necessary
Comparability	– Soil samples to be collected using CH2M HILL's SOPs.	
	– Detailed soil logs to be completed for each sample location noting any observed variations between soil conditions and signs of potential contamination.	
	– Primary samples to be stored, handled and transported under the same conditions and analysed by one laboratory using consistent methods.	
	– DQIs to indicate acceptable Precision and Accuracy.	

Precision

The precision of a duplicate determination was measured as relative percent difference (RPD), calculated from the following equation:

$$RPD = \left[\frac{X1 - X2}{\left(\frac{X1 + X2}{2} \right)} \right] \times 100$$

where: X1 is the primary sample analyte value
X2 is the duplicate sample analyte value

Field Precision

Intra-laboratory field duplicates are taken and analysed as an indicator of the effect of the field sampling protocol on the precision of analytical results. These duplicates also provide an indication of the nature of the field samples in terms of their relative heterogeneity and media variance. Intra-laboratory duplicate samples were collected at a rate of one per 20 samples in accordance with NEPC (1999).

Inter-laboratory field duplicates are taken and analysed as an indicator of the precision between different laboratories, as well as field sampling protocol and the nature of the field sample heterogeneity. Inter-laboratory duplicate samples are also required to be collected at a rate of one per 20 samples in accordance with NEPC (1999).

14 soil intra-laboratory duplicates and three soil inter-laboratory duplicates, representing 17 of 136 primary samples (13%), were submitted, while one water intra-laboratory duplicate representing one of six primary samples (17%), were submitted. This frequency of duplicates is in congruence with the DQIs specified in Table 1.

A summary of the assessment of the field intra-laboratory and inter-laboratory duplicates is provided below:

Field Duplicate

The RPDs for analytes, that were detected above the laboratories Limit of Reporting (LOR), ranged from 0 – 167.2%. The majority of RPDs were in congruence with the stipulated DQIs, with the exception of some intra-laboratory duplicates, as follows:

Parent_Field_ID	Matrix	Compound	Primary	Duplicate	Unit	EQL	RPD [%]
TP08/1.0	Soil (FILL)	Chromium	26.0	9.0	mg/kg	2	97.1
TP08/2.0	Soil	Chromium	22.0	12.0	mg/kg	2	58.8
MG05/0.5	Soil(FILL)	Chromium	32.0	18.0	mg/kg	2	56.0
MG05/0.5	Soil(FILL)	Lead	325	29	mg/kg	5	167.2
MG05/0.5	Soil(FILL)	Nickel	41.0	340.0	mg/kg	2	157.0
MG05/0.5	Soil(FILL)	TPH C15-C28	10,800	2,680	mg/kg	100	120.5
TP15/2.8	Soil	TPH C15-C28	1400.0	3740.0	mg/kg	100	91.1

There are seven duplicate results which are not in accordance with the specified DQI's. Five samples were collected from fill material. Fill material can be heterogeneous and variations

in analysis results within the same sample can occur. Two of the field duplicate results where taken from natural soil. These duplicate results are within an order of magnitude of the parent samples. CH2M HILL considers that the discussed exceedences will not affect the overall precision of the data.

Laboratory Precision

Precision is a measure of the variation in results from a laboratory method. The laboratory measures the precision of the analyses performed on a particular batch of samples using laboratory duplicates. Laboratory duplicate samples are analysed by ALS at a minimum rate of one in every twenty samples for both organic and inorganic analytes.

Acceptable RPDs for parameters are specified by the testing laboratory. In the situation where no limit is specified, CH2M HILL limits are employed.

A summary of the assessment of the laboratory duplicates is provided below:

Laboratory Duplicate

The RPDs for analytes, which were outside the laboratories reporting limits, are presented in the table below. The majority of the RPDs were in congruence with the stipulated DQIs, with the exception of some intra-laboratory duplicates, as follows:

Lab Duplicate	Compound	Primary	Duplicate	Unit	LOR	RPD [%]
283416-004_ES0609995	Chlorpyrifos	3.08	2.24	mg/kg	0.05	32
285483-004_ES0610062	Naphthalene	142	94	mg/kg	0.5	41
286773-058_ES0610135	Zinc	362	260	mg/kg	5	33

The above duplicate results are not in accordance with the specified DQI's. However, the exceedences are close to the stipulated DQI. The inconsistency in the duplicate samples reflects the heterogeneity of the soil. Therefore CH2M HILL considers that these DQI exceedences will not affect the overall precision of the data.

Accuracy

Accuracy is a measure of the closeness of the analytical result obtained by a method to the 'true' value. The laboratory measures accuracy using matrix spikes, laboratory control samples, control spikes, method blanks and surrogate spikes.

Matrix Spikes

Matrix spikes are prepared by spiking a field sample with a known concentration of a recommended spiking compound in order to ascertain the effects of the specific sample matrix on the recovery of analytes.

Accuracy as indicated by matrix spikes is measured in terms of percentage recovery as defined by the following equation:

$$\%R = \frac{SSR - SR}{SA} X\ 100$$

where: %R = percentage recovery of the spike
SSR = spiked sample result
SR = sample result (native)
SA = spike added

All matrix spike analyses undertaken were within the specified limits, with the exception of the following:

Batch No	Analyte	Recovery [%]	Recovery Limits [%]
ES0610135	Gamma BHC	60.4	75.7 - 110.4
ES0610135	Heptachlor	38.4	72.2 – 106.7
ES0610135	Aldrin	46.3	77.5 - 107.0
ES0610135	Dieldrin	56.0	76.4 - 109.7
ES0610135	4,4 DDT	22.5	67.1 - 118.1
ES0610135	Diazinon	56.5	75.0 - 107.1
ES0610135	Chlorpyrifos-methyl	46.6	74.8 - 107.91
ES0610135	Pirimphos-ethyl	41.1	68.0 - 109.4
ES0610135	Bromophos-ethyl	45.6	74.9 - 107.4
ES0610135	Prothiofos	70.1	75.5 - 106.1

Each of the abovementioned non-conformances are marginally below the stipulated recovery limits and occur within one sample batch. Therefore CH2M HILL considers that these DQI non-conformances will not affect the overall accuracy of the data.

Laboratory Control Samples

Laboratory control samples are prepared by spiking a clean matrix (i.e. a matrix with one of the target analytes above the LOR), with known quantities of an organic or inorganic spiking compound. Laboratory control samples are analysed at a rate of one per analytical batch for analytes.

Accuracy as indicated by laboratory control samples is measured in terms of percentage recovery as defined by the following equation:

$$\%R = LCSR/LCSC$$

where: %R = percentage recovery of the laboratory control sample
LCSR = laboratory control sample result
LCSC = laboratory control sample concentration

The DQI used to assess the performance of laboratory control samples was 70-130% recovery for inorganics and organics (or otherwise reported in the laboratory report).

The LCS recoveries for the inorganic parameters analysed in during this assessment are all within the DQIs (and recovery limits) specified.

The LCS recoveries for the organic parameters analysed during this assessment are reported within the DQIs (and recovery limits) specified, with the exception of the following:

Matrix	Batch No	Compound	Recovery [%]	DQI [%]
SOIL	ES0609995	Methyl Azinphos	26.4	29.8 - 137
SOIL	ES0610221	Methyl Azinphos	42.6	45.6 - 138
SOIL	ES0610062	Benzo(k)fluoranthene	120	74.2 - 117

All of the above results are close the DQI. CH2M HILL considers that these inconsistencies do not adversely affect the accuracy of the data for the purpose of this investigation.

Method Blanks

Method blanks monitor the externally introduced contaminants, which potentially derive from glassware, cleaning reagents and digestion reagents during the analysis process. The laboratory blank is treated as a sample in the laboratory, going through the same sample preparation and analysis procedures as corresponding samples.

Method blanks were analysed for all solid tests for inorganic and organic parameters. All method blank results were reported at below the LOR.

Surrogate Spikes

Both primary and QAQC samples analysed for organic parameters are spiked prior to extraction with surrogate compounds that are representative of the target analysis, however, are not commonly found in samples taken from the natural environment.

Accuracy as indicated by surrogate spikes is measured in terms of percentage recovery as defined by the following equation:

$$\%R = SSR/Sa \times 100$$

where: %R = percentage recovery of the spike
SSR = spiked sample result
SA = spike added

The DQIs used for the assessment are based on US EPA surrogate recovery limits as provided in Table 1.

The following surrogate recoveries were not within the DQIs specified in Table 1:

Sample ID	Matrix	Analyte	Recovery	Limits
DUP20	Soil	Phenol-d6	126%	10 - 94%

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents a characteristic of a population, parameter variations at a sample point or an environmental condition. Representativeness is a qualitative parameter, which is most concerned with the proper design and implementation of the sampling program.

To ensure representativeness is likely to be of acceptable quality the following procedures were undertaken:

Trip Spikes

Trip Spikes are a matrix of clean sand (for soil samples) or water (for groundwater samples) spiked with a known concentration BTEX and TPH C_6–C_9, these were transported with the samples collected during the sampling program. Recovery rates for each trip spike sample were within the specified DQI with the exception of the following:

Batch No	Analyte	Recovery	Unit	Trip Spike	Trip Spike Control
ES0613014	Benzene	64.5%	mg/kg	2.0	3.1
ES0613014	TPH C_6–C_9	60.4%	mg/kg	29.0	48

Trip Blanks

None of the analytes were detected above LOR.

CH2M HILL considers that these results reflect satisfactory representativeness.

Other general parameters were employed to ensure representativeness, including:

- The sampling and analysis program was developed by experienced professionals based on adequate site history and a thorough site inspection in accordance with NSW EPA guidelines and the NEPC (1999).
- Critical sample locations were identified and all critical samples were collected and analysed in accordance with the sample and analytical plan and data generated is validated to be of acceptable quality.
- Samples were placed in clean, preserved/unpreserved laboratory supplied containers suitable for the target analytes. Samples were stored, transported and handled at a temperature of less than 4 degrees Celsius and in accordance with NEPC (1999).
- Samples were transported under full chain of custody documentation including the sampler, nature of the sample, collection date, analyses to be preformed, sample preservation method and departure time from the site. The laboratory returned a copy of the signed CoC acknowledging the receipt data and time and identity of samples included in the shipment. The CoC documentation is included as **Appendix G.**
- All fieldwork was undertaken in general accordance with CH2M HILL's SOPs.

Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. Sample data should be comparable with other measurement data for similar samples and sample conditions. Data comparability was maintained by undertaking the investigations as follows:

- The samples were collected by the same CH2M HILL field personnel in general accordance with CH2M HILL's SOPs;
- Detailed soil logs were completed for each sample location noting any observed variations between soil conditions and signs of potential contamination;
- Primary samples were stored, handled and transported under the same conditions and analysed by the same laboratory using consistent methods; and
- DQIs indicated acceptable Precision and Accuracy.

Completeness

Completeness is defined as the percentage of measurements made which are judged to be valid measurements. The completeness goal is that a sufficient amount of valid data is generated. CH2M HILL considers that the DQIs for completeness is fulfilled within this investigation and the data is considered to be valid.

Laboratory Accreditation

Australian Laboratory Services (ALS) and Labmark are registered by the National Association of Testing Authority (NATA) for the requested analyses and conduct all the requested analyses in accordance with the guidelines outlined in NEPC (1999). Extraction and analysis methods and the LORs for the primary laboratory are provided in the ALS Certificates of Analysis found in **Appendix G**.

Conclusions

Although there were some minor non-conformances, the majority of the PARCC parameters were within the specified DQIs and, overall, the data is considered to be of sufficient quality to meet the objectives of the investigation.

Appendix C
CH2M HILL Bore Logs

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: BH12A

Project No.: 347496
Project: Macdonaldtown Gasworks
Site/Client: Railcorp
Date: 17/10/06 - 18/10/06
Logged By: Adam Sullivan

Final Depth (m bgs): 9.0
Bore Diameter (mm): 100
Weather: overcast with showers

SUBSURFACE PROFILE			SAMPLE			
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	Comments
0		Ground Surface				
		FILL gravel, sand, crushed rock, dry, with ash, coke and clinker layers				
1		***FILL*** sand, yellow, wet, with bands of clay				
2		***FILL*** silty Clay (original surface?), low plasticity, dark brown, black staining, wet, becoming more clay with depth				
3						very high HC odour
		CLAY - Natural medium plasticity, stiff, moist, red and grey mottled, weathered shale interlayered at 5 m BGS				
4			BH12A/4.2		324	very high HC odour, visible tar in pores
5			PID		73	strong volatile odour like cleaner or bleach, no tar in pores visible
6		***SHALE*** extremely weathered, red ironstone gravel fractures, becoming moderately weathered shale with red ironstone fractures	BH12A/6.0		2.0	slight HC odour
7						
		SHALE no recovery of core				
8						
9		End of Borehole	BH12A/9.0		2.0	

Contractor: Macquarie Drilling
Project Manager: Matt Bennett
Equipment/Drill Method: Geoprobe
Easting (AMG): 317150.333
Northing (AMG): 1247715.240
Ground Elevation (m AHD): 18.63

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: BH14A

Project No.: 347496
Project: Macdonaldtown Gasworks
Site/Client: Railcorp
Date: 18/10/2006
Logged By: Adam Sullivan

Final Depth (m bgs): 2.8
Bore Diameter (mm): 100
Weather: sunny, windy

SUBSURFACE PROFILE			SAMPLE			
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	Comments
0		Ground Surface				
		FILL gravelly sand, dry, loose, grey to black, with ballast				no odour, no visible contamination
1		***FILL*** reworked clay, very stiff, low plasticity, dark grey with red mottles, some rootlets				
		FILL Clay (original surface?), high plasticity, spongy, dark brown, moist, stiff, with gravel component	BH14A/1.4		24.0	strong HC odour
		CLAY high plasticity, spongy, moist, stiff,grey with red and yellow mottles				
2		***CLAY- Natural*** medium plasticity, very stiff, grey with weathered red mottles	PID		2.0	no odour
			BH14A/2.4		0.1	
		SHALE extremely weathered, friable				
		End of Borehole				
3						

Contractor: Macquarie Drilling
Project Manager: Matt Bennett
Equipment/Drill Method: Geoprobe PT
Easting (AMG): 317162.534
Northing (AMG): 1247754.287
Ground Elevation (m AHD): 18.89

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: BHA (angled bore)

Project No.: 347496
Project: Macdonaldtown Gasworks
Site/Client: Railcorp
Date: 16/10/06
Logged By: Adam Sullivan

Final Depth (m bgs): 10.2
Bore Diameter (mm): 100
Weather: overcast with showers

SUBSURFACE PROFILE			SAMPLE			
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	Comments
0		Ground Surface				
		FILL Ballast gravel, small to cobble size, firm, clay lumps, low plasticity, minor ash component.				Some ash gravels, no odours
1		***FILL*** Reworked clay, low to medium plasticity, rootlets, red with orange hues, moist, firm				No visual contamination, no odour
2		***FILL*** Reworked clay, low to medium plasticity, rootlets, red with orange hues, moist, firm, red and grey mottled, with ironstone gravels, coarse grain				Ash
		FILL sandy clays, ash gravels, wet				HC odour
3		***FILL*** silty Clay (original surface?), low plasticity, grey				HC odour
		CLAY - Natural soft, low to medium plasticity, green and grey hues, red weathered gravels, moist, red and grey mottled				
4		***CLAY*** grey and red, medium plasticity, moist, with weathered shale, friable, grey, black staining in grey clay. Red weathered shale with yellow hues from 5 m BGS	PID		0.0	
5			BHA/5.0		0.0	Strong HC odour
			DUP20			
6		***CLAY*** grey, very dark stained, with red weathered gravel, possible solicified tar in micropores.	PID		0.0	Change to smaller PT diameter, clay becoming very tight
7			BHA/7.0		15.0	Photo taken, high odours
8		***SHALE*** weathered shale, red with grey clay	BHA/8.4		86.0	Photo taken, very odorous, dark staining
9		***SHALE*** grey weathered shale, with beds of porous red gravels. Some dark stains in red material	BHA/9.6		150	
10			BHA/10.2		364	Refusal on red shale, dry friable, high odour
		End of Borehole				

Contractor: Macquarie Drilling
Project Manager: Matt Bennett
Equipment/Drill Method: Geoprobe PT
Easting (AMG): 317118.769
Northing (AMG): 1247672.561
Ground Elevation (m AHD): 18.46

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: BHB (angled bore)

Project No.: 347496
Project: Macdonaldtown Gasworks
Site/Client: Railcorp
Date: 17/10/06-19/10/06
Logged By: Adam Sullivan

Final Depth (m bgs): 9.6
Bore Diameter (mm): 100
Weather: overcast with showers

SUBSURFACE PROFILE			SAMPLE			
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	Comments
0		Ground Surface				
		FILL gravelly Sand, loose, brown, dry, ballast gravels				no odours
1		***FILL*** reworked Clay, stiff moist, red/orange to grey, with minor coarse ironstone gravel component				
		FILL silty Clay (original surface?), grey to green, wet, soft, with rootlets	PID		180.0	high HC odours, minor ash gravels, oily sheen
2						
3		***CLAY - Natural*** medium plasticity, grey/red, minor fine to medium grain gravels, moist, stiff				high HC odours
			PID		380.0	
4		***CLAY*** medium plasticity, red, weathered, minor fine to medium grain gravels, moist, stiff				
		BRICK Brick annulus				borehole moved out 0.5 m
5		***CLAY*** medium plasticity, red, weathered, minor fine to medium grain gravels, moist, stiff				
6		***CLAY*** very stiff, grey, interlayed with red gravel ironstone fractures. Prominent fracture with dark stained gravels @ 7.6 m BGS. Fracture @ 8.4m, 9,0 m and 9.5 m.	BHB/6.0		63.0	refusal on brick, move hole
7			BHB/7.2		50.0	high odours, no visible staining, no tar
						moderate HC odour, no tar
8			PID		98.0	
						root macro pores with black stains, photo taken
9			BHB9.0		49.0	high odours in fractures
			PID		33.0	
10		End of Borehole				

Contractor: Macquarie Drilling
Project Manager: Matt Bennett
Equipment/Drill Method: Geoprobe PT
Easting (AMG): 317125.223
Northing (AMG): 1247689.823
Ground Elevation (m AHD): 18.49

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: BHC1 (angled bore)

Project No.: 347496
Project: Macdonaldtown Gasworks
Site/Client: Railcorp
Date: 19/10/2006
Logged By: Adam Sullivan

Final Depth (m bgs): 8.0
Bore Diameter (mm): 100
Weather: sunny

SUBSURFACE PROFILE			SAMPLE			
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	Comments
0		Ground Surface				
		Drilling rods driven to 7.2 m BGS without sample recovery				
7		***SHALE*** extremely weathered, grey, friable, interlayed with red ironstone fractures	PID		40.0	Slight HC odour in fractures, minor dark staining
8		End of Borehole	BHC1/8.0 DUP23		N/A	

Contractor: Macquarie Drilling
Project Manager: Matt Bennett
Equipment/Drill Method: Geoprobe PT
Easting (AMG): 317122.983
Northing (AMG): 1247714.522
Ground Elevation (m AHD): 18.75

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: BHC2

Project No.: 347496
Project: Macdonaldtown Gasworks
Site/Client: Railcorp
Date: 19/10/2006
Logged By: Adam Sullivan

Final Depth (m bgs): 8.0
Bore Diameter (mm): 100
Weather: sunny

SUBSURFACE PROFILE			SAMPLE			
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	Comments
0		Ground Surface				
		Drilling rods driven to 4.8 m BGS without sample recovery				
5		***SHALE*** extremely weathered shale/grey clay, with red ironstone fractures, becoming extremely to moderately weathered shales. Ironstone fracture at 7.0m and 8.0 m BGS	PID		2.0	Minimal dark staining, no prominent HC odour
6			BHC2/6.0		1.0	
7			PID		2.0	Moderate HC odour, no prominent staining
8		End of Borehole	BHC2/8.0		2.0	No staining

Contractor: Macquarie Drilling
Project Manager: Matt Bennett
Equipment/Drill Method: Geoprobe PT
Easting (AMG): 317128.955
Northing (AMG): 1247714.323
Ground Elevation (m AHD): 18.66

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CHATSWOOD, NSW, 2067

Soil Bore Log: BHC (angled bore)

Project No.: 347496
Project: Macdonaldtown Gasworks
Site/Client: Railcorp
Date: 19/10/2006
Logged By: Adam Sullivan

Final Depth (m bgs): 9.2
Bore Diameter (mm): 100
Weather: sunny

SUBSURFACE PROFILE			SAMPLE			
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	Comments
0		Ground Surface				
		No log, drilling rods driven to the base of the gasholder annulus				
1						
2						
		FILL mixture of ironstone gravels and clays, black stains, wet, sloppy				High HC odours
3			PID		12.7	
			BHC/3.6		5.0	
4		crushed rock, saturated, black - gas holder annulus				
		Hit brick annulus, hole moved 1 m out				
5						
		Pierced through brick base annulus; free tar in bricks				Very high HC odours
6		Drive drilling rods to refusal. No sample recovery	BHC/6.0		550	Saturated soil
7						
8						
		SHALE - Natural moderately weathered, grey, moist, friable. Sample too small to determine fractures				
9			no sample			Minor HC odour
		End of Borehole				

Contractor: Macquarie Drilling
Project Manager: Matt Bennett
Equipment/Drill Method: Geoprobe PT
Easting (AMG): 317122.014
Northing (AMG): 1247714.141
Ground Elevation (m AHD): 18.78

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: BHD (angled bore)

Project No.: 347496
Project: Macdonaldtown Gasworks
Site/Client: Railcorp
Date: 20/10/2006
Logged By: Adam Sullivan

Final Depth (m bgs): 8.4
Bore Diameter (mm): 100
Weather: sunny

SUBSURFACE PROFILE			SAMPLE			
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	Comments
0		Ground Surface				
		Disturbed location of previous sample location MG05, no sample recovery				
6		***CLAY - Natural*** saturated grey, green with ironstone gravels				Minor HC odour Pocket of black ooze and discoloration, HC odour
7		***CLAY*** wet, red and grey mottles. Prominent fractures.	BHD/7.0		92	Slight HC odours in fractures
8			PID		241	
		SHALE extremely weathered, grey	BHD/8.4		220	
		End of Borehole				
9						

Contractor: Macquarie Drilling
Project Manager: Matt Bennett
Equipment/Drill Method: Geoprobe PT
Easting (AMG): 317107.953
Northing (AMG): 1247721.225
Ground Elevation (m AHD): 18.86

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: BHE

Project No.: 347496
Project: Macdonaldtown Gasworks
Site/Client: Railcorp
Date: 17/10/06
Logged By: Adam Sullivan

Final Depth (m bgs): 8.4
Bore Diameter (mm): 100
Weather: overcast with showers

SUBSURFACE PROFILE			SAMPLE			
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	Comments
0		Ground Surface				
		FILL fine sand, with ballast, grey brown, dry, rootlets				no odours
1		***FILL*** silty sand, dry, black				
		FILL reworked clay, orange, grey mottles, hard, high to medium plasticity, moist				slight HC odour
			BHE/1.6		1.0	very strong HC odour, oily sheen
2		***FILL*** medium sand, yellow to white, with clay component, orange to red				
			BHE/2.2		75.0	strong HC odour
		FILL silty Clay (original surface?), yellow and grey, soft, low plasticity, moist, brown, green and black staining. Clay getting firmer and more plastic in depth.				
3		***CLAY - Natural*** grey with dark grey and orange mottles, stiff, high plasticity, rootlets, stiffer with depth, very hard and stiff @ 3.5 m BGS				
			BHE/3.5		5.0	HC odour
4		***CLAY*** medium to high plasticity, red and grey mottles, moist, very stiff				
			PID		2.7	photo of soil pore and root with black staining, strong HC odour
5		***CLAY*** high weathered fractured zone, bands of stiff grey clay				
			PID		120.0	high HC odour, visible tar in pores and fractures
6						large fracture in red weathered material, photo taken
7			BHE/7.2		203.0	
		shaley CLAY large porous fractures of red ironstone gravels, interlayered with very stiff to hard, friable, shales, grey				high odour
8			PID		532.0	high odour in fractures, low odour in shale
		End of Borehole	BHE/8.4		180.0	
9						

Contractor: Macquarie Drilling
Project Manager: Matt Bennett
Equipment/Drill Method: Geoprobe
Easting (AMG): 317131.954
Northing (AMG): 1247692.932
Ground Elevation (m AHD): 18.5

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: BHF

Project No.: 347496
Project: Macdonaldtown Gasworks
Site/Client: Railcorp
Date: 17/10/06 - 18/10/06
Logged By: Adam Sullivan

Final Depth (m bgs): 9.0
Bore Diameter (mm): 100
Weather: overcast with showers

Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	Comments
0		Ground Surface				
		FILL gravels, rail ballast, sandy, brown, dry, ash gravels and clinker				No odours
1		***FILL*** reworked Clay, red/brown, gravels of ash and coke throughout, moist, hard	BHF/1.0		2.0	
		FILL Sand, wet, soft, bands of clay				
2		***FILL*** as above, becoming silty clay, low plasticity, dark brown, black staining, wet				High odour
		CLAY - Natural medium plasticity, red and grey mottles, with fine gravels, stiff, moist, fractured clay at 3.8m, 4.0m, 4.6m.	BHF/2.6		4.0	Some odour
3						
			BHF/3.6		6.0	Refusal with push tube, continue with solid stem auger
4						
			BHF/4.6		5.0	Some odour
5		***CLAY*** grey with yellow and red mottles, very stiff, medium plasticity, prominent weathered zones				Strong odour in weathered zones, tar in pores
6			PID		174	Photo of pores Tar in pores, moderate HC odour
7		***CLAY*** very stiff, grey, no mottles, weathered zones of red and grey clay	BHF/7.0 DUP22		65.0	Moderate HC odour
8		***SHALE*** weathered, fractured shale	BHF/8.4		246	
			BHF/8.5		88.0	Tar in pores, strong odour
			BHF/9.0		64.0	
9		End of Borehole				

Contractor: Macquarie Drilling
Project Manager: Matt Bennett
Equipment/Drill Method: Geoprobe
Easting (AMG): 317135.889
Northing (AMG): 1247701.057
Ground Elevation (m AHD): 18.56

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: BHG

Project No.: 347496
Project: Macdonaldtown Gasworks
Site/Client: Railcorp
Date: 20/10/2006
Logged By: Adam Sullivan

Final Depth (m bgs): 8.1
Bore Diameter (mm): 100
Weather: sunny

SUBSURFACE PROFILE			SAMPLE			
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	Comments
0		Ground Surface				
		Disturbed location of previous sample location MG06 Drive drilling rods to 4.8 m BGS, no sample recovery				
5		***CLAY - Natural*** medium plasticity, grey, moist, very stiff, some ironstone fractures.	PID		305	high odour of tar, free tar in majority of pores and fractures
6		***SHALE*** gradually becoming extremely weathered shale, grey with vertical fractures.	BHG/6.0		185	
			PID		35	
7			BHG/7.2		47	very minimal tar in pores, only one small pocket at 7.2 m
		SHALE moderately weathered with bands of fractured ironstone gravels	PID		5.0	
8			BHG/8.1		3.0	minor odours
		End of Borehole				
9						

Contractor: Macquarie Drilling
Project Manager: Matt Bennett
Equipment/Drill Method: Geoprobe PT
Easting (AMG): 317117.288
Northing (AMG): 1247724.529
Ground Elevation (m AHD): 18.61

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: MG01

Project No.: 347496
Project: Macdonaldtown Gasworks
Site/Client: Railcorp
Date: 15/8/06
Logged By: Adam Sullivan

Final Depth (m bgs): 4.6
Bore Diameter (mm): N/A
Weather: sunny, with storm and hail

Depth (m)	Description	Sample Number	USCS Class	PID (ppm)	Comments
0	Ground Surface				
	FILL sandy Gravel, loose, nonplastic, brown, medium to coarse grained sand,coarse gravel, dry, with rootlets	MG01/0.1		3.0	Coke fragments, ballast, fibro sheeting fragment; no odours
		MG01/0.2		1.0	No visual cont. no odour
	FILL clay, red and grey mottles, fine grained sand component, medium plasticity	MG01/0.5		0.0	No visual contamination, no odour
1	***FILL*** silty Clay, low plasticity, yellow-brown, with some gravel, medium grained, round, moist				No visual contamination, no odour
	FILL Clay, red and grey mottles, fine grained sand component, high plasticity, withgravel, yellow and iron, medium to coarse grained, moist, with yellow clay mottles, Ø: 5 cm	MG01/1.8		0.0	Minor HC odour, small pockets of ash material (<1 cm)
		MG01/1.4		0.0	Aromatic odour
	FILL Clay, medium to high plasticity, grey with brown hues, cobble sized shale fragments, moist, with large roots				
2	***FILL*** black ash and white shale mixture, coke gravels (Ø: 2 cm), loose, moist	MG01/2.2		1.0	Minor HC odour
	FILL sitly Clay (original surface?), high silt content, brown, wet, low plasticity				Clay pipe at 2.5 m BGS
	silty CLAY - Natural brown, low plasticity, moist	MG01/2.8		N/A	
3		MG01/3.2		0.3	
	CLAY high plasticity, with red and grey mottles, moist				
		MG01/3.6		0.2	No visual contamination, faint HC odour
4					
		MG01/5.0		1.2	
5	***shale CLAY*** highly weathered with red and grey mottles, very stiff				

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: 20 t Excavator
Easting (AMG): 317116.34
Northing (AMG): 1247667.86
Ground Elevation (m AHD): 18.58 (western end of trench)

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: MG02

Project No.: 347496
Project: Macdonaldtown Gasworks
Site/Client: Railcorp
Date: 15/8/06
Logged By: Adam Sullivan

Final Depth (m bgs): 4.7
Bore Diameter (mm): N/A
Weather: sunny, with storm and hail

SUBSURFACE PROFILE			SAMPLE			
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	Comments
0		Ground Surface				
		FILL Black ash, coke gravel, clinker material (vesicular), loose, dry	MG02/0.2		50	Visual contamination, high odours Exposed old monitoring well at 0.4 m BGS (SKM MW33)
		FILL Clay, red and grey mottles, moist, medium plasticity	MG02/0.4		25	Steel pipe at 3m, 7m, 8m from west side along the trench
1		***FILL*** Seam of black ash and coke gravel				Tar pipe at 1.2 m BGS and 5 m along the trench, water seepage from service conduit, water has sheen, high HC odour
		FILL Silty Clay (original surface?), spongy, wet, dark brown to black, low plasticity, black ooze, tar	MG02/1.5 MG02/1.8		68 600	High odour
2		***CLAY - Natural*** red and yellow mottles, moist	MG02/2.0		170	
			MG02/2.7		40	HC odours
3			MG02/3.3		75	
			MG02/3.7		75	
4						
		shale CLAY increased grey clay content, becoming weathered shale rock	MG02/4.7		66	
		End of Borehole				
5						

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: 20 t Excavator
Easting (AMG): 317122.41
Northing (AMG): 1247701.92
Ground Elevation (m AHD): 18.72

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: MG03

Project No.: 347496
Project: Macdonaldtown Gasworks
Site/Client: Railcorp
Date: 16/8/06
Logged By: Adam Sullivan

Final Depth (m bgs): 1.0
Bore Diameter (mm): N/A
Weather: sunny

SUBSURFACE PROFILE			SAMPLE			
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	Comments
0		Ground Surface				
		FILL gravelly, sandy silt, dark brown, moist, soft, with ballast,bricks, rail line, scrap metal, pipes, sandstone blocks	MG03/0.1		38	Shallow GW at 0.7 m BGS; trench collapse Dewatering has no effect on groundwater level
1		End of Borehole				Trench collapse
2						

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: 20 t Excavator
Easting (AMG): 317104.94
Northing (AMG): 1247704.93
Ground Elevation (m AHD): 18.75

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: MG04

Project No.: 347496
Project: Macdonaldtown Gasworks
Site/Client: Railcorp
Date: 16/8/06
Logged By: Adam Sullivan

Final Depth (m bgs): 1.0
Bore Diameter (mm): N/A
Weather: sunny

SUBSURFACE PROFILE			SAMPLE			
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	Comments
0		Ground Surface				
		FILL gravelly Sand, black/brown				Visual contamination, no odours
			MG04/0.5		16	
		FILL brick fill, no soil material, fibro sheeting, pipes and building rubble.				Water intrusion (high flow) Dewatering has no effect on groundwater level
1						
		End of Borehole	MG04/1.5			Trench collapse
2						

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: 20 t Excavator
Easting (AMG): 317116.70
Northing (AMG): 1247711.17
Ground Elevation (m AHD): 18.72

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: MG05

Project No.: 347496
Project: Macdonaldtown Gasworks
Site/Client: Railcorp
Date: 16/8/06
Logged By: Adam Sullivan

Final Depth (m bgs): 1.0
Bore Diameter (mm): N/A
Weather: sunny

SUBSURFACE PROFILE			SAMPLE			
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	Comments
0		Ground Surface				
		BITUMEN				
		FILL gravel subgrade, ash gravels and crushed rock				
		Brick foundation of second gas holder, move 1 m north	MG05/0.5		20	
		FILL silty Clay, brown, soft, very moist, fine gravels ,low plasticity	QC02			
1			not sampled			Clay pipe at 1.2 m BGS surrounded by ashy backfill
		CLAY - Natural red and grey mottles, stiff, high plasticity				Oil seepage from side wall at 1.6 m BGS
			MG05/1.8		850	Very high HC odours
2						
3						
			MG05/3.4		1700	
4						
			BG05/5.0		450	HC odours
5		End of Borehole				Wall collapse, stop excavating due to heritage sign of brickwork in gas holder

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: 20 t Excavator
Easting (AMG): 317110.82
Northing (AMG): 1247719.75
Ground Elevation (m AHD): 18.72

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: MG06

Project No.: 347496
Project: Macdonaldtown Gasworks
Site/Client: Railcorp
Date: 16/8/06
Logged By: Adam Sullivan

Final Depth (m bgs): 5.0
Bore Diameter (mm): N/A
Weather: sunny

SUBSURFACE PROFILE			SAMPLE			
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	Comments
0		Ground Surface				
		FILL gravelly Sand, and Clay, brown-black, moist, ballast, bricks, pipework, coke/ash gravels				Visual contamination Pipe and footing at 1 m along trench from north end
1		***FILL*** silty Clay (original surface?), low plasticity, brown, wet	MG06/1.0		80	High HC odour, visible tar and oil Tar pipe at 3 m along trench from north end
2		***CLAY - Natural*** red and green mottles, low plasticity, moist	MG06/2.0		450	High HC odour, visible tar in pores
3			MG06/3.5		50	
4			MG06/4.7		70	
5						Trench collapse

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: 20 t Excavator
Easting (AMG): 0
Northing (AMG): 0
Ground Elevation (m AHD): 0

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: MG07

Project No.: 347496
Project: Macdonaldtown Gasworks
Site/Client: Railcorp
Date: 16/8/06
Logged By: Adam Sullivan

Final Depth (m bgs): 4.0
Bore Diameter (mm): N/A
Weather: sunny

SUBSURFACE PROFILE			SAMPLE			
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	Comments
0		Ground Surface				
		FILL gravelly ash and ballast, black				
		FILL clay, medium plasticity, red and grey mottles, moist, brick chunks				No odour
			MG07/1.0		10	
1		***sandy CLAY - Natural*** low plasticity, red and yellow mottles, moist				
2						
3						No odour
			MG07/4.0		14	
4		End of Borehole				Limited excavation area
5						

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: 20 t Excavator
Easting (AMG): 317103.96
Northing (AMG): 1247696.52
Ground Elevation (m AHD): 18.74

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: MG08

Project No.: 347496
Project: Macdonaldtown Gasworks
Site/Client: Railcorp
Date: 17/8/06
Logged By: Adam Sullivan

Final Depth (m bgs): 4.0
Bore Diameter (mm): N/A
Weather: sunny

Depth (m)	Description	Number	USCS Class	PID (ppm)	Comments
0	Ground Surface				
	SAND				
	FILL sandy ash and ballast, coarse gravel, dry to moist, loose	MG08/0.3		24.1	HC odours
	FILL thin concrete slab brick work - layered gravelly clay, red/grey, medium plasticity, moist				Pipe at 0.3 m BGS and 1 m from north end of trench Tar seepage from n/s walls; high odour
1		MG08/1.0		16.4	
					Concrete footing 1.5 m BGS and 3.5 m from north end of trench
	FILL silty Clay (original surface?), brown/green, high plasticity, moist to we	MG08/1.5		95.6	Visible tar in soil pores, high odour
2	***CLAY - Natural*** high plasticity, red and grey mottles, moist	MG08/2.1		78.0	
					Visible tar in soil pores
3		MG08/3.1		42.0	
	shale CLAY weathered, medium plasticity, grey to white, moist	MG08/4.0		32.5	No tar in soil pores; faint HC odour
4	End of Borehole				Side wall collapse at tar seepage layer
5					

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: 20 t Excavator
Easting (AMG): 317142.77
Northing (AMG): 1247736.07
Ground Elevation (m AHD): 18.73 (south end of trench)

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: MG09A1

Project No.: 347496
Project: Macdonaldtown Gasworks
Site/Client: Railcorp
Date: 17/10/06
Logged By: Adam Sullivan

Final Depth (m bgs): 5.5
Bore Diameter (mm): 100
Weather: overcast with showers

Depth (m)	Description	Number	USCS Class	PID (ppm)	Comments
0	Ground Surface				
	FILL Brickwork layer				
	FILL Gravelly Sand				Metal pipe
	FILL fine sandy Clay, orange/brown, with red mottles, soft, low to medium plasticity, Tar seem @ 0.7 m BGS	MG09A1/0.7		261	Slight HC odour, oily sheen
1	***FILL*** silty Clay (original surface?), yellow and orange, soft, low plasticity, moist, getting very dark grey to black with depth				Strong HC odour, oily sheen
2	***CLAY - Natural*** grey to yellow, very soft, low plasticity, moist, with grey, red sandy clay inclulsions, becoming much more plastic and stiff				Slight HC odour
3	***CLAY*** heavy clay, grey, dark red, stiff, highly plastic, with silty clay inclusions and fracture.	MG09A1/3.6		0.0	
		DUP21			
4	heavy clay, weathered, red, silty clay inclusions light grey	MG09A1/4.8		1.5	
5		MG09A1/5.5		2.0	
	End of Borehole				Refusal in extremely to moderately weathered shale
6					

Contractor: Macquarie Drilling
Project Manager: Matt Bennett
Equipment/Drill Method: Geoprobe PT
Easting (AMG): 317134.074
Northing (AMG): 1247734.848
Ground Elevation (m AHD): 18.44

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: MG09B

Project No.: 347496
Project: Macdonaldtown Gasworks
Site/Client: Railcorp
Date: 17/8/06
Logged By: Adam Sullivan

Final Depth (m bgs): 2.5
Bore Diameter (mm): N/A
Weather: sunny

SUBSURFACE PROFILE			SAMPLE			
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	Comments
0		Ground Surface				
		FILL sandy gravel				
		CONCRETE				
		FILL Ash and clay, gravelly clay	MG09B/0.3		506	9 inch pipe, full of tar at 0.3 m BGS and 8 m along trench from north end
			MG09B/PIPE		257	
						12 inch pipe, full of water at 0.5 m BGS and 11 m along trench from north end*
			MG09B/0.6		242	
1						Water seepage, high flow
						High water flow through pores in gravel
		CLAY - Natural medium plasticity, red and grey mottles, moist				
2			MG09B/2.5		35.2	
		End of Borehole				Trench collapse
3						* Sample taken from pipe, free product, highly viscous, very damp

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: 20 t Excavator
Easting (AMG): 317141.13
Northing (AMG): 1247722.61
Ground Elevation (m AHD): 18.86 (south end of trench)

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: MG09C

Project No.: 347496
Project: Macdonaldtown Gasworks
Site/Client: Railcorp
Date: 17/8/06
Logged By: Adam Sullivan

Final Depth (m bgs): 3.8
Bore Diameter (mm): N/A
Weather: sunny

SUBSURFACE PROFILE			SAMPLE			
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	Comments
0		Ground Surface				
		FILL soil and ballast				
		CONCRETE				
		FILL ash gravels and sand	MG09C/0.3		230	
1		***FILL*** gravelly Clay, medium plasticity, moist, red/grey	MG09C/1.5		32	visible pockets of tar
		FILL silty Clay (original surface?), low plasticity, brown green, moist, firm	MG09C/1.9		190	high HC odour
2						
3						sample taken from pipe, free product, highly viscous, very damp
		wheathered shale CLAY - Natural medium plasticity, moist	MG09C/3.8		29.3	
		End of Borehole				
4						

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: 20 t Excavator
Easting (AMG): 317134.48
Northing (AMG): 1247721.27
Ground Elevation (m AHD): 18.7 (west end of trench)

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: MG10

Project No.: 347496
Project: Macdonaldtown Gasworks
Site/Client: Railcorp
Date: 17/8/06
Logged By: Adam Sullivan

Final Depth (m bgs): 0.7
Bore Diameter (mm): N/A
Weather: sunny

SUBSURFACE PROFILE			SAMPLE			
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	Comments
0		Ground Surface				
		FILL ash and ballast, sandy material, black, loose	MG10/0.2		184	HC odours
		FILL reworked Clay, red and grey mottles, high plasticity, moist	MG10/0.6		49.5	No odours
		End of Borehole				
1						

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: 20 t Excavator
Easting (AMG): 0
Northing (AMG): 0
Ground Elevation (m AHD): 0

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: MG10A

Project No.: 347496
Project: Macdonaldtown Gasworks
Site/Client: Railcorp
Date: 17/8/06
Logged By: Adam Sullivan

Final Depth (m bgs): 4.0
Bore Diameter (mm): N/A
Weather: sunny

SUBSURFACE PROFILE			SAMPLE			
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	Comments
0		Ground Surface				
		FILL sandy gravel, ballast				
		FILL black ash, and coke gravel	MG10A/0.7		92.3	
1		***FILL*** gravelly clay, medium plasticity, red/grey, moist				Water and tar seepage at 1.1 m BGS Brick footing from 0.7 to 1.6 m BGS
		FILL silty Clay (original surface?) high plasticity, brown/green, moist				
2		***CLAY - Natural*** high plasticity, red and grey mottles, moist, stiff	MG10A/2.8		101	
3		***shale CLAY*** weathered	MG10A/4.0		155	
4		End of Borehole				Trench collapse

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: 20 t Excavator
Easting (AMG): 317150.44
Northing (AMG): 1247736.72
Ground Elevation (m AHD): 18.85

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: MG10B

Project No.: 347496
Project: Macdonaldtown Gasworks
Site/Client: Railcorp
Date: 18/10/2006
Logged By: Adam Sullivan

Final Depth (m bgs): 3.5
Bore Diameter (mm): 100
Weather: overcast

SUBSURFACE PROFILE			SAMPLE			
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	Comments
0		Ground Surface				
		FILL clay, very stiff, dry				
		FILL gravelly sand, light brown, loose, dry, with ballast, roots,				
		FILL silty sand, dry, loose, dark brown to black, with ash, wood, clinker				
1						slight HC odour
		FILL reworked clay, grey, with red/brown mottles, stiff, moist, with gravel component. Getting less stiff and light brown with depth				no odour, no visible contamination
		CLAY - Natural with some silt, high plasticity, moist, spongy	MG10B/1.8		2.0	strong HC odour
2						moderate HC odour
		CLAY low to medium plasticity, stiff, grey with red and yellow mottles, weathered zone @ 2.6 m BGS.				
3			MG10B/3.0		2.0	
		SHALE weathered, friable, grey with red mottles				no odour
		End of Borehole				
4						

Contractor: Macquarie Drilling
Project Manager: Matt Bennett
Equipment/Drill Method: Geoprobe PT
Easting (AMG): 317157.472
Northing (AMG): 1247740.001
Ground Elevation (m AHD): 18.82

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: MG11

Project No.: 347496
Project: Macdonaldtown Gasworks
Site/Client: Railcorp
Date: 17/8/06
Logged By: Adam Sullivan

Final Depth (m bgs): 4.0
Bore Diameter (mm): N/A
Weather: sunny

SUBSURFACE PROFILE			SAMPLE			
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	Comments
0		Ground Surface				
		FILL very gravelly Sand,dry, grey/black, gravel is fine to coarse grain, angular, ash, coke, ballast	MG11/0.2		11.2	
		FILL gravelly Clay, dry, very firm, grey/red/orange, low plasticity, black compact coke				
		FILL Clay, dry, firm, orange and red, possibly reworked material				
1			MG11/1.5		8.2	broken water pipe at 1.5 m BGS and eastern end of trench, high odours
		FILL Sand, medium grain, yellow/orange, wet, compact, thick black staining from 1.9 m BGS, sand containing free tar				
2			MG11/2.0		5.3	
3		***CLAY - Natural*** very firm, dry, grey and red mottles, red portion is silty/sandy				
4			BG11/4.0		6.9	
		End of Borehole				

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: 20 t Excavator
Easting (AMG): 317138.23
Northing (AMG): 1247707.26
Ground Elevation (m AHD): 18.6

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: RP

Project No.: 347496
Project: Macdonaldtown Gasworks
Site/Client: Railcorp
Date: 16/08/06
Logged By: Adam Sullivan

Final Depth (m bgs): 2.0
Bore Diameter (mm): N/A
Weather: fine/overcast

SUBSURFACE PROFILE			SAMPLE			
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	Comments
0		Ground Surface				
		FILL gravelly Clay, firm, low plasticity, minor ashy gravels, ballast gravel up to cobbles				No odours, some minor ash
1		***FILL*** reworked clay, low to medium plasticity, rootlets, red with orange hues, moist, firm				
		FILL sandy Clay, low plasticity, red/brown Fill becoming more sand content with depth				Clay pipe at 1.8 m BGS with high water flow from pipe
2		End of Borehole				Water intrusion too high

Contractor: Macquarie Drilling
Project Manager: Matt Bennett
Equipment/Drill Method: 20t Excavator
Easting (AMG): 0
Northing (AMG): 0
Ground Elevation (m AHD): 0

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: TP01

Project No.: 347496
Project: MacDonaldtown Gasworks
Site/Client: RailCorp
Date: 15/08/06
Logged By: Chris Newland

Final Depth (m bgs): 3.5
Bore Diameter (mm): N/A
Weather: sunny, then storm and hail

SUBSURFACE PROFILE			SAMPLE			
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	Comments
0		Ground Surface				
		FILL gravelly Sand, subangular to subround, light brown, dry, crushed sandstone and concrete	TP01/0.0/0.25		4.3	
		FILL gravelly Sand, gravel subround to subangular, brown, grey, red, dry, with fragments of sandstone, shale, concrete, sand contains grey ash				Ash present
1			TP01/1.0		349	
		FILL gravelly Sand, gravelly sands, little or no fines, medium grained, yellow, dry	TP01/1.5		37.4	No visual contamination
2			TP01/2.0		52.1	
		FILL clayey Sand, gravel-sand-clay mixtures , gravel fine grained, subangular to subround, brown, dry, with sandstone and shale				No visual contamination
3			TP01/3.0		114	
		End of Borehole				
4						

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: Back Hoe
Easting (AMG): 317112.54
Northing (AMG): 1247638.33
Ground Elevation (m AHD): 18.04

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: TP02

Project No.: 347496
Project: MacDonaldtown Gasworks
Site/Client: RailCorp
Date: 15/08/06
Logged By: Chris Newland

Final Depth (m bgs): 5.1
Bore Diameter (mm): N/A
Weather: sunny, then storm and hail

SUBSURFACE PROFILE			SAMPLE			
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	Comments
0		Ground Surface				
		FILL sandy Gravel, medium to coarse grained, sandstone, white or light grey, dry	TP02/0.0-0.25		361	
		FILL gravelly Sand, medium to coarse grain, subangular to subround, dark grey/black, dry, clinker, coke and ash	TP02/0.5		12.2	old metal pipe at 0.8 m BGS
1			TP02/1.0		2.4	
		FILL gravelly, clayey Sand, brown/orange, dry, dead rootlets, patches of red sandy clay at 1.4 - 1.5 m BGS	TP02/1.5		2.8	
		FILL gravelly Sand, brown/dark brown, dry, cobbles and small boulders of sandstone, bricks. Layer of clinker gravel and cobbles at 2.4 m BGS	TP02/2.0		N/A	Top of brick wall (foundation) present at 2.7 m BGS; tracked back away from residential properties; steel bar at 2.7 m BGS
2						
3		***FILL*** sandy, gravelly Clay, low to medium plasticity, dark grey, fine to medium grained, subangular to subround, coke, rootlets	TP02/3.0		12.2	200 mm clay pipe (sewerage), poosibly connecting gas holder buildings to sewer main.
4		***CLAY - Natural*** Light grey, red mottled, iron staining around mottles.	TP02/4.0		5.5	Possibly layer of VENM from gas holder excavation
		CLAY High plasticity, stiff, red and grey mottles, ironstone gravels, coarse grained, moist	TP02/4.5		52.3	Strong HC like odour
5		End of Borehole				Trench collapse

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: Back Hoe
Easting (AMG): 317109.67
Northing (AMG): 1247657.65
Ground Elevation (m AHD): 19.07

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: TP03

Project No.: 347496
Project: MacDonaldtown Gasworks
Site/Client: RailCorp
Date: 15/08/06
Logged By: Chris Newland

Final Depth (m bgs): 4.0
Bore Diameter (mm): N/A
Weather: sunny, then storm and hail

SUBSURFACE PROFILE			SAMPLE			
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	Comments
0		Ground Surface				
		Fill gravelly Sand, brown, dark brown, dark grey, ash and crushed sandstone, ballast, clinker, ash	TP03/0.0-0.25		85.3	Slight odour
		Fill gravelly Clay, firm, medium plasticity, dry, orange and grey, fine to coarse gravel, subround to subangular, ballast, coke				Water ingres at 0.6 m BGS, fast ingres
			TP03/0.5		81.5	
1			TP03/1.0		64.0	
		Fill clayey Silt (original surface?), low plasticity, dark grey, wet	TP03/1.5		64.4	
						Strong HC odour
2			TP03/2.0		81.2	
		Silty CLAY - Natural firm, medium plasticity, red-brown and grey, mottled	TP03/3.0		41.1	Strong HC like odour
3						
			TP03/4.0		98.2	
4		End of Borehole				
5						

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: Back Hoe
Easting (AMG): 317139.83
Northing (AMG): 1247679.08
Ground Elevation (m AHD): 18.02

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: TP04

Project No.: 347496
Project: MacDonaldtown Gasworks
Site/Client: RailCorp
Date: 15/08/06
Logged By: Chris Newland

Final Depth (m bgs): 3.1
Bore Diameter (mm): N/A
Weather: sunny, then storm and hail

Depth (m)	Graphic Log	Description	Sample Number	USCS Class	PID (ppm)	Comments
0		Ground Surface				
		FILL gravelly Sand, brown, grey, dark grey, gravel, fine to coarse, subangular to subround of coke, clinker, sandstone	TP04/0.0-0.25		5.1	Ash sand
		FILL gravelly Clay, orange, light brown, grey, dry, mottled, firm, low plasticity, gravel medium to coarse grained, shale, weathered sandstone, black, odorous staining in clay at 0.7 m BGS	TP04/0.5		4.8	Black odour staining at 0.7 m BGS
1		Grey with red mottles, orange iron staining below 0.8 m BGS	TP04/0.7		3.1	
2		***clayey SILT - Natural*** (original surface?) wet, soft	TP04/2.0		3.5	Slight odour
3		***sandy CLAY*** Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays (CL), red/brown, grey, firm, mottled, wet	TP04/3.0		4.1	slight odour
		End of Borehole				
4						

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: Back Hoe
Easting (AMG): 317155.8
Northing (AMG): 1247705.63
Ground Elevation (m AHD): 18.5

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: TP05

Project No.: 347496
Project: MacDonaldtown Gasworks
Site/Client: RailCorp
Date: 15/08/06
Logged By: Chris Newland

Final Depth (m bgs): 2.3
Bore Diameter (mm): N/A
Weather: sunny, then storm and hail

SUBSURFACE PROFILE			SAMPLE			
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	Comments
0		Ground Surface				
		FILL Sandy Clay, dark brown, grey, black very gravelly sand of ash, clinker and coke, dry, gravel angular to subround, ash, coke, clinker	TP05/0.0-0.25		4.8	Black material with odour
		FILL dry, light brown, low plasticity				
		FILL yellow, medium grained	TP05/0.5		1.4	strong water ingress at 0.5 m BGS
1			TP05/1.0		2.8	
		clayey SILT - Natural (original surface?), dark brown, soft				
			TP05/1.5		12.4	
2		***CLAY*** red/brown, firm	TP05/2.0		2.7	
		End of Borehole				
3						

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: Back Hoe
Easting (AMG): 317185.53
Northing (AMG): 1247738.73
Ground Elevation (m AHD): 18.44

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: TP06

Project No.: 347496
Project: MacDonaldtown Gasworks
Site/Client: RailCorp
Date: 15/08/06
Logged By: Chris Newland

Final Depth (m bgs): 2.7
Bore Diameter (mm): N/A
Weather: sunny, then storm and hail

Depth (m)	Description	Number	USCS Class	PID (ppm)	Comments
0	Ground Surface				
	FILL gravelly Sand, ash, clinker and coke, gravel subround to angular, fine to coarse grained	TP06/0.0-0.25		10.7	Dark staining, smelly
	FILL sandy Clay, light brown to orange, firm, low plasticity, some clinker				
	FILL (original surface?) clayey gravel, orange/brown, medium to coarse grained, sandstone, grey-black subangular clinker	TP06/0.5		2.5	Groundwater ingress at 0.6 m BGS Black stains in places
1		TP06/1.0		7.1	
	FILL clayey Silt (original surface?) dark grey/brown, wet	TP06/1.5		2.7	Black stain in top 0.2 m of stratum
2	***CLAY - Natural*** red/brown, with grey mottles, firm, high plasticity	TP06/2.5		3.4	
	End of Borehole				
3					

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: Back Hoe
Easting (AMG): 317189.09
Northing (AMG): 1247749.95
Ground Elevation (m AHD): 18.53

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: TP07

Project No.: 347496
Project: MacDonaldtown Gasworks
Site/Client: RailCorp
Date: 15/08/06
Logged By: Chris Newland

Final Depth (m bgs): 2.2
Bore Diameter (mm): N/A
Weather: sunny, then storm and hail

SUBSURFACE PROFILE			SAMPLE			
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	Comments
0		Ground Surface				
		CONCRETE				poorly reinforced, broke through with clay spade
		FILL gravelly Sand, black to dark grey, dry, ash and coke, gravel fine to medium grained, of ash, coke, clinker	TP07/0.0-0.25		5.6	iron pipe at 0.3 m BGS running east-west water ingress at 0.4 m BGS
		FILL clayey Sand, brown, slightly gravelly, wet, half bricks, gravel fine to coarse grained, subround to subangular, sandstone, shale	TP07/0.5		3.8	
1		***FILL*** gravelly Clay, grey and red mottles, very firm, subangular to subround sandstone and shale	TP07/1.0		3.0	possibly reworked natural material
		FILL clayey Silt (original surface?), soft	TP07/1.5		2.3	
		CLAY - Natural firm to very firm, grey and redbrown mottles	TP07/2.0		4.0	
2		End of Borehole				
3						

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: Back Hoe
Easting (AMG): 317201.10
Northing (AMG): 1247755.82
Ground Elevation (m AHD): 18.89

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: TP08

Project No.: 347496
Project: MacDonaldtown Gasworks
Site/Client: RailCorp
Date: 15/08/06
Logged By: Chris Newland

Final Depth (m bgs): 2.6
Bore Diameter (mm): N/A
Weather: sunny, then storm and hail

Depth (m)	Graphic Log	Description	SAMPLE Number	SAMPLE USCS Class	SAMPLE PID (ppm)	Comments
0		Ground Surface				
		FILL gravelly Sand, dark brown, dark grey, dry, well graded sand of ash, clinker, coke, gravel well graded of same matter	TP08/0.0-0.25		15.5	visual contamination, odour
		FILL gravel, light brown, dry, gravel of sandstone	TP08/0.5		10.8	slight odour, no visual contamination
		FILL gravelly Clay, light brown with orange mottles, firm, dry, sand medium to coarse grained of sandstone, gravel subangular medium to coarse grained sandstone and shale				no odour or visual contamination
1		***FILL*** gravelly Clay, grey with red mottles, dry, gravel well graded, subangular to subround of sandstone	TP08/1.0		13.1	no odour or visual contamination
		FILL clayey Silt (original surface?), soft	TP08/1.5		16.4	possibly reworked natural material
		gravelly CLAY - Natural brown, very firm, gravel medium to coarse grained subangular shale	TP08/2.0		14.8	no odour or visual contamination
2		***CLAY*** grey with red mottles, very firm				no odour or visual contamination
3		End of Borehole				

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: Back Hoe
Easting (AMG): 317202.32
Northing (AMG): 1247766.15
Ground Elevation (m AHD): 19.15

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: TP09

Project No.: 347496
Project: MacDonaldtown Gasworks
Site/Client: RailCorp
Date: 15/08/06
Logged By: Chris Newland

Final Depth (m bgs): 2.6
Bore Diameter (mm): N/A
Weather: sunny, then storm and hail

Depth (m)	Description	Number	USCS Class	PID (ppm)	Comments
0	Ground Surface				
	FILL Sand, dark grey, dry, ash, clinker, coke, gravel well graded, angular to subangular, of ash, clinker, coke, ballast gravel present	TP09/0.0-0.25		12.9	visual contamination, odour
	FILL gravelly Sand,, light brown, dry, sand of crushed sandstone, gravel medium to coarse grained, subangular, of sandstone, with cobbles of sandstone	TP09/0.5		10.6	Black staining in top 0.1 m of stratum no odour or visual contamination
	FILL sandy Clay, possibly reworked natural material, grey with orange mottles, very firm, dry, gravel medium to coarse grained, angular shade				no odour or visual contamination
1		TP09/1.0		10.4	
		TP09/1.5		10.7	
	FILL clayey Silt (original surface?), soft				
2		TP09/2.0		12.8	no odour or visual contamination
		TP09/2.5		8.1	
	CLAY - Natural (CL), grey with red mottles, very firm				no odour or visual contamination
	End of Borehole				
3					

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: Back Hoe
Easting (AMG): 317218.1
Northing (AMG): 1247779.27
Ground Elevation (m AHD): 19.47

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: TP10

Project No.: 347496
Project: MacDonaldtown Gasworks
Site/Client: RailCorp
Date: 15/08/06
Logged By: Chris Newland

Final Depth (m bgs): 4.1
Bore Diameter (mm): N/A
Weather: sunny, then storm and hail

Depth (m)	Description	Number	USCS Class	PID (ppm)	Comments
0	Ground Surface				
	FILL gravelly Sand, dark brown, dark grey or black, of ash, coke, coal, gravel medium to coarse grained, angular to subangular of same material, presence of bricks, round cobbles	TP010/0.0-0.25		3.5	complete rail sleeper present; rusted rail rivets
		TP10/0.5		10.1	
1	***FILL*** single layer of red brick	TP10/1.0		5.3	No odour, some mild grey staining
	FILL Sand, dry medium grained,yellow sand, massive concrete boulder at 1.1 m BGS				no odour or visual contamination
	FILL gravelly Clay, orange with grey mottles, dry, medium to coarse grained, subangular to subround, of shale	TP10/1.5		8.6	no odour or visual contamination
	FILL sandy Gravel, grey, wet, of shale				water ingress at 1.7 m BGS
2		TP10/2.0		8.6	
	gravelly CLAY - Natural possibly reworked natural material, orange with grey mottles, very firm, gravel medium to coarse grained, angular shale				no odour or visual contamination
3		TP10/3.0		8.5	
	CLAY grey with red mottles, very firm; medium grained, angular shale gravel in top 0.1 mof stratum				
		TP10/4.0		12.4	
4	End of Borehole				
5					

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: Back Hoe
Easting (AMG): 317184.32
Northing (AMG): 1247770.00
Ground Elevation (m AHD): 20.10

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: TP11

Project No.: 347496
Project: MacDonaldtown Gasworks
Site/Client: RailCorp
Date: 15/08/06
Logged By: Chris Newland

Final Depth (m bgs): 3.2
Bore Diameter (mm): N/A
Weather: sunny, then storm and hail

SUBSURFACE PROFILE			SAMPLE			
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	Comments
0		Ground Surface				
		FILL gravelly Sand, brown, black, dry, ash and coke, rootlets in top 0.1 m	TP11/0.2		54.1	layer of dense coke gravel at 0.2 - 0.3 m BGS
		FILL clayey Sand, yellow, orange, wet				high water flow ingress at 0.5 m BGS
1		***FILL*** clayey Sand, interbeded with grey and red mottles, firm clay at 0.8 - 0.9 mBGS and 1.2 - 1.3 m BGS, reworked natural material	TP11/1.0		38.0	
2						
3						
		CLAY - Natural very firm, grey with red mottles	TP11/3.5		36.7	
4		End of Borehole				Trench collapse
5						

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: Back Hoe
Easting (AMG): 317158.91
Northing (AMG): 1247723.56
Ground Elevation (m AHD): 18.59

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: TP12

Project No.: 347496
Project: MacDonaldtown Gasworks
Site/Client: RailCorp
Date: 16/08/06
Logged By: Chris Newland

Final Depth (m bgs): 1.8
Bore Diameter (mm): N/A
Weather: overcast

SUBSURFACE PROFILE			SAMPLE			
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	Comments
0		Ground Surface				
		FILL gravelly Sand, brown, dry, gravel of ash, concrete, sandstone, brick fragments brick wall and concrete boulders at 0.6 m BGS Copper pipe segments at 1.1 m BGS	TP12/0.0-0.25		2.2	Topsoil of dark grey colour
			TP12/0.5		2.0	
		Brick wall and concrete boulders				
1			TP12/1.0		2.4	Fibro sheeting fragment found at 1.0 m BGS
		Copper pipe segment				
						No visual contamination, no odourl
		FILL building rubble, concrete, bricks, ceramics, fibro sheeting fragments are abundant				
						Refusal on concrete/brick
		End of Borehole				
2						
3						

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: Back Hoe
Easting (AMG): 317123.57
Northing (AMG): 1247736.37
Ground Elevation (m AHD): 20.13

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: TP13

Project No.: 347496
Project: MacDonaldtown Gasworks
Site/Client: RailCorp
Date: 15/08/06
Logged By: Chris Newland

Final Depth (m bgs): 1.7
Bore Diameter (mm): N/A
Weather: sunny, then storm and hail

SUBSURFACE PROFILE			SAMPLE			
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	Comments
0		Ground Surface				
		FILL gravelly Sand,, dry, compact, sand of ash, clinker, shale, coke, coal, gravel same material, angular to subangular	TP13/0.0-0.25		27.8	
		FILL sandy Gravel, brown, orange, dry, gravel, cobbles of sandstone, broken ceramic tiles and pipes present				
		FILL silty Clay (original surface?), brown, firm, dry, low plasticity, with some angular shale coarse gravel	TP13/0.5		13.2	
		silty CLAY - Natural orange/yellow, firm, dry, with red mottles, low plasticity				
1			TP13/1.0		9.1	
		CLAY very firm, dry, red and grey mottles	TP13/1.5		11.8	
		End of Borehole				
2						

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: Back Hoe
Easting (AMG): 317084.37
Northing (AMG): 1247717.07
Ground Elevation (m AHD): 18.7

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: TP14

Project No.: 347496
Project: MacDonaldtown Gasworks
Site/Client: RailCorp
Date: 15/08/06
Logged By: Chris Newland

Final Depth (m bgs): 1.8
Bore Diameter (mm): N/A
Weather: sunny, then storm and hail

SUBSURFACE PROFILE			SAMPLE			
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	Comments
0		Ground Surface				
		FILL gravelly Sand, dark brown, dry, ash	TP14/0.0-0.25		19.1	Visual black staining (ash), no odour
		FILL silty Clay (original surface?), brown to orange, dry, low plasticity, gravel fine grained, angular, shale	TP14/0.5		22.2	
		silty CLAY - Natural orange to brown, with red mottles, dry	TP14/1.0		16.4	
		silty CLAY grey with red mottles, dry	TP14/1.5		23.0	
2		End of Borehole				

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: Back Hoe
Easting (AMG): 317067.72
Northing (AMG): 1247713.76
Ground Elevation (m AHD): 18.7

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: TP15

Project No.: 347496
Project: Macdonaldtown Gasworks
Site/Client: Railcorp
Date: 17/8/06
Logged By: Adam Sullivan

Final Depth (m bgs): 4.1
Bore Diameter (mm): N/A
Weather: sunny

SUBSURFACE PROFILE			SAMPLE			
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	Comments
0		Ground Surface				
		FILL gravelly Sand, loose				
		FILL Ash and gravel	TP15/0.3		34.6	
1			TP15/1.0		311	water and free tar in brickwork footing at 1.1 m BGS
		FILL sandy Clay (original surface?), brown to green, high plasticity				
2						high HC odour
		CLAY - Natural medium plasticity, red and grey mottles, moist				visible tar in pores
			TP15/2.8		351	
3						tar in pores
		shale CLAY weathered	TP15/4.1		235	minor tar visible
4		End of Borehole				
5						

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: 20 t Excavator
Easting (AMG): 317145.97
Northing (AMG): 1247729.63
Ground Elevation (m AHD): 18.78

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: TP15A

Project No.: 347496
Project: Macdonaldtown Gasworks
Site/Client: Railcorp
Date: 17/10/06
Logged By: Adam Sullivan

Final Depth (m bgs): 8.0
Bore Diameter (mm): N/A
Weather: overcast with showers

SUBSURFACE PROFILE			SAMPLE			
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	Comments
0		Ground Surface				
		Disturbed from previous testpit TP15				
4						Photo taken of fracture
		SHALE weathered shale, friable, dry				Refusal, change to solid stem auger at 4.8 m BGS
5						Visible tar in pores, minor odours at 5.5 m BGS
6			TP15A/6.0		16.0	sample with geoprobe
7			TP15A/7.2		1.0	sample with geoprobe, no odour
8		End of Borehole				

Contractor: Macquarie Drilling
Project Manager: Matt Bennett
Equipment/Drill Method: Geoprobe PT
Easting (AMG): 317146.377
Northing (AMG): 1247729.433
Ground Elevation (m AHD): 18.80

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: TP16

Project No.: 347496
Project: MacDonaldtown Gasworks
Site/Client: RailCorp
Date: 17/08/06
Logged By: Chris Newland

Final Depth (m bgs): 3.8
Bore Diameter (mm): N/A
Weather: sunny

SUBSURFACE PROFILE			SAMPLE			
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	Comments
0		Ground Surface				
		FILL gravelly Sand, dark grey, black, dry, ash and coke				
		FILL gravelly Sand, orange and light brown, dry, with cobbles, sandstone	TP16/0.3		49.2	Groundwater ingress Black staining and free tar at 0.6 m BGS
1			TP16/1.0		2.1	
		CLAY - Natural grey and red mottles, very firm				
2						
3			TP16/3.5		43.9	
		End of Borehole				
4						
5						

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: 20t Excavator
Easting (AMG): 317172.67
Northing (AMG): 1247743.89
Ground Elevation (m AHD): 18.6

CH2M Hill (Australia) Pty Ltd
Level 7, 9 Help Street
CHATSWOOD, NSW, 2067

Soil Bore Log: TP18

Project No.: 347496
Project: MacDonaldtown Gasworks
Site/Client: RailCorp
Date: 17/08/06
Logged By: Chris Newland

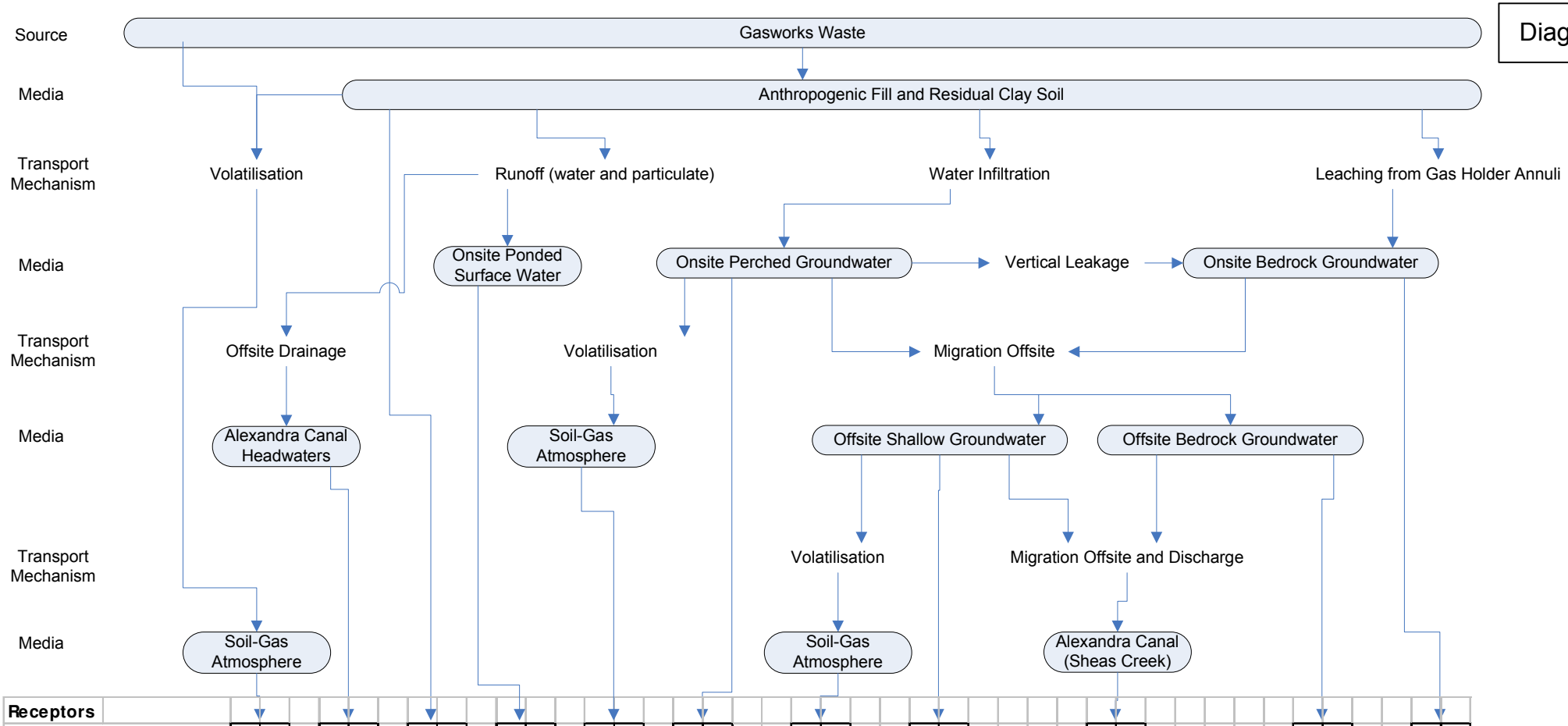
Final Depth (m bgs): 4.4
Bore Diameter (mm): N/A
Weather: sunny

SUBSURFACE PROFILE			SAMPLE			
Depth (m)	Graphic Log	Description	Number	USCS Class	PID (ppm)	Comments
0		Ground Surface				Fibro sheeting fragments
		FILL brown, dry, gravel of ash, concrete, sandstone, brick fragments brick wall and concrete boulders,corrugated iron, leather straps				
1		***FILL*** sandy Clay, orange with red mottles, dry, firm	TP18/1.2		4.9	
		FILL sandy Clay, firm, damp, brown				
2			TP18/1.9		1.9	
		CLAY - Natural red and grey mottles, stiff, red is friable, grey is firm				
3			TP18/3.2		85.9	
4			TP18/4.4		17.9	
		End of Borehole				
5						

Contractor: Online
Project Manager: Matt Bennett
Equipment/Drill Method: 20t Excavator
Easting (AMG): 317109.12
Northing (AMG): 1247729.32
Ground Elevation (m AHD): 19.84

Appendix D
Conceptual Site Model

Diagram A



Receptors	Dermal/Ingestion	Inhalation	Dermal/Ingestion	Inhalation	Dermal/Ingestion	Inhalation	Dermal/Ingestion	Inhalation	Dermal/Ingestion	Inhalation	Dermal/Ingestion	Inhalation	Dermal/Ingestion	Inhalation	Dermal/Ingestion	Inhalation	Dermal/Ingestion	Inhalation	Dermal/Ingestion	Inhalation
Onsite Construction/Short term w orkers		●			●		○			●	●									●
Onsite Long term Rail Employees		●			●		○			●	●									●
Offsite Residents		●	○							●				●	●		●			
Offsite users of Extracted Groundw ater														●	●			●		
Ecological (incl. Hypogean)			○								●				●		●	●		

Exposure Pathway
- ● Complete Pathw ay
- ○ Incomplete Pathw ay

Appendix E
Calibration Certificate and Records

FORM FWSL-02 CH2M HILL Equipment Calibration Daily Log Sheet - Soils

PID CALIBRATION (onsite only)

Calibration gas ppm?	100	iso	**DATE:**	17/10/06
START OF DAY				
PID reading after calibration	102		MIDDAY CHECK PID reading with Cal gas	105
END OF DAY				
PID reading after calibration			PID Correction Factor Used	
BACKGROUND READING:	0.0			
Calibration gas ppm?	100	iso	**DATE:**	18/10/06
START OF DAY				
PID reading after calibration	107		MIDDAY CHECK PID reading with Cal gas	
END OF DAY				
PID reading after calibration			PID Correction Factor Used	
BACKGROUND READING:	0.0			
Calibration gas ppm?	100	iso	**DATE:**	19/10/06
START OF DAY (fresh air zero 0.0ppm calibration)				
PID reading after calibration	99.7		MIDDAY CHECK PID reading with Cal gas	
END OF DAY				
PID reading after calibration			PID Correction Factor Used	
BACKGROUND READING:	0.0			
Calibration gas ppm?	100	iso	**DATE:**	20/10/06
START OF DAY (Fresh air zero = 0.0ppm)				
PID reading after calibration	96.0		MIDDAY CHECK PID reading with Cal gas	
END OF DAY				
PID reading after calibration			PID Correction Factor Used	
BACKGROUND READING:	0.0			
Calibration gas ppm?			**DATE:**	
START OF DAY				
PID reading after calibration			MIDDAY CHECK PID reading with Cal gas	
END OF DAY				
PID reading after calibration			PID Correction Factor Used	
BACKGROUND READING:				

FORM FWSL-02 CH2M HILL Equipment Calibration Daily Log Sheet - Soils

PID CALIBRATION (onsite only)

Calibration gas ppm?	100ppm	DATE:	15/8/06
START OF DAY	See calibration certificate from Envirosafe		
PID reading after calibration	✓	MIDDAY CHECK	
		PID reading with Cal gas	100ppm
END OF DAY			
PID reading after calibration	100ppm	PID Correction Factor Used	n/a
		Chris Newland	
BACKGROUND READING:			
Calibration gas ppm?	100ppm	DATE:	16/8/06
START OF DAY			
PID reading after calibration	100ppm	MIDDAY CHECK	
		PID reading with Cal gas	99.9ppm
END OF DAY			
PID reading after calibration	100ppm	PID Correction Factor Used	n/a
		Chris Newland	
BACKGROUND READING:	0.0ppm		
Calibration gas ppm?	100ppm	DATE:	17/8/06
START OF DAY			
PID reading after calibration	100ppm	MIDDAY CHECK	
		PID reading with Cal gas	101 ppm
END OF DAY			
PID reading after calibration	99.9ppm	PID Correction Factor Used	n/a
		Chris Newland	
BACKGROUND READING:	0-0ppm		
Calibration gas ppm?		DATE:	
START OF DAY			
PID reading after calibration	[illegible]	MIDDAY CHECK	
		PID reading with Cal gas	
END OF DAY			
PID reading after calibration		PID Correction Factor Used	
BACKGROUND READING:			
Calibration gas ppm?		DATE:	
START OF DAY			
PID reading after calibration		MIDDAY CHECK	
		PID reading with Cal gas	
END OF DAY			
PID reading after calibration		PID Correction Factor Used	
BACKGROUND READING:			

ENVIROEQUIP RENTALS

Your Friend in the Field

Equipment Report – Solinst Model 122 Interface Meter

This Meter has been performance checked / calibrated* as follows:

Cleaned/Tested	**Pass?**
Probe	☑
Tape/Reel	☑

☑ Performance Test & Battery Voltage Check (9 v) 8.0v minimum

Date: 14/08/2008 Checked by: MILENKO

Signed: _____

Please check that the following items are received and that all items are cleaned and decontaminated before return. A minimum $20 cleaning / service / repair charge may be applied to any unclean or damaged items. Items not returned will be billed for at the full replacement cost.

Sent	Received	Returned	Item
✓	☐	☐	Interface meter: 30 m
✓	☐	☐	Plastic Box / Bag
✓	☐	☐	Spare 9V Battery Qty _____
X	☐	☐	Probe Cleaning Brush
X	☐	☐	Decon
✓	☐	☐	Instruction leaflet
☐	☐	☐	
☐	☐	☐	

Processors Signature/ Initials MS

EE Quote Reference	RTO11426.	Condition on return
Customer Ref		
Equipment ID	S/122305E	
Equipment serial no.	122005800-1	
Return Date	/ /	
Return Time		

Sydney – Unit 1, 28 Barcoo Street, Chatswood, NSW 2067 Australia
Telephone: +61-2-9417-1513 FreeCall (interstate): 1-800-675-756
Fax: +61-2-9417-7669 Head Office Fax: +61-3-9646-4195
Email: rentals.syd@enviroequip.com Internet: www.rentals.enviroequip.com

ENVIROEQUIP RENTALS

Your Friend in the Field

EQUIPMENT CERTIFICATION REPORT

RAE SYSTEMS MINIRAE 2000 PID

This PID has been performance checked / calibrated as follows:

☑ Calibrate 0.0 ppm — Reading 0.0 ppm

☑ Calibrate 99.8 ppm Isobutylene — Reading 99.5 ppm

☑ Charged — ☑ Lamp Check 10.6eV

☑ Filter Check

Date: 14/08/2006

Checked by: MILENKO

Signature: [signature]

Please check that the following items are received and all items are returned. Please clean equipment before returning. A $20 service/repair charge applies to any unclean or damaged items.

Sent	Received	Returned	Description
☑	☐	☐	MiniRae 2000 PID
☑	☐	☐	Protective Yellow Rubber Boot
☑	☐	☐	Inlet Probe (Attached to PID).
☑	☐	☐	Charger 240 V to 12V, 500mA
☑	☐	☐	Instruction Manual
☑	☐	☐	Quick Reference Guide
☑	☐	☐	Water Trap Filter
☑	☐	☐	Carry case
☑	☐	☐	Spare Water Trap Filter
☑	☐	☐	Alkaline Battery Adapter
☐	☐	☐	_____

QUOTE NO.: RTO11426

ID: PIDMINSZ

SERIAL NO: 110-010011

ENVIROEQUIP Rentals & Sales Pty Ltd
Unit 1 / 28 Barcoo St
Chatswood NSW 2067
Tel: (02) 9417 1513 Fax: (02) 9417 7669
Email: sydney@enviroequip.com www.enviroequip.com

ENVIROEQUIP RENTALS

Your Friend in the Field

EQUIPMENT CERTIFICATION REPORT

RAE SYSTEMS MINIRAE 2000 PID

This PID has been performance checked / calibrated as follows:

☑ Calibrate 0.0 ppm — Reading 0.0 ppm

☑ Calibrate 99.8 ppm Isobutylene — Reading 98.6 ppm

☑ Charged — ☑ Lamp Check

☑ Filter Check

Date: 14/08/2006

Checked by: MILENKO

Signature: [signature]

Please check that the following items are received and all items are returned. Please clean equipment before returning. A $20 service/repair charge applies to any unclean or damaged items.

Sent	Received	Returned	Description
☑	☐	☐	MiniRae 2000 PID
☑	☐	☐	Protective Yellow Rubber Boot
☑	☐	☐	Inlet Probe (Attached to PID).
☑	☐	☐	Charger 240 V to 12V, 500mA
☑	☐	☐	Instruction Manual
☑	☐	☐	Quick Reference Guide
☑	☐	☐	Water Trap Filter
☑	☐	☐	Carry case
☑	☐	☐	Spare Water Trap Filter
☑	☐	☐	Alkaline Battery Adapter
☑	☐	☐	Regulator 713

QUOTE NO.: R7011426

ID: PIDMINSR

SERIAL NO: 110-007362

ENVIROEQUIP Rentals & Sales Pty Ltd
16 / 380 Eastern Valley Way
Chatswood NSW 2067
Tel: (02) 9417 1513 Fax: (02) 9417 7669
Email: sydney@enviroequip.com www.enviroequip.com

ENVIROEQUIP RENTALS

Your Friend in the Field

Equipment Report - MINIRAE 2000 PID

This PID has been performance checked / calibrated* as follows:

Calibration	Actual Value	Reading	Pass?		
Zero – fresh air	0.0 ppm	0.0 ppm	☑		
Span – Isobutylene	96.9 ppm	96.9 ppm	☑		
Operations Check					
☑ Performance Check (pump, lamp, sensor & battery voltage check)					
☑ Battery Charged	☑ Filters Check	☑ Spare battery Voltage (5.0v minimum) 5.4 V			

* Calibration gas traceability information is available upon request.

Date: 13/10/2006 Checked by: MILENKO

Signed: _____

Please check that the following items are received and that all items are cleaned and decontaminated before return. A minimum $20 cleaning / service / repair charge may be applied to any unclean or damaged items. Items not returned will be billed for at the full replacement cost.

Sent	Received	Returned	Item
☑	☐	☐	MiniRae 2000 PID / Operational Check, plus Battery Voltage @ 5.3 V
☑	☐	☐	Protective yellow rubber boot
☑	☐	☐	Inlet probe (attached to PID)
☑	☐	☐	Water trap filter.
☑	☐	☐	Spare water trap filter(s) Qty 1 @ $_____+GST / filter if opened.
☑	☐	☐	Charger 240V to 12V 500mA
☑	☐	☐	Instruction Manual behind foam on the lid of case "
☑	☐	☐	Quick Guide Sheet behind foam on the lid of case "
☑	☐	☐	Spare Alkaline Battery Compartment with/without batteries
☑	☐	☐	Carry Case
☑	☐	☐	Calibration regulator & tubing (optional)
☐	☐	☐	
☐	☐	☐	

Processors Signature/ Initials J.L

EE Quote Reference	QTO 11898	Condition on return
Customer Ref		
Equipment ID	PIDMINISAF	
Equipment serial no.	110900781	
Return Date	/ /	
Return Time		

Melbourne | **Sydney** | **Brisbane** | **Perth** | **Auckland** | **Kuala Lumpur**

Melbourne - 13A Rocklea Drive, Port Melbourne VIC 3207 Australia
Telephone: +61-3-9646-4190 FreeCall (interstate): 1-800-675-756
Rentals Direct Fax: +61-3-9681-9251 Head Office Fax: +61-3-9646-4195
Email: rentals.melb@enviroequip.com Internet: www.rentals.enviroequip.com

Appendix F
Remedial Options Screening

Long-List Remedial Options				
Remedial Approach	**Remedial Option**	**Brief Description**	**Remedial Application (Potential, Keep, Reject)**	**Fatal Flaw Limitation**
No action	No Action	No remedial action taken at the site.	Reject: Does not address SRoH, not aligned with future land use aspirations, human health and ecological risks.	Reject.
Institutional Controls	Health and safety program (i.e. SMP)	Implement a health and safety program for site users designed to minimise exposure pathways.	Keep: This strategy could be applicable as a component of the remedial strategy applied to areas of the former Manufactured Gas Plant (MGP) where there may be ongoing exposure risks after remediation. This may include capped areas, impacted ground water and can involve ongoing monitoring, especially of groundwater.	Keep.
	Site access restrictions	Limit access to impacted areas with security fencing to minimise exposure pathways to contamination.	Keep: Applicable for ongoing rail use, restricting public access & implementation of the SMP.	Keep.
Insitu Biological Treatment	Bioventing	Oxygen is delivered to insitu contaminated unsaturated soils by forced air movement to increase oxygen concentrations and stimulate biodegradation.	Potential: This technique is at experimental stage, however is applicable to MGP wastes such as VOCs and SVOCs.	Reject: This technology has limited application based on specific Site conditions including: • deep soil impacts, • shallow groundwater, • saturated soil layers, • low permeable clay/weathered shale • specific microbes used in the natural biodegradation process may not be present in the soil. Biodegradation is likely to take a number of years, which does not align with proposed Site uses given time and area required. Field testing would also be required. Operation and Maintenance (O & M) and capital investment required.

Long-List Remedial Options				
Remedial Approach	**Remedial Option**	**Brief Description**	**Remedial Application (Potential, Keep, Reject)**	**Fatal Flaw Limitation**
Insitu Biological Treatment	Enhanced Bioremediation	Naturally occurring microbes are stimulated by circulating water-based solutions through contaminated soils to enhance in situ biological degradation of organic contaminants or immobilization of inorganic contaminants.	Potential: This technique is applicable to VOCs and SVOCs. It may be applied as a soil remediation strategy that has a secondary benefit to groundwater remediation.	Reject: This technology has limited application based on specific Site conditions including: • minimal circulation of water–based solutions given low permeable natural clay and weathered shale with vertical fracturing and heterogeneous fill. • specific microbes used in the natural biodegradation process may not be present in the soil. Biodegradation is likely to take a number of years, which does not align with proposed site uses given time and area required. Field trials would also be required. Impacts have been identified in the shallow and deep groundwater systems; therefore extraction of injected solutions in the deep groundwater would not be feasible because solutions cannot be captured and contained above an impermeable clay layer. Risk of mobilising soil contaminants to groundwater and a higher degree of off site migration. Extraction of groundwater may require treatment prior to re-injection. O & M and capital investment required.
	Phytoremediation	A process using plants to remove, transfer, stabilize, and destroy contaminants in soil and sediment.	Reject: This technique is not applicable to MGP waste contaminants. Does not align with future land use aspirations.	Reject.

Long-List Remedial Options				
Remedial Approach	**Remedial Option**	**Brief Description**	**Remedial Application (Potential, Keep, Reject)**	**Fatal Flaw Limitation**
Insitu Physical / Chemical Treatment	Chemical Oxidation / Reduction	Chemically converts hazardous contaminants to compounds that are more stable, less mobile, and/or inert.	Potential: Specific technology for aromatic compounds (e.g. benzene) using Peroxide, Ozone or Permanganate ($KMnO_4$) as oxidizing agents. Can be a rapid remedial approach under the right conditions.	Keep: This technology would only be suitable for application after removal of source materials and applied at the limit of excavation depth or injected at base of Sth Gasholder (to remain as a heritage item) to treat leaching BTEX. This technology promotes mass reduction in the source area as well as groundwater plume treatment over the long term. Effectiveness may well be impeded by other sources of oxidant-consuming material such as organic matter, in the form of coke and coaly material often associated with MGP sites that may limit reaction process and/or make the process less effective by consuming large quantities of the oxidant.
	Electrokinetic Separation	Removes metals and organic contaminants from low permeability soil, mud, sludge, and marine dredging. Uses electrochemical and electrokinetic processes to desorb, and then remove, metals and polar organics.	Reject: Very limited previous application or performance data and not a proven technology for MGP wastes. Highly dependent on consistent soil moisture. High costs.	Reject.
	Fracturing Enhancement	Cracks developed by fracturing beneath the surface in low permeability soil and over-consolidated material to increase effectiveness of many other insitu processes.	Potential: Applicable given the geological condition of weathered shales and stiff clay. Can be used in conjunction with insitu chemical oxidation after excavation and source removal or at base of Sth Gasholder to promote treatment of leaching BTEX.	Reject: Commercial availability is very limited and costly. Fracturing may promote unstable ground around the Sth Gasholder, and promote migration of any residual contamination.

Long-List Remedial Options				
Remedial Approach	**Remedial Option**	**Brief Description**	**Remedial Application (Potential, Keep, Reject)**	**Fatal Flaw Limitation**
Insitu Physical / Chemical Treatment	Soil Flushing - Leaching and groundwater extraction	Water and an additive is applied to the soil or injected into the ground water. Contaminants are leached into the ground water, which is then extracted and treated.	Reject: Typically applied to metal contaminants and not a proven technology for MGP wastes. Not conducive to Site conditions (i.e. low permeable clays & heterogeneous fill). Still a developing technology with limited commercial success. High risk of additional contamination of groundwater. Requires field trials.	Reject.
	Soil Vapour Extraction (SVE)	Gas-phase volatiles are removed from soil through extraction wells applying a vacuum.	Potential: Technically feasible for VOC (BTEX) contaminants at varied depths, while SVOCs have limited treatability. Soil conditions (i.e. low permeable clays & heterogeneous fill) may hinder extraction process, which may be controlled by enhanced fracturing.	Keep: This technology would only be technically feasible for application after removal of source materials or at the base of the Sth Gasholder (to remain as a heritage item). Applicable where the volatile CoCs such as benzene are present and potentially present a human health risk from vapours within future or existing enclosures erected on the site. Benzene would be the target contaminant in the vadose zone in shale fractures above the bedrock aquifer. Pilot tests are recommended and application has O&M requirements (i.e. off gas capture and treatment, long term), and capital, however system can be integrated into Site redevelopment.
	Solidification / Stabilisation	Contaminants are physically bound or enclosed within a stabilised mass (solidification), or chemical reactions are induced between the stabilising agent and contaminants to reduce their mobility.	Reject: Application and additive methods would be very limited at depth given Site conditions (i.e. low permeable clays & heterogeneous fill). Insitu Vitrification that may be applicable to organic contaminants has very limited commercial availability (if at all in Australia).	Reject.

Long-List Remedial Options				
Remedial Approach	**Remedial Option**	**Brief Description**	**Remedial Application (Potential, Keep, Reject)**	**Fatal Flaw Limitation**
Insitu Thermal Treatment	Thermal Treatment	Increase volatilisation rate of semi-volatiles to facilitate extraction using steam/hot air, electrical resistance/electromagnetic/fiber optic/radio frequency heating.	Potential: Typically used as an enhanced soil vapour extraction (SVE) strategy and applicable to MGP wastes (VOCs & SVOCs). May aid secondary biodegradation.	Keep: Potentially suitable for application in combination with SVE after source removal on soils/fractured shale at limit of excavation depth or in the vicinity of retained Sth Gasholder, particularly for extracting BTEX. Groundwater level may impact the effectiveness of this technology

Long-List Remedial Options				
Remedial Approach	**Remedial Option**	**Brief Description**	**Remedial Application (Potential, Keep, Reject)**	**Fatal Flaw Limitation**
Exsitu Biological Treatment	Biopiles	Excavated soils are mixed with soil amendments and placed in aboveground enclosures or constructed bioremediation cells to achieve an aerated static pile composting process in which compost is formed into piles and aerated with blowers or vacuum pumps.	Potential: Can be applied for treating VOCs with some effectiveness on SVOCs. Treatment area required, which may not align with future Site redevelopment.	Keep, but unlikely to be effective except for low level impacted material: This technology may be technically feasible but probably of limited application at this site. Historically it has not been particularly effective in reducing the multi-ring (4 and greater) PAHs such as benzo(a) pyrene to acceptable human health levels, but can be effective in reducing the more volatile constituents such as naphthalene and co contaminants such as BTEX where reduction of these volatile constituents is a valid objective for onsite re-use at depth. Treatment will need to be off site considering restricted available land for the treatment process, sensitivity and proximity of the adjoining residential neighbourhood although off gases that are produced can be treated and odours minimised. The process is not suitable for grossly impacted materials such as where free tar is evident. Pre-treatment is usually required to improve handling and transport of the materials. Lower effectiveness on SVOCs (i.e. B(a)P) which may not meet regulatory requirements and needing further treatment and longer treatment periods (years). Treatment trials are recommended to assess effectiveness.
	Composting	Contaminated soil is excavated and mixed with bulking agents and organic amendments, such as wood chips, hay, manure, and vegetative wastes. Proper amendment selection to ensure adequate porosity and provides a balance of carbon and nitrogen to promote thermophilic, microbial activity.	Potential: Can be applied for treating VOCs, with some effectiveness on SVOCs. Treatment area required, which may not align with future Site redevelopment.	Keep: High fugitive emissions without control, especially VOC (Benzene), presenting potential health risks. Bulking agents substantially increase material volume, requiring large treatment area. Treatment will need to be off site or undertaken within a controlled atmosphere structure considering sensitivity of the adjoining residential neighbourhood and off gases that are produced. SVOCs would take a substantial time to degrade. The issues of fugitive emissions, sensitive receptors and timing can be addressed by using a secondary / off-site treatment area with appropriate controls, in a less sensitive environment.

Long-List Remedial Options				
Remedial Approach	**Remedial Option**	**Brief Description**	**Remedial Application (Potential, Keep, Reject)**	**Fatal Flaw Limitation**
Exsitu Biological Treatment	Landfarming	Contaminated soil, sediment, or sludge is excavated, applied into lined beds, and periodically turned over or tilled to aerate the waste.	Potential: Can be applied for treating VOCs with some effectiveness on SVOCs. Treatment area required, which may not align with future Site redevelopment	Keep: High fugitive emissions without control, especially VOC (Benzene), presenting potential health risks. Requires a large treatment area. Treatment will need to be off site considering sensitivity of the adjoining residential neighbourhood and off gases that are produced. SVOCs would take a substantial time to biodegrade. The issues of fugitive emissions, sensitive receptors and timing can be addressed by using a secondary / off-site treatment area with appropriate controls, in a less sensitive environment.
	Sulfur Oxidising/Reducing Bacteria	Anaerobic bacteria used to treat metal sulfides/sulfates to increase metal solubility and facilitate metal extraction.	Reject: Used to treat inorganic contaminants.	Reject.
	Slurry phase biotreatment	An aqueous slurry is created by combining soil, sediment, or sludge with water and other additives. The slurry is mixed to keep solids suspended and micro-organisms in contact with the soil contaminants. Upon completion of the process, the slurry is dewatered and the treated soil is disposed.	Potential: Enhanced exsitu biodegradation process applied to materials with VOC and SVOC impacts, similar to MGP waste products. A treatment trial is recommended.	Reject: Soil conditions (i.e. low permeable clay, heterogeneous fill) and existing free tar materials would exclude this option as technically feasible.

Long-List Remedial Options				
Remedial Approach	**Remedial Option**	**Brief Description**	**Remedial Application (Potential, Keep, Reject)**	**Fatal Flaw Limitation**
Exsitu Physical / Chemical Treatment	Solidification / Stabilisation/ Immobilisation	Contaminants are physically bound or enclosed within a stabilised mass (solidification), or chemical reactions are induced between the stabilising agent and contaminants to reduce their mobility.	Keep: Organic stabilisation of material containing high tar and moderate concentrations and potentially free tar (gross contaminants). Enables off site disposal of source and high PAH concentration materials, classified on TCLP alone. Stabilisation is usually undertaken by mixing with an appropriate amount of Portland cement, flyash and activated carbon to address the organic and metal contaminants. Treatability trials are required to determine the effectiveness of this method for treating say industrial waste classified material to solid waste classification. Where the PAH contamination can be demonstrated to be present and immobile without treatment within ash and coke then it may qualify for general immobilisation approval from the DEC. This treatment also has the potential to be applicable to ash/coke impacted material that may be retained on site in combination with a physical separation barrier (clay cap or integrated into redevelopment design under concrete slabs/paving) and a long term management plan.	Keep.
	Chemical Extraction	Waste contaminated soil and extractant are mixed, thereby dissolving the contaminants. The extracted solution is then placed in a separator, where the contaminants and extractant are separated for treatment and further use.	Potential: Solvent extraction applicable to coal tar wastes.	Keep: This technology may only be suitable for old service lines and pipes associated with the gasworks operation that contains residual tar. Physical separation to grade soil materials would be very difficult and high clay content would increase time. Introduces potentially toxic solvents to the waste material. Least effective on very high molecular weight organics. This technology is more economically suitable on larger sites with a greater volume of material requiring treatment.

Long-List Remedial Options				
Remedial Approach	**Remedial Option**	**Brief Description**	**Remedial Application (Potential, Keep, Reject)**	**Fatal Flaw Limitation**
Exsitu Physical / Chemical Treatment	Chemical Reduction / Oxidation	Reduction/oxidation chemically converts hazardous contaminants to non-hazardous or less toxic compounds that are more stable, less mobile, and/or inert. The oxidising agents most commonly used are ozone, hydrogen peroxide, hypochlorites, chlorine, and chlorine dioxide.	Reject: Additives are non-specific therefore the costs to treat source materials (free tar, ash/coke fill) would not be economically viable. This technology commonly used for inorganic contaminants but has been successful for organics in low TOC material.	Reject.
	Dehalogenation	Reagents are added to soils contaminated with halogenated organics. The dehalogenation process is achieved by either the replacement of the halogen molecules or the decomposition and partial volatilization of the contaminants.	Reject: Applicable to halogenated SVOCs and pesticides.	Reject.

Long-List Remedial Options				
Remedial Approach	**Remedial Option**	**Brief Description**	**Remedial Application (Potential, Keep, Reject)**	**Fatal Flaw Limitation**
Exsitu Physical / Chemical Treatment	Segregation	Segregation techniques concentrate contaminated solids through physical and chemical means. These processes seek to detach contaminants from the soil, sand, and/or binding material.	Potential: Can be applied to SVOC impacted material with limited applicability to VOCs. Off site treatment required.	Keep: This technology may be applied preceding additional treatment. For example retaining oversize materials in general fill such as bricks, footings, concrete, pipe work, and other building rubble (i.e. fibro cement sheeting). This technique reduces treatment volumes.
	Soil Washing	Contaminants sorbed onto fine soil particles are separated from bulk soil in an aqueous-based system on the basis of particle size. The wash water may be augmented with a basic leaching agent, surfactant, pH adjustment, or chelating agent to help remove organics and heavy metals.	Potential: Can be applied to SVOC impacted material with limited applicability to VOCs. Off site treatment required.	Reject: Stiff clays and heterogeneous fill would prove difficult to remove adsorbed organic compounds and increase treatment time and costs. Treatment will need to be off site considering sensitivity of the adjoining residential neighbourhood. High content of free tar would also introduce a high degree of difficulty removing adsorbed compounds.

Long-List Remedial Options				
Remedial Approach	**Remedial Option**	**Brief Description**	**Remedial Application (Potential, Keep, Reject)**	**Fatal Flaw Limitation**
Exsitu Thermal Treatment	Hot Gas Decontamination	The process involves raising the temperature of the contaminated material for a specified period of time. The gas effluent from the material is treated in an afterburner system to destroy all volatilised contaminants.	Reject: Typically used to decontaminate machinery and equipment, not impacted soil material.	Reject.
	Incineration and co-burning	High temperatures, 870-1,200 °C (1,600-2,200 °F), are used to combust (in the presence of oxygen) organic constituents in hazardous wastes.	Potential: Technology that is used for a broad range organic contaminants from a number of different industries.	Keep: However issues include gaining regulatory approval and limited available facilities other than through co-burning at a power station or cement kiln. This technology is applicable for high organic content materials such as free tar wastes. Materials can be treated to improve handling and transport (i.e. fly ash additive) or stabilised (i.e. quicklime) or other off site treatment technologies to reduce the mass of soil material or oversize materials (segregation). An example of this technology is co-burning with other feedstock at a power plant, where high calorific tarry material is mixed with coal feed to the power station or where in liquid tar form can be injected directly into the furnace. This has been previously undertaken in NSW but stopped due to regulatory / community concerns.

Long-List Remedial Options				
Remedial Approach	**Remedial Option**	**Brief Description**	**Remedial Application (Potential, Keep, Reject)**	**Fatal Flaw Limitation**
Exsitu Thermal Treatment	Pyrolysis	Chemical decomposition is induced in organic materials by heat in the absence of oxygen. Organic materials are transformed into gaseous components and a solid residue (coke) containing fixed carbon and ash.	Potential: Applicable to coal tar wastes. Technology may be used as a precursor to incineration.	Reject: The commercial availability of this technology is very limited and costly.
	Thermal Desorption	Wastes are heated to volatilise water and organic contaminants. A carrier gas or vacuum system transports volatilised water and organics to the gas treatment system.	Potential: This is a proven technology in treating organic contaminants, particularly High Temperature Thermal Desorption (HTTD) for VOCs and SVOCs.	Keep: Off site treatment is required given the sensitivity of the adjoining residential neighbourhood. This technology can have issues with high energy tarry materials and be relatively costly for small volumes where site mobilisation and establishment is required. No currently approved offsite thermal desorption facility available and onsite treatment with a portable plant would present logistic problems and regulatory and community issues.

Long-List Remedial Options				
Remedial Approach	**Remedial Option**	**Brief Description**	**Remedial Application (Potential, Keep, Reject)**	**Fatal Flaw Limitation**
Containment	Insitu Capping	The purpose of capping contaminated soil in-situ is to prevent the exposure of site users to the contaminated material and to reduce contaminant migration associated with infiltration and leaching by surface waters. Capping layers can range from a one-layer system of either soil, clay, concrete or synthetic liner, to complex multi-layer systems of soils and geosynthetic fabrics.	Keep: Considering the Site conditions and potential redevelopment aspirations, particular areas of the Site and associated impacted fill would enable this option to be feasible. Relatively shallow impacts of non leaching material are the likely scenario for this option to be applied. The capping may also be in the form of a physical separation barrier, such as sealed concrete areas or paving as part of the future redevelopment. This option would be implemented in combination with a pretreatment to stabilise leaching materials. A long term management plan would also be required.	Keep.
	Capping in Prescribed Containment Area Onsite	This option is similar to capping in-situ, except that contaminated soil on the site would be consolidated and capped in one area of the site.	Keep: Similar to the above, this technology could be implemented in combination with stabilisation of leaching materials.	Keep.
	Complete Encapsulation/Cap and contain	This option involves the complete encapsulation of contaminated soil and waste material on the site in a fully lined containment cell.	Reject: This technology is not technically feasible given the limited space on the Site and future land use aspiration. Cap and contain using vertical barrier (such as HDPE or soil bentonite cut off wall)	Reject. Cap and contain may have some application subsequent to gross contaminant removal where residual groundwater contamination poses a continued significant risk of harm and containment is required to mitigate this risk. However, Site specific issues are the fractured shale aquifer with no impermeable founding layer present potentially requiring deep grouting and continued hydraulic control and associated groundwater treatment, with O & M.

Long-List Remedial Options				
Remedial Approach	**Remedial Option**	**Brief Description**	**Remedial Application (Potential, Keep, Reject)**	**Fatal Flaw Limitation**
Excavation of Contaminated Material and Off-Site Disposal	Disposal to an Existing Off-site Facility	Contaminated material is removed and transported to an existing, appropriately licensed off-site disposal facility. Pre-treatment may be required.	Keep: This technology is technically feasible in combination with other technologies such as stabilisation / immobilisation. Alone this technique would be substantially high in costs given the concentrations of compounds in the MGP wastes. A facilty is unlikely to accept the waste in its given condition. Materials may be pretreated to lower the materials propensity to leach particular compounds, however not necessarily reduce the total concentrations. Pretreatment may involve stabilisation, (to achieve TCLP landfill criteria) biopiling (to reduce total concentrations to landfill acceptance criteria) and chemical extraction (pipe work only).	Keep.
Reuse and Recycling	Removal off-site for reuse and recycling by other appropriate facilities or retained on site and reused.	These materials have some value to other processing plants and may be able to be sold and removed from site for reuse.	Keep: This technology may only be used for oversize materials and fill materials meeting land use criteria. For example, demolition waste may be screened and removed off site to a recycling facility, or fill materials may be used to backfill excavated sections of the Site.	Keep.

Appendix G
Laboratory Analytical Reports and
Chain of Custody Forms

CUSTOMER CENTRIC - ANALYTICAL CHEMISTS

No. 13542.

Accredited for compliance with ISO/IEC 17025. The results of tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. NATA is a signatory to the APLAC mutual recognition arrangement for the mutual recognition of the equivalence of testing, calibration and inspection reports.

AUSTRALIAN QUARANTINE AND INSPECTION SERVICE

SYDNEY License No. N0356.

Quarantine Approved premises criteria 5.1 for quarantine containment level 1 (QCI) facilities. Class five criteria cover premises utilised for research, analysis,and/or testing of biological material, soil, animal, plant and human products.

FINAL CERTIFICATE OF ANALYSIS - ENVIRONMENTAL DIVISION

Laboratory Report No:	E028016
Client Name:	CH2M HILL Australia Pty. Ltd
Client Reference:	Macdonaldtown Gasworks
Contact Name:	Adam Sullivan
Chain of Custody No:	na
Sample Matrix:	SOIL

Cover Page 1 of 4
plus Sample Results

Date Received: 18/08/2006
Date Reported: 29/08/2006

This Final Certificate of Analysis consists of sample results, DQI's, method descriptions, laboratory definitions, and internationally recognised NATA accreditation and endorsement. The DQO compliance relates specifically to QA/QC results as performed as part of the sample analysis, and may provide an indication of sample result quality. Transfer of report ownership from Labmark to the client shall only occur once full & final payment has been settled and verified. All report copies may be retracted where full payment has not occured within the agreed settlement period.

QUALITY ASSURANCE CRITERIA

Accuracy:	matrix spike:	1 in first 5-20, then 1 every 20 samples
	lcs, crm, method:	1 per analytical batch
	surrogate spike:	addition per target organic method
Precision:	laboratory duplicate:	1 in first 5-10, then 1 every 10 samples
	laboratory triplicate:	re-extracted & reported when duplicate RPD values exceed acceptance criteria
Holding Times:	soils, waters:	Refer to LabMark Preservation & THT table VOC's 14 days water / soil VAC's 7 days water or 14 days acidified VAC's 14 days soil SVOC's 7 days water, 14 days soil Pesticides 7 days water, 14 days soil Metals 6 months general elements Mercury 28 days
Confirmation:	target organic analysis:	GC/MS, or confirmatory column
Sensitivity:	EQL:	Typically 2-5 x Method Detection Limit (MDL)

QUALITY CONTROL GLOBAL ACCEPTANCE CRITERIA (GAC)

Accuracy:	spike, lcs, crm surrogate:	general analytes 70% - 130% recovery phenol analytes 50% - 130% recovery organophosphorous pesticide analytes 60% - 130% recovery phenoxy acid herbicides 50% - 130% recovery
	anion/cation bal:	+/- 10% (0-3 meq/l), +/- 5% (>3 meq/l)
Precision:	method blank:	not detected >95% of the reported EQL
	duplicate lab RPD (metals):	0-30% (>10xEQL), 0-75% (5-10xEQL) 0-100% (<5xEQL)
	duplicate lab RPD:	0-50% (>10xEQL), 0-75% (5-10xEQL) 0-100% (<5xEQL)

QUALITY CONTROL ANALYTE SPECIFIC ACCEPTANCE CRITERIA (ASAC)

Accuracy:	spike, lcs, crm surrogate:	analyte specific recovery data <3xsd of historical mean
Uncertainty:	spike, lcs:	measurement calculated from historical analyte specific control charts

RESULT ANNOTATION

DQO:	Data Quality Objective	s:	matrix spike recovery	p:	pending
DQI:	Data Quality Indicator	d:	laboratory duplicate	lcs:	laboratory control sample
EQL:	Estimated Quantitation Limit	t:	laboratory triplicate	crm:	certified reference material
- - :	not applicable	r:	RPD relative % difference	mb:	method blank

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

NEPC GUIDELINE COMPLIANCE - DQO

1. GENERAL

A. Results relate specifically to samples as received. Sample results are not corrected for matrix spike, lcs, or surrogate recovery data.

B. EQL's are matrix dependant and may be increased due to sample dilution or matrix interference.

C. Laboratory QA/QC samples are specific to this project.

D. Inter-laboratory proficiency results are available upon request. NATA accreditation details available at www.nata.asn.au.

E. VOC spikes & surrogates added to samples during extraction, SVOC spikes & surrogates added prior to extraction.

F. Recovery data outside GAC limits shall be investigated and compared to ASAC (historical mean +/- 3sd). If recovery data <20%, then the relevant results for that compound are considered not reliable.

G. Recovery data (ms, surrogate, crm, lcs) outside ASAC limits shall initiate an investigative action. Anomolous QC data is examined in conjunction with other QC samples and a final decision whether to accept or reject results is provided by the professional judgement of the senior analyst. The USEPA-CLP National Functional Guidelines are referred to for specific recommendations.

H. Extraction (preparation) date refers to the date that sample preparation was initiated. Note that certain methods not requiring sample preparation (eg. VOCs in water, etc) may report a common extraction and analysis date.

I. LabMark shall maintain an official copy of this Certificate of Analysis for all tracable reference purposes.

2. CHAIN OF CUSTODY (COC) & SAMPLE RECEIPT NOTICE (SRN) REQUIREMENTS

A. SRN issued to client upon sample receipt & login verification.

B. Preservation & sampling date details specified on COC and SRN, unless noted.

C. Sample Integrity & Validated Time of Sample Receipt (VTSR) Holding Times verified (preservation may extend holding time, refer to preservation chart).

3. NATA ACCREDITED METHODS

A. NATA accreditation held for each method and sample matrix type reported, unless noted below.

B. NATA accredited in-house laboratory methods are referenced from NEPC, ASTM, modified USEPA / APHA documents. Corporate Accreditation No. 13542.

C. Subcontracted analyses: Refer to Sample Receipt Notice and additional DQO comments.

LabMark PTY LTD ABN 27 079 798 397
* SYDNEY: Unit 1, 8 Leighton Place Asquith NSW 2077 * MELBOURNE: 116 Moray Street, South Melbourne VIC 3205
* Telephone: (02) 9476 6533 * Fax: (02) 9476 8219 * Telephone: (03) 9686 8344 * Fax: (03) 9686 7344

4. QA/QC FREQUENCY COMPLIANCE TABLE SPECIFIC TO THIS REPORT

Matrix: **SOIL**

Page:	Method:	Totals:	#d	%d-ratio	#t	#s	%s-ratio
1	BTEX by P&T	3	0	0%	0	0	0%
1	Volatile TPH by P&T (vTPH)	3	0	0%	0	0	0%
2	Petroleum Hydrocarbons (TPH)	3	0	0%	0	0	0%
3	Polyaromatic Hydrocarbons (PAH)	2	0	0%	0	0	0%
4	Phenols by GC/MS	1	0	0%	0	0	0%
5	Acid extractable metals (M7)	2	0	0%	0	0	0%
6	Acid extractable mercury	2	0	0%	0	0	0%
7	Moisture	3	--	--	--	--	--

GLOSSARY:

#d	number of discrete duplicate extractions/analyses performed.
%d-ratio	NEPC guideline for laboratory duplicates is 1 in 10 samples (min 10%).
#t	number of triplicate extractions/analyses performed.
#s	number of spiked samples analysed.
%s-ratio	USEPA guideline for laboratory matrix spikes is 1 in 20 samples (min 5%).

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5. THERE ARE NO ADDITIONAL COMMENTS SPECIFIC TO THIS REPORT

A. All tests were conducted by LabMark Environmental Sydney, NATA accreditation No. 13542, Corporate Site No. 13535., unless indicated below.

Laboratory QA/QC data shall relate specifically to this report, and may provide an indication of site specific sample result quality. LabMark DOES NOT report NON-RELEVANT BATCH QA/QC data. Acceptance of this self assessment certificate does not preclude any requirement for a QA/QC review by a accredited contaminated site EPA auditor, when and wherever necessary. Laboratory QA/QC self assessment references available upon request.

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Laboratory Report No: E028016
Client Name: CH2M HILL Australia Pty. Ltd
Contact Name: Adam Sullivan
Client Reference Macdonaldtown Gasworks 347496

Page: 1 of 7
plus cover page
Date: 29/08/06
This report supercedes reports issued on: N/A

Final
Certificate
of Analysis

Laboratory Identification			**41278**	**41279**	**41280**	**lcs**	**mb**					
Sample Identification			DUP06	DUP07	QC02	QC	QC					
Depth (m)			--	--	--	--	--					
Sampling Date recorded on COC			16/8/06	16/8/06	16/8/06	--	--					
Laboratory Extraction (Preparation) Date			24/8/06	24/8/06	24/8/06	24/8/06	24/8/06					
Laboratory Analysis Date			26/8/06	26/8/06	26/8/06	25/8/06	25/8/06					
Method	**BTEX by P&T**	**EQL**										
E002.2	Benzene	0.2	<0.2	<0.2	<0.2	98%	<0.2					
	Toluene	0.5	<0.5	<0.5	<0.5	101%	<0.5					
	Ethylbenzene	0.5	<0.5	<0.5	<0.5	99%	<0.5					
	meta- and para-Xylene	1	<1	<1	<1	104%	<1					
	ortho-Xylene	0.5	<0.5	<0.5	<0.5	101%	<0.5					
	Total Xylene	--	--	--	--	--	--					
	CDFB (Surr @ 10mg/kg)	--	*72%*	*75%*	*75%*	*102%*	*100%*					
Method	**Volatile TPH by P&T (vTPH)**	**EQL**										
E003.2	C6 - C9 Fraction	10	<10	<10	<10	97%	<10					

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E002.2: 8-10g soil extracted with 20ml methanol. Analysis by P&T/GC/PID/MSD.
E003.2: 8-10g soil extracted with 20ml methanol. Analysis by P&T/GC/FID.

Laboratory Identification			**41278**	**41279**	**41280**	**lcs**	**mb**					
Sample Identification			DUP06	DUP07	QC02	QC	QC					
Depth (m)			--	--	--	--	--					
Sampling Date recorded on COC			16/8/06	16/8/06	16/8/06	--	--					
Laboratory Extraction (Preparation) Date			24/8/06	24/8/06	24/8/06	24/8/06	24/8/06					
Laboratory Analysis Date			26/8/06	26/8/06	26/8/06	26/8/06	26/8/06					
Method	**Petroleum Hydrocarbons (TPH)**	**EQL**										
E006.2	C10 - C14 Fraction	50	<50	<50	130	--	<50					
	C15 - C28 Fraction	100	<100	<100	2680	93%	<100					
	C29 - C36 Fraction	100	<100	<100	1320	--	<100					
	Sum of TPH C10 - C36	--	--	--	4130	--	--					

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E006.2: 8-10g soil extracted with 20ml DCM/Acetone (8:2). Analysis by GC/FID.

Laboratory Identification			**41278**	**41279**	**lcs**	**mb**						
Sample Identification			DUP06	DUP07	QC	QC						
Depth (m)			--	--	--	--						
Sampling Date recorded on COC			16/8/06	16/8/06	--	--						
Laboratory Extraction (Preparation) Date			24/8/06	24/8/06	24/8/06	24/8/06						
Laboratory Analysis Date			27/8/06	28/8/06	26/8/06	27/8/06						
Method	**Polyaromatic Hydrocarbons (PAH)**	**EQL**										
E007.2	Naphthalene	0.5	<0.5	<0.5	103%	<0.5						
	Acenaphthylene	0.5	<0.5	<0.5	106%	<0.5						
	Acenaphthene	0.5	<0.5	<0.5	103%	<0.5						
	Fluorene	0.5	<0.5	<0.5	108%	<0.5						
	Phenanthrene	0.5	<0.5	<0.5	109%	<0.5						
	Anthracene	0.5	<0.5	<0.5	103%	<0.5						
	Fluoranthene	0.5	<0.5	<0.5	105%	<0.5						
	Pyrene	0.5	<0.5	<0.5	102%	<0.5						
	Benz(a)anthracene	0.5	<0.5	<0.5	101%	<0.5						
	Chrysene	0.5	<0.5	<0.5	106%	<0.5						
	Benzo(b)&(k)fluoranthene	1	<1	<1	101%	<1						
	Benzo(a) pyrene	0.5	<0.5	<0.5	108%	<0.5						
	Indeno(1,2,3-c,d)pyrene	0.5	<0.5	<0.5	88%	<0.5						
	Dibenz(a,h)anthracene	0.5	<0.5	<0.5	91%	<0.5						
	Benzo(g,h,i)perylene	0.5	<0.5	<0.5	81%	<0.5						
	Sum of reported PAHs	--	--	--	--	--						
	2-FBP (Surr @ 5mg/kg)	--	*90%*	*92%*	*100%*	*103%*						
	TP-d14 (Surr @ 5mg/kg)	--	*93%*	*91%*	*97%*	*100%*						

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E007.2: 8-10g soil extracted with 20ml DCM/acetone (8:2). Analysis by GC/MS.

Laboratory Identification			**41279**	**lcs**	**mb**							
Sample Identification			DUP07	QC	QC							
Depth (m)			--	--	--							
Sampling Date recorded on COC			16/8/06	--	--							
Laboratory Extraction (Preparation) Date			24/8/06	24/8/06	24/8/06							
Laboratory Analysis Date			28/8/06	28/8/06	26/8/06							
Method	**Phenols by GC/MS**	**EQL**										
E008.2	Phenol	0.5	<0.5	79%	<0.5							
	2-chlorophenol	0.5	<0.5	82%	<0.5							
	2-methylphenol	0.5	<0.5	82%	<0.5							
	4-methylphenol	0.5	<0.5	90%	<0.5							
	2-nitrophenol	0.5	<0.5	85%	<0.5							
	2,4-dimethylphenol	0.5	<0.5	79%	<0.5							
	2,4-dichlorophenol	0.5	<0.5	85%	<0.5							
	4-chloro-3-methylphenol	0.5	<0.5	95%	<0.5							
	2,4,6-trichlorophenol	0.5	<0.5	81%	<0.5							
	2,4,5-trichlorophenol	0.5	<0.5	91%	<0.5							
	Pentachlorophenol	1	<1	60%	<1							
	Sum of reported phenols	--	--	--	--							
	2-FP (Surr @ 5mg/kg)	--	*90%*	*80%*	*74%*							
	Phenol-d5 (Surr @ 5mg/kg)	--	*91%*	*75%*	*77%*							
	2,4,6-TBP (Surr @ 5mg/kg)	--	*85%*	*79%*	*88%*							

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E008.2: 8-10g soil extracted with 20ml DCM/acetone (8:2). Analysis by GC/MS.

Laboratory Identification			**41279**	**41280**	**crm**	**lcs**	**mb**					
Sample Identification			DUP07	QC02	QC	QC	QC					
Depth (m)			--	--	--	--	--					
Sampling Date recorded on COC			16/8/06	16/8/06	--	--	--					
Laboratory Extraction (Preparation) Date			25/8/06	25/8/06	25/8/06	25/8/06	25/8/06					
Laboratory Analysis Date			26/8/06	26/8/06	26/8/06	26/8/06	26/8/06					
Method	**Acid extractable metals (M7)**	**EQL**										
E022.2	Arsenic	1	10	8	102%	94%	<1					
	Cadmium	0.1	<0.1	0.8	92%	92%	<0.1					
	Chromium	1	30	18	94%	89%	<1					
	Copper	2	2	93	95%	90%	<2					
	Nickel	1	<1	29	96%	93%	<1					
	Lead	2	16	340	89%	94%	<2					
	Zinc	5	9	400	90%	101%	<5					

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E022.2: 0.5g digested in nitric/hydrochloric acid. Analysis by ICP-MS.

Laboratory Identification			**41279**	**41280**	**crm**	**lcs**	**mb**					
Sample Identification			DUP07	QC02	QC	QC	QC					
Depth (m)			--	--	--	--	--					
Sampling Date recorded on COC			16/8/06	16/8/06	--	--	--					
Laboratory Extraction (Preparation) Date			25/8/06	25/8/06	25/8/06	25/8/06	25/8/06					
Laboratory Analysis Date			25/8/06	25/8/06	25/8/06	25/8/06	25/8/06					
Method	**Acid extractable mercury**	**EQL**										
E026.2	Mercury	0.05	<0.05	1.6	118%	110%	<0.05					

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E026.2: 0.5g digested with nitric/hydrochloric acid. Analysis by CV-ICP-MS or FIMS.

Laboratory Identification			**41278**	**41279**	**41280**							
Sample Identification			DUP06	DUP07	QC02							
Depth (m)			--	--	--							
Sampling Date recorded on COC			16/8/06	16/8/06	16/8/06							
Laboratory Extraction (Preparation) Date			24/8/06	24/8/06	24/8/06							
Laboratory Analysis Date			25/8/06	25/8/06	25/8/06							
Method	**Moisture**	**EQL**										
E005.2	Moisture	--	16	22	14							

Results expressed in % w/w unless otherwise specified

Comments:

E005.2: Moisture by gravimetric analysis. Results are in % w/w.

Quality, Service, Support

Report Date : 22/08/2006
Report Time : 2:19:15PM

Sample **Receipt** Notice (SRN) for **E028016**

Client Details		Laboratory Reference Information	
Client Name:	CH2M HILL Australia Pty. Ltd	**Please have this information ready when contacting Labmark.**	
Client Phone:	02 9950 0200		
Client Fax:	02 9950 0600	**Laboratory Report:**	**E028016**
Contact Name:	Adam Sullivan	**Quotation Number:**	- Not provided, standard prices apply
Contact Email:	Adam.Sullivan@ch2m.com.au	**Laboratory Address:**	Unit 1, 8 Leighton Pl. Asquith NSW 2077
Client Address:	P O Box 5392 Chatswood NSW 2067	**Phone:**	61 2 9476 6533
		Fax:	61 2 9476 8219
Project Name:	Macdonaldtown Gasworks	**Sample Receipt Contact:**	Jakleen El Galada
Project Number:	347496	**Email:**	jakleen.galada@labmark.com.au
CoC Number:	- Not provided -	**Reporting Contact:**	Jyothi Lal
Purchase Order:	- Not provided -	**Email:**	jyothi.lal@labmark.com.au
Surcharge:	No surcharge applied (results by 6:30pm on due date)		
Sample Matrix:	SOIL		
Date Sampled (earliest date):	16/08/2006	**NATA Accreditation:**	13542
Date Samples Received:	18/08/2006	**TGA GMP License:**	185-336 (Sydney)
Date Sample Receipt Notice issued:	22/08/2006	**APVMA License:**	6105 (Sydney)
Date Preliminary Report Due:	29/08/2006	**AQIS Approval:**	NO356 (Sydney)
		AQIS Entry Permit:	200409998 (Sydney)

Sample Condition:
COC received with samples. Report number and lab ID's defined on COC.
Samples received in good order .
Samples received with cooling media: Crushed ice .
Samples received chilled.
Security seals intact .
Sample container & sample integrity suitable .

Comments:

Holding Times:
Date received allows for sufficient time to meet Technical Holding Times.

Preservation:
Chemical preservation of samples satisfactory for requested analytes.

Important Notes:
Sample disposal of environmental samples shall be 31 days (water) and 3 months (soil, HN03 preserved samples) after laboratory receipt, unless otherwise requested in writing by the client. Samples requested to be held in non-refrigerated storage shall incur $5.00/ sample/ 3 months. Additional refrigerated storage shall incur $20/ sample/ 3 months. Combination prices apply only if requested. Transfer of report ownership from LabMark to the client shall occur once full and final payment has been settled and verified. All report copies may be retracted where full payment does not occur within the agreed settlement period.

Analysis comments:

Subcontracted Analyses:

Thank you for choosing Labmark to analyse your project samples.
Additional information on www.labmark.com.au

Report Date : 22/08/2006
Report Time : 2:19:15PM

Quality, Service, Support

Sample **Receipt** Notice (SRN) for **E028016**

The table below represents LabMark's understanding and interpretation of the customer supplied sample COC request. Please confirm that your COC request has been entered correctly. Due to THT and TAT requirements, testing shall commence immediately as per this table, unless the customer intervenes with a correction prior to testing.

GRID REVIEW TABLE

No.	Date	Depth	Client Sample ID	Requested Analysis: BTEX by P&T	Acid extractable mercury	Acid extractable metals (M7)	Moisture	Polyaromatic Hydrocarbons (PAH)	Phenols by GC/MS	PREP Not Reported	Petroleum Hydrocarbons (TPH)	Volatile TPH by P&T (vTPH)											
41278	16/08		DUP06	●			●	●		●	●	●											
41279	16/08		DUP07	●	●	●	●	●	●	●	●	●											
41280	16/08		QC02	●	●	●	●			●	●	●											
			Totals:	3	2	2	3	2	1	3	3	3											

Thank you for choosing Labmark to analyse your project samples.
Additional information on www.labmark.com.au

LabMark

Quality, Service, Support

Report Date : 22/08/2006
Report Time : 2:19:15PM

Sample **Receipt** Notice (SRN) for **E028016**

No.	Date	Depth	Client Sample ID	Requested Analysis: M8 - M7-T_S																			
41279	16/08		DUP07	●																			
41280	16/08		QC02	●																			
			Totals:	2																			

Thank you for choosing Labmark to analyse your project samples.
Additional information on www.labmark.com.au

Laboratory Quotation #

5/5

Job Ref: E029016.

CH2MHILL ACN 050 070 892

CHAIN OF CUSTODY RECORD

Level 7, 9 Help Street, Chatswood, NSW 2067 Australia Tel (61 2) 9950 0200 Fax (61 2) 9950 0600

COC # [redacted]

Project # 347496	~~Purchase Order #~~ SY/148/06
Project Name Macdonaldtown Gasworks	
Company Name ALS	
Project Manager or Contact & Phone # Adam Sullivan 0400 500 264	**Report Copy to:** →
Requested Completion Date: standard TAT	**Site ID** Macdonaldtown
Sample Disposal: Dispose ☑ Return ☐	

TOTAL # OF CONTAINERS

Requested Analytical Method #

Sampling Date	Sampling Time	Type	Matrix	CLIENT SAMPLE ID (9 CHARACTERS)	LAB QC	S-12	S-4	S-7	S-12	S-14A	S-19	E1026	Asbestos	HOLD
				TP14/1.0		X	X			X				X
				TP14/1.5		X		X				X		
				RP/2.0							X			
				RP/Pipe							X			
				DUP06	41278			X						
				DUP07	41279	X	X			X				
				QC02	41280	X	X							
				WO4							X			

Please send to Labmark for analysis

Preservative

QA REQUIREMENTS

Matrix Spike	☐ Yes	☐ No
Matrix Duplicate	☐ Yes	☐ No
Laboratory Duplicate	☐ Yes	☐ No
Lab Blank	☐ Yes	☐ No
Surrogate Spike	☐ Yes	☐ No
RPDs	☐ Yes	☐ No
Spike Recovery Data	☐ Yes	☐ No

LAB USE ONLY

Custody Seals	☐ Yes	☐ No
ICE	☐ Yes	☐ No

Comments	Lab ID

Sampled By and Title A. Sullivan	(Please sign and print name)	**Date/Time**	**Relinquished By** A. Sullivan	(Please sign and print name)	**Date/Time**
Received by	(Please sign and print name)	**Date/Time**	**Relinquished By**	(Please sign and print name)	**Date/Time** 18/7/16 1:15pm Sydney
Received by	(Please sign and print name)	**Date/Time** 18/7/16	**Shipped Via**		**Shipping #**

Special Instructions:

Relinquished by ALS 18-7-16 1:15pm.

Received 18/8 5:45

DISTRIBUTION: Original - LAB, Yellow - LAB, Pink - CH2MHILL

Quality, Service, Support

Report Date : 22/08/2006
Report Time : 2:19:15PM

Sample **Receipt** Notice (SRN) for **E028016**

Client Details		Laboratory Reference Information	
Client Name:	CH2M HILL Australia Pty. Ltd	**Please have this information ready when contacting Labmark.**	
Client Phone:	02 9950 0200		
Client Fax:	02 9950 0600	**Laboratory Report:**	**E028016**
Contact Name:	Adam Sullivan	**Quotation Number:**	- Not provided, standard prices apply
Contact Email:	Adam.Sullivan@ch2m.com.au	**Laboratory Address:**	Unit 1, 8 Leighton Pl. Asquith NSW 2077
Client Address:	P O Box 5392 Chatswood NSW 2067	**Phone:**	61 2 9476 6533
		Fax:	61 2 9476 8219
Project Name:	Macdonaldtown Gasworks	**Sample Receipt Contact:**	Jakleen El Galada
Project Number:	347496	**Email:**	jakleen.galada@labmark.com.au
CoC Number:	- Not provided -	**Reporting Contact:**	Jyothi Lal
Purchase Order:	- Not provided -	**Email:**	jyothi.lal@labmark.com.au
Surcharge:	No surcharge applied (results by 6:30pm on due date)		
Sample Matrix:	SOIL		
Date Sampled (earliest date):	16/08/2006	**NATA Accreditation:**	13542
Date Samples Received:	18/08/2006	**TGA GMP License:**	185-336 (Sydney)
Date Sample Receipt Notice issued:	22/08/2006	**APVMA License:**	6105 (Sydney)
Date Preliminary Report Due:	29/08/2006	**AQIS Approval:**	NO356 (Sydney)
		AQIS Entry Permit:	200409998 (Sydney)

Sample Condition:
COC received with samples. Report number and lab ID's defined on COC.
Samples received in good order .
Samples received with cooling media: Crushed ice .
Samples received chilled.
Security seals intact .
Sample container & sample integrity suitable .

Comments:

Holding Times:
Date received allows for sufficient time to meet Technical Holding Times.

Preservation:
Chemical preservation of samples satisfactory for requested analytes.

Important Notes:
Sample disposal of environmental samples shall be 31 days (water) and 3 months (soil, HN03 preserved samples) after laboratory receipt, unless otherwise requested in writing by the client. Samples requested to be held in non-refrigerated storage shall incur $5.00/ sample/ 3 months. Additional refrigerated storage shall incur $20/ sample/ 3 months. Combination prices apply only if requested. Transfer of report ownership from LabMark to the client shall occur once full and final payment has been settled and verified. All report copies may be retracted where full payment does not occur within the agreed settlement period.

Analysis comments:

Subcontracted Analyses:

Thank you for choosing Labmark to analyse your project samples.
Additional information on www.labmark.com.au

Report Date : 22/08/2006
Report Time : 2:19:15PM

Quality, Service, Support

Sample **Receipt** Notice (SRN) for **E028016**

The table below represents LabMark's understanding and interpretation of the customer supplied sample COC request. Please confirm that your COC request has been entered correctly. Due to THT and TAT requirements, testing shall commence immediately as per this table, unless the customer intervenes with a correction prior to testing.

GRID REVIEW TABLE

No.	Date	Depth	Client Sample ID	Requested Analysis: BTEX by P&T	Acid extractable mercury	Acid extractable metals (M7)	Moisture	Polyaromatic Hydrocarbons (PAH)	Phenols by GC/MS	PREP Not Reported	Petroleum Hydrocarbons (TPH)	Volatile TPH by P&T (vTPH)											
41278	16/08		DUP06	●			●	●		●	●	●											
41279	16/08		DUP07	●	●	●	●	●	●	●	●	●											
41280	16/08		QC02	●	●	●	●			●	●	●											
			Totals:	3	2	2	3	2	1	3	3	3											

Thank you for choosing Labmark to analyse your project samples.
Additional information on www.labmark.com.au

LabMark

Quality, Service, Support

Report Date : 22/08/2006
Report Time : 2:19:15PM

Sample **Receipt** Notice (SRN) for **E028016**

No.	Date	Depth	Client Sample ID	Requested Analysis: M8 - M7-T_S																			
41279	16/08		DUP07	●																			
41280	16/08		QC02	●																			
			Totals:	2																			

Thank you for choosing Labmark to analyse your project samples.
Additional information on www.labmark.com.au

Laboratory Quotation #

5/5

Job Ref: E029016.

CH2MHILL ACN 050 070 892

CHAIN OF CUSTODY RECORD

Level 7, 9 Help Street, Chatswood, NSW 2067 Australia Tel (61 2) 9950 0200 Fax (61 2) 9950 0600

COC # [redacted]

Project # 347496	~~Purchase Order #~~ SY/148/06
Project Name Macdonaldtown Gasworks	
Company Name ALS	
Project Manager or Contact & Phone # Adam Sullivan 0400 500 264	**Report Copy to:** →
Requested Completion Date: standard TAT	**Site ID** Macdonaldtown
Sample Disposal: Dispose ☑ Return ☐	

TOTAL # OF CONTAINERS

Requested Analytical Method #

Sampling Date	Sampling Time	Type	Matrix	CLIENT SAMPLE ID (9 CHARACTERS)	LAB QC	S-12	S-4	S-7	S-12	S-14A	S-19	E1026	Asbestos	HOLD
				TP14/1.0		X	X			X				X
				TP14/1.5		X		X				X		
				RP/2.0							X			
				RP/Pipe							X			
				DUP06	41278			X						
				DUP07	41279	X	X			X				
				QC02	41280	X	X							
				WO4							X			

Please send to Labmark for analysis

Preservative

QA REQUIREMENTS

Matrix Spike	☐ Yes	☐ No
Matrix Duplicate	☐ Yes	☐ No
Laboratory Duplicate	☐ Yes	☐ No
Lab Blank	☐ Yes	☐ No
Surrogate Spike	☐ Yes	☐ No
RPDs	☐ Yes	☐ No
Spike Recovery Data	☐ Yes	☐ No

LAB USE ONLY

Custody Seals	☐ Yes	☐ No
ICE	☐ Yes	☐ No

Comments	Lab ID

Sampled By and Title A. Sullivan	(Please sign and print name)	**Date/Time**	**Relinquished By** A. Sullivan	(Please sign and print name)	**Date/Time**
Received by	(Please sign and print name)	**Date/Time**	**Relinquished By**	(Please sign and print name)	**Date/Time** 18/7/16 1:15pm Sydney
Received by	(Please sign and print name)	**Date/Time** 18/7/16	**Shipped Via**		**Shipping #**

Special Instructions:

Relinquished by ALS 18-7-16 1:15pm.

Received 18/8 5:45

DISTRIBUTION: Original - LAB, Yellow - LAB, Pink - CH2MHILL

AUSTRALIAN SAFER ENVIRONMENT & TECHNOLOGY PTY LTD

ABN 36 088 095 112

Our ref : ASET9406/ 12568 / 1 - 5
Your ref :ES0609995
NATA Accreditation No: 14484

18 August 2006

Australian Laboratory Services Pty Ltd
277, Woodpark Road,
Smithfield,
NSW 2164.

Attn:Mr Greg Vogel,
Fax No:02-87848500

Dear Greg,

Asbestos Identification
This report presents the results of five samples, forwarded by Australian Laboratory Services Pty Ltd on 16 August 2006, for analysis for asbestos.

1.Introduction: Five samples forwarded were examined and analysed for the presence of asbestos.

2. Methods : The samples were examined under a Stereo Microscope and selected fibres were analysed by Polarized Light Microscopy in conjunction with dispersion Staining method **(Safer Environment Method 1.)**

3. Results :

Sample No. 1. ASET9406 / 12568 / 1. ES0609995 - 001 - MG01 - 0.1.
Approx dimensions 7.0 cm x 5.0 cm x 3.5 cm
The sample consisted of a mixture of soil, stones, plant matter, fragments of plaster, bitumin and brick.
No asbestos detected.

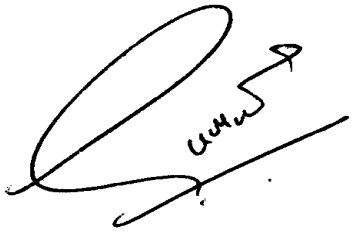
Sample No. 2. ASET9406 / 12568 / 2. ES0609995 - 002 - MG01 -0.2.
Approx dimensions 3.0 cm x 4.0 cm x 1.25 cm
The sample consisted of a fragment of a fibre cement material.
Chrysotile asbestos and Amosite asbestos detected.

Sample No. 3. ASET9406 / 12568 / 3. ES0609995 - 010 - TP01 - 0.25.
Approx dimensions 6.0 cm x 4.0 cm x 3.5 cm
The sample consisted of mixture of soil, stones, plant matter, fragments of plaster, cement and brick.
No asbestos detected.

Sample No. 4. ASET9406 / 12568 / 4. ES0609995 - 015 - TP 02 - 0.25.
Approx dimensions 5.0 cm x 4.5 cm x 3.5 cm
The sample consisted of a mixture of sandy soil, stones, plant matter and fragments of cement and brick.
No asbestos detected.

Sample No. 5. ASET9406 / 12568 / 5. ES0609995 - 020 - TP03 - 0.25.
Approx dimensions 5.0 cm x 4.0 cm x 3.0 cm
The sample consisted of a mixture of soil, stones and fragments of plaster and bitumen.
No asbestos detected.

Analysed and reported by,



Mahen De Silva . BSc. MSc. Grad Dip (Occ Hyg)
Occupational Hygienist / Approved Signatory.

ALS Environmental

CERTIFICATE OF ANALYSIS

Client	: **CH2M HILL PTY LTD**	*Laboratory*	: **ALS Environmental Sydney**	*Page*	: **1 of 17**
Contact	: **MR ADAM SULLIVAN**	*Contact*	: **Greg Vogel**	*Work Order*	: **ES0609995**
Address	: **PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515**	*Address*	: **277-289 Woodpark Road Smithfield NSW Australia 2164**		
E-mail	: **adam.sullivan@ch2m.com.au**	*E-mail*	: **Greg.Vogel@alsenviro.com**		
Telephone	: **02 9950 0200**	*Telephone*	: **+61 (02) 8784 8555**		
Facsimile	: **02 9950 0600**	*Facsimile*	: **+61 (02) 8784 8500**		
Project	: **347496 McDonaldtown Gasworks**	*Quote number*	: **----**	*Date received*	: **15 Aug 2006**
Order number	: **- Not provided -**			*Date issued*	: **23 Aug 2006**
C-O-C number	: **- Not provided -**			*No. of samples*	- *Received* : **36**
Site	: **MCDONALD TOWN**				*Analysed* : **19**

ALSE - Excellence in Analytical Testing

NATA Accredited Laboratory 825

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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*
Celine Conceicao	**Spectroscopist**	**Inorganics - NATA 825 (10911 - Sydney)**
Greg Vogel	**Laboratory Manager**	**Inorganics - NATA 825 (10911 - Sydney)**
Greg Vogel	**Laboratory Manager**	**Organics - NATA 825 (10911 - Sydney)**
Phyu Phyu Lwin	**Spectroscopist**	**Inorganics - NATA 825 (10911 - Sydney)**
Rassem Ayoubi	**Senior Organic Chemist**	**Organics - NATA 825 (10911 - Sydney)**
Sarah Millington	**Senior Inorganic Chemist**	**Inorganics - NATA 825 (10911 - Sydney)**

ALS Environmental

Comments

This report for the ALSE reference ES0609995 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 insuffient 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.

- **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 **ES0609995**

EP080:- The trip spike has been analysed for volatile TPH and BTEX only. The trip spike prepared in the lab using reagent grade sand spiked with petrol. The spike was dispatched from the lab.

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: MG01/1.8	MG01/2.8	MG01/5	QC01	TRIP BLANK
Sample Matrix Type / Description:				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time:				15 Aug 2006 15:00	15 Aug 2006 15:00	15 Aug 2006 15:00	15 Aug 2006 15:00	15 Aug 2006 15:00
Laboratory Sample ID:				ES0609995-004	ES0609995-005	ES0609995-006	ES0609995-007	ES0609995-008
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%	13.3	19.1	14.6	20.0	1.9
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	----	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg	4	----	----	----	----
Copper	7440-50-8	5	mg/kg	140	----	----	----	----
Lead	7439-92-1	5	mg/kg	65	----	----	----	----
Nickel	7440-02-0	2	mg/kg	2	----	----	----	----
Zinc	7440-66-6	5	mg/kg	12	----	----	----	----
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	----	----	----
EK026G: Total Cyanide By Discrete Analyser								
Total Cyanide	57-12-5	1.0	mg/kg	<1.0	----	----	----	----
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls		0.10	mg/kg	<0.10	----	----	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	----	----	----	----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	----	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	----	----	----	----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	----	----	----	----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	----	----	----	----
Aldrin	309-00-2	0.05	mg/kg	<0.05	----	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	----	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	----	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	----	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	----	----	----	----
Dieldrin	60-57-1	0.05	mg/kg	<0.05	----	----	----	----
4.4'-DDE	72-55-9	0.05	mg/kg	<0.05	----	----	----	----
Endrin	72-20-8	0.05	mg/kg	<0.05	----	----	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	----	----	----	----
4.4'-DDD	72-54-8	0.05	mg/kg	<0.05	----	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	----	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	----	----	----	----
4.4'-DDT	50-29-3	0.2	mg/kg	<0.2	----	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	----	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	----	----	----	----

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: MG01/1.8	MG01/2.8	MG01/5	QC01	TRIP BLANK
Sample Matrix Type / Description				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time				15 Aug 2006 15:00	15 Aug 2006 15:00	15 Aug 2006 15:00	15 Aug 2006 15:00	15 Aug 2006 15:00
Laboratory Sample ID				ES0609995-004	ES0609995-005	ES0609995-006	ES0609995-007	ES0609995-008
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	----	----	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	----	----	----	----
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	----	----	----	----
Dimethoate	60-51-5	0.05	mg/kg	<0.05	----	----	----	----
Diazinon	333-41-5	0.05	mg/kg	<0.05	----	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	----	----	----	----
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	----	----	----	----
Malathion	121-75-5	0.05	mg/kg	<0.05	----	----	----	----
Fenthion	55-38-9	0.05	mg/kg	<0.05	----	----	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	----	----	----	----
Parathion	56-38-2	0.2	mg/kg	<0.2	----	----	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	----	----	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	----	----	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	----	----	----	----
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	----	----	----	----
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	----	----	----	----
Ethion	563-12-2	0.05	mg/kg	<0.05	----	----	----	----
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	----	----	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	----	----	----	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	----	----	----	----
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	----	----	----	----
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	----	----	----	----
3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	----	----	----	----
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	----	----	----	----
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	----	----	----	----
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	----	----	----	----
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	----	----	----	----
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	----	----	----	----
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	----	----	----	----
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	----	----	----	----
Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	0.6	<0.5	<0.5	<0.5	----
Acenaphthylene	208-96-8	0.5	mg/kg	1.4	<0.5	<0.5	<0.5	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----

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Analytical Results

				Client Sample ID :	MG01/1.8	MG01/2.8	MG01/5	QC01	TRIP BLANK
				Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Date / Time :	15 Aug 2006 15:00	15 Aug 2006 15:00	15 Aug 2006 15:00	15 Aug 2006 15:00	15 Aug 2006 15:00
				Laboratory Sample ID :	ES0609995-004	ES0609995-005	ES0609995-006	ES0609995-007	ES0609995-008
Analyte	*CAS number*	*LOR*	*Units*						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Phenanthrene	85-01-8	0.5	mg/kg		1.3	<0.5	<0.5	<0.5	----
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	----
Fluoranthene	206-44-0	0.5	mg/kg		1.3	<0.5	<0.5	<0.5	----
Pyrene	129-00-0	0.5	mg/kg		1.1	<0.5	<0.5	<0.5	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		0.7	<0.5	<0.5	<0.5	----
Chrysene	218-01-9	0.5	mg/kg		0.9	<0.5	<0.5	<0.5	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg		1.0	<0.5	<0.5	<0.5	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		1.2	<0.5	<0.5	<0.5	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		0.6	<0.5	<0.5	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		0.7	<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	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		0.8	<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	108-38-3 106-42-3	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
ortho-Xylene	95-47-6	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		83.1	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE		0.1	%		84.0	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.1	%		79.6	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.1	%		80.8	78.5	76.6	77.8	----
2-Chlorophenol-D4	93951-73-6	0.1	%		83.8	83.2	80.6	77.9	----
2.4.6-Tribromophenol	118-79-6	0.1	%		86.3	78.5	77.4	74.0	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		82.7	80.5	79.0	77.4	----
Anthracene-d10	1719-06-8	0.1	%		84.3	83.1	78.8	82.6	----

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Analytical Results

				Client Sample ID :	MG01/1.8	MG01/2.8	MG01/5	QC01	TRIP BLANK
				Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Date / Time :	15 Aug 2006 15:00	15 Aug 2006 15:00	15 Aug 2006 15:00	15 Aug 2006 15:00	15 Aug 2006 15:00
				Laboratory Sample ID :					
Analyte	*CAS number*	*LOR*	*Units*		ES0609995-004	ES0609995-005	ES0609995-006	ES0609995-007	ES0609995-008
EP075(SIM)T: PAH Surrogates									
4-Terphenyl-d14	1718-51-0	0.1	%		78.4	78.2	74.1	74.2	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		102	115	80.7	84.3	81.2
Toluene-D8	2037-26-5	0.1	%		115	118	99.9	96.2	96.4
4-Bromofluorobenzene	460-00-4	0.1	%		114	113	90.4	89.2	87.4

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Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: TRIP SPIKE 1	TP01/1.0	TP01/1.5	TP01/3.0	DUP01
Sample Matrix Type / Description:				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time:				15 Aug 2006 15:00	15 Aug 2006 15:00	15 Aug 2006 15:00	15 Aug 2006 15:00	15 Aug 2006 15:00
Laboratory Sample ID:				ES0609995-009	ES0609995-011	ES0609995-012	ES0609995-013	ES0609995-014
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%	4.2	16.5	6.0	15.5	13.4
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	----	----	<5	----	----
Cadmium	7440-43-9	1	mg/kg	----	----	<1	----	----
Chromium	7440-47-3	2	mg/kg	----	----	<2	----	----
Copper	7440-50-8	5	mg/kg	----	----	14	----	----
Lead	7439-92-1	5	mg/kg	----	----	10	----	----
Nickel	7440-02-0	2	mg/kg	----	----	<2	----	----
Zinc	7440-66-6	5	mg/kg	----	----	<5	----	----
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	----	----	<0.1	----	----
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls		0.10	mg/kg	----	----	<0.10	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	----	----	<0.05	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	----	----	<0.05	----	----
beta-BHC	319-85-7	0.05	mg/kg	----	----	<0.05	----	----
gamma-BHC	58-89-9	0.05	mg/kg	----	----	<0.05	----	----
delta-BHC	319-86-8	0.05	mg/kg	----	----	<0.05	----	----
Heptachlor	76-44-8	0.05	mg/kg	----	----	<0.05	----	----
Aldrin	309-00-2	0.05	mg/kg	----	----	<0.05	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	----	----	<0.05	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	----	----	<0.05	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	----	----	<0.05	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	----	----	<0.05	----	----
Dieldrin	60-57-1	0.05	mg/kg	----	----	<0.05	----	----
4.4'-DDE	72-55-9	0.05	mg/kg	----	----	<0.05	----	----
Endrin	72-20-8	0.05	mg/kg	----	----	<0.05	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	----	----	<0.05	----	----
4.4'-DDD	72-54-8	0.05	mg/kg	----	----	<0.05	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	----	----	<0.05	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	----	----	<0.05	----	----
4.4'-DDT	50-29-3	0.2	mg/kg	----	----	<0.2	----	----
Endrin ketone	53494-70-5	0.05	mg/kg	----	----	<0.05	----	----
Methoxychlor	72-43-5	0.2	mg/kg	----	----	<0.2	----	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	----	----	<0.05	----	----

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Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: TRIP SPIKE 1	TP01/1.0	TP01/1.5	TP01/3.0	DUP01
Sample Matrix Type / Description:				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time:				15 Aug 2006 15:00	15 Aug 2006 15:00	15 Aug 2006 15:00	15 Aug 2006 15:00	15 Aug 2006 15:00
Laboratory Sample ID:				ES0609995-009	ES0609995-011	ES0609995-012	ES0609995-013	ES0609995-014
EP068B: Organophosphorus Pesticides (OP)								
Demeton-S-methyl	919-86-8	0.05	mg/kg	----	----	<0.05	----	----
Monocrotophos	6923-22-4	0.2	mg/kg	----	----	<0.2	----	----
Dimethoate	60-51-5	0.05	mg/kg	----	----	<0.05	----	----
Diazinon	333-41-5	0.05	mg/kg	----	----	<0.05	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	----	----	<0.05	----	----
Parathion-methyl	298-00-0	0.2	mg/kg	----	----	<0.2	----	----
Malathion	121-75-5	0.05	mg/kg	----	----	<0.05	----	----
Fenthion	55-38-9	0.05	mg/kg	----	----	<0.05	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg	----	----	<0.05	----	----
Parathion	56-38-2	0.2	mg/kg	----	----	<0.2	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	----	----	<0.05	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg	----	----	<0.05	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg	----	----	<0.05	----	----
Fenamiphos	22224-92-6	0.05	mg/kg	----	----	<0.05	----	----
Prothiofos	34643-46-4	0.05	mg/kg	----	----	<0.05	----	----
Ethion	563-12-2	0.05	mg/kg	----	----	<0.05	----	----
Carbophenothion	786-19-6	0.05	mg/kg	----	----	<0.05	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg	----	----	<0.05	----	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	----	----	<0.5	----	----
2-Chlorophenol	95-57-8	0.5	mg/kg	----	----	<0.5	----	----
2-Methylphenol	95-48-7	0.5	mg/kg	----	----	<0.5	----	----
3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	----	----	<1.0	----	----
2-Nitrophenol	88-75-5	0.5	mg/kg	----	----	<0.5	----	----
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	----	----	<0.5	----	----
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	----	----	<0.5	----	----
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	----	----	<0.5	----	----
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	----	----	<0.5	----	----
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	----	----	<0.5	----	----
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	----	----	<0.5	----	----
Pentachlorophenol	87-86-5	2.0	mg/kg	----	----	<2.0	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	1.3
Acenaphthylene	208-96-8	0.5	mg/kg	----	<0.5	<0.5	<0.5	2.8
Acenaphthene	83-32-9	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	----	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	----	<0.5	<0.5	0.6	3.2

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: TRIP SPIKE 1	TP01/1.0	TP01/1.5	TP01/3.0	DUP01
Sample Matrix Type / Description:				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time:				15 Aug 2006 15:00	15 Aug 2006 15:00	15 Aug 2006 15:00	15 Aug 2006 15:00	15 Aug 2006 15:00
Laboratory Sample ID:				ES0609995-009	ES0609995-011	ES0609995-012	ES0609995-013	ES0609995-014
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Anthracene	120-12-7	0.5	mg/kg	----	<0.5	<0.5	<0.5	1.9
Fluoranthene	206-44-0	0.5	mg/kg	----	<0.5	<0.5	1.2	8.2
Pyrene	129-00-0	0.5	mg/kg	----	<0.5	<0.5	1.5	13.7
Benz(a)anthracene	56-55-3	0.5	mg/kg	----	<0.5	<0.5	0.7	6.4
Chrysene	218-01-9	0.5	mg/kg	----	<0.5	<0.5	0.6	6.9
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	----	<0.5	<0.5	<0.5	6.6
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	----	<0.5	<0.5	0.6	6.2
Benzo(a)pyrene	50-32-8	0.5	mg/kg	----	<0.5	<0.5	0.7	7.9
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	----	<0.5	<0.5	<0.5	5.3
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	----	<0.5	<0.5	<0.5	2.0
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	----	<0.5	<0.5	<0.5	8.4
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction		2	mg/kg	52	<2	<2	<2	<2
C10 - C14 Fraction		50	mg/kg	----	<50	<50	<50	<50
C15 - C28 Fraction		100	mg/kg	----	<100	<100	<100	480
C29 - C36 Fraction		100	mg/kg	----	<100	<100	<100	430
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	3.3	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.2	mg/kg	13.0	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	100-41-4	0.2	mg/kg	3.0	<0.2	<0.2	<0.2	<0.2
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	12.1	<0.2	<0.2	<0.2	0.2
ortho-Xylene	95-47-6	0.2	mg/kg	4.7	<0.2	<0.2	<0.2	<0.2
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	----	----	66.7	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE		0.1	%	----	----	89.1	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	----	----	82.8	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	----	73.5	72.0	76.3	78.4
2-Chlorophenol-D4	93951-73-6	0.1	%	----	77.2	79.1	79.7	82.4
2.4.6-Tribromophenol	118-79-6	0.1	%	----	74.3	70.8	76.5	82.1
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	----	76.6	83.0	78.9	81.2
Anthracene-d10	1719-06-8	0.1	%	----	79.3	85.2	82.8	84.0
4-Terphenyl-d14	1718-51-0	0.1	%	----	72.5	76.0	75.2	76.4

ALS Environmental

Analytical Results

				Client Sample ID :	TRIP SPIKE 1	TP01/1.0	TP01/1.5	TP01/3.0	DUP01
				Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Date / Time :	15 Aug 2006 15:00	15 Aug 2006 15:00	15 Aug 2006 15:00	15 Aug 2006 15:00	15 Aug 2006 15:00
				Laboratory Sample ID :	ES0609995-009	ES0609995-011	ES0609995-012	ES0609995-013	ES0609995-014
Analyte	*CAS number*	*LOR*	*Units*						
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		80.0	107	101	105	113
Toluene-D8	2037-26-5	0.1	%		98.8	91.1	88.0	92.7	98.1
4-Bromofluorobenzene	460-00-4	0.1	%		93.6	85.9	102	84.2	88.2

ALS Environmental

Analytical Results

				Client Sample ID :	TP02/1.0	TP02/3.0	TP02/4.5	TP03/0.5	TP03/1.0
				Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Date / Time :	15 Aug 2006 15:00	15 Aug 2006 15:00	15 Aug 2006 15:00	15 Aug 2006 15:00	15 Aug 2006 15:00
				Laboratory Sample ID :					
Analyte	*CAS number*	*LOR*	*Units*		ES0609995-017	ES0609995-018	ES0609995-019	ES0609995-021	ES0609995-022
EA055: Moisture Content									
Moisture Content (dried @ 103°C)		1.0	%		15.8	17.9	12.2	19.0	17.7
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		----	----	----	----	<5
Cadmium	7440-43-9	1	mg/kg		----	----	----	----	<1
Chromium	7440-47-3	2	mg/kg		----	----	----	----	6
Copper	7440-50-8	5	mg/kg		----	----	----	----	17
Lead	7439-92-1	5	mg/kg		----	----	----	----	30
Nickel	7440-02-0	2	mg/kg		----	----	----	----	25
Zinc	7440-66-6	5	mg/kg		----	----	----	----	161
EG035T: Total Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		----	----	----	----	0.1
EP066: Polychlorinated Biphenyls (PCB)									
Total Polychlorinated biphenyls		0.10	mg/kg		----	----	----	----	<0.10
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		----	----	----	----	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		----	----	----	----	<0.05
beta-BHC	319-85-7	0.05	mg/kg		----	----	----	----	<0.05
gamma-BHC	58-89-9	0.05	mg/kg		----	----	----	----	<0.05
delta-BHC	319-86-8	0.05	mg/kg		----	----	----	----	<0.05
Heptachlor	76-44-8	0.05	mg/kg		----	----	----	----	<0.05
Aldrin	309-00-2	0.05	mg/kg		----	----	----	----	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg		----	----	----	----	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg		----	----	----	----	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg		----	----	----	----	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg		----	----	----	----	<0.05
Dieldrin	60-57-1	0.05	mg/kg		----	----	----	----	<0.05
4.4'-DDE	72-55-9	0.05	mg/kg		----	----	----	----	<0.05
Endrin	72-20-8	0.05	mg/kg		----	----	----	----	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg		----	----	----	----	<0.05
4.4'-DDD	72-54-8	0.05	mg/kg		----	----	----	----	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg		----	----	----	----	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg		----	----	----	----	<0.05
4.4'-DDT	50-29-3	0.2	mg/kg		----	----	----	----	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg		----	----	----	----	<0.05
Methoxychlor	72-43-5	0.2	mg/kg		----	----	----	----	<0.2
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		----	----	----	----	<0.05

ALS Environmental

Analytical Results

Client Sample ID :	TP02/1.0	TP02/3.0	TP02/4.5	TP03/0.5	TP03/1.0
Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time :	15 Aug 2006 15:00	15 Aug 2006 15:00	15 Aug 2006 15:00	15 Aug 2006 15:00	15 Aug 2006 15:00
Laboratory Sample ID :	ES0609995-017	ES0609995-018	ES0609995-019	ES0609995-021	ES0609995-022

Analyte	CAS number	LOR	Units					
EP068B: Organophosphorus Pesticides (OP)								
Demeton-S-methyl	919-86-8	0.05	mg/kg	----	----	----	----	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg	----	----	----	----	<0.2
Dimethoate	60-51-5	0.05	mg/kg	----	----	----	----	<0.05
Diazinon	333-41-5	0.05	mg/kg	----	----	----	----	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	----	----	----	----	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg	----	----	----	----	<0.2
Malathion	121-75-5	0.05	mg/kg	----	----	----	----	<0.05
Fenthion	55-38-9	0.05	mg/kg	----	----	----	----	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg	----	----	----	----	<0.05
Parathion	56-38-2	0.2	mg/kg	----	----	----	----	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	----	----	----	----	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg	----	----	----	----	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg	----	----	----	----	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg	----	----	----	----	<0.05
Prothiofos	34643-46-4	0.05	mg/kg	----	----	----	----	<0.05
Ethion	563-12-2	0.05	mg/kg	----	----	----	----	<0.05
Carbophenothion	786-19-6	0.05	mg/kg	----	----	----	----	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg	----	----	----	----	<0.05
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	----	----	----	----	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	----	----	----	----	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	----	----	----	----	<0.5
3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	----	----	----	----	<1.0
2-Nitrophenol	88-75-5	0.5	mg/kg	----	----	----	----	<0.5
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	----	----	----	----	<0.5
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	----	----	----	----	<0.5
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	----	----	----	----	<0.5
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	----	----	----	----	<0.5
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	----	----	----	----	<0.5
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	----	----	----	----	<0.5
Pentachlorophenol	87-86-5	2.0	mg/kg	----	----	----	----	<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

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: TP02/1.0	TP02/3.0	TP02/4.5	TP03/0.5	TP03/1.0
Sample Matrix Type / Description:				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time:				15 Aug 2006 15:00	15 Aug 2006 15:00	15 Aug 2006 15:00	15 Aug 2006 15:00	15 Aug 2006 15:00
Laboratory Sample ID:				ES0609995-017	ES0609995-018	ES0609995-019	ES0609995-021	ES0609995-022
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	0.6	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	0.6	<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	108-38-3 106-42-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	----	----	----	----	76.3
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE		0.1	%	----	----	----	----	100
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	----	----	----	----	92.8
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	76.5	78.8	79.2	96.2	71.0
2-Chlorophenol-D4	93951-73-6	0.1	%	80.4	87.5	89.2	106	80.1
2.4.6-Tribromophenol	118-79-6	0.1	%	76.5	75.9	78.4	104	72.0
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	79.2	91.3	91.6	110	83.0
Anthracene-d10	1719-06-8	0.1	%	81.3	92.4	93.8	111	84.8
4-Terphenyl-d14	1718-51-0	0.1	%	74.2	80.5	82.2	101	76.0

ALS Environmental

Analytical Results

				Client Sample ID :	TP02/1.0	TP02/3.0	TP02/4.5	TP03/0.5	TP03/1.0
				Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Date / Time :	15 Aug 2006 15:00	15 Aug 2006 15:00	15 Aug 2006 15:00	15 Aug 2006 15:00	15 Aug 2006 15:00
				Laboratory Sample ID :					
Analyte	*CAS number*	*LOR*	*Units*		ES0609995-017	ES0609995-018	ES0609995-019	ES0609995-021	ES0609995-022
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		109	105	98.2	93.0	86.2
Toluene-D8	2037-26-5	0.1	%		94.8	90.7	116	85.4	97.8
4-Bromofluorobenzene	460-00-4	0.1	%		84.9	81.6	118	100	105

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: TP03/2.0	TP03/4.0	DUP02	TS CONTROL 1
Sample Matrix Type / Description:				SOIL	SOIL	SOIL	SOIL
Sample Date / Time:				15 Aug 2006 15:00	15 Aug 2006 15:00	15 Aug 2006 15:00	15 Aug 2006 15:00
Laboratory Sample ID:				ES0609995-023	ES0609995-024	ES0609995-025	ES0609995-026
EA055: Moisture Content							
Moisture Content (dried @ 103°C)		1.0	%	27.3	16.6	17.2	4.3
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<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	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	----
EP080/071: Total Petroleum Hydrocarbons							
C6 - C9 Fraction		2	mg/kg	<2	<2	<2	65
C10 - C14 Fraction		50	mg/kg	<50	<50	<50	----
C15 - C28 Fraction		100	mg/kg	<100	<100	<100	----
C29 - C36 Fraction		100	mg/kg	<100	<100	<100	----
EP080: BTEX							
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	3.1
Toluene	108-88-3	0.2	mg/kg	<0.2	<0.2	<0.2	15.6
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	<0.2	<0.2	3.2
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	<0.2	<0.2	13.8
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	<0.2	5.0
EP075(SIM)S: Phenolic Compound Surrogates							
Phenol-d6	13127-88-3	0.1	%	76.5	75.1	77.2	----
2-Chlorophenol-D4	93951-73-6	0.1	%	84.1	85.0	85.3	----
2.4.6-Tribromophenol	118-79-6	0.1	%	79.2	78.8	78.9	----
EP075(SIM)T: PAH Surrogates							
2-Fluorobiphenyl	321-60-8	0.1	%	83.9	87.1	88.3	----
Anthracene-d10	1719-06-8	0.1	%	87.0	85.5	90.2	----

ALS Environmental

Analytical Results

				Client Sample ID :	TP03/2.0	TP03/4.0	DUP02	TS CONTROL 1	
				Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	
				Sample Date / Time :	15 Aug 2006 15:00	15 Aug 2006 15:00	15 Aug 2006 15:00	15 Aug 2006 15:00	
				Laboratory Sample ID :					
Analyte	*CAS number*	*LOR*	*Units*		ES0609995-023	ES0609995-024	ES0609995-025	ES0609995-026	
EP075(SIM)T: PAH Surrogates									
4-Terphenyl-d14	1718-51-0	0.1	%		79.0	78.9	81.4	----	
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		101	87.2	92.7	89.2	
Toluene-D8	2037-26-5	0.1	%		98.4	92.7	93.0	104	
4-Bromofluorobenzene	460-00-4	0.1	%		107	104	101	113	

ALS Environmental

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 GCMS			
EP068S: Organochlorine Pesticide Surrogate	Dibromo-DDE	10	136
EP068T: Organophosphorus Pesticide Surrogate	DEF	10	136
EP075(SIM): PAH/Phenols (SIM)			
EP075(SIM)S: Phenolic Compound Surrogates	Phenol-d6	24	113
	2-Chlorophenol-D4	23	134
	2,4,6-Tribromophenol	19	122
EP075(SIM)T: PAH Surrogates	2-Fluorobiphenyl	30	115
	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

CH2MHILL ACN 050 070 892

CHAIN OF CUSTODY RECORD

Level 7, 9 Help Street, Chatswood, NSW 2067 Australia Tel (61 2) 9950 0200 Fax (61 2) 9950 0600

Laboratory Quotation # HOLD

1/3 COC

COC # [redacted]

Project # 347496	~~Purchase Order #~~ SY/148/06
Project Name: Macdonaldtown Gasworks	
Company Name: ALS	
Project Manager or Contact & Phone #: Adam Sullivan 0400 500 264	Report Copy to: →
Requested Completion Date: standard TAT	Site ID: Macdonaldtown
Sample Disposal: Dispose ☑ Return ☐	

TOTAL # OF CONTAINERS

Requested Analytical Method #

Sampling Date	Sampling Time	Type	Matrix	CLIENT SAMPLE ID (9 CHARACTERS)	LAB QC	Asbestos	[redacted]	S-7	S-19	S-2	S-4	S-12	S-14A	EK026
15/8/06			Soil ✓	MG01/0.1	(1)	X		X						
				MG01/0.2	(2)	X								
				MG01/0.5	(3)			X						
				MG01/1.4	27		X							
				MG01/1.8	(4)		[redacted]	X						X
				MG01/2.2	28		X	[redacted]						
				MG01/2.8	(5)		[redacted]	X						
				MG01/3.2	29		X							
				MG01/3.6	30		X							
				MG01/5	(6)			X						
				QC01	(7)			X						
				MG01/Gas Pipe	31		X							[redacted]

CONTRACT WORK

WO: .....

LAB: ASET Asbestos

DATE: 15/8/06

SPLIT: .....

QA REQUIREMENTS		
Matrix Spike	☐ Yes	☐ No
Matrix Duplicate	☐ Yes	☐ No
Laboratory Duplicate	☐ Yes	☐ No
Lab Blank	☐ Yes	☐ No
Surrogate Spike	☐ Yes	☐ No
RPDs	☐ Yes	☐ No
Spike Recovery Data	☐ Yes	☐ No

LAB USE ONLY		
Custody Seals	☐ Yes	☐ No
ICE	☐ Yes	☐ No

Comments	Lab ID

ALS Environmental
Sydney
Work Order
ES0609995

Report Version: WOLabel 1.01

Telephone : 61-2-87848555

Sampled By and Title: R. Bell (Please sign and print name)	Date/Time 15/8/06	Relinquished By (Please sign and print name)	Date/Time
Received by: IDS (Please sign and print name)	Date/Time 15/8/06	Relinquished By (Please sign and print name)	Date/Time
Received by: Joy Stephens ALS (Please sign and print name) 5:20pm	Date/Time 15/8/6	Shipped Via	Shipping #

Special Instructions:

DISTRIBUTION: Original - LAB, Yellow - LAB, Pink - CH2MHILL

Laboratory Quotation #

2/3 COC

CH2MHILL ACN 050 070 892

CHAIN OF CUSTODY RECORD

Level 7, 9 Help Street, Chatswood, NSW 2067 Australia Tel (61 2) 9950 0200 Fax (61 2) 9950 0600

COC # [redacted]

Project # 347496	**~~Purchase Order #~~** SY/148/06
Project Name Macdonaldtown Gasworks	
Company Name ALS	
Project Manager or Contact & Phone # Adam Sullivan 0400 500 264	**Report Copy to:** →
Requested Completion Date: standard TAT	**Site ID** Macdonaldtown
Sample Disposal: Dispose ☑ Return ☐	

Sampling Date	Sampling Time	Type	Matrix: Soil	CLIENT SAMPLE ID (9 CHARACTERS)	LAB QC	TOTAL # OF CONTAINERS	Asbestos	S-7	S-19	S-2	S-4	S-12	S-14A	EK026	HOLD
				Requested Analytical Method #											
				Preservative											
15/8/06				TRIPBLANK	(1) (8)						X				
				Trip Spike (1)	(9)						X				
				TP01/0.25	(10)		X	X							
				TP01/1.0	(11)			X							
				TP01/1.5	(12)				X					X	analyse as per attached email 17/8/06
				TP01/2.0	32										
				TP01/3.0	(13)			X							
				DUP01	(14)			X							
				TP02/0.25	(15)		X		X					X	
				TP02/0.5	(16)			X							
				TP02/1.0	(17)			X							
not Received →				TP02/1.5	5										

QA REQUIREMENTS

Matrix Spike	☐ Yes	☐ No
Matrix Duplicate	☐ Yes	☐ No
Laboratory Duplicate	☐ Yes	☐ No
Lab Blank	☐ Yes	☐ No
Surrogate Spike	☐ Yes	☐ No
RPDs	☐ Yes	☐ No
Spike Recovery Data	☐ Yes	☐ No

LAB USE ONLY

Custody Seals	☐ Yes	☐ No
ICE	☐ Yes	☐ No

Comments	Lab ID

Sampled By and Title	(Please sign and print name)	**Date/Time** 15/8/06	**Relinquished By** (Please sign and print name) / **Date/Time**
Received by	(Please sign and print name)	**Date/Time** 15/8/06	**Relinquished By** (Please sign and print name) / **Date/Time**
Received by Sonja Upho AUS-SYD	(Please sign and print name)	**Date/Time** 15/8/06	**Shipped Via** / **Shipping #**

Special Instructions:

DISTRIBUTION: Original - LAB, Yellow - LAB, Pink - CH2MHILL

Laboratory Quotation #

3/3 COC

CH2MHILL ACN 050 070 892

CHAIN OF CUSTODY RECORD

Level 7, 9 Help Street, Chatswood, NSW 2067 Australia Tel (61 2) 9950 0200 Fax (61 2) 9950 0600

COC # [redacted]

Project # 347496	**~~Purchase Order #~~** SY/148/06
Project Name Macdonaldtown Geasworks	
Company Name ALS	
Project Manager or Contact & Phone # Adam Sullivan 0400 500 264	**Report Copy to:** →
Requested Completion Date: standard TAT	**Site ID** Macdonaldtown
Sample Disposal: Dispose ☑ Return ☐	

Sampling Date	Sampling Time	Type	Matrix (Soil)	CLIENT SAMPLE ID (9 CHARACTERS)	LAB QC	TOTAL # OF CONTAINERS	Asbestos	S-7	S-19	S-2	S-4	S-12	S-14A	EK026 LL	HOLD	Comments	Lab ID
				Requested Analytical Method #													
				Preservative													
15/8/06			✓	TP02/2.0	33												
				TP02/3.0	(18)			X									
				TP02/4.0	34												
				TP02/4.5	(19)			X									
				TP03/0.25	(20)		X	X									
				TP03/0.5	(21)			X									
				TP03/1.0	(22)				X						X	analyse as per attached email 17/8/06 ✓	
				TP03/1.5	35												
				TP03/2.0	(23)			X									
				TP03/3.0	36												
			✓	TP03/4.0	(24)			X									
				DUP02	(25)			X									

QA REQUIREMENTS

Matrix Spike	☐ Yes	☐ No
Matrix Duplicate	☐ Yes	☐ No
Laboratory Duplicate	☐ Yes	☐ No
Lab Blank	☐ Yes	☐ No
Surrogate Spike	☐ Yes	☐ No
RPDs	☐ Yes	☐ No
Spike Recovery Data	☐ Yes	☐ No

LAB USE ONLY

Custody Seals	☐ Yes	☐ No
ICE	☐ Yes	☐ No

Sampled By and Title	(Please sign and print name)	Date/Time	Relinquished By	(Please sign and print name)	Date/Time
	C. Sullivan	15/8/06			
Received by	(Please sign and print name)	Date/Time	**Relinquished By**	(Please sign and print name)	Date/Time
		15/8/06			
Received by Sophy	(Please sign and print name) Mrs 5.20pm	Date/Time 15/8/6.	**Shipped Via**	**Shipping #**	

Special Instructions:

24 TS - Control ① 11/8/6.

DISTRIBUTION: Original - LAB, Yellow - LAB, Pink - CH2MHILL

Margaret Valencic

From: Adam.Sullivan@ch2m.com.au
Sent: Wednesday, 16 August 2006 8:50 PM
To: Margaret Valencic
Subject: RE: COC for ALS Work Order ES0609995, Macdonaldtown Gasworks

Thanks Margaret

I could not find the missing sample on site, so please remove from the COC.

Also, please schedule TP01/1.5; TP02/0.25 and TP03/1.0 for an S-19 analysis and remove the HOLD status.

Regards

Adam

From: Margaret Valencic [mailto:Margaret.Valencic@als.com.au]
Sent: Wed 16/08/2006 9:12 AM
To: Sullivan, Adam /SYD
Subject: COC for ALS Work Order ES0609995, Macdonaldtown Gasworks

Adam,

Please find attached COC for work order ES0609995, as discussed.

We did not receive sample TP02/1.5 on the second page of COC.

<<es0609995_coc.pdf>>

Regards

Margaret Valencic
Administration Supervisor

ALS Laboratory Group
Sydney, Australia
Phone: +61 2 8784 8555
Direct: +61 2 8784 8510
Fax: +61 2 8784 8566
www.alsenviro.com

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ALS Environmental

QUALITY CONTROL REPORT

Client	:	**CH2M HILL PTY LTD**	**Laboratory**	:	ALS Environmental Sydney	**Page**	: **1 of 33**
Contact	:	MR ADAM SULLIVAN	**Contact**	:	Greg Vogel		
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	**Address**	:	277-289 Woodpark Road Smithfield NSW Australia 2164	**Work order**	: **ES0609995**
						Amendment No.	:
Project	:	347496 McDonaldtown Gasworks	**Quote number**	:	----	**Date received**	: 15 Aug 2006
Order number	:	- Not provided -				**Date issued**	: 23 Aug 2006
C-O-C number	:	- Not provided -					
Site	:	MCDONALD TOWN					
E-mail	:	adam.sullivan@ch2m.com.au	**E-mail**	:	Greg.Vogel@alsenviro.com	**No. of samples**	
Telephone	:	02 9950 0200	**Telephone**	:	+61 (02) 8784 8555	**Received**	: 36
Facsimile	:	02 9950 0600	**Facsimile**	:	+61 (02) 8784 8500	**Analysed**	: 19

This final report for the ALSE work order reference ES0609995 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

EP080:- The trip spike has been analysed for volatile TPH and BTEX only. The trip spike prepared in the lab using reagent grade sand spiked with petrol. The spike was dispatched from the lab.

ALSE - Excellence in Analytical Testing

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Accredited for compliance with ISO/IED 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	Department
Celine Conceicao	Inorganics - NATA 825 (10911 - Sydney)
Greg Vogel	Inorganics - NATA 825 (10911 - Sydney)
Greg Vogel	Organics - NATA 825 (10911 - Sydney)
Phyu Phyu Lwin	Inorganics - NATA 825 (10911 - Sydney)
Rassem Ayoubi	Organics - NATA 825 (10911 - Sydney)
Sarah Millington	Inorganics - NATA 825 (10911 - Sydney)

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						
EA055: Moisture Content - (QC Lot: 259647)				**%**	**%**	**%**
ES0609994-012	Anonymous	Moisture Content (dried @ 103°C)	1.0 %	14.2	14.8	4.6
ES0609994-021	Anonymous	Moisture Content (dried @ 103°C)	1.0 %	18.6	19.7	5.8
EA055: Moisture Content - (QC Lot: 259648)				**%**	**%**	**%**
ES0609995-014	DUP01	Moisture Content (dried @ 103°C)	1.0 %	13.4	13.5	0.0
ES0610045-001	Anonymous	Moisture Content (dried @ 103°C)	1.0 %	16.7	19.2	14.1
EA055: Moisture Content - (QC Lot: 260057)				**%**	**%**	**%**
ES0609995-018	TP02/3.0	Moisture Content (dried @ 103°C)	1.0 %	17.9	18.0	0.0
ES0610110-001	Anonymous	Moisture Content (dried @ 103°C)	1.0 %	18.4	19.1	3.8
EG005T: Total Metals by ICP-AES						
EG005T: Total Metals by ICP-AES - (QC Lot: 259074)				**mg/kg**	**mg/kg**	**%**
ES0609934-001	Anonymous	Arsenic	5 mg/kg	<5	16	103
		Cadmium	1 mg/kg	<1	<1	0.0
		Chromium	2 mg/kg	11	13	17.2
		Copper	5 mg/kg	49	49	0.0
		Lead	5 mg/kg	48	51	5.7
		Nickel	2 mg/kg	12	15	20.0
		Zinc	5 mg/kg	234	269	14.0
ES0610045-006	Anonymous	Arsenic	5 mg/kg	10	9	0.0
		Cadmium	1 mg/kg	2	2	0.0
		Chromium	2 mg/kg	3	3	0.0
		Copper	5 mg/kg	16	18	9.5
		Lead	5 mg/kg	85	90	5.8
		Nickel	2 mg/kg	<2	<2	0.0
		Zinc	5 mg/kg	244	236	3.3
EG035T: Total Mercury by FIMS						

Matrix Type: SOIL

Laboratory Duplicates (DUP) Report

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: 259075)				mg/kg	mg/kg	%
ES0609934-001	Anonymous	Mercury	0.1 mg/kg	<0.1	<0.1	0.0
ES0610045-006	Anonymous	Mercury	0.1 mg/kg	<0.1	<0.1	0.0
EK025G: Free cyanide by Discrete Analyser						
EK025G: Free cyanide by Discrete Analyser - (QC Lot: 258135)				mg/kg	mg/kg	%
ES0609932-001	Anonymous	Total Cyanide	1.0 mg/kg	<1.0	<1.0	0.0
EP066: Polychlorinated Biphenyls (PCB)						
EP066: Polychlorinated Biphenyls (PCB) - (QC Lot: 257741)				mg/kg	mg/kg	%
ES0609911-001	Anonymous	Total Polychlorinated biphenyls	0.10 mg/kg	<5.00	<5.00	0.0
ES0609980-054	Anonymous	Total Polychlorinated biphenyls	0.10 mg/kg	<0.10	<0.10	0.0
EP066: Polychlorinated Biphenyls (PCB) - (QC Lot: 258331)				mg/kg	mg/kg	%
ES0609995-015	TP02/0.25	Total Polychlorinated biphenyls	0.10 mg/kg	----	<0.10	
EP068A: Organochlorine Pesticides (OC)						
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 257739)				mg/kg	mg/kg	%
ES0609911-001	Anonymous	alpha-BHC	0.05 mg/kg	<0.25	<0.25	0.0
		Hexachlorobenzene (HCB)	0.05 mg/kg	<0.25	<0.25	0.0
		beta-BHC	0.05 mg/kg	<0.25	<0.25	0.0
		gamma-BHC	0.05 mg/kg	<0.25	<0.25	0.0
		delta-BHC	0.05 mg/kg	<0.25	<0.25	0.0
		Heptachlor	0.05 mg/kg	<0.25	<0.25	0.0
		Aldrin	0.05 mg/kg	<0.25	<0.25	0.0
		Heptachlor epoxide	0.05 mg/kg	<0.25	<0.25	0.0
		trans-Chlordane	0.05 mg/kg	<0.25	<0.25	0.0
		alpha-Endosulfan	0.05 mg/kg	<0.25	<0.25	0.0
		cis-Chlordane	0.05 mg/kg	<0.25	<0.25	0.0
		Dieldrin	0.05 mg/kg	<0.25	<0.25	0.0
		4,4'-DDE	0.05 mg/kg	<0.25	<0.25	0.0
		Endrin	0.05 mg/kg	<0.25	<0.25	0.0
		beta-Endosulfan	0.05 mg/kg	<0.25	<0.25	0.0
		4,4'-DDD	0.05 mg/kg	<0.25	<0.25	0.0

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) - continued						
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 257739) - continued				mg/kg	mg/kg	%
ES0609911-001	Anonymous	Endrin aldehyde	0.05 mg/kg	<0.25	<0.25	0.0
		Endosulfan sulfate	0.05 mg/kg	<0.25	<0.25	0.0
		4,4'-DDT	0.2 mg/kg	<0.2	<0.2	0.0
		Endrin ketone	0.05 mg/kg	<0.25	<0.25	0.0
		Methoxychlor	0.2 mg/kg	<0.2	<0.2	0.0
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 258329)				mg/kg	mg/kg	%
ES0609995-015	TP02/0.25	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
ES0610058-001	Anonymous	alpha-BHC	0.05 mg/kg	<0.12	<0.12	0.0
		Hexachlorobenzene (HCB)	0.05 mg/kg	<0.12	<0.12	0.0

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) - continued						
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 258329) - continued				mg/kg	mg/kg	%
ES0610058-001	Anonymous	beta-BHC	0.05 mg/kg	<0.12	<0.12	0.0
		gamma-BHC	0.05 mg/kg	<0.12	<0.12	0.0
		delta-BHC	0.05 mg/kg	<0.12	<0.12	0.0
		Heptachlor	0.05 mg/kg	<0.12	<0.12	0.0
		Aldrin	0.05 mg/kg	<0.12	<0.12	0.0
		Heptachlor epoxide	0.05 mg/kg	0.33	0.30	9.0
		trans-Chlordane	0.05 mg/kg	2.00	1.77	12.0
		alpha-Endosulfan	0.05 mg/kg	0.59	0.53	11.2
		cis-Chlordane	0.05 mg/kg	1.59	1.42	11.1
		Dieldrin	0.05 mg/kg	<0.12	<0.12	0.0
		4,4'-DDE	0.05 mg/kg	<0.12	<0.12	0.0
		Endrin	0.05 mg/kg	<0.12	<0.12	0.0
		beta-Endosulfan	0.05 mg/kg	<0.12	<0.12	0.0
		4,4'-DDD	0.05 mg/kg	<0.12	<0.12	0.0
		Endrin aldehyde	0.05 mg/kg	<0.12	<0.12	0.0
		Endosulfan sulfate	0.05 mg/kg	<0.12	<0.12	0.0
		4,4'-DDT	0.2 mg/kg	<0.2	<0.2	0.0
		Endrin ketone	0.05 mg/kg	<0.12	<0.12	0.0
		Methoxychlor	0.2 mg/kg	<0.2	<0.2	0.0
EP068B: Organophosphorus Pesticides (OP)						
EP068B: Organophosphorus Pesticides (OP) - (QC Lot: 257739)				mg/kg	mg/kg	%
ES0609911-001	Anonymous	Dichlorvos	0.05 mg/kg	<0.25	<0.25	0.0
		Demeton-S-methyl	0.05 mg/kg	<0.25	<0.25	0.0
		Monocrotophos	0.2 mg/kg	<0.2	<0.2	0.0
		Dimethoate	0.05 mg/kg	<0.25	<0.25	0.0
		Diazinon	0.05 mg/kg	<0.25	<0.25	0.0
		Chlorpyrifos-methyl	0.05 mg/kg	<0.25	<0.25	0.0
		Parathion-methyl	0.2 mg/kg	<0.2	<0.2	0.0
		Malathion	0.05 mg/kg	<0.25	<0.25	0.0

Matrix Type: SOIL

Laboratory Duplicates (DUP) Report

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: 257739) - continued				mg/kg	mg/kg	%
ES0609911-001	Anonymous	Fenthion	0.05 mg/kg	<0.25	<0.25	0.0
		Chlorpyrifos	0.05 mg/kg	3.08	2.24	31.4
		Parathion	0.2 mg/kg	<0.2	<0.2	0.0
		Pirimphos-ethyl	0.05 mg/kg	<0.25	<0.25	0.0
		Chlorfenvinphos	0.05 mg/kg	<0.25	<0.25	0.0
		Bromophos-ethyl	0.05 mg/kg	<0.25	<0.25	0.0
		Fenamiphos	0.05 mg/kg	0.44	0.32	32.4
		Prothiofos	0.05 mg/kg	0.53	0.37	34.4
		Ethion	0.05 mg/kg	<0.25	<0.25	0.0
		Carbophenothion	0.05 mg/kg	<0.25	<0.25	0.0
		Methyl Azinphos	0.05 mg/kg	<0.25	<0.25	0.0
EP068B: Organophosphorus Pesticides (OP) - (QC Lot: 258329)				mg/kg	mg/kg	%
ES0609995-015	TP02/0.25	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
		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

Matrix Type: SOIL

Laboratory Duplicates (DUP) Report

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: 258329) - continued				mg/kg	mg/kg	%
ES0609995-015	TP02/0.25	Carbophenothion	0.05 mg/kg	<0.05	<0.05	0.0
		Methyl Azinphos	0.05 mg/kg	<0.05	<0.05	0.0
ES0610058-001	Anonymous	Dichlorvos	0.05 mg/kg	<0.12	<0.12	0.0
		Demeton-S-methyl	0.05 mg/kg	<0.12	<0.12	0.0
		Monocrotophos	0.2 mg/kg	<0.2	<0.2	0.0
		Dimethoate	0.05 mg/kg	<0.12	<0.12	0.0
		Diazinon	0.05 mg/kg	<0.12	<0.12	0.0
		Chlorpyrifos-methyl	0.05 mg/kg	<0.12	<0.12	0.0
		Parathion-methyl	0.2 mg/kg	<0.2	<0.2	0.0
		Malathion	0.05 mg/kg	<0.12	<0.12	0.0
		Fenthion	0.05 mg/kg	<0.12	<0.12	0.0
		Chlorpyrifos	0.05 mg/kg	<0.12	<0.12	0.0
		Parathion	0.2 mg/kg	<0.2	<0.2	0.0
		Pirimphos-ethyl	0.05 mg/kg	<0.12	<0.12	0.0
		Chlorfenvinphos	0.05 mg/kg	<0.12	<0.12	0.0
		Bromophos-ethyl	0.05 mg/kg	<0.12	<0.12	0.0
		Fenamiphos	0.05 mg/kg	<0.12	<0.12	0.0
		Prothiofos	0.05 mg/kg	<0.12	<0.12	0.0
		Ethion	0.05 mg/kg	<0.12	<0.12	0.0
		Carbophenothion	0.05 mg/kg	<0.12	<0.12	0.0
		Methyl Azinphos	0.05 mg/kg	<0.12	<0.12	0.0
EP075(SIM)A: Phenolic Compounds						
EP075(SIM)A: Phenolic Compounds - (QC Lot: 258165)				mg/kg	mg/kg	%
ES0609994-017	Anonymous	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

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: 258165) - continued				mg/kg	mg/kg	%
ES0609994-017	Anonymous	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
ES0609995-006	MG01/5	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
EP075(SIM)A: Phenolic Compounds - (QC Lot: 258167)				mg/kg	mg/kg	%
ES0609995-018	TP02/3.0	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

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: 258167) - continued				mg/kg	mg/kg	%
ES0609995-018	TP02/3.0	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
ES0609995-024	TP03/4.0	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
EP075(SIM)A: Phenolic Compounds - (QC Lot: 258765)				mg/kg	mg/kg	%
ES0609995-012	TP01/1.5	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
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 258165)				mg/kg	mg/kg	%

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: 258165) - continued				mg/kg	mg/kg	%
ES0609994-017	Anonymous	Naphthalene	0.5 mg/kg	13.1	16.7	24.5
		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	1.0	1.3	25.5
		Anthracene	0.5 mg/kg	<0.5	<0.5	0.0
		Fluoranthene	0.5 mg/kg	0.6	0.8	28.4
		Pyrene	0.5 mg/kg	0.6	0.8	29.6
		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
ES0609995-006	MG01/5	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
		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

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: 258165) - continued				mg/kg	mg/kg	%
ES0609995-006	MG01/5	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
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 258167)				mg/kg	mg/kg	%
ES0609995-018	TP02/3.0	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
		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
ES0609995-024	TP03/4.0	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
		Benz(a)anthracene	0.5 mg/kg	<0.5	<0.5	0.0

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: 258167) - continued				mg/kg	mg/kg	%
ES0609995-024	TP03/4.0	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
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 258765)				mg/kg	mg/kg	%
ES0609995-012	TP01/1.5	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
		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: 258048)				mg/kg	mg/kg	%
ES0609995-001	MG01/0.1	C6 - C9 Fraction	2 mg/kg	<2	<2	0.0
ES0609995-010	TP01/0.25	C6 - C9 Fraction	2 mg/kg	<2	<2	0.0
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 258164)				mg/kg	mg/kg	%

Matrix Type: SOIL

Laboratory Duplicates (DUP) Report

Laboratory Sample ID	Client Sample ID	Analyte name	LOR	Original Result	Duplicate Result	RPD
EP080/071: Total Petroleum Hydrocarbons - continued						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 258164) - continued				mg/kg	mg/kg	%
ES0609994-017	Anonymous	C10 - C14 Fraction	50 mg/kg	330	390	16.8
		C15 - C28 Fraction	100 mg/kg	<100	<100	0.0
		C29 - C36 Fraction	100 mg/kg	<100	<100	0.0
ES0609995-006	MG01/5	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
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 258166)				mg/kg	mg/kg	%
ES0609995-018	TP02/3.0	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
ES0609995-024	TP03/4.0	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
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 258604)				mg/kg	mg/kg	%
ES0609995-012	TP01/1.5	C6 - C9 Fraction	2 mg/kg	<2	<2	0.0
ES0610045-007	Anonymous	C6 - C9 Fraction	2 mg/kg	<2	<2	0.0
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 258766)				mg/kg	mg/kg	%
ES0609995-012	TP01/1.5	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: 258048)				mg/kg	mg/kg	%
ES0609995-001	MG01/0.1	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
ES0609995-010	TP01/0.25	Benzene	0.2 mg/kg	<0.2	<0.2	0.0
		Toluene	0.2 mg/kg	<0.2	<0.2	0.0

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: 258048) - continued				mg/kg	mg/kg	%
ES0609995-010	TP01/0.25	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
EP080: BTEX - (QC Lot: 258604)				mg/kg	mg/kg	%
ES0609995-012	TP01/1.5	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
ES0610045-007	Anonymous	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

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.

Matrix Type: SOIL

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*
EG005T: Total Metals by ICP-AES						
EG005T: Total Metals by ICP-AES - (QC Lot: 259074)		mg/kg	mg/kg	%	%	%
Arsenic	5 mg/kg	----	13.1	89.5	86.6	123
	5 mg/kg	<5	----	----	----	----
Cadmium	1 mg/kg	<1	----	----	----	----
	1 mg/kg	----	2.76	101	79.9	120
Chromium	2 mg/kg	----	60.9	104	87.1	119
	2 mg/kg	<2	----	----	----	----
Copper	5 mg/kg	<5	----	----	----	----
	5 mg/kg	----	54.7	103	85.2	117
Lead	5 mg/kg	----	55.2	102	82.1	117
	5 mg/kg	<5	----	----	----	----
Nickel	2 mg/kg	----	54.8	108	88	122
	2 mg/kg	<2	----	----	----	----
Zinc	5 mg/kg	<5	----	----	----	----
	5 mg/kg	----	104	102	79	116
EG035T: Total Mercury by FIMS						
EG035T: Total Mercury by FIMS - (QC Lot: 259075)		mg/kg	mg/kg	%	%	%
Mercury	0.1 mg/kg	<0.1	----	----	----	----
	0.1 mg/kg	----	1.4	81.4	73.7	108
EK025G: Free cyanide by Discrete Analyser						
EK025G: Free cyanide by Discrete Analyser - (QC Lot: 258135)		mg/kg	mg/kg	%	%	%
Total Cyanide	1.0 mg/kg	<1.0	----	----	----	----
	1 mg/kg	----	50	98.3	70	130
EP066: Polychlorinated Biphenyls (PCB)						
EP066: Polychlorinated Biphenyls (PCB) - (QC Lot: 257741)		mg/kg	mg/kg	%	%	%

Matrix Type: SOIL

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP066: Polychlorinated Biphenyls (PCB) - continued						
EP066: Polychlorinated Biphenyls (PCB) - (QC Lot: 257741) - continued		mg/kg	mg/kg	%	%	%
Total Polychlorinated biphenyls	0.1 mg/kg	----	0.5	97.9	57.4	117
	0.10 mg/kg	<0.10	----	----	----	----
EP066: Polychlorinated Biphenyls (PCB) - (QC Lot: 258331)		mg/kg	mg/kg	%	%	%
Total Polychlorinated biphenyls	0.10 mg/kg	<0.10	----	----	----	----
	0.1 mg/kg	----	0.5	85.6	57.4	117
EP068A: Organochlorine Pesticides (OC)						
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 257739)		mg/kg	mg/kg	%	%	%
4,4'-DDD	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	108	65.3	116
4,4'-DDE	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	102	67.5	114
4,4'-DDT	0.2 mg/kg	----	0.25	101	58.4	127
	0.2 mg/kg	<0.2	----	----	----	----
Aldrin	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	103	67	113
alpha-BHC	0.05 mg/kg	----	0.25	101	60.8	116
	0.05 mg/kg	<0.05	----	----	----	----
alpha-Endosulfan	0.05 mg/kg	----	0.25	98.2	65.8	116
	0.05 mg/kg	<0.05	----	----	----	----
beta-BHC	0.05 mg/kg	----	0.25	111	59.8	117
	0.05 mg/kg	<0.05	----	----	----	----
beta-Endosulfan	0.05 mg/kg	----	0.25	105	66.1	117
	0.05 mg/kg	<0.05	----	----	----	----
cis-Chlordane	0.05 mg/kg	----	0.25	97.6	57.3	120
	0.05 mg/kg	<0.05	----	----	----	----
delta-BHC	0.05 mg/kg	----	0.25	105	65.8	114
	0.05 mg/kg	<0.05	----	----	----	----
Dieldrin	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	104	67.4	116

Matrix Type: SOIL

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP068A: Organochlorine Pesticides (OC) - continued						
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 257739) - continued		mg/kg	mg/kg	%	%	%
Endosulfan sulfate	0.05 mg/kg	----	0.25	96.0	63.6	119
	0.05 mg/kg	<0.05	----	----	----	----
Endrin	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	106	63	121
Endrin aldehyde	0.05 mg/kg	----	0.25	109	57.3	115
	0.05 mg/kg	<0.05	----	----	----	----
Endrin ketone	0.05 mg/kg	----	0.25	112	63.6	117
	0.05 mg/kg	<0.05	----	----	----	----
gamma-BHC	0.05 mg/kg	----	0.25	107	59.8	118
	0.05 mg/kg	<0.05	----	----	----	----
Heptachlor	0.05 mg/kg	----	0.25	101	65.6	115
	0.05 mg/kg	<0.05	----	----	----	----
Heptachlor epoxide	0.05 mg/kg	----	0.25	108	65.6	113
	0.05 mg/kg	<0.05	----	----	----	----
Hexachlorobenzene (HCB)	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	89.4	59.4	115
Methoxychlor	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	0.25	101	50.4	132
trans-Chlordane	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	90.6	60.7	113
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 258329)		mg/kg	mg/kg	%	%	%
4,4'-DDD	0.05 mg/kg	----	0.25	89.6	65.3	116
	0.05 mg/kg	<0.05	----	----	----	----
4,4'-DDE	0.05 mg/kg	----	0.25	86.6	67.5	114
	0.05 mg/kg	<0.05	----	----	----	----
4,4'-DDT	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	0.25	90.0	58.4	127
Aldrin	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	85.6	67	113

Matrix Type: SOIL

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP068A: Organochlorine Pesticides (OC) - continued						
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 258329) - continued		mg/kg	mg/kg	%	%	%
alpha-BHC	0.05 mg/kg	----	0.25	87.0	60.8	116
	0.05 mg/kg	<0.05	----	----	----	----
alpha-Endosulfan	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	81.8	65.8	116
beta-BHC	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	89.8	59.8	117
beta-Endosulfan	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	85.0	66.1	117
cis-Chlordane	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	81.2	57.3	120
delta-BHC	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	89.8	65.8	114
Dieldrin	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	87.6	67.4	116
Endosulfan sulfate	0.05 mg/kg	----	0.25	95.4	63.6	119
	0.05 mg/kg	<0.05	----	----	----	----
Endrin	0.05 mg/kg	----	0.25	79.0	63	121
	0.05 mg/kg	<0.05	----	----	----	----
Endrin aldehyde	0.05 mg/kg	----	0.25	84.8	57.3	115
	0.05 mg/kg	<0.05	----	----	----	----
Endrin ketone	0.05 mg/kg	----	0.25	109	63.6	117
	0.05 mg/kg	<0.05	----	----	----	----
gamma-BHC	0.05 mg/kg	----	0.25	85.6	59.8	118
	0.05 mg/kg	<0.05	----	----	----	----
Heptachlor	0.05 mg/kg	----	0.25	71.8	65.6	115
	0.05 mg/kg	<0.05	----	----	----	----
Heptachlor epoxide	0.05 mg/kg	----	0.25	89.8	65.6	113
	0.05 mg/kg	<0.05	----	----	----	----
Hexachlorobenzene (HCB)	0.05 mg/kg	----	0.25	84.8	59.4	115
	0.05 mg/kg	<0.05	----	----	----	----

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Matrix Type: SOIL

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP068A: Organochlorine Pesticides (OC) - continued						
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 258329) - continued		mg/kg	mg/kg	%	%	%
Methoxychlor	0.2 mg/kg	----	0.25	64.0	50.4	132
	0.2 mg/kg	<0.2	----	----	----	----
trans-Chlordane	0.05 mg/kg	----	0.25	76.2	60.7	113
	0.05 mg/kg	<0.05	----	----	----	----
EP068B: Organophosphorus Pesticides (OP)						
EP068B: Organophosphorus Pesticides (OP) - (QC Lot: 257739)		mg/kg	mg/kg	%	%	%
Methyl Azinphos	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	101	29.8	137
Bromophos-ethyl	0.05 mg/kg	----	0.25	99.0	64.3	114
	0.05 mg/kg	<0.05	----	----	----	----
Carbophenothion	0.05 mg/kg	----	0.25	104	59.5	119
	0.05 mg/kg	<0.05	----	----	----	----
Chlorfenvinphos	0.05 mg/kg	----	0.25	102	61.4	123
	0.05 mg/kg	<0.05	----	----	----	----
Chlorpyrifos	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	99.6	64.2	111
Chlorpyrifos-methyl	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	100	65.1	111
Demeton-S-methyl	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	130	10.1	159
Diazinon	0.05 mg/kg	----	0.25	102	64.9	111
	0.05 mg/kg	<0.05	----	----	----	----
Dichlorvos	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	96.3	25.5	124
Dimethoate	0.05 mg/kg	----	0.25	89.4	48.6	126
	0.05 mg/kg	<0.05	----	----	----	----
Ethion	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	95.2	62	116
Fenamiphos	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	101	45.5	128

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Matrix Type: SOIL

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP068B: Organophosphorus Pesticides (OP) - continued						
EP068B: Organophosphorus Pesticides (OP) - (QC Lot: 257739) - continued		mg/kg	mg/kg	%	%	%
Fenthion	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	94.2	64.7	110
Malathion	0.05 mg/kg	----	0.25	102	60.4	127
	0.05 mg/kg	<0.05	----	----	----	----
Monocrotophos	0.2 mg/kg	----	0.25	23.8	2.88	149
	0.2 mg/kg	<0.2	----	----	----	----
Parathion	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	0.25	95.0	60	116
Parathion-methyl	0.2 mg/kg	----	0.25	99.6	61.4	113
	0.2 mg/kg	<0.2	----	----	----	----
Pirimphos-ethyl	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	105	64.8	111
Prothiofos	0.05 mg/kg	----	0.25	100	65.4	111
	0.05 mg/kg	<0.05	----	----	----	----
EP068B: Organophosphorus Pesticides (OP) - (QC Lot: 258329)		mg/kg	mg/kg	%	%	%
Methyl Azinphos	0.05 mg/kg	----	0.25	26.4	29.8	137
	0.05 mg/kg	<0.05	----	----	----	----
Bromophos-ethyl	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	82.6	64.3	114
Carbophenothion	0.05 mg/kg	----	0.25	70.0	59.5	119
	0.05 mg/kg	<0.05	----	----	----	----
Chlorfenvinphos	0.05 mg/kg	----	0.25	78.2	61.4	123
	0.05 mg/kg	<0.05	----	----	----	----
Chlorpyrifos	0.05 mg/kg	----	0.25	84.4	64.2	111
	0.05 mg/kg	<0.05	----	----	----	----
Chlorpyrifos-methyl	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	80.8	65.1	111
Demeton-S-methyl	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	45.2	10.1	159

Matrix Type: SOIL

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP068B: Organophosphorus Pesticides (OP) - continued						
EP068B: Organophosphorus Pesticides (OP) - (QC Lot: 258329) - continued		mg/kg	mg/kg	%	%	%
Diazinon	0.05 mg/kg	----	0.25	82.8	64.9	111
	0.05 mg/kg	<0.05	----	----	----	----
Dichlorvos	0.05 mg/kg	----	0.25	80.0	25.5	124
	0.05 mg/kg	<0.05	----	----	----	----
Dimethoate	0.05 mg/kg	----	0.25	52.4	48.6	126
	0.05 mg/kg	<0.05	----	----	----	----
Ethion	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	77.6	62	116
Fenamiphos	0.05 mg/kg	----	0.25	66.4	45.5	128
	0.05 mg/kg	<0.05	----	----	----	----
Fenthion	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	76.4	64.7	110
Malathion	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	84.0	60.4	127
Monocrotophos	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	0.25	14.8	2.88	149
Parathion	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	0.25	77.2	60	116
Parathion-methyl	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	0.25	78.2	61.4	113
Pirimphos-ethyl	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	79.6	64.8	111
Prothiofos	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	83.4	65.4	111
EP075(SIM)A: Phenolic Compounds						
EP075(SIM)A: Phenolic Compounds - (QC Lot: 258165)		mg/kg	mg/kg	%	%	%
2,4,5-Trichlorophenol	0.5 mg/kg	----	4	80.8	68.9	112
	0.5 mg/kg	<0.5	----	----	----	----
2,4,6-Trichlorophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	81.0	62.2	115

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Matrix Type: SOIL

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP075(SIM)A: Phenolic Compounds - continued						
EP075(SIM)A: Phenolic Compounds - (QC Lot: 258165) - continued		mg/kg	mg/kg	%	%	%
2,4-Dichlorophenol	0.5 mg/kg	----	4	82.6	71.6	113
	0.5 mg/kg	<0.5	----	----	----	----
2,4-Dimethylphenol	0.5 mg/kg	----	4	92.4	74.5	119
	0.5 mg/kg	<0.5	----	----	----	----
2,6-Dichlorophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	87.2	74.8	115
2-Chlorophenol	0.5 mg/kg	----	4	85.6	80.2	115
	0.5 mg/kg	<0.5	----	----	----	----
2-Methylphenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	88.9	76.8	114
2-Nitrophenol	0.5 mg/kg	----	4	89.5	60.3	117
	0.5 mg/kg	<0.5	----	----	----	----
3- & 4-Methylphenol	1.0 mg/kg	----	8	82.3	72	119
	1.0 mg/kg	<1.0	----	----	----	----
4-Chloro-3-Methylphenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	84.9	76.4	114
Pentachlorophenol	1.0 mg/kg	----	8	47.1	1.23	91.6
	1.0 mg/kg	<1.0	----	----	----	----
Phenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	89.3	73.9	115
EP075(SIM)A: Phenolic Compounds - (QC Lot: 258167)		mg/kg	mg/kg	%	%	%
2,4,5-Trichlorophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	85.5	68.9	112
2,4,6-Trichlorophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	87.1	62.2	115
2,4-Dichlorophenol	0.5 mg/kg	----	4	85.8	71.6	113
	0.5 mg/kg	<0.5	----	----	----	----
2,4-Dimethylphenol	0.5 mg/kg	----	4	90.3	74.5	119
	0.5 mg/kg	<0.5	----	----	----	----

ALS Environmental

Matrix Type: SOIL

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP075(SIM)A: Phenolic Compounds - continued						
EP075(SIM)A: Phenolic Compounds - (QC Lot: 258167) - continued		mg/kg	mg/kg	%	%	%
2,6-Dichlorophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	86.3	74.8	115
2-Chlorophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	91.2	80.2	115
2-Methylphenol	0.5 mg/kg	----	4	88.3	76.8	114
	0.5 mg/kg	<0.5	----	----	----	----
2-Nitrophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	74.8	60.3	117
3- & 4-Methylphenol	1.0 mg/kg	----	8	84.9	72	119
	1.0 mg/kg	<1.0	----	----	----	----
4-Chloro-3-Methylphenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	87.5	76.4	114
Pentachlorophenol	1.0 mg/kg	----	8	19.8	1.23	91.6
	1.0 mg/kg	<1.0	----	----	----	----
Phenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	87.3	73.9	115
EP075(SIM)A: Phenolic Compounds - (QC Lot: 258765)		mg/kg	mg/kg	%	%	%
2,4,5-Trichlorophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	76.0	68.9	112
2,4,6-Trichlorophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	82.6	62.2	115
2,4-Dichlorophenol	0.5 mg/kg	----	4	84.3	71.6	113
	0.5 mg/kg	<0.5	----	----	----	----
2,4-Dimethylphenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	85.7	74.5	119
2,6-Dichlorophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	86.8	74.8	115
2-Chlorophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	86.0	80.2	115

ALS Environmental

Matrix Type: SOIL

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP075(SIM)A: Phenolic Compounds - continued						
EP075(SIM)A: Phenolic Compounds - (QC Lot: 258765) - continued		mg/kg	mg/kg	%	%	%
2-Methylphenol	0.5 mg/kg	----	4	85.2	76.8	114
	0.5 mg/kg	<0.5	----	----	----	----
2-Nitrophenol	0.5 mg/kg	----	4	81.9	60.3	117
	0.5 mg/kg	<0.5	----	----	----	----
3- & 4-Methylphenol	1.0 mg/kg	----	8	82.9	72	119
	1.0 mg/kg	<1.0	----	----	----	----
4-Chloro-3-Methylphenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	85.9	76.4	114
Pentachlorophenol	1.0 mg/kg	----	8	28.3	1.23	91.6
	1.0 mg/kg	<1.0	----	----	----	----
Phenol	0.5 mg/kg	----	4	83.7	73.9	115
	0.5 mg/kg	<0.5	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 258165)		mg/kg	mg/kg	%	%	%
Acenaphthene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	90.5	81.5	112
Acenaphthylene	0.5 mg/kg	----	4	89.1	79.6	113
	0.5 mg/kg	<0.5	----	----	----	----
Anthracene	0.5 mg/kg	----	4	91.0	81.1	112
	0.5 mg/kg	<0.5	----	----	----	----
Benz(a)anthracene	0.5 mg/kg	----	4	91.3	77.2	112
	0.5 mg/kg	<0.5	----	----	----	----
Benzo(a)pyrene	0.5 mg/kg	----	4	89.6	76.4	113
	0.5 mg/kg	<0.5	----	----	----	----
Benzo(b)fluoranthene	0.5 mg/kg	----	4	89.6	71.8	118
	0.5 mg/kg	<0.5	----	----	----	----
Benzo(g,h,i)perylene	0.5 mg/kg	----	4	96.2	72.4	114
	0.5 mg/kg	<0.5	----	----	----	----
Benzo(k)fluoranthene	0.5 mg/kg	----	4	90.1	74.2	117
	0.5 mg/kg	<0.5	----	----	----	----

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)B: Polynuclear Aromatic Hydrocarbons - continued						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 258165) - continued		mg/kg	mg/kg	%	%	%
Chrysene	0.5 mg/kg	----	4	91.9	79.8	114
	0.5 mg/kg	<0.5	----	----	----	----
Dibenz(a,h)anthracene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	92.0	71.7	113
Fluoranthene	0.5 mg/kg	----	4	89.1	78.8	113
	0.5 mg/kg	<0.5	----	----	----	----
Fluorene	0.5 mg/kg	----	4	88.8	79.9	112
	0.5 mg/kg	<0.5	----	----	----	----
Indeno(1,2,3,cd)pyrene	0.5 mg/kg	----	4	92.5	71	113
	0.5 mg/kg	<0.5	----	----	----	----
Naphthalene	0.5 mg/kg	----	4	92.6	81.9	113
	0.5 mg/kg	<0.5	----	----	----	----
Phenanthrene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	92.1	79.4	114
Pyrene	0.5 mg/kg	----	4	89.9	78.9	113
	0.5 mg/kg	<0.5	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 258167)		mg/kg	mg/kg	%	%	%
Acenaphthene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	90.2	81.5	112
Acenaphthylene	0.5 mg/kg	----	4	92.1	79.6	113
	0.5 mg/kg	<0.5	----	----	----	----
Anthracene	0.5 mg/kg	----	4	89.9	81.1	112
	0.5 mg/kg	<0.5	----	----	----	----
Benz(a)anthracene	0.5 mg/kg	----	4	94.3	77.2	112
	0.5 mg/kg	<0.5	----	----	----	----
Benzo(a)pyrene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	94.9	76.4	113
Benzo(b)fluoranthene	0.5 mg/kg	----	4	96.1	71.8	118
	0.5 mg/kg	<0.5	----	----	----	----

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)B: Polynuclear Aromatic Hydrocarbons - continued						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 258167) - continued		mg/kg	mg/kg	%	%	%
Benzo(g,h,i)perylene	0.5 mg/kg	----	4	85.4	72.4	114
	0.5 mg/kg	<0.5	----	----	----	----
Benzo(k)fluoranthene	0.5 mg/kg	----	4	92.8	74.2	117
	0.5 mg/kg	<0.5	----	----	----	----
Chrysene	0.5 mg/kg	----	4	93.5	79.8	114
	0.5 mg/kg	<0.5	----	----	----	----
Dibenz(a,h)anthracene	0.5 mg/kg	----	4	89.6	71.7	113
	0.5 mg/kg	<0.5	----	----	----	----
Fluoranthene	0.5 mg/kg	----	4	92.6	78.8	113
	0.5 mg/kg	<0.5	----	----	----	----
Fluorene	0.5 mg/kg	----	4	91.0	79.9	112
	0.5 mg/kg	<0.5	----	----	----	----
Indeno(1,2,3,cd)pyrene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	87.8	71	113
Naphthalene	0.5 mg/kg	----	4	90.8	81.9	113
	0.5 mg/kg	<0.5	----	----	----	----
Phenanthrene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	91.3	79.4	114
Pyrene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	93.0	78.9	113
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 258765)		mg/kg	mg/kg	%	%	%
Acenaphthene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	91.4	81.5	112
Acenaphthylene	0.5 mg/kg	----	4	91.9	79.6	113
	0.5 mg/kg	<0.5	----	----	----	----
Anthracene	0.5 mg/kg	----	4	89.6	81.1	112
	0.5 mg/kg	<0.5	----	----	----	----
Benz(a)anthracene	0.5 mg/kg	----	4	92.0	77.2	112
	0.5 mg/kg	<0.5	----	----	----	----

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Matrix Type: SOIL

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - continued						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 258765) - continued		mg/kg	mg/kg	%	%	%
Benzo(a)pyrene	0.5 mg/kg	----	4	89.8	76.4	113
	0.5 mg/kg	<0.5	----	----	----	----
Benzo(b)fluoranthene	0.5 mg/kg	----	4	89.0	71.8	118
	0.5 mg/kg	<0.5	----	----	----	----
Benzo(g,h,i)perylene	0.5 mg/kg	----	4	83.9	72.4	114
	0.5 mg/kg	<0.5	----	----	----	----
Benzo(k)fluoranthene	0.5 mg/kg	----	4	89.6	74.2	117
	0.5 mg/kg	<0.5	----	----	----	----
Chrysene	0.5 mg/kg	----	4	93.3	79.8	114
	0.5 mg/kg	<0.5	----	----	----	----
Dibenz(a,h)anthracene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	83.6	71.7	113
Fluoranthene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	95.2	78.8	113
Fluorene	0.5 mg/kg	----	4	91.6	79.9	112
	0.5 mg/kg	<0.5	----	----	----	----
Indeno(1,2,3,cd)pyrene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	84.2	71	113
Naphthalene	0.5 mg/kg	----	4	92.7	81.9	113
	0.5 mg/kg	<0.5	----	----	----	----
Phenanthrene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	92.1	79.4	114
Pyrene	0.5 mg/kg	----	4	95.6	78.9	113
	0.5 mg/kg	<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 258048)		mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	2 mg/kg	<2	----	----	----	----
	2 mg/kg	----	26	104	68.4	128
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 258164)		mg/kg	mg/kg	%	%	%

Matrix Type: SOIL

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP080/071: Total Petroleum Hydrocarbons - continued						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 258164) - continued		mg/kg	mg/kg	%	%	%
C10 - C14 Fraction	50 mg/kg	----	200	95.8	75.2	116
	50 mg/kg	<50	----	----	----	----
C15 - C28 Fraction	100 mg/kg	<100	----	----	----	----
	100 mg/kg	----	200	98.1	75.3	113
C29 - C36 Fraction	100 mg/kg	<100	----	----	----	----
	100 mg/kg	----	200	87.4	72.6	117
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 258166)		mg/kg	mg/kg	%	%	%
C10 - C14 Fraction	50 mg/kg	<50	----	----	----	----
	50 mg/kg	----	200	94.8	75.2	116
C15 - C28 Fraction	100 mg/kg	----	200	98.3	75.3	113
	100 mg/kg	<100	----	----	----	----
C29 - C36 Fraction	100 mg/kg	<100	----	----	----	----
	100 mg/kg	----	200	99.0	72.6	117
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 258604)		mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	2 mg/kg	----	26	93.6	68.4	128
	2 mg/kg	<2	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 258766)		mg/kg	mg/kg	%	%	%
C10 - C14 Fraction	50 mg/kg	<50	----	----	----	----
	50 mg/kg	----	200	87.1	75.2	116
C15 - C28 Fraction	100 mg/kg	----	200	85.4	75.3	113
	100 mg/kg	<100	----	----	----	----
C29 - C36 Fraction	100 mg/kg	----	200	86.9	72.6	117
	100 mg/kg	<100	----	----	----	----
EP080: BTEX						
EP080: BTEX - (QC Lot: 258048)		mg/kg	mg/kg	%	%	%
Benzene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	1	97.2	67.5	125
Ethylbenzene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	1	94.8	65.3	126

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*
EP080: BTEX - continued						
EP080: BTEX - (QC Lot: 258048) - continued		mg/kg	mg/kg	%	%	%
meta- & para-Xylene	0.2 mg/kg	----	2	93.1	66.5	124
	0.2 mg/kg	<0.2	----	----	----	----
ortho-Xylene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	1	92.2	66.7	123
Toluene	0.2 mg/kg	----	1	98.9	69	122
	0.2 mg/kg	<0.2	----	----	----	----
EP080: BTEX - (QC Lot: 258604)		mg/kg	mg/kg	%	%	%
Benzene	0.2 mg/kg	----	1	83.3	67.5	125
	0.2 mg/kg	<0.2	----	----	----	----
Ethylbenzene	0.2 mg/kg	----	1	87.3	65.3	126
	0.2 mg/kg	<0.2	----	----	----	----
meta- & para-Xylene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	2	89.8	66.5	124
ortho-Xylene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	1	91.3	66.7	123
Toluene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	1	91.8	69	122

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*	
					Sample Result	*Spike Recovery*	*Static Limits*	
Analyte name	*Laboratory Sample ID*	*Client Sample ID*	*LOR*	*Spike Concentration*		*MS*	*Low*	*High*
EG005T: Total Metals by ICP-AES								
EG005T: Total Metals by ICP-AES - (QC Lot: 259074)				mg/kg	mg/kg	%	%	%
Arsenic	ES0609934-001	Anonymous	5 mg/kg	50	<5	86.9	70	130
Cadmium			1 mg/kg	50	<1	86.2	70	130
Chromium			2 mg/kg	50	11	87.5	70	130
Copper			5 mg/kg	250	49	91.4	70	130
Lead			5 mg/kg	250	48	85.6	70	130
Nickel			2 mg/kg	50	12	85.9	70	130
Zinc			5 mg/kg	250	234	71.7	70	130
EG035T: Total Mercury by FIMS								
EG035T: Total Mercury by FIMS - (QC Lot: 259075)				mg/kg	mg/kg	%	%	%
Mercury	ES0609934-001	Anonymous	0.1 mg/kg	5	<0.1	83.7	70	130
EK025G: Free cyanide by Discrete Analyser								
EK025G: Free cyanide by Discrete Analyser - (QC Lot: 258135)				mg/kg	mg/kg	%	%	%
Total Cyanide	ES0609932-001	Anonymous	1 mg/kg	50	<1.0	102	70	130
EP066: Polychlorinated Biphenyls (PCB)								
EP066: Polychlorinated Biphenyls (PCB) - (QC Lot: 257741)				mg/kg	mg/kg	%	%	%
Total Polychlorinated biphenyls	ES0609911-001	Anonymous	0.1 mg/kg	0.5	<5.00	* Not Determined	70	130
EP066: Polychlorinated Biphenyls (PCB) - (QC Lot: 258331)				mg/kg	mg/kg	%	%	%
Total Polychlorinated biphenyls	ES0609995-015	TP02/0.25	0.1 mg/kg	0.5	----	* Not Determined	70	130
EP068A: Organochlorine Pesticides (OC)								
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 257739)				mg/kg	mg/kg	%	%	%
gamma-BHC	ES0609911-001	Anonymous	0.05 mg/kg	0.25	<0.25	* Not Determined	75.65	110.44
Heptachlor			0.05 mg/kg	0.25	<0.25	* Not Determined	72.2	106.71

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Matrix Type: SOIL

Matrix Spike (MS) Report

					Actual Results		Recovery Limits	
					Sample Result	Spike Recovery	Static Limits	
Analyte name	*Laboratory Sample ID*	*Client Sample ID*	*LOR*	*Spike Concentration*		*MS*	*Low*	*High*
EP068A: Organochlorine Pesticides (OC) - continued								
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 257739) - continued				mg/kg	mg/kg	%	%	%
Aldrin	ES0609911-001	Anonymous	0.05 mg/kg	0.25	<0.25	* Not Determined	77.54	107.0
Dieldrin			0.05 mg/kg	0.25	<0.25	* Not Determined	76.37	109.7
Endrin			0.05 mg/kg	1	<0.25	* Not Determined	68.51	119.47
4,4'-DDT			0.20 mg/kg	1	<0.2	* Not Determined	67.12	118.10
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 258329)				mg/kg	mg/kg	%	%	%
gamma-BHC	ES0609995-015	TP02/0.25	0.05 mg/kg	0.25	<0.05	85.7	75.65	110.44
Heptachlor			0.05 mg/kg	0.25	<0.05	77.5	72.2	106.71
Aldrin			0.05 mg/kg	0.25	<0.05	76.8	77.54	107.0
Dieldrin			0.05 mg/kg	0.25	<0.05	93.1	76.37	109.7
Endrin			0.05 mg/kg	1	<0.05	83.4	68.51	119.47
4,4'-DDT			0.2 mg/kg	1	<0.2	54.4	67.12	118.10
EP068B: Organophosphorus Pesticides (OP)								
EP068B: Organophosphorus Pesticides (OP) - (QC Lot: 257739)				mg/kg	mg/kg	%	%	%
Diazinon	ES0609911-001	Anonymous	0.05 mg/kg	0.25	<0.25	* Not Determined	75.85	107.06
Chlorpyrifos-methyl			0.05 mg/kg	0.25	<0.25	* Not Determined	74.84	107.91
Pirimphos-ethyl			0.05 mg/kg	0.25	<0.25	* Not Determined	67.98	109.42
Bromophos-ethyl			0.05 mg/kg	0.25	<0.25	* Not Determined	74.94	107.37
Prothiofos			0.05 mg/kg	0.25	0.53	* Not Determined	75.45	106.05
EP068B: Organophosphorus Pesticides (OP) - (QC Lot: 258329)				mg/kg	mg/kg	%	%	%
Diazinon	ES0609995-015	TP02/0.25	0.05 mg/kg	0.25	<0.05	87.6	75.85	107.06
Chlorpyrifos-methyl			0.05 mg/kg	0.25	<0.05	74.6	74.84	107.91
Pirimphos-ethyl			0.05 mg/kg	0.25	<0.05	82.3	67.98	109.42
Bromophos-ethyl			0.05 mg/kg	0.25	<0.05	81.7	74.94	107.37
Prothiofos			0.05 mg/kg	0.25	<0.05	82.2	75.45	106.05
EP075(SIM)A: Phenolic Compounds								
EP075(SIM)A: Phenolic Compounds - (QC Lot: 258165)				mg/kg	mg/kg	%	%	%
Phenol	ES0609994-017	Anonymous	0.5 mg/kg	10	<0.5	77.0	70	130
2-Chlorophenol			0.5 mg/kg	10	<0.5	74.8	70	130
2-Nitrophenol			0.5 mg/kg	10	<0.5	79.8	60	130

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Matrix Type: SOIL

Matrix Spike (MS) Report

					Actual Results		Recovery Limits	
					Sample Result	Spike Recovery	Static Limits	
Analyte name	*Laboratory Sample ID*	*Client Sample ID*	*LOR*	*Spike Concentration*		*MS*	*Low*	*High*
EP075(SIM)A: Phenolic Compounds - continued								
EP075(SIM)A: Phenolic Compounds - (QC Lot: 258165) - continued				mg/kg	mg/kg	%	%	%
4-Chloro-3-Methylphenol	ES0609994-017	Anonymous	0.5 mg/kg	10	<0.5	78.0	70	130
Pentachlorophenol			2.0 mg/kg	10	<2.0	85.6	20	130
EP075(SIM)A: Phenolic Compounds - (QC Lot: 258167)				mg/kg	mg/kg	%	%	%
Phenol	ES0609995-018	TP02/3.0	0.5 mg/kg	10	<0.5	74.8	70	130
2-Chlorophenol			0.5 mg/kg	10	<0.5	76.8	70	130
2-Nitrophenol			0.5 mg/kg	10	<0.5	72.4	60	130
4-Chloro-3-Methylphenol			0.5 mg/kg	10	<0.5	78.4	70	130
Pentachlorophenol			2.0 mg/kg	10	<2.0	41.4	20	130
EP075(SIM)A: Phenolic Compounds - (QC Lot: 258765)				mg/kg	mg/kg	%	%	%
Phenol	ES0609995-012	TP01/1.5	0.5 mg/kg	10	<0.5	76.0	70	130
2-Chlorophenol			0.5 mg/kg	10	<0.5	72.6	70	130
2-Nitrophenol			0.5 mg/kg	10	<0.5	77.2	60	130
4-Chloro-3-Methylphenol			0.5 mg/kg	10	<0.5	76.3	70	130
Pentachlorophenol			2.0 mg/kg	10	<2.0	87.4	20	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 258165)				mg/kg	mg/kg	%	%	%
Acenaphthene	ES0609994-017	Anonymous	0.5 mg/kg	10	<0.5	84.0	70	130
Pyrene			0.5 mg/kg	10	<0.5	92.8	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 258167)				mg/kg	mg/kg	%	%	%
Acenaphthene	ES0609995-018	TP02/3.0	0.5 mg/kg	10	<0.5	80.4	70	130
Pyrene			0.5 mg/kg	10	<0.5	84.4	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 258765)				mg/kg	mg/kg	%	%	%
Acenaphthene	ES0609995-012	TP01/1.5	0.5 mg/kg	10	<0.5	82.1	70	130
Pyrene			0.5 mg/kg	10	<0.5	84.2	70	130
EP080/071: Total Petroleum Hydrocarbons								
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 258048)				mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	ES0609995-001	MG01/0.1	2 mg/kg	26	<2	93.6	70	130
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 258164)				mg/kg	mg/kg	%	%	%

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Matrix Type: SOIL

Matrix Spike (MS) Report

					Actual Results		Recovery Limits	
					Sample Result	Spike Recovery	Static Limits	
Analyte name	*Laboratory Sample ID*	*Client Sample ID*	*LOR*	*Spike Concentration*		*MS*	*Low*	*High*
EP080/071: Total Petroleum Hydrocarbons - continued								
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 258164) - continued				mg/kg	mg/kg	%	%	%
C10 - C14 Fraction	ES0609994-017	Anonymous	50 mg/kg	700	330	72.2	70	130
C15 - C28 Fraction			100 mg/kg	3400	<100	116	70	130
C29 - C36 Fraction			100 mg/kg	3600	<100	92.2	70	130
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 258166)				mg/kg	mg/kg	%	%	%
C10 - C14 Fraction	ES0609995-018	TP02/3.0	50 mg/kg	700	<50	99.8	70	130
C15 - C28 Fraction			100 mg/kg	3400	<100	114	70	130
C29 - C36 Fraction			100 mg/kg	3600	<100	104	70	130
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 258604)				mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	ES0609995-012	TP01/1.5	2 mg/kg	26	<2	76.0	70	130
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 258766)				mg/kg	mg/kg	%	%	%
C10 - C14 Fraction	ES0609995-012	TP01/1.5	50 mg/kg	700	<50	80.5	70	130
C15 - C28 Fraction			100 mg/kg	3400	<100	97.3	70	130
C29 - C36 Fraction			100 mg/kg	3600	<100	77.5	70	130
EP080: BTEX								
EP080: BTEX - (QC Lot: 258048)				mg/kg	mg/kg	%	%	%
Benzene	ES0609995-001	MG01/0.1	0.2 mg/kg	2.5	<0.2	88.8	70	130
Toluene			0.2 mg/kg	2.5	<0.2	89.8	70	130
Ethylbenzene			0.2 mg/kg	2.5	<0.2	96.4	70	130
meta- & para-Xylene			0.2 mg/kg	2.5	<0.2	95.9	70	130
ortho-Xylene			0.2 mg/kg	2.5	<0.2	94.9	70	130
EP080: BTEX - (QC Lot: 258604)				mg/kg	mg/kg	%	%	%
Benzene	ES0609995-012	TP01/1.5	0.2 mg/kg	2.5	<0.2	80.8	70	130
Toluene			0.2 mg/kg	2.5	<0.2	74.8	70	130
Ethylbenzene			0.2 mg/kg	2.5	<0.2	83.3	70	130
meta- & para-Xylene			0.2 mg/kg	2.5	<0.2	86.0	70	130
ortho-Xylene			0.2 mg/kg	2.5	<0.2	84.3	70	130

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INTERPRETIVE QUALITY CONTROL REPORT

Client	:	**CH2M HILL PTY LTD**	**Laboratory**	:	ALS Environmental Sydney	**Page**	: **1 of 8**
Contact	:	MR ADAM SULLIVAN	**Contact**	:	Greg Vogel		
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	**Address**	:	277-289 Woodpark Road Smithfield NSW Australia 2164	**Work order**	: **ES0609995**
						Amendment No.	:
Project	:	347496 McDonaldtown Gasworks	**Quote number**	:	----	**Date received**	: 15 Aug 2006
Order number	:	- Not provided -				**Date issued**	: 23 Aug 2006
C-O-C number	:	- Not provided -					
Site	:	MCDONALD TOWN					
E-mail	:	adam.sullivan@ch2m.com.au	**E-mail**	:	Greg.Vogel@alsenviro.com	**No. of samples**	
Telephone	:	02 9950 0200	**Telephone**	:	+61 (02) 8784 8555	**Received**	: 36
Facsimile	:	02 9950 0600	**Facsimile**	:	+61 (02) 8784 8500	**Analysed**	: 19

This Interpretive Quality Control Report was issued on 23 Aug 2006 for the ALS work order reference ES0609995 and supersedes any previous reports with this reference.
This report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Type Frequency Compliance
- Summary of all Quality Control Outliers
- Brief Method Summaries

Interpretive Quality Control Report - Analysis Holding Time

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the sample aliquot was taken. Elapsed time to analysis represents time from sampling where no extraction / digestion is involved or time from extraction / digestion where this is present. For composite samples, sampling date/time is taken as that of the oldest sample contributing to that composite. Sample date/time for laboratory produced leaches are taken from the completion date/time of the leaching process. Outliers for holding time are based on USEPA SW846, APHA, AS and NEPM (1999). Failed outliers, refer to the 'Summary of Outliers'.

Matrix Type: SOIL ***Analysis Holding Time and Preservation***

Method / **Container /** Client Sample ID(s)		**Date Sampled**	**Extraction / Preparation**			**Analysis**		
			Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EA055-103: Moisture Content								
Soil Glass Jar - Unpreserved								
MG01/1.8,	MG01/2.8,	**15 Aug 2006**	----	----	----	**21 Aug 2006**	22 Aug 2006	Pass
MG01/5,	QC01,							
TRIP BLANK,	TRIP SPIKE 1,							
TP01/1.0,	TP01/1.5,							
TP01/3.0,	DUP01,							
TP02/1.0,	TP02/3.0,							
TP02/4.5,	TP03/0.5,							
TP03/1.0,	TP03/2.0,							
TP03/4.0,	DUP02,							
TS CONTROL 1								
EG005T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved								
MG01/1.8,	TP01/1.5,	**15 Aug 2006**	**18 Aug 2006**	11 Feb 2007	Pass	**21 Aug 2006**	11 Feb 2007	Pass
TP03/1.0								
EG035T: Total Mercury by FIMS								
Soil Glass Jar - Unpreserved								
MG01/1.8,	TP01/1.5,	**15 Aug 2006**	**18 Aug 2006**	12 Sep 2006	Pass	**21 Aug 2006**	12 Sep 2006	Pass
TP03/1.0								
EK026G: Total Cyanide By Discrete Analyser								
Soil Glass Jar - Unpreserved								
MG01/1.8		**15 Aug 2006**	**18 Aug 2006**	11 Feb 2007	Pass	**21 Aug 2006**	11 Feb 2007	Pass
EP066: Polychlorinated Biphenyls (PCB)								
Soil Glass Jar - Unpreserved								
MG01/1.8		**15 Aug 2006**	**18 Aug 2006**	29 Aug 2006	Pass	**21 Aug 2006**	27 Sep 2006	Pass
Soil Glass Jar - Unpreserved								
TP01/1.5,	TP03/1.0	**15 Aug 2006**	**19 Aug 2006**	29 Aug 2006	Pass	**21 Aug 2006**	28 Sep 2006	Pass
EP068: Pesticides by GCMS								
Soil Glass Jar - Unpreserved								
MG01/1.8		**15 Aug 2006**	**18 Aug 2006**	29 Aug 2006	Pass	**21 Aug 2006**	27 Sep 2006	Pass
Soil Glass Jar - Unpreserved								
TP01/1.5,	TP03/1.0	**15 Aug 2006**	**19 Aug 2006**	29 Aug 2006	Pass	**21 Aug 2006**	28 Sep 2006	Pass
EP071: TPH - Semivolatile Fraction								

Matrix Type: SOIL

Analysis Holding Time and Preservation

Method / **Container /** Client Sample ID(s)		**Date Sampled**	**Extraction / Preparation**			**Analysis**		
			Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EP071: TPH - Semivolatile Fraction **- continued**								
Soil Glass Jar - Unpreserved								
MG01/1.8,	MG01/2.8,	**15 Aug 2006**	----	29 Aug 2006		**18 Aug 2006**	29 Aug 2006	Pass
MG01/5,	QC01,							
TRIP BLANK,	TRIP SPIKE 1,							
TP01/1.0,	TP01/3.0,							
DUP01,	TP02/1.0							
Soil Glass Jar - Unpreserved								
TP01/1.5,	TP02/3.0,	**15 Aug 2006**	**18 Aug 2006**	29 Aug 2006	Pass	**18 Aug 2006**	27 Sep 2006	Pass
TP02/4.5,	TP03/0.5,							
TP03/1.0,	TP03/2.0,							
TP03/4.0,	DUP02,							
TS CONTROL 1								
EP075(SIM): PAH/Phenols (SIM)								
Soil Glass Jar - Unpreserved								
MG01/1.8,	MG01/2.8,	**15 Aug 2006**	----	29 Aug 2006		**18 Aug 2006**	29 Aug 2006	Pass
MG01/5,	QC01,							
TP01/1.0,	TP01/3.0,							
DUP01,	TP02/1.0							
Soil Glass Jar - Unpreserved								
TP01/1.5,	TP02/3.0,	**15 Aug 2006**	**18 Aug 2006**	29 Aug 2006	Pass	**18 Aug 2006**	27 Sep 2006	Pass
TP02/4.5,	TP03/0.5,							
TP03/1.0,	TP03/2.0,							
TP03/4.0,	DUP02							
EP080: TPH Volatiles/BTEX								
Soil Glass Jar - Unpreserved								
MG01/1.8,	MG01/2.8,	**15 Aug 2006**	**17 Aug 2006**	29 Aug 2006	Pass	**21 Aug 2006**	29 Aug 2006	Pass
MG01/5,	QC01,							
TRIP BLANK,	TRIP SPIKE 1,							
TP01/1.0,	TP01/3.0,							
DUP01,	TP02/1.0,							
TP02/3.0								
Soil Glass Jar - Unpreserved								
TP01/1.5,	TP02/4.5,	**15 Aug 2006**	**18 Aug 2006**	29 Aug 2006	Pass	**21 Aug 2006**	29 Aug 2006	Pass
TP03/0.5,	TP03/1.0,							
TP03/2.0,	TP03/4.0,							
DUP02,	TS CONTROL 1							

Interpretive Quality Control Report - Frequency of Quality Control Samples

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which this work order was processed. Actual rate should be greater than or equal to the expected rate.

Matrix Type: SOIL ***Frequency of Quality Control Samples***

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
EA055-103: Moisture Content	6	49	**12.2**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG005T: Total Metals by ICP-AES	2	20	**10.0**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035T: Total Mercury by FIMS	2	20	**10.0**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EK026G: Total Cyanide By Discrete Analyser	1	6	**16.7**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP066: Polychlorinated Biphenyls (PCB)	3	17	**17.6**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP068: Pesticides by GCMS	3	17	**17.6**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	5	41	**12.2**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	5	35	**14.3**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	4	40	**10.0**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Laboratory Control Samples (LCS)					
EG005T: Total Metals by ICP-AES	1	20	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035T: Total Mercury by FIMS	1	20	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EK026G: Total Cyanide By Discrete Analyser	1	6	**16.7**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP066: Polychlorinated Biphenyls (PCB)	2	17	**11.8**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP068: Pesticides by GCMS	2	17	**11.8**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	3	41	**7.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	3	35	**8.6**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	2	40	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Method Blanks (MB)					
EG005T: Total Metals by ICP-AES	1	20	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035T: Total Mercury by FIMS	1	20	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EK026G: Total Cyanide By Discrete Analyser	1	6	**16.7**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP066: Polychlorinated Biphenyls (PCB)	2	17	**11.8**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP068: Pesticides by GCMS	2	17	**11.8**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	3	41	**7.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	3	35	**8.6**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	2	40	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Matrix Spikes (MS)					
EG005T: Total Metals by ICP-AES	1	20	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035T: Total Mercury by FIMS	1	20	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EK026G: Total Cyanide By Discrete Analyser	1	6	**16.7**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP066: Polychlorinated Biphenyls (PCB)	2	17	**11.8**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP068: Pesticides by GCMS	2	17	**11.8**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	3	41	**7.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	3	35	**8.6**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	2	40	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement

Interpretive Quality Control Report - Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged on the 'Quality Control Report'. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). - Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot.

Non-surrogates

ALS QC Lot	Matrix Type	Laboratory Sample ID	Client Sample ID	Analyte	Data	Limits	Comment
Laboratory Duplicates (DUP)							
EP066: Polychlorinated Biphenyls (PCB)	SOIL	ES0609995-015	TP02/0.25	Total Polychlorinated biphenyls	<0.10		Analyte not determined in allocated original sample.
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	SOIL	ES0609994-017	Anonymous	Naphthalene	24.5 %	0-20 %	RPD exceeds LOR based limits
Laboratory Control Samples (LCS)							
EP068B: Organophosphorus Pesticides (OP)	SOIL	284038-002	----	Methyl Azinphos	26.4 %	29.8-137 %	Recovery less than lower control limit
Matrix Spikes (MS)							
EP066: Polychlorinated Biphenyls (PCB)	SOIL	ES0609911-001	Anonymous	Total Polychlorinated biphenyls	ND	----	Matrix spike recovery not determined due to sample matrix interference.
EP068A: Organochlorine Pesticides (OC)	SOIL	ES0609911-001	Anonymous	gamma-BHC	ND	----	Matrix spike recovery not determined due to sample matrix interference.
				Heptachlor	ND	----	Matrix spike recovery not determined due to sample matrix interference.
				Aldrin	ND	----	Matrix spike recovery not determined due to sample matrix interference.
				Dieldrin	ND	----	Matrix spike recovery not determined due to sample matrix interference.
				Endrin	ND	----	Matrix spike recovery not determined due to sample matrix interference.
				4,4'-DDT	ND	----	Matrix spike recovery not determined due to sample matrix interference.
EP068B: Organophosphorus Pesticides (OP)	SOIL	ES0609911-001	Anonymous	Diazinon	ND	----	Matrix spike recovery not determined due to sample matrix interference.
				Chlorpyrifos-methyl	ND	----	Matrix spike recovery not determined due to sample matrix interference.
				Pirimphos-ethyl	ND	----	Matrix spike recovery not determined due to sample matrix interference.
				Bromophos-ethyl	ND	----	Matrix spike recovery not determined due to sample matrix interference.
				Prothiofos	ND	----	Matrix spike recovery not determined due to sample matrix interference.
EP068A: Organochlorine Pesticides (OC)	SOIL	ES0609995-015	TP02/0.25	Aldrin	76.8 %	77.54-107.0 %	Recovery less than lower data quality objective
				4,4'-DDT	54.4 %	67.12-118.10 %	Recovery less than lower data quality objective
EP068B: Organophosphorus Pesticides (OP)	SOIL	ES0609995-015	TP02/0.25	Chlorpyrifos-methyl	74.6 %	74.84-107.91 %	Recovery less than lower data quality objective

- **For all matrices, no method blank result outliers occur.**

Surrogates

ALS QC Lot	Matrix Type	Laboratory Sample ID	Client Sample ID	Analyte	Data	Limits	Comment
Surrogates							
EP080S: TPH(V)/BTEX Surrogates	SOIL	ES0609995-005	MG01/2.8	Toluene-D8	118 %	81-117 %	Recovery greater than upper data quality objective

Outliers : Analysis Holding Time

The following report highlights outliers within this 'Interpretive Quality Control Report - Analysis Holding Time'.

Method / **Container /** Client Sample ID(s)		**Date Sampled**	**Extraction / Preparation**			**Analysis**		
			Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EP071: TPH - Semivolatile Fraction								
Soil Glass Jar - Unpreserved								
MG01/1.8,	MG01/2.8,	**15 Aug 2006**	----	29 Aug 2006		**18 Aug 2006**	29 Aug 2006	Pass
MG01/5,	QC01,							
TRIP BLANK,	TRIP SPIKE 1,							
TP01/1.0,	TP01/3.0,							
DUP01,	TP02/1.0							
Method / **Container /** Client Sample ID(s)		**Date Sampled**	**Extraction / Preparation**			**Analysis**		
			Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EP075(SIM): PAH/Phenols (SIM)								
Soil Glass Jar - Unpreserved								
MG01/1.8,	MG01/2.8,	**15 Aug 2006**	----	29 Aug 2006		**18 Aug 2006**	29 Aug 2006	Pass
MG01/5,	QC01,							
TP01/1.0,	TP01/3.0,							
DUP01,	TP02/1.0							

- **No holding time outliers occur.**

Outliers : Frequency of Quality Control Samples

The following report highlights outliers within this 'Interpretive Quality Control Report - Frequency of Quality Control Samples'.

- **No frequency outliers occur.**

Method Reference Summary

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.

Matrix Type: SOIL ***Method Reference Summary***

Preparation Methods

EK026PR : NaOH leach for TCN in Soils - APHA 20th ed., 4500 CN- C & N. Samples are extracted by end-over-end tumbling with NaOH.

EN69 : Hot Block Digest for metals in soils sediments and sludges - USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (1999) Schedule B(3) (Method 202)

ORG16 : Methanolic Extraction of Soils for Purge and Trap - (USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.

ORG17A : Tumbler Extraction of Solids (Option A - Concentrating) - In-house, Mechanical agitation (tumbler). 20g of sample, Na2SO4 and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

ORG17B : Tumbler Extraction of Solids (Option B - Non-concentrating) - In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.

Analytical Methods

ASB-SOL : Asbestos - Count (Solid) - Asbestos Count on solid matrices conducted by Subcontracting Laboratory

EA055-103 : Moisture Content - A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (1999) Schedule B(3) (Method 102)

EG005T : Total Metals by ICP-AES - (APHA 20th ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (1999) Schedule B(3)

EG035T : Total Mercury by FIMS - AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (1999) Schedule B(3)

EK026G : Total Cyanide By Discrete Analyser - APHA 20th 4500 CN - C & N. Caustic leach extracts of the sample are distilled with sulphuric acid, converting all CN species to HCN. The distillates are analyzed for CN by Seal. This method is compliant with NEPM (1999) Schedule B(3) (Method 403)

EP066 : Polychlorinated Biphenyls (PCB) - (USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 504)

EP068 : Pesticides by GCMS - (USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM (1999) Schedule B(3) (Method 504,505)

EP071 : TPH - Semivolatile Fraction - (USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)

EP075(SIM) : PAH/Phenols (SIM) - (USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 502 and 507)

Matrix Type: SOIL

Method Reference Summary

Analytical Methods

EP080 : TPH Volatiles/BTEX - (USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 501)

AUSTRALIAN LABORATORY SERVICES PTY LTD ABN 84 009 936 029
Smithfield NSW 2164 Australia
Telephone: +61 (02) 8784 8555 Facsimile: +61 (02) 8784 8500 http://www.alsenviro.com/

ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive report

Client Details

Client	:	**CH2M HILL PTY LTD**
Contact	:	**MR ADAM SULLIVAN**
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515
Project	:	**347496 McDonaldtown Gasworks**
Order number	:	**- Not provided -**
C-O-C Number	:	**- Not provided -**
Site	:	**MCDONALD TOWN**
Sampler	:	**- Not provided -**
E-mail	:	adam.sullivan@ch2m.com.au
Telephone	:	02 9950 0200
Facsimile	:	02 9950 0600

Laboratory Details

Laboratory	:	**ALS Environmental Sydney**
Manager	:	**Greg Vogel**
Address	:	Smithfield NSW Australia 2164
Quote number	:	----
Work order	:	**ES0609995**
E-mail	:	Greg.Vogel@alsenviro.com
Telephone	:	+61 (02) 8784 8555
Facsimile	:	+61 (02) 8784 8500

Dates

Date Samples Received	:	15 Aug 2006	**SRA Issue Date**	:	22 Aug 2006
Scheduled Reporting Date	:	**22 Aug 2006**	**Client Requested Date**	:	22 Aug 2006

Delivery Details

Mode of Delivery	:	Carrier.	**Temperature**		:	CHILLED - Ice present
No. of coolers/boxes	:	1 HARD	**No. of samples**	**- Received**		36
Security Seal	:	Intact.		**- Analysed**		26

Comments

- **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).**
- **Asbestos analysis to be conducted by ASET.**
- **Sample"TP02/1.5" was not received at the laboratory.**

- Analytical work for this work order will be conducted at ALSE Sydney.
- 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 Nazeeh Aoun.
- 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'.

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.

Client	: CH2M HILL PTY LTD	**Work Order**	: ES0609995
Project	: 347496 McDonaldtown Gasworks	**ALS Quote Reference**	: ----

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

Some items described below may be part of a laboratory process neccessary 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)	**EA055-103 - SOIL** Moisture Content	**EK026G (Solids) - SOIL** Total Cyanide By Discrete Analyser	**S-04 - SOIL** TPH/BTEX	**S-07 - SOIL** TPH/BTEX/PAH (SIM)	**S-19 - SOIL** TPH/BTEX/P/Ph/OC/OP/PCB/8 metals				
ES0609995-001	**MG01/0.1 - 15 Aug 2006**	]									
ES0609995-002	**MG01/0.2 - 15 Aug 2006**	]									
ES0609995-003	**MG01/0.5 - 15 Aug 2006**										
ES0609995-004	**MG01/1.8 - 15 Aug 2006**		]	]			]				
ES0609995-005	**MG01/2.8 - 15 Aug 2006**					]					
ES0609995-006	**MG01/5 - 15 Aug 2006**					]					
ES0609995-007	**QC01 - 15 Aug 2006**					]					
ES0609995-008	**TRIP BLANK - 15 Aug 2006**				]						
ES0609995-009	**TRIP SPIKE 1 - 15 Aug 2006**				]						
ES0609995-010	**TP01/0.25 - 15 Aug 2006**	]									
ES0609995-011	**TP01/1.0 - 15 Aug 2006**					]					
ES0609995-012	**TP01/1.5 - 15 Aug 2006**						]				
ES0609995-013	**TP01/3.0 - 15 Aug 2006**					]					
ES0609995-014	**DUP01 - 15 Aug 2006**					]					
ES0609995-015	**TP02/0.25 - 15 Aug 2006**	]									
ES0609995-016	**TP02/0.5 - 15 Aug 2006**										
ES0609995-017	**TP02/1.0 - 15 Aug 2006**					]					
ES0609995-018	**TP02/3.0 - 15 Aug 2006**					]					
ES0609995-019	**TP02/4.5 - 15 Aug 2006**					]					
ES0609995-020	**TP03/0.25 - 15 Aug 2006**	]									
ES0609995-021	**TP03/0.5 - 15 Aug 2006**					]					
ES0609995-022	**TP03/1.0 - 15 Aug 2006**						]				
ES0609995-023	**TP03/2.0 - 15 Aug 2006**					]					
ES0609995-024	**TP03/4.0 - 15 Aug 2006**					]					
ES0609995-025	**DUP02 - 15 Aug 2006**					]					
ES0609995-026	**TS CONTROL 1 - 15 Aug 2006**				]						
ES0609995-027	**MG01/1.4 - 15 Aug 2006**										
ES0609995-028	**MG01/2.2 - 15 Aug 2006**										
ES0609995-029	**MG01/3.2 - 15 Aug 2006**										
ES0609995-030	**MG01/3.6 - 15 Aug 2006**										
ES0609995-031	**MG01/GAS PIPE - 15 Aug 2006**										
ES0609995-032	**TP01/2.0 - 15 Aug 2006**										
ES0609995-033	**TP02/2.0 - 15 Aug 2006**										
ES0609995-034	**TP02/4.0 - 15 Aug 2006**										
ES0609995-035	**TP03/1.5 - 15 Aug 2006**										
ES0609995-036	**TP03/3.0 - 15 Aug 2006**										
	Total(s) :	**5**	**1**	**1**	**3**	**13**	**3**				

Client	: CH2M HILL PTY LTD	**Work Order**	: ES0609995
Project	: 347496 McDonaldtown Gasworks	**ALS Quote Reference**	: ----

ALS Environmental

Requested Reports

l **MR ADAM SULLIVAN**

-	Subcontracted Reports	Email	adam.sullivan@ch2m.com.au
-	A4 - Certificate of Analysis - NEPM format	Email	adam.sullivan@ch2m.com.au
-	A4 - Quality Control Report - NEPM format	Email	adam.sullivan@ch2m.com.au
-	A4 - Interpretive Quality Control Report - NEPM format	Email	adam.sullivan@ch2m.com.au
-	ENMRG Export Format	Email	adam.sullivan@ch2m.com.au
-	ESDAT Export Format	Email	adam.sullivan@ch2m.com.au
-	Chain of Custody Acknowledgement	Email	adam.sullivan@ch2m.com.au
-	A4 - Sample Receipt Notification - Comprehensive format	Email	adam.sullivan@ch2m.com.au
-	Invoice	Email	adam.sullivan@ch2m.com.au

Sample Container(s) / Preservation Non-Compliance Log

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

l **No sample container / preservation non-compliance exist.**

AUSTRALIAN SAFER ENVIRONMENT & TECHNOLOGY PTY LTD

ABN 36 088 095 112

Our ref : ASET9446/ 12607 / 1 - 8
Your ref :ES0610062
NATA Accreditation No: 14484

22 August 2006

Australian Laboratory Services Pty Ltd
277, Woodpark Road,
Smithfield,
NSW 2164.

Attn:Mr Greg Vogel,
Fax No:02-87848500

Dear Greg,
Asbestos Identification
This report presents the results of eight samples, forwarded by Australian Laboratory Services Pty Ltd on 18 August 2006, for analysis for asbestos.

1.Introduction: Eight samples forwarded were examined and analysed for the presence of asbestos.

2. Methods : The samples were examined under a Stereo Microscope and selected fibres were analysed by Polarized Light Microscopy in conjunction with dispersion Staining method **(Safer Environment Method 1.)**

3. Results :

Sample No. 1. ASET9446 / 12607 / 1. ES0610062 - 009 - MG 03 - 0.1.
Approx dimensions 6.0 cm x 5.0 cm x 4.0 cm
The sample consisted of a mixture of soil, stones and fragments of plaster , bitumin and glass.
No asbestos detected.

Sample No. 2. ASET9446 / 12607 / 2. ES0610062 - 010 - TP 04 - 0.25.
Approx dimensions 6.0 cm x 4.0 cm x 3.5 cm
The sample consisted of a mixture of clayish soil, stones, plant matter and fragments of plaster, cement and brick.
No asbestos detected.

Sample No. 3. ASET9446 / 12607 / 3. ES0610062 - 014TP 05 - 0.25.
Approx dimensions 4.5 cm x 4.0 cm x 3.0 cm
The sample consisted of a mixture of soil, stones and fragments of plaster, cement, bitumin and glass.
No asbestos detected.

Sample No. 4. ASET9446 / 12607 / 4. ES0610062 - 019 - TP06 - 0.25.
Approx dimensions 4.0 cm x 3.5 cm x 3.0 cm
The sample consisted of a mixture of soil, stones, fragments of plaster, cement, bitumin and glass.
No asbestos detected.

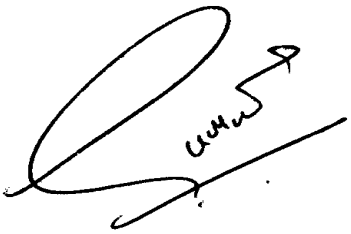
Sample No. 5. ASET9446 / 12607 / 5. ES0610062 - 023 - TP 07 - 0.25.
Approx dimensions 4.0 cm x 4.0 cm x 3.5 cm
The sample consisted of a mixture of soil, stones, plant matter and fragments of plaster and cement.
No asbestos detected.

Sample No. 6. ASET9446 / 12607 / 6. ES0610062 - 027 - TP08 - 0.25.
Approx dimensions 4.0 cm x 4.0 cm x 3.5 cm
The sample consisted of a mixture of soil, stones, plant matter and fragments of plaster, bitumin, cement, brick and glass.
No asbestos detected.

Sample No. 7. ASET9446 / 12607 / 7. ES0610062 - 031 - TP09 - 0.25.
Approx dimensions 4.0 cm x 3.5 cm x 3.5 cm
The sample consisted of a mixture of soil, stones, plant matter, fragments of plaster, cement and brick.
No asbestos detected.

Sample No. 8. ASET9446 / 12607 / 8. ES0610062 - 035 - TP 10 - 0.25
Approx dimensions 4.5 cm x 4.0 cm x 3.5 cm
The sample consisted of a mixture of soil, stones, plant matter and fragments of plaster, cement, bitumin, brick and glass.
No asbestos detected.

Analysed and reported by,



Mahen De Silva . BSc. MSc. Grad Dip (Occ Hyg)
Occupational Hygienist / Approved Signatory.

NATA
WORLD RECOGNISED
ACCREDITATION

ALS Environmental

CERTIFICATE OF ANALYSIS

Client	: **CH2M HILL PTY LTD**	*Laboratory*	: **ALS Environmental Sydney**	*Page*	: **1 of 34**
Contact	: **MR ADAM SULLIVAN**	*Contact*	: **Greg Vogel**	*Work Order*	: **ES0610062**
Address	: **PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515**	*Address*	: **277-289 Woodpark Road Smithfield NSW Australia 2164**		
E-mail	: **adam.sullivan@ch2m.com.au**	*E-mail*	: **Greg.Vogel@alsenviro.com**		
Telephone	: **02 9950 0200**	*Telephone*	: **+61 (02) 8784 8555**		
Facsimile	: **02 9950 0600**	*Facsimile*	: **+61 (02) 8784 8500**		
Project	: **347496 McDonaldtown Gasworks**	*Quote number*	: **----**	*Date received*	: **16 Aug 2006**
Order number	: **- Not provided -**			*Date issued*	: **28 Aug 2006**
C-O-C number	: **- Not provided -**			*No. of samples*	- *Received* : **59**
Site	: **MACDONALDTOWN**				*Analysed* : **39**

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*
Celine Conceicao	**Spectroscopist**	**Inorganics - NATA 825 (10911 - Sydney)**
Phyu Phyu Lwin	**Spectroscopist**	**Inorganics - NATA 825 (10911 - Sydney)**
Rassem Ayoubi	**Senior Organic Chemist**	**Organics - NATA 825 (10911 - Sydney)**
Sarah Millington	**Senior Inorganic Chemist**	**Inorganics - NATA 825 (10911 - Sydney)**

ALS Environmental

Comments

This report for the ALSE reference ES0610062 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 insuffient 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.

- **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 **ES0610062**

EPO68, EPO75(SIM), and EPO66: Particular samples required dilution prior to extraction due to matrix interferences. LOR values have been adjusted accordingly.
EP080: Various samples required dilution due to the presence of high level contaminants. LOR values have been adjusted accordingly.
EPO75(SIM) : Poor surrogate recovery due to high matrix interference.
EPO68:Particular samples TAR WELL #2 required dilution prior to extraction due to matrix interferences and high level of contaminants. LOR values have been adjusted accordingly.
EPO68, EPO75(SIM), and EPO66:Surrogates cannot be determined due to the matrix interferences.

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Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: MG02/0.2	MG02/1.8	MG02/4.7	TRIP BLANK 2	TRIP SPIKE 2
Sample Matrix Type / Description:				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time:				(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)
Laboratory Sample ID:				ES0610062-001	ES0610062-002	ES0610062-005	ES0610062-006	ES0610062-007
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%	16.6	23.7	18.2	14.6	5.8
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	----	8	----	----	----
Cadmium	7440-43-9	1	mg/kg	----	<1	----	----	----
Chromium	7440-47-3	2	mg/kg	----	28	----	----	----
Copper	7440-50-8	5	mg/kg	----	22	----	----	----
Lead	7439-92-1	5	mg/kg	----	93	----	----	----
Nickel	7440-02-0	2	mg/kg	----	6	----	----	----
Zinc	7440-66-6	5	mg/kg	----	156	----	----	----
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	----	<0.1	----	----	----
EK025G: Free cyanide by Discrete Analyser								
Total Cyanide	57-12-5	1.0	mg/kg	----	23.3	----	----	----
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls		0.10	mg/kg	----	<0.50	----	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	----	<0.25	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	----	<0.25	----	----	----
beta-BHC	319-85-7	0.05	mg/kg	----	<0.25	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg	----	<0.25	----	----	----
delta-BHC	319-86-8	0.05	mg/kg	----	<0.25	----	----	----
Heptachlor	76-44-8	0.05	mg/kg	----	<0.25	----	----	----
Aldrin	309-00-2	0.05	mg/kg	----	<0.25	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	----	<0.25	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	----	<0.25	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	----	<0.25	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	----	<0.25	----	----	----
Dieldrin	60-57-1	0.05	mg/kg	----	<0.25	----	----	----
4.4'-DDE	72-55-9	0.05	mg/kg	----	<0.25	----	----	----
Endrin	72-20-8	0.05	mg/kg	----	<0.25	----	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	----	<0.25	----	----	----
4.4'-DDD	72-54-8	0.05	mg/kg	----	<0.25	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	----	<0.25	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	----	<0.25	----	----	----
4.4'-DDT	50-29-3	0.2	mg/kg	----	<0.2	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg	----	<0.25	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg	----	<0.2	----	----	----

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Analytical Results

				Client Sample ID :	MG02/0.2	MG02/1.8	MG02/4.7	TRIP BLANK 2	TRIP SPIKE 2
				Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Date / Time :	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)
				Laboratory Sample ID :	ES0610062-001	ES0610062-002	ES0610062-005	ES0610062-006	ES0610062-007
Analyte	*CAS number*	*LOR*	*Units*						
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		----	<0.25	----	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg		----	<0.25	----	----	----
Monocrotophos	6923-22-4	0.2	mg/kg		----	<0.2	----	----	----
Dimethoate	60-51-5	0.05	mg/kg		----	<0.25	----	----	----
Diazinon	333-41-5	0.05	mg/kg		----	<0.25	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		----	<0.25	----	----	----
Parathion-methyl	298-00-0	0.2	mg/kg		----	<0.2	----	----	----
Malathion	121-75-5	0.05	mg/kg		----	<0.25	----	----	----
Fenthion	55-38-9	0.05	mg/kg		----	<0.25	----	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg		----	<0.25	----	----	----
Parathion	56-38-2	0.2	mg/kg		----	<0.2	----	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		----	<0.25	----	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg		----	<0.25	----	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg		----	<0.25	----	----	----
Fenamiphos	22224-92-6	0.05	mg/kg		----	<0.25	----	----	----
Prothiofos	34643-46-4	0.05	mg/kg		----	<0.25	----	----	----
Ethion	563-12-2	0.05	mg/kg		----	<0.25	----	----	----
Carbophenothion	786-19-6	0.05	mg/kg		----	<0.25	----	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg		----	<0.25	----	----	----
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		<0.5	<0.5	----	----	----
2-Chlorophenol	95-57-8	0.5	mg/kg		<0.5	<0.5	----	----	----
2-Methylphenol	95-48-7	0.5	mg/kg		<0.5	0.6	----	----	----
3- & 4-Methylphenol	1319-77-3	1.0	mg/kg		<1.0	4.3	----	----	----
2-Nitrophenol	88-75-5	0.5	mg/kg		<0.5	<0.5	----	----	----
2.4-Dimethylphenol	105-67-9	0.5	mg/kg		1.3	1.8	----	----	----
2.4-Dichlorophenol	120-83-2	0.5	mg/kg		<0.5	<0.5	----	----	----
2.6-Dichlorophenol	87-65-0	0.5	mg/kg		<0.5	<0.5	----	----	----
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg		<0.5	<0.5	----	----	----
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg		<0.5	<0.5	----	----	----
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg		<0.5	<0.5	----	----	----
Pentachlorophenol	87-86-5	2.0	mg/kg		<2.0	<2.0	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		142	1130	1.2	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	125	<0.5	----	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	70.8	<0.5	----	----
Fluorene	86-73-7	0.5	mg/kg		<0.5	275	<0.5	----	----

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: MG02/0.2	MG02/1.8	MG02/4.7	TRIP BLANK 2	TRIP SPIKE 2
Sample Matrix Type / Description:				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time:				(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)
Laboratory Sample ID:				ES0610062-001	ES0610062-002	ES0610062-005	ES0610062-006	ES0610062-007
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	961	<0.5	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	208	<0.5	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	590	<0.5	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	886	<0.5	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	202	<0.5	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	158	<0.5	----	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	193	<0.5	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	28.3	<0.5	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	178	<0.5	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	76.6	<0.5	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	98.2	<0.5	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	122	<0.5	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction		2	mg/kg	72	189	4	<2	29
C10 - C14 Fraction		50	mg/kg	290	10300	<50	<50	----
C15 - C28 Fraction		100	mg/kg	<100	21400	<100	<100	----
C29 - C36 Fraction		100	mg/kg	<100	4440	<100	<100	----
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	4.2	3.0	0.3	<0.2	2.0
Toluene	108-88-3	0.2	mg/kg	5.8	4.4	<0.2	<0.2	10.5
Ethylbenzene	100-41-4	0.2	mg/kg	22.1	30.2	<0.2	<0.2	2.0
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	15.2	93.4	<0.2	<0.2	8.5
ortho-Xylene	95-47-6	0.2	mg/kg	14.4	72.4	<0.2	<0.2	3.3
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	----	110	----	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE		0.1	%	----	90.2	----	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	----	95.9	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	102	110	97.1	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	106	120	99.0	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%	118	113	96.7	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	108	78.1	102	----	----
Anthracene-d10	1719-06-8	0.1	%	113	99.7	107	----	----

ALS Environmental

Analytical Results

				Client Sample ID :	MG02/0.2	MG02/1.8	MG02/4.7	TRIP BLANK 2	TRIP SPIKE 2
				Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Date / Time :	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)
				Laboratory Sample ID :					
Analyte	*CAS number*	*LOR*	*Units*		ES0610062-001	ES0610062-002	ES0610062-005	ES0610062-006	ES0610062-007
EP075(SIM)T: PAH Surrogates									
4-Terphenyl-d14	1718-51-0	0.1	%		118	34.1	91.5	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		108	106	106	110	97.0
Toluene-D8	2037-26-5	0.1	%		98.0	94.4	108	115	119
4-Bromofluorobenzene	460-00-4	0.1	%		117	108	110	108	108

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: TP02/4.5 Sample Matrix Type / Description: SOIL Sample Date / Time: (16 Aug 2006) (15:00) Laboratory Sample ID: ES0610062-008	Client Sample ID: MG03/0.1 Sample Matrix Type / Description: SOIL Sample Date / Time: (16 Aug 2006) (15:00) Laboratory Sample ID: ES0610062-009	Client Sample ID: TP04/0.5 Sample Matrix Type / Description: SOIL Sample Date / Time: (16 Aug 2006) (15:00) Laboratory Sample ID: ES0610062-011	Client Sample ID: TP04/0.7 Sample Matrix Type / Description: SOIL Sample Date / Time: (16 Aug 2006) (15:00) Laboratory Sample ID: ES0610062-012	Client Sample ID: TP04/3.0 Sample Matrix Type / Description: SOIL Sample Date / Time: (16 Aug 2006) (15:00) Laboratory Sample ID: ES0610062-013
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%	17.9	21.0	17.1	17.3	20.8
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	7	49	----	15	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	<1	----
Chromium	7440-47-3	2	mg/kg	22	17	----	11	----
Copper	7440-50-8	5	mg/kg	<5	202	----	16	----
Lead	7439-92-1	5	mg/kg	16	648	----	47	----
Nickel	7440-02-0	2	mg/kg	<2	16	----	<2	----
Zinc	7440-66-6	5	mg/kg	<5	315	----	17	----
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	0.9	----	0.1	----
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls		0.10	mg/kg	----	<0.10	----	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
4.4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
4.4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
4.4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	----	<0.2	----
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	----	<0.2	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	----	<0.05	----

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: TP02/4.5 Sample Matrix Type / Description: SOIL Sample Date / Time: (16 Aug 2006) (15:00) Laboratory Sample ID: ES0610062-008	Client Sample ID: MG03/0.1 Sample Matrix Type / Description: SOIL Sample Date / Time: (16 Aug 2006) (15:00) Laboratory Sample ID: ES0610062-009	Client Sample ID: TP04/0.5 Sample Matrix Type / Description: SOIL Sample Date / Time: (16 Aug 2006) (15:00) Laboratory Sample ID: ES0610062-011	Client Sample ID: TP04/0.7 Sample Matrix Type / Description: SOIL Sample Date / Time: (16 Aug 2006) (15:00) Laboratory Sample ID: ES0610062-012	Client Sample ID: TP04/3.0 Sample Matrix Type / Description: SOIL Sample Date / Time: (16 Aug 2006) (15:00) Laboratory Sample ID: ES0610062-013
EP068B: Organophosphorus Pesticides (OP)								
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	----	<0.2	----
Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	----	<0.2	----
Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	----	<0.2	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	----	<0.05	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	----	<0.5	----	----	----
2-Chlorophenol	95-57-8	0.5	mg/kg	----	<0.5	----	----	----
2-Methylphenol	95-48-7	0.5	mg/kg	----	<0.5	----	----	----
3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	----	<1.0	----	----	----
2-Nitrophenol	88-75-5	0.5	mg/kg	----	<0.5	----	----	----
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	----	<0.5	----	----	----
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	----	<0.5	----	----	----
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	----	<0.5	----	----	----
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	----	<0.5	----	----	----
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	----	<0.5	----	----	----
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	----	<0.5	----	----	----
Pentachlorophenol	87-86-5	2.0	mg/kg	----	<2.0	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	1.7	<0.5	1.3	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	3.8	<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	1.1	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	10.4	<0.5	<0.5	<0.5

ALS Environmental

Analytical Results

				Client Sample ID :	TP02/4.5	MG03/0.1	TP04/0.5	TP04/0.7	TP04/3.0
				Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Date / Time :	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)
				Laboratory Sample ID :					
Analyte	*CAS number*	*LOR*	*Units*		ES0610062-008	ES0610062-009	ES0610062-011	ES0610062-012	ES0610062-013
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Anthracene	120-12-7	0.5	mg/kg		<0.5	3.7	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	15.3	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg		<0.5	21.2	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	10.8	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	9.2	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg		<0.5	12.4	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	2.4	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	10.4	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	4.2	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	1.6	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	6.6	<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	100	<50	<50	<50
C15 - C28 Fraction		100	mg/kg		<100	1800	<100	<100	<100
C29 - C36 Fraction		100	mg/kg		<100	850	<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	108-38-3 106-42-3	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
ortho-Xylene	95-47-6	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
EP066S: PCB Surrogate									
Decachlorobiphenyl	2051-24-3	0.1	%		----	116	----	----	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE		0.1	%		83.4	77.1	----	82.5	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.1	%		87.9	96.1	----	96.5	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.1	%		113	89.6	92.5	91.0	85.8
2-Chlorophenol-D4	93951-73-6	0.1	%		117	91.6	95.3	92.9	89.3
2.4.6-Tribromophenol	118-79-6	0.1	%		113	91.1	95.5	96.5	80.9
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		111	88.5	92.1	81.9	85.3
Anthracene-d10	1719-06-8	0.1	%		114	89.4	91.2	93.8	93.4
4-Terphenyl-d14	1718-51-0	0.1	%		111	83.6	86.0	94.2	83.4

ALS Environmental

Analytical Results

				Client Sample ID :	TP02/4.5	MG03/0.1	TP04/0.5	TP04/0.7	TP04/3.0
				Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Date / Time :	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)
				Laboratory Sample ID :					
Analyte	*CAS number*	*LOR*	*Units*		ES0610062-008	ES0610062-009	ES0610062-011	ES0610062-012	ES0610062-013
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		90.8	93.4	106	83.2	85.7
Toluene-D8	2037-26-5	0.1	%		101	114	110	107	118
4-Bromofluorobenzene	460-00-4	0.1	%		94.9	92.0	103	106	116

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: TP05/0.25	TP05/0.5	TP05/1.5	TP05/2.0	DUP03
Sample Matrix Type / Description:				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time:				(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)
Laboratory Sample ID:				ES0610062-014	ES0610062-015	ES0610062-016	ES0610062-017	ES0610062-018
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%	19.6	16.2	17.5	23.9	21.3
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	----	<5	6	----	----
Cadmium	7440-43-9	1	mg/kg	----	<1	<1	----	----
Chromium	7440-47-3	2	mg/kg	----	<2	5	----	----
Copper	7440-50-8	5	mg/kg	----	15	29	----	----
Lead	7439-92-1	5	mg/kg	----	6	172	----	----
Nickel	7440-02-0	2	mg/kg	----	<2	10	----	----
Zinc	7440-66-6	5	mg/kg	----	28	147	----	----
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	----	<0.1	0.3	----	----
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls		0.10	mg/kg	----	<0.10	----	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	----	<0.05	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	----	<0.05	----	----	----
beta-BHC	319-85-7	0.05	mg/kg	----	<0.05	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg	----	<0.05	----	----	----
delta-BHC	319-86-8	0.05	mg/kg	----	<0.05	----	----	----
Heptachlor	76-44-8	0.05	mg/kg	----	<0.05	----	----	----
Aldrin	309-00-2	0.05	mg/kg	----	<0.05	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	----	<0.05	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	----	0.08	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	----	<0.05	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	----	0.06	----	----	----
Dieldrin	60-57-1	0.05	mg/kg	----	<0.05	----	----	----
4.4'-DDE	72-55-9	0.05	mg/kg	----	<0.05	----	----	----
Endrin	72-20-8	0.05	mg/kg	----	<0.05	----	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	----	<0.05	----	----	----
4.4'-DDD	72-54-8	0.05	mg/kg	----	<0.05	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	----	<0.05	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	----	<0.05	----	----	----
4.4'-DDT	50-29-3	0.2	mg/kg	----	<0.2	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg	----	<0.05	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg	----	<0.2	----	----	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	----	<0.05	----	----	----

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: TP05/0.25	TP05/0.5	TP05/1.5	TP05/2.0	DUP03
Sample Matrix Type / Description				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time				(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)
Laboratory Sample ID				ES0610062-014	ES0610062-015	ES0610062-016	ES0610062-017	ES0610062-018
EP068B: Organophosphorus Pesticides (OP)								
Demeton-S-methyl	919-86-8	0.05	mg/kg	----	<0.05	----	----	----
Monocrotophos	6923-22-4	0.2	mg/kg	----	<0.2	----	----	----
Dimethoate	60-51-5	0.05	mg/kg	----	<0.05	----	----	----
Diazinon	333-41-5	0.05	mg/kg	----	<0.05	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	----	<0.05	----	----	----
Parathion-methyl	298-00-0	0.2	mg/kg	----	<0.2	----	----	----
Malathion	121-75-5	0.05	mg/kg	----	<0.05	----	----	----
Fenthion	55-38-9	0.05	mg/kg	----	<0.05	----	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg	----	<0.05	----	----	----
Parathion	56-38-2	0.2	mg/kg	----	<0.2	----	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	----	<0.05	----	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg	----	<0.05	----	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg	----	<0.05	----	----	----
Fenamiphos	22224-92-6	0.05	mg/kg	----	<0.05	----	----	----
Prothiofos	34643-46-4	0.05	mg/kg	----	<0.05	----	----	----
Ethion	563-12-2	0.05	mg/kg	----	<0.05	----	----	----
Carbophenothion	786-19-6	0.05	mg/kg	----	<0.05	----	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg	----	<0.05	----	----	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	----	----	----
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	----	----	----
2-Methylphenol	95-48-7	0.5	mg/kg	2.4	<0.5	----	----	----
3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	4.0	<1.0	----	----	----
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	----	----	----
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	1.7	<0.5	----	----	----
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	----	----	----
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	----	----	----
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	----	----	----
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	----	----	----
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	----	----	----
Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	<2.0	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	965	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	114	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	72.1	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	196	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	792	<0.5	0.9	<0.5	<0.5

ALS Environmental

Analytical Results

Client Sample ID	TP05/0.25	TP05/0.5	TP05/1.5	TP05/2.0	DUP03
Sample Matrix Type / Description	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)
Laboratory Sample ID	ES0610062-014	ES0610062-015	ES0610062-016	ES0610062-017	ES0610062-018

Analyte	CAS number	LOR	Units					
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Anthracene	120-12-7	0.5	mg/kg	206	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	459	<0.5	1.2	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	684	<0.5	1.1	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	188	<0.5	0.7	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	154	<0.5	0.6	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	87.6	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	27.1	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	158	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	69.2	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	25.9	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	103	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction		2	mg/kg	----	<2	<2	<2	<2
C10 - C14 Fraction		50	mg/kg	----	<50	<50	<50	<50
C15 - C28 Fraction		100	mg/kg	----	<100	<100	<100	<100
C29 - C36 Fraction		100	mg/kg	----	<100	<100	<100	<100
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	----	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.2	mg/kg	----	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	100-41-4	0.2	mg/kg	----	<0.2	<0.2	<0.2	<0.2
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	----	<0.2	<0.2	<0.2	<0.2
ortho-Xylene	95-47-6	0.2	mg/kg	----	<0.2	<0.2	<0.2	<0.2
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	----	81.1	----	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE		0.1	%	----	68.6	----	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	----	73.2	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	101	88.0	92.8	111	82.2
2-Chlorophenol-D4	93951-73-6	0.1	%	111	92.6	95.6	121	86.1
2.4.6-Tribromophenol	118-79-6	0.1	%	96.7	86.3	90.0	114	80.5
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	78.0	86.4	81.1	113	80.8
Anthracene-d10	1719-06-8	0.1	%	91.4	107	95.4	131	90.1
4-Terphenyl-d14	1718-51-0	0.1	%	33.6	88.4	98.2	125	86.2

ALS Environmental

Analytical Results

				Client Sample ID :	TP05/0.25	TP05/0.5	TP05/1.5	TP05/2.0	DUP03
				Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Date / Time :	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)
				Laboratory Sample ID :					
Analyte	*CAS number*	*LOR*	*Units*		ES0610062-014	ES0610062-015	ES0610062-016	ES0610062-017	ES0610062-018
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		----	105	100	94.5	89.2
Toluene-D8	2037-26-5	0.1	%		----	119	114	102	106
4-Bromofluorobenzene	460-00-4	0.1	%		----	104	99.5	100	94.8

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: TP06/0.25	TP06/0.5	TP06/1.0	TP06/2.5	TP07/0.5
Sample Matrix Type / Description:				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time:				(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)
Laboratory Sample ID:				ES0610062-019	ES0610062-020	ES0610062-021	ES0610062-022	ES0610062-024
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%	----	11.4	20.8	23.1	17.5
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	----	----	<5	----	13
Cadmium	7440-43-9	1	mg/kg	----	----	<1	----	<1
Chromium	7440-47-3	2	mg/kg	----	----	5	----	5
Copper	7440-50-8	5	mg/kg	----	----	<5	----	60
Lead	7439-92-1	5	mg/kg	----	----	10	----	28
Nickel	7440-02-0	2	mg/kg	----	----	<2	----	2
Zinc	7440-66-6	5	mg/kg	----	----	6	----	11
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	----	----	<0.1	----	0.2
EK025G: Free cyanide by Discrete Analyser								
Total Cyanide	57-12-5	1.0	mg/kg	----	<1.0	<1.0	----	<1.0
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls		0.10	mg/kg	----	----	<0.10	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	----	----	<0.05	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	----	----	<0.05	----	----
beta-BHC	319-85-7	0.05	mg/kg	----	----	<0.05	----	----
gamma-BHC	58-89-9	0.05	mg/kg	----	----	<0.05	----	----
delta-BHC	319-86-8	0.05	mg/kg	----	----	<0.05	----	----
Heptachlor	76-44-8	0.05	mg/kg	----	----	<0.05	----	----
Aldrin	309-00-2	0.05	mg/kg	----	----	<0.05	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	----	----	<0.05	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	----	----	<0.05	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	----	----	<0.05	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	----	----	<0.05	----	----
Dieldrin	60-57-1	0.05	mg/kg	----	----	<0.05	----	----
4.4'-DDE	72-55-9	0.05	mg/kg	----	----	<0.05	----	----
Endrin	72-20-8	0.05	mg/kg	----	----	<0.05	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	----	----	<0.05	----	----
4.4'-DDD	72-54-8	0.05	mg/kg	----	----	<0.05	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	----	----	<0.05	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	----	----	<0.05	----	----
4.4'-DDT	50-29-3	0.2	mg/kg	----	----	<0.2	----	----
Endrin ketone	53494-70-5	0.05	mg/kg	----	----	<0.05	----	----
Methoxychlor	72-43-5	0.2	mg/kg	----	----	<0.2	----	----

ALS Environmental

Analytical Results

				Client Sample ID :	TP06/0.25	TP06/0.5	TP06/1.0	TP06/2.5	TP07/0.5
				Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Date / Time :	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)
				Laboratory Sample ID :					
Analyte	*CAS number*	*LOR*	*Units*		ES0610062-019	ES0610062-020	ES0610062-021	ES0610062-022	ES0610062-024
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		----	----	<0.05	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg		----	----	<0.05	----	----
Monocrotophos	6923-22-4	0.2	mg/kg		----	----	<0.2	----	----
Dimethoate	60-51-5	0.05	mg/kg		----	----	<0.05	----	----
Diazinon	333-41-5	0.05	mg/kg		----	----	<0.05	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		----	----	<0.05	----	----
Parathion-methyl	298-00-0	0.2	mg/kg		----	----	<0.2	----	----
Malathion	121-75-5	0.05	mg/kg		----	----	<0.05	----	----
Fenthion	55-38-9	0.05	mg/kg		----	----	<0.05	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg		----	----	<0.05	----	----
Parathion	56-38-2	0.2	mg/kg		----	----	<0.2	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		----	----	<0.05	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg		----	----	<0.05	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg		----	----	<0.05	----	----
Fenamiphos	22224-92-6	0.05	mg/kg		----	----	<0.05	----	----
Prothiofos	34643-46-4	0.05	mg/kg		----	----	<0.05	----	----
Ethion	563-12-2	0.05	mg/kg		----	----	<0.05	----	----
Carbophenothion	786-19-6	0.05	mg/kg		----	----	<0.05	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg		----	----	<0.05	----	----
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		6.6	----	<0.5	----	----
2-Chlorophenol	95-57-8	0.5	mg/kg		<0.5	----	<0.5	----	----
2-Methylphenol	95-48-7	0.5	mg/kg		3.0	----	<0.5	----	----
3- & 4-Methylphenol	1319-77-3	1.0	mg/kg		7.8	----	<1.0	----	----
2-Nitrophenol	88-75-5	0.5	mg/kg		<0.5	----	<0.5	----	----
2.4-Dimethylphenol	105-67-9	0.5	mg/kg		3.1	----	<0.5	----	----
2.4-Dichlorophenol	120-83-2	0.5	mg/kg		<0.5	----	<0.5	----	----
2.6-Dichlorophenol	87-65-0	0.5	mg/kg		<0.5	----	<0.5	----	----
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg		<0.5	----	<0.5	----	----
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg		<0.5	----	<0.5	----	----
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg		<0.5	----	<0.5	----	----
Pentachlorophenol	87-86-5	2.0	mg/kg		<2.0	----	<2.0	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		5.4	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		18.3	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		2.0	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		8.9	<0.5	<0.5	<0.5	<0.5

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: TP06/0.25	TP06/0.5	TP06/1.0	TP06/2.5	TP07/0.5
Sample Matrix Type / Description:				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time:				(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)
Laboratory Sample ID:				ES0610062-019	ES0610062-020	ES0610062-021	ES0610062-022	ES0610062-024
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Phenanthrene	85-01-8	0.5	mg/kg	70.8	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	30.2	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	106	<0.5	1.4	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	117	<0.5	1.7	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	69.8	<0.5	0.8	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	51.7	<0.5	0.8	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	70.6	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	17.4	<0.5	0.6	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	55.0	<0.5	0.7	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	26.8	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	10.6	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	29.7	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction		2	mg/kg	----	<2	<2	<2	<2
C10 - C14 Fraction		50	mg/kg	----	<50	<50	<50	<50
C15 - C28 Fraction		100	mg/kg	----	<100	<100	<100	<100
C29 - C36 Fraction		100	mg/kg	----	<100	<100	<100	<100
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	----	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.2	mg/kg	----	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	100-41-4	0.2	mg/kg	----	<0.2	<0.2	<0.2	<0.2
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	----	<0.2	<0.2	<0.2	<0.2
ortho-Xylene	95-47-6	0.2	mg/kg	----	<0.2	<0.2	<0.2	<0.2
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	----	----	101	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE		0.1	%	----	----	75.0	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	----	----	85.1	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	92.4	95.5	81.4	75.3	77.4
2-Chlorophenol-D4	93951-73-6	0.1	%	96.1	101	84.8	79.4	81.7
2.4.6-Tribromophenol	118-79-6	0.1	%	107	94.0	76.8	77.1	73.9
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	98.0	95.8	83.6	79.4	80.4
Anthracene-d10	1719-06-8	0.1	%	88.9	111	86.7	78.2	83.6

ALS Environmental

Analytical Results

				Client Sample ID :	**TP06/0.25**	**TP06/0.5**	**TP06/1.0**	**TP06/2.5**	**TP07/0.5**
				Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Date / Time :	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)
				Laboratory Sample ID :					
Analyte	***CAS number***	***LOR***	***Units***		**ES0610062-019**	**ES0610062-020**	**ES0610062-021**	**ES0610062-022**	**ES0610062-024**
EP075(SIM)T: PAH Surrogates									
4-Terphenyl-d14	1718-51-0	0.1	%		59.2	111	76.8	75.4	76.1
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		----	86.0	96.7	98.1	105
Toluene-D8	2037-26-5	0.1	%		----	99.3	95.5	90.3	93.2
4-Bromofluorobenzene	460-00-4	0.1	%		----	84.3	88.5	86.8	88.6

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: TP07/1.5	TP07/2.0	TP08/0.25	TP08/0.5	TP08/1.0
Sample Matrix Type / Description:				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time:				(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)
Laboratory Sample ID:				ES0610062-025	ES0610062-026	ES0610062-027	ES0610062-028	ES0610062-029
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%	26.4	22.0	----	14.8	18.7
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	----	----	----	<5	8
Cadmium	7440-43-9	1	mg/kg	----	----	----	<1	<1
Chromium	7440-47-3	2	mg/kg	----	----	----	16	26
Copper	7440-50-8	5	mg/kg	----	----	----	<5	<5
Lead	7439-92-1	5	mg/kg	----	----	----	8	14
Nickel	7440-02-0	2	mg/kg	----	----	----	<2	<2
Zinc	7440-66-6	5	mg/kg	----	----	----	5	<5
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	----	----	----	<0.1	<0.1
EK025G: Free cyanide by Discrete Analyser								
Total Cyanide	57-12-5	1.0	mg/kg	----	----	----	<1.0	<1.0
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls		0.10	mg/kg	----	----	----	<0.10	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	----	----	----	<0.05	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	----	----	----	<0.05	----
beta-BHC	319-85-7	0.05	mg/kg	----	----	----	<0.05	----
gamma-BHC	58-89-9	0.05	mg/kg	----	----	----	<0.05	----
delta-BHC	319-86-8	0.05	mg/kg	----	----	----	<0.05	----
Heptachlor	76-44-8	0.05	mg/kg	----	----	----	<0.05	----
Aldrin	309-00-2	0.05	mg/kg	----	----	----	<0.05	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	----	----	----	<0.05	----
trans-Chlordane	5103-74-2	0.05	mg/kg	----	----	----	<0.05	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	----	----	----	<0.05	----
cis-Chlordane	5103-71-9	0.05	mg/kg	----	----	----	<0.05	----
Dieldrin	60-57-1	0.05	mg/kg	----	----	----	<0.05	----
4.4'-DDE	72-55-9	0.05	mg/kg	----	----	----	<0.05	----
Endrin	72-20-8	0.05	mg/kg	----	----	----	<0.05	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	----	----	----	<0.05	----
4.4'-DDD	72-54-8	0.05	mg/kg	----	----	----	<0.05	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	----	----	----	<0.05	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	----	----	----	<0.05	----
4.4'-DDT	50-29-3	0.2	mg/kg	----	----	----	<0.2	----
Endrin ketone	53494-70-5	0.05	mg/kg	----	----	----	<0.05	----
Methoxychlor	72-43-5	0.2	mg/kg	----	----	----	<0.2	----

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID : TP07/1.5	TP07/2.0	TP08/0.25	TP08/0.5	TP08/1.0
Sample Matrix Type / Description :				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time :				(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)
Laboratory Sample ID :				ES0610062-025	ES0610062-026	ES0610062-027	ES0610062-028	ES0610062-029
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	----	----	----	<0.05	----
Demeton-S-methyl	919-86-8	0.05	mg/kg	----	----	----	<0.05	----
Monocrotophos	6923-22-4	0.2	mg/kg	----	----	----	<0.2	----
Dimethoate	60-51-5	0.05	mg/kg	----	----	----	<0.05	----
Diazinon	333-41-5	0.05	mg/kg	----	----	----	<0.05	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	----	----	----	<0.05	----
Parathion-methyl	298-00-0	0.2	mg/kg	----	----	----	<0.2	----
Malathion	121-75-5	0.05	mg/kg	----	----	----	<0.05	----
Fenthion	55-38-9	0.05	mg/kg	----	----	----	<0.05	----
Chlorpyrifos	2921-88-2	0.05	mg/kg	----	----	----	<0.05	----
Parathion	56-38-2	0.2	mg/kg	----	----	----	<0.2	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	----	----	----	<0.05	----
Chlorfenvinphos	470-90-6	0.05	mg/kg	----	----	----	<0.05	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg	----	----	----	<0.05	----
Fenamiphos	22224-92-6	0.05	mg/kg	----	----	----	<0.05	----
Prothiofos	34643-46-4	0.05	mg/kg	----	----	----	<0.05	----
Ethion	563-12-2	0.05	mg/kg	----	----	----	<0.05	----
Carbophenothion	786-19-6	0.05	mg/kg	----	----	----	<0.05	----
Azinphos Methyl	86-50-0	0.05	mg/kg	----	----	----	<0.05	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	----	----	<1.0	<1.0	<1.0
2-Nitrophenol	88-75-5	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2.0	mg/kg	----	----	<2.0	<2.0	<2.0
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.6	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	1.1	<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

ALS Environmental

Analytical Results

Client Sample ID				TP07/1.5	TP07/2.0	TP08/0.25	TP08/0.5	TP08/1.0
Sample Matrix Type / Description				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time				(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)
Laboratory Sample ID				ES0610062-025	ES0610062-026	ES0610062-027	ES0610062-028	ES0610062-029
Analyte	*CAS number*	*LOR*	*Units*					
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	4.7	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	2.0	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	10.1	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	12.8	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	7.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	7.0	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	5.4	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	6.7	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	8.2	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	4.6	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	1.9	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	5.8	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction		2	mg/kg	<2	<2	----	<2	<2
C10 - C14 Fraction		50	mg/kg	<50	<50	----	<50	<50
C15 - C28 Fraction		100	mg/kg	<100	<100	----	<100	<100
C29 - C36 Fraction		100	mg/kg	<100	<100	----	<100	<100
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	----	<0.2	<0.2
Toluene	108-88-3	0.2	mg/kg	<0.2	<0.2	----	<0.2	<0.2
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	<0.2	----	<0.2	<0.2
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	<0.2	----	<0.2	<0.2
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	----	<0.2	<0.2
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	----	----	----	100	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE		0.1	%	----	----	----	90.4	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	----	----	----	91.8	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	75.1	77.2	74.4	78.3	75.3
2-Chlorophenol-D4	93951-73-6	0.1	%	79.4	79.0	79.1	81.9	79.8
2.4.6-Tribromophenol	118-79-6	0.1	%	75.3	66.0	73.6	79.1	75.9
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	77.2	82.5	81.8	81.6	79.4
Anthracene-d10	1719-06-8	0.1	%	80.7	77.7	82.6	84.7	80.4

ALS Environmental

Analytical Results

				Client Sample ID :	TP07/1.5	TP07/2.0	TP08/0.25	TP08/0.5	TP08/1.0
				Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Date / Time :	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)
				Laboratory Sample ID :					
Analyte	*CAS number*	*LOR*	*Units*		ES0610062-025	ES0610062-026	ES0610062-027	ES0610062-028	ES0610062-029
EP075(SIM)T: PAH Surrogates									
4-Terphenyl-d14	1718-51-0	0.1	%		72.6	78.6	71.6	75.4	74.2
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		109	106	----	110	119
Toluene-D8	2037-26-5	0.1	%		113	92.7	----	92.6	102
4-Bromofluorobenzene	460-00-4	0.1	%		97.9	92.7	----	91.6	101

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: TP08/2.0	TP09/0.5	TP09/1.0	TP09/2.5	TP10/1.0
Sample Matrix Type / Description:				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time:				(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)
Laboratory Sample ID:				ES0610062-030	ES0610062-032	ES0610062-033	ES0610062-034	ES0610062-036
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%	21.8	9.7	19.8	24.2	6.9
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	6	----	5	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	----	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	22	----	7	13	2
Copper	7440-50-8	5	mg/kg	5	----	27	6	38
Lead	7439-92-1	5	mg/kg	17	----	22	17	25
Nickel	7440-02-0	2	mg/kg	<2	----	<2	<2	2
Zinc	7440-66-6	5	mg/kg	<5	----	<5	<5	160
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	<0.1	<0.1	<0.1
EK025G: Free cyanide by Discrete Analyser								
Total Cyanide	57-12-5	1.0	mg/kg	----	----	<1.0	----	<1.0
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls		0.10	mg/kg	----	----	----	----	<0.10
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	----	----	----	----	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	----	----	----	----	<0.05
beta-BHC	319-85-7	0.05	mg/kg	----	----	----	----	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	----	----	----	----	<0.05
delta-BHC	319-86-8	0.05	mg/kg	----	----	----	----	<0.05
Heptachlor	76-44-8	0.05	mg/kg	----	----	----	----	<0.05
Aldrin	309-00-2	0.05	mg/kg	----	----	----	----	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	----	----	----	----	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	----	----	----	----	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	----	----	----	----	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	----	----	----	----	<0.05
Dieldrin	60-57-1	0.05	mg/kg	----	----	----	----	<0.05
4.4'-DDE	72-55-9	0.05	mg/kg	----	----	----	----	<0.05
Endrin	72-20-8	0.05	mg/kg	----	----	----	----	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	----	----	----	----	<0.05
4.4'-DDD	72-54-8	0.05	mg/kg	----	----	----	----	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	----	----	----	----	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	----	----	----	----	<0.05
4.4'-DDT	50-29-3	0.2	mg/kg	----	----	----	----	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	----	----	----	----	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	----	----	----	----	<0.2

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: TP08/2.0	TP09/0.5	TP09/1.0	TP09/2.5	TP10/1.0
Sample Matrix Type / Description:				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time:				(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)
Laboratory Sample ID:				ES0610062-030	ES0610062-032	ES0610062-033	ES0610062-034	ES0610062-036
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	----	----	----	----	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg	----	----	----	----	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg	----	----	----	----	<0.2
Dimethoate	60-51-5	0.05	mg/kg	----	----	----	----	<0.05
Diazinon	333-41-5	0.05	mg/kg	----	----	----	----	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	----	----	----	----	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg	----	----	----	----	<0.2
Malathion	121-75-5	0.05	mg/kg	----	----	----	----	<0.05
Fenthion	55-38-9	0.05	mg/kg	----	----	----	----	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg	----	----	----	----	<0.05
Parathion	56-38-2	0.2	mg/kg	----	----	----	----	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	----	----	----	----	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg	----	----	----	----	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg	----	----	----	----	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg	----	----	----	----	<0.05
Prothiofos	34643-46-4	0.05	mg/kg	----	----	----	----	<0.05
Ethion	563-12-2	0.05	mg/kg	----	----	----	----	<0.05
Carbophenothion	786-19-6	0.05	mg/kg	----	----	----	----	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg	----	----	----	----	<0.05
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	----	----	<0.5	----	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	----	----	<0.5	----	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	----	----	<0.5	----	<0.5
3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	----	----	<1.0	----	<1.0
2-Nitrophenol	88-75-5	0.5	mg/kg	----	----	<0.5	----	<0.5
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	----	----	<0.5	----	<0.5
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	----	----	<0.5	----	<0.5
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	----	----	<0.5	----	<0.5
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	----	----	<0.5	----	<0.5
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	----	----	<0.5	----	<0.5
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	----	----	<0.5	----	<0.5
Pentachlorophenol	87-86-5	2.0	mg/kg	----	----	<2.0	----	<2.0
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	0.6	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	0.9	<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	0.7	<0.5	<0.5	<0.5

ALS Environmental

Analytical Results

Client Sample ID				TP08/2.0	TP09/0.5	TP09/1.0	TP09/2.5	TP10/1.0
Sample Matrix Type / Description				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time				(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)
Laboratory Sample ID				ES0610062-030	ES0610062-032	ES0610062-033	ES0610062-034	ES0610062-036
Analyte	*CAS number*	*LOR*	*Units*					
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	2.1	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	12.6	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	13.1	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6.0	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	5.2	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	3.7	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4.2	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	5.4	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	2.8	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	0.9	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	3.3	<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	290	<100	<100	<100
C29 - C36 Fraction		100	mg/kg	<100	180	<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	108-38-3 106-42-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	----	----	----	----	114
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE		0.1	%	----	----	----	----	89.9
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	----	----	----	----	91.4
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	78.1	81.4	80.5	80.9	80.0
2-Chlorophenol-D4	93951-73-6	0.1	%	81.7	84.8	82.7	85.1	83.6
2.4.6-Tribromophenol	118-79-6	0.1	%	73.4	78.5	76.7	78.8	73.1
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	80.3	84.6	83.1	86.8	83.0
Anthracene-d10	1719-06-8	0.1	%	80.2	87.5	83.6	85.5	88.3

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Analytical Results

			Client Sample ID :	**TP08/2.0**	**TP09/0.5**	**TP09/1.0**	**TP09/2.5**	**TP10/1.0**
			Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Date / Time :	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)
			Laboratory Sample ID :					
Analyte	***CAS number***	***LOR***	***Units***	**ES0610062-030**	**ES0610062-032**	**ES0610062-033**	**ES0610062-034**	**ES0610062-036**
EP075(SIM)T: PAH Surrogates								
4-Terphenyl-d14	1718-51-0	0.1	%	75.6	76.3	77.1	81.0	77.4
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	108	120	102	116	105
Toluene-D8	2037-26-5	0.1	%	89.6	97.4	86.1	99.2	99.5
4-Bromofluorobenzene	460-00-4	0.1	%	86.3	96.2	85.1	94.9	93.3

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Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: TP10/2.0	TP10/4.0	DUP04	DUP05	TAR WELL #2
Sample Matrix Type / Description:				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time:				(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)
Laboratory Sample ID:				ES0610062-037	ES0610062-038	ES0610062-039	ES0610062-040	ES0610062-044
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%	12.4	21.1	18.6	22.7	18.0
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	7	7	<5	<5	<5
Cadmium	7440-43-9	1	mg/kg	1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	9	17	9	12	<2
Copper	7440-50-8	5	mg/kg	44	6	<5	14	16
Lead	7439-92-1	5	mg/kg	62	16	11	72	14
Nickel	7440-02-0	2	mg/kg	5	<2	<2	2	8
Zinc	7440-66-6	5	mg/kg	634	<5	<5	12	23
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	0.1	3.0
EK025G: Free cyanide by Discrete Analyser								
Total Cyanide	57-12-5	1.0	mg/kg	2.2	----	----	----	67.1
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls		0.10	mg/kg	----	----	----	----	<5.00
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	----	----	----	----	<2.50
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	----	----	----	----	<2.50
beta-BHC	319-85-7	0.05	mg/kg	----	----	----	----	<2.50
gamma-BHC	58-89-9	0.05	mg/kg	----	----	----	----	<2.50
delta-BHC	319-86-8	0.05	mg/kg	----	----	----	----	<2.50
Heptachlor	76-44-8	0.05	mg/kg	----	----	----	----	<2.50
Aldrin	309-00-2	0.05	mg/kg	----	----	----	----	<2.50
Heptachlor epoxide	1024-57-3	0.05	mg/kg	----	----	----	----	<2.50
trans-Chlordane	5103-74-2	0.05	mg/kg	----	----	----	----	<2.50
alpha-Endosulfan	959-98-8	0.05	mg/kg	----	----	----	----	<2.50
cis-Chlordane	5103-71-9	0.05	mg/kg	----	----	----	----	<2.50
Dieldrin	60-57-1	0.05	mg/kg	----	----	----	----	<2.50
4.4'-DDE	72-55-9	0.05	mg/kg	----	----	----	----	<2.50
Endrin	72-20-8	0.05	mg/kg	----	----	----	----	<2.50
beta-Endosulfan	33213-65-9	0.05	mg/kg	----	----	----	----	<2.50
4.4'-DDD	72-54-8	0.05	mg/kg	----	----	----	----	<2.50
Endrin aldehyde	7421-93-4	0.05	mg/kg	----	----	----	----	<2.50
Endosulfan sulfate	1031-07-8	0.05	mg/kg	----	----	----	----	<2.50
4.4'-DDT	50-29-3	0.2	mg/kg	----	----	----	----	<2.5
Endrin ketone	53494-70-5	0.05	mg/kg	----	----	----	----	<2.50
Methoxychlor	72-43-5	0.2	mg/kg	----	----	----	----	<2.5

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Analytical Results

				Client Sample ID :	TP10/2.0	TP10/4.0	DUP04	DUP05	TAR WELL #2
				Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Date / Time :	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)
				Laboratory Sample ID :					
Analyte	*CAS number*	*LOR*	*Units*		ES0610062-037	ES0610062-038	ES0610062-039	ES0610062-040	ES0610062-044
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		----	----	----	----	<2.50
Demeton-S-methyl	919-86-8	0.05	mg/kg		----	----	----	----	<2.50
Monocrotophos	6923-22-4	0.2	mg/kg		----	----	----	----	<2.5
Dimethoate	60-51-5	0.05	mg/kg		----	----	----	----	<2.50
Diazinon	333-41-5	0.05	mg/kg		----	----	----	----	<2.50
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		----	----	----	----	<2.50
Parathion-methyl	298-00-0	0.2	mg/kg		----	----	----	----	<2.5
Malathion	121-75-5	0.05	mg/kg		----	----	----	----	<2.50
Fenthion	55-38-9	0.05	mg/kg		----	----	----	----	<2.50
Chlorpyrifos	2921-88-2	0.05	mg/kg		----	----	----	----	<2.50
Parathion	56-38-2	0.2	mg/kg		----	----	----	----	<2.5
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		----	----	----	----	<2.50
Chlorfenvinphos	470-90-6	0.05	mg/kg		----	----	----	----	<2.50
Bromophos-ethyl	4824-78-6	0.05	mg/kg		----	----	----	----	<2.50
Fenamiphos	22224-92-6	0.05	mg/kg		----	----	----	----	<2.50
Prothiofos	34643-46-4	0.05	mg/kg		----	----	----	----	<2.50
Ethion	563-12-2	0.05	mg/kg		----	----	----	----	<2.50
Carbophenothion	786-19-6	0.05	mg/kg		----	----	----	----	<2.50
Azinphos Methyl	86-50-0	0.05	mg/kg		----	----	----	----	<2.50
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		----	----	----	----	637
2-Chlorophenol	95-57-8	0.5	mg/kg		----	----	----	----	<2.0
2-Methylphenol	95-48-7	0.5	mg/kg		----	----	----	----	638
3- & 4-Methylphenol	1319-77-3	1.0	mg/kg		----	----	----	----	1180
2-Nitrophenol	88-75-5	0.5	mg/kg		----	----	----	----	10.2
2.4-Dimethylphenol	105-67-9	0.5	mg/kg		----	----	----	----	919
2.4-Dichlorophenol	120-83-2	0.5	mg/kg		----	----	----	----	<2.0
2.6-Dichlorophenol	87-65-0	0.5	mg/kg		----	----	----	----	<2.0
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg		----	----	----	----	2.0
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg		----	----	----	----	<2.0
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg		----	----	----	----	<2.0
Pentachlorophenol	87-86-5	2.0	mg/kg		----	----	----	----	<4.0
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	20600
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	861
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	104
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	513

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Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: TP10/2.0 Sample Matrix Type / Description: SOIL Sample Date / Time: (16 Aug 2006) (15:00) Laboratory Sample ID: ES0610062-037	Client Sample ID: TP10/4.0 Sample Matrix Type / Description: SOIL Sample Date / Time: (16 Aug 2006) (15:00) Laboratory Sample ID: ES0610062-038	Client Sample ID: DUP04 Sample Matrix Type / Description: SOIL Sample Date / Time: (16 Aug 2006) (15:00) Laboratory Sample ID: ES0610062-039	Client Sample ID: DUP05 Sample Matrix Type / Description: SOIL Sample Date / Time: (16 Aug 2006) (15:00) Laboratory Sample ID: ES0610062-040	Client Sample ID: TAR WELL #2 Sample Matrix Type / Description: SOIL Sample Date / Time: (16 Aug 2006) (15:00) Laboratory Sample ID: ES0610062-044
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Phenanthrene	85-01-8	0.5	mg/kg	1.8	<0.5	<0.5	<0.5	1040
Anthracene	120-12-7	0.5	mg/kg	0.7	<0.5	<0.5	<0.5	382
Fluoranthene	206-44-0	0.5	mg/kg	2.8	<0.5	<0.5	<0.5	518
Pyrene	129-00-0	0.5	mg/kg	2.5	<0.5	<0.5	<0.5	550
Benz(a)anthracene	56-55-3	0.5	mg/kg	1.4	<0.5	<0.5	<0.5	242
Chrysene	218-01-9	0.5	mg/kg	1.2	<0.5	<0.5	<0.5	199
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	0.8	<0.5	<0.5	<0.5	175
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	1.2	<0.5	<0.5	<0.5	71.2
Benzo(a)pyrene	50-32-8	0.5	mg/kg	1.0	<0.5	<0.5	<0.5	164
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	0.5	<0.5	<0.5	<0.5	56.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	17.8
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	0.6	<0.5	<0.5	<0.5	64.1
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction		2	mg/kg	<2	<2	<2	<2	6690
C10 - C14 Fraction		50	mg/kg	<50	<50	<50	<50	56700
C15 - C28 Fraction		100	mg/kg	<100	<100	<100	<100	35800
C29 - C36 Fraction		100	mg/kg	<100	<100	<100	<100	6200
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	814
Toluene	108-88-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	1680
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	254
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	2150
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	1020
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	----	----	----	----	Not Determined
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE		0.1	%	----	----	----	----	Not Determined
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	----	----	----	----	Not Determined
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	74.9	75.6	80.5	79.2	Not Determined
2-Chlorophenol-D4	93951-73-6	0.1	%	77.2	78.0	83.8	85.7	Not Determined
2.4.6-Tribromophenol	118-79-6	0.1	%	68.5	68.4	77.3	79.9	Not Determined
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	79.1	80.5	82.6	84.1	Not Determined
Anthracene-d10	1719-06-8	0.1	%	81.2	70.8	76.9	86.3	Not Determined

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Analytical Results

				Client Sample ID :	**TP10/2.0**	**TP10/4.0**	**DUP04**	**DUP05**	**TAR WELL #2**
				Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Date / Time :	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)
				Laboratory Sample ID :					
Analyte	***CAS number***	***LOR***	***Units***		**ES0610062-037**	**ES0610062-038**	**ES0610062-039**	**ES0610062-040**	**ES0610062-044**
EP075(SIM)T: PAH Surrogates									
4-Terphenyl-d14	1718-51-0	0.1	%		71.8	74.4	75.7	77.4	Not Determined
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		117	101	118	102	Not Determined
Toluene-D8	2037-26-5	0.1	%		93.4	83.4	100	91.3	Not Determined
4-Bromofluorobenzene	460-00-4	0.1	%		90.4	81.6	95.5	85.4	Not Determined

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Analytical Results

			Client Sample ID :	TRIP SPIKE CONTROL				
			Sample Matrix Type / Description :	SOIL				
			Sample Date / Time :	(16 Aug 2006) (15:00)				
			Laboratory Sample ID :	ES0610062-045				
Analyte	*CAS number*	*LOR*	*Units*					
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%	3.6				
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction		2	mg/kg	48				
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	3.1				
Toluene	108-88-3	0.2	mg/kg	13.9				
Ethylbenzene	100-41-4	0.2	mg/kg	2.8				
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	12.0				
ortho-Xylene	95-47-6	0.2	mg/kg	4.4				
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	83.7				
Toluene-D8	2037-26-5	0.1	%	98.5				
4-Bromofluorobenzene	460-00-4	0.1	%	87.7				

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Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: W01	W02	W03		
				Sample Matrix Type / Description: WATER	WATER	WATER		
				Sample Date / Time: (16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)	(16 Aug 2006) (15:00)		
				Laboratory Sample ID: ES0610062-041	ES0610062-042	ES0610062-043		
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls		1	µg/L	<1	<2	<6		
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.5	µg/L	<0.5	<0.9	<2.9		
Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L	<0.5	<0.9	<2.9		
beta-BHC	319-85-7	0.5	µg/L	<0.5	<0.9	<2.9		
gamma-BHC	58-89-9	0.5	µg/L	<0.5	<0.9	<2.9		
delta-BHC	319-86-8	0.5	µg/L	<0.5	<0.9	<2.9		
Heptachlor	76-44-8	0.5	µg/L	<0.5	<0.9	<2.9		
Aldrin	309-00-2	0.5	µg/L	<0.5	<0.9	<2.9		
Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	<0.9	<2.9		
trans-Chlordane	5103-74-2	0.5	µg/L	<0.5	<0.9	<2.9		
alpha-Endosulfan	959-98-8	0.5	µg/L	<0.5	<0.9	<2.9		
cis-Chlordane	5103-71-9	0.5	µg/L	<0.5	<0.9	<2.9		
Dieldrin	60-57-1	0.5	µg/L	<0.5	<0.9	<2.9		
4.4'-DDE	72-55-9	0.5	µg/L	<0.5	<0.9	<2.9		
Endrin	72-20-8	0.5	µg/L	<0.5	<0.9	<2.9		
beta-Endosulfan	33213-65-9	0.5	µg/L	<0.5	<0.9	<2.9		
4.4'-DDD	72-54-8	0.5	µg/L	<0.5	<0.9	<2.9		
Endrin aldehyde	7421-93-4	0.5	µg/L	<0.5	<0.9	<2.9		
Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	<0.9	<2.9		
4.4'-DDT	50-29-3	2	µg/L	<2	<2	<3		
Endrin ketone	53494-70-5	0.5	µg/L	<0.5	<0.9	<2.9		
Methoxychlor	72-43-5	2	µg/L	<2	<2	<3		
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	38.5	230	20900		
Acenaphthylene	208-96-8	1.0	µg/L	<1.0	6.4	1450		
Acenaphthene	83-32-9	1.0	µg/L	3.7	5.0	215		
Fluorene	86-73-7	1.0	µg/L	1.3	4.3	750		
Phenanthrene	85-01-8	1.0	µg/L	1.2	6.8	1520		
Anthracene	120-12-7	1.0	µg/L	<1.0	2.1	482		
Fluoranthene	206-44-0	1.0	µg/L	<1.0	3.1	622		
Pyrene	129-00-0	1.0	µg/L	<1.0	3.7	651		
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0	2.0	357		
Chrysene	218-01-9	1.0	µg/L	<1.0	<1.9	288		
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0	2.0	259		
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0	<1.9	77.1		
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<1.9	277		

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Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID : W01 Sample Matrix Type / Description : WATER Sample Date / Time : (16 Aug 2006) (15:00) Laboratory Sample ID : ES0610062-041	W02 WATER (16 Aug 2006) (15:00) ES0610062-042	W03 WATER (16 Aug 2006) (15:00) ES0610062-043		
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0	<1.9	97.9		
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0	<1.9	33.6		
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0	<1.9	124		
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction		20	µg/L	40	100	7240		
C10 - C14 Fraction		50	µg/L	280	2670	153000		
C15 - C28 Fraction		100	µg/L	200	800	50800		
C29 - C36 Fraction		50	µg/L	<50	<50	10600		
EP080: BTEX								
Benzene	71-43-2	1	µg/L	12	<5	1360		
Toluene	108-88-3	2	µg/L	<2	<5	1260		
Ethylbenzene	100-41-4	2	µg/L	<2	<5	160		
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	7	37	1180		
ortho-Xylene	95-47-6	2	µg/L	2	29	723		
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	62.1	61.0	108		
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE		0.1	%	85.2	80.1	110		
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	94.3	88.3	96.3		
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	23.7	20.9	Not Determined		
2-Chlorophenol-D4	93951-73-6	0.1	%	80.0	62.2	116		
2.4.6-Tribromophenol	118-79-6	0.1	%	97.7	68.7	108		
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	85.6	63.6	87.7		
Anthracene-d10	1719-06-8	0.1	%	86.7	69.5	104		
4-Terphenyl-d14	1718-51-0	0.1	%	101	69.3	95.9		
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	99.2	98.3	96.7		
Toluene-D8	2037-26-5	0.1	%	97.9	95.3	95.3		
4-Bromofluorobenzene	460-00-4	0.1	%	100	97.1	96.9		

ALS Environmental

Surrogate Control Limits

Matrix Type: WATER - 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			
EP068S: Organochlorine Pesticide Surrogate	Dibromo-DDE	10	136
EP068T: Organophosphorus Pesticide Surrogate	DEF	10	136
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	116
	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

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 GCMS			
EP068S: Organochlorine Pesticide Surrogate	Dibromo-DDE	10	136
EP068T: Organophosphorus Pesticide Surrogate	DEF	10	136
EP075(SIM): PAH/Phenols (SIM)			
EP075(SIM)S: Phenolic Compound Surrogates	Phenol-d6	24	113
	2-Chlorophenol-D4	23	134
	2,4,6-Tribromophenol	19	122
EP075(SIM)T: PAH Surrogates	2-Fluorobiphenyl	30	115
	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

CH2MHILL ACN 050 070 892

CHAIN OF CUSTODY RECORD

Level 7, 9 Help Street, Chatswood, NSW 2067 Australia Tel (61 2) 9950 0200 Fax (61 2) 9950 0600

Laboratory Quotation #

1/5

COC # [redacted]

Project # 347496	**~~Purchase Order #~~** SY/148/06
Project Name Macdonaldtown Greasworks	
Company Name ALS	
Project Manager or Contact & Phone # Adam Sullivan 0400 500 264	**Report Copy to:** →
Requested Completion Date: standard TAT	**Site ID** Macdonaldtown
Sample Disposal: Dispose ☑ Return ☐	

Sampling Date	Sampling Time	Type	Matrix	CLIENT SAMPLE ID (9 CHARACTERS)	LAB QC	TOTAL # OF CONTAINERS	S-7	S-19	S-4	S-2	S-12	S-14A	EK026	Asbestos	HOLD
	(1)		(M)	MG02/0.2			X					X			
	46		•	MG02/0.4											X
	47		•	MG02/1.5											X
	(2)			MG02/1.8				X					X		
	(3)			MG02/2.0			X								
48			•	MG02/2.7											X
	(4)			MG02/3.3			X								
49			•	MG02/3.7											X
	(5)			MG02/4.7			X								
	(6)			Trip Blank (2)					X						
	(7)			Trip Spike (2)					X						
	(8)			TP02/4.5			X		X	X	X				

QA REQUIREMENTS

Matrix Spike	☐ Yes	☐ No
Matrix Duplicate	☐ Yes	☐ No
Laboratory Duplicate	☐ Yes	☐ No
Lab Blank	☐ Yes	☐ No
Surrogate Spike	☐ Yes	☐ No
RPDs	☐ Yes	☐ No
Spike Recovery Data	☐ Yes	☐ No

LAB USE ONLY

Custody Seals	☐ Yes	☐ No
ICE	☐ Yes	☐ No

Comments	Lab ID
[redacted]	
⊛ High Contamination	

ALS Environmental
Sydney
Work Order
ES0610062

Report Version: WOLabel 1.01

Telephone : 61-2-87848555

Sampled By and Title	(Please sign and print name)	**Date/Time** 16/8	**Relinquished By** (Please sign and print name) **Date/Time**
Received by Ibrahim	(Please sign and print name)	**Date/Time** 16/8/06	**Relinquished By** (Please sign and print name) **Date/Time**
Received by Sayskopha	(Please sign and print name) AS 4.45	**Date/Time** 16/8/6.	**Shipped Via** **Shipping #**

Special Instructions:

CONTRACT WORK
WO: ES0610062
LAB: ASET Asbestos
DATE:
SPLIT:

DISTRIBUTION: Original - LAB, Yellow - LAB, Pink - CH2MHILL

CH2MHILL ACN 050 070 892

CHAIN OF CUSTODY RECORD

Level 7, 9 Help Street, Chatswood, NSW 2067 Australia Tel (61 2) 9950 0200 Fax (61 2) 9950 0600

Laboratory Quotation #

2/5

COC # [redacted]

Project # 347496	**~~Purchase Order #~~** SY/148/06
Project Name Macdonaldtown Gasworks	
Company Name ALS	
Project Manager or Contact & Phone # Adam Sullivan 0400 500 264	**Report Copy to:** →
Requested Completion Date: standard TAT	**Site ID** Macdonaldtown
Sample Disposal: Dispose ☑ Return ☐	

Sampling Date	Sampling Time	Type	Matrix	CLIENT SAMPLE ID (9 CHARACTERS)	LAB QC	TOTAL # OF CONTAINERS	S-7	S-19	S-4	S-2	S-12	S-14A	EK026	Asbestos	HOLD
	(9)			MG03/0.1				X						X	
	(10)			TP04/0.25				X						X	
	(11)			TP04/0.5			X								
	(12)			TP04/0.7			X			X	X				
50			•	TP04/2.0											
	(13)			TP04/3.0			X								
	(14)			TP05/0.25			X					X		X	
	(15)			TP05/0.5				X							
51			•	TP05/1.0											
	(16)			TP05/1.5			X			X					
	(17)			TP05/2.0			X								
	(18)			DUP03			X								

Preservative

QA REQUIREMENTS

Matrix Spike	☐ Yes ☐ No
Matrix Duplicate	☐ Yes ☐ No
Laboratory Duplicate	☐ Yes ☐ No
Lab Blank	☐ Yes ☐ No
Surrogate Spike	☐ Yes ☐ No
RPDs	☐ Yes ☐ No
Spike Recovery Data	☐ Yes ☐ No

LAB USE ONLY

Custody Seals	☐ Yes ☐ No
ICE	☐ Yes ☐ No

Comments	Lab ID

Sampled By and Title	(Please sign and print name)	**Date/Time** 16/8	**Relinquished By** (Please sign and print name)	**Date/Time**
Received by	(Please sign and print name)	**Date/Time**	**Relinquished By** (Please sign and print name)	**Date/Time**
Received by Sophie	(Please sign and print name) 4:45	**Date/Time** 16/8/16	**Shipped Via**	**Shipping #**

Special Instructions:

DISTRIBUTION: Original - LAB, Yellow - LAB, Pink - CH2MHILL

CH2MHILL ACN 050 070 892

CHAIN OF CUSTODY RECORD

Level 7, 9 Help Street, Chatswood, NSW 2067 Australia Tel (61 2) 9950 0200 Fax (61 2) 9950 0600

Laboratory Quotation #

3/5

COC # [redacted]

Project # 347496	**Purchase Order #** SY/148/06
Project Name Macdonaldtown Gasworks	
Company Name ALS	
Project Manager or Contact & Phone # Adam Sullivan 0400 500 264	**Report Copy to:** →
Requested Completion Date: standard TAT	**Site ID** Macdonaldtown
Sample Disposal: Dispose ☑ Return ☐	

Sampling Date	Sampling Time	Type	Matrix	CLIENT SAMPLE ID (9 CHARACTERS)	LAB QC	TOTAL # OF CONTAINERS	S-7	S-19	S-4	S-2	S-12	S-14A	EK026	Asbestos	140
	(19)			TP06/0.25			X			X		X		X	
	(20)			TP06/0.5			X						X		
	(21)			TP06/1.0				X					X		
52			•	TP06/1.5											X
	(22)			TP06/2.5			X								
	(23)			TP07/0.25			X							X	
	(24)			TP07/0.5			X			X			X		
53			•	TP07/1.0											
	(25)			TP07/1.5			X								
	(26)			TP07/2.0			X								
	(27)			TP08/0.25					X	X		X		X	
	(28)			TP08/0.5				X					X		

Requested Analytical Method #

Preservative

QA REQUIREMENTS

Matrix Spike	☐ Yes	☐ No
Matrix Duplicate	☐ Yes	☐ No
Laboratory Duplicate	☐ Yes	☐ No
Lab Blank	☐ Yes	☐ No
Surrogate Spike	☐ Yes	☐ No
RPDs	☐ Yes	☐ No
Spike Recovery Data	☐ Yes	☐ No

LAB USE ONLY

Custody Seals	☐ Yes	☐ No
ICE	☐ Yes	☐ No

Comments	Lab ID

Sampled By and Title	(Please sign and print name)	**Date/Time** 16/8	**Relinquished By** (Please sign and print name)	**Date/Time**
Received by	(Please sign and print name)	**Date/Time** 16/8	**Relinquished By** (Please sign and print name)	**Date/Time**
Received by	(Please sign and print name) AUS	**Date/Time** 4.45pm 16/8/16	**Shipped Via**	**Shipping #**

Special Instructions:

DISTRIBUTION: Original - LAB, Yellow - LAB, Pink - CH2MHILL

CH2MHILL ACN 050 070 892

CHAIN OF CUSTODY RECORD

Level 7, 9 Help Street, Chatswood, NSW 2067 Australia Tel (61 2) 9950 0200 Fax (61 2) 9950 0600

Laboratory Quotation #

4/5

COC # [redacted]

Project # 347496	**~~Purchase Order #~~** SY/148/06
Project Name Macdonaldtown Gasworks	
Company Name ALS	
Project Manager or Contact & Phone # Adam Sullivan 0400 500 264	**Report Copy to:** →
Requested Completion Date: standard TAT	**Site ID** Macdonaldtown
Sample Disposal: Dispose ☑ Return ☐	

TOTAL # OF CONTAINERS

Requested Analytical Method #

S-7	S-19	S-4	S-2	S-12	S-14A	E1026 Asbestos	HOLD
Preservative							

Sampling Date	Sampling Time	Type	Matrix	CLIENT SAMPLE ID (9 CHARACTERS)	LAB QC	S-7	S-19	S-4	S-2	S-12	S-14A	E1026 Asbestos	HOLD
	(29)			TP08/1.0		X			X		X	X	
54			•	TP08/1.5									
	(30)			TP08/2.0		X			X				
	(31)			TP09/0.25		X						X	
	(32)			TP09/0.5		X							
	(33)			TP09/1.0		X			X		X	X	
55			•	TP09/2.0									
	(34)			TP09/2.5		X			X				
	(35)			TP10/0.25		X						X	
56			•	TP10/0.5									
	(36)			TP10/1.0			X					X	
57			•	TP10/1.5									

QA REQUIREMENTS

Matrix Spike	☐ Yes	☐ No
Matrix Duplicate	☐ Yes	☐ No
Laboratory Duplicate	☐ Yes	☐ No
Lab Blank	☐ Yes	☐ No
Surrogate Spike	☐ Yes	☐ No
RPDs	☐ Yes	☐ No
Spike Recovery Data	☐ Yes	☐ No

LAB USE ONLY

Custody Seals	☐ Yes	☐ No
ICE	☐ Yes	☐ No

Comments	Lab ID

Sampled By and Title	(Please sign and print name) [redacted]	**Date/Time** 16/8	**Relinquished By** (Please sign and print name)	**Date/Time**
Received by	(Please sign and print name)	**Date/Time** 16/8	**Relinquished By** (Please sign and print name)	**Date/Time**
Received by	(Please sign and print name)	**Date/Time**	**Shipped Via**	**Shipping #**

Special Instructions:

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CH2MHILL ACN 050 070 892

CHAIN OF CUSTODY RECORD

Level 7, 9 Help Street, Chatswood, NSW 2067 Australia Tel (61 2) 9950 0200 Fax (61 2) 9950 0600

Laboratory Quotation #

5/5

COC # [redacted]

Project # 347496	**Purchase Order #** SY/148/06
Project Name Macdonaldtown Gasworks	
Company Name ALS	
Project Manager or Contact & Phone # Adam Sullivan 0400 500 264	**Report Copy to:** →
Requested Completion Date: standard TAT	**Site ID** Macdonaldtown
Sample Disposal: Dispose ☑ Return ☐	

Sampling Date	Sampling Time	Type	Matrix	CLIENT SAMPLE ID (9 CHARACTERS)	LAB QC	TOTAL # OF CONTAINERS	S-7	S-19	S-4	S-2	S-12	S-144	EK026	Asbestos	Hold	Comments	Lab ID
	(37)			TP101/2.0			X			X			X				
58				• TP101/3.0			~~X~~										
	(38)			TP101/4.0			X			X							
	(39)			DUP04			X			X							
	(40)			DUP05			X			X							
	(41)			WO1				X					X			(*) High Contamination	
	(42)			WO2				X					X			(*) High Contamination	
	(43)			WO3				X					X			(*) " "	
(15) Tripspike control	(44)			Tar Well #2				X					X			(*) " "	
~~59~~	Received			~~TP08 2.0 16.8.06~~													
60	Extract			TP09 1.5 16 8.06											X	→ on hold as per Adam Sullivan 12:20pm 17/8/06	

QA REQUIREMENTS

Matrix Spike	☐ Yes	☐ No
Matrix Duplicate	☐ Yes	☐ No
Laboratory Duplicate	☐ Yes	☐ No
Lab Blank	☐ Yes	☐ No
Surrogate Spike	☐ Yes	☐ No
RPDs	☐ Yes	☐ No
Spike Recovery Data	☐ Yes	☐ No

LAB USE ONLY

Custody Seals	☐ Yes	☐ No
ICE	☐ Yes	☐ No

Sampled By and Title	(Please sign and print name)	Date/Time 16/8	Relinquished By	(Please sign and print name)	Date/Time
Received by	(Please sign and print name)	Date/Time 16/8/06	Relinquished By	(Please sign and print name)	Date/Time
Received by Soy Sky ALS 4.45pm	(Please sign and print name)	Date/Time 16/8/6	Shipped Via		Shipping #

Special Instructions:

DISTRIBUTION: Original - LAB, Yellow - LAB, Pink - CH2MHILL

ALS Environmental

QUALITY CONTROL REPORT

Client	:	**CH2M HILL PTY LTD**	**Laboratory**	:	ALS Environmental Sydney	**Page**	: **1 of 33**
Contact	:	MR ADAM SULLIVAN	**Contact**	:	Greg Vogel		
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	**Address**	:	277-289 Woodpark Road Smithfield NSW Australia 2164	**Work order**	: **ES0610062**
						Amendment No.	:
Project	:	347496 McDonaldtown Gasworks	**Quote number**	:	----	**Date received**	: 16 Aug 2006
Order number	:	- Not provided -				**Date issued**	: 28 Aug 2006
C-O-C number	:	- Not provided -					
Site	:	MACDONALDTOWN					
E-mail	:	adam.sullivan@ch2m.com.au	**E-mail**	:	Greg.Vogel@alsenviro.com	**No. of samples**	
Telephone	:	02 9950 0200	**Telephone**	:	+61 (02) 8784 8555	**Received**	: 59
Facsimile	:	02 9950 0600	**Facsimile**	:	+61 (02) 8784 8500	**Analysed**	: 39

This final report for the ALSE work order reference ES0610062 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

EPO68, EPO75(SIM), and EPO66: Particular samples required dilution prior to extraction due to matrix interferences. LOR values have been adjusted accordingly.

EPO68:Particular samples TAR WELL #2 required dilution prior to extraction due to matrix interferences and high level of contaminants. LOR values have been adjusted accordingly.

EPO68, EPO75(SIM), and EPO66:Surrogates cannot be determined due to the matrix interferences.

EP080: Various samples required dilution due to the presence of high level contaminants. LOR values have been adjusted accordingly.

EPO75(SIM) : Poor surrogate recovery due to high matrix interference.

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Accredited for compliance with ISO/IED 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	Department
Celine Conceicao	Inorganics - NATA 825 (10911 - Sydney)
Phyu Phyu Lwin	Inorganics - NATA 825 (10911 - Sydney)
Rassem Ayoubi	Organics - NATA 825 (10911 - Sydney)
Sarah Millington	Inorganics - NATA 825 (10911 - Sydney)

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						
EA055: Moisture Content - (QC Lot: 260372)				**%**	**%**	**%**
ES0610042-001	Anonymous	Moisture Content (dried @ 103°C)	1.0 %	39.0	39.7	1.6
ES0610062-011	TP04/0.5	Moisture Content (dried @ 103°C)	1.0 %	17.1	17.1	0.0
EA055: Moisture Content - (QC Lot: 260373)				**%**	**%**	**%**
ES0610062-024	TP07/0.5	Moisture Content (dried @ 103°C)	1.0 %	17.5	17.1	2.1
ES0610062-036	TP10/1.0	Moisture Content (dried @ 103°C)	1.0 %	6.9	7.3	5.0
EA055: Moisture Content - (QC Lot: 260631)				**%**	**%**	**%**
ES0609984-001	Anonymous	Moisture Content (dried @ 103°C)	1.0 %	4.2	4.0	3.7
ES0610063-005	Anonymous	Moisture Content (dried @ 103°C)	1.0 %	16.3	15.2	7.2
EG005T: Total Metals by ICP-AES						
EG005T: Total Metals by ICP-AES - (QC Lot: 259253)				**mg/kg**	**mg/kg**	**%**
ES0609982-001	Anonymous	Arsenic	5 mg/kg	<5	<5	0.0
		Cadmium	1 mg/kg	<1	<1	0.0
		Chromium	2 mg/kg	22	23	0.0
		Copper	5 mg/kg	8	8	0.0
		Lead	5 mg/kg	25	25	0.0
		Nickel	2 mg/kg	4	5	0.0
		Zinc	5 mg/kg	7	5	29.8
ES0609982-012	Anonymous	Arsenic	5 mg/kg	<5	<5	0.0
		Cadmium	1 mg/kg	<1	<1	0.0
		Chromium	2 mg/kg	5	5	0.0
		Copper	5 mg/kg	12	9	25.1
		Lead	5 mg/kg	10	16	39.4
		Nickel	2 mg/kg	10	6	49.7
		Zinc	5 mg/kg	20	17	17.0
EG005T: Total Metals by ICP-AES - (QC Lot: 259255)				**mg/kg**	**mg/kg**	**%**

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: 259255) - continued				mg/kg	mg/kg	%
ES0610062-009	MG03/0.1	Arsenic	5 mg/kg	49	34	38.0
		Cadmium	1 mg/kg	<1	<1	0.0
		Chromium	2 mg/kg	17	24	34.1
		Copper	5 mg/kg	202	186	8.5
		Lead	5 mg/kg	648	697	7.3
		Nickel	2 mg/kg	16	14	11.4
		Zinc	5 mg/kg	315	326	3.4
ES0610062-029	TP08/1.0	Arsenic	5 mg/kg	8	8	0.0
		Cadmium	1 mg/kg	<1	<1	0.0
		Chromium	2 mg/kg	26	23	13.2
		Copper	5 mg/kg	<5	<5	0.0
		Lead	5 mg/kg	14	13	0.0
		Nickel	2 mg/kg	<2	<2	0.0
		Zinc	5 mg/kg	<5	<5	0.0
EG035T: Total Mercury by FIMS						
EG035T: Total Mercury by FIMS - (QC Lot: 259254)				mg/kg	mg/kg	%
ES0609982-001	Anonymous	Mercury	0.1 mg/kg	<0.1	<0.1	0.0
ES0609982-012	Anonymous	Mercury	0.1 mg/kg	<0.1	<0.1	0.0
EG035T: Total Mercury by FIMS - (QC Lot: 259256)				mg/kg	mg/kg	%
ES0610062-009	MG03/0.1	Mercury	0.1 mg/kg	0.9	1.2	21.0
ES0610062-029	TP08/1.0	Mercury	0.1 mg/kg	<0.1	<0.1	0.0
EK025G: Free cyanide by Discrete Analyser						
EK025G: Free cyanide by Discrete Analyser - (QC Lot: 259087)				mg/kg	mg/kg	%
ES0609974-001	Anonymous	Total Cyanide	1.0 mg/kg	<1.0	<1.0	0.0
ES0610062-021	TP06/1.0	Total Cyanide	1.0 mg/kg	<1.0	<1.0	0.0
EP066: Polychlorinated Biphenyls (PCB)						
EP066: Polychlorinated Biphenyls (PCB) - (QC Lot: 259813)				mg/kg	mg/kg	%
ES0610062-015	TP05/0.5	Total Polychlorinated biphenyls	0.10 mg/kg	<0.10	<0.10	0.0
ES0610118-002	Anonymous	Total Polychlorinated biphenyls	0.10 mg/kg	<0.10	<0.10	0.0

ALS Environmental

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: 259814)				mg/kg	mg/kg	%
ES0610062-015	TP05/0.5	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	0.08	0.10	31.1
		alpha-Endosulfan	0.05 mg/kg	<0.05	<0.05	0.0
		cis-Chlordane	0.05 mg/kg	0.06	0.08	29.2
		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
ES0610118-002	Anonymous	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

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) - continued						
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 259814) - continued				mg/kg	mg/kg	%
ES0610118-002	Anonymous	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: 259814)				mg/kg	mg/kg	%
ES0610062-015	TP05/0.5	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
		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

Matrix Type: SOIL

Laboratory Duplicates (DUP) Report

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: 259814) - continued				mg/kg	mg/kg	%
ES0610062-015	TP05/0.5	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
ES0610118-002	Anonymous	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
		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: 259545)				mg/kg	mg/kg	%
ES0610062-001	MG02/0.2	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

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: 259545) - continued				mg/kg	mg/kg	%
ES0610062-001	MG02/0.2	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	1.3	0.8	42.1
		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
ES0610062-011	TP04/0.5	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
EP075(SIM)A: Phenolic Compounds - (QC Lot: 259801)				mg/kg	mg/kg	%
ES0610062-021	TP06/1.0	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

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: 259801) - continued				mg/kg	mg/kg	%
ES0610062-021	TP06/1.0	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
ES0610062-036	TP10/1.0	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
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 259545)				mg/kg	mg/kg	%
ES0610062-001	MG02/0.2	Naphthalene	0.5 mg/kg	142	94.0	40.6
		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

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: 259545) - continued				mg/kg	mg/kg	%
ES0610062-001	MG02/0.2	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
ES0610062-011	TP04/0.5	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
		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
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 259801)				mg/kg	mg/kg	%
ES0610062-021	TP06/1.0	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

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: 259801) - continued				mg/kg	mg/kg	%
ES0610062-021	TP06/1.0	Fluoranthene	0.5 mg/kg	1.4	0.9	48.9
		Pyrene	0.5 mg/kg	1.7	1.0	50.3
		Benz(a)anthracene	0.5 mg/kg	0.8	0.5	37.9
		Chrysene	0.5 mg/kg	0.8	<0.5	44.8
		Benzo(b)fluoranthene	0.5 mg/kg	<0.5	<0.5	0.0
		Benzo(k)fluoranthene	0.5 mg/kg	0.6	<0.5	0.0
		Benzo(a)pyrene	0.5 mg/kg	0.7	<0.5	28.8
		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
ES0610062-036	TP10/1.0	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	2.6	134
		Anthracene	0.5 mg/kg	<0.5	0.6	22.0
		Fluoranthene	0.5 mg/kg	<0.5	2.1	124
		Pyrene	0.5 mg/kg	<0.5	2.1	122
		Benz(a)anthracene	0.5 mg/kg	<0.5	0.9	54.3
		Chrysene	0.5 mg/kg	<0.5	0.8	43.9
		Benzo(b)fluoranthene	0.5 mg/kg	<0.5	0.5	0.0
		Benzo(k)fluoranthene	0.5 mg/kg	<0.5	0.6	0.0
		Benzo(a)pyrene	0.5 mg/kg	<0.5	0.6	26.3
		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: 258865)				mg/kg	mg/kg	%
ES0610062-004	MG02/3.3	C6 - C9 Fraction	2 mg/kg	<2	<2	0.0

Matrix Type: SOIL

Laboratory Duplicates (DUP) Report

Laboratory Sample ID	Client Sample ID	Analyte name	LOR	Original Result	Duplicate Result	RPD
EP080/071: Total Petroleum Hydrocarbons - continued						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 258865) - continued				mg/kg	mg/kg	%
ES0610062-011	TP04/0.5	C6 - C9 Fraction	2 mg/kg	<2	<2	0.0
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 258866)				mg/kg	mg/kg	%
ES0610062-023	TP07/0.25	C6 - C9 Fraction	2 mg/kg	<2	<2	0.0
ES0610062-031	TP09/0.25	C6 - C9 Fraction	2 mg/kg	<2	<2	0.0
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 259252)				mg/kg	mg/kg	%
ES0610044-037	Anonymous	C6 - C9 Fraction	2 mg/kg	<2	<2	0.0
ES0610058-002	Anonymous	C6 - C9 Fraction	2 mg/kg	<2	<2	0.0
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 259546)				mg/kg	mg/kg	%
ES0610062-001	MG02/0.2	C10 - C14 Fraction	50 mg/kg	290	290	0.0
		C15 - C28 Fraction	100 mg/kg	<100	<100	0.0
		C29 - C36 Fraction	100 mg/kg	<100	120	21.6
ES0610062-011	TP04/0.5	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
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 259800)				mg/kg	mg/kg	%
ES0610062-021	TP06/1.0	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
ES0610062-036	TP10/1.0	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: 258865)				mg/kg	mg/kg	%
ES0610062-004	MG02/3.3	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
ES0610062-011	TP04/0.5	Benzene	0.2 mg/kg	<0.2	0.3	0.0

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: 258865) - continued				mg/kg	mg/kg	%
ES0610062-011	TP04/0.5	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
EP080: BTEX - (QC Lot: 258866)				mg/kg	mg/kg	%
ES0610062-023	TP07/0.25	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
ES0610062-031	TP09/0.25	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
EP080: BTEX - (QC Lot: 259252)				mg/kg	mg/kg	%
ES0610044-037	Anonymous	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
ES0610058-002	Anonymous	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

Matrix Type: WATER

Laboratory Duplicates (DUP) Report

Laboratory Sample ID	Client Sample ID	Analyte name	LOR	Original Result	Duplicate Result	RPD
EP080/071: Total Petroleum Hydrocarbons						

Matrix Type: WATER

Laboratory Duplicates (DUP) Report

Laboratory Sample ID	*Client Sample ID*	*Analyte name*	*LOR*	*Original Result*	*Duplicate Result*	*RPD*
EP080/071: Total Petroleum Hydrocarbons - continued						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 260023)				**µg/L**	**µg/L**	**%**
ES0610054-005	Anonymous	C6 - C9 Fraction	20 µg/L	<20	<20	0.0
ES0610079-001	Anonymous	C6 - C9 Fraction	20 µg/L	60	40	41.6
EP080: BTEX						
EP080: BTEX - (QC Lot: 260023)				**µg/L**	**µg/L**	**%**
ES0610054-005	Anonymous	Benzene	1 µg/L	<1	<1	0.0
		Toluene	2 µg/L	<2	<2	0.0
		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
ES0610079-001	Anonymous	Benzene	1 µg/L	2	2	0.0
		Toluene	2 µg/L	<2	<2	0.0
		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

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.

Matrix Type: SOIL

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*
EG005T: Total Metals by ICP-AES						
EG005T: Total Metals by ICP-AES - (QC Lot: 259253)		mg/kg	mg/kg	%	%	%
Arsenic	5 mg/kg	<5	----	----	----	----
	5 mg/kg	----	13.1	103	86.6	123
Cadmium	1 mg/kg	<1	----	----	----	----
	1 mg/kg	----	2.76	97.5	79.9	120
Chromium	2 mg/kg	----	60.9	97.0	87.1	119
	2 mg/kg	<2	----	----	----	----
Copper	5 mg/kg	----	54.7	95.0	85.2	117
	5 mg/kg	<5	----	----	----	----
Lead	5 mg/kg	<5	----	----	----	----
	5 mg/kg	----	55.2	93.5	82.1	117
Nickel	2 mg/kg	<2	----	----	----	----
	2 mg/kg	----	54.8	99.7	88	122
Zinc	5 mg/kg	<5	----	----	----	----
	5 mg/kg	----	104	93.0	79	116
EG005T: Total Metals by ICP-AES - (QC Lot: 259255)		mg/kg	mg/kg	%	%	%
Arsenic	5 mg/kg	<5	----	----	----	----
	5 mg/kg	----	13.1	107	86.6	123
Cadmium	1 mg/kg	----	2.76	98.5	79.9	120
	1 mg/kg	<1	----	----	----	----
Chromium	2 mg/kg	<2	----	----	----	----
	2 mg/kg	----	60.9	98.9	87.1	119
Copper	5 mg/kg	----	54.7	96.2	85.2	117
	5 mg/kg	<5	----	----	----	----
Lead	5 mg/kg	<5	----	----	----	----
	5 mg/kg	----	55.2	96.0	82.1	117

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*
EG005T: Total Metals by ICP-AES - continued						
EG005T: Total Metals by ICP-AES - (QC Lot: 259255) - continued		mg/kg	mg/kg	%	%	%
Nickel	2 mg/kg	<2	----	----	----	----
	2 mg/kg	----	54.8	101	88	122
Zinc	5 mg/kg	----	104	95.0	79	116
	5 mg/kg	<5	----	----	----	----
EG035T: Total Mercury by FIMS						
EG035T: Total Mercury by FIMS - (QC Lot: 259254)		mg/kg	mg/kg	%	%	%
Mercury	0.1 mg/kg	<0.1	----	----	----	----
	0.1 mg/kg	----	1.4	86.3	73.7	108
EG035T: Total Mercury by FIMS - (QC Lot: 259256)		mg/kg	mg/kg	%	%	%
Mercury	0.1 mg/kg	<0.1	----	----	----	----
	0.1 mg/kg	----	1.4	88.4	73.7	108
EK025G: Free cyanide by Discrete Analyser						
EK025G: Free cyanide by Discrete Analyser - (QC Lot: 259087)		mg/kg	mg/kg	%	%	%
Total Cyanide	1 mg/kg	----	50	98.1	70	130
	1.0 mg/kg	<1.0	----	----	----	----
EP066: Polychlorinated Biphenyls (PCB)						
EP066: Polychlorinated Biphenyls (PCB) - (QC Lot: 259813)		mg/kg	mg/kg	%	%	%
Total Polychlorinated biphenyls	0.1 mg/kg	----	0.5	71.6	57.4	117
	0.10 mg/kg	<0.10	----	----	----	----
EP068A: Organochlorine Pesticides (OC)						
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 259814)		mg/kg	mg/kg	%	%	%
4,4'-DDD	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	83.9	65.3	116
4,4'-DDE	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	84.9	67.5	114
4,4'-DDT	0.2 mg/kg	----	0.25	92.9	58.4	127
	0.2 mg/kg	<0.2	----	----	----	----

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Matrix Type: SOIL

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP068A: Organochlorine Pesticides (OC) - continued						
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 259814) - continued		mg/kg	mg/kg	%	%	%
Aldrin	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	85.3	67	113
alpha-BHC	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	87.1	60.8	116
alpha-Endosulfan	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	85.1	65.8	116
beta-BHC	0.05 mg/kg	----	0.25	89.5	59.8	117
	0.05 mg/kg	<0.05	----	----	----	----
beta-Endosulfan	0.05 mg/kg	----	0.25	86.0	66.1	117
	0.05 mg/kg	<0.05	----	----	----	----
cis-Chlordane	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	85.2	57.3	120
delta-BHC	0.05 mg/kg	----	0.25	86.3	65.8	114
	0.05 mg/kg	<0.05	----	----	----	----
Dieldrin	0.05 mg/kg	----	0.25	86.4	67.4	116
	0.05 mg/kg	<0.05	----	----	----	----
Endosulfan sulfate	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	85.2	63.6	119
Endrin	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	85.7	63	121
Endrin aldehyde	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	80.3	57.3	115
Endrin ketone	0.05 mg/kg	----	0.25	87.4	63.6	117
	0.05 mg/kg	<0.05	----	----	----	----
gamma-BHC	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	86.3	59.8	118
Heptachlor	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	81.5	65.6	115
Heptachlor epoxide	0.05 mg/kg	----	0.25	85.5	65.6	113
	0.05 mg/kg	<0.05	----	----	----	----

Matrix Type: SOIL

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP068A: Organochlorine Pesticides (OC) - continued						
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 259814) - continued		mg/kg	mg/kg	%	%	%
Hexachlorobenzene (HCB)	0.05 mg/kg	----	0.25	84.3	59.4	115
	0.05 mg/kg	<0.05	----	----	----	----
Methoxychlor	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	0.25	76.9	50.4	132
trans-Chlordane	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	85.4	60.7	113
EP068B: Organophosphorus Pesticides (OP)						
EP068B: Organophosphorus Pesticides (OP) - (QC Lot: 259814)		mg/kg	mg/kg	%	%	%
Methyl Azinphos	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	39.5	29.8	137
Bromophos-ethyl	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	83.7	64.3	114
Carbophenothion	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	81.0	59.5	119
Chlorfenvinphos	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	90.6	61.4	123
Chlorpyrifos	0.05 mg/kg	----	0.25	84.7	64.2	111
	0.05 mg/kg	<0.05	----	----	----	----
Chlorpyrifos-methyl	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	82.3	65.1	111
Demeton-S-methyl	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	69.8	10.1	159
Diazinon	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	82.0	64.9	111
Dichlorvos	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	82.3	25.5	124
Dimethoate	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	72.3	48.6	126
Ethion	0.05 mg/kg	----	0.25	83.6	62	116
	0.05 mg/kg	<0.05	----	----	----	----

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Matrix Type: SOIL

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP068B: Organophosphorus Pesticides (OP) - continued						
EP068B: Organophosphorus Pesticides (OP) - (QC Lot: 259814) - continued		mg/kg	mg/kg	%	%	%
Fenamiphos	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	79.6	45.5	128
Fenthion	0.05 mg/kg	----	0.25	84.6	64.7	110
	0.05 mg/kg	<0.05	----	----	----	----
Malathion	0.05 mg/kg	----	0.25	81.6	60.4	127
	0.05 mg/kg	<0.05	----	----	----	----
Monocrotophos	0.2 mg/kg	----	0.25	24.3	2.88	149
	0.2 mg/kg	<0.2	----	----	----	----
Parathion	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	0.25	78.5	60	116
Parathion-methyl	0.2 mg/kg	----	0.25	79.7	61.4	113
	0.2 mg/kg	<0.2	----	----	----	----
Pirimphos-ethyl	0.05 mg/kg	----	0.25	82.6	64.8	111
	0.05 mg/kg	<0.05	----	----	----	----
Prothiofos	0.05 mg/kg	----	0.25	85.6	65.4	111
	0.05 mg/kg	<0.05	----	----	----	----
EP075(SIM)A: Phenolic Compounds						
EP075(SIM)A: Phenolic Compounds - (QC Lot: 259545)		mg/kg	mg/kg	%	%	%
2,4,5-Trichlorophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	73.3	68.9	112
2,4,6-Trichlorophenol	0.5 mg/kg	----	4	77.3	62.2	115
	0.5 mg/kg	<0.5	----	----	----	----
2,4-Dichlorophenol	0.5 mg/kg	----	4	87.3	71.6	113
	0.5 mg/kg	<0.5	----	----	----	----
2,4-Dimethylphenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	91.5	74.5	119
2,6-Dichlorophenol	0.5 mg/kg	----	4	94.0	74.8	115
	0.5 mg/kg	<0.5	----	----	----	----
2-Chlorophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	96.5	80.2	115

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: 259545) - continued		mg/kg	mg/kg	%	%	%
2-Methylphenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	98.7	76.8	114
2-Nitrophenol	0.5 mg/kg	----	4	83.5	60.3	117
	0.5 mg/kg	<0.5	----	----	----	----
3- & 4-Methylphenol	1.0 mg/kg	<1.0	----	----	----	----
	1.0 mg/kg	----	8	98.1	72	119
4-Chloro-3-Methylphenol	0.5 mg/kg	----	4	101	76.4	114
	0.5 mg/kg	<0.5	----	----	----	----
Pentachlorophenol	1.0 mg/kg	----	8	29.9	1.23	91.6
	1.0 mg/kg	<1.0	----	----	----	----
Phenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	98.0	73.9	115
EP075(SIM)A: Phenolic Compounds - (QC Lot: 259801)		mg/kg	mg/kg	%	%	%
2,4,5-Trichlorophenol	0.5 mg/kg	----	4	83.0	68.9	112
	0.5 mg/kg	<0.5	----	----	----	----
2,4,6-Trichlorophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	77.4	62.2	115
2,4-Dichlorophenol	0.5 mg/kg	----	4	82.2	71.6	113
	0.5 mg/kg	<0.5	----	----	----	----
2,4-Dimethylphenol	0.5 mg/kg	----	4	92.4	74.5	119
	0.5 mg/kg	<0.5	----	----	----	----
2,6-Dichlorophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	86.7	74.8	115
2-Chlorophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	91.0	80.2	115
2-Methylphenol	0.5 mg/kg	----	4	90.1	76.8	114
	0.5 mg/kg	<0.5	----	----	----	----
2-Nitrophenol	0.5 mg/kg	----	4	91.7	60.3	117
	0.5 mg/kg	<0.5	----	----	----	----

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Matrix Type: SOIL

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP075(SIM)A: Phenolic Compounds - continued						
EP075(SIM)A: Phenolic Compounds - (QC Lot: 259801) - continued		mg/kg	mg/kg	%	%	%
3- & 4-Methylphenol	1.0 mg/kg	<1.0	----	----	----	----
	1.0 mg/kg	----	8	89.2	72	119
4-Chloro-3-Methylphenol	0.5 mg/kg	----	4	87.5	76.4	114
	0.5 mg/kg	<0.5	----	----	----	----
Pentachlorophenol	1.0 mg/kg	----	8	24.8	1.23	91.6
	1.0 mg/kg	<1.0	----	----	----	----
Phenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	94.8	73.9	115
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 259545)		mg/kg	mg/kg	%	%	%
Acenaphthene	0.5 mg/kg	----	4	102	81.5	112
	0.5 mg/kg	<0.5	----	----	----	----
Acenaphthylene	0.5 mg/kg	----	4	103	79.6	113
	0.5 mg/kg	<0.5	----	----	----	----
Anthracene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	106	81.1	112
Benz(a)anthracene	0.5 mg/kg	----	4	97.4	77.2	112
	0.5 mg/kg	<0.5	----	----	----	----
Benzo(a)pyrene	0.5 mg/kg	----	4	101	76.4	113
	0.5 mg/kg	<0.5	----	----	----	----
Benzo(b)fluoranthene	0.5 mg/kg	----	4	97.6	71.8	118
	0.5 mg/kg	<0.5	----	----	----	----
Benzo(g,h,i)perylene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	107	72.4	114
Benzo(k)fluoranthene	0.5 mg/kg	----	4	120	74.2	117
	0.5 mg/kg	<0.5	----	----	----	----
Chrysene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	103	79.8	114
Dibenz(a,h)anthracene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	102	71.7	113

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)B: Polynuclear Aromatic Hydrocarbons - continued						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 259545) - continued		mg/kg	mg/kg	%	%	%
Fluoranthene	0.5 mg/kg	----	4	100	78.8	113
	0.5 mg/kg	<0.5	----	----	----	----
Fluorene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	99.2	79.9	112
Indeno(1,2,3,cd)pyrene	0.5 mg/kg	----	4	98.2	71	113
	0.5 mg/kg	<0.5	----	----	----	----
Naphthalene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	96.9	81.9	113
Phenanthrene	0.5 mg/kg	----	4	103	79.4	114
	0.5 mg/kg	<0.5	----	----	----	----
Pyrene	0.5 mg/kg	----	4	100	78.9	113
	0.5 mg/kg	<0.5	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 259801)		mg/kg	mg/kg	%	%	%
Acenaphthene	0.5 mg/kg	----	4	97.7	81.5	112
	0.5 mg/kg	<0.5	----	----	----	----
Acenaphthylene	0.5 mg/kg	----	4	96.4	79.6	113
	0.5 mg/kg	<0.5	----	----	----	----
Anthracene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	97.0	81.1	112
Benz(a)anthracene	0.5 mg/kg	----	4	93.8	77.2	112
	0.5 mg/kg	<0.5	----	----	----	----
Benzo(a)pyrene	0.5 mg/kg	----	4	94.1	76.4	113
	0.5 mg/kg	<0.5	----	----	----	----
Benzo(b)fluoranthene	0.5 mg/kg	----	4	93.6	71.8	118
	0.5 mg/kg	<0.5	----	----	----	----
Benzo(g,h,i)perylene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	87.2	72.4	114
Benzo(k)fluoranthene	0.5 mg/kg	----	4	98.6	74.2	117
	0.5 mg/kg	<0.5	----	----	----	----

ALS Environmental

Matrix Type: SOIL

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - continued						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 259801) - continued		mg/kg	mg/kg	%	%	%
Chrysene	0.5 mg/kg	----	4	96.6	79.8	114
	0.5 mg/kg	<0.5	----	----	----	----
Dibenz(a,h)anthracene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	88.3	71.7	113
Fluoranthene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	97.0	78.8	113
Fluorene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	96.2	79.9	112
Indeno(1,2,3,cd)pyrene	0.5 mg/kg	----	4	86.3	71	113
	0.5 mg/kg	<0.5	----	----	----	----
Naphthalene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	96.2	81.9	113
Phenanthrene	0.5 mg/kg	----	4	95.3	79.4	114
	0.5 mg/kg	<0.5	----	----	----	----
Pyrene	0.5 mg/kg	----	4	99.3	78.9	113
	0.5 mg/kg	<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 258865)		mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	2 mg/kg	----	26	69.2	68.4	128
	2 mg/kg	<2	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 258866)		mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	2 mg/kg	<2	----	----	----	----
	2 mg/kg	----	26	97.4	68.4	128
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 259252)		mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	2 mg/kg	<2	----	----	----	----
	2 mg/kg	----	26	100	68.4	128
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 259546)		mg/kg	mg/kg	%	%	%
C10 - C14 Fraction	50 mg/kg	<50	----	----	----	----
	50 mg/kg	----	200	94.4	75.2	116

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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*
EP080/071: Total Petroleum Hydrocarbons - continued						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 259546) - continued		mg/kg	mg/kg	%	%	%
C15 - C28 Fraction	100 mg/kg	<100	----	----	----	----
	100 mg/kg	----	200	95.4	75.3	113
C29 - C36 Fraction	100 mg/kg	----	200	87.3	72.6	117
	100 mg/kg	<100	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 259800)		mg/kg	mg/kg	%	%	%
C10 - C14 Fraction	50 mg/kg	<50	----	----	----	----
	50 mg/kg	----	200	85.9	75.2	116
C15 - C28 Fraction	100 mg/kg	----	200	90.6	75.3	113
	100 mg/kg	<100	----	----	----	----
C29 - C36 Fraction	100 mg/kg	----	200	93.5	72.6	117
	100 mg/kg	<100	----	----	----	----
EP080: BTEX						
EP080: BTEX - (QC Lot: 258865)		mg/kg	mg/kg	%	%	%
Benzene	0.2 mg/kg	----	1	85.3	67.5	125
	0.2 mg/kg	<0.2	----	----	----	----
Ethylbenzene	0.2 mg/kg	----	1	92.9	65.3	126
	0.2 mg/kg	<0.2	----	----	----	----
meta- & para-Xylene	0.2 mg/kg	----	2	94.2	66.5	124
	0.2 mg/kg	<0.2	----	----	----	----
ortho-Xylene	0.2 mg/kg	----	1	96.0	66.7	123
	0.2 mg/kg	<0.2	----	----	----	----
Toluene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	1	79.5	69	122
EP080: BTEX - (QC Lot: 258866)		mg/kg	mg/kg	%	%	%
Benzene	0.2 mg/kg	----	1	93.7	67.5	125
	0.2 mg/kg	<0.2	----	----	----	----
Ethylbenzene	0.2 mg/kg	----	1	92.8	65.3	126
	0.2 mg/kg	<0.2	----	----	----	----

Matrix Type: SOIL ***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
EP080: BTEX - continued						
EP080: BTEX - (QC Lot: 258866) - continued		mg/kg	mg/kg	%	%	%
meta- & para-Xylene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	2	91.0	66.5	124
ortho-Xylene	0.2 mg/kg	----	1	87.8	66.7	123
	0.2 mg/kg	<0.2	----	----	----	----
Toluene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	1	93.2	69	122
EP080: BTEX - (QC Lot: 259252)		mg/kg	mg/kg	%	%	%
Benzene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	1	95.9	67.5	125
Ethylbenzene	0.2 mg/kg	----	1	98.8	65.3	126
	0.2 mg/kg	<0.2	----	----	----	----
meta- & para-Xylene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	2	101	66.5	124
ortho-Xylene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	1	98.4	66.7	123
Toluene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	1	102	69	122

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
EP066: Polychlorinated Biphenyls (PCB)						
EP066: Polychlorinated Biphenyls (PCB) - (QC Lot: 258775)		µg/L	µg/L	%	%	%
Total Polychlorinated biphenyls	1 µg/L	<1	----	----	----	----
	1 µg/L	----	10	70.4	61.6	107
EP068A: Organochlorine Pesticides (OC)						
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 258774)		µg/L	µg/L	%	%	%
4,4'-DDD	0.5 µg/L	----	5	97.1	68.2	117
	0.5 µg/L	<0.5	----	----	----	----

Matrix Type: WATER

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP068A: Organochlorine Pesticides (OC) - continued						
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 258774) - continued		µg/L	µg/L	%	%	%
4,4'-DDE	0.5 µg/L	----	5	88.3	68.9	114
	0.5 µg/L	<0.5	----	----	----	----
4,4'-DDT	2 µg/L	<2	----	----	----	----
	2.0 µg/L	----	5	63.9	57.6	123
Aldrin	0.5 µg/L	<0.5	----	----	----	----
	0.5 µg/L	----	5	89.5	68.5	114
alpha-BHC	0.5 µg/L	----	5	85.9	59.5	123
	0.5 µg/L	<0.5	----	----	----	----
alpha-Endosulfan	0.5 µg/L	----	5	84.4	68.5	116
	0.5 µg/L	<0.5	----	----	----	----
beta-BHC	0.5 µg/L	<0.5	----	----	----	----
	0.5 µg/L	----	5	82.8	59.3	122
beta-Endosulfan	0.5 µg/L	<0.5	----	----	----	----
	0.5 µg/L	----	5	89.1	68	117
cis-Chlordane	0.5 µg/L	<0.5	----	----	----	----
	0.5 µg/L	----	5	79.4	66.5	117
delta-BHC	0.5 µg/L	----	5	106	68	116
	0.5 µg/L	<0.5	----	----	----	----
Dieldrin	0.5 µg/L	<0.5	----	----	----	----
	0.5 µg/L	----	5	87.0	68.8	116
Endosulfan sulfate	0.5 µg/L	<0.5	----	----	----	----
	0.5 µg/L	----	5	94.2	65.9	119
Endrin	0.5 µg/L	----	5	81.9	66.2	122
	0.5 µg/L	<0.5	----	----	----	----
Endrin aldehyde	0.5 µg/L	<0.5	----	----	----	----
	0.5 µg/L	----	5	85.9	66.6	117
Endrin ketone	0.5 µg/L	<0.5	----	----	----	----
	0.5 µg/L	----	5	90.7	65	118
gamma-BHC	0.5 µg/L	<0.5	----	----	----	----
	0.5 µg/L	----	5	84.9	59.1	121

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Matrix Type: WATER

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP068A: Organochlorine Pesticides (OC) - continued						
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 258774) - continued		µg/L	µg/L	%	%	%
Heptachlor	0.5 µg/L	----	5	85.3	67.1	116
	0.5 µg/L	<0.5	----	----	----	----
Heptachlor epoxide	0.5 µg/L	----	5	90.0	69.8	113
	0.5 µg/L	<0.5	----	----	----	----
Hexachlorobenzene (HCB)	0.5 µg/L	<0.5	----	----	----	----
	0.5 µg/L	----	5	84.0	58.4	121
Methoxychlor	2 µg/L	<2	----	----	----	----
	2.0 µg/L	----	5	69.0	49.6	134
trans-Chlordane	0.5 µg/L	----	5	76.6	68.3	112
	0.5 µg/L	<0.5	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 258777)		µg/L	µg/L	%	%	%
Acenaphthene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	98.7	62.2	113
Acenaphthylene	0.2 µg/L	----	2	97.5	63.6	114
	0.5 µg/L	<0.5	----	----	----	----
Anthracene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	93.8	64.3	116
Benz(a)anthracene	0.2 µg/L	----	2	94.1	64.1	117
	0.5 µg/L	<0.5	----	----	----	----
Benzo(a)pyrene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	88.2	63.3	117
Benzo(b)fluoranthene	0.2 µg/L	----	2	93.6	61.7	119
	0.5 µg/L	<0.5	----	----	----	----
Benzo(g,h,i)perylene	0.2 µg/L	----	2	104	59.1	118
	0.5 µg/L	<0.5	----	----	----	----
Benzo(k)fluoranthene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	87.0	61.7	117
Chrysene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	87.7	62.5	116

Matrix Type: WATER

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - continued						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 258777) - continued		µg/L	µg/L	%	%	%
Dibenz(a,h)anthracene	0.2 µg/L	----	2	104	61.2	117
	0.5 µg/L	<0.5	----	----	----	----
Fluoranthene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	94.6	63.6	118
Fluorene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	99.4	63.9	115
Indeno(1,2,3,cd)pyrene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	101	59.9	118
Naphthalene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	101	62.4	114
Phenanthrene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	100	62.6	116
Pyrene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	96.4	63.1	118
EP080/071: Total Petroleum Hydrocarbons						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 258776)		µg/L	µg/L	%	%	%
C10 - C14 Fraction	50 µg/L	----	200	83.7	58.9	131
	50 µg/L	<50	----	----	----	----
C15 - C28 Fraction	100 µg/L	<100	----	----	----	----
	100 µg/L	----	200	96.2	73.9	138
C29 - C36 Fraction	50 µg/L	----	200	122	62.7	131
	50 µg/L	<50	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 260023)		µg/L	µg/L	%	%	%
C6 - C9 Fraction	20 µg/L	<20	----	----	----	----
	20 µg/L	----	260	88.9	75	127
EP080: BTEX						
EP080: BTEX - (QC Lot: 260023)		µg/L	µg/L	%	%	%
Benzene	1 µg/L	<1	----	----	----	----
	1 µg/L	----	10	89.7	76.2	124

Matrix Type: WATER

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*
EP080: BTEX - continued						
EP080: BTEX - (QC Lot: 260023) - continued		µg/L	µg/L	%	%	%
Ethylbenzene	2 µg/L	----	10	96.0	76.1	122
	2 µg/L	<2	----	----	----	----
meta- & para-Xylene	2 µg/L	----	10	96.8	75.7	123
	2 µg/L	<2	----	----	----	----
ortho-Xylene	2 µg/L	----	10	91.0	77.9	121
	2 µg/L	<2	----	----	----	----
Toluene	2 µg/L	<2	----	----	----	----
	2 µg/L	----	10	90.8	74.4	124

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*	
					Sample Result	*Spike Recovery*	*Static Limits*	
Analyte name	*Laboratory Sample ID*	*Client Sample ID*	*LOR*	*Spike Concentration*		*MS*	*Low*	*High*
EG005T: Total Metals by ICP-AES								
EG005T: Total Metals by ICP-AES - (QC Lot: 259253)				mg/kg	mg/kg	%	%	%
Arsenic	ES0609982-001	Anonymous	5 mg/kg	50	<5	88.9	70	130
Cadmium			1 mg/kg	50	<1	97.2	70	130
Chromium			2 mg/kg	50	22	98.6	70	130
Copper			5 mg/kg	250	8	104	70	130
Lead			5 mg/kg	250	25	94.7	70	130
Nickel			2 mg/kg	50	4	98.4	70	130
Zinc			5 mg/kg	250	7	93.0	70	130
EG005T: Total Metals by ICP-AES - (QC Lot: 259255)				mg/kg	mg/kg	%	%	%
Arsenic	ES0610062-009	MG03/0.1	5 mg/kg	50	39	91.2	70	130
Cadmium			1 mg/kg	50	<1	108	70	130
Chromium			2 mg/kg	50	14	111	70	130
Copper			5 mg/kg	250	160	90.4	70	130
Lead			5 mg/kg	250	512	95.4	70	130
Nickel			2 mg/kg	50	13	109	70	130
Zinc			5 mg/kg	250	249	87.6	70	130
EG035T: Total Mercury by FIMS								
EG035T: Total Mercury by FIMS - (QC Lot: 259254)				mg/kg	mg/kg	%	%	%
Mercury	ES0609982-001	Anonymous	0.1 mg/kg	5	<0.1	105	70	130
EG035T: Total Mercury by FIMS - (QC Lot: 259256)				mg/kg	mg/kg	%	%	%
Mercury	ES0610062-009	MG03/0.1	0.1 mg/kg	5	0.7	99.6	70	130
EK025G: Free cyanide by Discrete Analyser								
EK025G: Free cyanide by Discrete Analyser - (QC Lot: 259087)				mg/kg	mg/kg	%	%	%
Total Cyanide	ES0609974-001	Anonymous	1 mg/kg	50	<1.0	107	70	130
EP066: Polychlorinated Biphenyls (PCB)								

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Matrix Type: SOIL

Matrix Spike (MS) Report

					Actual Results		Recovery Limits	
					Sample Result	Spike Recovery	Static Limits	
Analyte name	*Laboratory Sample ID*	*Client Sample ID*	*LOR*	*Spike Concentration*		*MS*	*Low*	*High*
EP066: Polychlorinated Biphenyls (PCB) - continued								
EP066: Polychlorinated Biphenyls (PCB) - (QC Lot: 259813)				mg/kg	mg/kg	%	%	%
Total Polychlorinated biphenyls	ES0610062-015	TP05/0.5	0.1 mg/kg	0.5	<0.10	86.0	70	130
EP068A: Organochlorine Pesticides (OC)								
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 259814)				mg/kg	mg/kg	%	%	%
gamma-BHC	ES0610062-015	TP05/0.5	0.05 mg/kg	0.25	<0.05	76.7	75.65	110.44
Heptachlor			0.05 mg/kg	0.25	<0.05	85.0	72.2	106.71
Aldrin			0.05 mg/kg	0.25	<0.05	85.0	77.54	107.0
Dieldrin			0.05 mg/kg	0.25	<0.05	83.6	76.37	109.7
Endrin			0.05 mg/kg	1	<0.05	70.6	68.51	119.47
4,4'-DDT			0.2 mg/kg	1	<0.2	84.2	67.12	118.10
EP068B: Organophosphorus Pesticides (OP)								
EP068B: Organophosphorus Pesticides (OP) - (QC Lot: 259814)				mg/kg	mg/kg	%	%	%
Diazinon	ES0610062-015	TP05/0.5	0.05 mg/kg	0.25	<0.05	78.8	75.85	107.06
Chlorpyrifos-methyl			0.05 mg/kg	0.25	<0.05	78.6	74.84	107.91
Pirimphos-ethyl			0.05 mg/kg	0.25	<0.05	63.2	67.98	109.42
Bromophos-ethyl			0.05 mg/kg	0.25	<0.05	76.4	74.94	107.37
Prothiofos			0.05 mg/kg	0.25	<0.05	76.3	75.45	106.05
EP075(SIM)A: Phenolic Compounds								
EP075(SIM)A: Phenolic Compounds - (QC Lot: 259545)				mg/kg	mg/kg	%	%	%
Phenol	ES0610062-001	MG02/0.2	0.5 mg/kg	10	<0.5	89.8	70	130
2-Chlorophenol			0.5 mg/kg	10	<0.5	91.1	70	130
2-Nitrophenol			0.5 mg/kg	10	<0.5	87.3	60	130
4-Chloro-3-Methylphenol			0.5 mg/kg	10	<0.5	99.0	70	130
Pentachlorophenol			2.0 mg/kg	10	<2.0	98.2	20	130
EP075(SIM)A: Phenolic Compounds - (QC Lot: 259801)				mg/kg	mg/kg	%	%	%
Phenol	ES0610062-021	TP06/1.0	0.5 mg/kg	10	<0.5	78.7	70	130
2-Chlorophenol			0.5 mg/kg	10	<0.5	79.0	70	130
2-Nitrophenol			0.5 mg/kg	10	<0.5	81.6	60	130
4-Chloro-3-Methylphenol			0.5 mg/kg	10	<0.5	79.1	70	130

ALS Environmental

Matrix Type: SOIL

Matrix Spike (MS) Report

					Actual Results		Recovery Limits	
					Sample Result	Spike Recovery	Static Limits	
Analyte name	*Laboratory Sample ID*	*Client Sample ID*	*LOR*	*Spike Concentration*		*MS*	*Low*	*High*
EP075(SIM)A: Phenolic Compounds - continued								
EP075(SIM)A: Phenolic Compounds - (QC Lot: 259801) - continued				mg/kg	mg/kg	%	%	%
Pentachlorophenol	ES0610062-021	TP06/1.0	2.0 mg/kg	10	<2.0	78.8	20	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 259545)				mg/kg	mg/kg	%	%	%
Acenaphthene	ES0610062-001	MG02/0.2	0.5 mg/kg	10	<0.5	110	70	130
Pyrene			0.5 mg/kg	10	<0.5	105	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 259801)				mg/kg	mg/kg	%	%	%
Acenaphthene	ES0610062-021	TP06/1.0	0.5 mg/kg	10	<0.5	89.8	70	130
Pyrene			0.5 mg/kg	10	1.7	105	70	130
EP080/071: Total Petroleum Hydrocarbons								
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 258865)				mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	ES0610062-004	MG02/3.3	2 mg/kg	26	<2	73.3	70	130
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 258866)				mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	ES0610062-023	TP07/0.25	2 mg/kg	26	<2	72.7	70	130
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 259252)				mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	ES0610058-002	Anonymous	2 mg/kg	26	<2	88.4	70	130
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 259546)				mg/kg	mg/kg	%	%	%
C10 - C14 Fraction	ES0610062-001	MG02/0.2	50 mg/kg	700	290	94.4	70	130
C15 - C28 Fraction			100 mg/kg	3400	<100	114	70	130
C29 - C36 Fraction			100 mg/kg	3600	<100	113	70	130
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 259800)				mg/kg	mg/kg	%	%	%
C10 - C14 Fraction	ES0610062-021	TP06/1.0	50 mg/kg	700	<50	101	70	130
C15 - C28 Fraction			100 mg/kg	3400	<100	126	70	130
C29 - C36 Fraction			100 mg/kg	3600	<100	111	70	130
EP080: BTEX								
EP080: BTEX - (QC Lot: 258865)				mg/kg	mg/kg	%	%	%
Benzene	ES0610062-004	MG02/3.3	0.2 mg/kg	2.5	<0.2	103	70	130
Toluene			0.2 mg/kg	2.5	<0.2	88.6	70	130
Ethylbenzene			0.2 mg/kg	2.5	<0.2	102	70	130

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Matrix Type: SOIL ***Matrix Spike (MS) Report***

					Actual Results		Recovery Limits	
					Sample Result	Spike Recovery	Static Limits	
Analyte name	***Laboratory Sample ID***	***Client Sample ID***	***LOR***	***Spike Concentration***		***MS***	***Low***	***High***
EP080: BTEX - continued								
EP080: BTEX - (QC Lot: 258865) - continued				mg/kg	mg/kg	%	%	%
meta- & para-Xylene	ES0610062-004	MG02/3.3	0.2 mg/kg	2.5	<0.2	101	70	130
ortho-Xylene			0.2 mg/kg	2.5	<0.2	103	70	130
EP080: BTEX - (QC Lot: 258866)				mg/kg	mg/kg	%	%	%
Benzene	ES0610062-023	TP07/0.25	0.2 mg/kg	2.5	<0.2	77.3	70	130
Toluene			0.2 mg/kg	2.5	<0.2	71.8	70	130
Ethylbenzene			0.2 mg/kg	2.5	<0.2	78.7	70	130
meta- & para-Xylene			0.2 mg/kg	2.5	<0.2	78.9	70	130
ortho-Xylene			0.2 mg/kg	2.5	<0.2	76.0	70	130
EP080: BTEX - (QC Lot: 259252)				mg/kg	mg/kg	%	%	%
Benzene	ES0610058-002	Anonymous	0.2 mg/kg	2.5	<0.2	93.3	70	130
Toluene			0.2 mg/kg	2.5	<0.2	94.3	70	130
Ethylbenzene			0.2 mg/kg	2.5	<0.2	97.8	70	130
meta- & para-Xylene			0.2 mg/kg	2.5	<0.2	99.1	70	130
ortho-Xylene			0.2 mg/kg	2.5	<0.2	96.0	70	130

Matrix Type: WATER ***Matrix Spike (MS) Report***

					Actual Results		Recovery Limits	
					Sample Result	Spike Recovery	Static Limits	
Analyte name	***Laboratory Sample ID***	***Client Sample ID***	***LOR***	***Spike Concentration***		***MS***	***Low***	***High***
EP080/071: Total Petroleum Hydrocarbons								
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 260023)				µg/L	µg/L	%	%	%
C6 - C9 Fraction	ES0610079-001	Anonymous	20 µg/L	250	60	90.0	70	130
EP080: BTEX								
EP080: BTEX - (QC Lot: 260023)				µg/L	µg/L	%	%	%
Benzene	ES0610079-001	Anonymous	1 µg/L	25	2	106	70	130
Toluene			2 µg/L	25	<2	106	70	130
Ethylbenzene			2 µg/L	25	<2	109	70	130
meta- & para-Xylene			2 µg/L	25	<2	113	70	130
ortho-Xylene			2 µg/L	25	<2	107	70	130

ALS Environmental

INTERPRETIVE QUALITY CONTROL REPORT

Client	:	**CH2M HILL PTY LTD**	**Laboratory**	:	ALS Environmental Sydney	**Page**	: **1 of 12**
Contact	:	MR ADAM SULLIVAN	**Contact**	:	Greg Vogel		
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	**Address**	:	277-289 Woodpark Road Smithfield NSW Australia 2164	**Work order**	: **ES0610062**
						Amendment No.	:
Project	:	347496 McDonaldtown Gasworks	**Quote number**	:	----	**Date received**	: 16 Aug 2006
Order number	:	- Not provided -				**Date issued**	: 28 Aug 2006
C-O-C number	:	- Not provided -					
Site	:	MACDONALDTOWN					
E-mail	:	adam.sullivan@ch2m.com.au	**E-mail**	:	Greg.Vogel@alsenviro.com	**No. of samples**	
Telephone	:	02 9950 0200	**Telephone**	:	+61 (02) 8784 8555	**Received**	: 59
Facsimile	:	02 9950 0600	**Facsimile**	:	+61 (02) 8784 8500	**Analysed**	: 39

This Interpretive Quality Control Report was issued on 28 Aug 2006 for the ALS work order reference ES0610062 and supersedes any previous reports with this reference.
This report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Type Frequency Compliance
- Summary of all Quality Control Outliers
- Brief Method Summaries

ALS Environmental

Interpretive Quality Control Report - Analysis Holding Time

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the sample aliquot was taken. Elapsed time to analysis represents time from sampling where no extraction / digestion is involved or time from extraction / digestion where this is present. For composite samples, sampling date/time is taken as that of the oldest sample contributing to that composite. Sample date/time for laboratory produced leaches are taken from the completion date/time of the leaching process. Outliers for holding time are based on USEPA SW846, APHA, AS and NEPM (1999). Failed outliers, refer to the 'Summary of Outliers'.

Matrix Type: SOIL ***Analysis Holding Time and Preservation***

Method / **Container /** Client Sample ID(s)		Date Sampled	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EA055-103: Moisture Content								
Soil Glass Jar - Unpreserved								
MG02/0.2,	MG02/1.8,	**16 Aug 2006**	----	----	----	**22 Aug 2006**	23 Aug 2006	Pass
MG02/4.7,	TRIP BLANK 2,							
TRIP SPIKE 2,	TP02/4.5,							
MG03/0.1,	TP04/0.5,							
TP04/0.7,	TP04/3.0,							
TP05/0.25,	TP05/0.5,							
TP05/1.5,	TP05/2.0,							
DUP03,	TP06/0.5,							
TP06/1.0,	TP06/2.5,							
TP07/0.5,	TP07/1.5,							
TP07/2.0,	TP08/0.5,							
TP08/1.0,	TP08/2.0,							
DUP04,	TP09/0.5,							
TP09/2.5,	TP10/1.0,							
TP10/2.0,	TP10/4.0,							
DUP05,								
TAR WELL #2,	TRIP SPIKE CONTROL							
EG005T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved								
MG02/1.8,	TP02/4.5,	**16 Aug 2006**	**19 Aug 2006**	12 Feb 2007	Pass	**21 Aug 2006**	12 Feb 2007	Pass
MG03/0.1,	TP04/0.7,							
TP05/0.5,	TP05/1.5,							
TP06/1.0,	TP07/0.5,							
TP08/0.5,	TP08/1.0,							
TP08/2.0,	TP09/1.0,							
TP09/2.5,	TP10/1.0,							
TP10/2.0,	TP10/4.0,							
DUP04,	DUP05,							
TAR WELL #2								
EG035T: Total Mercury by FIMS								

Matrix Type: SOIL

Analysis Holding Time and Preservation

Method / **Container /** Client Sample ID(s)		**Date Sampled**	**Extraction / Preparation**			**Analysis**		
			Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EG035T: Total Mercury by FIMS **- continued**								
Soil Glass Jar - Unpreserved								
MG02/1.8,	TP02/4.5,	**16 Aug 2006**	**19 Aug 2006**	13 Sep 2006	Pass	**22 Aug 2006**	13 Sep 2006	Pass
MG03/0.1,	TP04/0.7,							
TP05/0.5,	TP05/1.5,							
TP06/1.0,	TP07/0.5,							
TP08/0.5,	TP08/1.0,							
TP08/2.0,	TP09/1.0,							
TP09/2.5,	TP10/1.0,							
TP10/2.0,	TP10/4.0,							
DUP04,	DUP05,							
TAR WELL #2								
EK026G: Total Cyanide By Discrete Analyser								
Soil Glass Jar - Unpreserved								
MG02/1.8,	TP06/0.5,	**16 Aug 2006**	**21 Aug 2006**	12 Feb 2007	Pass	**21 Aug 2006**	12 Feb 2007	Pass
TP06/1.0,	TP07/0.5,							
TP08/0.5,	TP08/1.0,							
TP09/1.0,	TP10/1.0,							
TP10/2.0,	TAR WELL #2							
EP066: Polychlorinated Biphenyls (PCB)								
Soil Glass Jar - Unpreserved								
MG02/1.8,	MG03/0.1,	**16 Aug 2006**	**21 Aug 2006**	30 Aug 2006	Pass	**22 Aug 2006**	30 Sep 2006	Pass
TP05/0.5,	TP06/1.0,							
TP08/0.5,	TP10/1.0,							
TAR WELL #2								
EP068: Pesticides by GCMS								
Soil Glass Jar - Unpreserved								
MG02/1.8,	TP02/4.5,	**16 Aug 2006**	**21 Aug 2006**	30 Aug 2006	Pass	**22 Aug 2006**	30 Sep 2006	Pass
MG03/0.1,	TP04/0.7,							
TP05/0.5,	TP06/1.0,							
TP08/0.5,	TP10/1.0,							
TAR WELL #2								
EP071: TPH - Semivolatile Fraction								
Soil Glass Jar - Unpreserved								
MG02/0.2,	MG02/1.8,	**16 Aug 2006**	**21 Aug 2006**	30 Aug 2006	Pass	**22 Aug 2006**	30 Sep 2006	Pass
MG02/4.7,	TRIP BLANK 2,							
TRIP SPIKE 2,	TP02/4.5,							
MG03/0.1,	TP04/0.5,							
TP04/0.7,	TP04/3.0,							
TP05/0.5,	TP05/1.5,							
TP05/2.0,	DUP03,							
TP06/0.5								

Matrix Type: SOIL

Analysis Holding Time and Preservation

Method / **Container /** Client Sample ID(s)		**Date Sampled**	**Extraction / Preparation**			**Analysis**		
			Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EP071: TPH - Semivolatile Fraction **- continued**								
Soil Glass Jar - Unpreserved								
TP06/1.0,	TP06/2.5,	**16 Aug 2006**	**22 Aug 2006**	30 Aug 2006	Pass	**22 Aug 2006**	1 Oct 2006	Pass
TP07/0.5,	TP07/1.5,							
TP07/2.0,	TP08/0.5,							
TP08/1.0,	TP08/2.0,							
TP09/0.5,	TP09/1.0,							
TP09/2.5,	TP10/1.0,							
TP10/2.0,	TP10/4.0,							
DUP04,	DUP05,							
TAR WELL #2,	TRIP SPIKE CONTROL							
EP075(SIM): PAH/Phenols (SIM)								
Soil Glass Jar - Unpreserved								
MG02/0.2,	MG02/1.8,	**16 Aug 2006**	**21 Aug 2006**	30 Aug 2006	Pass	**22 Aug 2006**	30 Sep 2006	Pass
MG02/4.7,	TP02/4.5,							
MG03/0.1,	TP04/0.5,							
TP04/0.7,	TP04/3.0,							
TP05/0.25,	TP05/0.5,							
TP05/1.5,	TP05/2.0,							
DUP03,	TP06/0.25,							
TP06/0.5								
Soil Glass Jar - Unpreserved								
TP06/1.0,	TP06/2.5,	**16 Aug 2006**	**22 Aug 2006**	30 Aug 2006	Pass	**23 Aug 2006**	1 Oct 2006	Pass
TP07/0.5,	TP07/1.5,							
TP07/2.0,	TP08/0.25,							
TP08/0.5,	TP08/1.0,							
TP08/2.0,	TP09/0.5,							
TP09/1.0,	TP09/2.5,							
TP10/1.0,	TP10/2.0,							
TP10/4.0,	DUP04,							
DUP05,	TAR WELL #2							
EP080: TPH Volatiles/BTEX								
Soil Glass Jar - Unpreserved								
TP06/1.0,	TP06/2.5,	**16 Aug 2006**	**18 Aug 2006**	30 Aug 2006	Pass	**20 Aug 2006**	30 Aug 2006	Pass
TP07/0.5,	TP07/1.5,							
TP07/2.0,	TP08/0.5,							
TP08/1.0,	TP08/2.0,							
TP09/0.5,	TP09/1.0,							
TP09/2.5,	TP10/1.0,							
TP10/2.0,	TP10/4.0,							
DUP04,	DUP05							

Matrix Type: SOIL ***Analysis Holding Time and Preservation***

Method / **Container /** Client Sample ID(s)	**Date Sampled**	**Extraction / Preparation**			**Analysis**		
		Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EP080: TPH Volatiles/BTEX **- continued**							
Soil Glass Jar - Unpreserved MG02/0.2, MG02/1.8, MG02/4.7, TRIP BLANK 2, TRIP SPIKE 2, TP02/4.5, MG03/0.1, TP04/0.5, TP04/0.7, TP04/3.0, TP05/0.5, TP05/1.5, TP05/2.0, DUP03, TP06/0.5	**16 Aug 2006**	**18 Aug 2006**	30 Aug 2006	Pass	**21 Aug 2006**	30 Aug 2006	Pass
Soil Glass Jar - Unpreserved TAR WELL #2, TRIP SPIKE CONTROL	**16 Aug 2006**	**19 Aug 2006**	30 Aug 2006	Pass	**22 Aug 2006**	30 Aug 2006	Pass

Matrix Type: WATER ***Analysis Holding Time and Preservation***

Method / **Container /** Client Sample ID(s)	**Date Sampled**	**Extraction / Preparation**			**Analysis**		
		Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EP066: Polychlorinated Biphenyls (PCB)							
Amber Glass Bottle - Unpreserved W01, W02, W03	**16 Aug 2006**	**18 Aug 2006**	23 Aug 2006	Pass	**21 Aug 2006**	27 Sep 2006	Pass
EP068: Pesticides							
Amber Glass Bottle - Unpreserved W01, W02, W03	**16 Aug 2006**	**18 Aug 2006**	23 Aug 2006	Pass	**21 Aug 2006**	27 Sep 2006	Pass
EP071: TPH - Semivolatile Fraction							
Amber Glass Bottle - Unpreserved W01, W02, W03	**16 Aug 2006**	**18 Aug 2006**	23 Aug 2006	Pass	**21 Aug 2006**	27 Sep 2006	Pass
EP075(SIM): PAH/Phenols (GC/MS - SIM)							
Amber Glass Bottle - Unpreserved W01, W02, W03	**16 Aug 2006**	**18 Aug 2006**	23 Aug 2006	Pass	**21 Aug 2006**	27 Sep 2006	Pass
EP080: TPH Volatiles/BTEX							
Amber VOC Vial - HCl or NaHSO4 W01, W02, W03	**16 Aug 2006**	**----**	----	----	**22 Aug 2006**	30 Aug 2006	Pass

Interpretive Quality Control Report - Frequency of Quality Control Samples

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which this work order was processed. Actual rate should be greater than or equal to the expected rate.

Matrix Type: SOIL ***Frequency of Quality Control Samples***

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	**Actual**	**Expected**	
Laboratory Duplicates (DUP)					
EA055-103: Moisture Content	6	59	**10.2**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG005T: Total Metals by ICP-AES	4	40	**10.0**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035T: Total Mercury by FIMS	4	40	**10.0**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EK026G: Total Cyanide By Discrete Analyser	2	19	**10.5**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP066: Polychlorinated Biphenyls (PCB)	2	18	**11.1**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP068: Pesticides by GCMS	2	20	**10.0**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	4	38	**10.5**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	4	36	**11.1**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	6	60	**10.0**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Laboratory Control Samples (LCS)					
EG005T: Total Metals by ICP-AES	2	40	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035T: Total Mercury by FIMS	2	40	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EK026G: Total Cyanide By Discrete Analyser	1	19	**5.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP066: Polychlorinated Biphenyls (PCB)	1	18	**5.6**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP068: Pesticides by GCMS	1	20	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	2	38	**5.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	2	36	**5.6**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	3	60	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Method Blanks (MB)					
EG005T: Total Metals by ICP-AES	2	40	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035T: Total Mercury by FIMS	2	40	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EK026G: Total Cyanide By Discrete Analyser	1	19	**5.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP066: Polychlorinated Biphenyls (PCB)	1	18	**5.6**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP068: Pesticides by GCMS	1	20	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	2	38	**5.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	2	36	**5.6**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	3	60	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Matrix Spikes (MS)					
EG005T: Total Metals by ICP-AES	2	40	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035T: Total Mercury by FIMS	2	40	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EK026G: Total Cyanide By Discrete Analyser	1	19	**5.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP066: Polychlorinated Biphenyls (PCB)	1	18	**5.6**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP068: Pesticides by GCMS	1	20	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	2	38	**5.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	2	36	**5.6**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	3	60	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement

Matrix Type: WATER ***Frequency of Quality Control Samples***

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
EP080: TPH Volatiles/BTEX	2	20	**10.0**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Laboratory Control Samples (LCS)					
EP066: Polychlorinated Biphenyls (PCB)	1	3	**33.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP068: Pesticides	1	3	**33.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	1	4	**25.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (GC/MS - SIM)	1	3	**33.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	1	20	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Method Blanks (MB)					
EP066: Polychlorinated Biphenyls (PCB)	1	3	**33.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP068: Pesticides	1	3	**33.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	1	4	**25.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (GC/MS - SIM)	1	3	**33.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	1	20	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Matrix Spikes (MS)					
EP080: TPH Volatiles/BTEX	1	20	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement

Interpretive Quality Control Report - Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged on the 'Quality Control Report'. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). - Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot.

Non-surrogates

ALS QC Lot	Matrix Type	Laboratory Sample ID	Client Sample ID	Analyte	Data	Limits	Comment
Laboratory Duplicates (DUP)							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	SOIL	ES0610062-001	MG02/0.2	Naphthalene	40.6 %	0-20 %	RPD exceeds LOR based limits
Laboratory Control Samples (LCS)							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	SOIL	285483-002	----	Benzo(k)fluoranthene	120 %	74.2-117 %	Recovery greater than upper control limit
Matrix Spikes (MS)							
EP068B: Organophosphorus Pesticides (OP)	SOIL	ES0610062-015	TP05/0.5	Pirimphos-ethyl	63.2 %	67.98-109.42 %	Recovery less than lower data quality objective

- **For all matrices, no method blank result outliers occur.**

Surrogates

ALS QC Lot	Matrix Type	Laboratory Sample ID	Client Sample ID	Analyte	Data	Limits	Comment
Surrogates							
EP066S: PCB Surrogate	SOIL	ES0610062-044	TAR WELL #2	Decachlorobiphenyl	ND	----	Surrogate recovery not determined due to either primary sample extract dilution or matrix interferences
EP068S: Organochlorine Pesticide Surrogate	SOIL	ES0610062-044	TAR WELL #2	Dibromo-DDE	ND	----	Surrogate recovery not determined due to either primary sample extract dilution or matrix interferences
EP068T: Organophosphorus Pesticide Surrogate	SOIL	ES0610062-044	TAR WELL #2	DEF	ND	----	Surrogate recovery not determined due to either primary sample extract dilution or matrix interferences
EP075(SIM)S: Phenolic Compound Surrogates	SOIL	ES0610062-044	TAR WELL #2	Phenol-d6	ND	----	Surrogate recovery not determined due to either primary sample extract dilution or matrix interferences
				2-Chlorophenol-D4	ND	----	Surrogate recovery not determined due to either primary sample extract dilution or matrix interferences
				2,4,6-Tribromophenol	ND	----	Surrogate recovery not determined due to either primary sample extract dilution or matrix interferences
EP075(SIM)T: PAH Surrogates	SOIL	ES0610062-044	TAR WELL #2	2-Fluorobiphenyl	ND	----	Surrogate recovery not determined due to either primary sample extract dilution or matrix interferences
				Anthracene-d10	ND	----	Surrogate recovery not determined due to either primary sample extract dilution or matrix interferences
				4-Terphenyl-d14	ND	----	Surrogate recovery not determined due to either primary sample extract dilution or matrix interferences
EP080S: TPH(V)/BTEX Surrogates	SOIL	ES0610062-007	TRIP SPIKE 2	Toluene-D8	119 %	81-117 %	Recovery greater than upper data quality objective
	SOIL	ES0610062-013	TP04/3.0	Toluene-D8	118 %	81-117 %	Recovery greater than upper data quality objective
	SOIL	ES0610062-015	TP05/0.5	Toluene-D8	119 %	81-117 %	Recovery greater than upper data quality objective
				1,2-Dichloroethane-D4	ND	----	Surrogate recovery not determined due to either primary sample extract dilution or matrix interferences
				Toluene-D8	ND	----	Surrogate recovery not determined due to either primary sample extract dilution or matrix interferences
				4-Bromofluorobenzene	ND	----	Surrogate recovery not determined due to either primary sample extract dilution or matrix interferences
Surrogates							
EP075(SIM)S: Phenolic Compound Surrogates	WATER	ES0610062-043	W03	Phenol-d6	ND	----	Surrogate recovery not determined due to either primary sample extract dilution or matrix interferences

Outliers : Analysis Holding Time

The following report highlights outliers within this 'Interpretive Quality Control Report - Analysis Holding Time'.

- **No holding time outliers occur.**

Outliers : Frequency of Quality Control Samples

The following report highlights outliers within this 'Interpretive Quality Control Report - Frequency of Quality Control Samples'.

- **No frequency outliers occur.**

Method Reference Summary

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.

Matrix Type: SOIL ***Method Reference Summary***

Preparation Methods

EK026PR : NaOH leach for TCN in Soils - APHA 20th ed., 4500 CN- C & N. Samples are extracted by end-over-end tumbling with NaOH.

EN69 : Hot Block Digest for metals in soils sediments and sludges - USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (1999) Schedule B(3) (Method 202)

ORG16 : Methanolic Extraction of Soils for Purge and Trap - (USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.

ORG17A : Tumbler Extraction of Solids (Option A - Concentrating) - In-house, Mechanical agitation (tumbler). 20g of sample, Na2SO4 and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

ORG17B : Tumbler Extraction of Solids (Option B - Non-concentrating) - In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.

Analytical Methods

ASB-SOL : Asbestos - Count (Solid) - Asbestos Count on solid matrices conducted by Subcontracting Laboratory

EA055-103 : Moisture Content - A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (1999) Schedule B(3) (Method 102)

EG005T : Total Metals by ICP-AES - (APHA 20th ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (1999) Schedule B(3)

EG035T : Total Mercury by FIMS - AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (1999) Schedule B(3)

EK026G : Total Cyanide By Discrete Analyser - APHA 20th 4500 CN - C & N. Caustic leach extracts of the sample are distilled with sulphuric acid, converting all CN species to HCN. The distillates are analyzed for CN by Seal. This method is compliant with NEPM (1999) Schedule B(3) (Method 403)

EP066 : Polychlorinated Biphenyls (PCB) - (USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 504)

EP068 : Pesticides by GCMS - (USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM (1999) Schedule B(3) (Method 504,505)

EP071 : TPH - Semivolatile Fraction - (USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)

EP075(SIM) : PAH/Phenols (SIM) - (USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 502 and 507)

Matrix Type: SOIL ***Method Reference Summary***

Analytical Methods

EP080 : TPH Volatiles/BTEX - (USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 501)

Matrix Type: WATER ***Method Reference Summary***

Preparation Methods

ORG14 : Separatory Funnel Extraction of Liquids - USEPA SW 846 - 3510B 500 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2). ALS default excludes sediment which may be resident in the container.

Analytical Methods

EP066 : Polychlorinated Biphenyls (PCB) - USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

EP068 : Pesticides - USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

EP071 : TPH - Semivolatile Fraction - USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

EP075(SIM) : PAH/Phenols (GC/MS - SIM) - USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

EP080 : TPH Volatiles/BTEX - USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

AUSTRALIAN LABORATORY SERVICES PTY LTD ABN 84 009 936 029
Smithfield NSW 2164 Australia
Telephone: +61 (02) 8784 8555 Facsimile: +61 (02) 8784 8500 http://www.alsenviro.com/

ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive report

Client Details

Client	:	**CH2M HILL PTY LTD**
Contact	:	**MR ADAM SULLIVAN**
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515
Project	:	**347496 McDonaldtown Gasworks**
Order number	:	**- Not provided -**
C-O-C Number	:	**- Not provided -**
Site	:	**MACDONALDTOWN**
Sampler	:	**- Not provided -**
E-mail	:	adam.sullivan@ch2m.com.au
Telephone	:	02 9950 0200
Facsimile	:	02 9950 0600

Laboratory Details

Laboratory	:	**ALS Environmental Sydney**
Manager	:	**Greg Vogel**
Address	:	Smithfield NSW Australia 2164
Quote number	:	----
Work order	:	**ES0610062**
E-mail	:	Greg.Vogel@alsenviro.com
Telephone	:	+61 (02) 8784 8555
Facsimile	:	+61 (02) 8784 8500

Dates

Date Samples Received	:	16 Aug 2006	**SRA Issue Date**	:	22 Aug 2006
Scheduled Reporting Date	:	**23 Aug 2006**	**Client Requested Date**	:	23 Aug 2006

Delivery Details

Mode of Delivery	:	Carrier.	**Temperature**	:	CHILLED - Ice present
No. of coolers/boxes	:	2 HARD	**No. of samples** - **Received**		59
Security Seal	:	Intact.	- **Analysed**		45

Comments

- **Samples received in appropriately pretreated and preserved containers.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **Asbestos analysis to be conducted by ASET.**
- **Samples "W01,W02,W03" analysis to be conducted TPH/BTEX/PAH/OC/PCB as per A.Sullivan 17/08/06 1.20pm.**
  Sample "TP09 1.5 16/08/06' was received extra and has been placed on hold as advised.
- **Sample(s) have been received within recommended holding times.**

- Analytical work for this work order will be conducted at ALSE Sydney.
- 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 Nazeeh Aoun.
- 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'.

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.

Client	: CH2M HILL PTY LTD	**Work Order**	: ES0610062
Project	: 347496 McDonaldtown Gasworks	**ALS Quote Reference**	: ----

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

Some items described below may be part of a laboratory process neccessary 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)	**EA055-103 - SOIL** Moisture Content	**EK026G (Solids) - SOIL** Total Cyanide By Discrete Analyser	**S-02 - SOIL** 8 Metals (incl. Digestion)	**S-04 - SOIL** TPH/BTEX	**S-05 - SOIL** TPH/BTEX/8 Metals	**S-07 - SOIL** TPH/BTEX/PAH (SIM)	**S-12 - SOIL** OC/OP Pesticides	**S-14A - SOIL** PAH/Phenols (16 PAH - SIM)	**S-19 - SOIL** TPH/BTEX/P/Ph/OC/OP/PCB/8 metals
ES0610062-001	**MG02/0.2 - 16 Aug 2006**					⌋				⌋	
ES0610062-002	**MG02/1.8 - 16 Aug 2006**		⌋	⌋							⌋
ES0610062-003	**MG02/2.0 - 16 Aug 2006**										
ES0610062-004	**MG02/3.3 - 16 Aug 2006**										
ES0610062-005	**MG02/4.7 - 16 Aug 2006**							⌋			
ES0610062-006	**TRIP BLANK 2 - 16 Aug 2006**					⌋					
ES0610062-007	**TRIP SPIKE 2 - 16 Aug 2006**					⌋					
ES0610062-008	**TP02/4.5 - 16 Aug 2006**				⌋			⌋	⌋		
ES0610062-009	**MG03/0.1 - 16 Aug 2006**	⌋									⌋
ES0610062-010	**TP04/0.25 - 16 Aug 2006**	⌋									
ES0610062-011	**TP04/0.5 - 16 Aug 2006**							⌋			
ES0610062-012	**TP04/0.7 - 16 Aug 2006**				⌋			⌋	⌋		
ES0610062-013	**TP04/3.0 - 16 Aug 2006**							⌋			
ES0610062-014	**TP05/0.25 - 16 Aug 2006**	⌋								⌋	
ES0610062-015	**TP05/0.5 - 16 Aug 2006**										⌋
ES0610062-016	**TP05/1.5 - 16 Aug 2006**				⌋			⌋			
ES0610062-017	**TP05/2.0 - 16 Aug 2006**							⌋			
ES0610062-018	**DUP03 - 16 Aug 2006**							⌋			
ES0610062-019	**TP06/0.25 - 16 Aug 2006**	⌋								⌋	
ES0610062-020	**TP06/0.5 - 16 Aug 2006**		⌋	⌋				⌋			
ES0610062-021	**TP06/1.0 - 16 Aug 2006**		⌋	⌋							⌋
ES0610062-022	**TP06/2.5 - 16 Aug 2006**							⌋			
ES0610062-023	**TP07/0.25 - 16 Aug 2006**	⌋									
ES0610062-024	**TP07/0.5 - 16 Aug 2006**		⌋	⌋	⌋			⌋			
ES0610062-025	**TP07/1.5 - 16 Aug 2006**							⌋			
ES0610062-026	**TP07/2.0 - 16 Aug 2006**							⌋			
ES0610062-027	**TP08/0.25 - 16 Aug 2006**	⌋								⌋	
ES0610062-028	**TP08/0.5 - 16 Aug 2006**		⌋	⌋							⌋
ES0610062-029	**TP08/1.0 - 16 Aug 2006**		⌋	⌋			⌋			⌋	
ES0610062-030	**TP08/2.0 - 16 Aug 2006**				⌋			⌋			
ES0610062-031	**TP09/0.25 - 16 Aug 2006**	⌋									
ES0610062-032	**TP09/0.5 - 16 Aug 2006**							⌋			
ES0610062-033	**TP09/1.0 - 16 Aug 2006**		⌋	⌋			⌋			⌋	
ES0610062-034	**TP09/2.5 - 16 Aug 2006**				⌋			⌋			
ES0610062-035	**TP10/0.25 - 16 Aug 2006**	⌋									
ES0610062-036	**TP10/1.0 - 16 Aug 2006**		⌋	⌋							⌋
ES0610062-037	**TP10/2.0 - 16 Aug 2006**		⌋	⌋	⌋			⌋			
ES0610062-038	**TP10/4.0 - 16 Aug 2006**				⌋			⌋			
ES0610062-039	**DUP04 - 16 Aug 2006**				⌋			⌋			
ES0610062-040	**DUP05 - 16 Aug 2006**				⌋			⌋			
ES0610062-041	**W01 - 16 Aug 2006**										
ES0610062-042	**W02 - 16 Aug 2006**										
ES0610062-043	**W03 - 16 Aug 2006**										
ES0610062-044	**TAR WELL #2 - 16 Aug 2006**		⌋	⌋							⌋
ES0610062-045	**TRIP SPIKE CONTROL - 16 Aug 2006**					⌋					

Client	: CH2M HILL PTY LTD	**Work Order**	: ES0610062
Project	: 347496 McDonaldtown Gasworks	**ALS Quote Reference**	: ----

ALS Environmental

ALS Sample ID.	Client Sample ID - Sample Date	**Requested Analysis**									
		ASB-SOL - SOIL Asbestos - Count (Solid)	**EA055-103 - SOIL** Moisture Content	**EK026G (Solids) - SOIL** Total Cyanide By Discrete Analyser	**S-02 - SOIL** 8 Metals (incl. Digestion)	**S-04 - SOIL** TPH/BTEX	**S-05 - SOIL** TPH/BTEX/8 Metals	**S-07 - SOIL** TPH/BTEX/PAH (SIM)	**S-12 - SOIL** OC/OP Pesticides	**S-14A - SOIL** PAH/Phenols (16 PAH - SIM)	**S-19 - SOIL** TPH/BTEX/P/Ph/OC/OP/PCB/8 metals
ES0610062-046	**MG02/0.2 - 16 Aug 2006**										
ES0610062-047	**MG02/1.5 - 16 Aug 2006**										
ES0610062-048	**MG02/2.7 - 16 Aug 2006**										
ES0610062-049	**MG02/3.7 - 16 Aug 2006**										
ES0610062-050	**TP04/2.0 - 16 Aug 2006**										
ES0610062-051	**TP05/1.0 - 16 Aug 2006**										
ES0610062-052	**TP06/1.5 - 16 Aug 2006**										
ES0610062-053	**TP07/1.0 - 16 Aug 2006**										
ES0610062-054	**TP08/1.5 - 16 Aug 2006**										
ES0610062-055	**TP09/2.0 - 16 Aug 2006**										
ES0610062-056	**TP10/0.5 - 16 Aug 2006**										
ES0610062-057	**TP10/1.5 - 16 Aug 2006**										
ES0610062-058	**TP10/3.0 - 16 Aug 2006**										
ES0610062-060	**TP09/1.5 - 16 Aug 2006**										
	Total(s) :	**8**	**10**	**10**	**10**	**4**	**2**	**20**	**2**	**6**	**7**

Client	: CH2M HILL PTY LTD	**Work Order**	: ES0610062
Project	: 347496 McDonaldtown Gasworks	**ALS Quote Reference**	: ----

ALS Environmental

ALS Sample ID.	Client Sample ID - Sample Date	Requested Analysis									
		W-07 - WATER TPH/BTEX/PAH	**W-11 - WATER** OC/PCB								
ES0610062-001	MG02/0.2 - 16 Aug 2006										
ES0610062-002	MG02/1.8 - 16 Aug 2006										
ES0610062-003	MG02/2.0 - 16 Aug 2006										
ES0610062-004	MG02/3.3 - 16 Aug 2006										
ES0610062-005	MG02/4.7 - 16 Aug 2006										
ES0610062-006	TRIP BLANK 2 - 16 Aug 2006										
ES0610062-007	TRIP SPIKE 2 - 16 Aug 2006										
ES0610062-008	TP02/4.5 - 16 Aug 2006										
ES0610062-009	MG03/0.1 - 16 Aug 2006										
ES0610062-010	TP04/0.25 - 16 Aug 2006										
ES0610062-011	TP04/0.5 - 16 Aug 2006										
ES0610062-012	TP04/0.7 - 16 Aug 2006										
ES0610062-013	TP04/3.0 - 16 Aug 2006										
ES0610062-014	TP05/0.25 - 16 Aug 2006										
ES0610062-015	TP05/0.5 - 16 Aug 2006										
ES0610062-016	TP05/1.5 - 16 Aug 2006										
ES0610062-017	TP05/2.0 - 16 Aug 2006										
ES0610062-018	DUP03 - 16 Aug 2006										
ES0610062-019	TP06/0.25 - 16 Aug 2006										
ES0610062-020	TP06/0.5 - 16 Aug 2006										
ES0610062-021	TP06/1.0 - 16 Aug 2006										
ES0610062-022	TP06/2.5 - 16 Aug 2006										
ES0610062-023	TP07/0.25 - 16 Aug 2006										
ES0610062-024	TP07/0.5 - 16 Aug 2006										
ES0610062-025	TP07/1.5 - 16 Aug 2006										
ES0610062-026	TP07/2.0 - 16 Aug 2006										
ES0610062-027	TP08/0.25 - 16 Aug 2006										
ES0610062-028	TP08/0.5 - 16 Aug 2006										
ES0610062-029	TP08/1.0 - 16 Aug 2006										
ES0610062-030	TP08/2.0 - 16 Aug 2006										
ES0610062-031	TP09/0.25 - 16 Aug 2006										
ES0610062-032	TP09/0.5 - 16 Aug 2006										
ES0610062-033	TP09/1.0 - 16 Aug 2006										
ES0610062-034	TP09/2.5 - 16 Aug 2006										
ES0610062-035	TP10/0.25 - 16 Aug 2006										
ES0610062-036	TP10/1.0 - 16 Aug 2006										
ES0610062-037	TP10/2.0 - 16 Aug 2006										
ES0610062-038	TP10/4.0 - 16 Aug 2006										
ES0610062-039	DUP04 - 16 Aug 2006										
ES0610062-040	DUP05 - 16 Aug 2006										
ES0610062-041	W01 - 16 Aug 2006	]	]								
ES0610062-042	W02 - 16 Aug 2006	]	]								
ES0610062-043	W03 - 16 Aug 2006	]	]								
ES0610062-044	TAR WELL #2 - 16 Aug 2006										
ES0610062-045	TRIP SPIKE CONTROL - 16 Aug 2006										
ES0610062-046	MG02/0.2 - 16 Aug 2006										
ES0610062-047	MG02/1.5 - 16 Aug 2006										
ES0610062-048	MG02/2.7 - 16 Aug 2006										
ES0610062-049	MG02/3.7 - 16 Aug 2006										

Client	: CH2M HILL PTY LTD	**Work Order**	: ES0610062
Project	: 347496 McDonaldtown Gasworks	**ALS Quote Reference**	: ----

ALS Environmental

ALS Sample ID.	Client Sample ID - Sample Date	**Requested Analysis**									
		W-07 - WATER TPH/BTEX/PAH	**W-11 - WATER** OC/PCB								
ES0610062-050	**TP04/2.0 - 16 Aug 2006**										
ES0610062-051	**TP05/1.0 - 16 Aug 2006**										
ES0610062-052	**TP06/1.5 - 16 Aug 2006**										
ES0610062-053	**TP07/1.0 - 16 Aug 2006**										
ES0610062-054	**TP08/1.5 - 16 Aug 2006**										
ES0610062-055	**TP09/2.0 - 16 Aug 2006**										
ES0610062-056	**TP10/0.5 - 16 Aug 2006**										
ES0610062-057	**TP10/1.5 - 16 Aug 2006**										
ES0610062-058	**TP10/3.0 - 16 Aug 2006**										
ES0610062-060	**TP09/1.5 - 16 Aug 2006**										
	Total(s) :	**3**	**3**								

Client	: CH2M HILL PTY LTD	**Work Order**	: ES0610062
Project	: 347496 McDonaldtown Gasworks	**ALS Quote Reference**	: ----

Requested Reports

l **MR ADAM SULLIVAN**

-	A4 - Certificate of Analysis - NEPM format	Email	adam.sullivan@ch2m.com.au
-	A4 - Interpretive Quality Control Report - NEPM format	Email	adam.sullivan@ch2m.com.au
-	A4 - Quality Control Report - NEPM format	Email	adam.sullivan@ch2m.com.au
-	Subcontracted Reports	Email	adam.sullivan@ch2m.com.au
-	ESDAT Export Format	Email	adam.sullivan@ch2m.com.au
-	ENMRG Export Format	Email	adam.sullivan@ch2m.com.au
-	A4 - Sample Receipt Notification - Comprehensive format	Email	adam.sullivan@ch2m.com.au
-	Chain of Custody Acknowledgement	Email	adam.sullivan@ch2m.com.au
-	Invoice	Email	adam.sullivan@ch2m.com.au

Sample Container(s) / Preservation Non-Compliance Log

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

l **No sample container / preservation non-compliance exist.**

AUSTRALIAN SAFER ENVIRONMENT & TECHNOLOGY PTY LTD

ABN 36 088 095 112

Our ref : ASET9438/ 12600 / 1 - 7
Your ref :ES0610135 -
NATA Accreditation No: 14484

23 August 2006

Australian Laboratory Services Pty Ltd
277, Woodpark Road,
Smithfield,
NSW 2164.

Attn:Mr Greg Vogel,
Fax No:02-87848500

Dear Greg,
Asbestos Identification
This report presents the results of seven samples, forwarded by Australian Laboratory Services Pty Ltd on 18 August 2006, for analysis for asbestos.

1.Introduction: Seven samples forwarded were examined and analysed for the presence of asbestos.

2. Methods : The samples were examined under a Stereo Microscope and selected fibres were analysed by Polarized Light Microscopy in conjunction with dispersion Staining method **(Safer Environment Method 1.)**

3. Results :

Sample No. 1. ASET9438 / 12600 / 1. ES0610135 - 019 - MG10 - 0.2.
Approx dimensions 5.0 cm x 4.5 cm x 3.5 cm
The sample consisted of a mixture of blackish soil, stones, plant matter and fragments of plaster, brick and glass.
No asbestos detected.

Sample No. 2. ASET9438 / 12600 / 2. ES0610135 - 020 - MG10 A - 0.7.
Approx dimensions 4.5 cm x 5.0 cm x 3.5 cm
The sample consisted of mixture of blackish soil, stones, fragments of plaster, bitumin and glass.
No asbestos detected.

Sample No. 3. ASET9438 / 12600 / 3. ES0610135 - 023 - MG 04 - 1.5.
Approx dimensions 5.0 cm x 4.5 cm x 4.0 cm
The sample consisted of a mixture of soil, stones, plant matter and fragments of plaster, fibre cement* and brick.
Chrysotile* asbestos and Crocidolite* asbestos detected.

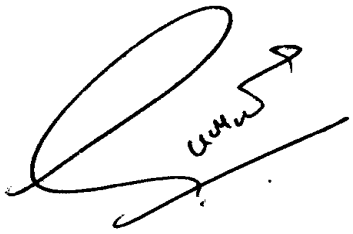
Sample No. 4. ASET9438 / 12600 / 4. ES0610135 - 024 - MG 04 -1.5.
Approx dimensions 6.0 cm x 5.0 cm x 1.0 cm
The sample consisted of a fragment of a fibro cement material.
Chrysotile asbestos and Amosite asbestos detected.

Sample No. 5. ASET9438 / 12600 / 5. ES0610135 - 037 - TP12 - 0.25.
Approx dimensions 6.0 cm x 5.0 cm x 3.5 cm
The sample consisted of a mixture of soil, stones, plant matter and fragments of fibre cement*, brick and plaster.
Chrysotile* asbestos detected.

Sample No. 6. ASET9438 / 12600 / 6. ES0610135 - 039 - TP 13 - 0.25.
Approx dimensions 6.0 cm x 5.0 cm x 4..0 cm
The sample consisted of a mixture of soil, stones, plant matter and fragments of plaster, ceramic brick, ceramic tiles, and glass.
No asbestos detected.

Sample No. 7. ASET9438 / 12600 / 7. ES0610135 - 042 - TP14 - 0.25.
Approx dimensions 5.0 cm x 4.0 cm x 2.5 cm
The sample consisted of a mixture of soil, stones, plant matter and fragments of plaster, bitumin and brick.
No asbestos detected.

Analysed and reported by,



Mahen De Silva . BSc. MSc. Grad Dip (Occ Hyg)
Occupational Hygienist / Approved Signatory.

ALS Environmental

CERTIFICATE OF ANALYSIS

Client	: CH2M HILL PTY LTD	Laboratory	: ALS Environmental Sydney	Page	: 1 of 40
Contact	: MR ADAM SULLIVAN	Contact	: Greg Vogel	Work Order	: ES0610135
Address	: PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164		
E-mail	: adam.sullivan@ch2m.com.au	E-mail	: Greg.Vogel@alsenviro.com		
Telephone	: 02 9950 0200	Telephone	: +61 (02) 8784 8555		
Facsimile	: 02 9950 0600	Facsimile	: +61 (02) 8784 8500		
Project	: 347496 MACDONALDTOWN GASWORKS	Quote number	: ----	Date received	: 17 Aug 2006
Order number	: - Not provided -			Date issued	: 30 Aug 2006
C-O-C number	: - Not provided -			No. of samples	- Received : 55
Site	: MACDONALD				Analysed : 46

ALSE - Excellence in Analytical Testing

NATA Accredited Laboratory 825

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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	Position	Department
Celine Conceicao	Spectroscopist	Inorganics - NATA 825 (10911 - Sydney)
Peter Dickenson	Senior Spectroscopist	Inorganics - NATA 825 (10911 - Sydney)
PHALAK INTHAKESONE	Organics Co-ordinator	Organics - NATA 825 (10911 - Sydney)
Phyu Phyu Lwin	Spectroscopist	Inorganics - NATA 825 (10911 - Sydney)
Sarah Millington	Senior Inorganic Chemist	Inorganics - NATA 825 (10911 - Sydney)

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Comments

This report for the ALSE reference ES0610135 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 insuffient 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.

- **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 **ES0610135**

Poor duplicate precision for Pb and Zn due to sample heterogeneity.
EP080 : Surrogates could not be determined for sample MG09B/PIPE due to sample matrix interferences.
EPO68: Poor matrix spike recovery due to sample matrix interferences. Confirmed by re-extraction and re-analysis.
Sample TRIP SPIKE contains volatile compounds spiked into the sample containers prior to dispatch from the laboratory. BTEX compounds spiked at 20 ug/L.
EP080: The trip spike and its control have been analysed for volatile TPH and BTEX only. The trip spike and control were prepared in the lab using reagent grade sand spiked with petrol. The spike was dispatched from the lab and the control retained.
EPO66 & EPO68 : Particular samples required dilution due to the presence of high level contaminants. LOR values have been adjusted accordingly. Surrogates were diluted outside of the analytical range and were therefore not determined.

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Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: MG08/0.3	MG08/1.5	MG08/2.1	MG08/4.0	MG09B/0.3
Sample Matrix Type / Description:				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time:				17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00
Laboratory Sample ID:				ES0610135-001	ES0610135-003	ES0610135-004	ES0610135-005	ES0610135-006
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%	19.0	23.5	25.1	16.8	24.3
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	7	<5	----	----	11
Cadmium	7440-43-9	1	mg/kg	1	<1	----	----	<1
Chromium	7440-47-3	2	mg/kg	8	12	----	----	15
Copper	7440-50-8	5	mg/kg	125	<5	----	----	28
Lead	7439-92-1	5	mg/kg	643	7	----	----	311
Nickel	7440-02-0	2	mg/kg	19	<2	----	----	11
Zinc	7440-66-6	5	mg/kg	1100	<5	----	----	100
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	0.4	<0.1	----	----	0.1
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls		0.10	mg/kg	----	<0.25	----	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	----	<1.25	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	----	<1.25	----	----	----
beta-BHC	319-85-7	0.05	mg/kg	----	<1.25	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg	----	<1.25	----	----	----
delta-BHC	319-86-8	0.05	mg/kg	----	<1.25	----	----	----
Heptachlor	76-44-8	0.05	mg/kg	----	<1.25	----	----	----
Aldrin	309-00-2	0.05	mg/kg	----	<1.25	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	----	<1.25	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	----	<1.25	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	----	<1.25	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	----	<1.25	----	----	----
Dieldrin	60-57-1	0.05	mg/kg	----	<1.25	----	----	----
4.4'-DDE	72-55-9	0.05	mg/kg	----	<1.25	----	----	----
Endrin	72-20-8	0.05	mg/kg	----	<1.25	----	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	----	<1.25	----	----	----
4.4'-DDD	72-54-8	0.05	mg/kg	----	<1.25	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	----	<1.25	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	----	<1.25	----	----	----
4.4'-DDT	50-29-3	0.2	mg/kg	----	<1.2	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg	----	<1.25	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg	----	<1.2	----	----	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	----	<1.25	----	----	----

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Analytical Results

				Client Sample ID :	MG08/0.3	MG08/1.5	MG08/2.1	MG08/4.0	MG09B/0.3
				Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Date / Time :	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00
				Laboratory Sample ID :	ES0610135-001	ES0610135-003	ES0610135-004	ES0610135-005	ES0610135-006
Analyte	*CAS number*	*LOR*	*Units*						
EP068B: Organophosphorus Pesticides (OP)									
Demeton-S-methyl	919-86-8	0.05	mg/kg		----	<1.25	----	----	----
Monocrotophos	6923-22-4	0.2	mg/kg		----	<1.2	----	----	----
Dimethoate	60-51-5	0.05	mg/kg		----	<1.25	----	----	----
Diazinon	333-41-5	0.05	mg/kg		----	<1.25	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		----	<1.25	----	----	----
Parathion-methyl	298-00-0	0.2	mg/kg		----	<1.2	----	----	----
Malathion	121-75-5	0.05	mg/kg		----	<1.25	----	----	----
Fenthion	55-38-9	0.05	mg/kg		----	<1.25	----	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg		----	<1.25	----	----	----
Parathion	56-38-2	0.2	mg/kg		----	<1.2	----	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		----	<1.25	----	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg		----	<1.25	----	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg		----	<1.25	----	----	----
Fenamiphos	22224-92-6	0.05	mg/kg		----	<1.25	----	----	----
Prothiofos	34643-46-4	0.05	mg/kg		----	<1.25	----	----	----
Ethion	563-12-2	0.05	mg/kg		----	<1.25	----	----	----
Carbophenothion	786-19-6	0.05	mg/kg		----	<1.25	----	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg		----	<1.25	----	----	----
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		----	6.0	----	----	----
2-Chlorophenol	95-57-8	0.5	mg/kg		----	<0.5	----	----	----
2-Methylphenol	95-48-7	0.5	mg/kg		----	6.8	----	----	----
3- & 4-Methylphenol	1319-77-3	1.0	mg/kg		----	12.2	----	----	----
2-Nitrophenol	88-75-5	0.5	mg/kg		----	<0.5	----	----	----
2.4-Dimethylphenol	105-67-9	0.5	mg/kg		----	14.0	----	----	----
2.4-Dichlorophenol	120-83-2	0.5	mg/kg		----	<0.5	----	----	----
2.6-Dichlorophenol	87-65-0	0.5	mg/kg		----	<0.5	----	----	----
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg		----	<0.5	----	----	----
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg		----	<0.5	----	----	----
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg		----	<0.5	----	----	----
Pentachlorophenol	87-86-5	2.0	mg/kg		----	<2.0	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		----	4820	128	3.4	----
Acenaphthylene	208-96-8	0.5	mg/kg		----	479	8.1	<0.5	----
Acenaphthene	83-32-9	0.5	mg/kg		----	1100	14.3	0.7	----
Fluorene	86-73-7	0.5	mg/kg		----	849	17.5	0.5	----
Phenanthrene	85-01-8	0.5	mg/kg		----	2250	50.3	1.9	----

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Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: MG08/0.3	MG08/1.5	MG08/2.1	MG08/4.0	MG09B/0.3
Sample Matrix Type / Description:				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time:				17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00
Laboratory Sample ID:				ES0610135-001	ES0610135-003	ES0610135-004	ES0610135-005	ES0610135-006
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Anthracene	120-12-7	0.5	mg/kg	----	650	11.8	<0.5	----
Fluoranthene	206-44-0	0.5	mg/kg	----	1180	20.2	0.8	----
Pyrene	129-00-0	0.5	mg/kg	----	1390	34.8	1.1	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	----	534	8.2	<0.5	----
Chrysene	218-01-9	0.5	mg/kg	----	447	7.2	<0.5	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	----	276	3.2	<0.5	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	----	304	4.4	<0.5	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	----	444	6.9	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	----	198	2.2	<0.5	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	----	59.6	0.6	<0.5	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	----	257	3.5	<0.5	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction		2	mg/kg	----	51	97	<2	12
C10 - C14 Fraction		50	mg/kg	----	99100	740	<50	790
C15 - C28 Fraction		100	mg/kg	----	310000	1620	<100	13800
C29 - C36 Fraction		100	mg/kg	----	26000	430	<100	6110
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	----	0.2	0.3	<0.2	0.5
Toluene	108-88-3	0.2	mg/kg	----	0.5	0.4	<0.2	1.1
Ethylbenzene	100-41-4	0.2	mg/kg	----	3.6	12.3	<0.2	0.3
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	----	4.7	5.0	<0.2	2.4
ortho-Xylene	95-47-6	0.2	mg/kg	----	5.9	1.0	<0.2	1.6
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	----	102	----	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE		0.1	%	----	Not Determined	----	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	----	Not Determined	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	----	84.5	102	89.2	----
2-Chlorophenol-D4	93951-73-6	0.1	%	----	82.6	103	90.1	----
2.4.6-Tribromophenol	118-79-6	0.1	%	----	70.8	117	79.5	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	----	58.2	99.8	86.0	----
Anthracene-d10	1719-06-8	0.1	%	----	81.6	99.8	88.6	----
4-Terphenyl-d14	1718-51-0	0.1	%	----	114	88.8	77.8	----

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Analytical Results

				Client Sample ID :	MG08/0.3	MG08/1.5	MG08/2.1	MG08/4.0	MG09B/0.3
				Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Date / Time :	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00
				Laboratory Sample ID :					
Analyte	*CAS number*	*LOR*	*Units*		ES0610135-001	ES0610135-003	ES0610135-004	ES0610135-005	ES0610135-006
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		----	109	88.7	89.5	104
Toluene-D8	2037-26-5	0.1	%		----	98.1	94.7	82.5	116
4-Bromofluorobenzene	460-00-4	0.1	%		----	108	96.4	86.8	113

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Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID : MG09B/0.6	MG09B/2.5	MG09B/PIPE	MG09C/0.3	MG09C/1.9
Sample Matrix Type / Description :				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time :				17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00
Laboratory Sample ID :				ES0610135-007	ES0610135-008	ES0610135-009	ES0610135-010	ES0610135-012
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%	19.8	22.1	24.0	13.0	23.8
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	----	<5	12	<5
Cadmium	7440-43-9	1	mg/kg	<1	----	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	26	----	<2	15	14
Copper	7440-50-8	5	mg/kg	<5	----	<5	135	<5
Lead	7439-92-1	5	mg/kg	11	----	51	106	18
Nickel	7440-02-0	2	mg/kg	<2	----	3	19	3
Zinc	7440-66-6	5	mg/kg	9	----	55	241	<5
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	1.2	0.2	<0.1
EK025G: Free cyanide by Discrete Analyser								
Total Cyanide	57-12-5	1.0	mg/kg	----	----	----	<1.0	<1.0
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls		0.10	mg/kg	<0.10	----	<0.50	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	----	<2.50	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	----	<2.50	----	----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	----	<2.50	----	----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	----	<2.50	----	----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	----	<2.50	----	----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	----	<2.50	----	----
Aldrin	309-00-2	0.05	mg/kg	<0.05	----	<2.50	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	----	<2.50	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	----	<2.50	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	----	<2.50	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	----	<2.50	----	----
Dieldrin	60-57-1	0.05	mg/kg	<0.05	----	<2.50	----	----
4.4'-DDE	72-55-9	0.05	mg/kg	<0.05	----	<2.50	----	----
Endrin	72-20-8	0.05	mg/kg	<0.05	----	<2.50	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	----	<2.50	----	----
4.4'-DDD	72-54-8	0.05	mg/kg	<0.05	----	<2.50	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	----	<2.50	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	----	<2.50	----	----
4.4'-DDT	50-29-3	0.2	mg/kg	<0.2	----	<2.5	----	----
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	----	<2.50	----	----
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	----	<2.5	----	----

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Analytical Results

				Client Sample ID :	MG09B/0.6	MG09B/2.5	MG09B/PIPE	MG09C/0.3	MG09C/1.9
				Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Date / Time :	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00
				Laboratory Sample ID :					
Analyte	*CAS number*	*LOR*	*Units*		ES0610135-007	ES0610135-008	ES0610135-009	ES0610135-010	ES0610135-012
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		<0.05	----	<2.50	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05	----	<2.50	----	----
Monocrotophos	6923-22-4	0.2	mg/kg		<0.2	----	<2.5	----	----
Dimethoate	60-51-5	0.05	mg/kg		<0.05	----	<2.50	----	----
Diazinon	333-41-5	0.05	mg/kg		<0.05	----	<2.50	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.05	----	<2.50	----	----
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2	----	<2.5	----	----
Malathion	121-75-5	0.05	mg/kg		<0.05	----	<2.50	----	----
Fenthion	55-38-9	0.05	mg/kg		<0.05	----	<2.50	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05	----	<2.50	----	----
Parathion	56-38-2	0.2	mg/kg		<0.2	----	<2.5	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.05	----	<2.50	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05	----	<2.50	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.05	----	<2.50	----	----
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05	----	<2.50	----	----
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	----	<2.50	----	----
Ethion	563-12-2	0.05	mg/kg		<0.05	----	<2.50	----	----
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	----	<2.50	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	----	<2.50	----	----
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		<0.5	----	2060	----	----
2-Chlorophenol	95-57-8	0.5	mg/kg		<0.5	----	<2.0	----	----
2-Methylphenol	95-48-7	0.5	mg/kg		<0.5	----	1730	----	----
3- & 4-Methylphenol	1319-77-3	1.0	mg/kg		<1.0	----	3590	----	----
2-Nitrophenol	88-75-5	0.5	mg/kg		<0.5	----	<2.0	----	----
2.4-Dimethylphenol	105-67-9	0.5	mg/kg		<0.5	----	2490	----	----
2.4-Dichlorophenol	120-83-2	0.5	mg/kg		<0.5	----	<2.0	----	----
2.6-Dichlorophenol	87-65-0	0.5	mg/kg		<0.5	----	2.4	----	----
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg		<0.5	----	<2.0	----	----
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg		<0.5	----	<2.0	----	----
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg		<0.5	----	<2.0	----	----
Pentachlorophenol	87-86-5	2.0	mg/kg		<2.0	----	<4.0	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	0.7	9750	0.6	4.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	2260	0.8	5.9
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	355	<0.5	8.3
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	1720	<0.5	7.6

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: MG09B/0.6	MG09B/2.5	MG09B/PIPE	MG09C/0.3	MG09C/1.9
Sample Matrix Type / Description:				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time:				17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00
Laboratory Sample ID:				ES0610135-007	ES0610135-008	ES0610135-009	ES0610135-010	ES0610135-012
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	3920	2.9	15.4
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	1380	1.0	3.6
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	1770	6.8	6.9
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	1870	7.8	9.4
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	921	4.4	2.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	765	4.3	2.3
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	364	4.1	1.2
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	545	3.9	1.6
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	595	5.0	2.1
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	241	3.2	1.0
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	99.3	1.3	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	250	3.9	1.3
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction		2	mg/kg	<2	<2	3770	<2	18
C10 - C14 Fraction		50	mg/kg	<50	<50	402000	<50	300
C15 - C28 Fraction		100	mg/kg	<100	<100	654000	630	360
C29 - C36 Fraction		100	mg/kg	<100	<100	124000	520	<100
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	576	<0.2	<0.2
Toluene	108-88-3	0.2	mg/kg	<0.2	<0.2	1210	<0.2	0.4
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	<0.2	156	<0.2	0.5
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	<0.2	1040	<0.2	0.4
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	476	<0.2	0.2
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	85.7	----	118	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE		0.1	%	95.0	----	Not Determined	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	94.4	----	Not Determined	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	87.2	94.7	Not Determined	76.2	78.1
2-Chlorophenol-D4	93951-73-6	0.1	%	91.2	96.9	Not Determined	85.8	87.8
2.4.6-Tribromophenol	118-79-6	0.1	%	76.2	83.6	Not Determined	91.1	104
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	86.7	94.8	Not Determined	79.1	83.4
Anthracene-d10	1719-06-8	0.1	%	89.2	96.0	Not Determined	84.7	87.2

ALS Environmental

Analytical Results

				Client Sample ID :	MG09B/0.6	MG09B/2.5	MG09B/PIPE	MG09C/0.3	MG09C/1.9
				Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Date / Time :	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00
				Laboratory Sample ID :					
Analyte	*CAS number*	*LOR*	*Units*		ES0610135-007	ES0610135-008	ES0610135-009	ES0610135-010	ES0610135-012
EP075(SIM)T: PAH Surrogates									
4-Terphenyl-d14	1718-51-0	0.1	%		79.3	87.0	Not Determined	77.4	80.8
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		88.4	91.6	Not Determined	106	97.0
Toluene-D8	2037-26-5	0.1	%		84.0	83.3	Not Determined	112	98.2
4-Bromofluorobenzene	460-00-4	0.1	%		93.8	105	Not Determined	113	114

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: MG09C/3.8 Sample Matrix Type / Description: SOIL Sample Date / Time: 17 Aug 2006 15:00 Laboratory Sample ID: ES0610135-013	TP15/0.3 SOIL 17 Aug 2006 15:00 ES0610135-014	TP15/2.8 SOIL 17 Aug 2006 15:00 ES0610135-015	TP15/4.1 SOIL 17 Aug 2006 15:00 ES0610135-016	QC03 SOIL 17 Aug 2006 15:00 ES0610135-017
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%	20.2	16.6	23.0	18.6	20.8
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	8	----	5	6	6
Cadmium	7440-43-9	1	mg/kg	<1	----	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	32	----	20	15	22
Copper	7440-50-8	5	mg/kg	<5	----	<5	<5	<5
Lead	7439-92-1	5	mg/kg	11	----	5	26	12
Nickel	7440-02-0	2	mg/kg	<2	----	<2	<2	<2
Zinc	7440-66-6	5	mg/kg	<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
EK025G: Free cyanide by Discrete Analyser								
Total Cyanide	57-12-5	1.0	mg/kg	----	1.1	1.9	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	----	----	<0.12	<0.05	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	----	----	<0.12	<0.05	----
beta-BHC	319-85-7	0.05	mg/kg	----	----	<0.12	<0.05	----
gamma-BHC	58-89-9	0.05	mg/kg	----	----	<0.12	<0.05	----
delta-BHC	319-86-8	0.05	mg/kg	----	----	<0.12	<0.05	----
Heptachlor	76-44-8	0.05	mg/kg	----	----	<0.12	<0.05	----
Aldrin	309-00-2	0.05	mg/kg	----	----	<0.12	<0.05	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	----	----	<0.12	<0.05	----
trans-Chlordane	5103-74-2	0.05	mg/kg	----	----	<0.12	<0.05	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	----	----	<0.12	<0.05	----
cis-Chlordane	5103-71-9	0.05	mg/kg	----	----	<0.12	<0.05	----
Dieldrin	60-57-1	0.05	mg/kg	----	----	<0.12	<0.05	----
4.4'-DDE	72-55-9	0.05	mg/kg	----	----	<0.12	<0.05	----
Endrin	72-20-8	0.05	mg/kg	----	----	<0.12	<0.05	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	----	----	<0.12	<0.05	----
4.4'-DDD	72-54-8	0.05	mg/kg	----	----	<0.12	<0.05	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	----	----	<0.12	<0.05	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	----	----	<0.12	<0.05	----
4.4'-DDT	50-29-3	0.2	mg/kg	----	----	<0.2	<0.2	----
Endrin ketone	53494-70-5	0.05	mg/kg	----	----	<0.12	<0.05	----
Methoxychlor	72-43-5	0.2	mg/kg	----	----	<0.2	<0.2	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	----	----	<0.12	<0.05	----

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: MG09C/3.8	TP15/0.3	TP15/2.8	TP15/4.1	QC03
Sample Matrix Type / Description				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time				17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00
Laboratory Sample ID				ES0610135-013	ES0610135-014	ES0610135-015	ES0610135-016	ES0610135-017
EP068B: Organophosphorus Pesticides (OP)								
Demeton-S-methyl	919-86-8	0.05	mg/kg	----	----	<0.12	<0.05	----
Monocrotophos	6923-22-4	0.2	mg/kg	----	----	<0.2	<0.2	----
Dimethoate	60-51-5	0.05	mg/kg	----	----	<0.12	<0.05	----
Diazinon	333-41-5	0.05	mg/kg	----	----	<0.12	<0.05	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	----	----	<0.12	<0.05	----
Parathion-methyl	298-00-0	0.2	mg/kg	----	----	<0.2	<0.2	----
Malathion	121-75-5	0.05	mg/kg	----	----	<0.12	<0.05	----
Fenthion	55-38-9	0.05	mg/kg	----	----	<0.12	<0.05	----
Chlorpyrifos	2921-88-2	0.05	mg/kg	----	----	<0.12	<0.05	----
Parathion	56-38-2	0.2	mg/kg	----	----	<0.2	<0.2	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	----	----	<0.12	<0.05	----
Chlorfenvinphos	470-90-6	0.05	mg/kg	----	----	<0.12	<0.05	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg	----	----	<0.12	<0.05	----
Fenamiphos	22224-92-6	0.05	mg/kg	----	----	<0.12	<0.05	----
Prothiofos	34643-46-4	0.05	mg/kg	----	----	<0.12	<0.05	----
Ethion	563-12-2	0.05	mg/kg	----	----	<0.12	<0.05	----
Carbophenothion	786-19-6	0.05	mg/kg	----	----	<0.12	<0.05	----
Azinphos Methyl	86-50-0	0.05	mg/kg	----	----	<0.12	<0.05	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	164	7.8	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	0.5	19.4	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	8.0	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	25.1	0.9	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	1.2	57.3	3.3	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	19.7	0.8	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	2.5	35.6	1.6	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	2.9	31.0	1.9	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	1.8	16.0	0.7	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	1.7	12.7	0.6	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	1.6	7.1	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	1.7	9.3	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	2.2	10.8	0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	1.4	4.1	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	0.6	1.6	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	1.7	4.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction		2	mg/kg	<2	<2	107	65	<2

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: MG09C/3.8	TP15/0.3	TP15/2.8	TP15/4.1	QC03
Sample Matrix Type / Description				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time				17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00
Laboratory Sample ID				ES0610135-013	ES0610135-014	ES0610135-015	ES0610135-016	ES0610135-017
EP080/071: Total Petroleum Hydrocarbons								
C10 - C14 Fraction		50	mg/kg	<50	<50	450	<50	<50
C15 - C28 Fraction		100	mg/kg	<100	230	1400	<100	<100
C29 - C36 Fraction		100	mg/kg	<100	150	240	<100	<100
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	1.8	2.7	<0.2
Toluene	108-88-3	0.2	mg/kg	<0.2	<0.2	10.9	10.6	<0.2
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	<0.2	17.5	4.9	<0.2
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	<0.2	38.7	15.5	<0.2
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	17.5	9.3	<0.2
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE		0.1	%	----	----	85.6	83.7	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	----	----	80.9	94.6	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	83.2	77.9	77.5	86.1	74.4
2-Chlorophenol-D4	93951-73-6	0.1	%	88.1	83.8	82.5	89.6	77.2
2.4.6-Tribromophenol	118-79-6	0.1	%	89.2	88.3	79.7	76.7	67.6
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	77.1	78.0	83.2	87.1	76.4
Anthracene-d10	1719-06-8	0.1	%	78.3	82.5	85.8	86.8	75.8
4-Terphenyl-d14	1718-51-0	0.1	%	76.5	75.6	77.9	82.5	73.9
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	107	88.9	93.6	111	86.4
Toluene-D8	2037-26-5	0.1	%	90.3	105	85.0	118	85.3
4-Bromofluorobenzene	460-00-4	0.1	%	98.8	116	103	118	90.0

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: QC04	MG10/0.2	MG10A/0.7	MG10A/2.8	MG10A/4.0
Sample Matrix Type / Description				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time				17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00
Laboratory Sample ID				ES0610135-018	ES0610135-019	ES0610135-020	ES0610135-021	ES0610135-022
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%	28.8	16.5	26.6	19.4	15.2
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	6	275	17	26	<5
Cadmium	7440-43-9	1	mg/kg	<1	1	3	<1	<1
Chromium	7440-47-3	2	mg/kg	20	17	20	34	7
Copper	7440-50-8	5	mg/kg	<5	273	103	<5	6
Lead	7439-92-1	5	mg/kg	11	251	426	18	19
Nickel	7440-02-0	2	mg/kg	<2	19	19	<2	<2
Zinc	7440-66-6	5	mg/kg	<5	217	472	<5	<5
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	0.2	1.1	<0.1	<0.1
EK025G: Free cyanide by Discrete Analyser								
Total Cyanide	57-12-5	1.0	mg/kg	4.1	8.0	27.1	----	----
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls		0.10	mg/kg	----	<0.10	----	<0.10	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	<0.12	<0.05	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	<0.12	<0.05	----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	<0.12	<0.05	----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	<0.12	<0.05	----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	<0.12	<0.05	----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	<0.12	<0.05	----
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	<0.12	<0.05	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	<0.12	<0.05	----
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	<0.12	<0.05	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	<0.12	<0.05	----
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	<0.12	<0.05	----
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	<0.12	<0.05	----
4.4'-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	<0.12	<0.05	----
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	<0.12	<0.05	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	<0.12	<0.05	----
4.4'-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	<0.12	<0.05	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	<0.12	<0.05	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	<0.12	<0.05	----
4.4'-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	----
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	<0.12	<0.05	----
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	----

ALS Environmental

Analytical Results

				Client Sample ID :	QC04	MG10/0.2	MG10A/0.7	MG10A/2.8	MG10A/4.0
				Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Date / Time :	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00
				Laboratory Sample ID :					
Analyte	*CAS number*	*LOR*	*Units*		ES0610135-018	ES0610135-019	ES0610135-020	ES0610135-021	ES0610135-022
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		<0.05	<0.05	<0.12	<0.05	----
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05	<0.05	<0.12	<0.05	----
Monocrotophos	6923-22-4	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	----
Dimethoate	60-51-5	0.05	mg/kg		<0.05	<0.05	<0.12	<0.05	----
Diazinon	333-41-5	0.05	mg/kg		<0.05	<0.05	<0.12	<0.05	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.05	<0.05	<0.12	<0.05	----
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	----
Malathion	121-75-5	0.05	mg/kg		<0.05	<0.05	<0.12	<0.05	----
Fenthion	55-38-9	0.05	mg/kg		<0.05	<0.05	<0.12	<0.05	----
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05	<0.05	<0.12	<0.05	----
Parathion	56-38-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.05	<0.05	<0.12	<0.05	----
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05	<0.05	<0.12	<0.05	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.05	<0.05	<0.12	<0.05	----
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05	<0.05	<0.12	<0.05	----
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	<0.05	<0.12	<0.05	----
Ethion	563-12-2	0.05	mg/kg		<0.05	<0.05	<0.12	<0.05	----
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	<0.05	<0.12	<0.05	----
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	<0.05	<0.12	<0.05	----
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		----	<0.5	16.6	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg		----	<0.5	11.0	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1.0	mg/kg		----	<1.0	31.5	<1.0	<1.0
2-Nitrophenol	88-75-5	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
2.4-Dimethylphenol	105-67-9	0.5	mg/kg		----	<0.5	17.4	<0.5	<0.5
2.4-Dichlorophenol	120-83-2	0.5	mg/kg		----	<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
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg		----	<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
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg		----	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2.0	mg/kg		----	<2.0	<2.0	<2.0	<2.0
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		378	0.8	179	73.7	0.7
Acenaphthylene	208-96-8	0.5	mg/kg		39.2	1.0	154	7.4	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		12.5	<0.5	26.8	3.7	<0.5
Fluorene	86-73-7	0.5	mg/kg		45.3	<0.5	160	12.7	<0.5

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: QC04	MG10/0.2	MG10A/0.7	MG10A/2.8	MG10A/4.0
Sample Matrix Type / Description				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time				17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00
Laboratory Sample ID				ES0610135-018	ES0610135-019	ES0610135-020	ES0610135-021	ES0610135-022
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Phenanthrene	85-01-8	0.5	mg/kg	100	2.8	478	31.0	<0.5
Anthracene	120-12-7	0.5	mg/kg	36.2	0.9	214	10.3	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	63.2	3.7	694	15.8	<0.5
Pyrene	129-00-0	0.5	mg/kg	55.5	4.2	795	18.8	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	29.7	2.1	426	7.4	<0.5
Chrysene	218-01-9	0.5	mg/kg	23.5	2.1	351	6.0	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	13.0	1.5	253	3.4	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	17.3	1.6	280	4.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	20.2	1.8	339	6.3	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	7.9	1.0	155	2.2	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	2.9	<0.5	71.4	0.8	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	8.7	1.2	182	2.9	<0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction		2	mg/kg	90	<2	<2	56	<2
C10 - C14 Fraction		50	mg/kg	1200	<50	9650	760	<50
C15 - C28 Fraction		100	mg/kg	3740	1390	200000	3060	<100
C29 - C36 Fraction		100	mg/kg	890	500	25300	250	<100
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	1.6	<0.2	<0.2	1.1	<0.2
Toluene	108-88-3	0.2	mg/kg	9.5	<0.2	<0.2	1.9	<0.2
Ethylbenzene	100-41-4	0.2	mg/kg	15.3	<0.2	<0.2	6.3	<0.2
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	33.6	<0.2	<0.2	10.5	<0.2
ortho-Xylene	95-47-6	0.2	mg/kg	15.2	<0.2	<0.2	8.4	<0.2
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	----	84.8	----	78.9	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE		0.1	%	83.5	79.4	Not Determined	79.8	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	76.2	85.0	Not Determined	87.4	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	75.5	62.2	76.8	83.0	81.1
2-Chlorophenol-D4	93951-73-6	0.1	%	77.4	67.1	80.5	84.3	84.6
2.4.6-Tribromophenol	118-79-6	0.1	%	79.2	56.1	91.1	89.5	82.0
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	81.9	82.4	80.4	84.7	83.8
Anthracene-d10	1719-06-8	0.1	%	82.5	83.8	79.8	86.7	82.1

ALS Environmental

Analytical Results

				Client Sample ID :	**QC04**	**MG10/0.2**	**MG10A/0.7**	**MG10A/2.8**	**MG10A/4.0**
				Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Date / Time :	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00
				Laboratory Sample ID :					
Analyte	***CAS number***	***LOR***	***Units***		**ES0610135-018**	**ES0610135-019**	**ES0610135-020**	**ES0610135-021**	**ES0610135-022**
EP075(SIM)T: PAH Surrogates									
4-Terphenyl-d14	1718-51-0	0.1	%		74.8	78.8	82.1	78.0	75.6
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		83.8	116	93.5	115	108
Toluene-D8	2037-26-5	0.1	%		83.6	96.6	99.9	93.8	93.9
4-Bromofluorobenzene	460-00-4	0.1	%		103	93.7	105	110	114

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: MG04/0.5	MG04/1.5	TRIP BLANK 3	TRIP SPIKE 3	MG05/0.5
Sample Matrix Type / Description				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time				17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00
Laboratory Sample ID				ES0610135-023	ES0610135-024	ES0610135-025	ES0610135-026	ES0610135-027
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%	19.5	21.8	19.2	1.3	11.5
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	13	6	----	----	11
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	----	<1
Chromium	7440-47-3	2	mg/kg	11	10	----	----	32
Copper	7440-50-8	5	mg/kg	195	110	----	----	117
Lead	7439-92-1	5	mg/kg	2140	744	----	----	325
Nickel	7440-02-0	2	mg/kg	17	6	----	----	41
Zinc	7440-66-6	5	mg/kg	342	180	----	----	311
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	0.3	0.7	----	----	0.7
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls		0.10	mg/kg	----	<0.10	----	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	----	<0.05	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	----	<0.05	----	----	----
beta-BHC	319-85-7	0.05	mg/kg	----	<0.05	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg	----	<0.05	----	----	----
delta-BHC	319-86-8	0.05	mg/kg	----	<0.05	----	----	----
Heptachlor	76-44-8	0.05	mg/kg	----	<0.05	----	----	----
Aldrin	309-00-2	0.05	mg/kg	----	<0.05	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	----	<0.05	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	----	<0.05	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	----	<0.05	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	----	<0.05	----	----	----
Dieldrin	60-57-1	0.05	mg/kg	----	<0.05	----	----	----
4.4'-DDE	72-55-9	0.05	mg/kg	----	<0.05	----	----	----
Endrin	72-20-8	0.05	mg/kg	----	<0.05	----	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	----	<0.05	----	----	----
4.4'-DDD	72-54-8	0.05	mg/kg	----	<0.05	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	----	<0.05	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	----	<0.05	----	----	----
4.4'-DDT	50-29-3	0.2	mg/kg	----	<0.2	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg	----	<0.05	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg	----	<0.2	----	----	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	----	<0.05	----	----	----

ALS Environmental

Analytical Results

				Client Sample ID :	MG04/0.5	MG04/1.5	TRIP BLANK 3	TRIP SPIKE 3	MG05/0.5
				Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Date / Time :	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00
				Laboratory Sample ID :	ES0610135-023	ES0610135-024	ES0610135-025	ES0610135-026	ES0610135-027
Analyte	*CAS number*	*LOR*	*Units*						
EP068B: Organophosphorus Pesticides (OP)									
Demeton-S-methyl	919-86-8	0.05	mg/kg		----	<0.05	----	----	----
Monocrotophos	6923-22-4	0.2	mg/kg		----	<0.2	----	----	----
Dimethoate	60-51-5	0.05	mg/kg		----	<0.05	----	----	----
Diazinon	333-41-5	0.05	mg/kg		----	<0.05	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		----	<0.05	----	----	----
Parathion-methyl	298-00-0	0.2	mg/kg		----	<0.2	----	----	----
Malathion	121-75-5	0.05	mg/kg		----	<0.05	----	----	----
Fenthion	55-38-9	0.05	mg/kg		----	<0.05	----	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg		----	<0.05	----	----	----
Parathion	56-38-2	0.2	mg/kg		----	<0.2	----	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		----	<0.05	----	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg		----	<0.05	----	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg		----	<0.05	----	----	----
Fenamiphos	22224-92-6	0.05	mg/kg		----	<0.05	----	----	----
Prothiofos	34643-46-4	0.05	mg/kg		----	<0.05	----	----	----
Ethion	563-12-2	0.05	mg/kg		----	<0.05	----	----	----
Carbophenothion	786-19-6	0.05	mg/kg		----	<0.05	----	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg		----	<0.05	----	----	----
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		----	<0.5	----	----	----
2-Chlorophenol	95-57-8	0.5	mg/kg		----	<0.5	----	----	----
2-Methylphenol	95-48-7	0.5	mg/kg		----	<0.5	----	----	----
3- & 4-Methylphenol	1319-77-3	1.0	mg/kg		----	<1.0	----	----	----
2-Nitrophenol	88-75-5	0.5	mg/kg		----	<0.5	----	----	----
2.4-Dimethylphenol	105-67-9	0.5	mg/kg		----	<0.5	----	----	----
2.4-Dichlorophenol	120-83-2	0.5	mg/kg		----	<0.5	----	----	----
2.6-Dichlorophenol	87-65-0	0.5	mg/kg		----	<0.5	----	----	----
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg		----	<0.5	----	----	----
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg		----	<0.5	----	----	----
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg		----	<0.5	----	----	----
Pentachlorophenol	87-86-5	2.0	mg/kg		----	<2.0	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	0.5	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		0.5	<0.5	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	----	----	----
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg		5.5	1.7	----	----	----

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: MG04/0.5	MG04/1.5	TRIP BLANK 3	TRIP SPIKE 3	MG05/0.5
Sample Matrix Type / Description:				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time:				17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00
Laboratory Sample ID:				ES0610135-023	ES0610135-024	ES0610135-025	ES0610135-026	ES0610135-027
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Anthracene	120-12-7	0.5	mg/kg	1.7	0.5	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	9.9	2.7	----	----	----
Pyrene	129-00-0	0.5	mg/kg	9.3	2.6	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	5.1	1.3	----	----	----
Chrysene	218-01-9	0.5	mg/kg	4.8	1.4	----	----	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	4.3	1.0	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	5.2	1.0	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	6.0	1.3	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	3.4	0.6	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	1.4	<0.5	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	4.2	0.7	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction		2	mg/kg	<2	<2	<2	34	<2
C10 - C14 Fraction		50	mg/kg	<50	<50	<50	----	280
C15 - C28 Fraction		100	mg/kg	1340	240	<100	----	10800
C29 - C36 Fraction		100	mg/kg	470	<100	<100	----	2260
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	2.6	<0.2
Toluene	108-88-3	0.2	mg/kg	<0.2	<0.2	<0.2	10.0	<0.2
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	<0.2	<0.2	2.6	<0.2
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	<0.2	<0.2	10.6	<0.2
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	<0.2	4.1	<0.2
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	----	79.7	----	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE		0.1	%	----	85.0	----	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	----	87.3	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	78.4	87.8	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	81.4	88.4	----	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%	75.1	77.7	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	81.3	84.2	----	----	----
Anthracene-d10	1719-06-8	0.1	%	83.4	87.9	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	76.3	80.3	----	----	----

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Analytical Results

			Client Sample ID :	**MG04/0.5**	**MG04/1.5**	**TRIP BLANK 3**	**TRIP SPIKE 3**	**MG05/0.5**
			Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Date / Time :	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00
			Laboratory Sample ID :					
Analyte	***CAS number***	***LOR***	***Units***	**ES0610135-023**	**ES0610135-024**	**ES0610135-025**	**ES0610135-026**	**ES0610135-027**
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	90.1	117	120	117	90.6
Toluene-D8	2037-26-5	0.1	%	102	109	117	106	115
4-Bromofluorobenzene	460-00-4	0.1	%	113	109	109	120	112

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID : MG05/1.8	MG05/3.4	MG05/5.0	MG06/1.0	MG06/2.0
Sample Matrix Type / Description :				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time :				17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00
Laboratory Sample ID :				ES0610135-029	ES0610135-030	ES0610135-031	ES0610135-032	ES0610135-033
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%	20.9	18.8	15.3	19.3	20.5
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	6	----	----	<5	6
Cadmium	7440-43-9	1	mg/kg	<1	----	----	<1	<1
Chromium	7440-47-3	2	mg/kg	21	----	----	9	25
Copper	7440-50-8	5	mg/kg	<5	----	----	<5	<5
Lead	7439-92-1	5	mg/kg	24	----	----	21	21
Nickel	7440-02-0	2	mg/kg	<2	----	----	2	<2
Zinc	7440-66-6	5	mg/kg	<5	----	----	<5	<5
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	----	<0.1	<0.1
EK025G: Free cyanide by Discrete Analyser								
Total Cyanide	57-12-5	1.0	mg/kg	----	----	----	2.7	----
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls		0.10	mg/kg	<0.10	----	----	----	<0.10
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	----	----	----	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	----	----	----	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	----	----	----	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	----	----	----	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	----	----	----	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	----	----	----	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	----	----	----	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	----	----	----	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	----	----	----	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	----	----	----	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	----	----	----	<0.05
Dieldrin	60-57-1	0.05	mg/kg	<0.05	----	----	----	<0.05
4.4'-DDE	72-55-9	0.05	mg/kg	<0.05	----	----	----	<0.05
Endrin	72-20-8	0.05	mg/kg	<0.05	----	----	----	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	----	----	----	<0.05
4.4'-DDD	72-54-8	0.05	mg/kg	<0.05	----	----	----	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	----	----	----	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	----	----	----	<0.05
4.4'-DDT	50-29-3	0.2	mg/kg	<0.2	----	----	----	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	----	----	----	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	----	----	----	<0.2

ALS Environmental

Analytical Results

				Client Sample ID :	MG05/1.8	MG05/3.4	MG05/5.0	MG06/1.0	MG06/2.0
				Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Date / Time :	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00
				Laboratory Sample ID :					
Analyte	*CAS number*	*LOR*	*Units*		ES0610135-029	ES0610135-030	ES0610135-031	ES0610135-032	ES0610135-033
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		<0.05	----	----	----	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg		<0.05	----	----	----	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg		<0.2	----	----	----	<0.2
Dimethoate	60-51-5	0.05	mg/kg		<0.05	----	----	----	<0.05
Diazinon	333-41-5	0.05	mg/kg		<0.05	----	----	----	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		<0.05	----	----	----	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg		<0.2	----	----	----	<0.2
Malathion	121-75-5	0.05	mg/kg		<0.05	----	----	----	<0.05
Fenthion	55-38-9	0.05	mg/kg		<0.05	----	----	----	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg		<0.05	----	----	----	<0.05
Parathion	56-38-2	0.2	mg/kg		<0.2	----	----	----	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		<0.05	----	----	----	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg		<0.05	----	----	----	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg		<0.05	----	----	----	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg		<0.05	----	----	----	<0.05
Prothiofos	34643-46-4	0.05	mg/kg		<0.05	----	----	----	<0.05
Ethion	563-12-2	0.05	mg/kg		<0.05	----	----	----	<0.05
Carbophenothion	786-19-6	0.05	mg/kg		<0.05	----	----	----	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg		<0.05	----	----	----	<0.05
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		<0.5	<0.5	----	----	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg		<0.5	<0.5	----	----	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg		<0.5	<0.5	----	----	<0.5
3- & 4-Methylphenol	1319-77-3	1.0	mg/kg		<1.0	<1.0	----	----	<1.0
2-Nitrophenol	88-75-5	0.5	mg/kg		<0.5	<0.5	----	----	<0.5
2.4-Dimethylphenol	105-67-9	0.5	mg/kg		<0.5	<0.5	----	----	<0.5
2.4-Dichlorophenol	120-83-2	0.5	mg/kg		<0.5	<0.5	----	----	<0.5
2.6-Dichlorophenol	87-65-0	0.5	mg/kg		<0.5	<0.5	----	----	<0.5
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg		<0.5	<0.5	----	----	<0.5
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg		<0.5	<0.5	----	----	<0.5
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg		<0.5	<0.5	----	----	<0.5
Pentachlorophenol	87-86-5	2.0	mg/kg		<2.0	<2.0	----	----	<2.0
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		218	34.0	50.5	74.8	73.7
Acenaphthylene	208-96-8	0.5	mg/kg		10.2	2.2	2.9	3.1	2.4
Acenaphthene	83-32-9	0.5	mg/kg		9.6	<0.5	0.6	5.8	3.6
Fluorene	86-73-7	0.5	mg/kg		7.1	1.4	1.5	6.1	2.6

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID : MG05/1.8 Sample Matrix Type / Description : SOIL Sample Date / Time : 17 Aug 2006 15:00 Laboratory Sample ID : ES0610135-029	MG05/3.4 SOIL 17 Aug 2006 15:00 ES0610135-030	MG05/5.0 SOIL 17 Aug 2006 15:00 ES0610135-031	MG06/1.0 SOIL 17 Aug 2006 15:00 ES0610135-032	MG06/2.0 SOIL 17 Aug 2006 15:00 ES0610135-033
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Phenanthrene	85-01-8	0.5	mg/kg	13.8	2.8	3.7	14.2	6.6
Anthracene	120-12-7	0.5	mg/kg	4.4	0.8	1.1	3.8	2.0
Fluoranthene	206-44-0	0.5	mg/kg	6.3	1.2	1.7	7.0	3.0
Pyrene	129-00-0	0.5	mg/kg	7.5	1.4	1.9	9.2	4.0
Benz(a)anthracene	56-55-3	0.5	mg/kg	2.8	<0.5	0.6	2.8	1.2
Chrysene	218-01-9	0.5	mg/kg	2.5	<0.5	0.6	2.4	1.1
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	1.1	<0.5	<0.5	1.0	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	1.6	<0.5	<0.5	1.4	0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	2.2	<0.5	<0.5	2.0	0.8
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	0.6	<0.5	<0.5	0.6	<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	0.8	<0.5	<0.5	0.8	<0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction		2	mg/kg	118	----	92	18	41
C10 - C14 Fraction		50	mg/kg	2100	----	580	660	620
C15 - C28 Fraction		100	mg/kg	940	----	740	610	980
C29 - C36 Fraction		100	mg/kg	<100	----	<100	<100	<100
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<1.0	----	<0.2	0.2	<0.2
Toluene	108-88-3	0.2	mg/kg	5.6	----	7.3	0.8	2.5
Ethylbenzene	100-41-4	0.2	mg/kg	15.0	----	3.9	3.0	6.9
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	53.3	----	22.7	5.0	13.9
ortho-Xylene	95-47-6	0.2	mg/kg	27.1	----	12.3	4.5	8.8
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	78.0	----	----	----	91.4
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE		0.1	%	69.4	----	----	----	91.6
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	73.3	----	----	----	91.6
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	86.7	88.1	87.2	88.9	85.1
2-Chlorophenol-D4	93951-73-6	0.1	%	84.8	88.8	88.9	89.4	84.8
2.4.6-Tribromophenol	118-79-6	0.1	%	79.4	75.8	76.1	84.8	74.0
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	87.1	86.5	87.4	88.1	83.4
Anthracene-d10	1719-06-8	0.1	%	89.8	87.7	87.5	91.6	84.5

ALS Environmental

Analytical Results

				Client Sample ID :	MG05/1.8	MG05/3.4	MG05/5.0	MG06/1.0	MG06/2.0
				Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Date / Time :	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00
				Laboratory Sample ID :					
Analyte	*CAS number*	*LOR*	*Units*		ES0610135-029	ES0610135-030	ES0610135-031	ES0610135-032	ES0610135-033
EP075(SIM)T: PAH Surrogates									
4-Terphenyl-d14	1718-51-0	0.1	%		82.0	82.8	84.6	84.5	78.6
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		114	----	104	80.2	79.4
Toluene-D8	2037-26-5	0.1	%		99.8	----	111	99.5	101
4-Bromofluorobenzene	460-00-4	0.1	%		113	----	102	115	118

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: MG06/4.7	MG07/1.0	MG07/4.0	TP12/0.25	TP12/0.5
Sample Matrix Type / Description				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time				17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00
Laboratory Sample ID				ES0610135-034	ES0610135-035	ES0610135-036	ES0610135-037	ES0610135-038
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%	19.3	18.2	17.7	22.1	15.5
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	5	<5	31	71
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	2	1
Chromium	7440-47-3	2	mg/kg	18	22	27	26	18
Copper	7440-50-8	5	mg/kg	<5	13	<5	248	334
Lead	7439-92-1	5	mg/kg	23	26	20	1060	219
Nickel	7440-02-0	2	mg/kg	<2	<2	<2	21	11
Zinc	7440-66-6	5	mg/kg	<5	61	<5	1110	362
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	0.7	0.2
EK025G: Free cyanide by Discrete Analyser								
Total Cyanide	57-12-5	1.0	mg/kg	2.1	----	----	----	----
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls		0.10	mg/kg	----	----	<0.10	----	<0.10
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	----	----	<0.05	----	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	----	----	<0.05	----	<0.05
beta-BHC	319-85-7	0.05	mg/kg	----	----	<0.05	----	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	----	----	<0.05	----	<0.05
delta-BHC	319-86-8	0.05	mg/kg	----	----	<0.05	----	<0.05
Heptachlor	76-44-8	0.05	mg/kg	----	----	<0.05	----	<0.05
Aldrin	309-00-2	0.05	mg/kg	----	----	<0.05	----	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	----	----	<0.05	----	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	----	----	<0.05	----	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	----	----	<0.05	----	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	----	----	<0.05	----	<0.05
Dieldrin	60-57-1	0.05	mg/kg	----	----	<0.05	----	<0.05
4.4'-DDE	72-55-9	0.05	mg/kg	----	----	<0.05	----	<0.05
Endrin	72-20-8	0.05	mg/kg	----	----	<0.05	----	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	----	----	<0.05	----	<0.05
4.4'-DDD	72-54-8	0.05	mg/kg	----	----	<0.05	----	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	----	----	<0.05	----	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	----	----	<0.05	----	<0.05
4.4'-DDT	50-29-3	0.2	mg/kg	----	----	<0.2	----	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	----	----	<0.05	----	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	----	----	<0.2	----	<0.2

ALS Environmental

Analytical Results

				MG06/4.7	MG07/1.0	MG07/4.0	TP12/0.25	TP12/0.5
			Client Sample ID :					
			Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Date / Time :	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00
			Laboratory Sample ID :					
Analyte	*CAS number*	*LOR*	*Units*	ES0610135-034	ES0610135-035	ES0610135-036	ES0610135-037	ES0610135-038
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	----	----	<0.05	----	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg	----	----	<0.05	----	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg	----	----	<0.2	----	<0.2
Dimethoate	60-51-5	0.05	mg/kg	----	----	<0.05	----	<0.05
Diazinon	333-41-5	0.05	mg/kg	----	----	<0.05	----	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	----	----	<0.05	----	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg	----	----	<0.2	----	<0.2
Malathion	121-75-5	0.05	mg/kg	----	----	<0.05	----	<0.05
Fenthion	55-38-9	0.05	mg/kg	----	----	<0.05	----	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg	----	----	<0.05	----	<0.05
Parathion	56-38-2	0.2	mg/kg	----	----	<0.2	----	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	----	----	<0.05	----	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg	----	----	<0.05	----	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg	----	----	<0.05	----	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg	----	----	<0.05	----	<0.05
Prothiofos	34643-46-4	0.05	mg/kg	----	----	<0.05	----	<0.05
Ethion	563-12-2	0.05	mg/kg	----	----	<0.05	----	<0.05
Carbophenothion	786-19-6	0.05	mg/kg	----	----	<0.05	----	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg	----	----	<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
2-Chlorophenol	95-57-8	0.5	mg/kg	----	<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
3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	----	<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
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	----	<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
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	----	<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
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	----	<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
Pentachlorophenol	87-86-5	2.0	mg/kg	----	<2.0	<2.0	<2.0	<2.0
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	3.0	<0.5	<0.5	1.8	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	0.5	<0.5	<0.5	4.0	<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

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: MG06/4.7	MG07/1.0	MG07/4.0	TP12/0.25	TP12/0.5
Sample Matrix Type / Description:				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time:				17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00
Laboratory Sample ID:				ES0610135-034	ES0610135-035	ES0610135-036	ES0610135-037	ES0610135-038
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Phenanthrene	85-01-8	0.5	mg/kg	1.2	<0.5	<0.5	7.1	1.0
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	3.0	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	0.6	<0.5	<0.5	15.0	2.0
Pyrene	129-00-0	0.5	mg/kg	0.8	<0.5	<0.5	19.2	2.0
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	9.3	1.0
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	9.4	1.0
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	<0.5	8.2	0.8
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	8.5	0.9
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	9.6	1.0
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	7.4	0.7
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	2.8	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	11.1	1.0
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction		2	mg/kg	6	<2	<2	<2	<2
C10 - C14 Fraction		50	mg/kg	<50	<50	<50	180	<50
C15 - C28 Fraction		100	mg/kg	<100	<100	<100	1420	<100
C29 - C36 Fraction		100	mg/kg	<100	<100	<100	720	<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	0.5	<0.2	<0.2	<0.2	<0.2
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	0.8	<0.2	<0.2	<0.2	<0.2
ortho-Xylene	95-47-6	0.2	mg/kg	0.6	<0.2	<0.2	<0.2	<0.2
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	----	----	81.8	----	83.5
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE		0.1	%	----	----	93.2	----	90.8
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	----	----	83.0	----	91.2
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	87.4	83.2	83.2	77.1	84.2
2-Chlorophenol-D4	93951-73-6	0.1	%	90.0	85.4	86.0	79.7	87.2
2.4.6-Tribromophenol	118-79-6	0.1	%	82.2	72.3	74.3	88.5	76.4
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	87.0	80.9	82.2	83.9	83.3
Anthracene-d10	1719-06-8	0.1	%	88.6	81.6	82.9	87.8	87.0

ALS Environmental

Analytical Results

				Client Sample ID :	MG06/4.7	MG07/1.0	MG07/4.0	TP12/0.25	TP12/0.5
				Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Date / Time :	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00
				Laboratory Sample ID :					
Analyte	*CAS number*	*LOR*	*Units*		ES0610135-034	ES0610135-035	ES0610135-036	ES0610135-037	ES0610135-038
EP075(SIM)T: PAH Surrogates									
4-Terphenyl-d14	1718-51-0	0.1	%		85.8	80.8	83.2	81.8	82.1
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		82.3	95.2	101	101	97.8
Toluene-D8	2037-26-5	0.1	%		110	95.2	102	99.1	83.3
4-Bromofluorobenzene	460-00-4	0.1	%		103	91.7	93.3	92.8	117

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: TP13/0.25	TP13/1.0	TP13/1.5	TP14/0.25	TP14/0.5
Sample Matrix Type / Description:				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time:				17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00
Laboratory Sample ID:				ES0610135-039	ES0610135-040	ES0610135-041	ES0610135-042	ES0610135-043
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%	13.5	19.3	22.5	11.7	17.2
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	14	----	----	6	----
Cadmium	7440-43-9	1	mg/kg	1	----	----	<1	----
Chromium	7440-47-3	2	mg/kg	14	----	----	45	----
Copper	7440-50-8	5	mg/kg	172	----	----	94	----
Lead	7439-92-1	5	mg/kg	579	----	----	209	----
Nickel	7440-02-0	2	mg/kg	19	----	----	58	----
Zinc	7440-66-6	5	mg/kg	612	----	----	274	----
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	0.3	----	----	0.1	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	1.5	----	----	<0.5	----
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	----	----	<0.5	----
2-Methylphenol	95-48-7	0.5	mg/kg	1.0	----	----	<0.5	----
3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	2.8	----	----	<1.0	----
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	----	----	<0.5	----
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	1.4	----	----	<0.5	----
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	----	----	<0.5	----
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	----	----	<0.5	----
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	----	----	<0.5	----
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	----	----	<0.5	----
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	----	----	<0.5	----
Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	----	----	<2.0	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	3.2	<0.5	<0.5	1.0	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	8.6	<0.5	<0.5	2.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	1.6	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	2.2	<0.5	<0.5	0.7	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	32.5	<0.5	<0.5	9.2	<0.5
Anthracene	120-12-7	0.5	mg/kg	14.0	<0.5	<0.5	3.2	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	66.0	<0.5	<0.5	12.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	69.6	<0.5	<0.5	16.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	47.2	<0.5	<0.5	8.0	<0.5
Chrysene	218-01-9	0.5	mg/kg	43.5	<0.5	<0.5	7.6	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	38.8	<0.5	<0.5	5.2	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	41.1	<0.5	<0.5	6.6	<0.5

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: TP13/0.25 Sample Matrix Type / Description: SOIL Sample Date / Time: 17 Aug 2006 15:00 Laboratory Sample ID: ES0610135-039	TP13/1.0 SOIL 17 Aug 2006 15:00 ES0610135-040	TP13/1.5 SOIL 17 Aug 2006 15:00 ES0610135-041	TP14/0.25 SOIL 17 Aug 2006 15:00 ES0610135-042	TP14/0.5 SOIL 17 Aug 2006 15:00 ES0610135-043
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Benzo(a)pyrene	50-32-8	0.5	mg/kg	45.5	<0.5	<0.5	7.4	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	36.4	<0.5	<0.5	5.0	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	14.4	<0.5	<0.5	2.1	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	47.4	<0.5	<0.5	7.2	<0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction		2	mg/kg	<2	<2	<2	<2	<2
C10 - C14 Fraction		50	mg/kg	190	<50	<50	50	<50
C15 - C28 Fraction		100	mg/kg	6010	<100	<100	2770	<100
C29 - C36 Fraction		100	mg/kg	2670	<100	<100	680	<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	108-38-3 106-42-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	73.5	85.1	83.1	80.3	82.9
2-Chlorophenol-D4	93951-73-6	0.1	%	75.1	87.6	86.1	82.8	84.4
2.4.6-Tribromophenol	118-79-6	0.1	%	87.4	87.0	80.9	82.3	80.2
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	82.2	83.8	83.4	81.9	81.7
Anthracene-d10	1719-06-8	0.1	%	87.7	84.4	82.9	87.1	80.7
4-Terphenyl-d14	1718-51-0	0.1	%	80.9	80.3	80.2	80.6	79.3
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	111	101	102	104	98.6
Toluene-D8	2037-26-5	0.1	%	102	97.8	102	104	106
4-Bromofluorobenzene	460-00-4	0.1	%	90.3	91.3	92.1	92.9	90.8

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: TP14/1.0	TP14/1.5	RP/2.0	RP/PIPE	TS CONTROL
Sample Matrix Type / Description				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time				17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00
Laboratory Sample ID				ES0610135-044	ES0610135-045	ES0610135-046	ES0610135-047	ES0610135-049
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%	21.6	21.9	17.9	27.6	1.7
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	8	7	6	7	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	----
Chromium	7440-47-3	2	mg/kg	28	26	20	14	----
Copper	7440-50-8	5	mg/kg	<5	<5	28	86	----
Lead	7439-92-1	5	mg/kg	15	22	93	193	----
Nickel	7440-02-0	2	mg/kg	<2	<2	4	21	----
Zinc	7440-66-6	5	mg/kg	10	20	34	1060	----
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.1	2.7	----
EK025G: Free cyanide by Discrete Analyser								
Total Cyanide	57-12-5	1.0	mg/kg	----	<1.0	----	----	----
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls		0.10	mg/kg	----	----	<0.10	<0.50	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	----	----	<0.05	<2.50	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	----	----	<0.05	<2.50	----
beta-BHC	319-85-7	0.05	mg/kg	----	----	<0.05	<2.50	----
gamma-BHC	58-89-9	0.05	mg/kg	----	----	<0.05	<2.50	----
delta-BHC	319-86-8	0.05	mg/kg	----	----	<0.05	<2.50	----
Heptachlor	76-44-8	0.05	mg/kg	----	----	<0.05	<2.50	----
Aldrin	309-00-2	0.05	mg/kg	----	----	<0.05	<2.50	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	----	----	<0.05	<2.50	----
trans-Chlordane	5103-74-2	0.05	mg/kg	----	----	<0.05	<2.50	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	----	----	<0.05	<2.50	----
cis-Chlordane	5103-71-9	0.05	mg/kg	----	----	<0.05	<2.50	----
Dieldrin	60-57-1	0.05	mg/kg	----	----	<0.05	<2.50	----
4.4'-DDE	72-55-9	0.05	mg/kg	----	----	<0.05	<2.50	----
Endrin	72-20-8	0.05	mg/kg	----	----	<0.05	<2.50	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	----	----	<0.05	<2.50	----
4.4'-DDD	72-54-8	0.05	mg/kg	----	----	<0.05	<2.50	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	----	----	<0.05	<2.50	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	----	----	<0.05	<2.50	----
4.4'-DDT	50-29-3	0.2	mg/kg	----	----	<0.2	<2.5	----
Endrin ketone	53494-70-5	0.05	mg/kg	----	----	<0.05	<2.50	----
Methoxychlor	72-43-5	0.2	mg/kg	----	----	<0.2	<2.5	----

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID : TP14/1.0 Sample Matrix Type / Description : SOIL Sample Date / Time : 17 Aug 2006 15:00 Laboratory Sample ID : ES0610135-044	TP14/1.5 SOIL 17 Aug 2006 15:00 ES0610135-045	RP/2.0 SOIL 17 Aug 2006 15:00 ES0610135-046	RP/PIPE SOIL 17 Aug 2006 15:00 ES0610135-047	TS CONTROL SOIL 17 Aug 2006 15:00 ES0610135-049
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	----	----	<0.05	<2.50	----
Demeton-S-methyl	919-86-8	0.05	mg/kg	----	----	<0.05	<2.50	----
Monocrotophos	6923-22-4	0.2	mg/kg	----	----	<0.2	<2.5	----
Dimethoate	60-51-5	0.05	mg/kg	----	----	<0.05	<2.50	----
Diazinon	333-41-5	0.05	mg/kg	----	----	<0.05	<2.50	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	----	----	<0.05	<2.50	----
Parathion-methyl	298-00-0	0.2	mg/kg	----	----	<0.2	<2.5	----
Malathion	121-75-5	0.05	mg/kg	----	----	<0.05	<2.50	----
Fenthion	55-38-9	0.05	mg/kg	----	----	<0.05	<2.50	----
Chlorpyrifos	2921-88-2	0.05	mg/kg	----	----	<0.05	<2.50	----
Parathion	56-38-2	0.2	mg/kg	----	----	<0.2	<2.5	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	----	----	<0.05	<2.50	----
Chlorfenvinphos	470-90-6	0.05	mg/kg	----	----	<0.05	<2.50	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg	----	----	<0.05	<2.50	----
Fenamiphos	22224-92-6	0.05	mg/kg	----	----	<0.05	<2.50	----
Prothiofos	34643-46-4	0.05	mg/kg	----	----	<0.05	<2.50	----
Ethion	563-12-2	0.05	mg/kg	----	----	<0.05	<2.50	----
Carbophenothion	786-19-6	0.05	mg/kg	----	----	<0.05	<2.50	----
Azinphos Methyl	86-50-0	0.05	mg/kg	----	----	<0.05	<2.50	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	----	<0.5	7.6	----
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	----	<1.0	<1.0	----
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	----	<0.5	<0.5	----
Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	----	<2.0	<2.0	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	3.3	2550	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	7.5	1140	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	1020	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	2020	----

ALS Environmental

Analytical Results

Client Sample ID	TP14/1.0	TP14/1.5	RP/2.0	RP/PIPE	TS CONTROL
Sample Matrix Type / Description	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00
Laboratory Sample ID	ES0610135-044	ES0610135-045	ES0610135-046	ES0610135-047	ES0610135-049

Analyte	CAS number	LOR	Units					
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	5.3	5460	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	3.6	1500	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	10.8	2190	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	17.5	2270	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	10.0	718	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	9.4	563	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	13.1	453	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	5.6	152	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	12.8	491	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	6.5	146	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	2.0	50.8	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	9.8	166	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction		2	mg/kg	<2	<2	<2	70	35
C10 - C14 Fraction		50	mg/kg	<50	<50	120	4590	----
C15 - C28 Fraction		100	mg/kg	<100	<100	930	15200	----
C29 - C36 Fraction		100	mg/kg	<100	<100	680	4870	----
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	2.0	2.6
Toluene	108-88-3	0.2	mg/kg	<0.2	<0.2	<0.2	3.6	11.0
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	<0.2	<0.2	1.1	2.5
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	<0.2	<0.2	26.0	10.3
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	<0.2	21.4	4.1
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	----	----	91.8	101	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE		0.1	%	----	----	91.4	Not Determined	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	----	----	90.7	Not Determined	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	75.4	92.9	90.7	97.8	----
2-Chlorophenol-D4	93951-73-6	0.1	%	81.2	91.3	98.7	91.0	----
2.4.6-Tribromophenol	118-79-6	0.1	%	74.7	89.8	84.4	105	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	79.2	90.3	88.9	79.2	----
Anthracene-d10	1719-06-8	0.1	%	78.7	90.6	92.3	92.4	----

ALS Environmental

Analytical Results

				Client Sample ID :	TP14/1.0	TP14/1.5	RP/2.0	RP/PIPE	TS CONTROL
				Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Date / Time :	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00
				Laboratory Sample ID :					
Analyte	*CAS number*	*LOR*	*Units*		ES0610135-044	ES0610135-045	ES0610135-046	ES0610135-047	ES0610135-049
EP075(SIM)T: PAH Surrogates									
4-Terphenyl-d14	1718-51-0	0.1	%		76.4	89.4	85.2	79.7	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		94.3	106	102	98.8	99.6
Toluene-D8	2037-26-5	0.1	%		91.4	103	95.3	85.3	97.7
4-Bromofluorobenzene	460-00-4	0.1	%		86.6	92.2	91.1	82.3	97.5

ALS Environmental

Analytical Results

				Client Sample ID :	W04			
				Sample Matrix Type / Description :	WATER			
				Sample Date / Time :	17 Aug 2006 15:00			
				Laboratory Sample ID :	ES0610135-048			
Analyte	CAS number	LOR	Units					
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	0.008				
Cadmium	7440-43-9	0.0001	mg/L	0.0007				
Chromium	7440-47-3	0.001	mg/L	0.007				
Copper	7440-50-8	0.001	mg/L	0.043				
Lead	7439-92-1	0.001	mg/L	0.087				
Nickel	7440-02-0	0.001	mg/L	0.016				
Zinc	7440-66-6	0.005	mg/L	0.302				
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001				
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls		1	µg/L	<1				
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.5	µg/L	<0.5				
Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L	<0.5				
beta-BHC	319-85-7	0.5	µg/L	<0.5				
gamma-BHC	58-89-9	0.5	µg/L	<0.5				
delta-BHC	319-86-8	0.5	µg/L	<0.5				
Heptachlor	76-44-8	0.5	µg/L	<0.5				
Aldrin	309-00-2	0.5	µg/L	<0.5				
Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5				
trans-Chlordane	5103-74-2	0.5	µg/L	<0.5				
alpha-Endosulfan	959-98-8	0.5	µg/L	<0.5				
cis-Chlordane	5103-71-9	0.5	µg/L	<0.5				
Dieldrin	60-57-1	0.5	µg/L	<0.5				
4.4'-DDE	72-55-9	0.5	µg/L	<0.5				
Endrin	72-20-8	0.5	µg/L	<0.5				
beta-Endosulfan	33213-65-9	0.5	µg/L	<0.5				
4.4'-DDD	72-54-8	0.5	µg/L	<0.5				
Endrin aldehyde	7421-93-4	0.5	µg/L	<0.5				
Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5				
4.4'-DDT	50-29-3	2	µg/L	<2				
Endrin ketone	53494-70-5	0.5	µg/L	<0.5				
Methoxychlor	72-43-5	2	µg/L	<2				
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.5	µg/L	<0.5				
Demeton-S-methyl	919-86-8	0.5	µg/L	<0.5				
Monocrotophos	6923-22-4	2	µg/L	<2				

ALS Environmental

Analytical Results

	Client Sample ID :	W04				
	Sample Matrix Type / Description :	WATER				
	Sample Date / Time :	17 Aug 2006 15:00				
	Laboratory Sample ID :	ES0610135-048				
Analyte	CAS number	LOR	Units			
EP068B: Organophosphorus Pesticides (OP)						
Dimethoate	60-51-5	0.5	µg/L	<0.5		
Diazinon	333-41-5	0.5	µg/L	<0.5		
Chlorpyrifos-methyl	5598-13-0	0.5	µg/L	<0.5		
Parathion-methyl	298-00-0	2	µg/L	<2		
Malathion	121-75-5	0.5	µg/L	<0.5		
Fenthion	55-38-9	0.5	µg/L	<0.5		
Chlorpyrifos	2921-88-2	0.5	µg/L	<0.5		
Parathion	56-38-2	2	µg/L	<2		
Pirimphos-ethyl	23505-41-1	0.5	µg/L	<0.5		
Chlorfenvinphos	470-90-6	0.5	µg/L	<0.5		
Bromophos-ethyl	4824-78-6	0.5	µg/L	<0.5		
Fenamiphos	22224-92-6	0.5	µg/L	<0.5		
Prothiofos	34643-46-4	0.5	µg/L	<0.5		
Ethion	563-12-2	0.5	µg/L	<0.5		
Carbophenothion	786-19-6	0.5	µg/L	<0.5		
Azinphos Methyl	86-50-0	0.5	µg/L	<0.5		
EP075(SIM)A: Phenolic Compounds						
Phenol	108-95-2	1.0	µg/L	<1.0		
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0		
2-Methylphenol	95-48-7	1.0	µg/L	<1.0		
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0		
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0		
2.4-Dimethylphenol	105-67-9	1.0	µg/L	3.8		
2.4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0		
2.6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0		
4-Chloro-3-Methylphenol	59-50-7	1.0	µg/L	<1.0		
2.4.6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0		
2.4.5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0		
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0		
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons						
Naphthalene	91-20-3	1.0	µg/L	<1.0		
Acenaphthylene	208-96-8	1.0	µg/L	2.7		
Acenaphthene	83-32-9	1.0	µg/L	<1.0		
Fluorene	86-73-7	1.0	µg/L	<1.0		
Phenanthrene	85-01-8	1.0	µg/L	1.5		
Anthracene	120-12-7	1.0	µg/L	1.4		
Fluoranthene	206-44-0	1.0	µg/L	16.1		

ALS Environmental

Analytical Results

				Client Sample ID :	W04			
				Sample Matrix Type / Description :	WATER			
				Sample Date / Time :	17 Aug 2006 15:00			
				Laboratory Sample ID :	ES0610135-048			
Analyte	*CAS number*	*LOR*	*Units*					
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Pyrene	129-00-0	1.0	µg/L		23.6			
Benz(a)anthracene	56-55-3	1.0	µg/L		8.4			
Chrysene	218-01-9	1.0	µg/L		7.1			
Benzo(b)fluoranthene	205-99-2	1.0	µg/L		11.6			
Benzo(k)fluoranthene	207-08-9	1.0	µg/L		3.3			
Benzo(a)pyrene	50-32-8	0.5	µg/L		9.9			
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L		5.6			
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L		2.0			
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L		8.0			
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction		20	µg/L		<20			
C10 - C14 Fraction		50	µg/L		200			
C15 - C28 Fraction		100	µg/L		900			
C29 - C36 Fraction		50	µg/L		460			
EP080: BTEX								
Benzene	71-43-2	1	µg/L		<1			
Toluene	108-88-3	2	µg/L		<2			
Ethylbenzene	100-41-4	2	µg/L		<2			
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2			
ortho-Xylene	95-47-6	2	µg/L		<2			
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%		106			
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE		0.1	%		103			
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%		110			
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%		41.8			
2-Chlorophenol-D4	93951-73-6	0.1	%		111			
2.4.6-Tribromophenol	118-79-6	0.1	%		120			
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%		115			
Anthracene-d10	1719-06-8	0.1	%		132			
4-Terphenyl-d14	1718-51-0	0.1	%		115			
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%		81.3			

ALS Environmental

Analytical Results

			Client Sample ID :	W04				
			Sample Matrix Type / Description :	WATER				
			Sample Date / Time :	17 Aug 2006 15:00				
			Laboratory Sample ID :	ES0610135-048				
Analyte	*CAS number*	*LOR*	*Units*					
EP080S: TPH(V)/BTEX Surrogates								
Toluene-D8	2037-26-5	0.1	%	92.6				
4-Bromofluorobenzene	460-00-4	0.1	%	91.1				

ALS Environmental

Surrogate Control Limits

Matrix Type: WATER - 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			
EP068S: Organochlorine Pesticide Surrogate	Dibromo-DDE	10	136
EP068T: Organophosphorus Pesticide Surrogate	DEF	10	136
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	116
	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

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 GCMS			
EP068S: Organochlorine Pesticide Surrogate	Dibromo-DDE	10	136
EP068T: Organophosphorus Pesticide Surrogate	DEF	10	136
EP075(SIM): PAH/Phenols (SIM)			
EP075(SIM)S: Phenolic Compound Surrogates	Phenol-d6	24	113
	2-Chlorophenol-D4	23	134
	2,4,6-Tribromophenol	19	122
EP075(SIM)T: PAH Surrogates	2-Fluorobiphenyl	30	115
	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

CH2MHILL ACN 050 070 892

CHAIN OF CUSTODY RECORD

Level 7, 9 Help Street, Chatswood, NSW 2067 Australia Tel (61 2) 9950 0200 Fax (61 2) 9950 0600

Laboratory Quotation #

1/5

COC # [redacted]

Project # 347496	**Purchase Order #** SY/148/06
Project Name Macdonaldtown Greasworks	
Company Name ALS	
Project Manager or Contact & Phone # Adam Sullivan 0400 500 264	**Report Copy to:** →
Requested Completion Date: standard TAT	**Site ID** Macdonaldtown
Sample Disposal: Dispose ☑ Return ☐	

Sampling Date	Sampling Time	Type	Matrix	CLIENT SAMPLE ID (9 CHARACTERS)	LAB QC	TOTAL # OF CONTAINERS	S-2	S-4	S-7	S-12	S-14A	S-19	EK 026	ASBESTOS	HOLD!
				Preservative											
17/8/6			Soil	MG08/0.3	1		X		X						
				MG08/1.0	2				X						
				MG08/1.5	3							X			
				MG08/2.1	4				X						X
				MG08/3.1	50										
				MG08/4.0	5				X						
				MG09B/0.3	6		X	X							
				MG09B/0.6	7							X			
				MG09B/2.5	8				X						
				MG09B/PIPE	9							X			
				MG09C/0.3	10		X		X				X		
				MG09C/1.5	11							X			

Requested Analytical Method #

QA REQUIREMENTS

Matrix Spike	☐ Yes ☐ No
Matrix Duplicate	☐ Yes ☐ No
Laboratory Duplicate	☐ Yes ☐ No
Lab Blank	☐ Yes ☐ No
Surrogate Spike	☐ Yes ☐ No
RPDs	☐ Yes ☐ No
Spike Recovery Data	☐ Yes ☐ No

LAB USE ONLY

Custody Seals	☐ Yes ☐ No
ICE	☐ Yes ☐ No

ALS Environmental
Sydney
Work Order
ES0610135

Report Version: WOLabel 1.01
Telephone : 61-2-87848555

CONTRACT WORK

WO: .....

LAB: ASET Asbestos

DATE: 18-8-6 Soil 7 bag

SPLIT: .....

Sampled By and Title Adam Sullivan	(Please sign and print name)	**Date/Time** 17/8/6	**Relinquished By** Adam Sullivan
Received by IES	(Please sign and print name)	**Date/Time**	**Relinquished By**
Received by	(Please sign and print name) 4.35pm	**Date/Time** 17/8/6	**Shipped Via** / **Shipping #**

(Please sign and print name) — **Date/Time** 17/8/6

Special Instructions:

DISTRIBUTION: Original - LAB, Yellow - LAB, Pink - CH2MHILL

Laboratory Quotation #

2/5

CH2MHILL ACN 050 070 892

CHAIN OF CUSTODY RECORD

Level 7, 9 Help Street, Chatswood, NSW 2067 Australia Tel (61 2) 9950 0200 Fax (61 2) 9950 0600

COC # [redacted]

Project # 347496	**~~Purchase Order #~~** SY/148/06
Project Name Macdonaldtown Gasworks	
Company Name ALS	
Project Manager or Contact & Phone # Adam Sullivan 0400 500 264	**Report Copy to:** →
Requested Completion Date: standard TAT	**Site ID** Macdonaldtown
Sample Disposal: Dispose ☑ Return ☐	

TOTAL # OF CONTAINERS

Requested Analytical Method #

S-2	S-4	S-7	S-12	S-14A	S-19	EK 026	ASBESTOS	HOLD

Preservative

QA REQUIREMENTS

Matrix Spike	☐ Yes	☐ No
Matrix Duplicate	☐ Yes	☐ No
Laboratory Duplicate	☐ Yes	☐ No
Lab Blank	☐ Yes	☐ No
Surrogate Spike	☐ Yes	☐ No
RPDs	☐ Yes	☐ No
Spike Recovery Data	☐ Yes	☐ No

LAB USE ONLY

Custody Seals	☐ Yes	☐ No
ICE	☐ Yes	☐ No

Sampling Date	Sampling Time	Type	Matrix: Soil	CLIENT SAMPLE ID (9 CHARACTERS)	LAB QC	S-2	S-4	S-7	S-12	S-14A	S-19	EK 026	ASBESTOS	HOLD	Comments	Lab ID
17/8/6			✓	MG09C/1.9	12	X		X				X				
			✓	MG09C/3.8	13	X		X								
			✓	TP15/0.3	14			X				X				
			✓	TP15/1.0	SP											
			✓	TP15/2.8	15	X		X	X			X				
			✓	TP15/4.1	16	X		X	X							
			✓	QC03	17	X		X								
			✓	QC04	18	X		X	X			X				
			✓	MG10/0.2	19						X	X	X			
			✓	MG10/0.6	SP											
			✓	MG10A/0.7	20	X	X		X	X		X	X			
			✓	MG10A/2.8	21						X					

Sampled By and Title Adam Sullivan	(Please sign and print name)	**Date/Time** 17/8/6	**Relinquished By** Adam Sullivan (Please sign and print name)	**Date/Time** 17/8/6
Received by ALS	(Please sign and print name)	**Date/Time**	**Relinquished By** (Please sign and print name)	**Date/Time**
Received by [signature]	(Please sign and print name)	**Date/Time** 17/8/6	**Shipped Via**	**Shipping #**

Special Instructions:

DISTRIBUTION: Original - LAB, Yellow - LAB, Pink - CH2MHILL

CH2MHILL ACN 050 070 892

CHAIN OF CUSTODY RECORD

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Laboratory Quotation #

3/5

COC # [redacted]

Project # 347496	**~~Purchase Order #~~** SY/148/06
Project Name Macdonaldtown Greasworks	
Company Name ALS	
Project Manager or Contact & Phone # Adam Sullivan 0400 500 264	**Report Copy to:** →
Requested Completion Date: standard TAT	**Site ID** Macdonaldtown
Sample Disposal: Dispose ☑ Return ☐	

TOTAL # OF CONTAINERS

Requested Analytical Method #

Sampling Date	Sampling Time	Type	Matrix (Soil)	CLIENT SAMPLE ID (9 CHARACTERS)	LAB QC	S-2	S-4	S-7	S-12	S-14A	S-19	EK026	ASBESTOS	HOLD!
				Preservative										
17/8/16			✓	MG10A/4.0	22	X	X			X				
				MG04/0.5	23	X		X					X	
				MG04/1.5	24						X		X	
				Trip Blank (3)	25		X							
				Trip Spike (3)	26		X							
				MG05/0.5	27	X	X							
				MG05/1.2	28			X						
				MG05/1.8	29						X			
				MG05/3.4	30		X			X				
				MG05/5.0	31			X						
				MG06/1.0	32	X		X				X		
				MG06/2.0	33						X			

QA REQUIREMENTS

Matrix Spike	☐ Yes ☐ No
Matrix Duplicate	☐ Yes ☐ No
Laboratory Duplicate	☐ Yes ☐ No
Lab Blank	☐ Yes ☐ No
Surrogate Spike	☐ Yes ☐ No
RPDs	☐ Yes ☐ No
Spike Recovery Data	☐ Yes ☐ No

LAB USE ONLY

Custody Seals	☐ Yes ☐ No
ICE	☐ Yes ☐ No

Comments	Lab ID

Sampled By and Title Adam Sullivan	(Please sign and print name)	**Date/Time** 17/8/16	**Relinquished By** Adam Sullivan (Please sign and print name)	**Date/Time** 17/8/16
Received by IOS	(Please sign and print name)	**Date/Time**	**Relinquished By**	(Please sign and print name) **Date/Time**
Received by [illegible]	(Please sign and print name)	**Date/Time** 4:30pm 17/8/16	**Shipped Via**	**Shipping #**

Special Instructions:

DISTRIBUTION: Original - LAB, Yellow - LAB, Pink - CH2MHILL

Laboratory Quotation #

4/5

CH2MHILL ACN 050 070 892

CHAIN OF CUSTODY RECORD

Level 7, 9 Help Street, Chatswood, NSW 2067 Australia Tel (61 2) 9950 0200 Fax (61 2) 9950 0600

COC # [redacted]

Project # 347496	**~~Purchase Order #~~** SY/148/06
Project Name Macdonaldtown Greasworks	
Company Name ALS	
Project Manager or Contact & Phone # Adam Sullivan 0400 500 264	**Report Copy to:** →
Requested Completion Date: standard TAT	**Site ID** Macdonaldtown
Sample Disposal: Dispose ☑ Return ☐	

TOTAL # OF CONTAINERS

Requested Analytical Method #

S-2	S-4	S-7	S-12	S-14A	S-19	EK026	Asbestos	HOLD
								X
X		X				X		
X	X			X				
					X			
X	X			X			X	
					X			
X	X			X			X	
								X
		X						
		X						
X	X			X			X	
		X						

Preservative

QA REQUIREMENTS

Matrix Spike	☐ Yes ☐ No
Matrix Duplicate	☐ Yes ☐ No
Laboratory Duplicate	☐ Yes ☐ No
Lab Blank	☐ Yes ☐ No
Surrogate Spike	☐ Yes ☐ No
RPDs	☐ Yes ☐ No
Spike Recovery Data	☐ Yes ☐ No

LAB USE ONLY

Custody Seals	☐ Yes ☐ No
ICE	☐ Yes ☐ No

Sampling Date	Sampling Time	Type	Matrix	CLIENT SAMPLE ID (9 CHARACTERS)	LAB QC	Comments	Lab ID
				MG06/3.5	~~52~~		
				MG06/4.7	34		
				MG07/1.0	35		
				MG07/4.0	36		
				TP12/0.25	37		
				TP12/0.5	38		
				TP13/0.25	39		
				TP13/0.5	~~54~~		
				TP13/1.0	40		
				TP13/1.5	41		
				TP14/0.25	42		
				TP14/0.5	43		

Sampled By and Title A. Sullivan	(Please sign and print name)	**Date/Time**	**Relinquished By** A. Sullivan (Please sign and print name)	**Date/Time**
Received by ~~ALS~~	(Please sign and print name)	**Date/Time**	**Relinquished By** (Please sign and print name)	**Date/Time**
Received by ALS	(Please sign and print name)	**Date/Time** 4:35pm 7/8/06	**Shipped Via**	**Shipping #**

Special Instructions:

DISTRIBUTION: Original - LAB, Yellow - LAB, Pink - CH2MHILL

CH2MHILL ACN 050 070 892

CHAIN OF CUSTODY RECORD

Level 7, 9 Help Street, Chatswood, NSW 2067 Australia Tel (61 2) 9950 0200 Fax (61 2) 9950 0600

Laboratory Quotation #

5/5

COC # [redacted]

Project # 347496	**Purchase Order #** SY/148/06
Project Name Macdonaldtown Greasworks	
Company Name ALS	
Project Manager or Contact & Phone # Adam Sullivan 0400 500 264	**Report Copy to:** →
Requested Completion Date: standard TAT	**Site ID** Macdonaldtown
Sample Disposal: Dispose ☑ Return ☐	

TOTAL # OF CONTAINERS

Requested Analytical Method #

Sampling Date	Sampling Time	Type	Matrix	CLIENT SAMPLE ID (9 CHARACTERS)	LAB QC	S-2	S-4	S-7	S-12	S-144	S-19	E1026	Asbestos	HOLD
				TP14/1.0	44	X	X			X				X
				TP14/1.5	45	X		X				X		
				RP/2.0	46						X			
				RP/Pipe	47						X			
				DUP06				X						
acknowledgesoy				DUP07		X	X			X				
				QC02		X	X							
				WOA	48						X			
				TS CONTROL	49		X							
Extra sample				TP12	~~55~~									

Preservative

QA REQUIREMENTS

Matrix Spike	☐ Yes ☐ No
Matrix Duplicate	☐ Yes ☐ No
Laboratory Duplicate	☐ Yes ☐ No
Lab Blank	☐ Yes ☐ No
Surrogate Spike	☐ Yes ☐ No
RPDs	☐ Yes ☐ No
Spike Recovery Data	☐ Yes ☐ No

LAB USE ONLY

Custody Seals	☐ Yes ☐ No
ICE	☐ Yes ☐ No

Comments	Lab ID
(*) (*) (*) Please send to Labmark for analysis	

Sampled By and Title A. Sullivan	(Please sign and print name)	**Date/Time**	**Relinquished By** A. Sullivan (Please sign and print name) — **Date/Time**
Received by	(Please sign and print name)	**Date/Time**	**Relinquished By** (Please sign and print name) — **Date/Time**
Received by Soy Hyn	(Please sign and print name) 4:35pm 17/8/06	**Date/Time**	**Shipped Via** — **Shipping #**

Special Instructions:

DISTRIBUTION: Original - LAB, Yellow - LAB, Pink - CH2MHILL

ALS Environmental

QUALITY CONTROL REPORT

Client	:	**CH2M HILL PTY LTD**	**Laboratory**	:	ALS Environmental Sydney	**Page**	: **1 of 49**
Contact	:	MR ADAM SULLIVAN	**Contact**	:	Greg Vogel		
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	**Address**	:	277-289 Woodpark Road Smithfield NSW Australia 2164	**Work order**	: **ES0610135**
						Amendment No.	:
Project	:	347496 MACDONALDTOWN GASWORKS	**Quote number**	:	----	**Date received**	: 17 Aug 2006
Order number	:	- Not provided -				**Date issued**	: 30 Aug 2006
C-O-C number	:	- Not provided -					
Site	:	MACDONALD					
E-mail	:	adam.sullivan@ch2m.com.au	**E-mail**	:	Greg.Vogel@alsenviro.com	**No. of samples**	
Telephone	:	02 9950 0200	**Telephone**	:	+61 (02) 8784 8555	**Received**	: 55
Facsimile	:	02 9950 0600	**Facsimile**	:	+61 (02) 8784 8500	**Analysed**	: 46

This final report for the ALSE work order reference ES0610135 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

EP080 : Surrogates could not be determined for sample MG09B/PIPE due to sample matrix interferences.
Sample TRIP SPIKE contains volatile compounds spiked into the sample containers prior to dispatch from the laboratory. BTEX compounds spiked at 20 ug/L.
EP080: The trip spike and its control have been analysed for volatile TPH and BTEX only. The trip spike and control were prepared in the lab using reagent grade sand spiked with petrol. The spike was dispatched from the lab and the control retained.
EPO68: Poor matrix spike recovery due to sample matrix interferences. Confirmed by re-extraction and re-analysis.
EPO66 & EPO68 : Particular samples required dilution due to the presence of high level contaminants. LOR values have been adjusted accordingly. Surrogates were diluted outside of the analytical range and were therefore not determined.
Poor duplicate precision for Pb and Zn due to sample heterogeneity.

ALSE - Excellence in Analytical Testing

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

Accredited for compliance with ISO/IED 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	Department
Celine Conceicao	Inorganics - NATA 825 (10911 - Sydney)
Peter Dickenson	Inorganics - NATA 825 (10911 - Sydney)
PHALAK INTHAKESONE	Organics - NATA 825 (10911 - Sydney)
Phyu Phyu Lwin	Inorganics - NATA 825 (10911 - Sydney)
Sarah Millington	Inorganics - NATA 825 (10911 - Sydney)

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: SOIL ***Laboratory Duplicates (DUP) Report***

Laboratory Sample ID	*Client Sample ID*	*Analyte name*	*LOR*	*Original Result*	*Duplicate Result*	*RPD*
EA055: Moisture Content						
EA055: Moisture Content - (QC Lot: 261331)				**%**	**%**	**%**
ES0610121-001	Anonymous	Moisture Content (dried @ 103°C)	1.0 %	25.2	25.4	0.8
ES0610121-010	Anonymous	Moisture Content (dried @ 103°C)	1.0 %	59.0	59.4	0.6
EA055: Moisture Content - (QC Lot: 261332)				**%**	**%**	**%**
ES0610135-004	MG08/2.1	Moisture Content (dried @ 103°C)	1.0 %	25.1	25.4	1.3
ES0610135-014	TP15/0.3	Moisture Content (dried @ 103°C)	1.0 %	16.6	15.2	9.3
EA055: Moisture Content - (QC Lot: 261333)				**%**	**%**	**%**
ES0610135-025	TRIP BLANK 3	Moisture Content (dried @ 103°C)	1.0 %	19.2	19.4	0.8
ES0610135-035	MG07/1.0	Moisture Content (dried @ 103°C)	1.0 %	18.2	18.8	3.1
EA055: Moisture Content - (QC Lot: 261334)				**%**	**%**	**%**
ES0610135-047	RP/PIPE	Moisture Content (dried @ 103°C)	1.0 %	27.6	26.8	2.9
EA055: Moisture Content - (QC Lot: 264284)				**%**	**%**	**%**
ES0610135-044	TP14/1.0	Moisture Content (dried @ 103°C)	1.0 %	21.6	21.4	0.9
ES0610400-024	Anonymous	Moisture Content (dried @ 103°C)	1.0 %	16.1	16.0	0.6
EG005T: Total Metals by ICP-AES						
EG005T: Total Metals by ICP-AES - (QC Lot: 260716)				**mg/kg**	**mg/kg**	**%**
ES0610134-001	Anonymous	Arsenic	5 mg/kg	<5	<5	0.0
		Cadmium	1 mg/kg	<1	<1	0.0
		Chromium	2 mg/kg	5	6	0.0
		Copper	5 mg/kg	<5	<5	0.0
		Lead	5 mg/kg	<5	<5	0.0
		Nickel	2 mg/kg	2	3	0.0
		Zinc	5 mg/kg	23	23	0.0
ES0610135-012	MG09C/1.9	Arsenic	5 mg/kg	<5	<5	0.0
		Cadmium	1 mg/kg	<1	<1	0.0
		Chromium	2 mg/kg	14	12	14.5

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: 260716) - continued				mg/kg	mg/kg	%
ES0610135-012	MG09C/1.9	Copper	5 mg/kg	<5	6	21.7
		Lead	5 mg/kg	18	23	24.4
		Nickel	2 mg/kg	3	4	0.0
		Zinc	5 mg/kg	<5	6	24.3
EG005T: Total Metals by ICP-AES - (QC Lot: 260718)				mg/kg	mg/kg	%
ES0610135-023	MG04/0.5	Arsenic	5 mg/kg	13	14	0.0
		Cadmium	1 mg/kg	<1	<1	0.0
		Chromium	2 mg/kg	11	15	29.0
		Copper	5 mg/kg	195	195	0.0
		Lead	5 mg/kg	2140	2010	6.4
		Nickel	2 mg/kg	17	21	18.1
		Zinc	5 mg/kg	342	364	6.2
ES0610135-038	TP12/0.5	Arsenic	5 mg/kg	71	61	14.4
		Cadmium	1 mg/kg	1	1	0.0
		Chromium	2 mg/kg	18	22	20.7
		Copper	5 mg/kg	334	302	9.9
		Lead	5 mg/kg	219	244	10.7
		Nickel	2 mg/kg	11	16	38.9
		Zinc	5 mg/kg	362	260	32.8
EG005T: Total Metals by ICP-AES - (QC Lot: 260843)				mg/kg	mg/kg	%
ES0610135-042	TP14/0.25	Arsenic	5 mg/kg	6	6	0.0
		Cadmium	1 mg/kg	<1	<1	0.0
		Chromium	2 mg/kg	45	48	5.5
		Copper	5 mg/kg	94	95	1.6
		Lead	5 mg/kg	209	257	20.8
		Nickel	2 mg/kg	58	60	4.3
		Zinc	5 mg/kg	274	280	2.3
ES0610305-004	Anonymous	Arsenic	5 mg/kg	7	<5	27.9
		Cadmium	1 mg/kg	<1	<1	0.0

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: 260843) - continued				mg/kg	mg/kg	%
ES0610305-004	Anonymous	Chromium	2 mg/kg	17	14	20.6
		Copper	5 mg/kg	30	27	11.5
		Lead	5 mg/kg	57	36	44.5
		Nickel	2 mg/kg	12	9	26.5
		Zinc	5 mg/kg	94	74	23.8
EG005T: Total Metals by ICP-AES - (QC Lot: 264930)				mg/kg	mg/kg	%
ES0610135-044	TP14/1.0	Arsenic	5 mg/kg	8	8	0.0
		Cadmium	1 mg/kg	<1	<1	0.0
		Chromium	2 mg/kg	28	29	0.0
		Copper	5 mg/kg	<5	<5	0.0
		Lead	5 mg/kg	15	17	13.4
		Nickel	2 mg/kg	<2	<2	0.0
		Zinc	5 mg/kg	10	10	0.0
ES0610400-019	Anonymous	Arsenic	5 mg/kg	<5	<5	0.0
		Cadmium	1 mg/kg	<1	<1	0.0
		Chromium	2 mg/kg	22	19	12.7
		Copper	5 mg/kg	113	99	13.4
		Lead	5 mg/kg	15	13	12.4
		Nickel	2 mg/kg	3	4	0.0
		Zinc	5 mg/kg	221	208	6.3
EG035T: Total Mercury by FIMS						
EG035T: Total Mercury by FIMS - (QC Lot: 260717)				mg/kg	mg/kg	%
ES0610134-001	Anonymous	Mercury	0.1 mg/kg	<0.1	<0.1	0.0
ES0610135-012	MG09C/1.9	Mercury	0.1 mg/kg	<0.1	<0.1	0.0
EG035T: Total Mercury by FIMS - (QC Lot: 260719)				mg/kg	mg/kg	%
ES0610135-023	MG04/0.5	Mercury	0.1 mg/kg	0.3	0.5	37.0
ES0610135-038	TP12/0.5	Mercury	0.1 mg/kg	0.2	0.2	0.0
EG035T: Total Mercury by FIMS - (QC Lot: 260842)				mg/kg	mg/kg	%
ES0610135-042	TP14/0.25	Mercury	0.1 mg/kg	0.1	0.1	0.0

Matrix Type: SOIL

Laboratory Duplicates (DUP) Report

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: 260842) - continued				mg/kg	mg/kg	%
ES0610305-004	Anonymous	Mercury	0.1 mg/kg	0.1	0.1	0.0
EG035T: Total Mercury by FIMS - (QC Lot: 264931)				mg/kg	mg/kg	%
ES0610135-044	TP14/1.0	Mercury	0.1 mg/kg	<0.1	<0.1	0.0
ES0610400-019	Anonymous	Mercury	0.1 mg/kg	0.2	0.2	0.0
EK025G: Free cyanide by Discrete Analyser						
EK025G: Free cyanide by Discrete Analyser - (QC Lot: 260684)				mg/kg	mg/kg	%
ES0610135-010	MG09C/0.3	Total Cyanide	1.0 mg/kg	<1.0	<1.0	0.0
ES0610135-045	TP14/1.5	Total Cyanide	1.0 mg/kg	<1.0	1.3	24.6
EP066: Polychlorinated Biphenyls (PCB)						
EP066: Polychlorinated Biphenyls (PCB) - (QC Lot: 260398)				mg/kg	mg/kg	%
ES0610135-019	MG10/0.2	Total Polychlorinated biphenyls	0.10 mg/kg	<0.10	<0.10	0.0
ES0610135-038	TP12/0.5	Total Polychlorinated biphenyls	0.10 mg/kg	<0.10	<0.10	0.0
EP068A: Organochlorine Pesticides (OC)						
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 260399)				mg/kg	mg/kg	%
ES0610135-019	MG10/0.2	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

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) - continued						
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 260399) - continued				mg/kg	mg/kg	%
ES0610135-019	MG10/0.2	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
ES0610135-038	TP12/0.5	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: 260399)				mg/kg	mg/kg	%

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Matrix Type: SOIL

Laboratory Duplicates (DUP) Report

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: 260399) - continued				mg/kg	mg/kg	%
ES0610135-019	MG10/0.2	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
		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
ES0610135-038	TP12/0.5	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
		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

Matrix Type: SOIL

Laboratory Duplicates (DUP) Report

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: 260399) - continued				mg/kg	mg/kg	%
ES0610135-038	TP12/0.5	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: 260407)				mg/kg	mg/kg	%
ES0610135-013	MG09C/3.8	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
ES0610135-017	QC03	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

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: 260407) - continued				mg/kg	mg/kg	%
ES0610135-017	QC03	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)A: Phenolic Compounds - (QC Lot: 261190)				mg/kg	mg/kg	%
ES0610135-036	MG07/4.0	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
ES0610135-043	TP14/0.5	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

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: 261190) - continued				mg/kg	mg/kg	%
ES0610135-043	TP14/0.5	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)A: Phenolic Compounds - (QC Lot: 261195)				mg/kg	mg/kg	%
ES0610135-045	TP14/1.5	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
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 260407)				mg/kg	mg/kg	%
ES0610135-013	MG09C/3.8	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
		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

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: 260407) - continued				mg/kg	mg/kg	%
ES0610135-013	MG09C/3.8	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
ES0610135-017	QC03	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
		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
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 261190)				mg/kg	mg/kg	%
ES0610135-036	MG07/4.0	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

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: 261190) - continued				mg/kg	mg/kg	%
ES0610135-036	MG07/4.0	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
ES0610135-043	TP14/0.5	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
		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
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 261195)				mg/kg	mg/kg	%
ES0610135-045	TP14/1.5	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

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: 261195) - continued				mg/kg	mg/kg	%
ES0610135-045	TP14/1.5	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: 259275)				mg/kg	mg/kg	%
ES0610063-007	Anonymous	C6 - C9 Fraction	2 mg/kg	<2	<2	0.0
ES0610063-015	Anonymous	C6 - C9 Fraction	2 mg/kg	<2	<2	0.0
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 259316)				mg/kg	mg/kg	%
ES0610064-001	Anonymous	C6 - C9 Fraction	2 mg/kg	<2	<2	0.0
ES0610064-011	Anonymous	C6 - C9 Fraction	2 mg/kg	<2	<2	0.0
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 260101)				mg/kg	mg/kg	%
ES0610135-013	MG09C/3.8	C6 - C9 Fraction	2 mg/kg	<2	<2	0.0
ES0610135-023	MG04/0.5	C6 - C9 Fraction	2 mg/kg	<2	<2	0.0
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 260299)				mg/kg	mg/kg	%
ES0610135-036	MG07/4.0	C6 - C9 Fraction	2 mg/kg	<2	<2	0.0
ES0610135-037	TP12/0.25	C6 - C9 Fraction	2 mg/kg	<2	<2	0.0
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 260406)				mg/kg	mg/kg	%
ES0610135-013	MG09C/3.8	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

Matrix Type: SOIL

Laboratory Duplicates (DUP) Report

Laboratory Sample ID	Client Sample ID	Analyte name	LOR	Original Result	Duplicate Result	RPD
EP080/071: Total Petroleum Hydrocarbons - continued						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 260406) - continued				mg/kg	mg/kg	%
ES0610135-017	QC03	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
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 260459)				mg/kg	mg/kg	%
ES0610260-007	Anonymous	C6 - C9 Fraction	2 mg/kg	<2	<2	0.0
ES0610260-010	Anonymous	C6 - C9 Fraction	2 mg/kg	<2	<2	0.0
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 261189)				mg/kg	mg/kg	%
ES0610135-036	MG07/4.0	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
ES0610135-043	TP14/0.5	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
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 261196)				mg/kg	mg/kg	%
ES0610135-045	TP14/1.5	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
ES0610199-024	Anonymous	C10 - C14 Fraction	50 mg/kg	15400	14000	9.8
		C15 - C28 Fraction	100 mg/kg	2130	1900	11.4
		C29 - C36 Fraction	100 mg/kg	<100	<100	0.0
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 264139)				mg/kg	mg/kg	%
ES0610564-006	Anonymous	C6 - C9 Fraction	2 mg/kg	<2	<2	0.0
ES0610564-014	Anonymous	C6 - C9 Fraction	2 mg/kg	<2	<2	0.0
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 264260)				mg/kg	mg/kg	%
ES0610548-002	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
ES0610548-010	Anonymous	C10 - C14 Fraction	50 mg/kg	140	210	37.9
		C15 - C28 Fraction	100 mg/kg	1140	1300	12.6

Matrix Type: SOIL

Laboratory Duplicates (DUP) Report

Laboratory Sample ID	Client Sample ID	Analyte name	LOR	Original Result	Duplicate Result	RPD
EP080/071: Total Petroleum Hydrocarbons - continued						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 264260) - continued				mg/kg	mg/kg	%
ES0610548-010	Anonymous	C29 - C36 Fraction	100 mg/kg	<100	210	72.3
EP080: BTEX						
EP080: BTEX - (QC Lot: 259275)				mg/kg	mg/kg	%
ES0610063-007	Anonymous	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
ES0610063-015	Anonymous	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
EP080: BTEX - (QC Lot: 259316)				mg/kg	mg/kg	%
ES0610064-001	Anonymous	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
ES0610064-011	Anonymous	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
EP080: BTEX - (QC Lot: 260101)				mg/kg	mg/kg	%
ES0610135-013	MG09C/3.8	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

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: 260101) - continued				mg/kg	mg/kg	%
ES0610135-013	MG09C/3.8	ortho-Xylene	0.2 mg/kg	<0.2	<0.2	0.0
ES0610135-023	MG04/0.5	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
EP080: BTEX - (QC Lot: 260299)				mg/kg	mg/kg	%
ES0610135-036	MG07/4.0	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
ES0610135-037	TP12/0.25	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
EP080: BTEX - (QC Lot: 260459)				mg/kg	mg/kg	%
ES0610260-007	Anonymous	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
ES0610260-010	Anonymous	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
EP080: BTEX - (QC Lot: 264139)				mg/kg	mg/kg	%

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: 264139) - continued				mg/kg	mg/kg	%
ES0610564-006	Anonymous	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
ES0610564-014	Anonymous	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

Matrix Type: WATER — *Laboratory Duplicates (DUP) Report*

Laboratory Sample ID	Client Sample ID	Analyte name	LOR	Original Result	Duplicate Result	RPD
EG020T: Total Metals by ICP-MS						
EG020T: Total Metals by ICP-MS - (QC Lot: 259478)				mg/L	mg/L	%
ES0610097-001	Anonymous	Arsenic	0.001 mg/L	<0.001	<0.001	0.0
		Cadmium	0.0001 mg/L	<0.0001	<0.0001	0.0
		Chromium	0.001 mg/L	<0.001	<0.001	0.0
		Copper	0.001 mg/L	0.004	0.004	0.0
		Lead	0.001 mg/L	<0.001	<0.001	0.0
		Nickel	0.001 mg/L	<0.001	<0.001	0.0
		Zinc	0.005 mg/L	<0.005	<0.005	0.0
ES0610155-006	Anonymous	Arsenic	0.001 mg/L	<0.001	<0.001	0.0
		Cadmium	0.0001 mg/L	<0.0001	<0.0001	0.0
		Chromium	0.001 mg/L	<0.001	<0.001	0.0
		Copper	0.001 mg/L	0.013	0.013	0.0
		Lead	0.001 mg/L	<0.001	<0.001	0.0
		Nickel	0.001 mg/L	<0.001	<0.001	0.0
		Zinc	0.005 mg/L	0.015	0.012	18.6
EG035T: Total Mercury by FIMS						

Matrix Type: WATER

Laboratory Duplicates (DUP) Report

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: 259844)				**mg/L**	**mg/L**	**%**
ES0610115-010	Anonymous	Mercury	0.0001 mg/L	<0.0001	<0.0001	0.0
ES0610224-003	Anonymous	Mercury	0.0001 mg/L	<0.0001	<0.0001	0.0
EP080/071: Total Petroleum Hydrocarbons						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 262274)				**µg/L**	**µg/L**	**%**
ES0610200-022	Anonymous	C6 - C9 Fraction	20 µg/L	<20	<20	0.0
ES0610200-027	Anonymous	C6 - C9 Fraction	20 µg/L	140	100	31.5
EP080: BTEX						
EP080: BTEX - (QC Lot: 262274)				**µg/L**	**µg/L**	**%**
ES0610200-022	Anonymous	Benzene	1 µg/L	<1	<1	0.0
		Toluene	2 µg/L	<2	<2	0.0
		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
ES0610200-027	Anonymous	Benzene	1 µg/L	<1	<1	0.0
		Toluene	2 µg/L	<2	<2	0.0
		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

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.

Matrix Type: SOIL

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*
EG005T: Total Metals by ICP-AES						
EG005T: Total Metals by ICP-AES - (QC Lot: 260716)		mg/kg	mg/kg	%	%	%
Arsenic	5 mg/kg	----	13.1	99.1	86.6	123
	5 mg/kg	<5	----	----	----	----
Cadmium	1 mg/kg	<1	----	----	----	----
	1 mg/kg	----	2.76	98.3	79.9	120
Chromium	2 mg/kg	----	60.9	97.7	87.1	119
	2 mg/kg	<2	----	----	----	----
Copper	5 mg/kg	----	54.7	103	85.2	117
	5 mg/kg	<5	----	----	----	----
Lead	5 mg/kg	----	55.2	91.4	82.1	117
	5 mg/kg	<5	----	----	----	----
Nickel	2 mg/kg	<2	----	----	----	----
	2 mg/kg	----	54.8	98.9	88	122
Zinc	5 mg/kg	----	104	94.0	79	116
	5 mg/kg	<5	----	----	----	----
EG005T: Total Metals by ICP-AES - (QC Lot: 260718)		mg/kg	mg/kg	%	%	%
Arsenic	5 mg/kg	<5	----	----	----	----
	5 mg/kg	----	13.1	102	86.6	123
Cadmium	1 mg/kg	<1	----	----	----	----
	1 mg/kg	----	2.76	97.9	79.9	120
Chromium	2 mg/kg	----	60.9	98.1	87.1	119
	2 mg/kg	<2	----	----	----	----
Copper	5 mg/kg	----	54.7	106	85.2	117
	5 mg/kg	<5	----	----	----	----
Lead	5 mg/kg	----	55.2	93.7	82.1	117
	5 mg/kg	<5	----	----	----	----

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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*
EG005T: Total Metals by ICP-AES - continued						
EG005T: Total Metals by ICP-AES - (QC Lot: 260718) - continued		mg/kg	mg/kg	%	%	%
Nickel	2 mg/kg	----	54.8	98.8	88	122
	2 mg/kg	<2	----	----	----	----
Zinc	5 mg/kg	<5	----	----	----	----
	5 mg/kg	----	104	93.4	79	116
EG005T: Total Metals by ICP-AES - (QC Lot: 260843)		mg/kg	mg/kg	%	%	%
Arsenic	5 mg/kg	----	13.1	106	86.6	123
	5 mg/kg	<5	----	----	----	----
Cadmium	1 mg/kg	<1	----	----	----	----
	1 mg/kg	----	2.76	99.8	79.9	120
Chromium	2 mg/kg	----	60.9	103	87.1	119
	2 mg/kg	<2	----	----	----	----
Copper	5 mg/kg	<5	----	----	----	----
	5 mg/kg	----	54.7	110	85.2	117
Lead	5 mg/kg	----	55.2	108	82.1	117
	5 mg/kg	<5	----	----	----	----
Nickel	2 mg/kg	----	54.8	105	88	122
	2 mg/kg	<2	----	----	----	----
Zinc	5 mg/kg	<5	----	----	----	----
	5 mg/kg	----	104	107	79	116
EG005T: Total Metals by ICP-AES - (QC Lot: 264930)		mg/kg	mg/kg	%	%	%
Arsenic	5 mg/kg	----	13.1	110	86.6	123
	5 mg/kg	<5	----	----	----	----
Cadmium	1 mg/kg	<1	----	----	----	----
	1 mg/kg	----	2.76	115	79.9	120
Chromium	2 mg/kg	----	60.9	115	87.1	119
	2 mg/kg	<2	----	----	----	----
Copper	5 mg/kg	<5	----	----	----	----
	5 mg/kg	----	54.7	114	85.2	117
Lead	5 mg/kg	<5	----	----	----	----
	5 mg/kg	----	55.2	108	82.1	117

Matrix Type: SOIL

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EG005T: Total Metals by ICP-AES - continued						
EG005T: Total Metals by ICP-AES - (QC Lot: 264930) - continued		mg/kg	mg/kg	%	%	%
Nickel	2 mg/kg	----	54.8	116	88	122
	2 mg/kg	<2	----	----	----	----
Zinc	5 mg/kg	----	104	110	79	116
	5 mg/kg	<5	----	----	----	----
EG035T: Total Mercury by FIMS						
EG035T: Total Mercury by FIMS - (QC Lot: 260717)		mg/kg	mg/kg	%	%	%
Mercury	0.1 mg/kg	<0.1	----	----	----	----
	0.1 mg/kg	----	1.4	90.4	73.7	108
EG035T: Total Mercury by FIMS - (QC Lot: 260719)		mg/kg	mg/kg	%	%	%
Mercury	0.1 mg/kg	----	1.4	92.5	73.7	108
	0.1 mg/kg	<0.1	----	----	----	----
EG035T: Total Mercury by FIMS - (QC Lot: 260842)		mg/kg	mg/kg	%	%	%
Mercury	0.1 mg/kg	<0.1	----	----	----	----
	0.1 mg/kg	----	1.4	93.4	73.7	108
EG035T: Total Mercury by FIMS - (QC Lot: 264931)		mg/kg	mg/kg	%	%	%
Mercury	0.1 mg/kg	----	1.4	103	73.7	108
	0.1 mg/kg	<0.1	----	----	----	----
EK025G: Free cyanide by Discrete Analyser						
EK025G: Free cyanide by Discrete Analyser - (QC Lot: 260684)		mg/kg	mg/kg	%	%	%
Total Cyanide	1.0 mg/kg	<1.0	----	----	----	----
	1 mg/kg	----	50	104	70	130
EP066: Polychlorinated Biphenyls (PCB)						
EP066: Polychlorinated Biphenyls (PCB) - (QC Lot: 260398)		mg/kg	mg/kg	%	%	%
Total Polychlorinated biphenyls	0.10 mg/kg	<0.10	----	----	----	----
	0.1 mg/kg	----	0.5	70.6	57.4	117
EP068A: Organochlorine Pesticides (OC)						
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 260399)		mg/kg	mg/kg	%	%	%

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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
EP068A: Organochlorine Pesticides (OC) - continued						
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 260399) - continued		mg/kg	mg/kg	%	%	%
4,4'-DDD	0.05 mg/kg	----	0.25	89.8	65.3	116
	0.05 mg/kg	<0.05	----	----	----	----
4,4'-DDE	0.05 mg/kg	----	0.25	89.2	67.5	114
	0.05 mg/kg	<0.05	----	----	----	----
4,4'-DDT	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	0.25	89.2	58.4	127
Aldrin	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	88.0	67	113
alpha-BHC	0.05 mg/kg	----	0.25	106	60.8	116
	0.05 mg/kg	<0.05	----	----	----	----
alpha-Endosulfan	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	89.6	65.8	116
beta-BHC	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	88.2	59.8	117
beta-Endosulfan	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	89.6	66.1	117
cis-Chlordane	0.05 mg/kg	----	0.25	88.6	57.3	120
	0.05 mg/kg	<0.05	----	----	----	----
delta-BHC	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	95.2	65.8	114
Dieldrin	0.05 mg/kg	----	0.25	90.3	67.4	116
	0.05 mg/kg	<0.05	----	----	----	----
Endosulfan sulfate	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	89.9	63.6	119
Endrin	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	81.7	63	121
Endrin aldehyde	0.05 mg/kg	----	0.25	84.5	57.3	115
	0.05 mg/kg	<0.05	----	----	----	----
Endrin ketone	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	91.2	63.6	117

ALS Environmental

Matrix Type: SOIL

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP068A: Organochlorine Pesticides (OC) - continued						
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 260399) - continued		mg/kg	mg/kg	%	%	%
gamma-BHC	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	87.2	59.8	118
Heptachlor	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	90.0	65.6	115
Heptachlor epoxide	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	89.4	65.6	113
Hexachlorobenzene (HCB)	0.05 mg/kg	----	0.25	91.4	59.4	115
	0.05 mg/kg	<0.05	----	----	----	----
Methoxychlor	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	0.25	88.9	50.4	132
trans-Chlordane	0.05 mg/kg	----	0.25	88.4	60.7	113
	0.05 mg/kg	<0.05	----	----	----	----
EP068B: Organophosphorus Pesticides (OP)						
EP068B: Organophosphorus Pesticides (OP) - (QC Lot: 260399)		mg/kg	mg/kg	%	%	%
Methyl Azinphos	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	64.9	29.8	137
Bromophos-ethyl	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	89.0	64.3	114
Carbophenothion	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	82.2	59.5	119
Chlorfenvinphos	0.05 mg/kg	----	0.25	101	61.4	123
	0.05 mg/kg	<0.05	----	----	----	----
Chlorpyrifos	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	87.2	64.2	111
Chlorpyrifos-methyl	0.05 mg/kg	----	0.25	90.9	65.1	111
	0.05 mg/kg	<0.05	----	----	----	----
Demeton-S-methyl	0.05 mg/kg	----	0.25	77.4	10.1	159
	0.05 mg/kg	<0.05	----	----	----	----
Diazinon	0.05 mg/kg	----	0.25	88.7	64.9	111
	0.05 mg/kg	<0.05	----	----	----	----

ALS Environmental

Matrix Type: SOIL

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP068B: Organophosphorus Pesticides (OP) - continued						
EP068B: Organophosphorus Pesticides (OP) - (QC Lot: 260399) - continued		mg/kg	mg/kg	%	%	%
Dichlorvos	0.05 mg/kg	----	0.25	77.4	25.5	124
	0.05 mg/kg	<0.05	----	----	----	----
Dimethoate	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	84.5	48.6	126
Ethion	0.05 mg/kg	----	0.25	87.3	62	116
	0.05 mg/kg	<0.05	----	----	----	----
Fenamiphos	0.05 mg/kg	----	0.25	82.0	45.5	128
	0.05 mg/kg	<0.05	----	----	----	----
Fenthion	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	88.3	64.7	110
Malathion	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	91.8	60.4	127
Monocrotophos	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	0.25	61.9	2.88	149
Parathion	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	0.25	85.0	60	116
Parathion-methyl	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	0.25	82.0	61.4	113
Pirimphos-ethyl	0.05 mg/kg	----	0.25	87.7	64.8	111
	0.05 mg/kg	<0.05	----	----	----	----
Prothiofos	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	86.6	65.4	111
EP075(SIM)A: Phenolic Compounds						
EP075(SIM)A: Phenolic Compounds - (QC Lot: 260407)		mg/kg	mg/kg	%	%	%
2,4,5-Trichlorophenol	0.5 mg/kg	----	4	67.5	68.9	112
	0.5 mg/kg	<0.5	----	----	----	----
2,4,6-Trichlorophenol	0.5 mg/kg	----	4	81.3	62.2	115
	0.5 mg/kg	<0.5	----	----	----	----
2,4-Dichlorophenol	0.5 mg/kg	----	4	87.2	71.6	113
	0.5 mg/kg	<0.5	----	----	----	----

ALS Environmental

Matrix Type: SOIL

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP075(SIM)A: Phenolic Compounds - continued						
EP075(SIM)A: Phenolic Compounds - (QC Lot: 260407) - continued		mg/kg	mg/kg	%	%	%
2,4-Dimethylphenol	0.5 mg/kg	----	4	97.7	74.5	119
	0.5 mg/kg	<0.5	----	----	----	----
2,6-Dichlorophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	91.7	74.8	115
2-Chlorophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	95.3	80.2	115
2-Methylphenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	98.4	76.8	114
2-Nitrophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	84.6	60.3	117
3- & 4-Methylphenol	1.0 mg/kg	<1.0	----	----	----	----
	1.0 mg/kg	----	8	97.3	72	119
4-Chloro-3-Methylphenol	0.5 mg/kg	----	4	93.6	76.4	114
	0.5 mg/kg	<0.5	----	----	----	----
Pentachlorophenol	1.0 mg/kg	<1.0	----	----	----	----
	1.0 mg/kg	----	8	27.0	1.23	91.6
Phenol	0.5 mg/kg	----	4	97.8	73.9	115
	0.5 mg/kg	<0.5	----	----	----	----
EP075(SIM)A: Phenolic Compounds - (QC Lot: 261190)		mg/kg	mg/kg	%	%	%
2,4,5-Trichlorophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	74.6	68.9	112
2,4,6-Trichlorophenol	0.5 mg/kg	----	4	80.6	62.2	115
	0.5 mg/kg	<0.5	----	----	----	----
2,4-Dichlorophenol	0.5 mg/kg	----	4	81.2	71.6	113
	0.5 mg/kg	<0.5	----	----	----	----
2,4-Dimethylphenol	0.5 mg/kg	----	4	95.2	74.5	119
	0.5 mg/kg	<0.5	----	----	----	----
2,6-Dichlorophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	87.8	74.8	115

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: 261190) - continued		mg/kg	mg/kg	%	%	%
2-Chlorophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	95.2	80.2	115
2-Methylphenol	0.5 mg/kg	----	4	94.4	76.8	114
	0.5 mg/kg	<0.5	----	----	----	----
2-Nitrophenol	0.5 mg/kg	----	4	74.5	60.3	117
	0.5 mg/kg	<0.5	----	----	----	----
3- & 4-Methylphenol	1.0 mg/kg	----	8	93.0	72	119
	1.0 mg/kg	<1.0	----	----	----	----
4-Chloro-3-Methylphenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	87.7	76.4	114
Pentachlorophenol	1.0 mg/kg	<1.0	----	----	----	----
	1.0 mg/kg	----	8	24.4	1.23	91.6
Phenol	0.5 mg/kg	----	4	94.3	73.9	115
	0.5 mg/kg	<0.5	----	----	----	----
EP075(SIM)A: Phenolic Compounds - (QC Lot: 261195)		mg/kg	mg/kg	%	%	%
2,4,5-Trichlorophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	93.0	68.9	112
2,4,6-Trichlorophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	82.7	62.2	115
2,4-Dichlorophenol	0.5 mg/kg	----	4	74.5	71.6	113
	0.5 mg/kg	<0.5	----	----	----	----
2,4-Dimethylphenol	0.5 mg/kg	----	4	85.0	74.5	119
	0.5 mg/kg	<0.5	----	----	----	----
2,6-Dichlorophenol	0.5 mg/kg	----	4	83.7	74.8	115
	0.5 mg/kg	<0.5	----	----	----	----
2-Chlorophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	91.8	80.2	115
2-Methylphenol	0.5 mg/kg	----	4	89.4	76.8	114
	0.5 mg/kg	<0.5	----	----	----	----

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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: 261195) - continued		mg/kg	mg/kg	%	%	%
2-Nitrophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	72.9	60.3	117
3- & 4-Methylphenol	1.0 mg/kg	<1.0	----	----	----	----
	1.0 mg/kg	----	8	85.9	72	119
4-Chloro-3-Methylphenol	0.5 mg/kg	----	4	88.4	76.4	114
	0.5 mg/kg	<0.5	----	----	----	----
Pentachlorophenol	1.0 mg/kg	<1.0	----	----	----	----
	1.0 mg/kg	----	8	87.2	1.23	91.6
Phenol	0.5 mg/kg	----	4	95.0	73.9	115
	0.5 mg/kg	<0.5	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 260407)		mg/kg	mg/kg	%	%	%
Acenaphthene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	99.4	81.5	112
Acenaphthylene	0.5 mg/kg	----	4	104	79.6	113
	0.5 mg/kg	<0.5	----	----	----	----
Anthracene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	99.1	81.1	112
Benz(a)anthracene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	103	77.2	112
Benzo(a)pyrene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	98.4	76.4	113
Benzo(b)fluoranthene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	106	71.8	118
Benzo(g,h,i)perylene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	87.0	72.4	114
Benzo(k)fluoranthene	0.5 mg/kg	----	4	103	74.2	117
	0.5 mg/kg	<0.5	----	----	----	----
Chrysene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	98.8	79.8	114

Matrix Type: SOIL

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - continued						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 260407) - continued		mg/kg	mg/kg	%	%	%
Dibenz(a,h)anthracene	0.5 mg/kg	----	4	90.0	71.7	113
	0.5 mg/kg	<0.5	----	----	----	----
Fluoranthene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	107	78.8	113
Fluorene	0.5 mg/kg	----	4	99.3	79.9	112
	0.5 mg/kg	<0.5	----	----	----	----
Indeno(1,2,3,cd)pyrene	0.5 mg/kg	----	4	91.3	71	113
	0.5 mg/kg	<0.5	----	----	----	----
Naphthalene	0.5 mg/kg	----	4	107	81.9	113
	0.5 mg/kg	<0.5	----	----	----	----
Phenanthrene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	103	79.4	114
Pyrene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	107	78.9	113
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 261190)		mg/kg	mg/kg	%	%	%
Acenaphthene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	97.6	81.5	112
Acenaphthylene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	95.4	79.6	113
Anthracene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	93.0	81.1	112
Benz(a)anthracene	0.5 mg/kg	----	4	94.4	77.2	112
	0.5 mg/kg	<0.5	----	----	----	----
Benzo(a)pyrene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	97.2	76.4	113
Benzo(b)fluoranthene	0.5 mg/kg	----	4	89.5	71.8	118
	0.5 mg/kg	<0.5	----	----	----	----
Benzo(g,h,i)perylene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	76.0	72.4	114

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Matrix Type: SOIL

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - continued						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 261190) - continued		mg/kg	mg/kg	%	%	%
Benzo(k)fluoranthene	0.5 mg/kg	----	4	92.0	74.2	117
	0.5 mg/kg	<0.5	----	----	----	----
Chrysene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	98.9	79.8	114
Dibenz(a,h)anthracene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	78.0	71.7	113
Fluoranthene	0.5 mg/kg	----	4	97.8	78.8	113
	0.5 mg/kg	<0.5	----	----	----	----
Fluorene	0.5 mg/kg	----	4	93.5	79.9	112
	0.5 mg/kg	<0.5	----	----	----	----
Indeno(1,2,3,cd)pyrene	0.5 mg/kg	----	4	72.3	71	113
	0.5 mg/kg	<0.5	----	----	----	----
Naphthalene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	96.5	81.9	113
Phenanthrene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	97.6	79.4	114
Pyrene	0.5 mg/kg	----	4	100	78.9	113
	0.5 mg/kg	<0.5	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 261195)		mg/kg	mg/kg	%	%	%
Acenaphthene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	93.5	81.5	112
Acenaphthylene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	91.2	79.6	113
Anthracene	0.5 mg/kg	----	4	91.5	81.1	112
	0.5 mg/kg	<0.5	----	----	----	----
Benz(a)anthracene	0.5 mg/kg	----	4	88.3	77.2	112
	0.5 mg/kg	<0.5	----	----	----	----
Benzo(a)pyrene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	91.8	76.4	113

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Matrix Type: SOIL

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - continued						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 261195) - continued		mg/kg	mg/kg	%	%	%
Benzo(b)fluoranthene	0.5 mg/kg	----	4	87.8	71.8	118
	0.5 mg/kg	<0.5	----	----	----	----
Benzo(g,h,i)perylene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	85.0	72.4	114
Benzo(k)fluoranthene	0.5 mg/kg	----	4	85.9	74.2	117
	0.5 mg/kg	<0.5	----	----	----	----
Chrysene	0.5 mg/kg	----	4	91.9	79.8	114
	0.5 mg/kg	<0.5	----	----	----	----
Dibenz(a,h)anthracene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	79.6	71.7	113
Fluoranthene	0.5 mg/kg	----	4	87.8	78.8	113
	0.5 mg/kg	<0.5	----	----	----	----
Fluorene	0.5 mg/kg	----	4	88.4	79.9	112
	0.5 mg/kg	<0.5	----	----	----	----
Indeno(1,2,3,cd)pyrene	0.5 mg/kg	----	4	82.3	71	113
	0.5 mg/kg	<0.5	----	----	----	----
Naphthalene	0.5 mg/kg	----	4	95.9	81.9	113
	0.5 mg/kg	<0.5	----	----	----	----
Phenanthrene	0.5 mg/kg	----	4	93.5	79.4	114
	0.5 mg/kg	<0.5	----	----	----	----
Pyrene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	89.2	78.9	113
EP080/071: Total Petroleum Hydrocarbons						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 259275)		mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	2 mg/kg	----	26	72.3	68.4	128
	2 mg/kg	<2	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 259316)		mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	2 mg/kg	<2	----	----	----	----
	2 mg/kg	----	26	112	68.4	128

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*
EP080/071: Total Petroleum Hydrocarbons - continued						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 260101)		mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	2 mg/kg	<2	----	----	----	----
	2 mg/kg	----	26	89.7	68.4	128
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 260299)		mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	2 mg/kg	----	26	102	68.4	128
	2 mg/kg	<2	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 260406)		mg/kg	mg/kg	%	%	%
C10 - C14 Fraction	50 mg/kg	<50	----	----	----	----
	50 mg/kg	----	200	96.0	75.2	116
C15 - C28 Fraction	100 mg/kg	<100	----	----	----	----
	100 mg/kg	----	200	101	75.3	113
C29 - C36 Fraction	100 mg/kg	----	200	86.4	72.6	117
	100 mg/kg	<100	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 260459)		mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	2 mg/kg	<2	----	----	----	----
	2 mg/kg	----	26	86.3	68.4	128
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 261189)		mg/kg	mg/kg	%	%	%
C10 - C14 Fraction	50 mg/kg	----	200	86.0	75.2	116
	50 mg/kg	<50	----	----	----	----
C15 - C28 Fraction	100 mg/kg	----	200	95.0	75.3	113
	100 mg/kg	<100	----	----	----	----
C29 - C36 Fraction	100 mg/kg	<100	----	----	----	----
	100 mg/kg	----	200	106	72.6	117
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 261196)		mg/kg	mg/kg	%	%	%
C10 - C14 Fraction	50 mg/kg	----	200	83.5	75.2	116
	50 mg/kg	<50	----	----	----	----
C15 - C28 Fraction	100 mg/kg	----	200	93.4	75.3	113
	100 mg/kg	<100	----	----	----	----
C29 - C36 Fraction	100 mg/kg	<100	----	----	----	----
	100 mg/kg	----	200	109	72.6	117

Matrix Type: SOIL

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP080/071: Total Petroleum Hydrocarbons - continued						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 264139)		mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	2 mg/kg	<2	----	----	----	----
	2 mg/kg	----	26	78.1	68.4	128
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 264260)		mg/kg	mg/kg	%	%	%
C10 - C14 Fraction	50 mg/kg	<50	----	----	----	----
	50 mg/kg	----	200	94.6	75.2	116
C15 - C28 Fraction	100 mg/kg	----	200	98.1	75.3	113
	100 mg/kg	<100	----	----	----	----
C29 - C36 Fraction	100 mg/kg	----	200	109	72.6	117
	100 mg/kg	<100	----	----	----	----
EP080: BTEX						
EP080: BTEX - (QC Lot: 259275)		mg/kg	mg/kg	%	%	%
Benzene	0.2 mg/kg	----	1	81.1	67.5	125
	0.2 mg/kg	<0.2	----	----	----	----
Ethylbenzene	0.2 mg/kg	----	1	81.9	65.3	126
	0.2 mg/kg	<0.2	----	----	----	----
meta- & para-Xylene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	2	83.8	66.5	124
ortho-Xylene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	1	86.6	66.7	123
Toluene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	1	89.6	69	122
EP080: BTEX - (QC Lot: 259316)		mg/kg	mg/kg	%	%	%
Benzene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	1	89.5	67.5	125
Ethylbenzene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	1	97.4	65.3	126
meta- & para-Xylene	0.2 mg/kg	----	2	96.2	66.5	124
	0.2 mg/kg	<0.2	----	----	----	----

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Matrix Type: SOIL

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP080: BTEX - continued						
EP080: BTEX - (QC Lot: 259316) - continued		mg/kg	mg/kg	%	%	%
ortho-Xylene	0.2 mg/kg	----	1	96.1	66.7	123
	0.2 mg/kg	<0.2	----	----	----	----
Toluene	0.2 mg/kg	----	1	119	69	122
	0.2 mg/kg	<0.2	----	----	----	----
EP080: BTEX - (QC Lot: 260101)		mg/kg	mg/kg	%	%	%
Benzene	0.2 mg/kg	----	1	86.8	67.5	125
	0.2 mg/kg	<0.2	----	----	----	----
Ethylbenzene	0.2 mg/kg	----	1	88.6	65.3	126
	0.2 mg/kg	<0.2	----	----	----	----
meta- & para-Xylene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	2	89.4	66.5	124
ortho-Xylene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	1	86.9	66.7	123
Toluene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	1	84.5	69	122
EP080: BTEX - (QC Lot: 260299)		mg/kg	mg/kg	%	%	%
Benzene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	1	83.8	67.5	125
Ethylbenzene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	1	82.8	65.3	126
meta- & para-Xylene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	2	87.4	66.5	124
ortho-Xylene	0.2 mg/kg	----	1	83.6	66.7	123
	0.2 mg/kg	<0.2	----	----	----	----
Toluene	0.2 mg/kg	----	1	87.2	69	122
	0.2 mg/kg	<0.2	----	----	----	----
EP080: BTEX - (QC Lot: 260459)		mg/kg	mg/kg	%	%	%
Benzene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	1	92.6	67.5	125

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Matrix Type: SOIL

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP080: BTEX - continued						
EP080: BTEX - (QC Lot: 260459) - continued		mg/kg	mg/kg	%	%	%
Ethylbenzene	0.2 mg/kg	----	1	94.0	65.3	126
	0.2 mg/kg	<0.2	----	----	----	----
meta- & para-Xylene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	2	89.9	66.5	124
ortho-Xylene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	1	92.2	66.7	123
Toluene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	1	87.4	69	122
EP080: BTEX - (QC Lot: 264139)		mg/kg	mg/kg	%	%	%
Benzene	0.2 mg/kg	----	1	85.8	67.5	125
	0.2 mg/kg	<0.2	----	----	----	----
Ethylbenzene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	1	84.6	65.3	126
meta- & para-Xylene	0.2 mg/kg	----	2	86.6	66.5	124
	0.2 mg/kg	<0.2	----	----	----	----
ortho-Xylene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	1	84.6	66.7	123
Toluene	0.2 mg/kg	----	1	73.0	69	122
	0.2 mg/kg	<0.2	----	----	----	----

Matrix Type: WATER

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EG020T: Total Metals by ICP-MS						
EG020T: Total Metals by ICP-MS - (QC Lot: 259478)		mg/L	mg/L	%	%	%
Arsenic	0.001 mg/L	----	0.1	94.6	78.7	111
	0.001 mg/L	<0.001	----	----	----	----
Cadmium	0.0001 mg/L	<0.0001	----	----	----	----
	0.0001 mg/L	----	0.1	92.0	79.3	111

Matrix Type: WATER

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EG020T: Total Metals by ICP-MS - continued						
EG020T: Total Metals by ICP-MS - (QC Lot: 259478) - continued		mg/L	mg/L	%	%	%
Chromium	0.001 mg/L	----	0.1	96.5	83.4	114
	0.001 mg/L	<0.001	----	----	----	----
Copper	0.001 mg/L	<0.001	----	----	----	----
	0.001 mg/L	----	0.1	93.9	80.1	118
Lead	0.001 mg/L	<0.001	----	----	----	----
	0.001 mg/L	----	0.1	93.8	83.2	116
Nickel	0.001 mg/L	<0.001	----	----	----	----
	0.001 mg/L	----	0.1	96.6	84.3	115
Zinc	0.005 mg/L	<0.005	----	----	----	----
	0.005 mg/L	----	0.1	89.4	77.2	109
EG035T: Total Mercury by FIMS						
EG035T: Total Mercury by FIMS - (QC Lot: 259844)		mg/L	mg/L	%	%	%
Mercury	0.0001 mg/L	----	0.010	101	78.6	118
	0.0001 mg/L	<0.0001	----	----	----	----
EP066: Polychlorinated Biphenyls (PCB)						
EP066: Polychlorinated Biphenyls (PCB) - (QC Lot: 260335)		µg/L	µg/L	%	%	%
Total Polychlorinated biphenyls	1 µg/L	----	10	88.2	61.6	107
	1 µg/L	<1	----	----	----	----
EP068A: Organochlorine Pesticides (OC)						
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 260336)		µg/L	µg/L	%	%	%
4,4'-DDD	0.5 µg/L	----	5	86.9	68.2	117
	0.5 µg/L	<0.5	----	----	----	----
4,4'-DDE	0.5 µg/L	----	5	90.2	68.9	114
	0.5 µg/L	<0.5	----	----	----	----
4,4'-DDT	2 µg/L	<2	----	----	----	----
	2.0 µg/L	----	5	101	57.6	123
Aldrin	0.5 µg/L	<0.5	----	----	----	----
	0.5 µg/L	----	5	86.7	68.5	114

ALS Environmental

Matrix Type: WATER

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP068A: Organochlorine Pesticides (OC) - continued						
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 260336) - continued		µg/L	µg/L	%	%	%
alpha-BHC	0.5 µg/L	----	5	85.9	59.5	123
	0.5 µg/L	<0.5	----	----	----	----
alpha-Endosulfan	0.5 µg/L	----	5	88.4	68.5	116
	0.5 µg/L	<0.5	----	----	----	----
beta-BHC	0.5 µg/L	----	5	82.8	59.3	122
	0.5 µg/L	<0.5	----	----	----	----
beta-Endosulfan	0.5 µg/L	<0.5	----	----	----	----
	0.5 µg/L	----	5	89.7	68	117
cis-Chlordane	0.5 µg/L	----	5	88.8	66.5	117
	0.5 µg/L	<0.5	----	----	----	----
delta-BHC	0.5 µg/L	----	5	81.5	68	116
	0.5 µg/L	<0.5	----	----	----	----
Dieldrin	0.5 µg/L	<0.5	----	----	----	----
	0.5 µg/L	----	5	88.6	68.8	116
Endosulfan sulfate	0.5 µg/L	----	5	93.8	65.9	119
	0.5 µg/L	<0.5	----	----	----	----
Endrin	0.5 µg/L	----	5	101	66.2	122
	0.5 µg/L	<0.5	----	----	----	----
Endrin aldehyde	0.5 µg/L	----	5	87.4	66.6	117
	0.5 µg/L	<0.5	----	----	----	----
Endrin ketone	0.5 µg/L	----	5	87.4	65	118
	0.5 µg/L	<0.5	----	----	----	----
gamma-BHC	0.5 µg/L	<0.5	----	----	----	----
	0.5 µg/L	----	5	83.6	59.1	121
Heptachlor	0.5 µg/L	<0.5	----	----	----	----
	0.5 µg/L	----	5	91.4	67.1	116
Heptachlor epoxide	0.5 µg/L	<0.5	----	----	----	----
	0.5 µg/L	----	5	87.8	69.8	113
Hexachlorobenzene (HCB)	0.5 µg/L	----	5	84.5	58.4	121
	0.5 µg/L	<0.5	----	----	----	----

ALS Environmental

Matrix Type: WATER

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*
EP068A: Organochlorine Pesticides (OC) - continued						
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 260336) - continued		µg/L	µg/L	%	%	%
Methoxychlor	2 µg/L	<2	----	----	----	----
	2.0 µg/L	----	5	95.1	49.6	134
trans-Chlordane	0.5 µg/L	<0.5	----	----	----	----
	0.5 µg/L	----	5	87.3	68.3	112
EP068B: Organophosphorus Pesticides (OP)						
EP068B: Organophosphorus Pesticides (OP) - (QC Lot: 260336)		µg/L	µg/L	%	%	%
Methyl Azinphos	0.5 µg/L	<0.5	----	----	----	----
	0.5 µg/L	----	5	89.2	45.6	138
Bromophos-ethyl	0.5 µg/L	----	5	89.4	67.7	114
	0.5 µg/L	<0.5	----	----	----	----
Carbophenothion	0.5 µg/L	<0.5	----	----	----	----
	0.5 µg/L	----	5	94.8	65	121
Chlorfenvinphos	0.5 µg/L	----	5	112	64	127
	0.5 µg/L	<0.5	----	----	----	----
Chlorpyrifos	0.5 µg/L	----	5	90.0	70	112
	0.5 µg/L	<0.5	----	----	----	----
Chlorpyrifos-methyl	0.5 µg/L	<0.5	----	----	----	----
	0.5 µg/L	----	5	91.4	69.5	112
Demeton-S-methyl	0.5 µg/L	<0.5	----	----	----	----
	0.5 µg/L	----	5	93.8	26.8	154
Diazinon	0.5 µg/L	----	5	90.9	66.5	115
	0.5 µg/L	<0.5	----	----	----	----
Dichlorvos	0.5 µg/L	----	5	86.3	56.9	128
	0.5 µg/L	<0.5	----	----	----	----
Dimethoate	0.5 µg/L	<0.5	----	----	----	----
	0.5 µg/L	----	5	91.7	48.6	126
Ethion	0.5 µg/L	----	5	93.5	67	116
	0.5 µg/L	<0.5	----	----	----	----
Fenamiphos	0.5 µg/L	----	5	98.5	50.5	129
	0.5 µg/L	<0.5	----	----	----	----

Matrix Type: WATER

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP068B: Organophosphorus Pesticides (OP) - continued						
EP068B: Organophosphorus Pesticides (OP) - (QC Lot: 260336) - continued		µg/L	µg/L	%	%	%
Fenthion	0.5 µg/L	----	5	90.3	69.8	114
	0.5 µg/L	<0.5	----	----	----	----
Malathion	0.5 µg/L	----	5	94.6	59.8	127
	0.5 µg/L	<0.5	----	----	----	----
Monocrotophos	0.5 µg/L	----	5	24.8	10	89.1
	2 µg/L	<2	----	----	----	----
Parathion	2 µg/L	<2	----	----	----	----
	2.0 µg/L	----	5	94.8	62.5	116
Parathion-methyl	2.0 µg/L	----	5	97.8	63.9	115
	2 µg/L	<2	----	----	----	----
Pirimphos-ethyl	0.5 µg/L	<0.5	----	----	----	----
	0.5 µg/L	----	5	89.3	67.1	112
Prothiofos	0.5 µg/L	----	5	91.1	69.2	111
	0.5 µg/L	<0.5	----	----	----	----
EP075(SIM)A: Phenolic Compounds						
EP075(SIM)A: Phenolic Compounds - (QC Lot: 260334)		µg/L	µg/L	%	%	%
2,4,5-Trichlorophenol	0.2 µg/L	----	2	92.0	65.3	121
	0.5 µg/L	<0.5	----	----	----	----
2,4,6-Trichlorophenol	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	93.2	63.1	122
2,4-Dichlorophenol	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	94.3	64.4	121
2,4-Dimethylphenol	0.2 µg/L	----	2	97.7	61.7	118
	0.5 µg/L	<0.5	----	----	----	----
2,6-Dichlorophenol	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	89.7	65.7	120
2-Chlorophenol	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	89.3	62.3	117
2-Methylphenol	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	82.8	53.9	110

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Matrix Type: WATER

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP075(SIM)A: Phenolic Compounds - continued						
EP075(SIM)A: Phenolic Compounds - (QC Lot: 260334) - continued		µg/L	µg/L	%	%	%
2-Nitrophenol	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	100	58.2	127
3- & 4-Methylphenol	0.4 µg/L	----	4	75.2	40.9	103
	1.0 µg/L	<1.0	----	----	----	----
4-Chloro-3-Methylphenol	0.2 µg/L	----	2	85.8	66.4	119
	0.5 µg/L	<0.5	----	----	----	----
Pentachlorophenol	1.0 µg/L	<1.0	----	----	----	----
	0.4 µg/L	----	4	109	10.9	145
Phenol	0.2 µg/L	----	2	34.5	19.5	60.7
	0.5 µg/L	<0.5	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 260334)		µg/L	µg/L	%	%	%
Acenaphthene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	100	62.2	113
Acenaphthylene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	96.0	63.6	114
Anthracene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	98.7	64.3	116
Benz(a)anthracene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	104	64.1	117
Benzo(a)pyrene	0.2 µg/L	----	2	96.3	63.3	117
	0.5 µg/L	<0.5	----	----	----	----
Benzo(b)fluoranthene	0.2 µg/L	----	2	92.2	61.7	119
	0.5 µg/L	<0.5	----	----	----	----
Benzo(g,h,i)perylene	0.2 µg/L	----	2	92.6	59.1	118
	0.5 µg/L	<0.5	----	----	----	----
Benzo(k)fluoranthene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	98.0	61.7	117
Chrysene	0.2 µg/L	----	2	94.3	62.5	116
	0.5 µg/L	<0.5	----	----	----	----

ALS Environmental

Matrix Type: WATER

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - continued						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 260334) - continued		µg/L	µg/L	%	%	%
Dibenz(a,h)anthracene	0.2 µg/L	----	2	99.2	61.2	117
	0.5 µg/L	<0.5	----	----	----	----
Fluoranthene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	93.3	63.6	118
Fluorene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	90.7	63.9	115
Indeno(1,2,3,cd)pyrene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	109	59.9	118
Naphthalene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	101	62.4	114
Phenanthrene	0.2 µg/L	----	2	101	62.6	116
	0.5 µg/L	<0.5	----	----	----	----
Pyrene	0.2 µg/L	----	2	95.2	63.1	118
	0.5 µg/L	<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 260333)		µg/L	µg/L	%	%	%
C10 - C14 Fraction	50 µg/L	<50	----	----	----	----
	50 µg/L	----	200	77.4	58.9	131
C15 - C28 Fraction	100 µg/L	<100	----	----	----	----
	100 µg/L	----	200	97.3	73.9	138
C29 - C36 Fraction	50 µg/L	----	200	107	62.7	131
	50 µg/L	<50	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 262274)		µg/L	µg/L	%	%	%
C6 - C9 Fraction	20 µg/L	<20	----	----	----	----
	20 µg/L	----	260	98.0	75	127
EP080: BTEX						
EP080: BTEX - (QC Lot: 262274)		µg/L	µg/L	%	%	%
Benzene	1 µg/L	----	10	109	76.2	124
	1 µg/L	<1	----	----	----	----

Matrix Type: WATER

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*
EP080: BTEX - continued						
EP080: BTEX - (QC Lot: 262274) - continued		µg/L	µg/L	%	%	%
Ethylbenzene	2 µg/L	----	10	101	76.1	122
	2 µg/L	<2	----	----	----	----
meta- & para-Xylene	2 µg/L	<2	----	----	----	----
	2 µg/L	----	10	102	75.7	123
ortho-Xylene	2 µg/L	----	10	97.3	77.9	121
	2 µg/L	<2	----	----	----	----
Toluene	2 µg/L	----	10	105	74.4	124
	2 µg/L	<2	----	----	----	----

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*	
					Sample Result	*Spike Recovery*	*Static Limits*	
Analyte name	*Laboratory Sample ID*	*Client Sample ID*	*LOR*	*Spike Concentration*		*MS*	*Low*	*High*
EG005T: Total Metals by ICP-AES								
EG005T: Total Metals by ICP-AES - (QC Lot: 260716)				mg/kg	mg/kg	%	%	%
Arsenic	ES0610134-001	Anonymous	5 mg/kg	50	<5	97.4	70	130
Cadmium			1 mg/kg	50	<1	97.6	70	130
Chromium			2 mg/kg	50	5	100	70	130
Copper			5 mg/kg	250	<5	107	70	130
Lead			5 mg/kg	250	<5	95.1	70	130
Nickel			2 mg/kg	50	2	100	70	130
Zinc			5 mg/kg	250	23	97.4	70	130
EG005T: Total Metals by ICP-AES - (QC Lot: 260718)				mg/kg	mg/kg	%	%	%
Arsenic	ES0610135-023	MG04/0.5	5 mg/kg	50	13	89.7	70	130
Cadmium			1 mg/kg	50	<1	89.6	70	130
Chromium			2 mg/kg	50	11	96.3	70	130
Copper			5 mg/kg	250	195	90.4	70	130
Lead			5 mg/kg	250	2140	* Not Determined	70	130
Nickel			2 mg/kg	50	17	90.6	70	130
Zinc			5 mg/kg	250	342	105	70	130
EG005T: Total Metals by ICP-AES - (QC Lot: 260843)				mg/kg	mg/kg	%	%	%
Arsenic	ES0610135-042	TP14/0.25	5 mg/kg	50	6	93.0	70	130
Cadmium			1 mg/kg	50	<1	88.7	70	130
Chromium			2 mg/kg	50	45	78.1	70	130
Copper			5 mg/kg	250	94	115	70	130
Lead			5 mg/kg	250	209	98.7	70	130
Nickel			2 mg/kg	50	58	79.0	70	130
Zinc			5 mg/kg	250	274	79.5	70	130
EG005T: Total Metals by ICP-AES - (QC Lot: 264930)				mg/kg	mg/kg	%	%	%
Arsenic	ES0610135-044	TP14/1.0	5 mg/kg	50	8	80.2	70	130

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Matrix Type: SOIL

Matrix Spike (MS) Report

					Actual Results		Recovery Limits	
					Sample Result	Spike Recovery	Static Limits	
Analyte name	*Laboratory Sample ID*	*Client Sample ID*	*LOR*	*Spike Concentration*		*MS*	*Low*	*High*
EG005T: Total Metals by ICP-AES - continued								
EG005T: Total Metals by ICP-AES - (QC Lot: 264930) - continued				mg/kg	mg/kg	%	%	%
Cadmium	ES0610135-044	TP14/1.0	1 mg/kg	50	<1	106	70	130
Chromium			2 mg/kg	50	28	104	70	130
Copper			5 mg/kg	250	<5	115	70	130
Lead			5 mg/kg	250	15	100	70	130
Nickel			2 mg/kg	50	<2	105	70	130
Zinc			5 mg/kg	250	10	99.4	70	130
EG035T: Total Mercury by FIMS								
EG035T: Total Mercury by FIMS - (QC Lot: 260717)				mg/kg	mg/kg	%	%	%
Mercury	ES0610134-001	Anonymous	0.1 mg/kg	5	<0.1	98.6	70	130
EG035T: Total Mercury by FIMS - (QC Lot: 260719)				mg/kg	mg/kg	%	%	%
Mercury	ES0610135-023	MG04/0.5	0.1 mg/kg	5	0.3	94.7	70	130
EG035T: Total Mercury by FIMS - (QC Lot: 260842)				mg/kg	mg/kg	%	%	%
Mercury	ES0610135-042	TP14/0.25	0.1 mg/kg	5	<0.1	99.7	70	130
EG035T: Total Mercury by FIMS - (QC Lot: 264931)				mg/kg	mg/kg	%	%	%
Mercury	ES0610135-044	TP14/1.0	0.1 mg/kg	5	<0.1	109	70	130
EK025G: Free cyanide by Discrete Analyser								
EK025G: Free cyanide by Discrete Analyser - (QC Lot: 260684)				mg/kg	mg/kg	%	%	%
Total Cyanide	ES0610135-010	MG09C/0.3	1 mg/kg	50	<1.0	108	70	130
EP066: Polychlorinated Biphenyls (PCB)								
EP066: Polychlorinated Biphenyls (PCB) - (QC Lot: 260398)				mg/kg	mg/kg	%	%	%
Total Polychlorinated biphenyls	ES0610135-019	MG10/0.2	0.1 mg/kg	0.5	<0.10	105	70	130
EP068A: Organochlorine Pesticides (OC)								
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 260399)				mg/kg	mg/kg	%	%	%
gamma-BHC	ES0610135-019	MG10/0.2	0.05 mg/kg	0.25	<0.05	60.4	75.65	110.44
Heptachlor			0.05 mg/kg	0.25	<0.05	38.4	72.2	106.71
Aldrin			0.05 mg/kg	0.25	<0.05	46.3	77.54	107.0
Dieldrin			0.05 mg/kg	0.25	<0.05	56.0	76.37	109.7

ALS Environmental

Matrix Type: SOIL

Matrix Spike (MS) Report

					Actual Results		Recovery Limits	
					Sample Result	Spike Recovery	Static Limits	
Analyte name	*Laboratory Sample ID*	*Client Sample ID*	*LOR*	*Spike Concentration*		*MS*	*Low*	*High*
EP068A: Organochlorine Pesticides (OC) - continued								
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 260399) - continued				mg/kg	mg/kg	%	%	%
Endrin	ES0610135-019	MG10/0.2	0.05 mg/kg	1	<0.05	* Not Determined	68.51	119.47
4,4'-DDT			0.2 mg/kg	1	<0.2	22.4	67.12	118.10
EP068B: Organophosphorus Pesticides (OP)								
EP068B: Organophosphorus Pesticides (OP) - (QC Lot: 260399)				mg/kg	mg/kg	%	%	%
Diazinon	ES0610135-019	MG10/0.2	0.05 mg/kg	0.25	<0.05	56.5	75.85	107.06
Chlorpyrifos-methyl			0.05 mg/kg	0.25	<0.05	46.6	74.84	107.91
Pirimphos-ethyl			0.05 mg/kg	0.25	<0.05	41.1	67.98	109.42
Bromophos-ethyl			0.05 mg/kg	0.25	<0.05	45.6	74.94	107.37
Prothiofos			0.05 mg/kg	0.25	<0.05	70.1	75.45	106.05
EP075(SIM)A: Phenolic Compounds								
EP075(SIM)A: Phenolic Compounds - (QC Lot: 260407)				mg/kg	mg/kg	%	%	%
Phenol	ES0610135-013	MG09C/3.8	0.5 mg/kg	10	<0.5	91.0	70	130
2-Chlorophenol			0.5 mg/kg	10	<0.5	89.8	70	130
2-Nitrophenol			0.5 mg/kg	10	<0.5	95.4	60	130
4-Chloro-3-Methylphenol			0.5 mg/kg	10	<0.5	93.0	70	130
Pentachlorophenol			2.0 mg/kg	10	<2.0	95.1	20	130
EP075(SIM)A: Phenolic Compounds - (QC Lot: 261190)				mg/kg	mg/kg	%	%	%
Phenol	ES0610135-043	TP14/0.5	0.5 mg/kg	10	<0.5	89.4	70	130
2-Chlorophenol			0.5 mg/kg	10	<0.5	89.3	70	130
2-Nitrophenol			0.5 mg/kg	10	<0.5	79.4	60	130
4-Chloro-3-Methylphenol			0.5 mg/kg	10	<0.5	87.4	70	130
Pentachlorophenol			2.0 mg/kg	10	<2.0	47.2	20	130
EP075(SIM)A: Phenolic Compounds - (QC Lot: 261195)				mg/kg	mg/kg	%	%	%
Phenol	ES0610135-045	TP14/1.5	0.5 mg/kg	10	<0.5	89.3	70	130
2-Chlorophenol			0.5 mg/kg	10	<0.5	86.2	70	130
2-Nitrophenol			0.5 mg/kg	10	<0.5	66.8	60	130
4-Chloro-3-Methylphenol			0.5 mg/kg	10	<0.5	90.4	70	130
Pentachlorophenol			2.0 mg/kg	10	<2.0	101	20	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								

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Matrix Type: SOIL

Matrix Spike (MS) Report

					Actual Results		Recovery Limits	
					Sample Result	Spike Recovery	Static Limits	
Analyte name	*Laboratory Sample ID*	*Client Sample ID*	*LOR*	*Spike Concentration*		*MS*	*Low*	*High*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - continued								
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 260407)				mg/kg	mg/kg	%	%	%
Acenaphthene	ES0610135-013	MG09C/3.8	0.5 mg/kg	10	<0.5	97.2	70	130
Pyrene			0.5 mg/kg	10	<0.5	106	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 261190)				mg/kg	mg/kg	%	%	%
Acenaphthene	ES0610135-043	TP14/0.5	0.5 mg/kg	10	<0.5	98.3	70	130
Pyrene			0.5 mg/kg	10	<0.5	104	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 261195)				mg/kg	mg/kg	%	%	%
Acenaphthene	ES0610135-045	TP14/1.5	0.5 mg/kg	10	<0.5	93.4	70	130
Pyrene			0.5 mg/kg	10	<0.5	93.0	70	130
EP080/071: Total Petroleum Hydrocarbons								
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 259275)				mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	ES0610063-007	Anonymous	2 mg/kg	26	<2	72.1	70	130
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 259316)				mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	ES0610064-001	Anonymous	2 mg/kg	26	<2	83.4	70	130
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 260101)				mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	ES0610135-023	MG04/0.5	2 mg/kg	26	<2	72.1	70	130
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 260299)				mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	ES0610135-036	MG07/4.0	2 mg/kg	26	<2	72.0	70	130
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 260406)				mg/kg	mg/kg	%	%	%
C10 - C14 Fraction	ES0610135-013	MG09C/3.8	50 mg/kg	700	<50	80.1	70	130
C15 - C28 Fraction			100 mg/kg	3400	<100	96.9	70	130
C29 - C36 Fraction			100 mg/kg	3600	<100	89.6	70	130
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 260459)				mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	ES0610260-007	Anonymous	2 mg/kg	26	<2	78.4	70	130
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 261189)				mg/kg	mg/kg	%	%	%
C10 - C14 Fraction	ES0610135-043	TP14/0.5	50 mg/kg	700	<50	88.2	70	130
C15 - C28 Fraction			100 mg/kg	3400	<100	93.9	70	130
C29 - C36 Fraction			100 mg/kg	3600	<100	80.6	70	130

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Matrix Type: SOIL

Matrix Spike (MS) Report

					Actual Results		Recovery Limits	
					Sample Result	Spike Recovery	Static Limits	
Analyte name	*Laboratory Sample ID*	*Client Sample ID*	*LOR*	*Spike Concentration*		*MS*	*Low*	*High*
EP080/071: Total Petroleum Hydrocarbons - continued								
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 261196)				mg/kg	mg/kg	%	%	%
C10 - C14 Fraction	ES0610135-045	TP14/1.5	50 mg/kg	700	<50	74.6	70	130
C15 - C28 Fraction			100 mg/kg	3400	<100	85.4	70	130
C29 - C36 Fraction			100 mg/kg	3600	<100	84.3	70	130
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 264139)				mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	ES0610564-006	Anonymous	2 mg/kg	26	<2	75.1	70	130
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 264260)				mg/kg	mg/kg	%	%	%
C10 - C14 Fraction	ES0610548-002	Anonymous	50 mg/kg	700	<50	72.2	70	130
C15 - C28 Fraction			100 mg/kg	3400	<100	87.0	70	130
C29 - C36 Fraction			100 mg/kg	3600	<100	80.4	70	130
EP080: BTEX								
EP080: BTEX - (QC Lot: 259275)				mg/kg	mg/kg	%	%	%
Benzene	ES0610063-007	Anonymous	0.2 mg/kg	2.5	<0.2	92.1	70	130
Toluene			0.2 mg/kg	2.5	<0.2	89.2	70	130
Ethylbenzene			0.2 mg/kg	2.5	<0.2	90.0	70	130
meta- & para-Xylene			0.2 mg/kg	2.5	<0.2	89.0	70	130
ortho-Xylene			0.2 mg/kg	2.5	<0.2	89.0	70	130
EP080: BTEX - (QC Lot: 259316)				mg/kg	mg/kg	%	%	%
Benzene	ES0610064-001	Anonymous	0.2 mg/kg	2.5	<0.2	86.6	70	130
Toluene			0.2 mg/kg	2.5	<0.2	81.1	70	130
Ethylbenzene			0.2 mg/kg	2.5	<0.2	92.7	70	130
meta- & para-Xylene			0.2 mg/kg	2.5	<0.2	94.9	70	130
ortho-Xylene			0.2 mg/kg	2.5	<0.2	91.1	70	130
EP080: BTEX - (QC Lot: 260101)				mg/kg	mg/kg	%	%	%
Benzene	ES0610135-023	MG04/0.5	0.2 mg/kg	2.5	<0.2	88.3	70	130
Toluene			0.2 mg/kg	2.5	<0.2	75.1	70	130
Ethylbenzene			0.2 mg/kg	2.5	<0.2	85.9	70	130
meta- & para-Xylene			0.2 mg/kg	2.5	<0.2	86.7	70	130
ortho-Xylene			0.2 mg/kg	2.5	<0.2	83.9	70	130

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Matrix Type: SOIL

Matrix Spike (MS) Report

					Actual Results		Recovery Limits	
					Sample Result	Spike Recovery	Static Limits	
Analyte name	*Laboratory Sample ID*	*Client Sample ID*	*LOR*	*Spike Concentration*		*MS*	*Low*	*High*
EP080: BTEX - continued								
EP080: BTEX - (QC Lot: 260299)				mg/kg	mg/kg	%	%	%
Benzene	ES0610135-036	MG07/4.0	0.2 mg/kg	2.5	<0.2	80.0	70	130
Toluene			0.2 mg/kg	2.5	<0.2	83.0	70	130
Ethylbenzene			0.2 mg/kg	2.5	<0.2	85.0	70	130
meta- & para-Xylene			0.2 mg/kg	2.5	<0.2	83.1	70	130
ortho-Xylene			0.2 mg/kg	2.5	<0.2	83.1	70	130
EP080: BTEX - (QC Lot: 260459)				mg/kg	mg/kg	%	%	%
Benzene	ES0610260-007	Anonymous	0.2 mg/kg	2.5	<0.2	84.1	70	130
Toluene			0.2 mg/kg	2.5	<0.2	78.4	70	130
Ethylbenzene			0.2 mg/kg	2.5	<0.2	87.1	70	130
meta- & para-Xylene			0.2 mg/kg	2.5	<0.2	87.4	70	130
ortho-Xylene			0.2 mg/kg	2.5	<0.2	87.9	70	130
EP080: BTEX - (QC Lot: 264139)				mg/kg	mg/kg	%	%	%
Benzene	ES0610564-006	Anonymous	0.2 mg/kg	2.5	<0.2	88.2	70	130
Toluene			0.2 mg/kg	2.5	<0.2	73.6	70	130
Ethylbenzene			0.2 mg/kg	2.5	<0.2	95.8	70	130
meta- & para-Xylene			0.2 mg/kg	2.5	<0.2	95.9	70	130
ortho-Xylene			0.2 mg/kg	2.5	<0.2	92.5	70	130

Matrix Type: WATER

Matrix Spike (MS) Report

					Actual Results		Recovery Limits	
					Sample Result	Spike Recovery	Static Limits	
Analyte name	*Laboratory Sample ID*	*Client Sample ID*	*LOR*	*Spike Concentration*		*MS*	*Low*	*High*
EG020T: Total Metals by ICP-MS								
EG020T: Total Metals by ICP-MS - (QC Lot: 259478)				mg/L	mg/L	%	%	%
Arsenic	ES0610097-002	Anonymous	0.001 mg/L	1	<0.001	82.3	70	130
Cadmium			0.0001 mg/L	0.25	<0.0001	78.6	70	130
Chromium			0.001 mg/L	1	<0.001	74.2	70	130
Copper			0.001 mg/L	1	0.004	75.7	70	130
Lead			0.001 mg/L	1	<0.001	76.6	70	130
Nickel			0.001 mg/L	1	<0.001	77.2	70	130

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Matrix Type: WATER

Matrix Spike (MS) Report

					Actual Results		Recovery Limits	
					Sample Result	Spike Recovery	Static Limits	
Analyte name	*Laboratory Sample ID*	*Client Sample ID*	*LOR*	*Spike Concentration*		*MS*	*Low*	*High*
EG020T: Total Metals by ICP-MS - continued								
EG020T: Total Metals by ICP-MS - (QC Lot: 259478) - continued				mg/L	mg/L	%	%	%
Zinc	ES0610097-002	Anonymous	0.005 mg/L	1	<0.005	76.4	70	130
EG035T: Total Mercury by FIMS								
EG035T: Total Mercury by FIMS - (QC Lot: 259844)				mg/L	mg/L	%	%	%
Mercury	ES0610115-010	Anonymous	0.0001 mg/L	0.010	<0.0001	90.7	70	130
EP080/071: Total Petroleum Hydrocarbons								
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 262274)				µg/L	µg/L	%	%	%
C6 - C9 Fraction	ES0610200-022	Anonymous	20 µg/L	250	<20	109	70	130
EP080: BTEX								
EP080: BTEX - (QC Lot: 262274)				µg/L	µg/L	%	%	%
Benzene	ES0610200-022	Anonymous	1 µg/L	25	<1	115	70	130
Toluene			2 µg/L	25	<2	108	70	130
Ethylbenzene			2 µg/L	25	<2	111	70	130
meta- & para-Xylene			2 µg/L	25	<2	111	70	130
ortho-Xylene			2 µg/L	25	<2	111	70	130

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INTERPRETIVE QUALITY CONTROL REPORT

Client	:	**CH2M HILL PTY LTD**	**Laboratory**	:	ALS Environmental Sydney	**Page**	: **1 of 14**
Contact	:	MR ADAM SULLIVAN	**Contact**	:	Greg Vogel		
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	**Address**	:	277-289 Woodpark Road Smithfield NSW Australia 2164	**Work order**	: **ES0610135**
						Amendment No.	:
Project	:	347496 MACDONALDTOWN GASWORKS	**Quote number**	:	----	**Date received**	: 17 Aug 2006
Order number	:	- Not provided -				**Date issued**	: 30 Aug 2006
C-O-C number	:	- Not provided -					
Site	:	MACDONALD					
E-mail	:	adam.sullivan@ch2m.com.au	**E-mail**	:	Greg.Vogel@alsenviro.com	**No. of samples**	
Telephone	:	02 9950 0200	**Telephone**	:	+61 (02) 8784 8555	**Received**	: 55
Facsimile	:	02 9950 0600	**Facsimile**	:	+61 (02) 8784 8500	**Analysed**	: 46

This Interpretive Quality Control Report was issued on 30 Aug 2006 for the ALS work order reference ES0610135 and supersedes any previous reports with this reference.
This report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Type Frequency Compliance
- Summary of all Quality Control Outliers
- Brief Method Summaries

Interpretive Quality Control Report - Analysis Holding Time

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the sample aliquot was taken. Elapsed time to analysis represents time from sampling where no extraction / digestion is involved or time from extraction / digestion where this is present. For composite samples, sampling date/time is taken as that of the oldest sample contributing to that composite. Sample date/time for laboratory produced leaches are taken from the completion date/time of the leaching process. Outliers for holding time are based on USEPA SW846, APHA, AS and NEPM (1999). Failed outliers, refer to the 'Summary of Outliers'.

Matrix Type: SOIL ***Analysis Holding Time and Preservation***

Method / **Container /** Client Sample ID(s)		**Date Sampled**	**Extraction / Preparation**			**Analysis**		
			Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EA055-103: Moisture Content								
Soil Glass Jar - Unpreserved								
MG08/0.3,	MG08/1.5,	**17 Aug 2006**	----	----	----	**23 Aug 2006**	24 Aug 2006	Pass
MG08/2.1,	MG08/4.0,							
MG09B/0.3,	MG09B/0.6,							
MG09B/2.5,	MG09B/PIPE,							
MG09C/0.3,	MG09C/1.9,							
MG09C/3.8,	TP15/0.3,							
TP15/2.8,	TP15/4.1,							
QC03,	QC04,							
MG10/0.2,	MG10A/0.7,							
MG10A/2.8,	MG10A/4.0,							
MG04/0.5,	MG04/1.5,							
TRIP BLANK 3,	TRIP SPIKE 3,							
MG05/0.5,	MG05/1.8,							
MG05/3.4,	MG05/5.0,							
MG06/1.0,	MG06/2.0,							
MG06/4.7,	MG07/1.0,							
MG07/4.0,	TP12/0.25,							
TP12/0.5,	TP13/0.25,							
TP13/1.0,	TP13/1.5,							
TP14/0.25,	TP14/0.5,							
TP14/1.5,	RP/2.0,							
RP/PIPE,	TS CONTROL							
Soil Glass Jar - Unpreserved								
TP14/1.0		**17 Aug 2006**	----	----	----	**29 Aug 2006**	24 Aug 2006	**Fail by 5 days**
EG005T: Total Metals by ICP-AES								

Matrix Type: SOIL

Analysis Holding Time and Preservation

Method / **Container /** Client Sample ID(s)	**Date Sampled**	**Extraction / Preparation**			**Analysis**		
		Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EG005T: Total Metals by ICP-AES **- continued**							
Soil Glass Jar - Unpreserved							
MG08/0.3, MG08/1.5, MG09B/0.3, MG09B/0.6, MG09B/PIPE, MG09C/0.3, MG09C/1.9, MG09C/3.8, TP15/2.8, TP15/4.1, QC03, QC04, MG10/0.2, MG10A/0.7, MG10A/2.8, MG10A/4.0, MG04/0.5, MG04/1.5, MG05/0.5, MG05/1.8, MG06/1.0, MG06/2.0, MG06/4.7, MG07/1.0, MG07/4.0, TP12/0.25, TP12/0.5, TP13/0.25, TP14/0.25, TP14/1.5, RP/2.0, RP/PIPE	**17 Aug 2006**	**22 Aug 2006**	13 Feb 2007	Pass	**23 Aug 2006**	13 Feb 2007	Pass
Soil Glass Jar - Unpreserved							
TP14/1.0	**17 Aug 2006**	**30 Aug 2006**	13 Feb 2007	Pass	**30 Aug 2006**	13 Feb 2007	Pass
EG035T: Total Mercury by FIMS							
Soil Glass Jar - Unpreserved							
MG08/0.3, MG08/1.5, MG09B/0.3, MG09B/0.6, MG09B/PIPE, MG09C/0.3, MG09C/1.9, MG09C/3.8, TP15/2.8, TP15/4.1, QC03, QC04, MG10/0.2, MG10A/0.7, MG10A/2.8, MG10A/4.0, MG04/0.5, MG04/1.5, MG05/0.5, MG05/1.8, MG06/1.0, MG06/2.0, MG06/4.7, MG07/1.0, MG07/4.0, TP12/0.25, TP12/0.5, TP13/0.25, TP14/0.25, TP14/1.5, RP/2.0, RP/PIPE	**17 Aug 2006**	**22 Aug 2006**	14 Sep 2006	Pass	**23 Aug 2006**	14 Sep 2006	Pass
Soil Glass Jar - Unpreserved							
TP14/1.0	**17 Aug 2006**	**30 Aug 2006**	14 Sep 2006	Pass	**30 Aug 2006**	14 Sep 2006	Pass
EK026G: Total Cyanide By Discrete Analyser							

Matrix Type: SOIL

Analysis Holding Time and Preservation

Method / **Container /** Client Sample ID(s)		**Date Sampled**	**Extraction / Preparation**			**Analysis**		
			Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EK026G: Total Cyanide By Discrete Analyser **- continued**								
Soil Glass Jar - Unpreserved								
MG09C/0.3,	MG09C/1.9,	**17 Aug 2006**	**23 Aug 2006**	13 Feb 2007	Pass	**23 Aug 2006**	13 Feb 2007	Pass
TP15/0.3,	TP15/2.8,							
QC04,	MG10/0.2,							
MG10A/0.7,	MG06/1.0,							
MG06/4.7,	TP14/1.5							
EP066: Polychlorinated Biphenyls (PCB)								
Soil Glass Jar - Unpreserved								
MG08/1.5,	MG09B/0.6,	**17 Aug 2006**	**24 Aug 2006**	31 Aug 2006	Pass	**25 Aug 2006**	3 Oct 2006	Pass
MG09B/PIPE,	MG10/0.2,							
MG10A/2.8,	MG04/1.5,							
MG05/1.8,	MG06/2.0,							
MG07/4.0,	TP12/0.5,							
RP/2.0,	RP/PIPE							
EP068: Pesticides by GCMS								
Soil Glass Jar - Unpreserved								
MG08/1.5,	MG09B/0.6,	**17 Aug 2006**	**24 Aug 2006**	31 Aug 2006	Pass	**25 Aug 2006**	3 Oct 2006	Pass
MG09B/PIPE,	TP15/2.8,							
TP15/4.1,	QC04,							
MG10/0.2,	MG10A/0.7,							
MG10A/2.8,	MG04/1.5,							
MG05/1.8,	MG06/2.0,							
MG07/4.0,	TP12/0.5,							
RP/2.0,	RP/PIPE							
EP071: TPH - Semivolatile Fraction								

Matrix Type: SOIL

Analysis Holding Time and Preservation

Method / **Container /** Client Sample ID(s)		**Date Sampled**	**Extraction / Preparation**			**Analysis**		
			Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EP071: TPH - Semivolatile Fraction **- continued**								
Soil Glass Jar - Unpreserved								
MG08/1.5,	MG08/2.1,	**17 Aug 2006**	**24 Aug 2006**	31 Aug 2006	Pass	**24 Aug 2006**	3 Oct 2006	Pass
MG08/4.0,	MG09B/0.3,							
MG09B/0.6,	MG09B/2.5,							
MG09B/PIPE,	MG09C/0.3,							
MG09C/1.9,	MG09C/3.8,							
TP15/0.3,	TP15/2.8,							
TP15/4.1,	QC03,							
QC04,	MG10/0.2,							
MG10A/0.7,	MG10A/2.8,							
MG10A/4.0,	MG04/0.5,							
MG04/1.5,	TRIP BLANK 3,							
TRIP SPIKE 3,	MG05/0.5,							
MG05/1.8,	MG05/5.0,							
MG06/1.0,	MG06/2.0,							
MG06/4.7,	MG07/1.0,							
MG07/4.0,	TP12/0.25,							
TP12/0.5,	TP13/0.25,							
TP13/1.0,	TP13/1.5,							
TP14/0.25,	TP14/0.5,							
TP14/1.5,	RP/2.0,							
RP/PIPE,	TS CONTROL							
Soil Glass Jar - Unpreserved								
TP14/1.0		**17 Aug 2006**	**29 Aug 2006**	31 Aug 2006	Pass	**29 Aug 2006**	8 Oct 2006	Pass
EP075(SIM): PAH/Phenols (SIM)								
Soil Glass Jar - Unpreserved								
TP14/1.5,	RP/2.0,	**17 Aug 2006**	**24 Aug 2006**	31 Aug 2006	Pass	**24 Aug 2006**	3 Oct 2006	Pass
RP/PIPE								

Matrix Type: SOIL

Analysis Holding Time and Preservation

Method / **Container /** Client Sample ID(s)	**Date Sampled**	**Extraction / Preparation**			**Analysis**		
		Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EP075(SIM): PAH/Phenols (SIM) **- continued**							
Soil Glass Jar - Unpreserved							
MG08/1.5, MG08/2.1, MG08/4.0, MG09B/0.6, MG09B/2.5, MG09B/PIPE, MG09C/0.3, MG09C/1.9, MG09C/3.8, TP15/0.3, TP15/2.8, TP15/4.1, QC03, QC04, MG10/0.2, MG10A/0.7, MG10A/2.8, MG10A/4.0, MG04/0.5, MG04/1.5, MG05/1.8, MG05/3.4, MG05/5.0, MG06/1.0, MG06/2.0, MG06/4.7, MG07/1.0, MG07/4.0, TP12/0.25, TP12/0.5, TP13/0.25, TP13/1.0, TP13/1.5, TP14/0.25, TP14/0.5, TP14/1.0	**17 Aug 2006**	**24 Aug 2006**	31 Aug 2006	Pass	**25 Aug 2006**	3 Oct 2006	Pass
EP080: TPH Volatiles/BTEX							
Soil Glass Jar - Unpreserved							
MG08/1.5, MG08/2.1, MG10/0.2, MG10A/0.7	**17 Aug 2006**	**19 Aug 2006**	31 Aug 2006	Pass	**21 Aug 2006**	31 Aug 2006	Pass
Soil Glass Jar - Unpreserved							
MG08/4.0, MG09B/0.3, MG09B/0.6, MG09B/2.5, MG09B/PIPE, MG09C/0.3, MG09C/1.9, MG09C/3.8, TP15/0.3, TP15/2.8, TP15/4.1, QC03, QC04, MG10A/2.8, MG10A/4.0, MG04/0.5, MG04/1.5	**17 Aug 2006**	**21 Aug 2006**	31 Aug 2006	Pass	**23 Aug 2006**	31 Aug 2006	Pass
Soil Glass Jar - Unpreserved							
TS CONTROL	**17 Aug 2006**	**22 Aug 2006**	31 Aug 2006	Pass	**22 Aug 2006**	31 Aug 2006	Pass

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Matrix Type: SOIL ***Analysis Holding Time and Preservation***

Method / **Container /** Client Sample ID(s)	**Date Sampled**	**Extraction / Preparation**			**Analysis**		
		Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EP080: TPH Volatiles/BTEX **- continued**							
Soil Glass Jar - Unpreserved							
TRIP BLANK 3, TRIP SPIKE 3, MG05/0.5, MG05/1.8, MG05/5.0, MG06/1.0, MG06/2.0, MG06/4.7, MG07/1.0, MG07/4.0, TP12/0.25, TP12/0.5, TP13/0.25, TP13/1.0, TP13/1.5, TP14/0.25, TP14/0.5, TP14/1.5, RP/2.0, RP/PIPE	**17 Aug 2006**	**22 Aug 2006**	31 Aug 2006	Pass	**23 Aug 2006**	31 Aug 2006	Pass
Soil Glass Jar - Unpreserved							
TP14/1.0	**17 Aug 2006**	**29 Jul 2006**	31 Aug 2006	Pass	**29 Aug 2006**	31 Aug 2006	Pass

Matrix Type: WATER ***Analysis Holding Time and Preservation***

Method / **Container /** Client Sample ID(s)	**Date Sampled**	**Extraction / Preparation**			**Analysis**		
		Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EG020A-T: Total Metals by ICP-MS - Suite A							
Clear Plastic Bottle - Nitric Acid; Unfiltered							
W04	**17 Aug 2006**	**21 Aug 2006**	13 Feb 2007	Pass	**21 Aug 2006**	13 Feb 2007	Pass
EG035T: Total Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered							
W04	**17 Aug 2006**	----	----	----	**21 Aug 2006**	14 Sep 2006	Pass
EP066: Polychlorinated Biphenyls (PCB)							
Amber Glass Bottle - Unpreserved							
W04	**17 Aug 2006**	**22 Aug 2006**	24 Aug 2006	Pass	**23 Aug 2006**	1 Oct 2006	Pass
EP068: Pesticides							
Amber Glass Bottle - Unpreserved							
W04	**17 Aug 2006**	**22 Aug 2006**	24 Aug 2006	Pass	**23 Aug 2006**	1 Oct 2006	Pass
EP071: TPH - Semivolatile Fraction							
Amber Glass Bottle - Unpreserved							
W04	**17 Aug 2006**	**22 Aug 2006**	24 Aug 2006	Pass	**23 Aug 2006**	1 Oct 2006	Pass
EP075(SIM): PAH/Phenols (GC/MS - SIM)							
Amber Glass Bottle - Unpreserved							
W04	**17 Aug 2006**	**22 Aug 2006**	24 Aug 2006	Pass	**23 Aug 2006**	1 Oct 2006	Pass
EP080: TPH Volatiles/BTEX							
Amber VOC Vial - HCl or NaHSO4							
W04	**17 Aug 2006**	**----**	----	----	**25 Aug 2006**	31 Aug 2006	Pass

Interpretive Quality Control Report - Frequency of Quality Control Samples

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which this work order was processed. Actual rate should be greater than or equal to the expected rate.

Matrix Type: SOIL ***Frequency of Quality Control Samples***

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
EA055-103: Moisture Content	9	80	**11.3**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG005T: Total Metals by ICP-AES	8	79	**10.1**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035T: Total Mercury by FIMS	8	69	**11.6**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EK026G: Total Cyanide By Discrete Analyser	2	10	**20.0**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP066: Polychlorinated Biphenyls (PCB)	2	12	**16.7**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP068: Pesticides by GCMS	2	16	**12.5**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	8	75	**10.7**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	5	39	**12.8**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	12	113	**10.6**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Laboratory Control Samples (LCS)					
EG005T: Total Metals by ICP-AES	4	79	**5.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035T: Total Mercury by FIMS	4	69	**5.8**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EK026G: Total Cyanide By Discrete Analyser	1	10	**10.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP066: Polychlorinated Biphenyls (PCB)	1	12	**8.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP068: Pesticides by GCMS	1	16	**6.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	4	75	**5.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	3	39	**7.7**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	6	113	**5.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Method Blanks (MB)					
EG005T: Total Metals by ICP-AES	4	79	**5.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035T: Total Mercury by FIMS	4	69	**5.8**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EK026G: Total Cyanide By Discrete Analyser	1	10	**10.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP066: Polychlorinated Biphenyls (PCB)	1	12	**8.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP068: Pesticides by GCMS	1	16	**6.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	4	75	**5.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	3	39	**7.7**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	6	113	**5.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Matrix Spikes (MS)					
EG005T: Total Metals by ICP-AES	4	79	**5.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035T: Total Mercury by FIMS	4	69	**5.8**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EK026G: Total Cyanide By Discrete Analyser	1	10	**10.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP066: Polychlorinated Biphenyls (PCB)	1	12	**8.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP068: Pesticides by GCMS	1	16	**6.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	4	75	**5.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	3	39	**7.7**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	6	113	**5.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement

Matrix Type: WATER ***Frequency of Quality Control Samples***

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	**Actual**	**Expected**	
Laboratory Duplicates (DUP)					
EG020A-T: Total Metals by ICP-MS - Suite A	2	14	**14.3**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035T: Total Mercury by FIMS	2	11	**18.2**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	2	20	**10.0**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Laboratory Control Samples (LCS)					
EG020A-T: Total Metals by ICP-MS - Suite A	1	14	**7.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035T: Total Mercury by FIMS	1	11	**9.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP066: Polychlorinated Biphenyls (PCB)	1	2	**50.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP068: Pesticides	1	2	**50.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	1	8	**12.5**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (GC/MS - SIM)	1	7	**14.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	1	20	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Method Blanks (MB)					
EG020A-T: Total Metals by ICP-MS - Suite A	1	14	**7.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035T: Total Mercury by FIMS	1	11	**9.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP066: Polychlorinated Biphenyls (PCB)	1	2	**50.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP068: Pesticides	1	2	**50.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	1	8	**12.5**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (GC/MS - SIM)	1	7	**14.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	1	20	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Matrix Spikes (MS)					
EG020A-T: Total Metals by ICP-MS - Suite A	1	14	**7.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035T: Total Mercury by FIMS	1	11	**9.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	1	20	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement

Interpretive Quality Control Report - Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged on the 'Quality Control Report'. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). - Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot.

Non-surrogates

ALS QC Lot	Matrix Type	Laboratory Sample ID	Client Sample ID	Analyte	Data	Limits	Comment
Laboratory Duplicates (DUP)							
EG005T: Total Metals by ICP-AES	SOIL	ES0610135-038	TP12/0.5	Zinc	32.8 %	0-20 %	RPD exceeds LOR based limits
EG005T: Total Metals by ICP-AES	SOIL	ES0610135-042	TP14/0.25	Lead	20.8 %	0-20 %	RPD exceeds LOR based limits
Laboratory Control Samples (LCS)							
EP075(SIM)A: Phenolic Compounds	SOIL	286449-007	----	2,4,5-Trichlorophenol	67.5 %	68.9-112 %	Recovery less than lower control limit
Matrix Spikes (MS)							
EG005T: Total Metals by ICP-AES	SOIL	ES0610135-023	MG04/0.5	Lead	ND	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP068A: Organochlorine Pesticides (OC)	SOIL	ES0610135-019	MG10/0.2	gamma-BHC	60.4 %	75.65-110.44 %	Recovery less than lower data quality objective
				Heptachlor	38.4 %	72.2-106.71 %	Recovery less than lower data quality objective
				Aldrin	46.3 %	77.54-107.0 %	Recovery less than lower data quality objective
				Dieldrin	56.0 %	76.37-109.7 %	Recovery less than lower data quality objective
				Endrin	ND	----	Matrix spike recovery not determined due to sample matrix interference.
				4,4'-DDT	22.4 %	67.12-118.10 %	Recovery less than lower data quality objective
EP068B: Organophosphorus Pesticides (OP)	SOIL	ES0610135-019	MG10/0.2	Diazinon	56.5 %	75.85-107.06 %	Recovery less than lower data quality objective
				Chlorpyrifos-methyl	46.6 %	74.84-107.91 %	Recovery less than lower data quality objective
				Pirimphos-ethyl	41.1 %	67.98-109.42 %	Recovery less than lower data quality objective
				Bromophos-ethyl	45.6 %	74.94-107.37 %	Recovery less than lower data quality objective
				Prothiofos	70.1 %	75.45-106.05 %	Recovery less than lower data quality objective

l **For all matrices, no method blank result outliers occur.**

Surrogates

ALS QC Lot	Matrix Type	Laboratory Sample ID	Client Sample ID	Analyte	Data	Limits	Comment
Surrogates							
EP068S: Organochlorine Pesticide Surrogate	SOIL	ES0610135-003	MG08/1.5	Dibromo-DDE	ND	----	Surrogate recovery not determined due to either primary sample extract dilution or matrix interferences
	SOIL	ES0610135-009	MG09B/PIPE	Dibromo-DDE	ND	----	Surrogate recovery not determined due to either primary sample extract dilution or matrix interferences
	SOIL	ES0610135-020	MG10A/0.7	Dibromo-DDE	ND	----	Surrogate recovery not determined due to either primary sample extract dilution or matrix interferences
	SOIL	ES0610135-047	RP/PIPE	Dibromo-DDE	ND	----	Surrogate recovery not determined due to either primary sample extract dilution or matrix interferences
EP068T: Organophosphorus Pesticide Surrogate	SOIL	ES0610135-003	MG08/1.5	DEF	ND	----	Surrogate recovery not determined due to either primary sample extract dilution or matrix interferences
	SOIL	ES0610135-009	MG09B/PIPE	DEF	ND	----	Surrogate recovery not determined due to either primary sample extract dilution or matrix interferences
	SOIL	ES0610135-020	MG10A/0.7	DEF	ND	----	Surrogate recovery not determined due to either primary sample extract dilution or matrix interferences
	SOIL	ES0610135-047	RP/PIPE	DEF	ND	----	Surrogate recovery not determined due to either primary sample extract dilution or matrix interferences
EP075(SIM)S: Phenolic Compound Surrogates	SOIL	ES0610135-009	MG09B/PIPE	Phenol-d6	ND	----	Surrogate recovery not determined due to either primary sample extract dilution or matrix interferences
				2-Chlorophenol-D4	ND	----	Surrogate recovery not determined due to either primary sample extract dilution or matrix interferences
				2,4,6-Tribromophenol	ND	----	Surrogate recovery not determined due to either primary sample extract dilution or matrix interferences
EP075(SIM)T: PAH Surrogates	SOIL	ES0610135-009	MG09B/PIPE	2-Fluorobiphenyl	ND	----	Surrogate recovery not determined due to either primary sample extract dilution or matrix interferences
				Anthracene-d10	ND	----	Surrogate recovery not determined due to either primary sample extract dilution or matrix interferences
				4-Terphenyl-d14	ND	----	Surrogate recovery not determined due to either primary sample extract dilution or matrix interferences

				1,2-Dichloroethane-D4	ND	----	Surrogate recovery not determined due to either primary sample extract dilution or matrix interferences
				Toluene-D8	ND	----	Surrogate recovery not determined due to either primary sample extract dilution or matrix interferences
				4-Bromofluorobenzene	ND	----	Surrogate recovery not determined due to either primary sample extract dilution or matrix interferences
	SOIL	ES0610135-016	TP15/4.1	Toluene-D8	118 %	81-117 %	Recovery greater than upper data quality objective
EP080S: TPH(V)/BTEX Surrogates	SOIL	ES0610135-025	TRIP BLANK 3	Toluene-D8	117 %	81-117 %	Recovery greater than upper data quality objective
				1,2-Dichloroethane-D4	79.4 %	80-120 %	Recovery less than lower data quality objective

Outliers : Analysis Holding Time

The following report highlights outliers within this 'Interpretive Quality Control Report - Analysis Holding Time'.

Method / Container / Client Sample ID(s)	Date Sampled	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EA055-103: Moisture Content							
Soil Glass Jar - Unpreserved TP14/1.0	**17 Aug 2006**	----	----	----	**29 Aug 2006**	24 Aug 2006	**Fail by 5 days**

- **No holding time outliers occur.**

Outliers : Frequency of Quality Control Samples

The following report highlights outliers within this 'Interpretive Quality Control Report - Frequency of Quality Control Samples'.

- **No frequency outliers occur.**

Method Reference Summary

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.

Matrix Type: SOIL ***Method Reference Summary***

Preparation Methods

EK026PR : NaOH leach for TCN in Soils - APHA 20th ed., 4500 CN- C & N. Samples are extracted by end-over-end tumbling with NaOH.

EN69 : Hot Block Digest for metals in soils sediments and sludges - USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (1999) Schedule B(3) (Method 202)

ORG16 : Methanolic Extraction of Soils for Purge and Trap - (USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.

ORG17A : Tumbler Extraction of Solids (Option A - Concentrating) - In-house, Mechanical agitation (tumbler). 20g of sample, Na2SO4 and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

ORG17B : Tumbler Extraction of Solids (Option B - Non-concentrating) - In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.

Analytical Methods

ASB-SOL : Asbestos - Count (Solid) - Asbestos Count on solid matrices conducted by Subcontracting Laboratory

EA055-103 : Moisture Content - A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (1999) Schedule B(3) (Method 102)

EG005T : Total Metals by ICP-AES - (APHA 20th ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (1999) Schedule B(3)

EG035T : Total Mercury by FIMS - AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (1999) Schedule B(3)

EK026G : Total Cyanide By Discrete Analyser - APHA 20th 4500 CN - C & N. Caustic leach extracts of the sample are distilled with sulphuric acid, converting all CN species to HCN. The distillates are analyzed for CN by Seal. This method is compliant with NEPM (1999) Schedule B(3) (Method 403)

EP066 : Polychlorinated Biphenyls (PCB) - (USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 504)

EP068 : Pesticides by GCMS - (USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM (1999) Schedule B(3) (Method 504,505)

EP071 : TPH - Semivolatile Fraction - (USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)

EP075(SIM) : PAH/Phenols (SIM) - (USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 502 and 507)

Matrix Type: SOIL ***Method Reference Summary***

Analytical Methods

EP080 : TPH Volatiles/BTEX - (USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 501)

Matrix Type: WATER ***Method Reference Summary***

Preparation Methods

EN25 : Digestion for Total Recoverable Metals - USEPA SW846-3005 Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

ORG14 : Separatory Funnel Extraction of Liquids - USEPA SW 846 - 3510B 500 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2). ALS default excludes sediment which may be resident in the container.

Analytical Methods

EG020A-T : Total Metals by ICP-MS - Suite A - (APHA 20th ed., 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020): The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.

EG035T : Total Mercury by FIMS - AS 3550, APHA 3112 Hg - B (Flow-injection ($SnCl_2$)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by $SnCl_2$ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

EP066 : Polychlorinated Biphenyls (PCB) - USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

EP068 : Pesticides - USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

EP071 : TPH - Semivolatile Fraction - USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

EP075(SIM) : PAH/Phenols (GC/MS - SIM) - USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

EP080 : TPH Volatiles/BTEX - USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

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ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive report

Client Details

Client	:	**CH2M HILL PTY LTD**
Contact	:	**MR ADAM SULLIVAN**
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515
Project	:	**347496 MACDONALDTOWN GASWORK**
Order number	:	**- Not provided -**
C-O-C Number	:	**- Not provided -**
Site	:	**MACDONALD**
Sampler	:	**- Not provided -**
E-mail	:	adam.sullivan@ch2m.com.au
Telephone	:	02 9950 0200
Facsimile	:	02 9950 0600

Laboratory Details

Laboratory	:	**ALS Environmental Sydney**
Manager	:	**Greg Vogel**
Address	:	Smithfield NSW Australia 2164
Quote number	:	----
Work order	:	**ES0610135**
E-mail	:	Greg.Vogel@alsenviro.com
Telephone	:	+61 (02) 8784 8555
Facsimile	:	+61 (02) 8784 8500

Dates

Date Samples Received	:	17 Aug 2006	**SRA Issue Date**	:	28 Aug 2006
Scheduled Reporting Date	:	**30 Aug 2006**	**Client Requested Date**	:	25 Aug 2006

Delivery Details

Mode of Delivery	:	Carrier.	**Temperature**	:	CHILLED - Ice present
No. of coolers/boxes	:	2 HARD	**No. of samples** - **Received**		55
Security Seal	:	Intact.	- **Analysed**		47

Comments

- **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).**

- Analytical work for this work order will be conducted at ALSE Sydney.
- 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 Nazeeh Aoun.
- 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'.

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.

Client	: CH2M HILL PTY LTD	**Work Order**	: ES0610135
Project	: 347496 MACDONALDTOWN GASWORKS	**ALS Quote Reference**	: ----

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

Some items described below may be part of a laboratory process neccessary 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)	**EA055-103 - SOIL** Moisture Content	**EK026G (Solids) - SOIL** Total Cyanide By Discrete Analyser	**S-02 - SOIL** 8 Metals (incl. Digestion)	**S-04 - SOIL** TPH/BTEX	**S-07 - SOIL** TPH/BTEX/PAH (SIM)	**S-12 - SOIL** OC/OP Pesticides	**S-14A - SOIL** PAH/Phenols (16 PAH - SIM)	**S-19 - SOIL** TPH/BTEX/P/Ph/OC/OP/PCB/8 metals	**W-19T - WATER** TPH/BTX/P/Ph/OC/OP/PCB/8 metals
ES0610135-001	**MG08/0.3 - 17 Aug 2006**				⌋						
ES0610135-002	**MG08/1.0 - 17 Aug 2006**										
ES0610135-003	**MG08/1.5 - 17 Aug 2006**									⌋	
ES0610135-004	**MG08/2.1 - 17 Aug 2006**						⌋				
ES0610135-005	**MG08/4.0 - 17 Aug 2006**						⌋				
ES0610135-006	**MG09B/0.3 - 17 Aug 2006**				⌋	⌋					
ES0610135-007	**MG09B/0.6 - 17 Aug 2006**									⌋	
ES0610135-008	**MG09B/2.5 - 17 Aug 2006**						⌋				
ES0610135-009	**MG09B/PIPE - 17 Aug 2006**									⌋	
ES0610135-010	**MG09C/0.3 - 17 Aug 2006**		⌋	⌋	⌋		⌋				
ES0610135-011	**MG09C/1.5 - 17 Aug 2006**										
ES0610135-012	**MG09C/1.9 - 17 Aug 2006**		⌋	⌋	⌋		⌋				
ES0610135-013	**MG09C/3.8 - 17 Aug 2006**				⌋		⌋				
ES0610135-014	**TP15/0.3 - 17 Aug 2006**		⌋	⌋			⌋				
ES0610135-015	**TP15/2.8 - 17 Aug 2006**		⌋	⌋	⌋		⌋	⌋			
ES0610135-016	**TP15/4.1 - 17 Aug 2006**				⌋		⌋	⌋			
ES0610135-017	**QC03 - 17 Aug 2006**				⌋		⌋				
ES0610135-018	**QC04 - 17 Aug 2006**		⌋	⌋	⌋		⌋	⌋			
ES0610135-019	**MG10/0.2 - 17 Aug 2006**	⌋	⌋	⌋						⌋	
ES0610135-020	**MG10A/0.7 - 17 Aug 2006**	⌋	⌋	⌋	⌋	⌋		⌋	⌋		
ES0610135-021	**MG10A/2.8 - 17 Aug 2006**									⌋	
ES0610135-022	**MG10A/4.0 - 17 Aug 2006**				⌋	⌋			⌋		
ES0610135-023	**MG04/0.5 - 17 Aug 2006**	⌋			⌋		⌋				
ES0610135-024	**MG04/1.5 - 17 Aug 2006**	⌋								⌋	
ES0610135-025	**TRIP BLANK 3 - 17 Aug 2006**					⌋					
ES0610135-026	**TRIP SPIKE 3 - 17 Aug 2006**					⌋					
ES0610135-027	**MG05/0.5 - 17 Aug 2006**				⌋	⌋					
ES0610135-028	**MG05/1.2 - 17 Aug 2006**										
ES0610135-029	**MG05/1.8 - 17 Aug 2006**									⌋	
ES0610135-030	**MG05/3.4 - 17 Aug 2006**								⌋		
ES0610135-031	**MG05/5.0 - 17 Aug 2006**						⌋				
ES0610135-032	**MG06/1.0 - 17 Aug 2006**		⌋	⌋	⌋		⌋				
ES0610135-033	**MG06/2.0 - 17 Aug 2006**									⌋	
ES0610135-034	**MG06/4.7 - 17 Aug 2006**		⌋	⌋	⌋		⌋				
ES0610135-035	**MG07/1.0 - 17 Aug 2006**				⌋	⌋			⌋		
ES0610135-036	**MG07/4.0 - 17 Aug 2006**									⌋	
ES0610135-037	**TP12/0.25 - 17 Aug 2006**	⌋			⌋	⌋			⌋		
ES0610135-038	**TP12/0.5 - 17 Aug 2006**									⌋	
ES0610135-039	**TP13/0.25 - 17 Aug 2006**	⌋			⌋	⌋			⌋		
ES0610135-040	**TP13/1.0 - 17 Aug 2006**						⌋				
ES0610135-041	**TP13/1.5 - 17 Aug 2006**						⌋				
ES0610135-042	**TP14/0.25 - 17 Aug 2006**	⌋			⌋	⌋			⌋		
ES0610135-043	**TP14/0.5 - 17 Aug 2006**						⌋				
ES0610135-044	**TP14/1.0 - 17 Aug 2006**				⌋	⌋			⌋		
ES0610135-045	**TP14/1.5 - 17 Aug 2006**		⌋	⌋	⌋		⌋				

Client	: CH2M HILL PTY LTD	**Work Order**	: ES0610135
Project	: 347496 MACDONALDTOWN GASWORKS	**ALS Quote Reference**	: ----

ALS Environmental

ALS Sample ID.	Client Sample ID - Sample Date	**Requested Analysis**									
		ASB-SOL - SOIL Asbestos - Count (Solid)	**EA055-103 - SOIL** Moisture Content	**EK026G (Solids) - SOIL** Total Cyanide By Discrete Analyser	**S-02 - SOIL** 8 Metals (incl. Digestion)	**S-04 - SOIL** TPH/BTEX	**S-07 - SOIL** TPH/BTEX/PAH (SIM)	**S-12 - SOIL** OC/OP Pesticides	**S-14A - SOIL** PAH/Phenols (16 PAH - SIM)	**S-19 - SOIL** TPH/BTEX/P/Ph/OC/OP/PCB/8 metals	**W-19T - WATER** TPH/BTX/P/Ph/OC/OP/PCB/8 metals
ES0610135-046	**RP/2.0 - 17 Aug 2006**									]	
ES0610135-047	**RP/PIPE - 17 Aug 2006**									]	
ES0610135-048	**W04 - 17 Aug 2006**										]
ES0610135-049	**TS CONTROL - 17 Aug 2006**					]					
ES0610135-050	**MG08/3.1 - 17 Aug 2006**										
ES0610135-051	**TP15/1.0 - 17 Aug 2006**										
ES0610135-052	**MG10/0.6 - 17 Aug 2006**										
ES0610135-053	**MG06/3.5 - 17 Aug 2006**										
ES0610135-055	**TP13/0.5 - 17 Aug 2006**										
ES0610135-056	**TP12 - 18 Aug 2006**										
	Total(s) :	**7**	**10**	**10**	**21**	**12**	**19**	**4**	**8**	**12**	**1**

Client	: CH2M HILL PTY LTD	**Work Order**	: ES0610135
Project	: 347496 MACDONALDTOWN GASWORKS	**ALS Quote Reference**	: ----

Requested Reports

l **MR ADAM SULLIVAN**

-	A4 - Certificate of Analysis - NEPM format	Email	adam.sullivan@ch2m.com.au
-	A4 - Quality Control Report - NEPM format	Email	adam.sullivan@ch2m.com.au
-	A4 - Interpretive Quality Control Report - NEPM format	Email	adam.sullivan@ch2m.com.au
-	Subcontracted Reports	Email	adam.sullivan@ch2m.com.au
-	ENMRG Export Format	Email	adam.sullivan@ch2m.com.au
-	ESDAT Export Format	Email	adam.sullivan@ch2m.com.au
-	Chain of Custody Acknowledgement	Email	adam.sullivan@ch2m.com.au
-	A4 - Sample Receipt Notification - Comprehensive format	Email	adam.sullivan@ch2m.com.au
-	Invoice	Email	adam.sullivan@ch2m.com.au

Sample Container(s) / Preservation Non-Compliance Log

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

l **No sample container / preservation non-compliance exist.**

AUSTRALIAN SAFER ENVIRONMENT & TECHNOLOGY PTY LTD
ABN 36 088 095 112

Our ref : ASET 9469/ 12631 / 1 - 4
Your ref: ES0610221
NATA Accreditation No: 14484

23 August 2006

Australian Laboratory Services Pty. Ltd.
277 Woodpark Road
Smithfield NSW 2164

Attn:Mr Greg Vogel

Dear Greg,

Asbestos Identification
This report presents the results of four samples, forwarded by Australian Laboratory Services Pty. Ltd on 21 August 2006, for analysis for asbestos.

1.Introduction: Four samples forwarded were examined and analysed for the presence of asbestos.

2. Methods : The samples were examined under a Stereo Microscope and selected fibres were analysed by Polarized Light Microscopy in conjunction with Dispersion Staining method **(Safer Environment Method 1.)**

3. Results :

Sample No. 1. ASET 9469 / 12631 / 1. ES0610221 - 7 - MG10 - 0.2.
Approx dimensions 14.0 cm x 4.0 cm x 2.0 cm
The sample consisted of a mixture of sandy soil, stones, plant matter, fragments of plaster and brick.
No asbestos detected.

Sample No. 2. ASET 9469 / 12631 / 2. ES0610221 - 8 - MG09 - B.
Approx dimensions 6.0 cm x 7.0 cm x 1.0 cm
The sample consisted of a fragment of a fibro plaster cement material.
Chrysotile asbestos detected.

Sample No. 3. ASET 9469 / 12631 / 3. ES0610221 - 9 - TP18.
Approx dimensions 5.0 cm x 5.0 cm x 0.8 cm
The sample consisted of a mixture of sandy soil and stones.
No asbestos detected.

Sample No. 4. ASET 9469 / 12631 / 4. ES0610221 - 18 - TP11 - 0.2.
Approx dimensions 14.0 cm x 3.0 cm x 2.0 cm
The sample consisted of a mixture of clayish sandy soil, stones, plant matter, plaster and fragments of bitumen.
No asbestos detected.

Analysed and reported by,



Karu Jayasundara. BSc (Hons) MAus IMM.
Mineralogist / Chartered Professional of Geology
Approved Signatory.

WORLD RECOGNISED ACCREDITATION

ALS Environmental

CERTIFICATE OF ANALYSIS

Client	: CH2M HILL PTY LTD	Laboratory	: ALS Environmental Sydney	Page	: 1 of 19
Contact	: MR ADAM SULLIVAN	Contact	: Greg Vogel	Work Order	: ES0610221
Address	: PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164		
E-mail	: adam.sullivan@ch2m.com.au	E-mail	: Greg.Vogel@alsenviro.com		
Telephone	: 02 9950 0200	Telephone	: +61 (02) 8784 8555		
Facsimile	: 02 9950 0600	Facsimile	: +61 (02) 8784 8500		
Project	: 347496 MACDONALDTOWN GASWORKS	Quote number	: ----	Date received	: 18 Aug 2006
Order number	: - Not provided -			Date issued	: 29 Aug 2006
C-O-C number	: - Not provided -			No. of samples	- Received : 22
Site	: MACDONALDTOWN				Analysed : 18

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
Celine Conceicao	Spectroscopist	Inorganics - NATA 825 (10911 - Sydney)
Pabi Subba		Organics - NATA 825 (10911 - Sydney)
PHALAK INTHAKESONE	Organics Co-ordinator	Organics - NATA 825 (10911 - Sydney)
Phyu Phyu Lwin	Spectroscopist	Inorganics - NATA 825 (10911 - Sydney)
Sarah Millington	Senior Inorganic Chemist	Inorganics - NATA 825 (10911 - Sydney)

ALS Environmental

Comments

This report for the ALSE reference ES0610221 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 insuffient 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.

- **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 **ES0610221**

EPO75(SIM) : Surrogate (Phenol-d6) could not be determined for sample W06 due to sample matrix interference.
LCS recovery for various organic analytes fall outside ALS dynamic control limits, However they are within the acceptance criteria based on USEPA SW-846.
EPO66 & EPO68 :Sample MG11/2.0 required dilution due to matrix interferences. LOR values have been adjusted accordingly.
EPO68: Surrogate (TP16/1.0) could not be determined for sample TP16/1.0 due to sample matrix interferences.

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: TP16/3.5	TP18/1.2	TP18/3.2	TP18/4.4	DUP08
Sample Matrix Type / Description:				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time:				17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00
Laboratory Sample ID:				ES0610221-001	ES0610221-002	ES0610221-004	ES0610221-005	ES0610221-006
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%	19.2	18.8	23.4	21.2	15.5
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	7	7	6	6	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	14	22	25	23	16
Copper	7440-50-8	5	mg/kg	14	16	14	<5	<5
Lead	7439-92-1	5	mg/kg	23	73	19	13	5
Nickel	7440-02-0	2	mg/kg	<2	<2	6	2	<2
Zinc	7440-66-6	5	mg/kg	<5	52	17	<5	33
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EK025G: Free cyanide by Discrete Analyser								
Total Cyanide	57-12-5	1.0	mg/kg	<1.0	3.0	<1.0	----	<1.0
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls		0.10	mg/kg	----	<0.10	----	----	<0.10
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	----	<0.05	----	----	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	----	<0.05	----	----	<0.05
beta-BHC	319-85-7	0.05	mg/kg	----	<0.05	----	----	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	----	<0.05	----	----	<0.05
delta-BHC	319-86-8	0.05	mg/kg	----	<0.05	----	----	<0.05
Heptachlor	76-44-8	0.05	mg/kg	----	<0.05	----	----	<0.05
Aldrin	309-00-2	0.05	mg/kg	----	<0.05	----	----	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	----	<0.05	----	----	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	----	<0.05	----	----	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	----	<0.05	----	----	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	----	<0.05	----	----	<0.05
Dieldrin	60-57-1	0.05	mg/kg	----	<0.05	----	----	<0.05
4.4'-DDE	72-55-9	0.05	mg/kg	----	<0.05	----	----	<0.05
Endrin	72-20-8	0.05	mg/kg	----	<0.05	----	----	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	----	<0.05	----	----	<0.05
4.4'-DDD	72-54-8	0.05	mg/kg	----	<0.05	----	----	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	----	<0.05	----	----	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	----	<0.05	----	----	<0.05
4.4'-DDT	50-29-3	0.2	mg/kg	----	<0.2	----	----	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	----	<0.05	----	----	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	----	<0.2	----	----	<0.2

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: TP16/3.5	TP18/1.2	TP18/3.2	TP18/4.4	DUP08
Sample Matrix Type / Description				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time				17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00
Laboratory Sample ID				ES0610221-001	ES0610221-002	ES0610221-004	ES0610221-005	ES0610221-006
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	----	<0.05	----	----	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg	----	<0.05	----	----	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg	----	<0.2	----	----	<0.2
Dimethoate	60-51-5	0.05	mg/kg	----	<0.05	----	----	<0.05
Diazinon	333-41-5	0.05	mg/kg	----	<0.05	----	----	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	----	<0.05	----	----	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg	----	<0.2	----	----	<0.2
Malathion	121-75-5	0.05	mg/kg	----	<0.05	----	----	<0.05
Fenthion	55-38-9	0.05	mg/kg	----	<0.05	----	----	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg	----	<0.05	----	----	<0.05
Parathion	56-38-2	0.2	mg/kg	----	<0.2	----	----	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	----	<0.05	----	----	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg	----	<0.05	----	----	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg	----	<0.05	----	----	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg	----	<0.05	----	----	<0.05
Prothiofos	34643-46-4	0.05	mg/kg	----	<0.05	----	----	<0.05
Ethion	563-12-2	0.05	mg/kg	----	<0.05	----	----	<0.05
Carbophenothion	786-19-6	0.05	mg/kg	----	<0.05	----	----	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg	----	<0.05	----	----	<0.05
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	----	----	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	----	----	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	----	----	<0.5
3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	<1.0	----	----	<1.0
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	----	----	<0.5
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	----	----	<0.5
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	----	----	<0.5
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	----	----	<0.5
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	----	----	<0.5
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	----	----	<0.5
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	----	----	<0.5
Pentachlorophenol	87-86-5	2.0	mg/kg	<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

ALS Environmental

Analytical Results

Client Sample ID :	TP16/3.5	TP18/1.2	TP18/3.2	TP18/4.4	DUP08
Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time :	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00
Laboratory Sample ID :	ES0610221-001	ES0610221-002	ES0610221-004	ES0610221-005	ES0610221-006

Analyte	CAS number	LOR	Units					
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
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	108-38-3 106-42-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	----	91.4	----	----	74.4
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE		0.1	%	----	98.5	----	----	78.4
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	----	97.9	----	----	75.7
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	81.0	76.5	76.1	72.0	76.7
2-Chlorophenol-D4	93951-73-6	0.1	%	88.2	84.0	82.8	78.6	84.5
2.4.6-Tribromophenol	118-79-6	0.1	%	79.4	78.0	75.4	65.9	67.0
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	90.9	85.3	87.6	82.1	85.7
Anthracene-d10	1719-06-8	0.1	%	86.2	84.8	87.6	80.9	86.5

ALS Environmental

Analytical Results

				Client Sample ID :	TP16/3.5	TP18/1.2	TP18/3.2	TP18/4.4	DUP08
				Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Date / Time :	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00
				Laboratory Sample ID :					
Analyte	*CAS number*	*LOR*	*Units*		ES0610221-001	ES0610221-002	ES0610221-004	ES0610221-005	ES0610221-006
EP075(SIM)T: PAH Surrogates									
4-Terphenyl-d14	1718-51-0	0.1	%		79.2	73.6	75.5	70.5	75.9
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		92.3	85.2	86.4	83.9	91.9
Toluene-D8	2037-26-5	0.1	%		101	89.5	89.9	91.3	93.8
4-Bromofluorobenzene	460-00-4	0.1	%		95.9	90.7	89.2	89.4	89.7

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID : TRIP BLANK Sample Matrix Type / Description : SOIL Sample Date / Time : 17 Aug 2006 15:00 Laboratory Sample ID : ES0610221-010	MG11/0.2 SOIL 17 Aug 2006 15:00 ES0610221-014	MG11/1.5 SOIL 17 Aug 2006 15:00 ES0610221-015	MG11/2.0 SOIL 17 Aug 2006 15:00 ES0610221-016	MG11/4.0 SOIL 17 Aug 2006 15:00 ES0610221-017
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%	<1.0	11.7	18.3	18.9	20.1
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	----	38	----	<5	7
Cadmium	7440-43-9	1	mg/kg	----	<1	----	<1	<1
Chromium	7440-47-3	2	mg/kg	----	18	----	10	26
Copper	7440-50-8	5	mg/kg	----	94	----	6	<5
Lead	7439-92-1	5	mg/kg	----	174	----	25	13
Nickel	7440-02-0	2	mg/kg	----	11	----	<2	<2
Zinc	7440-66-6	5	mg/kg	----	143	----	17	<5
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	----	0.2	----	<0.1	<0.1
EK025G: Free cyanide by Discrete Analyser								
Total Cyanide	57-12-5	1.0	mg/kg	----	<1.0	2.5	3.5	<1.0
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls		0.10	mg/kg	----	----	----	<0.25	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	----	----	----	<0.12	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	----	----	----	<0.12	----
beta-BHC	319-85-7	0.05	mg/kg	----	----	----	<0.12	----
gamma-BHC	58-89-9	0.05	mg/kg	----	----	----	<0.12	----
delta-BHC	319-86-8	0.05	mg/kg	----	----	----	<0.12	----
Heptachlor	76-44-8	0.05	mg/kg	----	----	----	<0.12	----
Aldrin	309-00-2	0.05	mg/kg	----	----	----	<0.12	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	----	----	----	<0.12	----
trans-Chlordane	5103-74-2	0.05	mg/kg	----	----	----	<0.12	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	----	----	----	<0.12	----
cis-Chlordane	5103-71-9	0.05	mg/kg	----	----	----	<0.12	----
Dieldrin	60-57-1	0.05	mg/kg	----	----	----	<0.12	----
4.4'-DDE	72-55-9	0.05	mg/kg	----	----	----	<0.12	----
Endrin	72-20-8	0.05	mg/kg	----	----	----	<0.12	----
beta-Endosulfan	33213-65-9	0.05	mg/kg	----	----	----	<0.12	----
4.4'-DDD	72-54-8	0.05	mg/kg	----	----	----	<0.12	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	----	----	----	<0.12	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	----	----	----	<0.12	----
4.4'-DDT	50-29-3	0.2	mg/kg	----	----	----	<0.2	----
Endrin ketone	53494-70-5	0.05	mg/kg	----	----	----	<0.12	----
Methoxychlor	72-43-5	0.2	mg/kg	----	----	----	<0.2	----

ALS Environmental

Analytical Results

				Client Sample ID :	TRIP BLANK	MG11/0.2	MG11/1.5	MG11/2.0	MG11/4.0
				Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Date / Time :	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00
				Laboratory Sample ID :	ES0610221-010	ES0610221-014	ES0610221-015	ES0610221-016	ES0610221-017
Analyte	*CAS number*	*LOR*	*Units*						
EP068B: Organophosphorus Pesticides (OP)									
Dichlorvos	62-73-7	0.05	mg/kg		----	----	----	<0.12	----
Demeton-S-methyl	919-86-8	0.05	mg/kg		----	----	----	<0.12	----
Monocrotophos	6923-22-4	0.2	mg/kg		----	----	----	<0.2	----
Dimethoate	60-51-5	0.05	mg/kg		----	----	----	<0.12	----
Diazinon	333-41-5	0.05	mg/kg		----	----	----	<0.12	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg		----	----	----	<0.12	----
Parathion-methyl	298-00-0	0.2	mg/kg		----	----	----	<0.2	----
Malathion	121-75-5	0.05	mg/kg		----	----	----	<0.12	----
Fenthion	55-38-9	0.05	mg/kg		----	----	----	<0.12	----
Chlorpyrifos	2921-88-2	0.05	mg/kg		----	----	----	<0.12	----
Parathion	56-38-2	0.2	mg/kg		----	----	----	<0.2	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg		----	----	----	<0.12	----
Chlorfenvinphos	470-90-6	0.05	mg/kg		----	----	----	<0.12	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg		----	----	----	<0.12	----
Fenamiphos	22224-92-6	0.05	mg/kg		----	----	----	<0.12	----
Prothiofos	34643-46-4	0.05	mg/kg		----	----	----	<0.12	----
Ethion	563-12-2	0.05	mg/kg		----	----	----	<0.12	----
Carbophenothion	786-19-6	0.05	mg/kg		----	----	----	<0.12	----
Azinphos Methyl	86-50-0	0.05	mg/kg		----	----	----	<0.12	----
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		----	----	----	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg		----	----	----	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg		----	----	----	0.6	<0.5
3- & 4-Methylphenol	1319-77-3	1.0	mg/kg		----	----	----	<1.0	<1.0
2-Nitrophenol	88-75-5	0.5	mg/kg		----	----	----	<0.5	<0.5
2.4-Dimethylphenol	105-67-9	0.5	mg/kg		----	----	----	0.5	<0.5
2.4-Dichlorophenol	120-83-2	0.5	mg/kg		----	----	----	<0.5	<0.5
2.6-Dichlorophenol	87-65-0	0.5	mg/kg		----	----	----	<0.5	<0.5
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg		----	----	----	<0.5	<0.5
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg		----	----	----	<0.5	<0.5
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg		----	----	----	<0.5	<0.5
Pentachlorophenol	87-86-5	2.0	mg/kg		----	----	----	<2.0	<2.0
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		----	9.8	----	2.6	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		----	14.8	----	25.4	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		----	1.4	----	6.3	<0.5
Fluorene	86-73-7	0.5	mg/kg		----	4.9	----	48.2	<0.5

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: TRIP BLANK Sample Matrix Type / Description: SOIL Sample Date / Time: 17 Aug 2006 15:00 Laboratory Sample ID: ES0610221-010	MG11/0.2 SOIL 17 Aug 2006 15:00 ES0610221-014	MG11/1.5 SOIL 17 Aug 2006 15:00 ES0610221-015	MG11/2.0 SOIL 17 Aug 2006 15:00 ES0610221-016	MG11/4.0 SOIL 17 Aug 2006 15:00 ES0610221-017
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Phenanthrene	85-01-8	0.5	mg/kg	----	110	----	157	<0.5
Anthracene	120-12-7	0.5	mg/kg	----	26.0	----	47.8	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	----	141	----	94.7	<0.5
Pyrene	129-00-0	0.5	mg/kg	----	147	----	121	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	----	49.8	----	47.6	<0.5
Chrysene	218-01-9	0.5	mg/kg	----	39.4	----	33.3	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	----	45.1	----	40.1	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	----	16.9	----	13.8	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	----	42.0	----	48.8	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	----	19.6	----	15.6	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	----	6.4	----	4.9	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	----	22.5	----	21.7	<0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction		2	mg/kg	<2	<2	----	10	<2
C10 - C14 Fraction		50	mg/kg	<50	290	----	330	<50
C15 - C28 Fraction		100	mg/kg	<100	4720	----	5760	<100
C29 - C36 Fraction		100	mg/kg	<100	1200	----	1660	<100
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	----	<0.2	<0.2
Toluene	108-88-3	0.2	mg/kg	<0.2	<0.2	----	<0.2	<0.2
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	<0.2	----	<0.2	<0.2
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	<0.2	----	<0.2	<0.2
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	----	<0.2	<0.2
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	----	----	----	83.0	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE		0.1	%	----	----	----	74.0	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	----	----	----	64.8	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	----	81.9	----	83.0	82.7
2-Chlorophenol-D4	93951-73-6	0.1	%	----	84.9	----	86.2	87.5
2.4.6-Tribromophenol	118-79-6	0.1	%	----	116	----	106	96.8
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	----	86.1	----	84.9	87.6
Anthracene-d10	1719-06-8	0.1	%	----	89.1	----	89.2	87.4

ALS Environmental

Analytical Results

			Client Sample ID :	**TRIP BLANK**	**MG11/0.2**	**MG11/1.5**	**MG11/2.0**	**MG11/4.0**
			Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
			Sample Date / Time :	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00
			Laboratory Sample ID :	**ES0610221-010**	**ES0610221-014**	**ES0610221-015**	**ES0610221-016**	**ES0610221-017**
Analyte	***CAS number***	***LOR***	***Units***					
EP075(SIM)T: PAH Surrogates								
4-Terphenyl-d14	1718-51-0	0.1	%	----	67.0	----	66.9	75.2
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	97.4	80.2	----	116	90.5
Toluene-D8	2037-26-5	0.1	%	101	101	----	106	89.4
4-Bromofluorobenzene	460-00-4	0.1	%	96.0	94.5	----	109	91.3

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: TP11/0.2	TP11/1.0	TP11/3.5	TP16/0.3	TP16/1.0
Sample Matrix Type / Description:				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time:				17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00
Laboratory Sample ID:				ES0610221-018	ES0610221-019	ES0610221-020	ES0610221-021	ES0610221-022
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%	20.4	14.6	24.1	21.7	18.0
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	26	<5	----	11	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	<1	<1
Chromium	7440-47-3	2	mg/kg	19	12	----	7	3
Copper	7440-50-8	5	mg/kg	176	<5	----	273	25
Lead	7439-92-1	5	mg/kg	344	<5	----	175	18
Nickel	7440-02-0	2	mg/kg	23	<2	----	11	4
Zinc	7440-66-6	5	mg/kg	205	32	----	74	58
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	0.3	<0.1	----	3.3	<0.1
EK025G: Free cyanide by Discrete Analyser								
Total Cyanide	57-12-5	1.0	mg/kg	----	<1.0	----	----	<1.0
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls		0.10	mg/kg	----	<0.10	----	----	<0.10
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	----	<0.05	----	----	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	----	<0.05	----	----	<0.05
beta-BHC	319-85-7	0.05	mg/kg	----	<0.05	----	----	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	----	<0.05	----	----	<0.05
delta-BHC	319-86-8	0.05	mg/kg	----	<0.05	----	----	<0.05
Heptachlor	76-44-8	0.05	mg/kg	----	<0.05	----	----	<0.05
Aldrin	309-00-2	0.05	mg/kg	----	<0.05	----	----	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	----	<0.05	----	----	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	----	<0.05	----	----	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	----	<0.05	----	----	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	----	<0.05	----	----	<0.05
Dieldrin	60-57-1	0.05	mg/kg	----	<0.05	----	----	<0.05
4.4'-DDE	72-55-9	0.05	mg/kg	----	<0.05	----	----	<0.05
Endrin	72-20-8	0.05	mg/kg	----	<0.05	----	----	<0.05
beta-Endosulfan	33213-65-9	0.05	mg/kg	----	<0.05	----	----	<0.05
4.4'-DDD	72-54-8	0.05	mg/kg	----	<0.05	----	----	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	----	<0.05	----	----	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	----	<0.05	----	----	<0.05
4.4'-DDT	50-29-3	0.2	mg/kg	----	<0.2	----	----	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	----	<0.05	----	----	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	----	<0.2	----	----	<0.2

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: TP11/0.2	TP11/1.0	TP11/3.5	TP16/0.3	TP16/1.0
Sample Matrix Type / Description:				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time:				17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00
Laboratory Sample ID:				ES0610221-018	ES0610221-019	ES0610221-020	ES0610221-021	ES0610221-022
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	----	<0.05	----	----	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg	----	<0.05	----	----	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg	----	<0.2	----	----	<0.2
Dimethoate	60-51-5	0.05	mg/kg	----	<0.05	----	----	<0.05
Diazinon	333-41-5	0.05	mg/kg	----	<0.05	----	----	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	----	<0.05	----	----	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg	----	<0.2	----	----	<0.2
Malathion	121-75-5	0.05	mg/kg	----	<0.05	----	----	<0.05
Fenthion	55-38-9	0.05	mg/kg	----	<0.05	----	----	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg	----	<0.05	----	----	<0.05
Parathion	56-38-2	0.2	mg/kg	----	<0.2	----	----	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	----	<0.05	----	----	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg	----	<0.05	----	----	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg	----	<0.05	----	----	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg	----	<0.05	----	----	<0.05
Prothiofos	34643-46-4	0.05	mg/kg	----	<0.05	----	----	<0.05
Ethion	563-12-2	0.05	mg/kg	----	<0.05	----	----	<0.05
Carbophenothion	786-19-6	0.05	mg/kg	----	<0.05	----	----	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg	----	<0.05	----	----	<0.05
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	----	<0.5	----	----	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	----	<0.5	----	----	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	----	<0.5	----	----	<0.5
3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	----	<1.0	----	----	<1.0
2-Nitrophenol	88-75-5	0.5	mg/kg	----	<0.5	----	----	<0.5
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	----	<0.5	----	----	0.6
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	----	<0.5	----	----	<0.5
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	----	<0.5	----	----	<0.5
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	----	<0.5	----	----	<0.5
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	----	<0.5	----	----	<0.5
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	----	<0.5	----	----	<0.5
Pentachlorophenol	87-86-5	2.0	mg/kg	----	<2.0	----	----	<2.0
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	0.8	<0.5	<0.5	1.0	38.7
Acenaphthylene	208-96-8	0.5	mg/kg	1.4	<0.5	<0.5	1.1	11.0
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	9.8
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	14.0

ALS Environmental

Analytical Results

Client Sample ID	TP11/0.2	TP11/1.0	TP11/3.5	TP16/0.3	TP16/1.0
Sample Matrix Type / Description	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00
Laboratory Sample ID	ES0610221-018	ES0610221-019	ES0610221-020	ES0610221-021	ES0610221-022

Analyte	CAS number	LOR	Units					
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Phenanthrene	85-01-8	0.5	mg/kg	4.9	<0.5	<0.5	2.3	42.8
Anthracene	120-12-7	0.5	mg/kg	2.0	<0.5	<0.5	1.4	17.9
Fluoranthene	206-44-0	0.5	mg/kg	9.0	<0.5	<0.5	5.4	50.0
Pyrene	129-00-0	0.5	mg/kg	10.5	<0.5	<0.5	7.1	72.3
Benz(a)anthracene	56-55-3	0.5	mg/kg	6.1	<0.5	<0.5	5.0	23.8
Chrysene	218-01-9	0.5	mg/kg	5.1	<0.5	<0.5	4.4	21.2
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	6.9	<0.5	<0.5	7.7	37.1
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	2.3	<0.5	<0.5	2.3	9.3
Benzo(a)pyrene	50-32-8	0.5	mg/kg	6.2	<0.5	<0.5	6.9	39.4
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	2.9	<0.5	<0.5	4.0	13.9
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	1.1	<0.5	<0.5	1.4	4.7
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	3.6	<0.5	<0.5	5.2	19.2
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction		2	mg/kg	<2	<2	<2	13	166
C10 - C14 Fraction		50	mg/kg	<50	<50	<50	60	320
C15 - C28 Fraction		100	mg/kg	850	<100	<100	760	5120
C29 - C36 Fraction		100	mg/kg	510	<100	<100	460	2200
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	1.2	3.1
Toluene	108-88-3	0.2	mg/kg	<0.2	<0.2	<0.2	2.8	3.7
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	<0.2	<0.2	0.3	6.4
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	<0.2	<0.2	3.5	53.8
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	<0.2	2.1	7.4
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	----	80.9	----	----	63.2
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE		0.1	%	----	93.4	----	----	68.2
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	----	83.0	----	----	Not Determined
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	78.3	84.7	81.6	73.0	92.7
2-Chlorophenol-D4	93951-73-6	0.1	%	81.5	89.1	84.9	78.2	97.7
2.4.6-Tribromophenol	118-79-6	0.1	%	99.2	97.3	92.2	97.2	119
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	85.5	88.8	87.5	85.4	93.6
Anthracene-d10	1719-06-8	0.1	%	84.3	88.1	86.0	83.3	94.9

ALS Environmental

Analytical Results

				Client Sample ID :	TP11/0.2	TP11/1.0	TP11/3.5	TP16/0.3	TP16/1.0
				Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Date / Time :	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00
				Laboratory Sample ID :					
Analyte	*CAS number*	*LOR*	*Units*		ES0610221-018	ES0610221-019	ES0610221-020	ES0610221-021	ES0610221-022
EP075(SIM)T: PAH Surrogates									
4-Terphenyl-d14	1718-51-0	0.1	%		71.0	76.6	74.8	70.8	75.6
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		90.0	93.5	90.2	105	96.8
Toluene-D8	2037-26-5	0.1	%		87.8	95.1	95.6	99.7	89.6
4-Bromofluorobenzene	460-00-4	0.1	%		86.6	91.9	92.3	97.6	92.0

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: W05 Sample Matrix Type / Description: WATER Sample Date / Time: 17 Aug 2006 15:00 Laboratory Sample ID: ES0610221-011	Client Sample ID: W06 Sample Matrix Type / Description: WATER Sample Date / Time: 17 Aug 2006 15:00 Laboratory Sample ID: ES0610221-012	Client Sample ID: QA01 Sample Matrix Type / Description: WATER Sample Date / Time: 17 Aug 2006 15:00 Laboratory Sample ID: ES0610221-013		
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	0.001	<0.001		
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.0005	<0.0001		
Chromium	7440-47-3	0.001	mg/L	<0.001	0.008	<0.001		
Copper	7440-50-8	0.001	mg/L	<0.001	0.007	<0.001		
Lead	7439-92-1	0.001	mg/L	0.003	0.107	0.003		
Nickel	7440-02-0	0.001	mg/L	<0.001	0.004	<0.001		
Zinc	7440-66-6	0.005	mg/L	0.016	0.277	0.026		
EG035T: Total Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001		
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls		1	µg/L	<1	<1	<1		
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.5	µg/L	<0.5	<0.5	<0.5		
Hexachlorobenzene (HCB)	118-74-1	0.5	µg/L	<0.5	<0.5	<0.5		
beta-BHC	319-85-7	0.5	µg/L	<0.5	<0.5	<0.5		
gamma-BHC	58-89-9	0.5	µg/L	<0.5	<0.5	<0.5		
delta-BHC	319-86-8	0.5	µg/L	<0.5	<0.5	<0.5		
Heptachlor	76-44-8	0.5	µg/L	<0.5	<0.5	<0.5		
Aldrin	309-00-2	0.5	µg/L	<0.5	<0.5	<0.5		
Heptachlor epoxide	1024-57-3	0.5	µg/L	<0.5	<0.5	<0.5		
trans-Chlordane	5103-74-2	0.5	µg/L	<0.5	<0.5	<0.5		
alpha-Endosulfan	959-98-8	0.5	µg/L	<0.5	<0.5	<0.5		
cis-Chlordane	5103-71-9	0.5	µg/L	<0.5	<0.5	<0.5		
Dieldrin	60-57-1	0.5	µg/L	<0.5	<0.5	<0.5		
4.4'-DDE	72-55-9	0.5	µg/L	<0.5	<0.5	<0.5		
Endrin	72-20-8	0.5	µg/L	<0.5	<0.5	<0.5		
beta-Endosulfan	33213-65-9	0.5	µg/L	<0.5	<0.5	<0.5		
4.4'-DDD	72-54-8	0.5	µg/L	<0.5	<0.5	<0.5		
Endrin aldehyde	7421-93-4	0.5	µg/L	<0.5	<0.5	<0.5		
Endosulfan sulfate	1031-07-8	0.5	µg/L	<0.5	<0.5	<0.5		
4.4'-DDT	50-29-3	2	µg/L	<2	<2	<2		
Endrin ketone	53494-70-5	0.5	µg/L	<0.5	<0.5	<0.5		
Methoxychlor	72-43-5	2	µg/L	<2	<2	<2		
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.5	µg/L	<0.5	<0.5	<0.5		
Demeton-S-methyl	919-86-8	0.5	µg/L	<0.5	<0.5	<0.5		
Monocrotophos	6923-22-4	2	µg/L	<2	<2	<2		

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: W05 Sample Matrix Type / Description: WATER Sample Date / Time: 17 Aug 2006 15:00 Laboratory Sample ID: ES0610221-011	Client Sample ID: W06 Sample Matrix Type / Description: WATER Sample Date / Time: 17 Aug 2006 15:00 Laboratory Sample ID: ES0610221-012	Client Sample ID: QA01 Sample Matrix Type / Description: WATER Sample Date / Time: 17 Aug 2006 15:00 Laboratory Sample ID: ES0610221-013		
EP068B: Organophosphorus Pesticides (OP)								
Dimethoate	60-51-5	0.5	µg/L	<0.5	<0.5	<0.5		
Diazinon	333-41-5	0.5	µg/L	<0.5	<0.5	<0.5		
Chlorpyrifos-methyl	5598-13-0	0.5	µg/L	<0.5	<0.5	<0.5		
Parathion-methyl	298-00-0	2	µg/L	<2	<2	<2		
Malathion	121-75-5	0.5	µg/L	<0.5	<0.5	<0.5		
Fenthion	55-38-9	0.5	µg/L	<0.5	<0.5	<0.5		
Chlorpyrifos	2921-88-2	0.5	µg/L	<0.5	<0.5	<0.5		
Parathion	56-38-2	2	µg/L	<2	<2	<2		
Pirimphos-ethyl	23505-41-1	0.5	µg/L	<0.5	<0.5	<0.5		
Chlorfenvinphos	470-90-6	0.5	µg/L	<0.5	<0.5	<0.5		
Bromophos-ethyl	4824-78-6	0.5	µg/L	<0.5	<0.5	<0.5		
Fenamiphos	22224-92-6	0.5	µg/L	<0.5	<0.5	<0.5		
Prothiofos	34643-46-4	0.5	µg/L	<0.5	<0.5	<0.5		
Ethion	563-12-2	0.5	µg/L	<0.5	<0.5	<0.5		
Carbophenothion	786-19-6	0.5	µg/L	<0.5	<0.5	<0.5		
Azinphos Methyl	86-50-0	0.5	µg/L	<0.5	<0.5	<0.5		
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	1.0	µg/L	<1.0	63.5	<1.0		
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0	<1.0	<1.0		
2-Methylphenol	95-48-7	1.0	µg/L	<1.0	<1.0	<1.0		
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0	<2.0	<2.0		
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0	<1.0	<1.0		
2.4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0	<1.0	<1.0		
2.4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0	<1.0	<1.0		
2.6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0	<1.0	<1.0		
4-Chloro-3-Methylphenol	59-50-7	1.0	µg/L	<1.0	<1.0	<1.0		
2.4.6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0	<1.0	<1.0		
2.4.5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0	<1.0	<1.0		
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0	<2.0	<2.0		
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		

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: W05 Sample Matrix Type / Description: WATER Sample Date / Time: 17 Aug 2006 15:00 Laboratory Sample ID: ES0610221-011	Client Sample ID: W06 Sample Matrix Type / Description: WATER Sample Date / Time: 17 Aug 2006 15:00 Laboratory Sample ID: ES0610221-012	Client Sample ID: QA01 Sample Matrix Type / Description: WATER Sample Date / Time: 17 Aug 2006 15:00 Laboratory Sample ID: ES0610221-013		
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
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	<0.5		
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	<50	420	<50		
C15 - C28 Fraction		100	µg/L	<100	<100	<100		
C29 - C36 Fraction		50	µg/L	<50	<50	<50		
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	108-38-3 106-42-3	2	µg/L	<2	<2	<2		
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2		
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	97.7	90.8	88.1		
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE		0.1	%	85.9	77.8	76.2		
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.1	%	85.8	78.0	75.6		
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	27.1	Not Determined	28.1		
2-Chlorophenol-D4	93951-73-6	0.1	%	74.2	69.8	74.8		
2.4.6-Tribromophenol	118-79-6	0.1	%	67.1	69.2	63.8		
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	82.8	80.4	76.8		
Anthracene-d10	1719-06-8	0.1	%	83.9	78.5	75.1		
4-Terphenyl-d14	1718-51-0	0.1	%	79.9	74.2	69.2		
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	110	109	117		

ALS Environmental

Analytical Results

				Client Sample ID :	W05	W06	QA01		
				Sample Matrix Type / Description :	WATER	WATER	WATER		
				Sample Date / Time :	17 Aug 2006 15:00	17 Aug 2006 15:00	17 Aug 2006 15:00		
				Laboratory Sample ID :	ES0610221-011	ES0610221-012	ES0610221-013		
Analyte	*CAS number*	*LOR*	*Units*						
EP080S: TPH(V)/BTEX Surrogates									
Toluene-D8	2037-26-5	0.1	%		105	92.5	98.9		
4-Bromofluorobenzene	460-00-4	0.1	%		102	88.5	100		

ALS Environmental

Surrogate Control Limits

Matrix Type: WATER - 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			
EP068S: Organochlorine Pesticide Surrogate	Dibromo-DDE	10	136
EP068T: Organophosphorus Pesticide Surrogate	DEF	10	136
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	116
	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

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 GCMS			
EP068S: Organochlorine Pesticide Surrogate	Dibromo-DDE	10	136
EP068T: Organophosphorus Pesticide Surrogate	DEF	10	136
EP075(SIM): PAH/Phenols (SIM)			
EP075(SIM)S: Phenolic Compound Surrogates	Phenol-d6	24	113
	2-Chlorophenol-D4	23	134
	2,4,6-Tribromophenol	19	122
EP075(SIM)T: PAH Surrogates	2-Fluorobiphenyl	30	115
	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

Laboratory Quotation #

1/2

CH2MHILL ACN 050 070 892

CHAIN OF CUSTODY RECORD

Level 7, 9 Help Street, Chatswood, NSW 2067 Australia Tel (61 2) 9950 0200 Fax (61 2) 9950 0600

COC # [redacted]

Project # 347496	~~Purchase Order #~~ SY/148/06
Project Name Macdonaldtown Gasworks	
Company Name ALS	
Project Manager or Contact & Phone # Adam Sullivan 0400 500 264	**Report Copy to:** →
Requested Completion Date: standard TAT	**Site ID** Macdonaldtown
Sample Disposal: Dispose ☑ Return ☐	

TOTAL # OF CONTAINERS

Requested Analytical Method #

S-2	S-4	S-7	S-12	S-144	S-19	EK026	Asbestos	Hold

Preservative

QA REQUIREMENTS

Matrix Spike	☐ Yes	☐ No
Matrix Duplicate	☐ Yes	☐ No
Laboratory Duplicate	☐ Yes	☐ No
Lab Blank	☐ Yes	☐ No
Surrogate Spike	☐ Yes	☐ No
RPDs	☐ Yes	☐ No
Spike Recovery Data	☐ Yes	☐ No

LAB USE ONLY

Custody Seals	☐ Yes	☐ No
ICE	☐ Yes	☐ No

Sampling Date	Sampling Time	Type	Matrix	CLIENT SAMPLE ID (9 CHARACTERS)	LAB QC	S-2	S-4	S-7	S-12	S-144	S-19	EK026	Asbestos	Hold	Comments	Lab ID
17/8/06			SOIL	TP16/3.5	①	X	X			X		X				
				TP18/1.2	②						X	X				
				TP18/1.9	③						[redacted]			X		
				TP18/3.2	④	X		X				X				
				TP18/4.4	⑤	X		X								
				DUP08	⑥						X	X				
				MG10/0.2	⑦								X			
				MG09/B	⑧								X			
				TP18	⑨								X			
				Trip Blank	⑩		X									

CONTRACT WORK

WO: ES0610221

LAB: ASET (Asbestos)

DATE: 18-8-06

SPLIT:

ALS Environmental
Sydney
Work Order
ES0610221

Telephone : +61 (02) 8784 8555

Sampled By and Title A. Sullivan	(Please sign and print name) [signature]	**Date/Time** 18/8/06	**Relinquished By** A. Sullivan (Please sign and print name) [signature] Date/Time
Received by [signature]	(Please sign and print name) [signature]	**Date/Time** 18/8/06	**Relinquished By** (Please sign and print name) Date/Time
Received by Frank Ferraro	(Please sign and print name) [signature]	**Date/Time** 18/8/06 15:25	**Shipped Via** **Shipping #**

Special Instructions:

DISTRIBU

LL

Laboratory Quotation #

2/2

CH2MHILL ACN 050 070 892

CHAIN OF CUSTODY RECORD

Level 7, 9 Help Street, Chatswood, NSW 2067 Australia Tel (61 2) 9950 0200 Fax (61 2) 9950 0600

COC # [redacted]

Project # 347496	~~Purchase Order #~~ SY/148/06
Project Name Macdonaldtown Gasworks	
Company Name ALS	
Project Manager or Contact & Phone # Adam Sullivan 0400 500 264	**Report Copy to:** →
Requested Completion Date: standard TAT	**Site ID** Macdonaldtown
Sample Disposal: Dispose ☑ Return ☐	

Sampling Date	Sampling Time	Type	Matrix: Water	Matrix: Soil	CLIENT SAMPLE ID (9 CHARACTERS)	LAB QC	TOTAL # OF CONTAINERS	Requested Analytical Method # / Preservative: S-2	S-4	S-7	S-12	S-14A	S-19	EK026	Asbestos	HOLD	Comments	Lab ID
17/8/06			X		WO5	(11)							X					
			X		WO6	(12)							X					
			X		QA01	(13)							X					
				X	MG11/0.2	(14)		X		X				X					
					MG11/1.5	(15)				(X)				X			cancel as per attached email. 21/8/06	
					MG11/2.0	(16)							X	X				
					MG11/4.0	(17)		X	X			X		X				
					TP11/0.2	(18)		X		X					X			
					TP11/1.0	(19)		~~X~~					X	X				
					TP11/3.5	(20)				X								
V				V	TP16/0.3	(21)		X		X								
					TP16/1.0	(22)							X	X				

Sampled By and Title A. Sullivan	(Please sign and print name)	**Date/Time** 18/8/06	**Relinquished By** A. Sullivan (Please sign and print name)	**Date/Time**
Received by [illegible]	(Please sign and print name)	**Date/Time** 18/8	**Relinquished By** (Please sign and print name)	**Date/Time**
Received by Frank Ferraro	(Please sign and print name)	**Date/Time** 18/08/06 15:30	**Shipped Via**	**Shipping #**

Special Instructions:

QA REQUIREMENTS

Matrix Spike	☐ Yes	☐ No
Matrix Duplicate	☐ Yes	☐ No
Laboratory Duplicate	☐ Yes	☐ No
Lab Blank	☐ Yes	☐ No
Surrogate Spike	☐ Yes	☐ No
RPDs	☐ Yes	☐ No
Spike Recovery Data	☐ Yes	☐ No

LAB USE ONLY

Custody Seals	☐ Yes	☐ No
ICE	☐ Yes	☐ No

DISTRIBUTION: Original - LAB, Yellow - LAB, Pink - CH2MHILL

Margaret Valencic

From: Adam.Sullivan@ch2m.com.au
Sent: Saturday, 19 August 2006 1:50 PM
To: Margaret Valencic
Cc: Adam.Sullivan@ch2m.com.au
Subject: RE: COC for ALS Work Order ES0609995, Macdonaldtown Gasworks
Importance: High

Hi Margaret

I have an urgent request to halt analysis on a number of samples that were received recently from our site in Macdonaldtown. The request is presented in the table below.

ALS Work Order #	CH2MHILL Sample ID	Analysis to be removed
ES0609995	MG01/0.1	S-7
	MG01/0.5	S-7
	TP01/0.25	S-7
	TP02/0.25	S-19
	TP02/0.5	S-7
	TP03/0.25	S-7
ES0610062	MG02/2.0	S-7
	MG02/3.3	S-7
	TP04/0.25	S-19
	TP05/0.25	S-7
	TP06/0.25	S-7 and S-2
	TP07/0.25	S-7
	TP08/0.25	S-2 and S-4
	TP09/0.25	S-7
	TP10/0.25	S-7
ES0610135	MG08/0.3	S-7
	MG08/1.0	S-7
	MG09C/1.5	S-19
	MG05/1.2	S-7
	MG05/3.4	S-4
	TP14/1.0	S-2 and S-4
ES0610221	MG11/1.5 - 15	S-7

These samples can be placed on hold and may be tested at a later date.

Please confirm that this request can be action asap.

This is an urgent request. Please let me know if there will be any issues with this request.

Thanks in advance and sorry for any inconvenience.

Regards

Adam

From: Margaret Valencic [mailto:Margaret.Valencic@als.com.au]

Sent: Wed 16/08/2006 9:12 AM
To: Sullivan, Adam /SYD
Subject: COC for ALS Work Order ES0609995, Macdonaldtown Gasworks

Adam,

Please find attached COC for work order ES0609995, as discussed.

We did not receive sample TP02/1.5 on the second page of COC.

<<es0609995_coc.pdf>>

Regards

Margaret Valencic
Administration Supervisor

ALS Laboratory Group
Sydney, Australia
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Direct: +61 2 8784 8510
Fax: +61 2 8784 8566
www.alsenviro.com

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This email has been scanned through the ALS Domain
****

ALS Environmental

QUALITY CONTROL REPORT

Client	:	**CH2M HILL PTY LTD**	**Laboratory**	: ALS Environmental Sydney	**Page**	:	**1 of 29**
Contact	:	MR ADAM SULLIVAN	**Contact**	: Greg Vogel			
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	**Address**	: 277-289 Woodpark Road Smithfield NSW Australia 2164	**Work order**	:	**ES0610221**
					Amendment No.	:	
Project	:	347496 MACDONALDTOWN GASWORKS	**Quote number**	: ----	**Date received**	:	18 Aug 2006
Order number	:	- Not provided -			**Date issued**	:	29 Aug 2006
C-O-C number	:	- Not provided -					
Site	:	MACDONALDTOWN					
E-mail	:	adam.sullivan@ch2m.com.au	**E-mail**	: Greg.Vogel@alsenviro.com	**No. of samples**		
Telephone	:	02 9950 0200	**Telephone**	: +61 (02) 8784 8555	**Received**	:	22
Facsimile	:	02 9950 0600	**Facsimile**	: +61 (02) 8784 8500	**Analysed**	:	18

This final report for the ALSE work order reference ES0610221 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

EPO68: Surrogate (TP16/1.0) could not be determined for sample TP16/1.0 due to sample matrix interferences.
EPO66 & EPO68 :Sample MG11/2.0 required dilution due to matrix interferences. LOR values have been adjusted accordingly.
EPO75(SIM) : Surrogate (Phenol-d6) could not be determined for sample W06 due to sample matrix interference.
LCS recovery for various organic analytes fall outside ALS dynamic control limits, However they are within the acceptance criteria based on USEPA SW-846.

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/IED 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	Department
Celine Conceicao	Inorganics - NATA 825 (10911 - Sydney)
Pabi Subba	Organics - NATA 825 (10911 - Sydney)
PHALAK INTHAKESONE	Organics - NATA 825 (10911 - Sydney)
Phyu Phyu Lwin	Inorganics - NATA 825 (10911 - Sydney)
Sarah Millington	Inorganics - NATA 825 (10911 - Sydney)

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: SOIL ***Laboratory Duplicates (DUP) Report***

Laboratory Sample ID	*Client Sample ID*	*Analyte name*	*LOR*	*Original Result*	*Duplicate Result*	*RPD*
EA055: Moisture Content						
EA055: Moisture Content - (QC Lot: 261547)				**%**	**%**	**%**
ES0610218-001	Anonymous	Moisture Content (dried @ 103°C)	1.0 %	38.6	41.5	7.2
ES0610220-014	Anonymous	Moisture Content (dried @ 103°C)	1.0 %	14.9	17.7	17.0
EA055: Moisture Content - (QC Lot: 261548)				**%**	**%**	**%**
ES0610221-004	TP18/3.2	Moisture Content (dried @ 103°C)	1.0 %	23.4	23.6	0.7
ES0610221-019	TP11/1.0	Moisture Content (dried @ 103°C)	1.0 %	14.6	14.6	0.0
EA055: Moisture Content - (QC Lot: 262249)				**%**	**%**	**%**
ES0610313-002	Anonymous	Moisture Content (dried @ 103°C)	1.0 %	5.5	5.6	0.0
ES0610350-009	Anonymous	Moisture Content (dried @ 103°C)	1.0 %	8.3	12.4	39.4
EG005T: Total Metals by ICP-AES						
EG005T: Total Metals by ICP-AES - (QC Lot: 261950)				**mg/kg**	**mg/kg**	**%**
ES0610200-017	Anonymous	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	9	<5	58.1
		Nickel	2 mg/kg	<2	<2	0.0
		Zinc	5 mg/kg	<5	<5	0.0
ES0610221-019	TP11/1.0	Arsenic	5 mg/kg	<5	<5	0.0
		Cadmium	1 mg/kg	<1	<1	0.0
		Chromium	2 mg/kg	12	9	34.0
		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	32	28	15.1
EG005T: Total Metals by ICP-AES - (QC Lot: 262307)				**mg/kg**	**mg/kg**	**%**

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: 262307) - continued				mg/kg	mg/kg	%
ES0610221-021	TP16/0.3	Arsenic	5 mg/kg	11	9	13.0
		Cadmium	1 mg/kg	<1	<1	0.0
		Chromium	2 mg/kg	7	6	20.1
		Copper	5 mg/kg	273	275	0.7
		Lead	5 mg/kg	175	177	1.2
		Nickel	2 mg/kg	11	11	0.0
		Zinc	5 mg/kg	74	60	20.3
ES0610260-003	Anonymous	Arsenic	5 mg/kg	<5	<5	0.0
		Cadmium	1 mg/kg	<1	<1	0.0
		Chromium	2 mg/kg	10	10	0.0
		Copper	5 mg/kg	169	140	19.2
		Lead	5 mg/kg	6	6	0.0
		Nickel	2 mg/kg	6	6	0.0
		Zinc	5 mg/kg	73	66	11.3
EG035T: Total Mercury by FIMS						
EG035T: Total Mercury by FIMS - (QC Lot: 261951)				mg/kg	mg/kg	%
ES0610220-015	Anonymous	Mercury	0.1 mg/kg	<0.1	<0.1	0.0
ES0610221-019	TP11/1.0	Mercury	0.1 mg/kg	<0.1	<0.1	0.0
EG035T: Total Mercury by FIMS - (QC Lot: 262308)				mg/kg	mg/kg	%
ES0610221-021	TP16/0.3	Mercury	0.1 mg/kg	3.3	3.3	0.0
ES0610260-003	Anonymous	Mercury	0.1 mg/kg	<0.1	<0.1	0.0
EK025G: Free cyanide by Discrete Analyser						
EK025G: Free cyanide by Discrete Analyser - (QC Lot: 261288)				mg/kg	mg/kg	%
ES0610221-001	TP16/3.5	Total Cyanide	1.0 mg/kg	<1.0	<1.0	0.0
ES0610221-022	TP16/1.0	Total Cyanide	1.0 mg/kg	<1.0	<1.0	0.0
EP066: Polychlorinated Biphenyls (PCB)						
EP066: Polychlorinated Biphenyls (PCB) - (QC Lot: 260403)				mg/kg	mg/kg	%
ES0610221-002	TP18/1.2	Total Polychlorinated biphenyls	0.10 mg/kg	<0.10	<0.10	0.0
EP068A: Organochlorine Pesticides (OC)						

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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) - continued						
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 260404)				mg/kg	mg/kg	%
ES0610221-002	TP18/1.2	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: 260404)				mg/kg	mg/kg	%
ES0610221-002	TP18/1.2	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

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Matrix Type: SOIL

Laboratory Duplicates (DUP) Report

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: 260404) - continued				mg/kg	mg/kg	%
ES0610221-002	TP18/1.2	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: 261611)				mg/kg	mg/kg	%
ES0610221-001	TP16/3.5	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
ES0610221-018	TP11/0.2	Phenol	0.5 mg/kg	<0.5	<0.5	0.0
		2-Chlorophenol	0.5 mg/kg	<0.5	<0.5	0.0

ALS Environmental

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: 261611) - continued				mg/kg	mg/kg	%
ES0610221-018	TP11/0.2	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: 261611)				mg/kg	mg/kg	%
ES0610221-001	TP16/3.5	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
		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
ES0610221-018	TP11/0.2	Naphthalene	0.5 mg/kg	0.8	<0.5	40.5

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: 261611) - continued				mg/kg	mg/kg	%
ES0610221-018	TP11/0.2	Acenaphthylene	0.5 mg/kg	1.4	1.1	26.5
		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	4.9	4.6	5.6
		Anthracene	0.5 mg/kg	2.0	1.9	7.4
		Fluoranthene	0.5 mg/kg	9.0	7.1	23.7
		Pyrene	0.5 mg/kg	10.5	8.1	25.7
		Benz(a)anthracene	0.5 mg/kg	6.1	4.6	27.2
		Chrysene	0.5 mg/kg	5.1	3.8	30.2
		Benzo(b)fluoranthene	0.5 mg/kg	6.9	4.8	35.4
		Benzo(k)fluoranthene	0.5 mg/kg	2.3	1.6	38.8
		Benzo(a)pyrene	0.5 mg/kg	6.2	4.4	34.4
		Indeno(1,2,3,cd)pyrene	0.5 mg/kg	2.9	2.0	37.6
		Dibenz(a,h)anthracene	0.5 mg/kg	1.1	0.7	37.8
		Benzo(g,h,i)perylene	0.5 mg/kg	3.6	2.5	37.7
EP080/071: Total Petroleum Hydrocarbons						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 260952)				mg/kg	mg/kg	%
ES0610251-001	Anonymous	C6 - C9 Fraction	2 mg/kg	237	235	0.9
ES0610256-001	Anonymous	C6 - C9 Fraction	2 mg/kg	34	29	16.9
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 260998)				mg/kg	mg/kg	%
ES0610242-003	Anonymous	C6 - C9 Fraction	2 mg/kg	20	24	18.5
ES0610242-004	Anonymous	C6 - C9 Fraction	2 mg/kg	<2	<2	0.0
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 261612)				mg/kg	mg/kg	%
ES0610221-001	TP16/3.5	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
ES0610221-018	TP11/0.2	C10 - C14 Fraction	50 mg/kg	<50	<50	0.0
		C15 - C28 Fraction	100 mg/kg	850	960	12.4
		C29 - C36 Fraction	100 mg/kg	510	750	38.1

Matrix Type: SOIL

Laboratory Duplicates (DUP) Report

Laboratory Sample ID	Client Sample ID	Analyte name	LOR	Original Result	Duplicate Result	RPD
EP080: BTEX						
EP080: BTEX - (QC Lot: 260952)				mg/kg	mg/kg	%
ES0610251-001	Anonymous	Benzene	0.2 mg/kg	2.4	2.5	0.0
		Toluene	0.2 mg/kg	31.0	31.8	2.3
		Ethylbenzene	0.2 mg/kg	18.9	20.6	8.7
		meta- & para-Xylene	0.2 mg/kg	98.9	106	7.3
		ortho-Xylene	0.2 mg/kg	45.5	48.2	5.7
ES0610256-001	Anonymous	Benzene	0.2 mg/kg	<0.2	0.3	0.0
		Toluene	0.2 mg/kg	2.7	2.2	19.5
		Ethylbenzene	0.2 mg/kg	1.0	1.3	24.5
		meta- & para-Xylene	0.2 mg/kg	4.9	5.0	2.4
		ortho-Xylene	0.2 mg/kg	3.1	2.9	8.1
EP080: BTEX - (QC Lot: 260998)				mg/kg	mg/kg	%
ES0610242-003	Anonymous	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	1.1	0.7	49.0
		meta- & para-Xylene	0.2 mg/kg	2.5	1.5	47.9
		ortho-Xylene	0.2 mg/kg	<0.2	<0.2	0.0
ES0610242-004	Anonymous	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

Matrix Type: WATER

Laboratory Duplicates (DUP) Report

Laboratory Sample ID	Client Sample ID	Analyte name	LOR	Original Result	Duplicate Result	RPD
EG020T: Total Metals by ICP-MS						
EG020T: Total Metals by ICP-MS - (QC Lot: 260308)				mg/L	mg/L	%
EP0602041-001	Anonymous	Arsenic	0.001 mg/L	0.003	0.003	0.0
		Cadmium	0.0001 mg/L	0.0002	0.0001	0.0
		Chromium	0.001 mg/L	<0.001	<0.001	0.0
		Copper	0.001 mg/L	<0.001	<0.001	0.0

ALS Environmental

Matrix Type: WATER

Laboratory Duplicates (DUP) Report

Laboratory Sample ID	Client Sample ID	Analyte name	LOR	Original Result	Duplicate Result	RPD
EG020T: Total Metals by ICP-MS - continued						
EG020T: Total Metals by ICP-MS - (QC Lot: 260308) - continued				mg/L	mg/L	%
EP0602041-001	Anonymous	Lead	0.001 mg/L	<0.001	<0.001	0.0
		Nickel	0.001 mg/L	<0.001	<0.001	0.0
		Zinc	0.005 mg/L	0.007	<0.005	29.3
ES0610241-001	Anonymous	Arsenic	0.001 mg/L	<0.001	<0.001	0.0
		Cadmium	0.0001 mg/L	<0.0001	<0.0001	0.0
		Chromium	0.001 mg/L	<0.001	<0.001	0.0
		Copper	0.001 mg/L	0.003	0.003	0.0
		Lead	0.001 mg/L	<0.001	<0.001	0.0
		Nickel	0.001 mg/L	<0.001	<0.001	0.0
		Zinc	0.005 mg/L	<0.005	<0.005	0.0
EG035T: Total Mercury by FIMS						
EG035T: Total Mercury by FIMS - (QC Lot: 260382)				mg/L	mg/L	%
ES0610115-012	Anonymous	Mercury	0.0001 mg/L	<0.0001	<0.0001	0.0
ES0610243-005	Anonymous	Mercury	0.0001 mg/L	<0.0001	<0.0001	0.0
EP080/071: Total Petroleum Hydrocarbons						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 262274)				µg/L	µg/L	%
ES0610200-022	Anonymous	C6 - C9 Fraction	20 µg/L	<20	<20	0.0
ES0610200-027	Anonymous	C6 - C9 Fraction	20 µg/L	140	100	31.5
EP080: BTEX						
EP080: BTEX - (QC Lot: 262274)				µg/L	µg/L	%
ES0610200-022	Anonymous	Benzene	1 µg/L	<1	<1	0.0
		Toluene	2 µg/L	<2	<2	0.0
		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
ES0610200-027	Anonymous	Benzene	1 µg/L	<1	<1	0.0
		Toluene	2 µg/L	<2	<2	0.0
		Ethylbenzene	2 µg/L	<2	<2	0.0
		meta- & para-Xylene	2 µg/L	<2	<2	0.0

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: 262274) - continued				**µg/L**	**µg/L**	**%**
ES0610200-027	Anonymous	ortho-Xylene	2 µg/L	<2	<2	0.0

ALS Environmental

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.

Matrix Type: SOIL

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*
EG005T: Total Metals by ICP-AES						
EG005T: Total Metals by ICP-AES - (QC Lot: 261950)		mg/kg	mg/kg	%	%	%
Arsenic	5 mg/kg	<5	----	----	----	----
	5 mg/kg	----	13.1	106	86.6	123
Cadmium	1 mg/kg	----	2.76	99.0	79.9	120
	1 mg/kg	<1	----	----	----	----
Chromium	2 mg/kg	<2	----	----	----	----
	2 mg/kg	----	60.9	100	87.1	119
Copper	5 mg/kg	<5	----	----	----	----
	5 mg/kg	----	54.7	102	85.2	117
Lead	5 mg/kg	<5	----	----	----	----
	5 mg/kg	----	55.2	97.9	82.1	117
Nickel	2 mg/kg	<2	----	----	----	----
	2 mg/kg	----	54.8	105	88	122
Zinc	5 mg/kg	<5	----	----	----	----
	5 mg/kg	----	104	97.9	79	116
EG005T: Total Metals by ICP-AES - (QC Lot: 262307)		mg/kg	mg/kg	%	%	%
Arsenic	5 mg/kg	<5	----	----	----	----
	5 mg/kg	----	13.1	102	86.6	123
Cadmium	1 mg/kg	<1	----	----	----	----
	1 mg/kg	----	2.76	92.1	79.9	120
Chromium	2 mg/kg	----	60.9	95.1	87.1	119
	2 mg/kg	<2	----	----	----	----
Copper	5 mg/kg	----	54.7	96.4	85.2	117
	5 mg/kg	<5	----	----	----	----
Lead	5 mg/kg	----	55.2	92.3	82.1	117
	5 mg/kg	<5	----	----	----	----

ALS Environmental

Matrix Type: SOIL

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EG005T: Total Metals by ICP-AES - continued						
EG005T: Total Metals by ICP-AES - (QC Lot: 262307) - continued		mg/kg	mg/kg	%	%	%
Nickel	2 mg/kg	<2	----	----	----	----
	2 mg/kg	----	54.8	98.6	88	122
Zinc	5 mg/kg	<5	----	----	----	----
	5 mg/kg	----	104	92.0	79	116
EG035T: Total Mercury by FIMS						
EG035T: Total Mercury by FIMS - (QC Lot: 261951)		mg/kg	mg/kg	%	%	%
Mercury	0.1 mg/kg	<0.1	----	----	----	----
	0.1 mg/kg	----	1.4	89.0	73.7	108
EG035T: Total Mercury by FIMS - (QC Lot: 262308)		mg/kg	mg/kg	%	%	%
Mercury	0.1 mg/kg	----	1.4	85.4	73.7	108
	0.1 mg/kg	<0.1	----	----	----	----
EK025G: Free cyanide by Discrete Analyser						
EK025G: Free cyanide by Discrete Analyser - (QC Lot: 261288)		mg/kg	mg/kg	%	%	%
Total Cyanide	1.0 mg/kg	<1.0	----	----	----	----
	1 mg/kg	----	50	99.0	70	130
EP066: Polychlorinated Biphenyls (PCB)						
EP066: Polychlorinated Biphenyls (PCB) - (QC Lot: 260403)		mg/kg	mg/kg	%	%	%
Total Polychlorinated biphenyls	0.10 mg/kg	<0.10	----	----	----	----
	0.1 mg/kg	----	0.5	70.6	57.4	117
EP068A: Organochlorine Pesticides (OC)						
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 260404)		mg/kg	mg/kg	%	%	%
4,4'-DDD	0.05 mg/kg	----	0.25	75.8	65.3	116
	0.05 mg/kg	<0.05	----	----	----	----
4,4'-DDE	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	80.4	67.5	114
4,4'-DDT	0.2 mg/kg	----	0.25	78.1	58.4	127
	0.2 mg/kg	<0.2	----	----	----	----

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*	*High*
EP068A: Organochlorine Pesticides (OC) - continued						
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 260404) - continued		mg/kg	mg/kg	%	%	%
Aldrin	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	81.0	67	113
alpha-BHC	0.05 mg/kg	----	0.25	97.7	60.8	116
	0.05 mg/kg	<0.05	----	----	----	----
alpha-Endosulfan	0.05 mg/kg	----	0.25	76.1	65.8	116
	0.05 mg/kg	<0.05	----	----	----	----
beta-BHC	0.05 mg/kg	----	0.25	78.0	59.8	117
	0.05 mg/kg	<0.05	----	----	----	----
beta-Endosulfan	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	79.7	66.1	117
cis-Chlordane	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	81.8	57.3	120
delta-BHC	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	94.4	65.8	114
Dieldrin	0.05 mg/kg	----	0.25	79.1	67.4	116
	0.05 mg/kg	<0.05	----	----	----	----
Endosulfan sulfate	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	97.5	63.6	119
Endrin	0.05 mg/kg	----	0.25	64.0	63	121
	0.05 mg/kg	<0.05	----	----	----	----
Endrin aldehyde	0.05 mg/kg	----	0.25	85.8	57.3	115
	0.05 mg/kg	<0.05	----	----	----	----
Endrin ketone	0.05 mg/kg	----	0.25	106	63.6	117
	0.05 mg/kg	<0.05	----	----	----	----
gamma-BHC	0.05 mg/kg	----	0.25	82.1	59.8	118
	0.05 mg/kg	<0.05	----	----	----	----
Heptachlor	0.05 mg/kg	----	0.25	82.0	65.6	115
	0.05 mg/kg	<0.05	----	----	----	----
Heptachlor epoxide	0.05 mg/kg	----	0.25	87.7	65.6	113
	0.05 mg/kg	<0.05	----	----	----	----

Matrix Type: SOIL

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP068A: Organochlorine Pesticides (OC) - continued						
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 260404) - continued		mg/kg	mg/kg	%	%	%
Hexachlorobenzene (HCB)	0.05 mg/kg	----	0.25	82.6	59.4	115
	0.05 mg/kg	<0.05	----	----	----	----
Methoxychlor	0.2 mg/kg	----	0.25	67.9	50.4	132
	0.2 mg/kg	<0.2	----	----	----	----
trans-Chlordane	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	82.8	60.7	113
EP068B: Organophosphorus Pesticides (OP)						
EP068B: Organophosphorus Pesticides (OP) - (QC Lot: 260404)		mg/kg	mg/kg	%	%	%
Methyl Azinphos	0.05 mg/kg	----	0.25	76.9	29.8	137
	0.05 mg/kg	<0.05	----	----	----	----
Bromophos-ethyl	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	78.8	64.3	114
Carbophenothion	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	79.8	59.5	119
Chlorfenvinphos	0.05 mg/kg	----	0.25	90.0	61.4	123
	0.05 mg/kg	<0.05	----	----	----	----
Chlorpyrifos	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	77.9	64.2	111
Chlorpyrifos-methyl	0.05 mg/kg	----	0.25	84.9	65.1	111
	0.05 mg/kg	<0.05	----	----	----	----
Demeton-S-methyl	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	71.0	10.1	159
Diazinon	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	82.2	64.9	111
Dichlorvos	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	73.8	25.5	124
Dimethoate	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	78.4	48.6	126
Ethion	0.05 mg/kg	----	0.25	67.8	62	116
	0.05 mg/kg	<0.05	----	----	----	----

ALS Environmental

Matrix Type: SOIL

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP068B: Organophosphorus Pesticides (OP) - continued						
EP068B: Organophosphorus Pesticides (OP) - (QC Lot: 260404) - continued		mg/kg	mg/kg	%	%	%
Fenamiphos	0.05 mg/kg	----	0.25	78.4	45.5	128
	0.05 mg/kg	<0.05	----	----	----	----
Fenthion	0.05 mg/kg	----	0.25	81.0	64.7	110
	0.05 mg/kg	<0.05	----	----	----	----
Malathion	0.05 mg/kg	----	0.25	90.6	60.4	127
	0.05 mg/kg	<0.05	----	----	----	----
Monocrotophos	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	0.25	61.4	2.88	149
Parathion	0.2 mg/kg	----	0.25	97.2	60	116
	0.2 mg/kg	<0.2	----	----	----	----
Parathion-methyl	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	0.25	82.0	61.4	113
Pirimphos-ethyl	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	82.0	64.8	111
Prothiofos	0.05 mg/kg	<0.05	----	----	----	----
	0.05 mg/kg	----	0.25	80.9	65.4	111
EP075(SIM)A: Phenolic Compounds						
EP075(SIM)A: Phenolic Compounds - (QC Lot: 261611)		mg/kg	mg/kg	%	%	%
2,4,5-Trichlorophenol	0.5 mg/kg	----	4	80.4	68.9	112
	0.5 mg/kg	<0.5	----	----	----	----
2,4,6-Trichlorophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	79.7	62.2	115
2,4-Dichlorophenol	0.5 mg/kg	----	4	90.6	71.6	113
	0.5 mg/kg	<0.5	----	----	----	----
2,4-Dimethylphenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	97.8	74.5	119
2,6-Dichlorophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	95.6	74.8	115
2-Chlorophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	97.7	80.2	115

ALS Environmental

Matrix Type: SOIL

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP075(SIM)A: Phenolic Compounds - continued						
EP075(SIM)A: Phenolic Compounds - (QC Lot: 261611) - continued		mg/kg	mg/kg	%	%	%
2-Methylphenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	95.5	76.8	114
2-Nitrophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	79.9	60.3	117
3- & 4-Methylphenol	1.0 mg/kg	----	8	93.8	72	119
	1.0 mg/kg	<1.0	----	----	----	----
4-Chloro-3-Methylphenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	97.9	76.4	114
Pentachlorophenol	1.0 mg/kg	----	8	27.7	1.23	91.6
	1.0 mg/kg	<1.0	----	----	----	----
Phenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	95.4	73.9	115
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 261611)		mg/kg	mg/kg	%	%	%
Acenaphthene	0.5 mg/kg	----	4	99.3	81.5	112
	0.5 mg/kg	<0.5	----	----	----	----
Acenaphthylene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	98.5	79.6	113
Anthracene	0.5 mg/kg	----	4	106	81.1	112
	0.5 mg/kg	<0.5	----	----	----	----
Benz(a)anthracene	0.5 mg/kg	----	4	104	77.2	112
	0.5 mg/kg	<0.5	----	----	----	----
Benzo(a)pyrene	0.5 mg/kg	----	4	97.0	76.4	113
	0.5 mg/kg	<0.5	----	----	----	----
Benzo(b)fluoranthene	0.5 mg/kg	----	4	112	71.8	118
	0.5 mg/kg	<0.5	----	----	----	----
Benzo(g,h,i)perylene	0.5 mg/kg	----	4	98.9	72.4	114
	0.5 mg/kg	<0.5	----	----	----	----
Benzo(k)fluoranthene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	98.9	74.2	117

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)B: Polynuclear Aromatic Hydrocarbons - continued						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 261611) - continued		mg/kg	mg/kg	%	%	%
Chrysene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	102	79.8	114
Dibenz(a,h)anthracene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	95.8	71.7	113
Fluoranthene	0.5 mg/kg	----	4	104	78.8	113
	0.5 mg/kg	<0.5	----	----	----	----
Fluorene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	100	79.9	112
Indeno(1,2,3,cd)pyrene	0.5 mg/kg	----	4	96.8	71	113
	0.5 mg/kg	<0.5	----	----	----	----
Naphthalene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	104	81.9	113
Phenanthrene	0.5 mg/kg	----	4	105	79.4	114
	0.5 mg/kg	<0.5	----	----	----	----
Pyrene	0.5 mg/kg	----	4	106	78.9	113
	0.5 mg/kg	<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 260952)		mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	2 mg/kg	<2	----	----	----	----
	2 mg/kg	----	26	93.2	68.4	128
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 260998)		mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	2 mg/kg	<2	----	----	----	----
	2 mg/kg	----	26	116	68.4	128
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 261612)		mg/kg	mg/kg	%	%	%
C10 - C14 Fraction	50 mg/kg	----	200	94.3	75.2	116
	50 mg/kg	<50	----	----	----	----
C15 - C28 Fraction	100 mg/kg	----	200	85.7	75.3	113
	100 mg/kg	<100	----	----	----	----

ALS Environmental

Matrix Type: SOIL

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP080/071: Total Petroleum Hydrocarbons - continued						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 261612) - continued		mg/kg	mg/kg	%	%	%
C29 - C36 Fraction	100 mg/kg	<100	----	----	----	----
	100 mg/kg	----	200	86.0	72.6	117
EP080: BTEX						
EP080: BTEX - (QC Lot: 260952)		mg/kg	mg/kg	%	%	%
Benzene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	1	84.6	67.5	125
Ethylbenzene	0.2 mg/kg	----	1	91.7	65.3	126
	0.2 mg/kg	<0.2	----	----	----	----
meta- & para-Xylene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	2	84.2	66.5	124
ortho-Xylene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	1	95.5	66.7	123
Toluene	0.2 mg/kg	----	1	84.8	69	122
	0.2 mg/kg	<0.2	----	----	----	----
EP080: BTEX - (QC Lot: 260998)		mg/kg	mg/kg	%	%	%
Benzene	0.2 mg/kg	----	1	119	67.5	125
	0.2 mg/kg	<0.2	----	----	----	----
Ethylbenzene	0.2 mg/kg	----	1	120	65.3	126
	0.2 mg/kg	<0.2	----	----	----	----
meta- & para-Xylene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	2	111	66.5	124
ortho-Xylene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	1	120	66.7	123
Toluene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	1	121	69	122

Matrix Type: WATER

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High

ALS Environmental

Matrix Type: WATER

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EG020T: Total Metals by ICP-MS						
EG020T: Total Metals by ICP-MS - (QC Lot: 260308)		mg/L	mg/L	%	%	%
Arsenic	0.001 mg/L	<0.001	----	----	----	----
	0.001 mg/L	----	0.1	95.1	78.7	111
Cadmium	0.0001 mg/L	<0.0001	----	----	----	----
	0.0001 mg/L	----	0.1	91.3	79.3	111
Chromium	0.001 mg/L	----	0.1	95.1	83.4	114
	0.001 mg/L	<0.001	----	----	----	----
Copper	0.001 mg/L	<0.001	----	----	----	----
	0.001 mg/L	----	0.1	89.8	80.1	118
Lead	0.001 mg/L	----	0.1	92.0	83.2	116
	0.001 mg/L	<0.001	----	----	----	----
Nickel	0.001 mg/L	----	0.1	92.8	84.3	115
	0.001 mg/L	<0.001	----	----	----	----
Zinc	0.005 mg/L	<0.005	----	----	----	----
	0.005 mg/L	----	0.1	88.6	77.2	109
EG035T: Total Mercury by FIMS						
EG035T: Total Mercury by FIMS - (QC Lot: 260382)		mg/L	mg/L	%	%	%
Mercury	0.0001 mg/L	<0.0001	----	----	----	----
	0.0001 mg/L	----	0.010	98.9	78.6	118
EP066: Polychlorinated Biphenyls (PCB)						
EP066: Polychlorinated Biphenyls (PCB) - (QC Lot: 260252)		µg/L	µg/L	%	%	%
Total Polychlorinated biphenyls	1 µg/L	----	10	107	61.6	107
	1 µg/L	<1	----	----	----	----
EP068A: Organochlorine Pesticides (OC)						
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 260253)		µg/L	µg/L	%	%	%
4,4'-DDD	0.5 µg/L	<0.5	----	----	----	----
	0.5 µg/L	----	5	94.5	68.2	117
4,4'-DDE	0.5 µg/L	<0.5	----	----	----	----
	0.5 µg/L	----	5	93.1	68.9	114

ALS Environmental

Matrix Type: WATER

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
EP068A: Organochlorine Pesticides (OC) - continued						
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 260253) - continued		µg/L	µg/L	%	%	%
4,4'-DDT	2.0 µg/L	----	5	81.7	57.6	123
	2 µg/L	<2	----	----	----	----
Aldrin	0.5 µg/L	----	5	91.4	68.5	114
	0.5 µg/L	<0.5	----	----	----	----
alpha-BHC	0.5 µg/L	<0.5	----	----	----	----
	0.5 µg/L	----	5	86.8	59.5	123
alpha-Endosulfan	0.5 µg/L	----	5	92.5	68.5	116
	0.5 µg/L	<0.5	----	----	----	----
beta-BHC	0.5 µg/L	----	5	87.1	59.3	122
	0.5 µg/L	<0.5	----	----	----	----
beta-Endosulfan	0.5 µg/L	----	5	93.3	68	117
	0.5 µg/L	<0.5	----	----	----	----
cis-Chlordane	0.5 µg/L	<0.5	----	----	----	----
	0.5 µg/L	----	5	92.4	66.5	117
delta-BHC	0.5 µg/L	<0.5	----	----	----	----
	0.5 µg/L	----	5	88.9	68	116
Dieldrin	0.5 µg/L	----	5	93.0	68.8	116
	0.5 µg/L	<0.5	----	----	----	----
Endosulfan sulfate	0.5 µg/L	----	5	85.9	65.9	119
	0.5 µg/L	<0.5	----	----	----	----
Endrin	0.5 µg/L	<0.5	----	----	----	----
	0.5 µg/L	----	5	94.0	66.2	122
Endrin aldehyde	0.5 µg/L	----	5	92.9	66.6	117
	0.5 µg/L	<0.5	----	----	----	----
Endrin ketone	0.5 µg/L	----	5	91.5	65	118
	0.5 µg/L	<0.5	----	----	----	----
gamma-BHC	0.5 µg/L	<0.5	----	----	----	----
	0.5 µg/L	----	5	105	59.1	121
Heptachlor	0.5 µg/L	<0.5	----	----	----	----
	0.5 µg/L	----	5	90.6	67.1	116

ALS Environmental

Matrix Type: WATER

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP068A: Organochlorine Pesticides (OC) - continued						
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 260253) - continued		µg/L	µg/L	%	%	%
Heptachlor epoxide	0.5 µg/L	<0.5	----	----	----	----
	0.5 µg/L	----	5	90.4	69.8	113
Hexachlorobenzene (HCB)	0.5 µg/L	----	5	84.3	58.4	121
	0.5 µg/L	<0.5	----	----	----	----
Methoxychlor	2.0 µg/L	----	5	71.4	49.6	134
	2 µg/L	<2	----	----	----	----
trans-Chlordane	0.5 µg/L	----	5	92.1	68.3	112
	0.5 µg/L	<0.5	----	----	----	----
EP068B: Organophosphorus Pesticides (OP)						
EP068B: Organophosphorus Pesticides (OP) - (QC Lot: 260253)		µg/L	µg/L	%	%	%
Methyl Azinphos	0.5 µg/L	----	5	42.6	45.6	138
	0.5 µg/L	<0.5	----	----	----	----
Bromophos-ethyl	0.5 µg/L	----	5	90.9	67.7	114
	0.5 µg/L	<0.5	----	----	----	----
Carbophenothion	0.5 µg/L	<0.5	----	----	----	----
	0.5 µg/L	----	5	91.1	65	121
Chlorfenvinphos	0.5 µg/L	----	5	95.0	64	127
	0.5 µg/L	<0.5	----	----	----	----
Chlorpyrifos	0.5 µg/L	----	5	89.7	70	112
	0.5 µg/L	<0.5	----	----	----	----
Chlorpyrifos-methyl	0.5 µg/L	<0.5	----	----	----	----
	0.5 µg/L	----	5	85.2	69.5	112
Demeton-S-methyl	0.5 µg/L	<0.5	----	----	----	----
	0.5 µg/L	----	5	77.8	26.8	154
Diazinon	0.5 µg/L	----	5	87.8	66.5	115
	0.5 µg/L	<0.5	----	----	----	----
Dichlorvos	0.5 µg/L	<0.5	----	----	----	----
	0.5 µg/L	----	5	80.7	56.9	128
Dimethoate	0.5 µg/L	----	5	75.6	48.6	126
	0.5 µg/L	<0.5	----	----	----	----

ALS Environmental

Matrix Type: WATER

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP068B: Organophosphorus Pesticides (OP) - continued						
EP068B: Organophosphorus Pesticides (OP) - (QC Lot: 260253) - continued		µg/L	µg/L	%	%	%
Ethion	0.5 µg/L	<0.5	----	----	----	----
	0.5 µg/L	----	5	89.9	67	116
Fenamiphos	0.5 µg/L	<0.5	----	----	----	----
	0.5 µg/L	----	5	87.1	50.5	129
Fenthion	0.5 µg/L	<0.5	----	----	----	----
	0.5 µg/L	----	5	89.0	69.8	114
Malathion	0.5 µg/L	<0.5	----	----	----	----
	0.5 µg/L	----	5	77.4	59.8	127
Monocrotophos	0.5 µg/L	----	5	19.1	10	89.1
	2 µg/L	<2	----	----	----	----
Parathion	2.0 µg/L	----	5	89.0	62.5	116
	2 µg/L	<2	----	----	----	----
Parathion-methyl	2.0 µg/L	----	5	83.0	63.9	115
	2 µg/L	<2	----	----	----	----
Pirimphos-ethyl	0.5 µg/L	<0.5	----	----	----	----
	0.5 µg/L	----	5	91.2	67.1	112
Prothiofos	0.5 µg/L	----	5	91.0	69.2	111
	0.5 µg/L	<0.5	----	----	----	----
EP075(SIM)A: Phenolic Compounds						
EP075(SIM)A: Phenolic Compounds - (QC Lot: 260249)		µg/L	µg/L	%	%	%
2,4,5-Trichlorophenol	0.2 µg/L	----	2	78.4	65.3	121
	0.5 µg/L	<0.5	----	----	----	----
2,4,6-Trichlorophenol	0.2 µg/L	----	2	76.9	63.1	122
	0.5 µg/L	<0.5	----	----	----	----
2,4-Dichlorophenol	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	77.3	64.4	121
2,4-Dimethylphenol	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	83.2	61.7	118
2,6-Dichlorophenol	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	79.5	65.7	120

ALS Environmental

Matrix Type: WATER

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: 260249) - continued		µg/L	µg/L	%	%	%
2-Chlorophenol	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	81.1	62.3	117
2-Methylphenol	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	64.1	53.9	110
2-Nitrophenol	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	75.2	58.2	127
3- & 4-Methylphenol	0.4 µg/L	----	4	58.2	40.9	103
	1.0 µg/L	<1.0	----	----	----	----
4-Chloro-3-Methylphenol	0.2 µg/L	----	2	80.8	66.4	119
	0.5 µg/L	<0.5	----	----	----	----
Pentachlorophenol	0.4 µg/L	----	4	44.5	10.9	145
	1.0 µg/L	<1.0	----	----	----	----
Phenol	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	31.2	19.5	60.7
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 260249)		µg/L	µg/L	%	%	%
Acenaphthene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	84.8	62.2	113
Acenaphthylene	0.2 µg/L	----	2	85.7	63.6	114
	0.5 µg/L	<0.5	----	----	----	----
Anthracene	0.2 µg/L	----	2	89.9	64.3	116
	0.5 µg/L	<0.5	----	----	----	----
Benz(a)anthracene	0.2 µg/L	----	2	86.0	64.1	117
	0.5 µg/L	<0.5	----	----	----	----
Benzo(a)pyrene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	84.4	63.3	117
Benzo(b)fluoranthene	0.2 µg/L	----	2	86.4	61.7	119
	0.5 µg/L	<0.5	----	----	----	----
Benzo(g,h,i)perylene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	85.4	59.1	118

ALS Environmental

Matrix Type: WATER

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - continued						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 260249) - continued		µg/L	µg/L	%	%	%
Benzo(k)fluoranthene	0.2 µg/L	----	2	83.2	61.7	117
	0.5 µg/L	<0.5	----	----	----	----
Chrysene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	84.1	62.5	116
Dibenz(a,h)anthracene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	82.6	61.2	117
Fluoranthene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	87.4	63.6	118
Fluorene	0.2 µg/L	----	2	85.8	63.9	115
	0.5 µg/L	<0.5	----	----	----	----
Indeno(1,2,3,cd)pyrene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	83.7	59.9	118
Naphthalene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	116	62.4	114
Phenanthrene	0.2 µg/L	----	2	89.4	62.6	116
	0.5 µg/L	<0.5	----	----	----	----
Pyrene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	88.5	63.1	118
EP080/071: Total Petroleum Hydrocarbons						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 260250)		µg/L	µg/L	%	%	%
C10 - C14 Fraction	50 µg/L	<50	----	----	----	----
	50 µg/L	----	200	99.5	58.9	131
C15 - C28 Fraction	100 µg/L	----	200	95.5	73.9	138
	100 µg/L	<100	----	----	----	----
C29 - C36 Fraction	50 µg/L	<50	----	----	----	----
	50 µg/L	----	200	101	62.7	131
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 262274)		µg/L	µg/L	%	%	%
C6 - C9 Fraction	20 µg/L	<20	----	----	----	----
	20 µg/L	----	260	98.0	75	127

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*
EP080: BTEX						
EP080: BTEX - (QC Lot: 262274)		µg/L	µg/L	%	%	%
Benzene	1 µg/L	<1	----	----	----	----
	1 µg/L	----	10	109	76.2	124
Ethylbenzene	2 µg/L	<2	----	----	----	----
	2 µg/L	----	10	101	76.1	122
meta- & para-Xylene	2 µg/L	----	10	102	75.7	123
	2 µg/L	<2	----	----	----	----
ortho-Xylene	2 µg/L	<2	----	----	----	----
	2 µg/L	----	10	97.3	77.9	121
Toluene	2 µg/L	<2	----	----	----	----
	2 µg/L	----	10	105	74.4	124

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*	
					Sample Result	*Spike Recovery*	*Static Limits*	
Analyte name	*Laboratory Sample ID*	*Client Sample ID*	*LOR*	*Spike Concentration*		*MS*	*Low*	*High*
EG005T: Total Metals by ICP-AES								
EG005T: Total Metals by ICP-AES - (QC Lot: 261950)				mg/kg	mg/kg	%	%	%
Arsenic	ES0610200-017	Anonymous	5 mg/kg	50	<5	104	70	130
Cadmium			1 mg/kg	50	<1	89.1	70	130
Chromium			2 mg/kg	50	2	91.7	70	130
Copper			5 mg/kg	250	<5	113	70	130
Lead			5 mg/kg	250	9	84.8	70	130
Nickel			2 mg/kg	50	<2	89.4	70	130
Zinc			5 mg/kg	250	<5	81.7	70	130
EG005T: Total Metals by ICP-AES - (QC Lot: 262307)				mg/kg	mg/kg	%	%	%
Arsenic	ES0610221-021	TP16/0.3	5 mg/kg	50	11	104	70	130
Cadmium			1 mg/kg	50	<1	97.8	70	130
Chromium			2 mg/kg	50	7	100	70	130
Copper			5 mg/kg	250	273	112	70	130
Lead			5 mg/kg	250	175	114	70	130
Nickel			2 mg/kg	50	11	99.2	70	130
Zinc			5 mg/kg	250	74	94.4	70	130
EG035T: Total Mercury by FIMS								
EG035T: Total Mercury by FIMS - (QC Lot: 261951)				mg/kg	mg/kg	%	%	%
Mercury	ES0610220-015	Anonymous	0.1 mg/kg	5	<0.1	95.6	70	130
EG035T: Total Mercury by FIMS - (QC Lot: 262308)				mg/kg	mg/kg	%	%	%
Mercury	ES0610221-021	TP16/0.3	0.1 mg/kg	5	3.3	78.6	70	130
EK025G: Free cyanide by Discrete Analyser								
EK025G: Free cyanide by Discrete Analyser - (QC Lot: 261288)				mg/kg	mg/kg	%	%	%
Total Cyanide	ES0610221-001	TP16/3.5	1 mg/kg	50	<1.0	100	70	130
EP066: Polychlorinated Biphenyls (PCB)								

ALS Environmental

Matrix Type: SOIL

Matrix Spike (MS) Report

					Actual Results		Recovery Limits	
					Sample Result	Spike Recovery	Static Limits	
Analyte name	*Laboratory Sample ID*	*Client Sample ID*	*LOR*	*Spike Concentration*		*MS*	*Low*	*High*
EP066: Polychlorinated Biphenyls (PCB) - continued								
EP066: Polychlorinated Biphenyls (PCB) - (QC Lot: 260403)				mg/kg	mg/kg	%	%	%
Total Polychlorinated biphenyls	ES0610221-002	TP18/1.2	0.1 mg/kg	0.5	<0.10	90.6	70	130
EP068A: Organochlorine Pesticides (OC)								
EP068A: Organochlorine Pesticides (OC) - (QC Lot: 260404)				mg/kg	mg/kg	%	%	%
gamma-BHC	ES0610221-002	TP18/1.2	0.05 mg/kg	0.25	<0.05	78.4	75.65	110.44
Heptachlor			0.05 mg/kg	0.25	<0.05	72.8	72.2	106.71
Aldrin			0.05 mg/kg	0.25	<0.05	72.2	77.54	107.0
Dieldrin			0.05 mg/kg	0.25	<0.05	73.6	76.37	109.7
Endrin			0.05 mg/kg	1	<0.05	78.6	68.51	119.47
4,4'-DDT			0.2 mg/kg	1	<0.2	74.4	67.12	118.10
EP068B: Organophosphorus Pesticides (OP)								
EP068B: Organophosphorus Pesticides (OP) - (QC Lot: 260404)				mg/kg	mg/kg	%	%	%
Diazinon	ES0610221-002	TP18/1.2	0.05 mg/kg	0.25	<0.05	81.0	75.85	107.06
Chlorpyrifos-methyl			0.05 mg/kg	0.25	<0.05	75.4	74.84	107.91
Pirimphos-ethyl			0.05 mg/kg	0.25	<0.05	73.0	67.98	109.42
Bromophos-ethyl			0.05 mg/kg	0.25	<0.05	72.2	74.94	107.37
Prothiofos			0.05 mg/kg	0.25	<0.05	75.0	75.45	106.05
EP075(SIM)A: Phenolic Compounds								
EP075(SIM)A: Phenolic Compounds - (QC Lot: 261611)				mg/kg	mg/kg	%	%	%
Phenol	ES0610221-001	TP16/3.5	0.5 mg/kg	10	<0.5	93.0	70	130
2-Chlorophenol			0.5 mg/kg	10	<0.5	99.6	70	130
2-Nitrophenol			0.5 mg/kg	10	<0.5	95.2	60	130
4-Chloro-3-Methylphenol			0.5 mg/kg	10	<0.5	99.0	70	130
Pentachlorophenol			2.0 mg/kg	10	<2.0	108	20	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 261611)				mg/kg	mg/kg	%	%	%
Acenaphthene	ES0610221-001	TP16/3.5	0.5 mg/kg	10	<0.5	108	70	130
Pyrene			0.5 mg/kg	10	<0.5	108	70	130
EP080/071: Total Petroleum Hydrocarbons								

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Matrix Type: SOIL — *Matrix Spike (MS) Report*

Analyte name	Laboratory Sample ID	Client Sample ID	LOR	Spike Concentration	Actual Results: Sample Result	Actual Results: Spike Recovery MS	Recovery Limits: Static Limits Low	Recovery Limits: Static Limits High
EP080/071: Total Petroleum Hydrocarbons - continued								
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 260952)				mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	ES0610256-001	Anonymous	2 mg/kg	26	34	74.9	70	130
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 260998)				mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	ES0610242-004	Anonymous	2 mg/kg	26	<2	74.0	70	130
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 261612)				mg/kg	mg/kg	%	%	%
C10 - C14 Fraction	ES0610221-001	TP16/3.5	50 mg/kg	700	<50	71.6	70	130
C15 - C28 Fraction			100 mg/kg	3400	<100	93.2	70	130
C29 - C36 Fraction			100 mg/kg	3600	<100	89.8	70	130
EP080: BTEX								
EP080: BTEX - (QC Lot: 260952)				mg/kg	mg/kg	%	%	%
Benzene	ES0610256-001	Anonymous	0.2 mg/kg	2.5	<0.2	97.7	70	130
Toluene			0.2 mg/kg	2.5	2.7	80.6	70	130
Ethylbenzene			0.2 mg/kg	2.5	1.0	95.8	70	130
meta- & para-Xylene			0.2 mg/kg	2.5	4.9	97.2	70	130
ortho-Xylene			0.2 mg/kg	2.5	3.1	77.8	70	130
EP080: BTEX - (QC Lot: 260998)				mg/kg	mg/kg	%	%	%
Benzene	ES0610242-004	Anonymous	0.2 mg/kg	2.5	<0.2	82.3	70	130
Toluene			0.2 mg/kg	2.5	<0.2	78.1	70	130
Ethylbenzene			0.2 mg/kg	2.5	<0.2	87.7	70	130
meta- & para-Xylene			0.2 mg/kg	2.5	<0.2	87.9	70	130
ortho-Xylene			0.2 mg/kg	2.5	<0.2	85.7	70	130

Matrix Type: WATER — *Matrix Spike (MS) Report*

Analyte name	Laboratory Sample ID	Client Sample ID	LOR	Spike Concentration	Actual Results: Sample Result	Actual Results: Spike Recovery MS	Recovery Limits: Static Limits Low	Recovery Limits: Static Limits High
EG020T: Total Metals by ICP-MS								
EG020T: Total Metals by ICP-MS - (QC Lot: 260308)				mg/L	mg/L	%	%	%
Arsenic	EP0602041-002	Anonymous	0.001 mg/L	1	0.003	102	70	130
Cadmium			0.0001 mg/L	0.25	0.0001	95.5	70	130
Chromium			0.001 mg/L	1	<0.001	91.6	70	130

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Matrix Type: WATER

Matrix Spike (MS) Report

					Actual Results		Recovery Limits	
					Sample Result	Spike Recovery	Static Limits	
Analyte name	***Laboratory Sample ID***	***Client Sample ID***	***LOR***	***Spike Concentration***		***MS***	***Low***	***High***
EG020T: Total Metals by ICP-MS - continued								
EG020T: Total Metals by ICP-MS - (QC Lot: 260308) - continued				mg/L	mg/L	%	%	%
Copper	EP0602041-002	Anonymous	0.001 mg/L	1	<0.001	91.4	70	130
Lead			0.001 mg/L	1	<0.001	92.6	70	130
Nickel			0.001 mg/L	1	<0.001	93.8	70	130
Zinc			0.005 mg/L	1	<0.005	93.6	70	130
EG035T: Total Mercury by FIMS								
EG035T: Total Mercury by FIMS - (QC Lot: 260382)				mg/L	mg/L	%	%	%
Mercury	ES0610115-012	Anonymous	0.0001 mg/L	0.010	<0.0001	86.6	70	130
EP080/071: Total Petroleum Hydrocarbons								
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 262274)				µg/L	µg/L	%	%	%
C6 - C9 Fraction	ES0610200-022	Anonymous	20 µg/L	250	<20	109	70	130
EP080: BTEX								
EP080: BTEX - (QC Lot: 262274)				µg/L	µg/L	%	%	%
Benzene	ES0610200-022	Anonymous	1 µg/L	25	<1	115	70	130
Toluene			2 µg/L	25	<2	108	70	130
Ethylbenzene			2 µg/L	25	<2	111	70	130
meta- & para-Xylene			2 µg/L	25	<2	111	70	130
ortho-Xylene			2 µg/L	25	<2	111	70	130

ALS Environmental

INTERPRETIVE QUALITY CONTROL REPORT

Client	:	**CH2M HILL PTY LTD**	**Laboratory**	:	ALS Environmental Sydney	**Page**	: **1 of 10**
Contact	:	MR ADAM SULLIVAN	**Contact**	:	Greg Vogel		
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	**Address**	:	277-289 Woodpark Road Smithfield NSW Australia 2164	**Work order**	: **ES0610221**
						Amendment No.	:
Project	:	347496 MACDONALDTOWN GASWORKS	**Quote number**	:	----	**Date received**	: 18 Aug 2006
Order number	:	- Not provided -				**Date issued**	: 29 Aug 2006
C-O-C number	:	- Not provided -					
Site	:	MACDONALDTOWN					
E-mail	:	adam.sullivan@ch2m.com.au	**E-mail**	:	Greg.Vogel@alsenviro.com	**No. of samples**	
Telephone	:	02 9950 0200	**Telephone**	:	+61 (02) 8784 8555	**Received**	: 22
Facsimile	:	02 9950 0600	**Facsimile**	:	+61 (02) 8784 8500	**Analysed**	: 18

This Interpretive Quality Control Report was issued on 29 Aug 2006 for the ALS work order reference ES0610221 and supersedes any previous reports with this reference.
This report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Type Frequency Compliance
- Summary of all Quality Control Outliers
- Brief Method Summaries

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Interpretive Quality Control Report - Analysis Holding Time

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the sample aliquot was taken. Elapsed time to analysis represents time from sampling where no extraction / digestion is involved or time from extraction / digestion where this is present. For composite samples, sampling date/time is taken as that of the oldest sample contributing to that composite. Sample date/time for laboratory produced leaches are taken from the completion date/time of the leaching process. Outliers for holding time are based on USEPA SW846, APHA, AS and NEPM (1999). Failed outliers, refer to the 'Summary of Outliers'.

Matrix Type: SOIL ***Analysis Holding Time and Preservation***

Method / **Container /** Client Sample ID(s)		**Date Sampled**	**Extraction / Preparation**			**Analysis**		
			Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EA055-103: Moisture Content								
Soil Glass Jar - Unpreserved								
TP16/3.5,	TP18/1.2,	**17 Aug 2006**	----	----	----	**23 Aug 2006**	24 Aug 2006	Pass
TP18/3.2,	TP18/4.4,							
DUP08,	TRIP BLANK,							
MG11/0.2,	MG11/1.5,							
MG11/2.0,	MG11/4.0,							
TP11/0.2,	TP11/1.0,							
TP11/3.5,	TP16/0.3,							
TP16/1.0								
EG005T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved								
TP16/3.5,	TP18/1.2,	**17 Aug 2006**	**24 Aug 2006**	13 Feb 2007	Pass	**25 Aug 2006**	13 Feb 2007	Pass
TP18/3.2,	TP18/4.4,							
DUP08,	MG11/0.2,							
MG11/2.0,	MG11/4.0,							
TP11/0.2,	TP11/1.0,							
TP16/0.3,	TP16/1.0							
EG035T: Total Mercury by FIMS								
Soil Glass Jar - Unpreserved								
TP16/3.5,	TP18/1.2,	**17 Aug 2006**	**24 Aug 2006**	14 Sep 2006	Pass	**25 Aug 2006**	14 Sep 2006	Pass
TP18/3.2,	TP18/4.4,							
DUP08,	MG11/0.2,							
MG11/2.0,	MG11/4.0,							
TP11/0.2,	TP11/1.0,							
TP16/0.3,	TP16/1.0							
EK026G: Total Cyanide By Discrete Analyser								
Soil Glass Jar - Unpreserved								
TP16/3.5,	TP18/1.2,	**17 Aug 2006**	**24 Aug 2006**	13 Feb 2007	Pass	**24 Aug 2006**	13 Feb 2007	Pass
TP18/3.2,	DUP08,							
MG11/0.2,	MG11/1.5,							
MG11/2.0,	MG11/4.0,							
TP11/1.0,	TP16/1.0							
EP066: Polychlorinated Biphenyls (PCB)								
Soil Glass Jar - Unpreserved								
TP18/1.2,	DUP08,	**17 Aug 2006**	**23 Aug 2006**	31 Aug 2006	Pass	**24 Aug 2006**	2 Oct 2006	Pass
MG11/2.0,	TP11/1.0,							
TP16/1.0								

Matrix Type: SOIL ***Analysis Holding Time and Preservation***

Method / **Container /** Client Sample ID(s)	**Date Sampled**	**Extraction / Preparation**			**Analysis**		
		Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EP068: Pesticides by GCMS							
Soil Glass Jar - Unpreserved							
TP18/1.2, DUP08, MG11/2.0, TP11/1.0, TP16/1.0	**17 Aug 2006**	**23 Aug 2006**	31 Aug 2006	Pass	**24 Aug 2006**	2 Oct 2006	Pass
EP071: TPH - Semivolatile Fraction							
Soil Glass Jar - Unpreserved							
TP16/3.5, TP18/1.2, TP18/3.2, TP18/4.4, DUP08, TRIP BLANK, MG11/0.2, MG11/2.0, MG11/4.0, TP11/0.2, TP11/1.0, TP11/3.5, TP16/0.3, TP16/1.0	**17 Aug 2006**	**24 Aug 2006**	31 Aug 2006	Pass	**24 Aug 2006**	3 Oct 2006	Pass
EP075(SIM): PAH/Phenols (SIM)							
Soil Glass Jar - Unpreserved							
TP16/3.5, TP18/1.2, TP18/3.2, TP18/4.4, DUP08, MG11/0.2, MG11/2.0, MG11/4.0, TP11/0.2, TP11/1.0, TP11/3.5, TP16/0.3, TP16/1.0	**17 Aug 2006**	**24 Aug 2006**	31 Aug 2006	Pass	**24 Aug 2006**	3 Oct 2006	Pass
EP080: TPH Volatiles/BTEX							
Soil Glass Jar - Unpreserved							
TP16/3.5, TP18/1.2, TP18/3.2, TP18/4.4, DUP08, TRIP BLANK	**17 Aug 2006**	**22 Aug 2006**	31 Aug 2006	Pass	**24 Aug 2006**	31 Aug 2006	Pass
Soil Glass Jar - Unpreserved							
MG11/0.2, MG11/2.0, MG11/4.0, TP11/0.2, TP11/1.0, TP11/3.5, TP16/0.3, TP16/1.0	**17 Aug 2006**	**22 Aug 2006**	31 Aug 2006	Pass	**25 Aug 2006**	31 Aug 2006	Pass

Matrix Type: WATER ***Analysis Holding Time and Preservation***

Method / **Container /** Client Sample ID(s)	**Date Sampled**	**Extraction / Preparation**			**Analysis**		
		Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EG020A-T: Total Metals by ICP-MS - Suite A							
Clear Plastic Bottle - Nitric Acid; Unfiltered							
W05, W06, QA01	**17 Aug 2006**	**22 Aug 2006**	13 Feb 2007	Pass	**23 Aug 2006**	13 Feb 2007	Pass
EG035T: Total Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered							
W05, W06, QA01	**17 Aug 2006**	----	----	----	**24 Aug 2006**	14 Sep 2006	Pass

Matrix Type: WATER ***Analysis Holding Time and Preservation***

Method / **Container /** Client Sample ID(s)	**Date Sampled**	**Extraction / Preparation**			**Analysis**		
		Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EP066: Polychlorinated Biphenyls (PCB)							
Amber Glass Bottle - Unpreserved							
W05, W06, QA01	**17 Aug 2006**	**23 Aug 2006**	24 Aug 2006	Pass	**24 Aug 2006**	2 Oct 2006	Pass
EP068: Pesticides							
Amber Glass Bottle - Unpreserved							
W05, W06, QA01	**17 Aug 2006**	**23 Aug 2006**	24 Aug 2006	Pass	**24 Aug 2006**	2 Oct 2006	Pass
EP071: TPH - Semivolatile Fraction							
Amber Glass Bottle - Unpreserved							
W05, W06, QA01	**17 Aug 2006**	**23 Aug 2006**	24 Aug 2006	Pass	**24 Aug 2006**	2 Oct 2006	Pass
EP075(SIM): PAH/Phenols (GC/MS - SIM)							
Amber Glass Bottle - Unpreserved							
W05, W06, QA01	**17 Aug 2006**	**23 Aug 2006**	24 Aug 2006	Pass	**24 Aug 2006**	2 Oct 2006	Pass
EP080: TPH Volatiles/BTEX							
Amber VOC Vial - HCl or NaHSO4							
W05, W06, QA01	**17 Aug 2006**	**----**	----	----	**25 Aug 2006**	31 Aug 2006	Pass

Interpretive Quality Control Report - Frequency of Quality Control Samples

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which this work order was processed. Actual rate should be greater than or equal to the expected rate.

Matrix Type: SOIL ***Frequency of Quality Control Samples***

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
EA055-103: Moisture Content	6	47	**12.8**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG005T: Total Metals by ICP-AES	4	40	**10.0**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035T: Total Mercury by FIMS	4	35	**11.4**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EK026G: Total Cyanide By Discrete Analyser	2	10	**20.0**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP066: Polychlorinated Biphenyls (PCB)	1	9	**11.1**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP068: Pesticides by GCMS	1	9	**11.1**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	2	18	**11.1**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	2	17	**11.8**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	4	34	**11.8**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Laboratory Control Samples (LCS)					
EG005T: Total Metals by ICP-AES	2	40	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035T: Total Mercury by FIMS	2	35	**5.7**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EK026G: Total Cyanide By Discrete Analyser	1	10	**10.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP066: Polychlorinated Biphenyls (PCB)	1	9	**11.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP068: Pesticides by GCMS	1	9	**11.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	1	18	**5.6**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	1	17	**5.9**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	2	34	**5.9**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Method Blanks (MB)					
EG005T: Total Metals by ICP-AES	2	40	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035T: Total Mercury by FIMS	2	35	**5.7**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EK026G: Total Cyanide By Discrete Analyser	1	10	**10.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP066: Polychlorinated Biphenyls (PCB)	1	9	**11.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP068: Pesticides by GCMS	1	9	**11.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	1	18	**5.6**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	1	17	**5.9**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	2	34	**5.9**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Matrix Spikes (MS)					
EG005T: Total Metals by ICP-AES	2	40	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035T: Total Mercury by FIMS	2	35	**5.7**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EK026G: Total Cyanide By Discrete Analyser	1	10	**10.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP066: Polychlorinated Biphenyls (PCB)	1	9	**11.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP068: Pesticides by GCMS	1	9	**11.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	1	18	**5.6**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	1	17	**5.9**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	2	34	**5.9**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement

Matrix Type: WATER ***Frequency of Quality Control Samples***

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	**Actual**	**Expected**	
Laboratory Duplicates (DUP)					
EG020A-T: Total Metals by ICP-MS - Suite A	2	20	**10.0**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035T: Total Mercury by FIMS	2	11	**18.2**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	2	20	**10.0**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Laboratory Control Samples (LCS)					
EG020A-T: Total Metals by ICP-MS - Suite A	1	20	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035T: Total Mercury by FIMS	1	11	**9.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP066: Polychlorinated Biphenyls (PCB)	1	3	**33.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP068: Pesticides	1	3	**33.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	1	5	**20.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (GC/MS - SIM)	1	4	**25.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	1	20	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Method Blanks (MB)					
EG020A-T: Total Metals by ICP-MS - Suite A	1	20	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035T: Total Mercury by FIMS	1	11	**9.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP066: Polychlorinated Biphenyls (PCB)	1	3	**33.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP068: Pesticides	1	3	**33.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	1	5	**20.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (GC/MS - SIM)	1	4	**25.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	1	20	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Matrix Spikes (MS)					
EG020A-T: Total Metals by ICP-MS - Suite A	1	20	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035T: Total Mercury by FIMS	1	11	**9.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	1	20	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement

Interpretive Quality Control Report - Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged on the 'Quality Control Report'. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). - Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot.

Non-surrogates

ALS QC Lot	Matrix Type	Laboratory Sample ID	Client Sample ID	Analyte	Data	Limits	Comment
Laboratory Duplicates (DUP)							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	SOIL	ES0610221-018	TP11/0.2	Pyrene	25.7 %	0-20 %	RPD exceeds LOR based limits
Laboratory Control Samples (LCS)							
EP066: Polychlorinated Biphenyls (PCB)	WATER	286316-017	----	Total Polychlorinated biphenyls	107 %	61.6-107 %	Recovery greater than upper control limit
EP068B: Organophosphorus Pesticides (OP)	WATER	286316-022	----	Methyl Azinphos	42.6 %	45.6-138 %	Recovery less than lower control limit
				Naphthalene	116 %	62.4-114 %	Recovery greater than upper control limit
Matrix Spikes (MS)							
EP068A: Organochlorine Pesticides (OC)	SOIL	ES0610221-002	TP18/1.2	Aldrin	72.2 %	77.54-107.0 %	Recovery less than lower data quality objective
				Dieldrin	73.6 %	76.37-109.7 %	Recovery less than lower data quality objective
EP068B: Organophosphorus Pesticides (OP)	SOIL	ES0610221-002	TP18/1.2	Bromophos-ethyl	72.2 %	74.94-107.37 %	Recovery less than lower data quality objective
				Prothiofos	75.0 %	75.45-106.05 %	Recovery less than lower data quality objective

- **For all matrices, no method blank result outliers occur.**

Surrogates

ALS QC Lot	Matrix Type	Laboratory Sample ID	Client Sample ID	Analyte	Data	Limits	Comment
Surrogates							
EP068T: Organophosphorus Pesticide Surrogate	SOIL	ES0610221-022	TP16/1.0	DEF	ND	----	Surrogate recovery not determined due to either primary sample extract dilution or matrix interferences
Surrogates							
EP075(SIM)S: Phenolic Compound Surrogates	WATER	ES0610221-012	W06	Phenol-d6	ND	----	Surrogate recovery not determined due to either primary sample extract dilution or matrix interferences

Outliers : Analysis Holding Time

The following report highlights outliers within this 'Interpretive Quality Control Report - Analysis Holding Time'.

- **No holding time outliers occur.**

Outliers : Frequency of Quality Control Samples

The following report highlights outliers within this 'Interpretive Quality Control Report - Frequency of Quality Control Samples'.

- **No frequency outliers occur.**

Method Reference Summary

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.

Matrix Type: SOIL ***Method Reference Summary***

Preparation Methods

EK026PR : NaOH leach for TCN in Soils - APHA 20th ed., 4500 CN- C & N. Samples are extracted by end-over-end tumbling with NaOH.

EN69 : Hot Block Digest for metals in soils sediments and sludges - USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (1999) Schedule B(3) (Method 202)

ORG16 : Methanolic Extraction of Soils for Purge and Trap - (USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.

ORG17A : Tumbler Extraction of Solids (Option A - Concentrating) - In-house, Mechanical agitation (tumbler). 20g of sample, Na2SO4 and surrogate are extracted with 150mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

ORG17B : Tumbler Extraction of Solids (Option B - Non-concentrating) - In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.

Analytical Methods

ASB-SOL : Asbestos - Count (Solid) - Asbestos Count on solid matrices conducted by Subcontracting Laboratory

EA055-103 : Moisture Content - A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (1999) Schedule B(3) (Method 102)

EG005T : Total Metals by ICP-AES - (APHA 20th ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (1999) Schedule B(3)

EG035T : Total Mercury by FIMS - AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (1999) Schedule B(3)

EK026G : Total Cyanide By Discrete Analyser - APHA 20th 4500 CN - C & N. Caustic leach extracts of the sample are distilled with sulphuric acid, converting all CN species to HCN. The distillates are analyzed for CN by Seal. This method is compliant with NEPM (1999) Schedule B(3) (Method 403)

EP066 : Polychlorinated Biphenyls (PCB) - (USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 504)

EP068 : Pesticides by GCMS - (USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM (1999) Schedule B(3) (Method 504,505)

EP071 : TPH - Semivolatile Fraction - (USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)

EP075(SIM) : PAH/Phenols (SIM) - (USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 502 and 507)

Matrix Type: SOIL ***Method Reference Summary***

Analytical Methods

EP080 : TPH Volatiles/BTEX - (USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 501)

Matrix Type: WATER ***Method Reference Summary***

Preparation Methods

EN25 : Digestion for Total Recoverable Metals - USEPA SW846-3005 Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

ORG14 : Separatory Funnel Extraction of Liquids - USEPA SW 846 - 3510B 500 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2). ALS default excludes sediment which may be resident in the container.

Analytical Methods

EG020A-T : Total Metals by ICP-MS - Suite A - (APHA 20th ed., 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020): The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.

EG035T : Total Mercury by FIMS - AS 3550, APHA 3112 Hg - B (Flow-injection ($SnCl_2$)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by $SnCl_2$ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

EP066 : Polychlorinated Biphenyls (PCB) - USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

EP068 : Pesticides - USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

EP071 : TPH - Semivolatile Fraction - USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

EP075(SIM) : PAH/Phenols (GC/MS - SIM) - USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

EP080 : TPH Volatiles/BTEX - USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

AUSTRALIAN LABORATORY SERVICES PTY LTD ABN 84 009 936 029
Smithfield NSW 2164 Australia
Telephone: +61 (02) 8784 8555 Facsimile: +61 (02) 8784 8500 http://www.alsenviro.com/

ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive report

Client Details

Client	:	**CH2M HILL PTY LTD**
Contact	:	**MR ADAM SULLIVAN**
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515
Project	:	**347496 MACDONALDTOWN GASWORK**
Order number	:	**- Not provided -**
C-O-C Number	:	**- Not provided -**
Site	:	**MACDONALDTOWN**
Sampler	:	**- Not provided -**
E-mail	:	adam.sullivan@ch2m.com.au
Telephone	:	02 9950 0200
Facsimile	:	02 9950 0600

Laboratory Details

Laboratory	:	**ALS Environmental Sydney**
Manager	:	**Greg Vogel**
Address	:	Smithfield NSW Australia 2164
Quote number	:	ES20050033
Work order	:	**ES0610221**
E-mail	:	Greg.Vogel@alsenviro.com
Telephone	:	+61 (02) 8784 8555
Facsimile	:	+61 (02) 8784 8500

Dates

Date Samples Received	:	18 Aug 2006	**SRA Issue Date**	:	21 Aug 2006
Scheduled Reporting Date	:	**29 Aug 2006**	**Client Requested Date**	:	25 Aug 2006

Delivery Details

Mode of Delivery	:	Carrier.	**Temperature**	:	CHILLED - Ice bricks present
No. of coolers/boxes	:	1 HARD	**No. of samples** - **Received**		22
Security Seal	:	Intact.	- **Analysed**		21

Comments

- **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).**
- **Asbestos analysis to be conducted by ASET.**

- Analytical work for this work order will be conducted at ALSE Sydney.
- 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 Nazeeh Aoun.
- 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'.

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.

Client	: CH2M HILL PTY LTD	**Work Order**	: ES0610221
Project	: 347496 MACDONALDTOWN GASWORKS	**ALS Quote Reference**	: ES20050033

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

Some items described below may be part of a laboratory process neccessary 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)	**EA055-103 - SOIL** Moisture Content	**EK026G (Solids) - SOIL** Total Cyanide By Discrete Analyser	**S-02 - SOIL** 8 Metals (incl. Digestion)	**S-04 - SOIL** TPH/BTEX	**S-05 - SOIL** TPH/BTEX/8 Metals	**S-07 - SOIL** TPH/BTEX/PAH (SIM)	**S-14A - SOIL** PAH/Phenols (16 PAH - SIM)	**S-19 - SOIL** TPH/BTEX/P/Ph/OC/OP/PCB/8 metals	**W-19T - WATER** TPH/BTX/P/Ph/OC/OP/PCB/8 metals
ES0610221-001	**TP16/3.5 - 17 Aug 2006**		⌋	⌋			⌋		⌋		
ES0610221-002	**TP18/1.2 - 17 Aug 2006**		⌋	⌋						⌋	
ES0610221-003	**TP18/1.9 - 17 Aug 2006**										
ES0610221-004	**TP18/3.2 - 17 Aug 2006**		⌋	⌋	⌋			⌋			
ES0610221-005	**TP18/4.4 - 17 Aug 2006**				⌋			⌋			
ES0610221-006	**DUP08 - 17 Aug 2006**		⌋	⌋						⌋	
ES0610221-007	**MG10/0.2 - 17 Aug 2006**	⌋									
ES0610221-008	**MG09/B - 17 Aug 2006**	⌋									
ES0610221-009	**TP18 - 17 Aug 2006**	⌋									
ES0610221-010	**TRIP BLANK - 17 Aug 2006**					⌋					
ES0610221-011	**W05 - 17 Aug 2006**										⌋
ES0610221-012	**W06 - 17 Aug 2006**										⌋
ES0610221-013	**QA01 - 17 Aug 2006**										⌋
ES0610221-014	**MG11/0.2 - 17 Aug 2006**		⌋	⌋	⌋			⌋			
ES0610221-015	**MG11/1.5 - 17 Aug 2006**		⌋	⌋							
ES0610221-016	**MG11/2.0 - 17 Aug 2006**		⌋	⌋						⌋	
ES0610221-017	**MG11/4.0 - 17 Aug 2006**		⌋	⌋			⌋		⌋		
ES0610221-018	**TP11/0.2 - 17 Aug 2006**	⌋			⌋			⌋			
ES0610221-019	**TP11/1.0 - 17 Aug 2006**		⌋	⌋						⌋	
ES0610221-020	**TP11/3.5 - 17 Aug 2006**							⌋			
ES0610221-021	**TP16/0.3 - 17 Aug 2006**				⌋			⌋			
ES0610221-022	**TP16/1.0 - 17 Aug 2006**		⌋	⌋						⌋	
	Total(s) :	**4**	**10**	**10**	**5**	**1**	**2**	**6**	**2**	**5**	**3**

Client	: CH2M HILL PTY LTD	**Work Order**	: ES0610221
Project	: 347496 MACDONALDTOWN GASWORKS	**ALS Quote Reference**	: ES20050033

Requested Reports

l **MR ADAM SULLIVAN**

-	A4 - Certificate of Analysis - NEPM format	Email	adam.sullivan@ch2m.com.au
-	A4 - Quality Control Report - NEPM format	Email	adam.sullivan@ch2m.com.au
-	A4 - Interpretive Quality Control Report - NEPM format	Email	adam.sullivan@ch2m.com.au
-	Subcontracted Reports	Email	adam.sullivan@ch2m.com.au
-	ENMRG Export Format	Email	adam.sullivan@ch2m.com.au
-	ESDAT Export Format	Email	adam.sullivan@ch2m.com.au
-	Chain of Custody Acknowledgement	Email	adam.sullivan@ch2m.com.au
-	A4 - Sample Receipt Notification - Comprehensive format	Email	adam.sullivan@ch2m.com.au
-	Invoice	Email	adam.sullivan@ch2m.com.au

Sample Container(s) / Preservation Non-Compliance Log

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

l **No sample container / preservation non-compliance exist.**

ALS Environmental

CERTIFICATE OF ANALYSIS

Client	: **CH2M HILL PTY LTD**	*Laboratory*	: **ALS Environmental Sydney**	*Page*	: **1 of 5**
Contact	: **MR ADAM SULLIVAN**	*Contact*	: **Greg Vogel**	*Work Order*	: **ES0610613**
Address	: **PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515**	*Address*	: **277-289 Woodpark Road Smithfield NSW Australia 2164**		
E-mail	: **adam.sullivan@ch2m.com.au**	*E-mail*	: **Greg.Vogel@alsenviro.com**		
Telephone	: **02 9950 0200**	*Telephone*	: **+61 (02) 8784 8555**		
Facsimile	: **02 9950 0600**	*Facsimile*	: **+61 (02) 8784 8500**		
Project	: **rebatch of ES0609995**	*Quote number*	: **EN00605**	*Date received*	: **28 Aug 2006**
Order number	: **- Not provided -**			*Date issued*	: **4 Sep 2006**
C-O-C number	: **- Not provided -**			*No. of samples*	- *Received* : **1**
Site	: **- Not provided -**				*Analysed* : **1**

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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*
PHALAK INTHAKESONE	**Organics Co-ordinator**	**Organics - NATA 825 (10911 - Sydney)**
Sarah Millington	**Senior Inorganic Chemist**	**Inorganics - NATA 825 (10911 - Sydney)**

ALS Environmental

Comments

This report for the ALSE reference ES0610613 supersedes any previous reports with this reference. Results apply to the sample 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 insuffient 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.

- **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 **ES0610613**

Sample was not extracted within the recommended holding time. Surrogate recoveries are within specification. ALS does not believe results have been compromised.

ALS Environmental

Analytical Results

				Client Sample ID :	TP01/0.25			
				Sample Matrix Type / Description :	SOIL			
				Sample Date / Time :	15 Aug 2006 15:00			
				Laboratory Sample ID :	ES0610613-001			
Analyte	*CAS number*	*LOR*	*Units*					
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%		14.7			
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg		0.6			
Acenaphthylene	208-96-8	0.5	mg/kg		1.3			
Acenaphthene	83-32-9	0.5	mg/kg		<0.5			
Fluorene	86-73-7	0.5	mg/kg		<0.5			
Phenanthrene	85-01-8	0.5	mg/kg		1.5			
Anthracene	120-12-7	0.5	mg/kg		0.9			
Fluoranthene	206-44-0	0.5	mg/kg		4.6			
Pyrene	129-00-0	0.5	mg/kg		7.0			
Benz(a)anthracene	56-55-3	0.5	mg/kg		3.2			
Chrysene	218-01-9	0.5	mg/kg		3.3			
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg		2.9			
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		3.2			
Benzo(a)pyrene	50-32-8	0.5	mg/kg		3.5			
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		2.2			
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		0.8			
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		3.2			
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction		2	mg/kg		<2			
C10 - C14 Fraction		50	mg/kg		<50			
C15 - C28 Fraction		100	mg/kg		250			
C29 - C36 Fraction		100	mg/kg		220			
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg		<0.2			
Toluene	108-88-3	0.2	mg/kg		<0.2			
Ethylbenzene	100-41-4	0.2	mg/kg		<0.2			
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg		<0.2			
ortho-Xylene	95-47-6	0.2	mg/kg		<0.2			
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%		86.9			
2-Chlorophenol-D4	93951-73-6	0.1	%		85.0			
2.4.6-Tribromophenol	118-79-6	0.1	%		94.7			
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%		82.8			
Anthracene-d10	1719-06-8	0.1	%		87.3			

ALS Environmental

Analytical Results

	Client Sample ID :	TP01/0.25				
	Sample Matrix Type / Description :	SOIL				
	Sample Date / Time :	15 Aug 2006 15:00				
	Laboratory Sample ID :	ES0610613-001				
Analyte	**CAS number**	**LOR**	**Units**			
EP075(SIM)T: PAH Surrogates						
4-Terphenyl-d14	1718-51-0	0.1	%	81.2		
EP080S: TPH(V)/BTEX Surrogates						
1.2-Dichloroethane-D4	17060-07-0	0.1	%	101		
Toluene-D8	2037-26-5	0.1	%	99.8		
4-Bromofluorobenzene	460-00-4	0.1	%	97.7		

ALS Environmental

Surrogate Control Limits

Matrix Type: SOIL - Surrogate Control Limits ***Surrogate Control Limits***

Method name	*Analyte name*	*Lower Limit*	*Upper Limit*
EP075(SIM): PAH/Phenols (SIM)			
EP075(SIM)S: Phenolic Compound Surrogates	Phenol-d6	24	113
	2-Chlorophenol-D4	23	134
	2,4,6-Tribromophenol	19	122
EP075(SIM)T: PAH Surrogates	2-Fluorobiphenyl	30	115
	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

Nazeeh Aoun

FADI 28/8/06 5:30pm

From: Nanthini Coilparampil
Sent: Monday, 28 August 2006 4:04 PM
To: Nazeeh Aoun
Subject: FW: Additional analysis - Project Quote SY/148/06

Hi Nazee,

Please Flow the E-mail and amend the work orders accordingly

From: Adam.Sullivan@ch2m.com.au [mailto:Adam.Sullivan@ch2m.com.au]
Sent: Monday, 28 August 2006 3:30 PM
To: Nanthini Coilparampil
Subject: FW: Additional analysis - Project Quote SY/148/06

Hi Nanthini

Could you please action my email below.

Thanks

From: Sullivan, Adam /SYD
Sent: Monday, 28 August 2006 3:27 PM
To: 'margaret.valencic@alsenviro.com'
Subject: Additional analysis - Project Quote SY/148/06

Hi Margaret

Re batch Can you add the following additional analysis to the Macdonaldtown project:

→ Work Order #ES0609995 – CH2M HILL sample ID (TP01/0.25) – analyse for analysis code S-7; (released)
Add ← Work Order #ES0610135 – CH2M HILL sample ID (TP14/1.0) – analyse for analysis code S-2 and S-4. still active ###

Please advise when this can be done.

Regards

Adam Sullivan
Project Manager

CH2M HILL Australia Pty Ltd
PO Box 5392
Chatswood NSW 1515
Ph: +61 2 9950 0221
Mob: 0400 500 264
Fax: +61 2 9950 0600

ALS Environmental
Sydney
Work Order
ES0610613
Telephone : +61 (02) 8784 8555

****
This e-mail has been swept by mimesweeper
through the ALS North America gateway.
****

ALS Environmental

QUALITY CONTROL REPORT

Client	:	**CH2M HILL PTY LTD**	**Laboratory**	: ALS Environmental Sydney	**Page**	:	**1 of 7**
Contact	:	MR ADAM SULLIVAN	**Contact**	: Greg Vogel			
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	**Address**	: 277-289 Woodpark Road Smithfield NSW Australia 2164	**Work order**	:	**ES0610613**
					Amendment No.	:	
Project	:	rebatch of ES0609995	**Quote number**	: EN00605	**Date received**	:	28 Aug 2006
Order number	:	- Not provided -			**Date issued**	:	4 Sep 2006
C-O-C number	:	- Not provided -					
Site	:	- Not provided -					
E-mail	:	adam.sullivan@ch2m.com.au	**E-mail**	: Greg.Vogel@alsenviro.com	**No. of samples**		
Telephone	:	02 9950 0200	**Telephone**	: +61 (02) 8784 8555	**Received**	:	1
Facsimile	:	02 9950 0600	**Facsimile**	: +61 (02) 8784 8500	**Analysed**	:	1

This final report for the ALSE work order reference ES0610613 supersedes any previous reports with this reference.

Results apply to the sample 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

Sample was not extracted within the recommended holding time. Surrogate recoveries are within specification. ALS does not believe results have been compromised.

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Accredited for compliance with ISO/IED 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	Department
PHALAK INTHAKESONE	Organics - NATA 825 (10911 - Sydney)
Sarah Millington	Inorganics - NATA 825 (10911 - Sydney)

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						
EA055: Moisture Content - (QC Lot: 264414)				**%**	**%**	**%**
ES0610472-019	Anonymous	Moisture Content (dried @ 103°C)	1.0 %	27.9	26.5	5.2
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 264711)				**mg/kg**	**mg/kg**	**%**
ES0610564-003	Anonymous	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
		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
ES0610613-001	TP01/0.25	Naphthalene	0.5 mg/kg	0.6	0.5	0.0
		Acenaphthylene	0.5 mg/kg	1.3	1.2	7.9
		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	1.5	1.8	15.2
		Anthracene	0.5 mg/kg	0.9	1.0	0.0

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: 264711) - continued				**mg/kg**	**mg/kg**	**%**
ES0610613-001	TP01/0.25	Fluoranthene	0.5 mg/kg	4.6	4.4	4.1
		Pyrene	0.5 mg/kg	7.0	6.8	3.8
		Benz(a)anthracene	0.5 mg/kg	3.2	3.1	5.0
		Chrysene	0.5 mg/kg	3.3	3.1	5.6
		Benzo(b)fluoranthene	0.5 mg/kg	2.9	2.8	3.9
		Benzo(k)fluoranthene	0.5 mg/kg	3.2	2.9	10.9
		Benzo(a)pyrene	0.5 mg/kg	3.5	3.4	3.8
		Indeno(1,2,3,cd)pyrene	0.5 mg/kg	2.2	2.1	5.9
		Dibenz(a,h)anthracene	0.5 mg/kg	0.8	0.8	0.0
		Benzo(g,h,i)perylene	0.5 mg/kg	3.2	3.0	5.1
EP080/071: Total Petroleum Hydrocarbons						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 264317)				**mg/kg**	**mg/kg**	**%**
ES0610579-002	Anonymous	C6 - C9 Fraction	2 mg/kg	<2	<2	0.0
ES0610617-003	Anonymous	C6 - C9 Fraction	2 mg/kg	<2	<2	0.0
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 264710)				**mg/kg**	**mg/kg**	**%**
ES0610564-003	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
ES0610613-001	TP01/0.25	C10 - C14 Fraction	50 mg/kg	<50	<50	0.0
		C15 - C28 Fraction	100 mg/kg	250	290	12.4
		C29 - C36 Fraction	100 mg/kg	220	250	11.8
EP080: BTEX						
EP080: BTEX - (QC Lot: 264317)				**mg/kg**	**mg/kg**	**%**
ES0610579-002	Anonymous	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
ES0610617-003	Anonymous	Benzene	0.2 mg/kg	<0.2	<0.2	0.0

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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: 264317) - continued				**mg/kg**	**mg/kg**	**%**
ES0610617-003	Anonymous	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

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

		Method blank result	*Actual Results*		*Recovery Limits*	
			Spike concentration	*Spike Recovery*	*Dynamic Recovery Limits*	
Analyte name	*LOR*			*LCS*	*Low*	*High*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 264711)		mg/kg	mg/kg	%	%	%
Acenaphthene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	82.1	81.5	112
Acenaphthylene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	80.9	79.6	113
Anthracene	0.5 mg/kg	----	4	85.0	81.1	112
	0.5 mg/kg	<0.5	----	----	----	----
Benz(a)anthracene	0.5 mg/kg	----	4	78.5	77.2	112
	0.5 mg/kg	<0.5	----	----	----	----
Benzo(a)pyrene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	85.2	76.4	113
Benzo(b)fluoranthene	0.5 mg/kg	----	4	79.2	71.8	118
	0.5 mg/kg	<0.5	----	----	----	----
Benzo(g,h,i)perylene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	77.1	72.4	114
Benzo(k)fluoranthene	0.5 mg/kg	----	4	85.5	74.2	117
	0.5 mg/kg	<0.5	----	----	----	----
Chrysene	0.5 mg/kg	----	4	83.6	79.8	114
	0.5 mg/kg	<0.5	----	----	----	----
Dibenz(a,h)anthracene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	79.6	71.7	113
Fluoranthene	0.5 mg/kg	----	4	81.3	78.8	113
	0.5 mg/kg	<0.5	----	----	----	----
Fluorene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	79.9	79.9	112
Indeno(1,2,3,cd)pyrene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	77.9	71	113

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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)B: Polynuclear Aromatic Hydrocarbons - continued						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 264711) - continued		mg/kg	mg/kg	%	%	%
Naphthalene	0.5 mg/kg	----	4	83.1	81.9	113
	0.5 mg/kg	<0.5	----	----	----	----
Phenanthrene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	82.9	79.4	114
Pyrene	0.5 mg/kg	----	4	82.1	78.9	113
	0.5 mg/kg	<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 264317)		mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	2 mg/kg	----	26	93.5	68.4	128
	2 mg/kg	<2	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 264710)		mg/kg	mg/kg	%	%	%
C10 - C14 Fraction	50 mg/kg	----	200	89.1	75.2	116
	50 mg/kg	<50	----	----	----	----
C15 - C28 Fraction	100 mg/kg	<100	----	----	----	----
	100 mg/kg	----	200	90.1	75.3	113
C29 - C36 Fraction	100 mg/kg	<100	----	----	----	----
	100 mg/kg	----	200	87.5	72.6	117
EP080: BTEX						
EP080: BTEX - (QC Lot: 264317)		mg/kg	mg/kg	%	%	%
Benzene	0.2 mg/kg	----	1	90.9	67.5	125
	0.2 mg/kg	<0.2	----	----	----	----
Ethylbenzene	0.2 mg/kg	----	1	86.4	65.3	126
	0.2 mg/kg	<0.2	----	----	----	----
meta- & para-Xylene	0.2 mg/kg	----	2	87.2	66.5	124
	0.2 mg/kg	<0.2	----	----	----	----
ortho-Xylene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	1	89.7	66.7	123
Toluene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	1	83.9	69	122

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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	
					Sample Result	Spike Recovery	Static Limits	
Analyte name	*Laboratory Sample ID*	*Client Sample ID*	*LOR*	*Spike Concentration*		*MS*	*Low*	*High*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 264711)				mg/kg	mg/kg	%	%	%
Acenaphthene	ES0610564-001	Anonymous	0.5 mg/kg	10	<0.5	79.2	70	130
Pyrene			0.5 mg/kg	10	<0.5	81.2	70	130
EP080/071: Total Petroleum Hydrocarbons								
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 264317)				mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	ES0610579-002	Anonymous	2 mg/kg	26	<2	103	70	130
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 264710)				mg/kg	mg/kg	%	%	%
C10 - C14 Fraction	ES0610564-003	Anonymous	50 mg/kg	700	<50	96.5	70	130
C15 - C28 Fraction			100 mg/kg	3400	<100	120	70	130
C29 - C36 Fraction			100 mg/kg	3600	<100	94.3	70	130
EP080: BTEX								
EP080: BTEX - (QC Lot: 264317)				mg/kg	mg/kg	%	%	%
Benzene	ES0610579-002	Anonymous	0.2 mg/kg	2.5	<0.2	77.0	70	130
Toluene			0.2 mg/kg	2.5	<0.2	74.6	70	130
Ethylbenzene			0.2 mg/kg	2.5	<0.2	76.3	70	130
meta- & para-Xylene			0.2 mg/kg	2.5	<0.2	74.3	70	130
ortho-Xylene			0.2 mg/kg	2.5	<0.2	76.1	70	130

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INTERPRETIVE QUALITY CONTROL REPORT

Client	:	**CH2M HILL PTY LTD**	**Laboratory**	:	ALS Environmental Sydney	**Page**	: **1 of 5**
Contact	:	MR ADAM SULLIVAN	**Contact**	:	Greg Vogel		
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	**Address**	:	277-289 Woodpark Road Smithfield NSW Australia 2164	**Work order**	: **ES0610613**
						Amendment No.	:
Project	:	rebatch of ES0609995	**Quote number**	:	EN00605	**Date received**	: 28 Aug 2006
Order number	:	- Not provided -				**Date issued**	: 4 Sep 2006
C-O-C number	:	- Not provided -					
Site	:	- Not provided -					
E-mail	:	adam.sullivan@ch2m.com.au	**E-mail**	:	Greg.Vogel@alsenviro.com	**No. of samples**	
Telephone	:	02 9950 0200	**Telephone**	:	+61 (02) 8784 8555	**Received**	: 1
Facsimile	:	02 9950 0600	**Facsimile**	:	+61 (02) 8784 8500	**Analysed**	: 1

This Interpretive Quality Control Report was issued on 4 Sep 2006 for the ALS work order reference ES0610613 and supersedes any previous reports with this reference.
This report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Type Frequency Compliance
- Summary of all Quality Control Outliers
- Brief Method Summaries

Interpretive Quality Control Report - Analysis Holding Time

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the sample aliquot was taken. Elapsed time to analysis represents time from sampling where no extraction / digestion is involved or time from extraction / digestion where this is present. For composite samples, sampling date/time is taken as that of the oldest sample contributing to that composite. Sample date/time for laboratory produced leaches are taken from the completion date/time of the leaching process. Outliers for holding time are based on USEPA SW846, APHA, AS and NEPM (1999). Failed outliers, refer to the 'Summary of Outliers'.

Matrix Type: SOIL ***Analysis Holding Time and Preservation***

Method / **Container /** Client Sample ID(s)	**Date Sampled**	**Extraction / Preparation**			**Analysis**		
		Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EA055-103: Moisture Content							
Soil Glass Jar - Unpreserved							
TP01/0.25	**15 Aug 2006**	----	----	----	**29 Aug 2006**	22 Aug 2006	**Fail by 7 days**
EP071: TPH - Semivolatile Fraction							
Soil Glass Jar - Unpreserved							
TP01/0.25	**15 Aug 2006**	**30 Aug 2006**	29 Aug 2006	**Fail by 1 day**	**30 Aug 2006**	9 Oct 2006	Pass
EP075(SIM): PAH/Phenols (SIM)							
Soil Glass Jar - Unpreserved							
TP01/0.25	**15 Aug 2006**	**30 Aug 2006**	29 Aug 2006	**Fail by 1 day**	**30 Aug 2006**	9 Oct 2006	Pass
EP080: TPH Volatiles/BTEX							
Soil Glass Jar - Unpreserved							
TP01/0.25	**15 Aug 2006**	**29 Aug 2006**	29 Aug 2006	Pass	**29 Aug 2006**	29 Aug 2006	Pass

Interpretive Quality Control Report - Frequency of Quality Control Samples

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which this work order was processed. Actual rate should be greater than or equal to the expected rate.

Matrix Type: SOIL ***Frequency of Quality Control Samples***

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
EA055-103: Moisture Content	1	3	**33.3**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	2	16	**12.5**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	2	15	**13.3**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	2	20	**10.0**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Laboratory Control Samples (LCS)					
EP071: TPH - Semivolatile Fraction	1	16	**6.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	1	15	**6.7**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	1	20	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Method Blanks (MB)					
EP071: TPH - Semivolatile Fraction	1	16	**6.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	1	15	**6.7**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	1	20	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Matrix Spikes (MS)					
EP071: TPH - Semivolatile Fraction	1	16	**6.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	1	15	**6.7**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	1	20	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement

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Interpretive Quality Control Report - Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged on the 'Quality Control Report'. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). 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. - Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot.

Non-surrogates

- **For all matrices, no RPD recovery outliers occur for the duplicate analysis.**
- **For all matrices, no method blank result outliers occur.**
- **For all matrices, no laboratory spike recoveries breaches occur.**
- **For all matrices, no matrix spike recoveries breaches occur.**

Surrogates

- **For all matrices, no surrogate recovery outliers occur.**

Outliers : Analysis Holding Time

The following report highlights outliers within this 'Interpretive Quality Control Report - Analysis Holding Time'.

Method / **Container /** Client Sample ID(s)	**Date Sampled**	**Extraction / Preparation**			**Analysis**		
		Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EA055-103: Moisture Content							
Soil Glass Jar - Unpreserved							
TP01/0.25	**15 Aug 2006**	----	----	----	**29 Aug 2006**	22 Aug 2006	**Fail by 7 days**
EP071: TPH - Semivolatile Fraction							
Soil Glass Jar - Unpreserved							
TP01/0.25	**15 Aug 2006**	**30 Aug 2006**	29 Aug 2006	**Fail by 1 day**	**30 Aug 2006**	9 Oct 2006	Pass
EP075(SIM): PAH/Phenols (SIM)							
Soil Glass Jar - Unpreserved							
TP01/0.25	**15 Aug 2006**	**30 Aug 2006**	29 Aug 2006	**Fail by 1 day**	**30 Aug 2006**	9 Oct 2006	Pass

Outliers : Frequency of Quality Control Samples

The following report highlights outliers within this 'Interpretive Quality Control Report - Frequency of Quality Control Samples'.

- **No frequency outliers occur.**

Method Reference Summary

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.

Matrix Type: SOIL ***Method Reference Summary***

Preparation Methods

ORG16 : Methanolic Extraction of Soils for Purge and Trap - (USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.

ORG17B : Tumbler Extraction of Solids (Option B - Non-concentrating) - In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.

Analytical Methods

EA055-103 : Moisture Content - A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (1999) Schedule B(3) (Method 102)

EP071 : TPH - Semivolatile Fraction - (USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)

EP075(SIM) : PAH/Phenols (SIM) - (USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 502 and 507)

EP080 : TPH Volatiles/BTEX - (USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 501)

AUSTRALIAN LABORATORY SERVICES PTY LTD ABN 84 009 936 029
Smithfield NSW 2164 Australia
Telephone: +61 (02) 8784 8555 Facsimile: +61 (02) 8784 8500 http://www.alsenviro.com/

ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive report

Client Details

Client	:	**CH2M HILL PTY LTD**
Contact	:	**MR ADAM SULLIVAN**
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515
Project	:	**347496 McDonaldtown Gasworks**
Order number	:	**REBATCH OF ES0609995**
C-O-C Number	:	**- Not provided -**
Site	:	**- Not provided -**
Sampler	:	**- Not provided -**
E-mail	:	adam.sullivan@ch2m.com.au
Telephone	:	02 9950 0200
Facsimile	:	02 9950 0600

Laboratory Details

Laboratory	:	**ALS Environmental Sydney**
Manager	:	**Greg Vogel**
Address	:	Smithfield NSW Australia 2164
Quote number	:	ES20050033
Work order	:	**ES0610613**
E-mail	:	Greg.Vogel@alsenviro.com
Telephone	:	+61 (02) 8784 8555
Facsimile	:	+61 (02) 8784 8500

Dates

Date Samples Received	:	28 Aug 2006	**SRA Issue Date**	:	28 Aug 2006
Scheduled Reporting Date	:	**4 Sep 2006**	**Client Requested Date**	:	4 Sep 2006

Delivery Details

Mode of Delivery	:	Carrier.	**Temperature**		:	AMBIENT
No. of coolers/boxes	:	REBATCH	**No. of samples**	**- Received**		1
Security Seal	:	Intact.		**- Analysed**		1

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 Sydney.
- 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 Nazeeh Aoun.
- 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'.

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.

Client	: CH2M HILL PTY LTD	**Work Order**	: ES0610613
Project	: 347496 McDonaldtown Gasworks	**ALS Quote Reference**	: ES20050033

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

Some items described below may be part of a laboratory process neccessary 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**									
		S-07 - SOIL TPH/BTEX/PAH (SIM)									
ES0610613-001	**TP01/0.25 - 15 Aug 2006**	]									
	Total(s) :	**1**									

Client	: CH2M HILL PTY LTD	**Work Order**	: ES0610613
Project	: 347496 McDonaldtown Gasworks	**ALS Quote Reference**	: ES20050033

ALS Environmental

Requested Reports

l **MR ADAM SULLIVAN**

-	A4 - Certificate of Analysis - NEPM format	Email	adam.sullivan@ch2m.com.au
-	A4 - Interpretive Quality Control Report - NEPM format	Email	adam.sullivan@ch2m.com.au
-	A4 - Quality Control Report - NEPM format	Email	adam.sullivan@ch2m.com.au
-	ESDAT Export Format	Email	adam.sullivan@ch2m.com.au
-	ENMRG Export Format	Email	adam.sullivan@ch2m.com.au
-	A4 - Sample Receipt Notification - Comprehensive format	Email	adam.sullivan@ch2m.com.au
-	Chain of Custody Acknowledgement	Email	adam.sullivan@ch2m.com.au
-	Invoice	Email	adam.sullivan@ch2m.com.au

Sample Container(s) / Preservation Non-Compliance Log

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

l **No sample container / preservation non-compliance exist.**

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CERTIFICATE OF ANALYSIS

Client	: CH2M HILL PTY LTD	Laboratory	: ALS Environmental Sydney	Page	: 1 of 10
Contact	: MR ADAM SULLIVAN	Contact	: Greg Vogel	Work Order	: ES0612955
Address	: PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164	Amendment No.	: 1
E-mail	: adam.sullivan@ch2m.com.au	E-mail	: Greg.Vogel@alsenviro.com		
Telephone	: 02 9950 0200	Telephone	: +61 (02) 8784 8555		
Facsimile	: 02 9950 0600	Facsimile	: +61 (02) 8784 8500		
Project	: 347496 MACDONALDTOWN GASWORKS	Quote number	: ----	Date received	: 17 Oct 2006
Order number	: - Not provided -			Date issued	: 25 Oct 2006
C-O-C number	: - Not provided -			No. of samples	- Received : 22
Site	: - Not provided -				Analysed : 17

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
PHALAK INTHAKESONE	Organics Co-ordinator	Organics - NATA 825 (10911 - Sydney)
Sarah Millington	Senior Inorganic Chemist	Inorganics - NATA 825 (10911 - Sydney)

ALS Environmental

Comments

This report for the ALSE reference ES0612955 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 insuffient 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 **ES0612955**

The trip spike and control were prepared in the lab using reagent grade sand spiked with petrol. The spike was dispatched from the lab and the control retained.

ALS Environmental

Analytical Results

				Client Sample ID :	BHA/5.0	BHA/7.0	BHA/10.2	BHA1/7.0	BHA1/10.2
				Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Date / Time :	16 Oct 2006 15:00	16 Oct 2006 15:00	16 Oct 2006 15:00	16 Oct 2006 15:00	16 Oct 2006 15:00
				Laboratory Sample ID :					
Analyte	*CAS number*	*LOR*	*Units*		ES0612955-001	ES0612955-002	ES0612955-003	ES0612955-004	ES0612955-005
EA055: Moisture Content									
Moisture Content (dried @ 103°C)		1.0	%		19.7	19.8	11.4	17.0	17.6
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	0.6	<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	3.5	<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
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

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: BHA/5.0 Sample Matrix Type / Description: SOIL Sample Date / Time: 16 Oct 2006 15:00 Laboratory Sample ID: ES0612955-001	BHA/7.0 SOIL 16 Oct 2006 15:00 ES0612955-002	BHA/10.2 SOIL 16 Oct 2006 15:00 ES0612955-003	BHA1/7.0 SOIL 16 Oct 2006 15:00 ES0612955-004	BHA1/10.2 SOIL 16 Oct 2006 15:00 ES0612955-005
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	0.4	0.3	1.6	1.4
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	108-38-3 106-42-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	104	96.6	96.6	116	115
2-Chlorophenol-D4	93951-73-6	0.1	%	105	98.6	97.8	119	119
2.4.6-Tribromophenol	118-79-6	0.1	%	96.4	92.8	83.2	97.2	106
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	110	106	104	106	105
Anthracene-d10	1719-06-8	0.1	%	102	92.8	102	109	106
4-Terphenyl-d14	1718-51-0	0.1	%	112	108	106	109	111
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	90.8	109	96.2	95.8	114
Toluene-D8	2037-26-5	0.1	%	83.8	99.5	87.7	87.0	102
4-Bromofluorobenzene	460-00-4	0.1	%	101	119	104	106	113

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Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: BHA2/7.0	BHA2/10.2	BHB/6.0	BHE/2.2	BHE/3.5
Sample Matrix Type / Description:				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time:				16 Oct 2006 15:00	16 Oct 2006 15:00	17 Oct 2006 15:00	17 Oct 2006 15:00	17 Oct 2006 15:00
Laboratory Sample ID:				ES0612955-006	ES0612955-007	ES0612955-008	ES0612955-009	ES0612955-010
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%	18.6	15.3	21.7	18.3	15.4
EK026G: Total Cyanide By Discrete Analyser								
Total Cyanide	57-12-5	1.0	mg/kg	----	----	----	<1.0	1.6
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	5.9	24.6	<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
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	4	155	<2
C10 - C14 Fraction		50	mg/kg	<50	<50	<50	170	<50
C15 - C28 Fraction		100	mg/kg	<100	<100	<100	190	<100

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Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID : BHA2/7.0	BHA2/10.2	BHB/6.0	BHE/2.2	BHE/3.5
Sample Matrix Type / Description :				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time :				16 Oct 2006 15:00	16 Oct 2006 15:00	17 Oct 2006 15:00	17 Oct 2006 15:00	17 Oct 2006 15:00
Laboratory Sample ID :				ES0612955-006	ES0612955-007	ES0612955-008	ES0612955-009	ES0612955-010
EP080/071: Total Petroleum Hydrocarbons								
C29 - C36 Fraction		100	mg/kg	<100	<100	<100	<100	<100
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	0.9	2.0	0.4	<0.2
Toluene	108-88-3	0.2	mg/kg	<0.2	<0.2	<0.2	0.4	<0.2
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	<0.2	0.5	16.1	<0.2
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	<0.2	0.4	6.5	<0.2
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	0.5	10.5	<0.2
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	117	123	125	124	117
2-Chlorophenol-D4	93951-73-6	0.1	%	120	127	120	128	121
2.4.6-Tribromophenol	118-79-6	0.1	%	106	106	116	111	74.3
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	108	107	116	117	108
Anthracene-d10	1719-06-8	0.1	%	109	109	107	115	105
4-Terphenyl-d14	1718-51-0	0.1	%	113	113	123	119	113
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	90.0	85.1	84.6	102	101
Toluene-D8	2037-26-5	0.1	%	112	86.2	85.7	100	99.0
4-Bromofluorobenzene	460-00-4	0.1	%	98.0	82.5	80.0	99.7	97.6

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Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: DUP20	BHF/3.6	BHF/1.0	BH12A/4.2	TRIP SPIKE 1
Sample Matrix Type / Description:				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time:				16 Oct 2006 15:00	17 Oct 2006 15:00	17 Oct 2006 15:00	17 Oct 2006 15:00	17 Oct 2006 15:00
Laboratory Sample ID:				ES0612955-011	ES0612955-012	ES0612955-013	ES0612955-014	ES0612955-015
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%	19.5	14.8	11.6	10.0	<1.0
EK026G: Total Cyanide By Discrete Analyser								
Total Cyanide	57-12-5	1.0	mg/kg	----	<1.0	5.3	4.6	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	<0.5	6.9	----
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	<0.5	8.1	----
3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	<1.0	<1.0	12.7	----
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	<0.5	16.2	----
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<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	----
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<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	----
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	----
Pentachlorophenol	87-86-5	2.0	mg/kg	<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	2.5	166	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	2.1	12.1	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	8.1	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.9	42.3	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	11.9	78.6	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	4.0	32.2	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	12.9	49.8	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	13.5	38.8	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	7.8	22.5	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	7.5	16.5	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	7.0	13.9	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	3.7	9.4	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	6.4	13.9	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	3.4	4.9	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	1.2	1.6	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	4.2	5.0	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction		2	mg/kg	<2	<2	<2	228	27
C10 - C14 Fraction		50	mg/kg	<50	<50	90	1190	<50
C15 - C28 Fraction		100	mg/kg	<100	<100	740	3350	<100

ALS Environmental

Analytical Results

				Client Sample ID :	DUP20	BHF/3.6	BHF/1.0	BH12A/4.2	TRIP SPIKE 1
				Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Date / Time :	16 Oct 2006 15:00	17 Oct 2006 15:00	17 Oct 2006 15:00	17 Oct 2006 15:00	17 Oct 2006 15:00
				Laboratory Sample ID :					
Analyte	*CAS number*	*LOR*	*Units*		ES0612955-011	ES0612955-012	ES0612955-013	ES0612955-014	ES0612955-015
EP080/071: Total Petroleum Hydrocarbons									
C29 - C36 Fraction		100	mg/kg		<100	<100	320	810	<100
EP080: BTEX									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	20.0	0.5
Toluene	108-88-3	0.2	mg/kg		<0.2	<0.2	<0.2	53.0	8.4
Ethylbenzene	100-41-4	0.2	mg/kg		<0.2	<0.2	<0.2	8.3	1.4
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg		<0.2	<0.2	<0.2	68.7	6.9
ortho-Xylene	95-47-6	0.2	mg/kg		<0.2	<0.2	<0.2	26.2	2.9
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.1	%		126	118	116	110	----
2-Chlorophenol-D4	93951-73-6	0.1	%		130	122	120	114	----
2.4.6-Tribromophenol	118-79-6	0.1	%		78.2	63.2	87.4	109	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		110	108	110	104	----
Anthracene-d10	1719-06-8	0.1	%		110	110	109	102	----
4-Terphenyl-d14	1718-51-0	0.1	%		118	115	112	104	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		103	102	105	90.2	88.4
Toluene-D8	2037-26-5	0.1	%		104	102	102	89.2	103
4-Bromofluorobenzene	460-00-4	0.1	%		99.9	97.9	102	98.8	102

ALS Environmental

Analytical Results

			Client Sample ID :	TRIP BLANK 1	TRIP SPIKE CONTROL			
			Sample Matrix Type / Description :	SOIL	SOIL			
			Sample Date / Time :	17 Oct 2006 15:00	16 Oct 2006 15:00			
			Laboratory Sample ID :	ES0612955-016	ES0612955-017			
Analyte	*CAS number*	*LOR*	*Units*					
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%	3.7	2.0			
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction		2	mg/kg	<2	27			
C10 - C14 Fraction		50	mg/kg	<50	<50			
C15 - C28 Fraction		100	mg/kg	<100	<100			
C29 - C36 Fraction		100	mg/kg	<100	<100			
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	0.7			
Toluene	108-88-3	0.2	mg/kg	<0.2	10.4			
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	1.6			
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	8.3			
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	2.7			
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	106	86.0			
Toluene-D8	2037-26-5	0.1	%	96.1	98.2			
4-Bromofluorobenzene	460-00-4	0.1	%	90.2	96.0			

ALS Environmental

Surrogate Control Limits

Matrix Type: SOIL - Surrogate Control Limits ***Surrogate Control Limits***

Method name	*Analyte name*	*Lower Limit*	*Upper Limit*
EP075(SIM): PAH/Phenols (SIM)			
EP075(SIM)S: Phenolic Compound Surrogates	Phenol-d6	24	113
	2-Chlorophenol-D4	23	134
	2,4,6-Tribromophenol	19	122
EP075(SIM)T: PAH Surrogates	2-Fluorobiphenyl	30	115
	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

CH2MHILL ACN 050 070 892

CHAIN OF CUSTODY RECORD

Level 7, 9 Help Street, Chatswood, NSW 2067 Australia Tel (61 2) 9950 0200 Fax (61 2) 9950 0600

Laboratory Quotation #

(12)

COC # [redacted]

Project # 347496	**Purchase Order #** SY/148/06
Project Name Macdonald Town Greasworks	
Company Name ALS	
Project Manager or Contact & Phone # Adam Sullivan 0400 500 264	**Report Copy to:** →
Requested Completion Date: Standard TAT	**Site ID** Macdonald Town
Sample Disposal: Dispose ☑ Return ☐	

Sampling Date	Sampling Time	Type	Matrix	CLIENT SAMPLE ID (9 CHARACTERS)	LAB QC	TOTAL # OF CONTAINERS	S-7	Phenols	EK026	S-4	HOLD				
				Preservative											
16/10			SOIL	① BH A / 5.0			X	X							
				② BH A / 7.0			X	X							
				18 BH A / 8.4							X				
				19 BH A / 9.6							X				
				③ BH A / 10.2			X	X							
				④ BH A 1 / 7.0			X	X							
				20 BH A 1 / 9.6							X				
				⑤ BH A 1 / 10.2			X	X							
				⑥ BH A 2 / 7.0			X	X							
				⑦ BH A 2 / 10.2			X	X							
17/10				⑧ BH B / 6.0			X	X							
17/10				21 BH E / 1.6							X				

QA REQUIREMENTS

Matrix Spike	☐ Yes	☐ No
Matrix Duplicate	☐ Yes	☐ No
Laboratory Duplicate	☐ Yes	☐ No
Lab Blank	☐ Yes	☐ No
Surrogate Spike	☐ Yes	☐ No
RPDs	☐ Yes	☐ No
Spike Recovery Data	☐ Yes	☐ No

LAB USE ONLY

Custody Seals	☐ Yes	☐ No
ICE	☐ Yes	☐ No

Comments	Lab ID

ALS Environmental
Sydney
Work Order
ES0612955

Telephone : +61 (02) 8784 8555

Sampled By and Title ASull & K Scott	(Please sign and print name) KScott	**Date/Time** 17/10/06 13:30	**Relinquished By** KATIE SCOTT (Please sign and print name) KScott	**Date/Time** 17/10/06 13:30
Received by [signature]	(Please sign and print name) AQ: 4:20pm	**Date/Time** 17/10/6	**Relinquished By** (Please sign and print name)	**Date/Time**
Received by	(Please sign and print name)	**Date/Time**	**Shipped Via**	**Shipping #**

Special Instructions:

DISTRIBUTION: Original - LAB, Yellow - LAB, Pink - CH2MHILL

Laboratory Quotation #

2/2

CH2MHILL ACN 050 070 892

CHAIN OF CUSTODY RECORD

Level 7, 9 Help Street, Chatswood, NSW 2067 Australia Tel (61 2) 9950 0200 Fax (61 2) 9950 0600

COC # [redacted]

Project # 347496	**Purchase Order #** SY/148/06
Project Name Macdonaldtown Gasworks	
Company Name ALS	
Project Manager or Contact & Phone # Adam Sullivan 0400 500 264	**Report Copy to:** →
Requested Completion Date: Standard TAT	**Site ID** Macdonaldtown
Sample Disposal: Dispose ☑ Return ☐	

Sampling Date	Sampling Time	Type	Matrix	CLIENT SAMPLE ID (9 CHARACTERS)	LAB QC	TOTAL # OF CONTAINERS	S-7	Phenols	EK026	S-4	HOLD
17/10			SOIL	⑨ BHE/2-2			X	X	X		
17/10				⑩ BHE/3-5			X	X	X		
16/10				⑪ DUP 20			X	X			
17/10				22 ⑫ BHF/2-6							X
17/10				⑬ BHF/3-6			X	X	X		
17/10				⑭ BHF/1-0			X	X	X		
17/10				⑭A BH12A/4-2			X	X	X		
17/10				⑮ TRIPSPIKE1						X	
17/10				⑯ TRIPBLANK1						X	
				⑰ TRIP SPIKE (control)							

Preservative

QA REQUIREMENTS

Matrix Spike	☐ Yes ☐ No
Matrix Duplicate	☐ Yes ☐ No
Laboratory Duplicate	☐ Yes ☐ No
Lab Blank	☐ Yes ☐ No
Surrogate Spike	☐ Yes ☐ No
RPDs	☐ Yes ☐ No
Spike Recovery Data	☐ Yes ☐ No

LAB USE ONLY

Custody Seals	☐ Yes ☐ No
ICE	☐ Yes ☐ No

Comments	Lab ID

Sampled By and Title A.S Project Supervisor & K.S.	(Please sign and print name)	**Date/Time** 17/10/06 13.30	**Relinquished By** KATIE SCOTT (Please sign and print name)	**Date/Time** 17/10/06 13.30
Received by [redacted] ALS	(Please sign and print name)	**Date/Time** 17/10/6	**Relinquished By** (Please sign and print name)	**Date/Time**
Received by	(Please sign and print name)	**Date/Time**	**Shipped Via**	**Shipping #**

Special Instructions:

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ALS Environmental

QUALITY CONTROL REPORT

Client	:	**CH2M HILL PTY LTD**	**Laboratory**	: ALS Environmental Sydney	**Page**	:	**1 of 18**
Contact	:	MR ADAM SULLIVAN	**Contact**	: Greg Vogel			
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	**Address**	: 277-289 Woodpark Road Smithfield NSW Australia 2164	**Work order**	:	**ES0612955**
					Amendment No.	:	**1**
Project	:	347496 MACDONALDTOWN GASWORKS	**Quote number**	: ----	**Date received**	:	17 Oct 2006
Order number	:	- Not provided -			**Date issued**	:	25 Oct 2006
C-O-C number	:	- Not provided -					
Site	:	- Not provided -					
E-mail	:	adam.sullivan@ch2m.com.au	**E-mail**	: Greg.Vogel@alsenviro.com	**No. of samples**		
Telephone	:	02 9950 0200	**Telephone**	: +61 (02) 8784 8555	**Received**	:	22
Facsimile	:	02 9950 0600	**Facsimile**	: +61 (02) 8784 8500	**Analysed**	:	17

This final report for the ALSE work order reference ES0612955 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

The trip spike and control were prepared in the lab using reagent grade sand spiked with petrol. The spike was dispatched from the lab and the control retained.

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/IED 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	Department
PHALAK INTHAKESONE	Organics - NATA 825 (10911 - Sydney)
Sarah Millington	Inorganics - NATA 825 (10911 - Sydney)

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: SOIL ***Laboratory Duplicates (DUP) Report***

Laboratory Sample ID	*Client Sample ID*	*Analyte name*	*LOR*	*Original Result*	*Duplicate Result*	*RPD*
EA055: Moisture Content						
EA055: Moisture Content - (QC Lot: 291984)				**%**	**%**	**%**
ES0612944-020	Anonymous	Moisture Content (dried @ 103°C)	1.0 %	19.7	19.7	0.0
ES0612944-029	Anonymous	Moisture Content (dried @ 103°C)	1.0 %	17.7	18.2	2.3
EA055: Moisture Content - (QC Lot: 291985)				**%**	**%**	**%**
ES0612955-002	BHA/7.0	Moisture Content (dried @ 103°C)	1.0 %	19.8	19.2	3.0
ES0612970-004	Anonymous	Moisture Content (dried @ 103°C)	1.0 %	5.5	5.5	0.0
EA055: Moisture Content - (QC Lot: 292337)				**%**	**%**	**%**
ES0612955-008	BHB/6.0	Moisture Content (dried @ 103°C)	1.0 %	21.7	20.1	7.9
ES0612959-002	Anonymous	Moisture Content (dried @ 103°C)	1.0 %	23.1	23.7	2.3
EA055: Moisture Content - (QC Lot: 293037)				**%**	**%**	**%**
ES0612955-011	DUP20	Moisture Content (dried @ 103°C)	1.0 %	19.5	17.7	9.7
ES0612957-008	Anonymous	Moisture Content (dried @ 103°C)	1.0 %	12.0	11.3	5.9
EK026G: Total Cyanide By Discrete Analyser						
EK026G: Total Cyanide By Discrete Analyser - (QC Lot: 292318)				**mg/kg**	**mg/kg**	**%**
ES0612955-009	BHE/2.2	Total Cyanide	1.0 mg/kg	<1.0	<1.0	0.0
EP075(SIM)A: Phenolic Compounds						
EP075(SIM)A: Phenolic Compounds - (QC Lot: 292440)				**mg/kg**	**mg/kg**	**%**
ES0612955-001	BHA/5.0	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

ALS Environmental

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: 292440) - continued				mg/kg	mg/kg	%
ES0612955-001	BHA/5.0	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
ES0612996-001	Anonymous	Phenol	0.5 mg/kg	<0.5	<0.5	0.0
		2-Chlorophenol	0.5 mg/kg	<0.5	<0.5	0.0
		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)A: Phenolic Compounds - (QC Lot: 292541)				mg/kg	mg/kg	%
ES0612955-004	BHA1/7.0	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
ES0612955-014	BH12A/4.2	Phenol	0.5 mg/kg	6.9	6.4	8.0

ALS Environmental

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: 292541) - continued				mg/kg	mg/kg	%
ES0612955-014	BH12A/4.2	2-Chlorophenol	0.5 mg/kg	<0.5	<0.5	0.0
		2-Methylphenol	0.5 mg/kg	8.1	7.1	12.7
		3- & 4-Methylphenol	1.0 mg/kg	12.7	11.2	12.5
		2-Nitrophenol	0.5 mg/kg	<0.5	<0.5	0.0
		2,4-Dimethylphenol	0.5 mg/kg	16.2	14.0	14.9
		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: 292440)				mg/kg	mg/kg	%
ES0612955-001	BHA/5.0	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
		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

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: 292440) - continued				mg/kg	mg/kg	%
ES0612996-001	Anonymous	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
		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
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 292541)				mg/kg	mg/kg	%
ES0612955-004	BHA1/7.0	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
		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

ALS Environmental

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: 292541) - continued				mg/kg	mg/kg	%
ES0612955-004	BHA1/7.0	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
ES0612955-014	BH12A/4.2	Naphthalene	0.5 mg/kg	166	139	17.7
		Acenaphthylene	0.5 mg/kg	12.1	10.4	15.3
		Acenaphthene	0.5 mg/kg	8.1	6.8	18.1
		Fluorene	0.5 mg/kg	42.3	35.6	17.3
		Phenanthrene	0.5 mg/kg	78.6	67.0	16.0
		Anthracene	0.5 mg/kg	32.2	27.2	16.9
		Fluoranthene	0.5 mg/kg	49.8	42.6	15.6
		Pyrene	0.5 mg/kg	38.8	33.2	15.6
		Benz(a)anthracene	0.5 mg/kg	22.5	19.0	17.0
		Chrysene	0.5 mg/kg	16.5	13.2	22.3
		Benzo(b)fluoranthene	0.5 mg/kg	13.9	11.8	17.0
		Benzo(k)fluoranthene	0.5 mg/kg	9.4	7.9	17.3
		Benzo(a)pyrene	0.5 mg/kg	13.9	11.6	17.3
		Indeno(1,2,3,cd)pyrene	0.5 mg/kg	4.9	4.1	18.5
		Dibenz(a,h)anthracene	0.5 mg/kg	1.6	1.4	7.3
		Benzo(g,h,i)perylene	0.5 mg/kg	5.0	4.1	18.2
EP080/071: Total Petroleum Hydrocarbons						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 291820)				mg/kg	mg/kg	%
ES0612895-041	Anonymous	C6 - C9 Fraction	2 mg/kg	<2	<2	0.0
ES0612944-005	Anonymous	C6 - C9 Fraction	2 mg/kg	<2	<2	0.0
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 292069)				mg/kg	mg/kg	%
ES0612957-012	Anonymous	C6 - C9 Fraction	2 mg/kg	<2	<2	0.0
ES0612971-030	Anonymous	C6 - C9 Fraction	2 mg/kg	<2	<2	0.0
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 292200)				mg/kg	mg/kg	%
ES0612990-008	Anonymous	C6 - C9 Fraction	2 mg/kg	<2	<2	0.0

ALS Environmental

Matrix Type: SOIL

Laboratory Duplicates (DUP) Report

Laboratory Sample ID	Client Sample ID	Analyte name	LOR	Original Result	Duplicate Result	RPD
EP080/071: Total Petroleum Hydrocarbons - continued						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 292200) - continued				**mg/kg**	**mg/kg**	**%**
ES0612996-001	Anonymous	C6 - C9 Fraction	2 mg/kg	<2	<2	0.0
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 292441)				**mg/kg**	**mg/kg**	**%**
ES0612955-001	BHA/5.0	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
ES0612996-001	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
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 292540)				**mg/kg**	**mg/kg**	**%**
ES0612955-004	BHA1/7.0	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
ES0612955-014	BH12A/4.2	C10 - C14 Fraction	50 mg/kg	1190	1050	12.5
		C15 - C28 Fraction	100 mg/kg	3350	2750	19.8
		C29 - C36 Fraction	100 mg/kg	810	840	3.4
EP080: BTEX						
EP080: BTEX - (QC Lot: 291820)				**mg/kg**	**mg/kg**	**%**
ES0612895-041	Anonymous	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
ES0612944-005	Anonymous	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
EP080: BTEX - (QC Lot: 292069)				**mg/kg**	**mg/kg**	**%**
ES0612957-012	Anonymous	Benzene	0.2 mg/kg	<0.2	<0.2	0.0

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: 292069) - continued				mg/kg	mg/kg	%
ES0612957-012	Anonymous	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
ES0612971-030	Anonymous	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
EP080: BTEX - (QC Lot: 292200)				mg/kg	mg/kg	%
ES0612990-008	Anonymous	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
ES0612996-001	Anonymous	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

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

		Method blank result	*Actual Results*		*Recovery Limits*	
			Spike concentration	*Spike Recovery*	*Dynamic Recovery Limits*	
Analyte name	*LOR*			*LCS*	*Low*	*High*
EK026G: Total Cyanide By Discrete Analyser						
EK026G: Total Cyanide By Discrete Analyser - (QC Lot: 292318)		mg/kg	mg/kg	%	%	%
Total Cyanide	1.0 mg/kg	<1.0	----	----	----	----
	1 mg/kg	----	50	104	70	130
EP075(SIM)A: Phenolic Compounds						
EP075(SIM)A: Phenolic Compounds - (QC Lot: 292440)		mg/kg	mg/kg	%	%	%
2,4,5-Trichlorophenol	0.5 mg/kg	----	4	72.4	68.9	112
	0.5 mg/kg	<0.5	----	----	----	----
2,4,6-Trichlorophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	72.3	62.2	115
2,4-Dichlorophenol	0.5 mg/kg	----	4	86.4	71.6	113
	0.5 mg/kg	<0.5	----	----	----	----
2,4-Dimethylphenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	90.2	74.5	119
2,6-Dichlorophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	86.5	74.8	115
2-Chlorophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	87.2	80.2	115
2-Methylphenol	0.5 mg/kg	----	4	85.3	76.8	114
	0.5 mg/kg	<0.5	----	----	----	----
2-Nitrophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	83.8	60.3	117
3- & 4-Methylphenol	1.0 mg/kg	<1.0	----	----	----	----
	1.0 mg/kg	----	8	87.4	72	119
4-Chloro-3-Methylphenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	86.5	76.4	114

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Matrix Type: SOIL

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP075(SIM)A: Phenolic Compounds - continued						
EP075(SIM)A: Phenolic Compounds - (QC Lot: 292440) - continued		mg/kg	mg/kg	%	%	%
Pentachlorophenol	1.0 mg/kg	----	8	26.7	1.23	91.6
	1.0 mg/kg	<1.0	----	----	----	----
Phenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	85.3	73.9	115
EP075(SIM)A: Phenolic Compounds - (QC Lot: 292541)		mg/kg	mg/kg	%	%	%
2,4,5-Trichlorophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	92.0	68.9	112
2,4,6-Trichlorophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	83.5	62.2	115
2,4-Dichlorophenol	0.5 mg/kg	----	4	90.5	71.6	113
	0.5 mg/kg	<0.5	----	----	----	----
2,4-Dimethylphenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	94.3	74.5	119
2,6-Dichlorophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	93.2	74.8	115
2-Chlorophenol	0.5 mg/kg	----	4	98.9	80.2	115
	0.5 mg/kg	<0.5	----	----	----	----
2-Methylphenol	0.5 mg/kg	----	4	97.8	76.8	114
	0.5 mg/kg	<0.5	----	----	----	----
2-Nitrophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	82.3	60.3	117
3- & 4-Methylphenol	1.0 mg/kg	<1.0	----	----	----	----
	1.0 mg/kg	----	8	96.4	72	119
4-Chloro-3-Methylphenol	0.5 mg/kg	----	4	87.0	76.4	114
	0.5 mg/kg	<0.5	----	----	----	----
Pentachlorophenol	1.0 mg/kg	----	8	22.2	1.23	91.6
	1.0 mg/kg	<1.0	----	----	----	----
Phenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	99.2	73.9	115
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons						

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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)B: Polynuclear Aromatic Hydrocarbons - continued						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 292440)		mg/kg	mg/kg	%	%	%
Acenaphthene	0.5 mg/kg	----	4	98.0	81.5	112
	0.5 mg/kg	<0.5	----	----	----	----
Acenaphthylene	0.5 mg/kg	----	4	101	79.6	113
	0.5 mg/kg	<0.5	----	----	----	----
Anthracene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	100	81.1	112
Benz(a)anthracene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	96.5	77.2	112
Benzo(a)pyrene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	99.2	76.4	113
Benzo(b)fluoranthene	0.5 mg/kg	----	4	107	71.8	118
	0.5 mg/kg	<0.5	----	----	----	----
Benzo(g,h,i)perylene	0.5 mg/kg	----	4	97.8	72.4	114
	0.5 mg/kg	<0.5	----	----	----	----
Benzo(k)fluoranthene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	90.0	74.2	117
Chrysene	0.5 mg/kg	----	4	97.5	79.8	114
	0.5 mg/kg	<0.5	----	----	----	----
Dibenz(a,h)anthracene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	96.0	71.7	113
Fluoranthene	0.5 mg/kg	----	4	100	78.8	113
	0.5 mg/kg	<0.5	----	----	----	----
Fluorene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	99.2	79.9	112
Indeno(1,2,3,cd)pyrene	0.5 mg/kg	----	4	99.1	71	113
	0.5 mg/kg	<0.5	----	----	----	----
Naphthalene	0.5 mg/kg	----	4	100	81.9	113
	0.5 mg/kg	<0.5	----	----	----	----
Phenanthrene	0.5 mg/kg	----	4	101	79.4	114
	0.5 mg/kg	<0.5	----	----	----	----

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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)B: Polynuclear Aromatic Hydrocarbons - continued						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 292440) - continued		mg/kg	mg/kg	%	%	%
Pyrene	0.5 mg/kg	----	4	99.7	78.9	113
	0.5 mg/kg	<0.5	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 292541)		mg/kg	mg/kg	%	%	%
Acenaphthene	0.5 mg/kg	----	4	105	81.5	112
	0.5 mg/kg	<0.5	----	----	----	----
Acenaphthylene	0.5 mg/kg	----	4	105	79.6	113
	0.5 mg/kg	<0.5	----	----	----	----
Anthracene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	104	81.1	112
Benz(a)anthracene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	104	77.2	112
Benzo(a)pyrene	0.5 mg/kg	----	4	103	76.4	113
	0.5 mg/kg	<0.5	----	----	----	----
Benzo(b)fluoranthene	0.5 mg/kg	----	4	101	71.8	118
	0.5 mg/kg	<0.5	----	----	----	----
Benzo(g,h,i)perylene	0.5 mg/kg	----	4	103	72.4	114
	0.5 mg/kg	<0.5	----	----	----	----
Benzo(k)fluoranthene	0.5 mg/kg	----	4	109	74.2	117
	0.5 mg/kg	<0.5	----	----	----	----
Chrysene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	109	79.8	114
Dibenz(a,h)anthracene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	103	71.7	113
Fluoranthene	0.5 mg/kg	----	4	104	78.8	113
	0.5 mg/kg	<0.5	----	----	----	----
Fluorene	0.5 mg/kg	----	4	104	79.9	112
	0.5 mg/kg	<0.5	----	----	----	----
Indeno(1,2,3,cd)pyrene	0.5 mg/kg	----	4	102	71	113
	0.5 mg/kg	<0.5	----	----	----	----

Matrix Type: SOIL

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - continued						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 292541) - continued		mg/kg	mg/kg	%	%	%
Naphthalene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	107	81.9	113
Phenanthrene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	104	79.4	114
Pyrene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	97.6	78.9	113
EP080/071: Total Petroleum Hydrocarbons						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 291820)		mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	2 mg/kg	<2	----	----	----	----
	2 mg/kg	----	26	94.8	68.4	128
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 292069)		mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	2 mg/kg	<2	----	----	----	----
	2 mg/kg	----	26	110	68.4	128
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 292200)		mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	2 mg/kg	<2	----	----	----	----
	2 mg/kg	----	26	100	68.4	128
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 292441)		mg/kg	mg/kg	%	%	%
C10 - C14 Fraction	50 mg/kg	<50	----	----	----	----
	50 mg/kg	----	200	100	75.2	116
C15 - C28 Fraction	100 mg/kg	<100	----	----	----	----
	100 mg/kg	----	200	86.9	75.3	113
C29 - C36 Fraction	100 mg/kg	----	200	100	72.6	117
	100 mg/kg	<100	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 292540)		mg/kg	mg/kg	%	%	%
C10 - C14 Fraction	50 mg/kg	<50	----	----	----	----
	50 mg/kg	----	200	99.4	75.2	116
C15 - C28 Fraction	100 mg/kg	<100	----	----	----	----
	100 mg/kg	----	200	92.7	75.3	113

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Matrix Type: SOIL

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP080/071: Total Petroleum Hydrocarbons - continued						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 292540) - continued		mg/kg	mg/kg	%	%	%
C29 - C36 Fraction	100 mg/kg	----	200	107	72.6	117
	100 mg/kg	<100	----	----	----	----
EP080: BTEX						
EP080: BTEX - (QC Lot: 291820)		mg/kg	mg/kg	%	%	%
Benzene	0.2 mg/kg	----	1	80.5	67.5	125
	0.2 mg/kg	<0.2	----	----	----	----
Ethylbenzene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	1	87.6	65.3	126
meta- & para-Xylene	0.2 mg/kg	----	2	87.4	66.5	124
	0.2 mg/kg	<0.2	----	----	----	----
ortho-Xylene	0.2 mg/kg	----	1	89.0	66.7	123
	0.2 mg/kg	<0.2	----	----	----	----
Toluene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	1	78.2	69	122
EP080: BTEX - (QC Lot: 292069)		mg/kg	mg/kg	%	%	%
Benzene	0.2 mg/kg	----	1	91.9	67.5	125
	0.2 mg/kg	<0.2	----	----	----	----
Ethylbenzene	0.2 mg/kg	----	1	92.0	65.3	126
	0.2 mg/kg	<0.2	----	----	----	----
meta- & para-Xylene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	2	94.9	66.5	124
ortho-Xylene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	1	93.6	66.7	123
Toluene	0.2 mg/kg	----	1	92.1	69	122
	0.2 mg/kg	<0.2	----	----	----	----
EP080: BTEX - (QC Lot: 292200)		mg/kg	mg/kg	%	%	%
Benzene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	1	87.1	67.5	125

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*
EP080: BTEX - continued						
EP080: BTEX - (QC Lot: 292200) - continued		mg/kg	mg/kg	%	%	%
Ethylbenzene	0.2 mg/kg	----	1	92.6	65.3	126
	0.2 mg/kg	<0.2	----	----	----	----
meta- & para-Xylene	0.2 mg/kg	----	2	91.8	66.5	124
	0.2 mg/kg	<0.2	----	----	----	----
ortho-Xylene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	1	91.9	66.7	123
Toluene	0.2 mg/kg	----	1	83.9	69	122
	0.2 mg/kg	<0.2	----	----	----	----

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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*	
					Sample Result	*Spike Recovery*	*Static Limits*	
Analyte name	*Laboratory Sample ID*	*Client Sample ID*	*LOR*	*Spike Concentration*		*MS*	*Low*	*High*
EK026G: Total Cyanide By Discrete Analyser								
EK026G: Total Cyanide By Discrete Analyser - (QC Lot: 292318)				mg/kg	mg/kg	%	%	%
Total Cyanide	ES0612955-009	BHE/2.2	1 mg/kg	50	<1.0	101	70	130
EP075(SIM)A: Phenolic Compounds								
EP075(SIM)A: Phenolic Compounds - (QC Lot: 292440)				mg/kg	mg/kg	%	%	%
Phenol	ES0612941-001	Anonymous	0.5 mg/kg	10	<0.5	74.9	70	130
2-Chlorophenol			0.5 mg/kg	10	<0.5	74.8	70	130
2-Nitrophenol			0.5 mg/kg	10	<0.5	78.8	60	130
4-Chloro-3-Methylphenol			0.5 mg/kg	10	<0.5	75.8	70	130
Pentachlorophenol			2.0 mg/kg	10	<2.0	67.5	20	130
EP075(SIM)A: Phenolic Compounds - (QC Lot: 292541)				mg/kg	mg/kg	%	%	%
Phenol	ES0612955-004	BHA1/7.0	0.5 mg/kg	10	<0.5	98.8	70	130
2-Chlorophenol			0.5 mg/kg	10	<0.5	90.3	70	130
2-Nitrophenol			0.5 mg/kg	10	<0.5	89.1	60	130
4-Chloro-3-Methylphenol			0.5 mg/kg	10	<0.5	85.2	70	130
Pentachlorophenol			2.0 mg/kg	10	<2.0	98.2	20	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 292440)				mg/kg	mg/kg	%	%	%
Acenaphthene	ES0612941-001	Anonymous	0.5 mg/kg	10	<0.5	80.1	70	130
Pyrene			0.5 mg/kg	10	<0.5	82.7	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 292541)				mg/kg	mg/kg	%	%	%
Acenaphthene	ES0612955-004	BHA1/7.0	0.5 mg/kg	10	<0.5	98.8	70	130
Pyrene			0.5 mg/kg	10	<0.5	95.4	70	130
EP080/071: Total Petroleum Hydrocarbons								
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 291820)				mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	ES0612895-041	Anonymous	2 mg/kg	26	<2	88.2	70	130

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Matrix Type: SOIL

Matrix Spike (MS) Report

					Actual Results		Recovery Limits	
					Sample Result	Spike Recovery	Static Limits	
Analyte name	*Laboratory Sample ID*	*Client Sample ID*	*LOR*	*Spike Concentration*		*MS*	*Low*	*High*
EP080/071: Total Petroleum Hydrocarbons - continued								
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 292069)				mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	ES0612971-030	Anonymous	2 mg/kg	26	<2	106	70	130
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 292200)				mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	ES0612990-008	Anonymous	2 mg/kg	26	<2	106	70	130
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 292441)				mg/kg	mg/kg	%	%	%
C10 - C14 Fraction	ES0612941-001	Anonymous	50 mg/kg	700	<50	73.0	70	130
C15 - C28 Fraction			100 mg/kg	3400	<100	98.4	70	130
C29 - C36 Fraction			100 mg/kg	3600	<100	95.2	70	130
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 292540)				mg/kg	mg/kg	%	%	%
C10 - C14 Fraction	ES0612955-004	BHA1/7.0	50 mg/kg	700	<50	90.4	70	130
C15 - C28 Fraction			100 mg/kg	3400	<100	114	70	130
C29 - C36 Fraction			100 mg/kg	3600	<100	87.8	70	130
EP080: BTEX								
EP080: BTEX - (QC Lot: 291820)				mg/kg	mg/kg	%	%	%
Benzene	ES0612895-041	Anonymous	0.2 mg/kg	2.5	<0.2	76.4	70	130
Toluene			0.2 mg/kg	2.5	<0.2	72.4	70	130
Ethylbenzene			0.2 mg/kg	2.5	<0.2	76.1	70	130
meta- & para-Xylene			0.2 mg/kg	2.5	<0.2	76.7	70	130
ortho-Xylene			0.2 mg/kg	2.5	<0.2	79.5	70	130
EP080: BTEX - (QC Lot: 292069)				mg/kg	mg/kg	%	%	%
Benzene	ES0612971-030	Anonymous	0.2 mg/kg	2.5	<0.2	77.5	70	130
Toluene			0.2 mg/kg	2.5	<0.2	70.8	70	130
Ethylbenzene			0.2 mg/kg	2.5	<0.2	85.7	70	130
meta- & para-Xylene			0.2 mg/kg	2.5	<0.2	85.2	70	130
ortho-Xylene			0.2 mg/kg	2.5	<0.2	84.1	70	130
EP080: BTEX - (QC Lot: 292200)				mg/kg	mg/kg	%	%	%
Benzene	ES0612990-008	Anonymous	0.2 mg/kg	2.5	<0.2	91.5	70	130
Toluene			0.2 mg/kg	2.5	<0.2	79.3	70	130
Ethylbenzene			0.2 mg/kg	2.5	<0.2	93.0	70	130

Matrix Type: SOIL

Matrix Spike (MS) Report

					Actual Results		Recovery Limits	
					Sample Result	Spike Recovery	Static Limits	
Analyte name	***Laboratory Sample ID***	***Client Sample ID***	***LOR***	***Spike Concentration***		***MS***	***Low***	***High***
EP080: BTEX - continued								
EP080: BTEX - (QC Lot: 292200) - continued				mg/kg	mg/kg	%	%	%
meta- & para-Xylene	ES0612990-008	Anonymous	0.2 mg/kg	2.5	<0.2	91.6	70	130
ortho-Xylene			0.2 mg/kg	2.5	<0.2	89.1	70	130

ALS Environmental

INTERPRETIVE QUALITY CONTROL REPORT

Client	:	**CH2M HILL PTY LTD**	**Laboratory**	:	ALS Environmental Sydney	**Page**	: **1 of 6**
Contact	:	MR ADAM SULLIVAN	**Contact**	:	Greg Vogel		
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	**Address**	:	Smithfield NSW Australia 2164	**Work order**	: **ES0612955**
						Amendment No.	: **1**
Project	:	347496 MACDONALDTOWN GASWORKS	**Quote number**	:	----	**Date received**	: 17 Oct 2006
Order number	:	- Not provided -				**Date issued**	: 25 Oct 2006
C-O-C number	:	- Not provided -					
Site	:	- Not provided -					
E-mail	:	adam.sullivan@ch2m.com.au	**E-mail**	:	Greg.Vogel@alsenviro.com	**No. of samples**	
Telephone	:	02 9950 0200	**Telephone**	:	+61 (02) 8784 8555	**Received**	: 22
Facsimile	:	02 9950 0600	**Facsimile**	:	+61 (02) 8784 8500	**Analysed**	: 17

This Interpretive Quality Control Report was issued on 25 Oct 2006 for the ALS work order reference ES0612955 and supersedes any previous reports with this reference.
This report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Type Frequency Compliance
- Summary of all Quality Control Outliers
- Brief Method Summaries

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Interpretive Quality Control Report - Analysis Holding Time

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the sample aliquot was taken. Elapsed time to analysis represents time from sampling where no extraction / digestion is involved or time from extraction / digestion where this is present. For composite samples, sampling date/time is taken as that of the oldest sample contributing to that composite. Sample date/time for laboratory produced leaches are taken from the completion date/time of the leaching process. Outliers for holding time are based on USEPA SW846, APHA, AS and NEPM (1999). Failed outliers, refer to the 'Summary of Outliers'.

Matrix Type: SOIL ***Analysis Holding Time and Preservation***

Method / **Container /** Client Sample ID(s)		**Date Sampled**	**Extraction / Preparation**			**Analysis**		
			Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EA055-103: Moisture Content								
Soil Glass Jar - Unpreserved								
BHA/5.0,	BHA/7.0,	**16 Oct 2006**	----	----	----	**18 Oct 2006**	23 Oct 2006	Pass
BHA/10.2,	BHA1/7.0,							
BHA1/10.2,	BHA2/7.0,							
BHA2/10.2								
Soil Glass Jar - Unpreserved								
DUP20,	TRIP SPIKE CONTROL	**16 Oct 2006**	----	----	----	**20 Oct 2006**	23 Oct 2006	Pass
Soil Glass Jar - Unpreserved								
BHB/6.0,	BHE/2.2,	**17 Oct 2006**	----	----	----	**19 Oct 2006**	24 Oct 2006	Pass
BHE/3.5,	BHF/3.6,							
BHF/1.0,	BH12A/4.2,							
TRIP SPIKE 1,	TRIP BLANK 1							
EK026G: Total Cyanide By Discrete Analyser								
Soil Glass Jar - Unpreserved								
BHE/2.2,	BHE/3.5,	**17 Oct 2006**	**19 Oct 2006**	24 Oct 2006	Pass	**19 Oct 2006**	2 Nov 2006	Pass
BHF/3.6,	BHF/1.0,							
BH12A/4.2								
EP071: TPH - Semivolatile Fraction								
Soil Glass Jar - Unpreserved								
BHA/5.0,	BHA/7.0,	**16 Oct 2006**	**19 Oct 2006**	30 Oct 2006	Pass	**20 Oct 2006**	28 Nov 2006	Pass
BHA/10.2								
Soil Glass Jar - Unpreserved								
BHA1/7.0,	BHA1/10.2,	**16 Oct 2006**	**20 Oct 2006**	30 Oct 2006	Pass	**20 Oct 2006**	29 Nov 2006	Pass
BHA2/7.0,	BHA2/10.2,							
DUP20,	TRIP SPIKE CONTROL							
Soil Glass Jar - Unpreserved								
BHB/6.0,	BHE/2.2,	**17 Oct 2006**	**20 Oct 2006**	31 Oct 2006	Pass	**20 Oct 2006**	29 Nov 2006	Pass
BHE/3.5,	BHF/3.6,							
BHF/1.0,	BH12A/4.2,							
TRIP SPIKE 1,	TRIP BLANK 1							
EP075(SIM): PAH/Phenols (SIM)								
Soil Glass Jar - Unpreserved								
BHA/5.0,	BHA/7.0,	**16 Oct 2006**	**19 Oct 2006**	30 Oct 2006	Pass	**20 Oct 2006**	28 Nov 2006	Pass
BHA/10.2								

Matrix Type: SOIL

Analysis Holding Time and Preservation

Method / **Container /** Client Sample ID(s)	**Date Sampled**	**Extraction / Preparation**			**Analysis**		
		Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EP075(SIM): PAH/Phenols (SIM) **- continued**							
Soil Glass Jar - Unpreserved BHA1/7.0, BHA1/10.2, BHA2/7.0, BHA2/10.2, DUP20	**16 Oct 2006**	**20 Oct 2006**	30 Oct 2006	Pass	**20 Oct 2006**	29 Nov 2006	Pass
Soil Glass Jar - Unpreserved BHB/6.0, BHE/2.2, BHE/3.5, BHF/3.6, BHF/1.0, BH12A/4.2	**17 Oct 2006**	**20 Oct 2006**	31 Oct 2006	Pass	**20 Oct 2006**	29 Nov 2006	Pass
EP080: TPH Volatiles/BTEX							
Soil Glass Jar - Unpreserved BHA/5.0, BHA/7.0, BHA/10.2, BHA1/7.0, BHA1/10.2, BHA2/7.0, BHA2/10.2, DUP20	**16 Oct 2006**	**18 Oct 2006**	30 Oct 2006	Pass	**18 Oct 2006**	30 Oct 2006	Pass
Soil Glass Jar - Unpreserved TRIP SPIKE CONTROL	**16 Oct 2006**	**18 Oct 2006**	30 Oct 2006	Pass	**19 Oct 2006**	30 Oct 2006	Pass
Soil Glass Jar - Unpreserved BHB/6.0, BHE/2.2, BHE/3.5, BHF/3.6, BHF/1.0, BH12A/4.2, TRIP SPIKE 1	**17 Oct 2006**	**18 Oct 2006**	31 Oct 2006	Pass	**18 Oct 2006**	31 Oct 2006	Pass
Soil Glass Jar - Unpreserved TRIP BLANK 1	**17 Oct 2006**	**18 Oct 2006**	31 Oct 2006	Pass	**19 Oct 2006**	31 Oct 2006	Pass

Interpretive Quality Control Report - Frequency of Quality Control Samples

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which this work order was processed. Actual rate should be greater than or equal to the expected rate.

Matrix Type: SOIL ***Frequency of Quality Control Samples***

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
EA055-103: Moisture Content	8	69	**11.6**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EK026G: Total Cyanide By Discrete Analyser	1	6	**16.7**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	4	26	**15.4**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	4	37	**10.8**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	6	59	**10.2**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Laboratory Control Samples (LCS)					
EK026G: Total Cyanide By Discrete Analyser	1	6	**16.7**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	2	26	**7.7**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	2	37	**5.4**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	3	59	**5.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Method Blanks (MB)					
EK026G: Total Cyanide By Discrete Analyser	1	6	**16.7**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	2	26	**7.7**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	2	37	**5.4**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	3	59	**5.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Matrix Spikes (MS)					
EK026G: Total Cyanide By Discrete Analyser	1	6	**16.7**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	2	26	**7.7**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	2	37	**5.4**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	3	59	**5.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement

Interpretive Quality Control Report - Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged on the 'Quality Control Report'. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). 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. - Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot.

Non-surrogates

ALS QC Lot	Matrix Type	Laboratory Sample ID	Client Sample ID	Analyte	Data	Limits	Comment
Laboratory Duplicates (DUP)							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	SOIL	ES0612955-014	BH12A/4.2	Chrysene	22.3 %	0-20 %	RPD exceeds LOR based limits

- **For all matrices, no method blank result outliers occur.**
- **For all matrices, no laboratory spike recoveries breaches occur.**
- **For all matrices, no matrix spike recoveries breaches occur.**

Surrogates

ALS QC Lot	Matrix Type	Laboratory Sample ID	Client Sample ID	Analyte	Data	Limits	Comment
Surrogates							
EP075(SIM)S: Phenolic Compound Surrogates	SOIL	ES0612955-004	BHA1/7.0	Phenol-d6	116 %	24-113 %	Recovery greater than upper data quality objective
	SOIL	ES0612955-005	BHA1/10.2	Phenol-d6	115 %	24-113 %	Recovery greater than upper data quality objective
	SOIL	ES0612955-006	BHA2/7.0	Phenol-d6	117 %	24-113 %	Recovery greater than upper data quality objective
	SOIL	ES0612955-007	BHA2/10.2	Phenol-d6	123 %	24-113 %	Recovery greater than upper data quality objective
	SOIL	ES0612955-008	BHB/6.0	Phenol-d6	125 %	24-113 %	Recovery greater than upper data quality objective
	SOIL	ES0612955-009	BHE/2.2	Phenol-d6	124 %	24-113 %	Recovery greater than upper data quality objective
	SOIL	ES0612955-010	BHE/3.5	Phenol-d6	117 %	24-113 %	Recovery greater than upper data quality objective
	SOIL	ES0612955-011	DUP20	Phenol-d6	126 %	24-113 %	Recovery greater than upper data quality objective
	SOIL	ES0612955-012	BHF/3.6	Phenol-d6	118 %	24-113 %	Recovery greater than upper data quality objective
	SOIL	ES0612955-013	BHF/1.0	Phenol-d6	116 %	24-113 %	Recovery greater than upper data quality objective
EP075(SIM)T: PAH Surrogates	SOIL	ES0612955-008	BHB/6.0	2-Fluorobiphenyl	116 %	30-115 %	Recovery greater than upper data quality objective
	SOIL	ES0612955-009	BHE/2.2	2-Fluorobiphenyl	117 %	30-115 %	Recovery greater than upper data quality objective

Outliers : Analysis Holding Time

The following report highlights outliers within this 'Interpretive Quality Control Report - Analysis Holding Time'.

- **No holding time outliers occur.**

Outliers : Frequency of Quality Control Samples

The following report highlights outliers within this 'Interpretive Quality Control Report - Frequency of Quality Control Samples'.

- **No frequency outliers occur.**

Method Reference Summary

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.

Matrix Type: SOIL ***Method Reference Summary***

Preparation Methods

EK026PR : NaOH leach for TCN in Soils - APHA 20th ed., 4500 CN- C & N. Samples are extracted by end-over-end tumbling with NaOH.

ORG16 : Methanolic Extraction of Soils for Purge and Trap - (USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.

ORG17B : Tumbler Extraction of Solids (Option B - Non-concentrating) - In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.

Analytical Methods

EA055-103 : Moisture Content - A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (1999) Schedule B(3) (Method 102)

EK026G : Total Cyanide By Discrete Analyser - APHA 20th 4500 CN - C & N. Caustic leach extracts of the sample are distilled with sulphuric acid, converting all CN species to HCN. The distillates are analyzed for CN by Seal. This method is compliant with NEPM (1999) Schedule B(3) (Method 403)

EP071 : TPH - Semivolatile Fraction - (USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)

EP075(SIM) : PAH/Phenols (SIM) - (USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 502 and 507)

EP080 : TPH Volatiles/BTEX - (USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 501)

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Telephone: +61 (02) 8784 8555 Facsimile: +61 (02) 8784 8500 http://www.alsenviro.com/

ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive report

Client Details

Client	:	**CH2M HILL PTY LTD**
Contact	:	**MR ADAM SULLIVAN**
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515
Project	:	**347496 MACDONALDTOWN GASWORK**
Order number	:	**- Not provided -**
C-O-C Number	:	**- Not provided -**
Site	:	**- Not provided -**
Sampler	:	**- Not provided -**
E-mail	:	adam.sullivan@ch2m.com.au
Telephone	:	02 9950 0200
Facsimile	:	02 9950 0600

Laboratory Details

Laboratory	:	**ALS Environmental Sydney**
Manager	:	**Greg Vogel**
Address	:	277-289 Woodpark Road Smithfield NSW Australia 2164
Quote number	:	----
Work order	:	**ES0612955**
E-mail	:	Greg.Vogel@alsenviro.com
Telephone	:	+61 (02) 8784 8555
Facsimile	:	+61 (02) 8784 8500

Dates

Date Samples Received	:	17 Oct 2006	**SRA Issue Date**	:	17 Oct 2006
Scheduled Reporting Date	:	**25 Oct 2006**	**Client Requested Date**	:	25 Oct 2006

Delivery Details

Mode of Delivery	:	Carrier.	**Temperature**	:	CHILLED - Ice present
No. of coolers/boxes	:	1 HARD	**No. of samples** - **Received**		22
Security Seal	:	Intact.	- **Analysed**		17

Comments

- **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).**

- Analytical work for this work order will be conducted at ALSE Sydney.
- 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 Nanthini Coilparampil
- 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'.

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Client	: CH2M HILL PTY LTD	**Work Order**	: ES0612955
Project	: 347496 MACDONALDTOWN GASWORKS	**ALS Quote Reference**	: ----

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

Some items described below may be part of a laboratory process neccessary 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**									
		EA055-103 - SOIL Moisture Content	**EK026G (Solids) - SOIL** Total Cyanide By Discrete Analyser	**S-04 - SOIL** TPH/BTEX	**S-14A - SOIL** PAH/Phenols (16 PAH - SIM)						
ES0612955-001	**BHA/5.0 - 16 Oct 2006**			]	]						
ES0612955-002	**BHA/7.0 - 16 Oct 2006**			]	]						
ES0612955-003	**BHA/10.2 - 16 Oct 2006**			]	]						
ES0612955-004	**BHA1/7.0 - 16 Oct 2006**			]	]						
ES0612955-005	**BHA1/10.2 - 16 Oct 2006**			]	]						
ES0612955-006	**BHA2/7.0 - 16 Oct 2006**			]	]						
ES0612955-007	**BHA2/10.2 - 16 Oct 2006**			]	]						
ES0612955-008	**BHB/6.0 - 17 Oct 2006**			]	]						
ES0612955-009	**BHE/2.2 - 17 Oct 2006**	]	]	]	]						
ES0612955-010	**BHE/3.5 - 17 Oct 2006**	]	]	]	]						
ES0612955-011	**DUP20 - 16 Oct 2006**			]	]						
ES0612955-012	**BHF/3.6 - 17 Oct 2006**	]	]	]	]						
ES0612955-013	**BHF/1.0 - 17 Oct 2006**	]	]	]	]						
ES0612955-014	**BH12A/4.2 - 17 Oct 2006**	]	]	]	]						
ES0612955-015	**TRIP SPIKE 1 - 17 Oct 2006**			]							
ES0612955-016	**TRIP BLANK 1 - 17 Oct 2006**			]							
ES0612955-017	**TRIP SPIKE CONTROL - 16 Oct 2006**			]							
ES0612955-018	**BHA/8.4 - 16 Oct 2006**										
ES0612955-019	**BHA/9.6 - 16 Oct 2006**										
ES0612955-020	**BHA1/9.6 - 16 Oct 2006**										
ES0612955-021	**BHE/1.6 - 17 Oct 2006**										
ES0612955-022	**BHF/2.6 - 17 Oct 2006**										
	Total(s) :	**5**	**5**	**17**	**14**						

Client	: CH2M HILL PTY LTD	**Work Order**	: ES0612955
Project	: 347496 MACDONALDTOWN GASWORKS	**ALS Quote Reference**	: ----

Requested Reports

l **ALL ACCOUNTS**

-	Invoice	Email	mogibu.rahman@ch2m.com.au

l **MR ADAM SULLIVAN**

-	A4 - Certificate of Analysis - NEPM format	Email	adam.sullivan@ch2m.com.au
-	A4 - Quality Control Report - NEPM format	Email	adam.sullivan@ch2m.com.au
-	A4 - Interpretive Quality Control Report - NEPM format	Email	adam.sullivan@ch2m.com.au
-	ENMRG Export Format	Email	adam.sullivan@ch2m.com.au
-	ESDAT Export Format	Email	adam.sullivan@ch2m.com.au
-	Chain of Custody Acknowledgement	Email	adam.sullivan@ch2m.com.au
-	A4 - Sample Receipt Notification - Comprehensive format	Email	adam.sullivan@ch2m.com.au

Sample Container(s) / Preservation Non-Compliance Log

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

l **No sample container / preservation non-compliance exist.**

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CERTIFICATE OF ANALYSIS

Client	: CH2M HILL PTY LTD	Laboratory	: ALS Environmental Sydney	Page	: 1 of 11
Contact	: MR ADAM SULLIVAN	Contact	: Greg Vogel	Work Order	: ES0613014
Address	: PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164		
E-mail	: adam.sullivan@ch2m.com.au	E-mail	: Greg.Vogel@alsenviro.com		
Telephone	: 02 9950 0200	Telephone	: +61 (02) 8784 8555		
Facsimile	: 02 9950 0600	Facsimile	: +61 (02) 8784 8500		
Project	: 347496 Macdonaldtown Gasworks	Quote number	: ----	Date received	: 18 Oct 2006
Order number	: - Not provided -			Date issued	: 25 Oct 2006
C-O-C number	: - Not provided -			No. of samples	- Received : 19
Site	: - Not provided -				Analysed : 16

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
PHALAK INTHAKESONE	Organics Co-ordinator	Organics - NATA 825 (10911 - Sydney)
Sarah Millington	Senior Inorganic Chemist	Inorganics - NATA 825 (10911 - Sydney)

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Comments

This report for the ALSE reference ES0613014 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 insuffient 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 **ES0613014**

The trip spike and control were prepared in the lab using reagent grade sand spiked with petrol. The spike was dispatched from the lab and the control retained.

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Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID : TP15A/6.0	TP15A/7.0	MG09A1/0.7	MG09A1/3.6	MG09A1/4.8
Sample Matrix Type / Description :				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time :				17 Oct 2006 15:00	17 Oct 2006 15:00	17 Oct 2006 15:00	17 Oct 2006 15:00	17 Oct 2006 15:00
Laboratory Sample ID :				ES0613014-001	ES0613014-002	ES0613014-003	ES0613014-004	ES0613014-005
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%	13.1	16.8	20.8	15.5	12.8
EK026G: Total Cyanide By Discrete Analyser								
Total Cyanide	57-12-5	1.0	mg/kg	<1.0	<1.0	23.6	<1.0	<1.0
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	2.0	<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	1.8	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	<1.0	3.2	<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	4.0	<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	0.8	<0.5	182	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	27.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	6.8	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	26.0	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	54.3	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	22.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	24.4	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	24.6	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	12.2	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	9.8	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	8.7	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	2.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	8.2	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	2.9	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.8	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	3.4	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction		2	mg/kg	<2	<2	39	<2	<2
C10 - C14 Fraction		50	mg/kg	<50	<50	850	<50	<50
C15 - C28 Fraction		100	mg/kg	<100	<100	2110	<100	<100

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Analytical Results

				Client Sample ID :	TP15A/6.0	TP15A/7.0	MG09A1/0.7	MG09A1/3.6	MG09A1/4.8
				Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Date / Time :	17 Oct 2006 15:00	17 Oct 2006 15:00	17 Oct 2006 15:00	17 Oct 2006 15:00	17 Oct 2006 15:00
				Laboratory Sample ID :					
Analyte	*CAS number*	*LOR*	*Units*		ES0613014-001	ES0613014-002	ES0613014-003	ES0613014-004	ES0613014-005
EP080/071: Total Petroleum Hydrocarbons									
C29 - C36 Fraction		100	mg/kg		<100	<100	560	<100	<100
EP080: BTEX									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	1.7	<0.2	<0.2
Toluene	108-88-3	0.2	mg/kg		<0.2	<0.2	6.6	<0.2	<0.2
Ethylbenzene	100-41-4	0.2	mg/kg		<0.2	<0.2	2.4	<0.2	<0.2
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg		<0.2	<0.2	14.5	<0.2	<0.2
ortho-Xylene	95-47-6	0.2	mg/kg		<0.2	<0.2	6.5	<0.2	<0.2
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.1	%		116	115	118	118	113
2-Chlorophenol-D4	93951-73-6	0.1	%		104	107	107	110	106
2.4.6-Tribromophenol	118-79-6	0.1	%		72.1	68.4	84.3	81.8	72.1
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		101	98.5	102	103	98.0
Anthracene-d10	1719-06-8	0.1	%		99.6	98.8	98.8	102	97.8
4-Terphenyl-d14	1718-51-0	0.1	%		106	106	104	105	99.8
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		80.7	80.2	84.0	105	114
Toluene-D8	2037-26-5	0.1	%		88.3	85.3	89.1	83.1	93.8
4-Bromofluorobenzene	460-00-4	0.1	%		86.2	92.1	90.1	85.2	78.2

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Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: MG10B/1.8	MG10B/3.0	BH14A/1.4	BH14A/2.4	BHF/7.0
Sample Matrix Type / Description:				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time:				18 Oct 2006 15:00	18 Oct 2006 15:00	18 Oct 2006 15:00	18 Oct 2006 15:00	18 Oct 2006 15:00
Laboratory Sample ID:				ES0613014-006	ES0613014-007	ES0613014-008	ES0613014-009	ES0613014-010
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%	19.0	14.9	20.0	16.2	12.4
EK026G: Total Cyanide By Discrete Analyser								
Total Cyanide	57-12-5	1.0	mg/kg	----	----	----	----	<1.0
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	3.1	<0.5	0.7	<0.5	0.8
Acenaphthylene	208-96-8	0.5	mg/kg	1.1	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	2.0	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	3.0	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	7.9	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	2.6	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	4.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	5.1	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	2.0	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	1.6	<0.5	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	1.3	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	0.7	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	1.6	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	0.6	<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	0.8	<0.5	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction		2	mg/kg	<2	<2	9	<2	7
C10 - C14 Fraction		50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction		100	mg/kg	<100	<100	<100	<100	<100

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Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: MG10B/1.8	MG10B/3.0	BH14A/1.4	BH14A/2.4	BHF/7.0
Sample Matrix Type / Description				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time				18 Oct 2006 15:00	18 Oct 2006 15:00	18 Oct 2006 15:00	18 Oct 2006 15:00	18 Oct 2006 15:00
Laboratory Sample ID				ES0613014-006	ES0613014-007	ES0613014-008	ES0613014-009	ES0613014-010
EP080/071: Total Petroleum Hydrocarbons								
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	0.4	<0.2	0.8
Toluene	108-88-3	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	0.4
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	<0.2	0.4	<0.2	0.6
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	0.4
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	118	123	114	110	110
2-Chlorophenol-D4	93951-73-6	0.1	%	107	117	106	101	104
2.4.6-Tribromophenol	118-79-6	0.1	%	77.1	65.8	69.4	53.5	53.2
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	105	107	100	93.9	95.5
Anthracene-d10	1719-06-8	0.1	%	105	106	99.4	93.5	95.1
4-Terphenyl-d14	1718-51-0	0.1	%	107	110	102	97.2	98.4
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	105	102	103	101	96.5
Toluene-D8	2037-26-5	0.1	%	84.2	95.8	81.8	88.6	84.6
4-Bromofluorobenzene	460-00-4	0.1	%	86.5	96.9	90.3	87.5	82.1

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Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: DUP21	DUP22	TRIP SPIKE 2	TRIP BLANK 2	TRIP SPIKE CONTROL
Sample Matrix Type / Description:				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time:				17 Oct 2006 15:00	18 Oct 2006 15:00	18 Oct 2006 15:00	18 Oct 2006 15:00	13 Oct 2006 15:00
Laboratory Sample ID:				ES0613014-012	ES0613014-013	ES0613014-014	ES0613014-015	ES0613014-016
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%	15.5	13.2	2.8	1.8	3.1
EK026G: Total Cyanide By Discrete Analyser								
Total Cyanide	57-12-5	1.0	mg/kg	<1.0	----	----	----	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	----	----	----
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	----	----	----
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	----	----	----
3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	<1.0	----	----	----
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	----	----	----
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	----	----	----
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	----	----	----
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	----	----	----
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	----	----	----
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	----	----	----
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	----	----	----
Pentachlorophenol	87-86-5	2.0	mg/kg	<2.0	<2.0	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	0.5	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	----	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction		2	mg/kg	<2	8	----	<2	----
C10 - C14 Fraction		50	mg/kg	<50	<50	----	<50	----
C15 - C28 Fraction		100	mg/kg	<100	<100	----	<100	----

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID : DUP21	DUP22	TRIP SPIKE 2	TRIP BLANK 2	TRIP SPIKE CONTROL
Sample Matrix Type / Description :				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time :				17 Oct 2006 15:00	18 Oct 2006 15:00	18 Oct 2006 15:00	18 Oct 2006 15:00	13 Oct 2006 15:00
Laboratory Sample ID :				ES0613014-012	ES0613014-013	ES0613014-014	ES0613014-015	ES0613014-016
EP080/071: Total Petroleum Hydrocarbons								
C29 - C36 Fraction		100	mg/kg	<100	<100	----	<100	----
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	1.0	0.7	<0.2	0.7
Toluene	108-88-3	0.2	mg/kg	<0.2	0.4	8.9	<0.2	9.7
Ethylbenzene	100-41-4	0.2	mg/kg	<0.2	<0.2	1.4	<0.2	1.6
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	<0.2	0.6	7.3	<0.2	8.0
ortho-Xylene	95-47-6	0.2	mg/kg	<0.2	0.5	3.0	<0.2	3.3
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	106	117	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	111	108	----	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%	69.0	52.5	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	99.5	99.5	----	----	----
Anthracene-d10	1719-06-8	0.1	%	96.5	99.4	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	102	101	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	103	106	111	111	118
Toluene-D8	2037-26-5	0.1	%	86.1	87.4	87.1	89.9	93.7
4-Bromofluorobenzene	460-00-4	0.1	%	88.0	92.1	90.3	86.9	96.2

ALS Environmental

Analytical Results

	Client Sample ID :	EQ1
	Sample Matrix Type / Description :	WATER
	Sample Date / Time :	17 Oct 2006 15:00
	Laboratory Sample ID :	ES0613014-011

Analyte	CAS number	LOR	Units	
EP075(SIM)A: Phenolic Compounds				
Phenol	108-95-2	1.0	µg/L	<1.0
2-Chlorophenol	95-57-8	1.0	µg/L	<1.0
2-Methylphenol	95-48-7	1.0	µg/L	<1.0
3- & 4-Methylphenol	1319-77-3	2.0	µg/L	<2.0
2-Nitrophenol	88-75-5	1.0	µg/L	<1.0
2.4-Dimethylphenol	105-67-9	1.0	µg/L	<1.0
2.4-Dichlorophenol	120-83-2	1.0	µg/L	<1.0
2.6-Dichlorophenol	87-65-0	1.0	µg/L	<1.0
4-Chloro-3-Methylphenol	59-50-7	1.0	µg/L	<1.0
2.4.6-Trichlorophenol	88-06-2	1.0	µg/L	<1.0
2.4.5-Trichlorophenol	95-95-4	1.0	µg/L	<1.0
Pentachlorophenol	87-86-5	2.0	µg/L	<2.0
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons				
Naphthalene	91-20-3	1.0	µg/L	<1.0
Acenaphthylene	208-96-8	1.0	µg/L	<1.0
Acenaphthene	83-32-9	1.0	µg/L	<1.0
Fluorene	86-73-7	1.0	µg/L	<1.0
Phenanthrene	85-01-8	1.0	µg/L	<1.0
Anthracene	120-12-7	1.0	µg/L	<1.0
Fluoranthene	206-44-0	1.0	µg/L	<1.0
Pyrene	129-00-0	1.0	µg/L	<1.0
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0
Chrysene	218-01-9	1.0	µg/L	<1.0
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0
EP080/071: Total Petroleum Hydrocarbons				
C6 - C9 Fraction		20	µg/L	<20
C10 - C14 Fraction		50	µg/L	<50
C15 - C28 Fraction		100	µg/L	<100
C29 - C36 Fraction		50	µg/L	<50
EP080: BTEX				
Benzene	71-43-2	1	µg/L	<1
Toluene	108-88-3	2	µg/L	<2

ALS Environmental

Analytical Results

				Client Sample ID :	EQ1			
				Sample Matrix Type / Description :	WATER			
				Sample Date / Time :	17 Oct 2006 15:00			
				Laboratory Sample ID :	ES0613014-011			
Analyte	*CAS number*	*LOR*	*Units*					
EP080: BTEX								
Ethylbenzene	100-41-4	2	µg/L		<2			
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2			
ortho-Xylene	95-47-6	2	µg/L		<2			
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%		29.3			
2-Chlorophenol-D4	93951-73-6	0.1	%		79.6			
2.4.6-Tribromophenol	118-79-6	0.1	%		84.2			
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%		81.8			
Anthracene-d10	1719-06-8	0.1	%		82.7			
4-Terphenyl-d14	1718-51-0	0.1	%		81.1			
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%		87.0			
Toluene-D8	2037-26-5	0.1	%		107			
4-Bromofluorobenzene	460-00-4	0.1	%		101			

ALS Environmental

Surrogate Control Limits

Matrix Type: WATER - Surrogate Control Limits ***Surrogate Control Limits***

Method name	*Analyte name*	*Lower Limit*	*Upper Limit*
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	116
	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

Matrix Type: SOIL - Surrogate Control Limits ***Surrogate Control Limits***

Method name	*Analyte name*	*Lower Limit*	*Upper Limit*
EP075(SIM): PAH/Phenols (SIM)			
EP075(SIM)S: Phenolic Compound Surrogates	Phenol-d6	24	113
	2-Chlorophenol-D4	23	134
	2,4,6-Tribromophenol	19	122
EP075(SIM)T: PAH Surrogates	2-Fluorobiphenyl	30	115
	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

CH2MHILL ACN 050 070 892

CHAIN OF CUSTODY RECORD

Level 7, 9 Help Street, Chatswood, NSW 2067 Australia Tel (61 2) 9950 0200 Fax (61 2) 9950 0600

Laboratory Quotation #

1/2

COC # 5519

Project # 347496	**Purchase Order #** SY/148/06
Project Name Macdonald Town Gasworks	
Company Name ALS	
Project Manager or Contact & Phone # Adam Sullivan 0400 500 264	**Report Copy to:**
Requested Completion Date: Standard TAT	**Site ID** Macdonald Town
Sample Disposal: Dispose ☑ Return ☐	

Sampling Date	Time	Type	Matrix	CLIENT SAMPLE ID (9 CHARACTERS)	LAB QC	TOTAL # OF CONTAINERS	S-7	Phenols	EK026	S-4	HOLD			
							Preservative							
17/10	(1)		S	TP15A/6.0			X	X	X					
"	(2)			TP15A/7.0			X	X	X					
"	(3)			MG09A1/0.7			X	X	X					
"	(4)			MG09A1/3.6			X	X	X					
"	(5)			MG09A1/4.8			X	X	X					
18/10	15			MG09A1/5.5						X				
"	(6)			MG10B/1.8			X	X						
"	(7)			MG10B/3.0			X	X						
"	(8)			BH14A/1.4			X	X						
"	(9)			BH14A/2.4			X	X						
"	18		V	BHF/4.6						X				
"	(10)			BHF/7.0			X	X	X					

QA REQUIREMENTS

Matrix Spike	☐ Yes	☐ No
Matrix Duplicate	☐ Yes	☐ No
Laboratory Duplicate	☐ Yes	☐ No
Lab Blank	☐ Yes	☐ No
Surrogate Spike	☐ Yes	☐ No
RPDs	☐ Yes	☐ No
Spike Recovery Data	☐ Yes	☐ No

LAB USE ONLY

Custody Seals	☐ Yes	☐ No
ICE	☐ Yes	☐ No

Comments	Lab ID

ALS Environmental
Sydney
Work Order
ES0613014

Telephone : +61 (02) 8784 8555

Sampled By and Title Adam Sullivan	(Please sign and print name) A. Sullivan	**Date/Time** 18/10/06	**Relinquished By** A. Sullivan (Please sign and print name) A. Sullivan	**Date/Time** 18/10/06
Received by Noreen	(Please sign and print name) [illegible]	**Date/Time** 18.10.06 4.00 pm	**Relinquished By** (Please sign and print name)	**Date/Time**
Received by	(Please sign and print name)	**Date/Time**	**Shipped Via**	**Shipping #**

Special Instructions:

DISTRIBUTION: Original - LAB, Yellow - LAB, Pink - CH2MHILL

2/2

CH2MHILL ACN 050 070 892

CHAIN OF CUSTODY RECORD

Laboratory Quotation #

Level 7, 9 Help Street, Chatswood, NSW 2067 Australia Tel (61 2) 9950 0200 Fax (61 2) 9950 0600

COC # 5519

Project # 347496	**Purchase Order #** SY/148/06
Project Name Macdonaldtown Gasworks	
Company Name ALS	
Project Manager or Contact & Phone # Adam Sullivan 0400 500 264	**Report Copy to:** →
Requested Completion Date: Standard TAT	**Site ID** Macdonaldtown
Sample Disposal: Dispose ☑ Return ☐	

Sampling Date	Time	Type	Matrix: Soil	Matrix: Water	CLIENT SAMPLE ID (9 CHARACTERS)	LAB QC	TOTAL # OF CONTAINERS	S-7	Phenols	EK026	S-4	HOLD
					Requested Analytical Method #							
					Preservative							
17/10	11			X	EQ1			X	X			
17/10	12		X		DUP21			X	X	X		
18/10	13		↓		DUP22			X	X			
"	14				Trip spike (2)						X	
"	15				Trip blk (2)						X	
19	~~16~~				BHF/8.4							
	16				Trip spike control			13.10.06				

QA REQUIREMENTS

Matrix Spike	☐ Yes	☐ No
Matrix Duplicate	☐ Yes	☐ No
Laboratory Duplicate	☐ Yes	☐ No
Lab Blank	☐ Yes	☐ No
Surrogate Spike	☐ Yes	☐ No
RPDs	☐ Yes	☐ No
Spike Recovery Data	☐ Yes	☐ No

LAB USE ONLY

Custody Seals	☐ Yes	☐ No
ICE	☐ Yes	☐ No

Comments	Lab ID

Sampled By and Title (Please sign and print name)	**Date/Time**	**Relinquished By** (Please sign and print name)	**Date/Time**
Received by Noreen (Please sign and print name)	**Date/Time** 18.10.06 4pm	**Relinquished By** (Please sign and print name)	**Date/Time**
Received by (Please sign and print name)	**Date/Time**	**Shipped Via**	**Shipping #**

Special Instructions:

DISTRIBUTION: Original - LAB, Yellow - LAB, Pink - CH2MHILL

ALS Environmental

QUALITY CONTROL REPORT

Client	:	**CH2M HILL PTY LTD**	**Laboratory**	: ALS Environmental Sydney	**Page**	:	**1 of 13**
Contact	:	MR ADAM SULLIVAN	**Contact**	: Greg Vogel			
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	**Address**	: 277-289 Woodpark Road Smithfield NSW Australia 2164	**Work order**	:	**ES0613014**
					Amendment No.	:	
Project	:	347496 Macdonaldtown Gasworks	**Quote number**	: ----	**Date received**	:	18 Oct 2006
Order number	:	- Not provided -			**Date issued**	:	25 Oct 2006
C-O-C number	:	- Not provided -					
Site	:	- Not provided -					
E-mail	:	adam.sullivan@ch2m.com.au	**E-mail**	: Greg.Vogel@alsenviro.com	**No. of samples**		
Telephone	:	02 9950 0200	**Telephone**	: +61 (02) 8784 8555	**Received**	:	19
Facsimile	:	02 9950 0600	**Facsimile**	: +61 (02) 8784 8500	**Analysed**	:	16

This final report for the ALSE work order reference ES0613014 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

The trip spike and control were prepared in the lab using reagent grade sand spiked with petrol. The spike was dispatched from the lab and the control retained.

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/IED 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	Department
PHALAK INTHAKESONE	Organics - NATA 825 (10911 - Sydney)
Sarah Millington	Inorganics - NATA 825 (10911 - Sydney)

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						
EA055: Moisture Content - (QC Lot: 293188)				**%**	**%**	**%**
ES0613014-001	TP15A/6.0	Moisture Content (dried @ 103°C)	1.0 %	13.1	13.3	1.4
ES0613014-010	BHF/7.0	Moisture Content (dried @ 103°C)	1.0 %	12.4	12.5	1.3
EK026G: Total Cyanide By Discrete Analyser						
EK026G: Total Cyanide By Discrete Analyser - (QC Lot: 292886)				**mg/kg**	**mg/kg**	**%**
ES0613014-001	TP15A/6.0	Total Cyanide	1.0 mg/kg	<1.0	<1.0	0.0
EP075(SIM)A: Phenolic Compounds						
EP075(SIM)A: Phenolic Compounds - (QC Lot: 293050)				**mg/kg**	**mg/kg**	**%**
ES0613014-001	TP15A/6.0	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
ES0613014-012	DUP21	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

ALS Environmental

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: 293050) - continued				mg/kg	mg/kg	%
ES0613014-012	DUP21	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: 293050)				mg/kg	mg/kg	%
ES0613014-001	TP15A/6.0	Naphthalene	0.5 mg/kg	0.8	<0.5	48.9
		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
ES0613014-012	DUP21	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

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: 293050) - continued				mg/kg	mg/kg	%
ES0613014-012	DUP21	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: 292797)				mg/kg	mg/kg	%
ES0613014-005	MG09A1/4.8	C6 - C9 Fraction	2 mg/kg	<2	<2	0.0
ES0613014-008	BH14A/1.4	C6 - C9 Fraction	2 mg/kg	9	8	16.1
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 293051)				mg/kg	mg/kg	%
ES0613014-001	TP15A/6.0	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
ES0613014-012	DUP21	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: 292797)				mg/kg	mg/kg	%
ES0613014-005	MG09A1/4.8	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

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: 292797) - continued				**mg/kg**	**mg/kg**	**%**
ES0613014-008	BH14A/1.4	Benzene	0.2 mg/kg	0.4	0.4	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	0.4	0.5	0.0
		ortho-Xylene	0.2 mg/kg	<0.2	<0.2	0.0

Matrix Type: WATER ***Laboratory Duplicates (DUP) Report***

Laboratory Sample ID	*Client Sample ID*	*Analyte name*	*LOR*	*Original Result*	*Duplicate Result*	*RPD*
EP080/071: Total Petroleum Hydrocarbons						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 292856)				**µg/L**	**µg/L**	**%**
ES0613033-003	Anonymous	C6 - C9 Fraction	20 µg/L	<20	<20	0.0
ES0613033-010	Anonymous	C6 - C9 Fraction	20 µg/L	130	110	13.2
EP080: BTEX						
EP080: BTEX - (QC Lot: 292856)				**µg/L**	**µg/L**	**%**
ES0613033-003	Anonymous	Benzene	1 µg/L	<1	<1	0.0
		Toluene	2 µg/L	<2	<2	0.0
		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
ES0613033-010	Anonymous	Benzene	1 µg/L	11	9	15.9
		Toluene	2 µg/L	<2	<2	0.0
		Ethylbenzene	2 µg/L	<2	<2	0.0
		meta- & para-Xylene	2 µg/L	3	2	0.0
		ortho-Xylene	2 µg/L	<2	<2	0.0

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

		Method blank result	*Actual Results*		*Recovery Limits*	
			Spike concentration	*Spike Recovery*	*Dynamic Recovery Limits*	
Analyte name	*LOR*			*LCS*	*Low*	*High*
EK026G: Total Cyanide By Discrete Analyser						
EK026G: Total Cyanide By Discrete Analyser - (QC Lot: 292886)		mg/kg	mg/kg	%	%	%
Total Cyanide	1 mg/kg	----	50	99.3	70	130
	1.0 mg/kg	<1.0	----	----	----	----
EP075(SIM)A: Phenolic Compounds						
EP075(SIM)A: Phenolic Compounds - (QC Lot: 293050)		mg/kg	mg/kg	%	%	%
2,4,5-Trichlorophenol	0.5 mg/kg	----	4	79.5	68.9	112
	0.5 mg/kg	<0.5	----	----	----	----
2,4,6-Trichlorophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	68.6	62.2	115
2,4-Dichlorophenol	0.5 mg/kg	----	4	80.2	71.6	113
	0.5 mg/kg	<0.5	----	----	----	----
2,4-Dimethylphenol	0.5 mg/kg	----	4	87.6	74.5	119
	0.5 mg/kg	<0.5	----	----	----	----
2,6-Dichlorophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	83.0	74.8	115
2-Chlorophenol	0.5 mg/kg	----	4	101	80.2	115
	0.5 mg/kg	<0.5	----	----	----	----
2-Methylphenol	0.5 mg/kg	----	4	90.4	76.8	114
	0.5 mg/kg	<0.5	----	----	----	----
2-Nitrophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	68.8	60.3	117
3- & 4-Methylphenol	1.0 mg/kg	<1.0	----	----	----	----
	1.0 mg/kg	----	8	89.6	72	119
4-Chloro-3-Methylphenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	75.5	76.4	114

ALS Environmental

Matrix Type: SOIL

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP075(SIM)A: Phenolic Compounds - continued						
EP075(SIM)A: Phenolic Compounds - (QC Lot: 293050) - continued		mg/kg	mg/kg	%	%	%
Pentachlorophenol	1.0 mg/kg	<1.0	----	----	----	----
	1.0 mg/kg	----	8	19.0	1.23	91.6
Phenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	99.7	73.9	115
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 293050)		mg/kg	mg/kg	%	%	%
Acenaphthene	0.5 mg/kg	----	4	95.0	81.5	112
	0.5 mg/kg	<0.5	----	----	----	----
Acenaphthylene	0.5 mg/kg	----	4	95.3	79.6	113
	0.5 mg/kg	<0.5	----	----	----	----
Anthracene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	92.7	81.1	112
Benz(a)anthracene	0.5 mg/kg	----	4	97.3	77.2	112
	0.5 mg/kg	<0.5	----	----	----	----
Benzo(a)pyrene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	93.1	76.4	113
Benzo(b)fluoranthene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	96.2	71.8	118
Benzo(g,h,i)perylene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	92.1	72.4	114
Benzo(k)fluoranthene	0.5 mg/kg	----	4	94.7	74.2	117
	0.5 mg/kg	<0.5	----	----	----	----
Chrysene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	93.5	79.8	114
Dibenz(a,h)anthracene	0.5 mg/kg	----	4	90.5	71.7	113
	0.5 mg/kg	<0.5	----	----	----	----
Fluoranthene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	93.6	78.8	113
Fluorene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	95.4	79.9	112

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*	*High*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - continued						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 293050) - continued		mg/kg	mg/kg	%	%	%
Indeno(1,2,3,cd)pyrene	0.5 mg/kg	----	4	91.4	71	113
	0.5 mg/kg	<0.5	----	----	----	----
Naphthalene	0.5 mg/kg	----	4	97.7	81.9	113
	0.5 mg/kg	<0.5	----	----	----	----
Phenanthrene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	94.4	79.4	114
Pyrene	0.5 mg/kg	----	4	87.9	78.9	113
	0.5 mg/kg	<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 292797)		mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	2 mg/kg	<2	----	----	----	----
	2 mg/kg	----	26	84.6	68.4	128
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 293051)		mg/kg	mg/kg	%	%	%
C10 - C14 Fraction	50 mg/kg	----	200	104	75.2	116
	50 mg/kg	<50	----	----	----	----
C15 - C28 Fraction	100 mg/kg	<100	----	----	----	----
	100 mg/kg	----	200	107	75.3	113
C29 - C36 Fraction	100 mg/kg	<100	----	----	----	----
	100 mg/kg	----	200	94.0	72.6	117
EP080: BTEX						
EP080: BTEX - (QC Lot: 292797)		mg/kg	mg/kg	%	%	%
Benzene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	1	96.8	67.5	125
Ethylbenzene	0.2 mg/kg	----	1	93.3	65.3	126
	0.2 mg/kg	<0.2	----	----	----	----
meta- & para-Xylene	0.2 mg/kg	----	2	85.6	66.5	124
	0.2 mg/kg	<0.2	----	----	----	----
ortho-Xylene	0.2 mg/kg	----	1	90.3	66.7	123
	0.2 mg/kg	<0.2	----	----	----	----

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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*
EP080: BTEX - continued						
EP080: BTEX - (QC Lot: 292797) - continued		mg/kg	mg/kg	%	%	%
Toluene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	1	89.7	69	122

Matrix Type: WATER

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						
EP075(SIM)A: Phenolic Compounds - (QC Lot: 292806)		µg/L	µg/L	%	%	%
2,4,5-Trichlorophenol	0.2 µg/L	----	2	98.4	65.3	121
	0.5 µg/L	<0.5	----	----	----	----
2,4,6-Trichlorophenol	0.2 µg/L	----	2	97.1	63.1	122
	0.5 µg/L	<0.5	----	----	----	----
2,4-Dichlorophenol	0.2 µg/L	----	2	96.4	64.4	121
	0.5 µg/L	<0.5	----	----	----	----
2,4-Dimethylphenol	0.2 µg/L	----	2	91.6	61.7	118
	0.5 µg/L	<0.5	----	----	----	----
2,6-Dichlorophenol	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	98.2	65.7	120
2-Chlorophenol	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	97.5	62.3	117
2-Methylphenol	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	82.4	53.9	110
2-Nitrophenol	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	115	58.2	127
3- & 4-Methylphenol	0.4 µg/L	----	4	73.4	40.9	103
	1.0 µg/L	<1.0	----	----	----	----
4-Chloro-3-Methylphenol	0.2 µg/L	----	2	98.7	66.4	119
	0.5 µg/L	<0.5	----	----	----	----
Pentachlorophenol	0.4 µg/L	----	4	107	10.9	145
	1.0 µg/L	<1.0	----	----	----	----

ALS Environmental

Matrix Type: WATER

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP075(SIM)A: Phenolic Compounds - continued						
EP075(SIM)A: Phenolic Compounds - (QC Lot: 292806) - continued		µg/L	µg/L	%	%	%
Phenol	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	45.0	19.5	60.7
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 292806)		µg/L	µg/L	%	%	%
Acenaphthene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	112	62.2	113
Acenaphthylene	0.2 µg/L	----	2	112	63.6	114
	0.5 µg/L	<0.5	----	----	----	----
Anthracene	0.2 µg/L	----	2	110	64.3	116
	0.5 µg/L	<0.5	----	----	----	----
Benz(a)anthracene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	115	64.1	117
Benzo(a)pyrene	0.2 µg/L	----	2	114	63.3	117
	0.5 µg/L	<0.5	----	----	----	----
Benzo(b)fluoranthene	0.2 µg/L	----	2	119	61.7	119
	0.5 µg/L	<0.5	----	----	----	----
Benzo(g,h,i)perylene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	111	59.1	118
Benzo(k)fluoranthene	0.2 µg/L	----	2	108	61.7	117
	0.5 µg/L	<0.5	----	----	----	----
Chrysene	0.2 µg/L	----	2	112	62.5	116
	0.5 µg/L	<0.5	----	----	----	----
Dibenz(a,h)anthracene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	112	61.2	117
Fluoranthene	0.2 µg/L	----	2	116	63.6	118
	0.5 µg/L	<0.5	----	----	----	----
Fluorene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	115	63.9	115
Indeno(1,2,3,cd)pyrene	0.2 µg/L	----	2	113	59.9	118
	0.5 µg/L	<0.5	----	----	----	----

Matrix Type: WATER

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)B: Polynuclear Aromatic Hydrocarbons - continued						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 292806) - continued		µg/L	µg/L	%	%	%
Naphthalene	0.2 µg/L	----	2	113	62.4	114
	0.5 µg/L	<0.5	----	----	----	----
Phenanthrene	0.2 µg/L	----	2	114	62.6	116
	0.5 µg/L	<0.5	----	----	----	----
Pyrene	0.2 µg/L	----	2	113	63.1	118
	0.5 µg/L	<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 292807)		µg/L	µg/L	%	%	%
C10 - C14 Fraction	50 µg/L	<50	----	----	----	----
	50 µg/L	----	200	75.2	58.9	131
C15 - C28 Fraction	100 µg/L	----	200	90.6	73.9	138
	100 µg/L	<100	----	----	----	----
C29 - C36 Fraction	50 µg/L	<50	----	----	----	----
	50 µg/L	----	200	88.8	62.7	131
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 292856)		µg/L	µg/L	%	%	%
C6 - C9 Fraction	20 µg/L	----	260	83.4	75	127
	20 µg/L	<20	----	----	----	----
EP080: BTEX						
EP080: BTEX - (QC Lot: 292856)		µg/L	µg/L	%	%	%
Benzene	1 µg/L	<1	----	----	----	----
	1 µg/L	----	10	91.8	76.2	124
Ethylbenzene	2 µg/L	<2	----	----	----	----
	2 µg/L	----	10	102	76.1	122
meta- & para-Xylene	2 µg/L	----	10	96.0	75.7	123
	2 µg/L	<2	----	----	----	----
ortho-Xylene	2 µg/L	----	10	95.8	77.9	121
	2 µg/L	<2	----	----	----	----
Toluene	2 µg/L	<2	----	----	----	----
	2 µg/L	----	10	98.0	74.4	124

ALS Environmental

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	
					Sample Result	Spike Recovery	Static Limits	
Analyte name	*Laboratory Sample ID*	*Client Sample ID*	*LOR*	*Spike Concentration*		*MS*	*Low*	*High*
EK026G: Total Cyanide By Discrete Analyser								
EK026G: Total Cyanide By Discrete Analyser - (QC Lot: 292886)				mg/kg	mg/kg	%	%	%
Total Cyanide	ES0613014-001	TP15A/6.0	1 mg/kg	50	<1.0	88.9	70	130
EP075(SIM)A: Phenolic Compounds								
EP075(SIM)A: Phenolic Compounds - (QC Lot: 293050)				mg/kg	mg/kg	%	%	%
Phenol	ES0613014-001	TP15A/6.0	0.5 mg/kg	10	<0.5	93.8	70	130
2-Chlorophenol			0.5 mg/kg	10	<0.5	91.4	70	130
2-Nitrophenol			0.5 mg/kg	10	<0.5	80.6	60	130
4-Chloro-3-Methylphenol			0.5 mg/kg	10	<0.5	77.1	70	130
Pentachlorophenol			2.0 mg/kg	10	<2.0	50.0	20	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 293050)				mg/kg	mg/kg	%	%	%
Acenaphthene	ES0613014-001	TP15A/6.0	0.5 mg/kg	10	<0.5	93.2	70	130
Pyrene			0.5 mg/kg	10	<0.5	89.8	70	130
EP080/071: Total Petroleum Hydrocarbons								
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 292797)				mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	ES0613014-005	MG09A1/4.8	2 mg/kg	26	<2	96.8	70	130
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 293051)				mg/kg	mg/kg	%	%	%
C10 - C14 Fraction	ES0613014-001	TP15A/6.0	50 mg/kg	700	<50	88.3	70	130
C15 - C28 Fraction			100 mg/kg	3400	<100	110	70	130
C29 - C36 Fraction			100 mg/kg	3600	<100	85.3	70	130
EP080: BTEX								
EP080: BTEX - (QC Lot: 292797)				mg/kg	mg/kg	%	%	%
Benzene	ES0613014-005	MG09A1/4.8	0.2 mg/kg	2.5	<0.2	111	70	130
Toluene			0.2 mg/kg	2.5	<0.2	84.7	70	130
Ethylbenzene			0.2 mg/kg	2.5	<0.2	92.3	70	130

ALS Environmental

Matrix Type: SOIL ***Matrix Spike (MS) Report***

					Actual Results		Recovery Limits	
					Sample Result	Spike Recovery	Static Limits	
Analyte name	***Laboratory Sample ID***	***Client Sample ID***	***LOR***	***Spike Concentration***		***MS***	***Low***	***High***
EP080: BTEX - continued								
EP080: BTEX - (QC Lot: 292797) - continued				mg/kg	mg/kg	%	%	%
meta- & para-Xylene	ES0613014-005	MG09A1/4.8	0.2 mg/kg	2.5	<0.2	76.6	70	130
ortho-Xylene			0.2 mg/kg	2.5	<0.2	92.4	70	130

Matrix Type: WATER ***Matrix Spike (MS) Report***

					Actual Results		Recovery Limits	
					Sample Result	Spike Recovery	Static Limits	
Analyte name	***Laboratory Sample ID***	***Client Sample ID***	***LOR***	***Spike Concentration***		***MS***	***Low***	***High***
EP080/071: Total Petroleum Hydrocarbons								
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 292856)				µg/L	µg/L	%	%	%
C6 - C9 Fraction	ES0613033-003	Anonymous	20 µg/L	250	<20	110	70	130
EP080: BTEX								
EP080: BTEX - (QC Lot: 292856)				µg/L	µg/L	%	%	%
Benzene	ES0613033-003	Anonymous	1 µg/L	25	<1	82.7	70	130
Toluene			2 µg/L	25	<2	77.3	70	130
Ethylbenzene			2 µg/L	25	<2	86.0	70	130
meta- & para-Xylene			2 µg/L	25	<2	86.6	70	130
ortho-Xylene			2 µg/L	25	<2	82.8	70	130

ALS Environmental

INTERPRETIVE QUALITY CONTROL REPORT

Client	:	**CH2M HILL PTY LTD**	**Laboratory**	:	ALS Environmental Sydney	**Page**	: **1 of 6**
Contact	:	MR ADAM SULLIVAN	**Contact**	:	Greg Vogel		
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	**Address**	:	Smithfield NSW Australia 2164	**Work order**	: **ES0613014**
						Amendment No.	:
Project	:	347496 Macdonaldtown Gasworks	**Quote number**	:	----	**Date received**	: 18 Oct 2006
Order number	:	- Not provided -				**Date issued**	: 25 Oct 2006
C-O-C number	:	- Not provided -					
Site	:	- Not provided -					
E-mail	:	adam.sullivan@ch2m.com.au	**E-mail**	:	Greg.Vogel@alsenviro.com	**No. of samples**	
Telephone	:	02 9950 0200	**Telephone**	:	+61 (02) 8784 8555	**Received**	: 19
Facsimile	:	02 9950 0600	**Facsimile**	:	+61 (02) 8784 8500	**Analysed**	: 16

This Interpretive Quality Control Report was issued on 25 Oct 2006 for the ALS work order reference ES0613014 and supersedes any previous reports with this reference.
This report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Type Frequency Compliance
- Summary of all Quality Control Outliers
- Brief Method Summaries

ALS Environmental

Interpretive Quality Control Report - Analysis Holding Time

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the sample aliquot was taken. Elapsed time to analysis represents time from sampling where no extraction / digestion is involved or time from extraction / digestion where this is present. For composite samples, sampling date/time is taken as that of the oldest sample contributing to that composite. Sample date/time for laboratory produced leaches are taken from the completion date/time of the leaching process. Outliers for holding time are based on USEPA SW846, APHA, AS and NEPM (1999). Failed outliers, refer to the 'Summary of Outliers'.

Matrix Type: SOIL ***Analysis Holding Time and Preservation***

Method / **Container /** Client Sample ID(s)	Date Sampled	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EA055-103: Moisture Content							
Soil Glass Jar - Unpreserved TRIP SPIKE CONTROL	**13 Oct 2006**	----	----	----	**20 Oct 2006**	20 Oct 2006	Pass
Soil Glass Jar - Unpreserved TP15A/6.0, TP15A/7.0, MG09A1/0.7, MG09A1/3.6, MG09A1/4.8, DUP21	**17 Oct 2006**	----	----	----	**20 Oct 2006**	24 Oct 2006	Pass
Soil Glass Jar - Unpreserved MG10B/1.8, MG10B/3.0, BH14A/1.4, BH14A/2.4, BHF/7.0, DUP22, TRIP SPIKE 2, TRIP BLANK 2	**18 Oct 2006**	----	----	----	**20 Oct 2006**	25 Oct 2006	Pass
EK026G: Total Cyanide By Discrete Analyser							
Soil Glass Jar - Unpreserved TP15A/6.0, TP15A/7.0, MG09A1/0.7, MG09A1/3.6, MG09A1/4.8, DUP21	**17 Oct 2006**	**20 Oct 2006**	24 Oct 2006	Pass	**20 Oct 2006**	3 Nov 2006	Pass
Soil Glass Jar - Unpreserved BHF/7.0	**18 Oct 2006**	**20 Oct 2006**	25 Oct 2006	Pass	**20 Oct 2006**	3 Nov 2006	Pass
EP071: TPH - Semivolatile Fraction							
Soil Glass Jar - Unpreserved TP15A/6.0, TP15A/7.0, MG09A1/0.7, MG09A1/3.6, MG09A1/4.8, DUP21	**17 Oct 2006**	**20 Oct 2006**	31 Oct 2006	Pass	**20 Oct 2006**	29 Nov 2006	Pass
Soil Glass Jar - Unpreserved MG10B/1.8, MG10B/3.0, BH14A/1.4, BH14A/2.4, BHF/7.0, DUP22, TRIP SPIKE 2, TRIP BLANK 2	**18 Oct 2006**	**20 Oct 2006**	1 Nov 2006	Pass	**20 Oct 2006**	29 Nov 2006	Pass
EP075(SIM): PAH/Phenols (SIM)							
Soil Glass Jar - Unpreserved TP15A/6.0, TP15A/7.0, MG09A1/0.7, MG09A1/3.6, MG09A1/4.8, DUP21	**17 Oct 2006**	**20 Oct 2006**	31 Oct 2006	Pass	**20 Oct 2006**	29 Nov 2006	Pass
Soil Glass Jar - Unpreserved MG10B/1.8, MG10B/3.0, BH14A/1.4, BH14A/2.4, BHF/7.0, DUP22	**18 Oct 2006**	**20 Oct 2006**	1 Nov 2006	Pass	**20 Oct 2006**	29 Nov 2006	Pass

Matrix Type: SOIL ***Analysis Holding Time and Preservation***

Method / **Container /** Client Sample ID(s)	**Date Sampled**	**Extraction / Preparation** Date extracted	Due for extraction	Pass?	**Analysis** Date analysed	Due for analysis	Pass?
EP080: TPH Volatiles/BTEX							
Soil Glass Jar - Unpreserved TRIP SPIKE CONTROL	**13 Oct 2006**	**19 Oct 2006**	27 Oct 2006	Pass	**20 Oct 2006**	27 Oct 2006	Pass
Soil Glass Jar - Unpreserved TP15A/6.0, TP15A/7.0, MG09A1/0.7, MG09A1/3.6, MG09A1/4.8, DUP21	**17 Oct 2006**	**19 Oct 2006**	31 Oct 2006	Pass	**20 Oct 2006**	31 Oct 2006	Pass
Soil Glass Jar - Unpreserved MG10B/1.8, MG10B/3.0, BH14A/1.4, BH14A/2.4, BHF/7.0, DUP22, TRIP SPIKE 2, TRIP BLANK 2	**18 Oct 2006**	**19 Oct 2006**	1 Nov 2006	Pass	**20 Oct 2006**	1 Nov 2006	Pass

Matrix Type: WATER ***Analysis Holding Time and Preservation***

Method / **Container /** Client Sample ID(s)	**Date Sampled**	**Extraction / Preparation** Date extracted	Due for extraction	Pass?	**Analysis** Date analysed	Due for analysis	Pass?
EP071: TPH - Semivolatile Fraction							
Amber Glass Bottle - Unpreserved EQ1	**17 Oct 2006**	**20 Oct 2006**	24 Oct 2006	Pass	**20 Oct 2006**	29 Nov 2006	Pass
EP075(SIM): PAH/Phenols (GC/MS - SIM)							
Amber Glass Bottle - Unpreserved EQ1	**17 Oct 2006**	**20 Oct 2006**	24 Oct 2006	Pass	**20 Oct 2006**	29 Nov 2006	Pass
EP080: TPH Volatiles/BTEX							
Amber VOC Vial - HCl or NaHSO4 EQ1	**17 Oct 2006**	**----**	----	----	**19 Oct 2006**	31 Oct 2006	Pass

Interpretive Quality Control Report - Frequency of Quality Control Samples

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which this work order was processed. Actual rate should be greater than or equal to the expected rate.

Matrix Type: SOIL ***Frequency of Quality Control Samples***

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
EA055-103: Moisture Content	2	20	**10.0**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EK026G: Total Cyanide By Discrete Analyser	1	7	**14.3**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	2	20	**10.0**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	2	12	**16.7**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	2	15	**13.3**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Laboratory Control Samples (LCS)					
EK026G: Total Cyanide By Discrete Analyser	1	7	**14.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	1	20	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	1	12	**8.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	1	15	**6.7**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Method Blanks (MB)					
EK026G: Total Cyanide By Discrete Analyser	1	7	**14.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	1	20	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	1	12	**8.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	1	15	**6.7**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Matrix Spikes (MS)					
EK026G: Total Cyanide By Discrete Analyser	1	7	**14.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	1	20	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	1	12	**8.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	1	15	**6.7**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement

Matrix Type: WATER ***Frequency of Quality Control Samples***

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
EP080: TPH Volatiles/BTEX	2	19	**10.5**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Laboratory Control Samples (LCS)					
EP071: TPH - Semivolatile Fraction	1	11	**9.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (GC/MS - SIM)	1	13	**7.7**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	1	19	**5.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Method Blanks (MB)					
EP071: TPH - Semivolatile Fraction	1	11	**9.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (GC/MS - SIM)	1	13	**7.7**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	1	19	**5.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Matrix Spikes (MS)					
EP080: TPH Volatiles/BTEX	1	19	**5.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement

Interpretive Quality Control Report - Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged on the 'Quality Control Report'. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). 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. - Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot.

Non-surrogates

ALS QC Lot	Matrix Type	Laboratory Sample ID	Client Sample ID	Analyte	Data	Limits	Comment
Laboratory Control Samples (LCS)							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	WATER	323148-002	----	Fluorene	115 %	63.9-115 %	Recovery greater than upper control limit
				Benzo(b)fluoranthene	119 %	61.7-119 %	Recovery greater than upper control limit
EP075(SIM)A: Phenolic Compounds	SOIL	323473-002	----	4-Chloro-3-Methylphenol	75.5 %	76.4-114 %	Recovery less than lower control limit

- **For all matrices, no RPD recovery outliers occur for the duplicate analysis.**
- **For all matrices, no method blank result outliers occur.**
- **For all matrices, no matrix spike recoveries breaches occur.**

Surrogates

ALS QC Lot	Matrix Type	Laboratory Sample ID	Client Sample ID	Analyte	Data	Limits	Comment
Surrogates							
EP075(SIM)S: Phenolic Compound Surrogates	SOIL	ES0613014-001	TP15A/6.0	Phenol-d6	116 %	24-113 %	Recovery greater than upper data quality objective
	SOIL	ES0613014-002	TP15A/7.0	Phenol-d6	115 %	24-113 %	Recovery greater than upper data quality objective
	SOIL	ES0613014-003	MG09A1/0.7	Phenol-d6	118 %	24-113 %	Recovery greater than upper data quality objective
	SOIL	ES0613014-004	MG09A1/3.6	Phenol-d6	118 %	24-113 %	Recovery greater than upper data quality objective
	SOIL	ES0613014-005	MG09A1/4.8	Phenol-d6	113 %	24-113 %	Recovery greater than upper data quality objective
	SOIL	ES0613014-006	MG10B/1.8	Phenol-d6	118 %	24-113 %	Recovery greater than upper data quality objective
	SOIL	ES0613014-007	MG10B/3.0	Phenol-d6	123 %	24-113 %	Recovery greater than upper data quality objective
	SOIL	ES0613014-008	BH14A/1.4	Phenol-d6	114 %	24-113 %	Recovery greater than upper data quality objective
	SOIL	ES0613014-013	DUP22	Phenol-d6	117 %	24-113 %	Recovery greater than upper data quality objective

Outliers : Analysis Holding Time

The following report highlights outliers within this 'Interpretive Quality Control Report - Analysis Holding Time'.

- **No holding time outliers occur.**

Outliers : Frequency of Quality Control Samples

The following report highlights outliers within this 'Interpretive Quality Control Report - Frequency of Quality Control Samples'.

- **No frequency outliers occur.**

Method Reference Summary

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.

Matrix Type: SOIL ***Method Reference Summary***

Preparation Methods

EK026PR : NaOH leach for TCN in Soils - APHA 20th ed., 4500 CN- C & N. Samples are extracted by end-over-end tumbling with NaOH.

ORG16 : Methanolic Extraction of Soils for Purge and Trap - (USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.

ORG17B : Tumbler Extraction of Solids (Option B - Non-concentrating) - In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.

Analytical Methods

EA055-103 : Moisture Content - A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (1999) Schedule B(3) (Method 102)

EK026G : Total Cyanide By Discrete Analyser - APHA 20th 4500 CN - C & N. Caustic leach extracts of the sample are distilled with sulphuric acid, converting all CN species to HCN. The distillates are analyzed for CN by Seal. This method is compliant with NEPM (1999) Schedule B(3) (Method 403)

EP071 : TPH - Semivolatile Fraction - (USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)

EP075(SIM) : PAH/Phenols (SIM) - (USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 502 and 507)

EP080 : TPH Volatiles/BTEX - (USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 501)

Matrix Type: WATER ***Method Reference Summary***

Preparation Methods

ORG14 : Separatory Funnel Extraction of Liquids - USEPA SW 846 - 3510B 500 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2). ALS default excludes sediment which may be resident in the container.

Analytical Methods

EP071 : TPH - Semivolatile Fraction - USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

EP075(SIM) : PAH/Phenols (GC/MS - SIM) - USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

EP080 : TPH Volatiles/BTEX - USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

AUSTRALIAN LABORATORY SERVICES PTY LTD ABN 84 009 936 029
277-289 Woodpark Road Smithfield NSW 2164 Australia
Telephone: +61 (02) 8784 8555 Facsimile: +61 (02) 8784 8500 http://www.alsenviro.com/

ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive report

Client Details

Client	:	**CH2M HILL PTY LTD**
Contact	:	**MR ADAM SULLIVAN**
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515
Project	:	**347496 MACDONALDTOWN GASWORK**
Order number	:	**- Not provided -**
C-O-C Number	:	**- Not provided -**
Site	:	**- Not provided -**
Sampler	:	**- Not provided -**
E-mail	:	adam.sullivan@ch2m.com.au
Telephone	:	02 9950 0200
Facsimile	:	02 9950 0600

Laboratory Details

Laboratory	:	**ALS Environmental Sydney**
Manager	:	**Greg Vogel**
Address	:	277-289 Woodpark Road Smithfield NSW Australia 2164
Quote number	:	----
Work order	:	**ES0613014**
E-mail	:	Greg.Vogel@alsenviro.com
Telephone	:	+61 (02) 8784 8555
Facsimile	:	+61 (02) 8784 8500

Dates

Date Samples Received	:	18 Oct 2006	**SRA Issue Date**	:	19 Oct 2006
Scheduled Reporting Date	:	**25 Oct 2006**	**Client Requested Date**	:	25 Oct 2006

Delivery Details

Mode of Delivery	:	Carrier.	**Temperature**	:	CHILLED - Ice present
No. of coolers/boxes	:	1 HARD	**No. of samples** - **Received**		19
Security Seal	:	Intact.	- **Analysed**		16

Comments

- **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).**

- Analytical work for this work order will be conducted at ALSE Sydney.
- 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 Nanthini Coilparampil
- 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'.

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.

Client	: CH2M HILL PTY LTD	**Work Order**	: ES0613014
Project	: 347496 MACDONALDTOWN GASWORKS	**ALS Quote Reference**	: ----

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

Some items described below may be part of a laboratory process neccessary 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-04 - WATER TPH/BTEX	**W-14A - WATER** PAH/Phenols (SIM)	**EA055-103 - SOIL** Moisture Content	**EK026G (Solids) - SOIL** Total Cyanide By Discrete Analyser	**EP080 - SOIL** BTEX	**S-04 - SOIL** TPH/BTEX	**S-14A - SOIL** PAH/Phenols (16 PAH - SIM)			
ES0613014-001	**TP15A/6.0 - 17 Oct 2006**			]	]		]	]			
ES0613014-002	**TP15A/7.0 - 17 Oct 2006**			]	]		]	]			
ES0613014-003	**MG09A1/0.7 - 17 Oct 2006**			]	]		]	]			
ES0613014-004	**MG09A1/3.6 - 17 Oct 2006**			]	]		]	]			
ES0613014-005	**MG09A1/4.8 - 17 Oct 2006**			]	]		]	]			
ES0613014-006	**MG10B/1.8 - 18 Oct 2006**						]	]			
ES0613014-007	**MG10B/3.0 - 18 Oct 2006**						]	]			
ES0613014-008	**BH14A/1.4 - 18 Oct 2006**						]	]			
ES0613014-009	**BH14A/2.4 - 18 Oct 2006**						]	]			
ES0613014-010	**BHF/7.0 - 18 Oct 2006**			]	]		]	]			
ES0613014-011	**EQ1 - 17 Oct 2006**	]	]								
ES0613014-012	**DUP21 - 17 Oct 2006**			]	]		]	]			
ES0613014-013	**DUP22 - 18 Oct 2006**						]	]			
ES0613014-014	**TRIP SPIKE 2 - 18 Oct 2006**						]				
ES0613014-015	**TRIP BLANK 2 - 18 Oct 2006**						]				
ES0613014-016	**TRIP SPIKE CONTROL - 13 Oct 2006**			]		]					
ES0613014-017	**MG09A1/5.5 - 18 Oct 2006**										
ES0613014-018	**BHF/4.6 - 18 Oct 2006**										
ES0613014-019	**BHF/8.4 - 18 Oct 2006**										
	Total(s) :	**1**	**1**	**8**	**7**	**1**	**14**	**12**			

Client	: CH2M HILL PTY LTD	**Work Order**	: ES0613014
Project	: 347496 MACDONALDTOWN GASWORKS	**ALS Quote Reference**	: ----

Requested Reports

l **ALL ACCOUNTS**

-	Invoice	Email	mogibu.rahman@ch2m.com.au

l **MR ADAM SULLIVAN**

-	A4 - Certificate of Analysis - NEPM format	Email	adam.sullivan@ch2m.com.au
-	A4 - Quality Control Report - NEPM format	Email	adam.sullivan@ch2m.com.au
-	A4 - Interpretive Quality Control Report - NEPM format	Email	adam.sullivan@ch2m.com.au
-	ENMRG Export Format	Email	adam.sullivan@ch2m.com.au
-	ESDAT Export Format	Email	adam.sullivan@ch2m.com.au
-	Chain of Custody Acknowledgement	Email	adam.sullivan@ch2m.com.au
-	A4 - Sample Receipt Notification - Comprehensive format	Email	adam.sullivan@ch2m.com.au

Sample Container(s) / Preservation Non-Compliance Log

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

l **No sample container / preservation non-compliance exist.**

ALS Environmental

CERTIFICATE OF ANALYSIS

Client	: CH2M HILL PTY LTD	Laboratory	: ALS Environmental Sydney	Page	: 1 of 13
Contact	: MR ADAM SULLIVAN	Contact	: Greg Vogel	Work Order	: ES0613192
Address	: PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164		
E-mail	: adam.sullivan@ch2m.com.au	E-mail	: Greg.Vogel@alsenviro.com		
Telephone	: 02 9950 0200	Telephone	: +61 (02) 8784 8555		
Facsimile	: 02 9950 0600	Facsimile	: +61 (02) 8784 8500		
Project	: 347496 Macdonaldtown Gasworks	Quote number	: ----	Date received	: 20 Oct 2006
Order number	: - Not provided -			Date issued	: 30 Oct 2006
C-O-C number	: - Not provided -			No. of samples	- Received : 24
Site	: - Not provided -				Analysed : 19

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
PHALAK INTHAKESONE	Organics Co-ordinator	Organics - NATA 825 (10911 - Sydney)
Sarah Millington	Senior Inorganic Chemist	Inorganics - NATA 825 (10911 - Sydney)

ALS Environmental

Comments

This report for the ALSE reference ES0613192 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 insuffient 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 **ES0613192**

EP080:ES0613192 #4 required dilution(X10) due to the presence of high level contaminants. LOR values have been adjusted accordingly.

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: BH12A/6.0	BHB/9.0	BHC/6.0	BHE/8.4	BHF/8.5
Sample Matrix Type / Description:				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time:				19 Oct 2006 15:00	19 Oct 2006 15:00	19 Oct 2006 15:00	19 Oct 2006 15:00	19 Oct 2006 15:00
Laboratory Sample ID:				ES0613192-002	ES0613192-003	ES0613192-004	ES0613192-005	ES0613192-006
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%	11.9	8.6	17.3	12.0	10.2
EK026G: Total Cyanide By Discrete Analyser								
Total Cyanide	57-12-5	1.0	mg/kg	----	----	----	<1.0	<1.0
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	2.3	<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	2.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	<1.0	2.6	<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	5.0	<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	1420	1.9	99.8
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	69.7	<0.5	4.2
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	17.5	<0.5	1.4
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	54.4	<0.5	4.8
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	113	<0.5	7.6
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	32.1	<0.5	2.4
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	45.9	<0.5	3.8
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	57.4	<0.5	3.7
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	21.6	<0.5	1.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	17.8	<0.5	1.2
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	12.8	<0.5	1.1
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	9.1	<0.5	0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	17.6	<0.5	1.1
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	6.6	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	1.9	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	9.0	<0.5	0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction		2	mg/kg	<2	<2	559	2	22
C10 - C14 Fraction		50	mg/kg	<50	<50	5440	<50	650
C15 - C28 Fraction		100	mg/kg	<100	<100	2610	<100	510

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Analytical Results

				Client Sample ID :	BH12A/6.0	BHB/9.0	BHC/6.0	BHE/8.4	BHF/8.5
				Sample Matrix Type / Description :	SOIL	SOIL	SOIL	SOIL	SOIL
				Sample Date / Time :	19 Oct 2006 15:00	19 Oct 2006 15:00	19 Oct 2006 15:00	19 Oct 2006 15:00	19 Oct 2006 15:00
				Laboratory Sample ID :	ES0613192-002	ES0613192-003	ES0613192-004	ES0613192-005	ES0613192-006
Analyte	*CAS number*	*LOR*	*Units*						
EP080/071: Total Petroleum Hydrocarbons									
C29 - C36 Fraction		100	mg/kg		<100	<100	710	<100	100
EP080: BTEX									
Benzene	71-43-2	0.2	mg/kg		0.2	<0.2	6.4	1.6	0.8
Toluene	108-88-3	0.2	mg/kg		<0.2	<0.2	38.7	0.2	<0.2
Ethylbenzene	100-41-4	0.2	mg/kg		<0.2	<0.2	40.8	<0.2	1.9
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg		<0.2	<0.2	164	0.2	4.6
ortho-Xylene	95-47-6	0.2	mg/kg		<0.2	<0.2	82.7	0.2	5.2
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.1	%		85.6	92.6	85.2	86.4	103
2-Chlorophenol-D4	93951-73-6	0.1	%		81.6	91.1	88.8	90.2	108
2.4.6-Tribromophenol	118-79-6	0.1	%		78.0	76.4	88.2	79.0	105
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		83.7	87.1	81.5	85.0	100
Anthracene-d10	1719-06-8	0.1	%		81.6	84.2	83.5	82.0	98.9
4-Terphenyl-d14	1718-51-0	0.1	%		81.1	84.4	82.4	80.2	96.6
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		105	106	108	110	106
Toluene-D8	2037-26-5	0.1	%		103	102	81.2	111	121
4-Bromofluorobenzene	460-00-4	0.1	%		86.8	89.6	89.9	99.0	106

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Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: TRIP SPIKE Sample Matrix Type / Description: SOIL Sample Date / Time: 19 Oct 2006 15:00 Laboratory Sample ID: ES0613192-007	Client Sample ID: TRIP BLANK 3 Sample Matrix Type / Description: SOIL Sample Date / Time: 19 Oct 2006 15:00 Laboratory Sample ID: ES0613192-008	Client Sample ID: BHC1/8.0 Sample Matrix Type / Description: SOIL Sample Date / Time: 20 Oct 2006 15:00 Laboratory Sample ID: ES0613192-010	Client Sample ID: BHC2/6.0 Sample Matrix Type / Description: SOIL Sample Date / Time: 20 Oct 2006 15:00 Laboratory Sample ID: ES0613192-011	Client Sample ID: BHC2/8.0 Sample Matrix Type / Description: SOIL Sample Date / Time: 20 Oct 2006 15:00 Laboratory Sample ID: ES0613192-012
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%	2.3	3.1	12.8	14.4	12.7
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	----	----	<1.0	<1.0	<1.0
2-Nitrophenol	88-75-5	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2.0	mg/kg	----	----	<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
Acenaphthylene	208-96-8	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	----	----	<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
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	----	----	<0.5	<0.5	<0.5
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction		2	mg/kg	27	<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

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Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: TRIP SPIKE Sample Matrix Type / Description: SOIL Sample Date / Time: 19 Oct 2006 15:00 Laboratory Sample ID: ES0613192-007	Client Sample ID: TRIP BLANK 3 Sample Matrix Type / Description: SOIL Sample Date / Time: 19 Oct 2006 15:00 Laboratory Sample ID: ES0613192-008	Client Sample ID: BHC1/8.0 Sample Matrix Type / Description: SOIL Sample Date / Time: 20 Oct 2006 15:00 Laboratory Sample ID: ES0613192-010	Client Sample ID: BHC2/6.0 Sample Matrix Type / Description: SOIL Sample Date / Time: 20 Oct 2006 15:00 Laboratory Sample ID: ES0613192-011	Client Sample ID: BHC2/8.0 Sample Matrix Type / Description: SOIL Sample Date / Time: 20 Oct 2006 15:00 Laboratory Sample ID: ES0613192-012
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	0.5	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.2	mg/kg	8.3	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	100-41-4	0.2	mg/kg	1.2	<0.2	<0.2	<0.2	<0.2
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	6.4	<0.2	<0.2	<0.2	<0.2
ortho-Xylene	95-47-6	0.2	mg/kg	2.5	<0.2	<0.2	<0.2	<0.2
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	----	----	89.2	86.4	88.1
2-Chlorophenol-D4	93951-73-6	0.1	%	----	----	87.6	92.2	90.1
2.4.6-Tribromophenol	118-79-6	0.1	%	----	----	73.5	74.2	73.4
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	----	----	86.0	90.9	91.4
Anthracene-d10	1719-06-8	0.1	%	----	----	83.1	87.8	88.1
4-Terphenyl-d14	1718-51-0	0.1	%	----	----	82.7	88.2	88.6
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	110	104	113	97.5	113
Toluene-D8	2037-26-5	0.1	%	110	105	114	98.9	108
4-Bromofluorobenzene	460-00-4	0.1	%	100	92.0	101	87.6	95.1

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Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: BHD/7.0	BHD/8.4	BHG/6.0	BHG/7.2	BHG/8.1
Sample Matrix Type / Description				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time				20 Oct 2006 15:00	20 Oct 2006 15:00	20 Oct 2006 15:00	20 Oct 2006 15:00	20 Oct 2006 15:00
Laboratory Sample ID				ES0613192-013	ES0613192-014	ES0613192-015	ES0613192-016	ES0613192-017
EA055: Moisture Content								
Moisture Content (dried @ 103°C)		1.0	%	24.4	16.2	16.6	15.2	10.6
EK026G: Total Cyanide By Discrete Analyser								
Total Cyanide	57-12-5	1.0	mg/kg	----	----	<1.0	----	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	11.4	7.4	<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	0.6	3.9	3.8	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1.0	5.8	5.4	<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	2.4	4.1	<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	38.1	1.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	1.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	1.1	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	4.2	0.7	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	10.7	2.1	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	3.2	0.6	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	5.0	1.1	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	5.5	1.3	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	1.7	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	1.5	<0.5	<0.5
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	<0.5	1.1	<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	1.0	<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	8	9	24	8	<2
C10 - C14 Fraction		50	mg/kg	<50	<50	160	<50	<50
C15 - C28 Fraction		100	mg/kg	<100	<100	220	<100	<100

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Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: BHD/7.0	BHD/8.4	BHG/6.0	BHG/7.2	BHG/8.1
Sample Matrix Type / Description				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Date / Time				20 Oct 2006 15:00	20 Oct 2006 15:00	20 Oct 2006 15:00	20 Oct 2006 15:00	20 Oct 2006 15:00
Laboratory Sample ID				ES0613192-013	ES0613192-014	ES0613192-015	ES0613192-016	ES0613192-017
EP080/071: Total Petroleum Hydrocarbons								
C29 - C36 Fraction		100	mg/kg	<100	<100	<100	<100	<100
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	5.4	7.5	2.4	<0.2	<0.2
Toluene	108-88-3	0.2	mg/kg	0.2	0.9	4.1	<0.2	<0.2
Ethylbenzene	100-41-4	0.2	mg/kg	0.7	<0.2	1.3	0.4	<0.2
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	1.0	0.5	5.5	0.6	<0.2
ortho-Xylene	95-47-6	0.2	mg/kg	0.6	0.3	3.2	1.0	<0.2
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	80.5	84.5	91.7	86.9	85.1
2-Chlorophenol-D4	93951-73-6	0.1	%	86.8	86.8	93.7	89.5	87.1
2.4.6-Tribromophenol	118-79-6	0.1	%	73.1	73.6	76.4	73.5	69.8
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	86.3	89.8	87.3	91.4	89.3
Anthracene-d10	1719-06-8	0.1	%	82.5	86.5	85.3	87.5	85.8
4-Terphenyl-d14	1718-51-0	0.1	%	85.1	85.4	84.7	88.9	87.6
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	106	110	102	102	104
Toluene-D8	2037-26-5	0.1	%	101	106	99.7	103	104
4-Bromofluorobenzene	460-00-4	0.1	%	95.8	94.9	96.3	94.5	92.3

ALS Environmental

Analytical Results

				Client Sample ID :	TRIP SPIKE CONTROL 3	DUP23			
				Sample Matrix Type / Description :	SOIL	SOIL			
				Sample Date / Time :	20 Oct 2006 15:00	20 Oct 2006 15:00			
				Laboratory Sample ID :					
Analyte	*CAS number*	*LOR*	*Units*		ES0613192-018	ES0613192-024			
EA055: Moisture Content									
Moisture Content (dried @ 103°C)		1.0	%		4.0	12.8			
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		----	<0.5			
2-Chlorophenol	95-57-8	0.5	mg/kg		----	<0.5			
2-Methylphenol	95-48-7	0.5	mg/kg		----	<0.5			
3- & 4-Methylphenol	1319-77-3	1.0	mg/kg		----	<1.0			
2-Nitrophenol	88-75-5	0.5	mg/kg		----	<0.5			
2.4-Dimethylphenol	105-67-9	0.5	mg/kg		----	<0.5			
2.4-Dichlorophenol	120-83-2	0.5	mg/kg		----	<0.5			
2.6-Dichlorophenol	87-65-0	0.5	mg/kg		----	<0.5			
4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg		----	<0.5			
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg		----	<0.5			
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg		----	<0.5			
Pentachlorophenol	87-86-5	2.0	mg/kg		----	<2.0			
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		----	<0.5			
Acenaphthylene	208-96-8	0.5	mg/kg		----	<0.5			
Acenaphthene	83-32-9	0.5	mg/kg		----	<0.5			
Fluorene	86-73-7	0.5	mg/kg		----	<0.5			
Phenanthrene	85-01-8	0.5	mg/kg		----	<0.5			
Anthracene	120-12-7	0.5	mg/kg		----	<0.5			
Fluoranthene	206-44-0	0.5	mg/kg		----	<0.5			
Pyrene	129-00-0	0.5	mg/kg		----	<0.5			
Benz(a)anthracene	56-55-3	0.5	mg/kg		----	<0.5			
Chrysene	218-01-9	0.5	mg/kg		----	<0.5			
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg		----	<0.5			
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		----	<0.5			
Benzo(a)pyrene	50-32-8	0.5	mg/kg		----	<0.5			
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		----	<0.5			
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		----	<0.5			
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		----	<0.5			
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction		2	mg/kg		32	<2			
C10 - C14 Fraction		50	mg/kg		<50	<50			
C15 - C28 Fraction		100	mg/kg		<100	<100			
C29 - C36 Fraction		100	mg/kg		<100	<100			

ALS Environmental

Analytical Results

Client Sample ID				TRIP SPIKE CONTROL 3	DUP23			
Sample Matrix Type / Description				SOIL	SOIL			
Sample Date / Time				20 Oct 2006 15:00	20 Oct 2006 15:00			
Laboratory Sample ID				ES0613192-018	ES0613192-024			
Analyte	*CAS number*	*LOR*	*Units*					
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	0.6	<0.2			
Toluene	108-88-3	0.2	mg/kg	9.7	<0.2			
Ethylbenzene	100-41-4	0.2	mg/kg	1.4	<0.2			
meta- & para-Xylene	108-38-3 106-42-3	0.2	mg/kg	7.4	<0.2			
ortho-Xylene	95-47-6	0.2	mg/kg	2.8	<0.2			
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	----	80.4			
2-Chlorophenol-D4	93951-73-6	0.1	%	----	82.1			
2.4.6-Tribromophenol	118-79-6	0.1	%	----	64.6			
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	----	85.9			
Anthracene-d10	1719-06-8	0.1	%	----	82.5			
4-Terphenyl-d14	1718-51-0	0.1	%	----	83.6			
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	99.0	106			
Toluene-D8	2037-26-5	0.1	%	102	100			
4-Bromofluorobenzene	460-00-4	0.1	%	94.9	92.0			

ALS Environmental

Analytical Results

				Client Sample ID :	EQ2	EQ3			
				Sample Matrix Type / Description :	WATER	WATER			
				Sample Date / Time :	18 Oct 2006 15:00	19 Oct 2006 15:00			
				Laboratory Sample ID :					
Analyte	*CAS number*	*LOR*	*Units*		ES0613192-001	ES0613192-009			
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	1.0	µg/L		<1.0	<1.0			
2-Chlorophenol	95-57-8	1.0	µg/L		<1.0	<1.0			
2-Methylphenol	95-48-7	1.0	µg/L		<1.0	<1.0			
3- & 4-Methylphenol	1319-77-3	2.0	µg/L		<2.0	<2.0			
2-Nitrophenol	88-75-5	1.0	µg/L		<1.0	<1.0			
2.4-Dimethylphenol	105-67-9	1.0	µg/L		<1.0	<1.0			
2.4-Dichlorophenol	120-83-2	1.0	µg/L		<1.0	<1.0			
2.6-Dichlorophenol	87-65-0	1.0	µg/L		<1.0	<1.0			
4-Chloro-3-Methylphenol	59-50-7	1.0	µg/L		<1.0	<1.0			
2.4.6-Trichlorophenol	88-06-2	1.0	µg/L		<1.0	<1.0			
2.4.5-Trichlorophenol	95-95-4	1.0	µg/L		<1.0	<1.0			
Pentachlorophenol	87-86-5	2.0	µg/L		<2.0	<2.0			
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L		<1.0	<1.0			
Acenaphthylene	208-96-8	1.0	µg/L		<1.0	<1.0			
Acenaphthene	83-32-9	1.0	µg/L		<1.0	<1.0			
Fluorene	86-73-7	1.0	µg/L		<1.0	<1.0			
Phenanthrene	85-01-8	1.0	µg/L		<1.0	<1.0			
Anthracene	120-12-7	1.0	µg/L		<1.0	<1.0			
Fluoranthene	206-44-0	1.0	µg/L		<1.0	<1.0			
Pyrene	129-00-0	1.0	µg/L		<1.0	<1.0			
Benz(a)anthracene	56-55-3	1.0	µg/L		<1.0	<1.0			
Chrysene	218-01-9	1.0	µg/L		<1.0	<1.0			
Benzo(b)fluoranthene	205-99-2	1.0	µg/L		<1.0	<1.0			
Benzo(k)fluoranthene	207-08-9	1.0	µg/L		<1.0	<1.0			
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	<0.5			
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L		<1.0	<1.0			
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L		<1.0	<1.0			
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L		<1.0	<1.0			
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction		20	µg/L		<20	<20			
C10 - C14 Fraction		50	µg/L		<50	130			
C15 - C28 Fraction		100	µg/L		<100	200			
C29 - C36 Fraction		50	µg/L		<50	<50			
EP080: BTEX									
Benzene	71-43-2	1	µg/L		<1	<1			
Toluene	108-88-3	2	µg/L		<2	<2			

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: EQ2 Sample Matrix Type / Description: WATER Sample Date / Time: 18 Oct 2006 15:00 Laboratory Sample ID: ES0613192-001	Client Sample ID: EQ3 Sample Matrix Type / Description: WATER Sample Date / Time: 19 Oct 2006 15:00 Laboratory Sample ID: ES0613192-009			
EP080: BTEX								
Ethylbenzene	100-41-4	2	µg/L	<2	<2			
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2			
ortho-Xylene	95-47-6	2	µg/L	<2	<2			
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	29.4	30.4			
2-Chlorophenol-D4	93951-73-6	0.1	%	88.5	89.5			
2.4.6-Tribromophenol	118-79-6	0.1	%	99.2	101			
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	85.4	89.5			
Anthracene-d10	1719-06-8	0.1	%	90.5	92.9			
4-Terphenyl-d14	1718-51-0	0.1	%	90.0	94.2			
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	95.3	110			
Toluene-D8	2037-26-5	0.1	%	102	93.2			
4-Bromofluorobenzene	460-00-4	0.1	%	103	92.3			

ALS Environmental

Surrogate Control Limits

Matrix Type: WATER - Surrogate Control Limits ***Surrogate Control Limits***

Method name	*Analyte name*	*Lower Limit*	*Upper Limit*
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	116
	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

Matrix Type: SOIL - Surrogate Control Limits ***Surrogate Control Limits***

Method name	*Analyte name*	*Lower Limit*	*Upper Limit*
EP075(SIM): PAH/Phenols (SIM)			
EP075(SIM)S: Phenolic Compound Surrogates	Phenol-d6	24	113
	2-Chlorophenol-D4	23	134
	2,4,6-Tribromophenol	19	122
EP075(SIM)T: PAH Surrogates	2-Fluorobiphenyl	30	115
	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

CH2MHILL ACN 050 070 892

CHAIN OF CUSTODY RECORD

Level 7, 9 Help Street, Chatswood, NSW 2067 Australia Tel (61 2) 9950 0200 Fax (61 2) 9950 0600

Laboratory Quotation #

COC # [illegible]

Project # 347496	Purchase Order # SY/148/06
Project Name: Macdonaldtown Gasworks	
Company Name: ALS	
Project Manager or Contact & Phone #: Adam Sullivan 0400 500 264	Report Copy to: →
Requested Completion Date: Standard TAT	Site ID: Macdonaldtown
Sample Disposal: Dispose ☑ Return ☐	

Sampling Date	Sampling Time	Type	Matrix	CLIENT SAMPLE ID (9 CHARACTERS)	LAB QC	TOTAL # OF CONTAINERS	S-7	Phenols	EK026	S-4	HOLD					Lab ID
				Preservative												
18/10			X	EQ2			X	X								
19/10			X	BH12A/6.0			X	X								
19/10				BH12A/9.0							X					
19/10				BHB/7.2							X					
[illegible]				BHB/9.0			X	X								
[illegible]				BHC/3.6							X					
[illegible]				BHC/6.0			X	X								
19/10				BHE/7.2							X					
19/10				BHE/8.4			X	X	X							
18/10				BHF/8.5			X	X	X							
18/10				BHF/9.0							X					
				Trip Spike (3)												

Very High Contamination

ALS Environmental
Sydney
Work Order
ES0613192

Telephone : +61 (02) 8784 8555

QA REQUIREMENTS		
Matrix Spike	☐ Yes	☐ No
Matrix Duplicate	☐ Yes	☐ No
Laboratory Duplicate	☐ Yes	☐ No
Lab Blank	☐ Yes	☐ No
Surrogate Spike	☐ Yes	☐ No
RPDs	☐ Yes	☐ No
Spike Recovery Data	☐ Yes	☐ No

LAB USE ONLY

☐ Yes ☐ No

☐ Yes ☐ No

Sampled By and Title	(Please sign and print name)	Date/Time	Relinquished By	(Please sign and print name)	Date/Time
A. Sullivan	A. Sullivan	20/10/06	A. Sullivan	A. Sullivan 20/10/06	
Received by: Sarah Mullhall	(Please sign and print name) 20/10/06 17:00pm	Date/Time	Relinquished By	(Please sign and print name)	Date/Time
Received by: JESSIE Edouid	(Please sign and print name)	Date/Time 20-10-06-5:15pm	Shipped Via		Shipping #

Special Instructions:

DISTRIBUTION: Original - LAB, Yellow - LAB, Pink - CH2MHILL

Laboratory Quotation #

2/2

CH2MHILL ACN 050 070 892

CHAIN OF CUSTODY RECORD

Level 7, 9 Help Street, Chatswood, NSW 2067 Australia Tel (61 2) 9950 0200 Fax (61 2) 9950 0600

COC # 5[illegible]9

Project # 347496	**Purchase Order #** SY/148/06
Project Name Macdonaldtown Gasworks	
Company Name ALS	
Project Manager or Contact & Phone # Adam Sullivan 0400 500 264	**Report Copy to:** →
Requested Completion Date: Standard TAT	**Site ID** Macdonaldtown
Sample Disposal: Dispose ☑ Return ☐	

Sampling Date	Sampling Time	Type	Matrix: soil	Matrix: water	CLIENT SAMPLE ID (9 CHARACTERS)	LAB QC	TOTAL # OF CONTAINERS	S-7	Phenols	EK026	S-4	HOLD				Comments	Lab ID
			X		Trip Blank (3)						X						
19/10				X	EQ3			X	X								
20/10			X		BHC1/8.0			X	X								
20/10					DUP23							X					
20/10					BHC2/6.0			X	X								
20/10					BHC2/8.0			X	X								
11					BHD/7.0			X	X								
11					BHB/8.4			X	X								
11					BHE/6.0			X	X	X						⇐ Very High Contamination	
11					BHG/7.2			X	X								
11					BHF/8.1			X	X								
					TRIPSPIKECONTROL3						X						

Requested Analytical Method #

Preservative

QA REQUIREMENTS

Matrix Spike	☐ Yes	☐ No
Matrix Duplicate	☐ Yes	☐ No
Laboratory Duplicate	☐ Yes	☐ No
Lab Blank	☐ Yes	☐ No
Surrogate Spike	☐ Yes	☐ No
RPDs	☐ Yes	☐ No
Spike Recovery Data	☐ Yes	☐ No

LAB USE ONLY

Custody Seals	☐ Yes	☐ No
ICE	☐ Yes	☐ No

Sampled By and Title	(Please sign and print name)	Date/Time	Relinquished By	(Please sign and print name)	Date/Time
Received by	(Please sign and print name)	Date/Time	Relinquished By	(Please sign and print name)	Date/Time
Received by David Jessup	(Please sign and print name)	Date/Time 20-10-06	Shipped Via		Shipping #
Special Instructions:					

DISTRIBUTION: Original - LAB, Yellow - LAB, Pink - CH2MHILL

ALS Environmental

QUALITY CONTROL REPORT

Client	:	**CH2M HILL PTY LTD**	**Laboratory**	:	ALS Environmental Sydney	**Page**	: **1 of 13**
Contact	:	MR ADAM SULLIVAN	**Contact**	:	Greg Vogel		
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	**Address**	:	277-289 Woodpark Road Smithfield NSW Australia 2164	**Work order**	: **ES0613192**
						Amendment No.	:
Project	:	347496 Macdonaldtown Gasworks	**Quote number**	:	----	**Date received**	: 20 Oct 2006
Order number	:	- Not provided -				**Date issued**	: 30 Oct 2006
C-O-C number	:	- Not provided -					
Site	:	- Not provided -					
E-mail	:	adam.sullivan@ch2m.com.au	**E-mail**	:	Greg.Vogel@alsenviro.com	**No. of samples**	
Telephone	:	02 9950 0200	**Telephone**	:	+61 (02) 8784 8555	**Received**	: 24
Facsimile	:	02 9950 0600	**Facsimile**	:	+61 (02) 8784 8500	**Analysed**	: 19

This final report for the ALSE work order reference ES0613192 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

EP080:ES0613192 #4 required dilution(X10) due to the presence of high level contaminants. LOR values have been adjusted accordingly.

ALSE - Excellence in Analytical Testing

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Accredited for compliance with ISO/IED 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	Department
PHALAK INTHAKESONE	Organics - NATA 825 (10911 - Sydney)
Sarah Millington	Inorganics - NATA 825 (10911 - Sydney)

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: SOIL ***Laboratory Duplicates (DUP) Report***

Laboratory Sample ID	*Client Sample ID*	*Analyte name*	*LOR*	*Original Result*	*Duplicate Result*	*RPD*
EA055: Moisture Content						
EA055: Moisture Content - (QC Lot: 295671)				**%**	**%**	**%**
ES0613192-002	BH12A/6.0	Moisture Content (dried @ 103°C)	1.0 %	11.9	13.3	11.4
ES0613192-012	BHC2/8.0	Moisture Content (dried @ 103°C)	1.0 %	12.7	11.0	13.9
EK026G: Total Cyanide By Discrete Analyser						
EK026G: Total Cyanide By Discrete Analyser - (QC Lot: 295910)				**mg/kg**	**mg/kg**	**%**
ES0613192-005	BHE/8.4	Total Cyanide	1.0 mg/kg	<1.0	<1.0	0.0
EP075(SIM)A: Phenolic Compounds						
EP075(SIM)A: Phenolic Compounds - (QC Lot: 295668)				**mg/kg**	**mg/kg**	**%**
ES0613161-001	Anonymous	Phenol	0.5 mg/kg	<0.5	<0.5	0.0
		2-Chlorophenol	0.5 mg/kg	<0.5	<0.5	0.0
		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
ES0613192-011	BHC2/6.0	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

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: 295668) - continued				mg/kg	mg/kg	%
ES0613192-011	BHC2/6.0	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: 295668)				mg/kg	mg/kg	%
ES0613161-001	Anonymous	Naphthalene	0.5 mg/kg	1.0	1.2	22.5
		Acenaphthylene	0.5 mg/kg	1.0	1.1	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	4.6	4.8	5.2
		Anthracene	0.5 mg/kg	1.4	1.4	0.0
		Fluoranthene	0.5 mg/kg	9.9	9.4	4.7
		Pyrene	0.5 mg/kg	10.0	9.7	2.8
		Benz(a)anthracene	0.5 mg/kg	5.0	5.0	0.0
		Chrysene	0.5 mg/kg	5.3	5.2	0.0
		Benzo(b)fluoranthene	0.5 mg/kg	5.2	5.4	3.2
		Benzo(k)fluoranthene	0.5 mg/kg	2.7	2.7	0.0
		Benzo(a)pyrene	0.5 mg/kg	4.8	4.8	0.0
		Indeno(1,2,3,cd)pyrene	0.5 mg/kg	2.4	2.4	0.0
		Dibenz(a,h)anthracene	0.5 mg/kg	0.7	0.7	0.0
		Benzo(g,h,i)perylene	0.5 mg/kg	2.7	2.7	0.0
ES0613192-011	BHC2/6.0	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

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: 295668) - continued				mg/kg	mg/kg	%
ES0613192-011	BHC2/6.0	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: 295038)				mg/kg	mg/kg	%
ES0613186-007	Anonymous	C6 - C9 Fraction	2 mg/kg	3	<2	0.0
ES0613192-010	BHC1/8.0	C6 - C9 Fraction	2 mg/kg	<2	<2	0.0
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 295669)				mg/kg	mg/kg	%
ES0613161-001	Anonymous	C10 - C14 Fraction	50 mg/kg	<50	<50	0.0
		C15 - C28 Fraction	100 mg/kg	390	410	6.1
		C29 - C36 Fraction	100 mg/kg	190	260	29.9
ES0613192-011	BHC2/6.0	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: 295038)				mg/kg	mg/kg	%
ES0613186-007	Anonymous	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

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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: 295038) - continued				mg/kg	mg/kg	%
ES0613192-010	BHC1/8.0	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

Matrix Type: WATER

Laboratory Duplicates (DUP) Report

Laboratory Sample ID	Client Sample ID	Analyte name	LOR	Original Result	Duplicate Result	RPD
EP080/071: Total Petroleum Hydrocarbons						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 294477)				µg/L	µg/L	%
ES0613192-009	EQ3	C6 - C9 Fraction	20 µg/L	<20	<20	0.0
ES0613204-017	Anonymous	C6 - C9 Fraction	20 µg/L	<20	<20	0.0
EP080: BTEX						
EP080: BTEX - (QC Lot: 294477)				µg/L	µg/L	%
ES0613192-009	EQ3	Benzene	1 µg/L	<1	<1	0.0
		Toluene	2 µg/L	<2	<2	0.0
		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
ES0613204-017	Anonymous	Benzene	1 µg/L	<1	<1	0.0
		Toluene	2 µg/L	<2	<2	0.0
		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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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

		Method blank result	*Actual Results*		*Recovery Limits*	
			Spike concentration	*Spike Recovery*	*Dynamic Recovery Limits*	
Analyte name	*LOR*			*LCS*	*Low*	*High*
EK026G: Total Cyanide By Discrete Analyser						
EK026G: Total Cyanide By Discrete Analyser - (QC Lot: 295910)		mg/kg	mg/kg	%	%	%
Total Cyanide	1 mg/kg	----	50	110	70	130
	1.0 mg/kg	<1.0	----	----	----	----
EP075(SIM)A: Phenolic Compounds						
EP075(SIM)A: Phenolic Compounds - (QC Lot: 295668)		mg/kg	mg/kg	%	%	%
2,4,5-Trichlorophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	89.5	68.9	112
2,4,6-Trichlorophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	91.0	62.2	115
2,4-Dichlorophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	97.8	71.6	113
2,4-Dimethylphenol	0.5 mg/kg	----	4	109	74.5	119
	0.5 mg/kg	<0.5	----	----	----	----
2,6-Dichlorophenol	0.5 mg/kg	----	4	102	74.8	115
	0.5 mg/kg	<0.5	----	----	----	----
2-Chlorophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	100	80.2	115
2-Methylphenol	0.5 mg/kg	----	4	106	76.8	114
	0.5 mg/kg	<0.5	----	----	----	----
2-Nitrophenol	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	101	60.3	117
3- & 4-Methylphenol	1.0 mg/kg	<1.0	----	----	----	----
	1.0 mg/kg	----	8	105	72	119
4-Chloro-3-Methylphenol	0.5 mg/kg	----	4	103	76.4	114
	0.5 mg/kg	<0.5	----	----	----	----

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Matrix Type: SOIL

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP075(SIM)A: Phenolic Compounds - continued						
EP075(SIM)A: Phenolic Compounds - (QC Lot: 295668) - continued		mg/kg	mg/kg	%	%	%
Pentachlorophenol	1.0 mg/kg	----	8	33.8	1.23	91.6
	1.0 mg/kg	<1.0	----	----	----	----
Phenol	0.5 mg/kg	----	4	104	73.9	115
	0.5 mg/kg	<0.5	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 295668)		mg/kg	mg/kg	%	%	%
Acenaphthene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	106	81.5	112
Acenaphthylene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	107	79.6	113
Anthracene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	105	81.1	112
Benz(a)anthracene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	103	77.2	112
Benzo(a)pyrene	0.5 mg/kg	----	4	103	76.4	113
	0.5 mg/kg	<0.5	----	----	----	----
Benzo(b)fluoranthene	0.5 mg/kg	----	4	99.6	71.8	118
	0.5 mg/kg	<0.5	----	----	----	----
Benzo(g,h,i)perylene	0.5 mg/kg	----	4	91.8	72.4	114
	0.5 mg/kg	<0.5	----	----	----	----
Benzo(k)fluoranthene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	84.7	74.2	117
Chrysene	0.5 mg/kg	----	4	104	79.8	114
	0.5 mg/kg	<0.5	----	----	----	----
Dibenz(a,h)anthracene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	93.6	71.7	113
Fluoranthene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	102	78.8	113
Fluorene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	105	79.9	112

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	Dynamic Recovery Limits	
Analyte name	*LOR*			*LCS*	*Low*	*High*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - continued						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 295668) - continued		mg/kg	mg/kg	%	%	%
Indeno(1,2,3,cd)pyrene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	94.1	71	113
Naphthalene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	107	81.9	113
Phenanthrene	0.5 mg/kg	----	4	106	79.4	114
	0.5 mg/kg	<0.5	----	----	----	----
Pyrene	0.5 mg/kg	<0.5	----	----	----	----
	0.5 mg/kg	----	4	101	78.9	113
EP080/071: Total Petroleum Hydrocarbons						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 295038)		mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	2 mg/kg	<2	----	----	----	----
	2 mg/kg	----	26	89.9	68.4	128
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 295669)		mg/kg	mg/kg	%	%	%
C10 - C14 Fraction	50 mg/kg	----	200	111	75.2	116
	50 mg/kg	<50	----	----	----	----
C15 - C28 Fraction	100 mg/kg	<100	----	----	----	----
	100 mg/kg	----	200	108	75.3	113
C29 - C36 Fraction	100 mg/kg	<100	----	----	----	----
	100 mg/kg	----	200	113	72.6	117
EP080: BTEX						
EP080: BTEX - (QC Lot: 295038)		mg/kg	mg/kg	%	%	%
Benzene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	1	92.8	67.5	125
Ethylbenzene	0.2 mg/kg	----	1	88.0	65.3	126
	0.2 mg/kg	<0.2	----	----	----	----
meta- & para-Xylene	0.2 mg/kg	----	2	91.4	66.5	124
	0.2 mg/kg	<0.2	----	----	----	----
ortho-Xylene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	1	89.5	66.7	123

ALS Environmental

Matrix Type: SOIL

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP080: BTEX - continued						
EP080: BTEX - (QC Lot: 295038) - continued		mg/kg	mg/kg	%	%	%
Toluene	0.2 mg/kg	<0.2	----	----	----	----
	0.2 mg/kg	----	1	84.1	69	122

Matrix Type: WATER

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP075(SIM)A: Phenolic Compounds						
EP075(SIM)A: Phenolic Compounds - (QC Lot: 294257)		µg/L	µg/L	%	%	%
2,4,5-Trichlorophenol	0.2 µg/L	----	2	97.7	65.3	121
	0.5 µg/L	<0.5	----	----	----	----
2,4,6-Trichlorophenol	0.2 µg/L	----	2	101	63.1	122
	0.5 µg/L	<0.5	----	----	----	----
2,4-Dichlorophenol	0.2 µg/L	----	2	101	64.4	121
	0.5 µg/L	<0.5	----	----	----	----
2,4-Dimethylphenol	0.2 µg/L	----	2	90.9	61.7	118
	0.5 µg/L	<0.5	----	----	----	----
2,6-Dichlorophenol	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	100	65.7	120
2-Chlorophenol	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	94.4	62.3	117
2-Methylphenol	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	86.5	53.9	110
2-Nitrophenol	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	96.9	58.2	127
3- & 4-Methylphenol	0.4 µg/L	----	4	78.5	40.9	103
	1.0 µg/L	<1.0	----	----	----	----
4-Chloro-3-Methylphenol	0.2 µg/L	----	2	102	66.4	119
	0.5 µg/L	<0.5	----	----	----	----
Pentachlorophenol	0.4 µg/L	----	4	86.8	10.9	145
	1.0 µg/L	<1.0	----	----	----	----

Matrix Type: WATER

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP075(SIM)A: Phenolic Compounds - continued						
EP075(SIM)A: Phenolic Compounds - (QC Lot: 294257) - continued		µg/L	µg/L	%	%	%
Phenol	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	45.4	19.5	60.7
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 294257)		µg/L	µg/L	%	%	%
Acenaphthene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	82.6	62.2	113
Acenaphthylene	0.2 µg/L	----	2	91.8	63.6	114
	0.5 µg/L	<0.5	----	----	----	----
Anthracene	0.2 µg/L	----	2	108	64.3	116
	0.5 µg/L	<0.5	----	----	----	----
Benz(a)anthracene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	117	64.1	117
Benzo(a)pyrene	0.2 µg/L	----	2	113	63.3	117
	0.5 µg/L	<0.5	----	----	----	----
Benzo(b)fluoranthene	0.2 µg/L	----	2	121	61.7	119
	0.5 µg/L	<0.5	----	----	----	----
Benzo(g,h,i)perylene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	115	59.1	118
Benzo(k)fluoranthene	0.2 µg/L	----	2	113	61.7	117
	0.5 µg/L	<0.5	----	----	----	----
Chrysene	0.2 µg/L	----	2	115	62.5	116
	0.5 µg/L	<0.5	----	----	----	----
Dibenz(a,h)anthracene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	115	61.2	117
Fluoranthene	0.2 µg/L	----	2	112	63.6	118
	0.5 µg/L	<0.5	----	----	----	----
Fluorene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	99.0	63.9	115
Indeno(1,2,3,cd)pyrene	0.2 µg/L	----	2	115	59.9	118
	0.5 µg/L	<0.5	----	----	----	----

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Matrix Type: WATER

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

Analyte name	LOR	Method blank result	Actual Results: Spike concentration	Actual Results: Spike Recovery LCS	Recovery Limits: Dynamic Recovery Limits Low	Recovery Limits: Dynamic Recovery Limits High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - continued						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 294257) - continued		µg/L	µg/L	%	%	%
Naphthalene	0.2 µg/L	----	2	73.7	62.4	114
	0.5 µg/L	<0.5	----	----	----	----
Phenanthrene	0.2 µg/L	----	2	108	62.6	116
	0.5 µg/L	<0.5	----	----	----	----
Pyrene	0.2 µg/L	----	2	119	63.1	118
	0.5 µg/L	<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 294256)		µg/L	µg/L	%	%	%
C10 - C14 Fraction	50 µg/L	<50	----	----	----	----
	50 µg/L	----	200	69.5	58.9	131
C15 - C28 Fraction	100 µg/L	----	200	90.5	73.9	138
	100 µg/L	<100	----	----	----	----
C29 - C36 Fraction	50 µg/L	<50	----	----	----	----
	50 µg/L	----	200	93.5	62.7	131
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 294477)		µg/L	µg/L	%	%	%
C6 - C9 Fraction	20 µg/L	<20	----	----	----	----
	20 µg/L	----	260	103	75	127
EP080: BTEX						
EP080: BTEX - (QC Lot: 294477)		µg/L	µg/L	%	%	%
Benzene	1 µg/L	<1	----	----	----	----
	1 µg/L	----	10	93.2	76.2	124
Ethylbenzene	2 µg/L	----	10	95.3	76.1	122
	2 µg/L	<2	----	----	----	----
meta- & para-Xylene	2 µg/L	<2	----	----	----	----
	2 µg/L	----	10	96.6	75.7	123
ortho-Xylene	2 µg/L	<2	----	----	----	----
	2 µg/L	----	10	95.5	77.9	121
Toluene	2 µg/L	----	10	97.4	74.4	124
	2 µg/L	<2	----	----	----	----

ALS Environmental

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	
					Sample Result	Spike Recovery	Static Limits	
Analyte name	*Laboratory Sample ID*	*Client Sample ID*	*LOR*	*Spike Concentration*		*MS*	*Low*	*High*
EK026G: Total Cyanide By Discrete Analyser								
EK026G: Total Cyanide By Discrete Analyser - (QC Lot: 295910)				mg/kg	mg/kg	%	%	%
Total Cyanide	ES0613192-005	BHE/8.4	1 mg/kg	50	<1.0	97.2	70	130
EP075(SIM)A: Phenolic Compounds								
EP075(SIM)A: Phenolic Compounds - (QC Lot: 295668)				mg/kg	mg/kg	%	%	%
Phenol	ES0613161-001	Anonymous	0.5 mg/kg	10	<0.5	73.9	70	130
2-Chlorophenol			0.5 mg/kg	10	<0.5	75.7	70	130
2-Nitrophenol			0.5 mg/kg	10	<0.5	74.0	60	130
4-Chloro-3-Methylphenol			0.5 mg/kg	10	<0.5	75.4	70	130
Pentachlorophenol			2.0 mg/kg	10	<2.0	61.6	20	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 295668)				mg/kg	mg/kg	%	%	%
Acenaphthene	ES0613161-001	Anonymous	0.5 mg/kg	10	<0.5	75.9	70	130
Pyrene			0.5 mg/kg	10	10.0	106	70	130
EP080/071: Total Petroleum Hydrocarbons								
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 295038)				mg/kg	mg/kg	%	%	%
C6 - C9 Fraction	ES0613186-007	Anonymous	2 mg/kg	26	3	91.7	70	130
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 295669)				mg/kg	mg/kg	%	%	%
C10 - C14 Fraction	ES0613161-001	Anonymous	50 mg/kg	700	<50	93.5	70	130
C15 - C28 Fraction			100 mg/kg	3400	390	114	70	130
C29 - C36 Fraction			100 mg/kg	3600	190	77.3	70	130
EP080: BTEX								
EP080: BTEX - (QC Lot: 295038)				mg/kg	mg/kg	%	%	%
Benzene	ES0613186-007	Anonymous	0.2 mg/kg	2.5	<0.2	87.1	70	130
Toluene			0.2 mg/kg	2.5	<0.2	75.6	70	130
Ethylbenzene			0.2 mg/kg	2.5	<0.2	84.2	70	130

ALS Environmental

Matrix Type: SOIL ***Matrix Spike (MS) Report***

					Actual Results		Recovery Limits	
					Sample Result	Spike Recovery	Static Limits	
Analyte name	***Laboratory Sample ID***	***Client Sample ID***	***LOR***	***Spike Concentration***		***MS***	***Low***	***High***
EP080: BTEX - continued								
EP080: BTEX - (QC Lot: 295038) - continued				mg/kg	mg/kg	%	%	%
meta- & para-Xylene	ES0613186-007	Anonymous	0.2 mg/kg	2.5	<0.2	85.3	70	130
ortho-Xylene			0.2 mg/kg	2.5	<0.2	83.1	70	130

Matrix Type: WATER ***Matrix Spike (MS) Report***

					Actual Results		Recovery Limits	
					Sample Result	Spike Recovery	Static Limits	
Analyte name	***Laboratory Sample ID***	***Client Sample ID***	***LOR***	***Spike Concentration***		***MS***	***Low***	***High***
EP080/071: Total Petroleum Hydrocarbons								
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 294477)				µg/L	µg/L	%	%	%
C6 - C9 Fraction	ES0613204-017	Anonymous	20 µg/L	250	<20	87.7	70	130
EP080: BTEX								
EP080: BTEX - (QC Lot: 294477)				µg/L	µg/L	%	%	%
Benzene	ES0613204-017	Anonymous	1 µg/L	25	<1	73.7	70	130
Toluene			2 µg/L	25	<2	76.3	70	130
Ethylbenzene			2 µg/L	25	<2	81.8	70	130
meta- & para-Xylene			2 µg/L	25	<2	83.7	70	130
ortho-Xylene			2 µg/L	25	<2	76.7	70	130

ALS Environmental

INTERPRETIVE QUALITY CONTROL REPORT

Client	:	**CH2M HILL PTY LTD**	**Laboratory**	:	ALS Environmental Sydney	**Page**	: **1 of 6**
Contact	:	MR ADAM SULLIVAN	**Contact**	:	Greg Vogel		
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	**Address**	:	Smithfield NSW Australia 2164	**Work order**	: **ES0613192**
						Amendment No.	:
Project	:	347496 Macdonaldtown Gasworks	**Quote number**	:	----	**Date received**	: 20 Oct 2006
Order number	:	- Not provided -				**Date issued**	: 30 Oct 2006
C-O-C number	:	- Not provided -					
Site	:	- Not provided -					
E-mail	:	adam.sullivan@ch2m.com.au	**E-mail**	:	Greg.Vogel@alsenviro.com	**No. of samples**	
Telephone	:	02 9950 0200	**Telephone**	:	+61 (02) 8784 8555	**Received**	: 24
Facsimile	:	02 9950 0600	**Facsimile**	:	+61 (02) 8784 8500	**Analysed**	: 19

This Interpretive Quality Control Report was issued on 30 Oct 2006 for the ALS work order reference ES0613192 and supersedes any previous reports with this reference.
This report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Type Frequency Compliance
- Summary of all Quality Control Outliers
- Brief Method Summaries

ALS Environmental

Interpretive Quality Control Report - Analysis Holding Time

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the sample aliquot was taken. Elapsed time to analysis represents time from sampling where no extraction / digestion is involved or time from extraction / digestion where this is present. For composite samples, sampling date/time is taken as that of the oldest sample contributing to that composite. Sample date/time for laboratory produced leaches are taken from the completion date/time of the leaching process. Outliers for holding time are based on USEPA SW846, APHA, AS and NEPM (1999). Failed outliers, refer to the 'Summary of Outliers'.

Matrix Type: SOIL ***Analysis Holding Time and Preservation***

Method / **Container /** Client Sample ID(s)		**Date Sampled**	**Extraction / Preparation**			**Analysis**		
			Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EA055-103: Moisture Content								
Soil Glass Jar - Unpreserved								
BH12A/6.0,	BHB/9.0,	**19 Oct 2006**	----	----	----	**25 Oct 2006**	26 Oct 2006	Pass
BHC/6.0,	BHE/8.4,							
BHF/8.5,	TRIP SPIKE,							
TRIP BLANK 3								
Soil Glass Jar - Unpreserved								
BHC1/8.0,	BHC2/6.0,	**20 Oct 2006**	----	----	----	**25 Oct 2006**	27 Oct 2006	Pass
BHC2/8.0,	BHD/7.0,							
BHD/8.4,	BHG/6.0,							
BHG/7.2,	BHG/8.1,							
TRIP SPIKE CONTROL 3,	DUP23							
EK026G: Total Cyanide By Discrete Analyser								
Soil Glass Jar - Unpreserved								
BHE/8.4,	BHF/8.5	**19 Oct 2006**	**26 Oct 2006**	26 Oct 2006	Pass	**26 Oct 2006**	9 Nov 2006	Pass
Soil Glass Jar - Unpreserved								
BHG/6.0		**20 Oct 2006**	**26 Oct 2006**	27 Oct 2006	Pass	**26 Oct 2006**	9 Nov 2006	Pass
EP071: TPH - Semivolatile Fraction								
Soil Glass Jar - Unpreserved								
BH12A/6.0,	BHB/9.0,	**19 Oct 2006**	**25 Oct 2006**	2 Nov 2006	Pass	**27 Oct 2006**	4 Dec 2006	Pass
BHC/6.0,	BHE/8.4,							
BHF/8.5,	TRIP SPIKE,							
TRIP BLANK 3								
Soil Glass Jar - Unpreserved								
BHC1/8.0,	BHC2/6.0,	**20 Oct 2006**	**25 Oct 2006**	3 Nov 2006	Pass	**27 Oct 2006**	4 Dec 2006	Pass
BHC2/8.0,	BHD/7.0,							
BHD/8.4,	BHG/6.0,							
BHG/7.2,	BHG/8.1,							
TRIP SPIKE CONTROL 3,	DUP23							
EP075(SIM): PAH/Phenols (SIM)								
Soil Glass Jar - Unpreserved								
BH12A/6.0,	BHB/9.0,	**19 Oct 2006**	**25 Oct 2006**	2 Nov 2006	Pass	**27 Oct 2006**	4 Dec 2006	Pass
BHC/6.0,	BHE/8.4,							
BHF/8.5								

Matrix Type: SOIL ***Analysis Holding Time and Preservation***

Method / **Container /** Client Sample ID(s)	**Date Sampled**	**Extraction / Preparation** Date extracted	Due for extraction	Pass?	**Analysis** Date analysed	Due for analysis	Pass?
EP075(SIM): PAH/Phenols (SIM) **- continued**							
Soil Glass Jar - Unpreserved BHC1/8.0, BHC2/6.0, BHC2/8.0, BHD/7.0, BHD/8.4, BHG/6.0, BHG/7.2, BHG/8.1, DUP23	**20 Oct 2006**	**25 Oct 2006**	3 Nov 2006	Pass	**27 Oct 2006**	4 Dec 2006	Pass
EP080: TPH Volatiles/BTEX							
Soil Glass Jar - Unpreserved BH12A/6.0, BHB/9.0, BHC/6.0, BHE/8.4, BHF/8.5, TRIP SPIKE, TRIP BLANK 3	**19 Oct 2006**	**25 Oct 2006**	2 Nov 2006	Pass	**25 Oct 2006**	2 Nov 2006	Pass
Soil Glass Jar - Unpreserved BHC1/8.0, BHC2/6.0, BHC2/8.0, BHD/7.0, BHD/8.4, BHG/6.0, BHG/7.2, BHG/8.1, TRIP SPIKE CONTROL 3, DUP23	**20 Oct 2006**	**25 Oct 2006**	3 Nov 2006	Pass	**25 Oct 2006**	3 Nov 2006	Pass

Matrix Type: WATER ***Analysis Holding Time and Preservation***

Method / **Container /** Client Sample ID(s)	**Date Sampled**	**Extraction / Preparation** Date extracted	Due for extraction	Pass?	**Analysis** Date analysed	Due for analysis	Pass?
EP071: TPH - Semivolatile Fraction							
Amber Glass Bottle - Unpreserved EQ2	**18 Oct 2006**	**23 Oct 2006**	25 Oct 2006	Pass	**24 Oct 2006**	3 Dec 2006	Pass
Amber Glass Bottle - Unpreserved EQ3	**19 Oct 2006**	**23 Oct 2006**	26 Oct 2006	Pass	**24 Oct 2006**	3 Dec 2006	Pass
EP075(SIM): PAH/Phenols (GC/MS - SIM)							
Amber Glass Bottle - Unpreserved EQ2	**18 Oct 2006**	**23 Oct 2006**	25 Oct 2006	Pass	**24 Oct 2006**	3 Dec 2006	Pass
Amber Glass Bottle - Unpreserved EQ3	**19 Oct 2006**	**23 Oct 2006**	26 Oct 2006	Pass	**24 Oct 2006**	3 Dec 2006	Pass
EP080: TPH Volatiles/BTEX							
Amber VOC Vial - HCl or NaHSO4 EQ2	**18 Oct 2006**	**----**	----	----	**24 Oct 2006**	1 Nov 2006	Pass
Amber VOC Vial - HCl or NaHSO4 EQ3	**19 Oct 2006**	**----**	----	----	**24 Oct 2006**	2 Nov 2006	Pass

Interpretive Quality Control Report - Frequency of Quality Control Samples

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which this work order was processed. Actual rate should be greater than or equal to the expected rate.

Matrix Type: SOIL ***Frequency of Quality Control Samples***

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
EA055-103: Moisture Content	2	17	**11.8**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EK026G: Total Cyanide By Discrete Analyser	1	5	**20.0**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	2	19	**10.5**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	2	16	**12.5**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	2	20	**10.0**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Laboratory Control Samples (LCS)					
EK026G: Total Cyanide By Discrete Analyser	1	5	**20.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	1	19	**5.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	1	16	**6.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	1	20	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Method Blanks (MB)					
EK026G: Total Cyanide By Discrete Analyser	1	5	**20.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	1	19	**5.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	1	16	**6.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	1	20	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Matrix Spikes (MS)					
EK026G: Total Cyanide By Discrete Analyser	1	5	**20.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP071: TPH - Semivolatile Fraction	1	19	**5.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (SIM)	1	16	**6.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	1	20	**5.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement

Matrix Type: WATER ***Frequency of Quality Control Samples***

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
EP080: TPH Volatiles/BTEX	2	12	**16.7**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Laboratory Control Samples (LCS)					
EP071: TPH - Semivolatile Fraction	1	10	**10.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (GC/MS - SIM)	1	17	**5.9**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	1	12	**8.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Method Blanks (MB)					
EP071: TPH - Semivolatile Fraction	1	10	**10.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (GC/MS - SIM)	1	17	**5.9**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	1	12	**8.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Matrix Spikes (MS)					
EP080: TPH Volatiles/BTEX	1	12	**8.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement

Interpretive Quality Control Report - Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged on the 'Quality Control Report'. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). 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. - Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot.

Non-surrogates

ALS QC Lot	Matrix Type	Laboratory Sample ID	Client Sample ID	Analyte	Data	Limits	Comment
Laboratory Control Samples (LCS)							
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons	WATER	324745-007	----	Pyrene	119 %	63.1-118 %	Recovery greater than upper control limit
				Benzo(b)fluoranthene	121 %	61.7-119 %	Recovery greater than upper control limit

- **For all matrices, no RPD recovery outliers occur for the duplicate analysis.**
- **For all matrices, no method blank result outliers occur.**
- **For all matrices, no matrix spike recoveries breaches occur.**

Surrogates

ALS QC Lot	Matrix Type	Laboratory Sample ID	Client Sample ID	Analyte	Data	Limits	Comment
Surrogates							
EP080S: TPH(V)/BTEX Surrogates	SOIL	ES0613192-006	BHF/8.5	Toluene-D8	121 %	81-117 %	Recovery greater than upper data quality objective

Outliers : Analysis Holding Time

The following report highlights outliers within this 'Interpretive Quality Control Report - Analysis Holding Time'.

- **No holding time outliers occur.**

Outliers : Frequency of Quality Control Samples

The following report highlights outliers within this 'Interpretive Quality Control Report - Frequency of Quality Control Samples'.

- **No frequency outliers occur.**

Method Reference Summary

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.

Matrix Type: SOIL ***Method Reference Summary***

Preparation Methods

EK026PR : NaOH leach for TCN in Soils - APHA 20th ed., 4500 CN- C & N. Samples are extracted by end-over-end tumbling with NaOH.

ORG16 : Methanolic Extraction of Soils for Purge and Trap - (USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.

ORG17B : Tumbler Extraction of Solids (Option B - Non-concentrating) - In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 20mL 1:1 DCM/Acetone by end over end tumble. The solvent is transferred directly to a GC vial for analysis.

Analytical Methods

EA055-103 : Moisture Content - A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (1999) Schedule B(3) (Method 102)

EK026G : Total Cyanide By Discrete Analyser - APHA 20th 4500 CN - C & N. Caustic leach extracts of the sample are distilled with sulphuric acid, converting all CN species to HCN. The distillates are analyzed for CN by Seal. This method is compliant with NEPM (1999) Schedule B(3) (Method 403)

EP071 : TPH - Semivolatile Fraction - (USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C36. This method is compliant with NEPM (1999) Schedule B(3) (Method 506.1)

EP075(SIM) : PAH/Phenols (SIM) - (USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 502 and 507)

EP080 : TPH Volatiles/BTEX - (USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Method 501)

Matrix Type: WATER ***Method Reference Summary***

Preparation Methods

ORG14 : Separatory Funnel Extraction of Liquids - USEPA SW 846 - 3510B 500 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2). ALS default excludes sediment which may be resident in the container.

Analytical Methods

EP071 : TPH - Semivolatile Fraction - USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

EP075(SIM) : PAH/Phenols (GC/MS - SIM) - USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

EP080 : TPH Volatiles/BTEX - USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

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ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive report

Client Details

Client	:	**CH2M HILL PTY LTD**
Contact	:	**MR ADAM SULLIVAN**
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515
Project	:	**347496 Macdonaldtown Gasworks**
Order number	:	**- Not provided -**
C-O-C Number	:	**- Not provided -**
Site	:	**- Not provided -**
Sampler	:	**- Not provided -**
E-mail	:	adam.sullivan@ch2m.com.au
Telephone	:	02 9950 0200
Facsimile	:	02 9950 0600

Laboratory Details

Laboratory	:	**ALS Environmental Sydney**
Manager	:	**Greg Vogel**
Address	:	277-289 Woodpark Road Smithfield NSW Australia 2164
Quote number	:	----
Work order	:	**ES0613192**
E-mail	:	Greg.Vogel@alsenviro.com
Telephone	:	+61 (02) 8784 8555
Facsimile	:	+61 (02) 8784 8500

Dates

Date Samples Received	:	20 Oct 2006	**SRA Issue Date**	:	23 Oct 2006
Scheduled Reporting Date	:	**30 Oct 2006**	**Client Requested Date**	:	30 Oct 2006

Delivery Details

Mode of Delivery	:	Carrier.	**Temperature**	:	CHILLED - Ice present
No. of coolers/boxes	:	1 HARD	**No. of samples** - **Received**		24
Security Seal	:	Intact.	- **Analysed**		19

Comments

- **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).**

- Analytical work for this work order will be conducted at ALSE Sydney.
- 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 Nanthini Coilparampil
- 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'.

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Client	: CH2M HILL PTY LTD	**Work Order**	: ES0613192
Project	: 347496 Macdonaldtown Gasworks	**ALS Quote Reference**	: ----

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

Some items described below may be part of a laboratory process neccessary 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-04 - WATER TPH/BTEX	**W-14A - WATER** PAH/Phenols (SIM)	**EA055-103 - SOIL** Moisture Content	**EK026G (Solids) - SOIL** Total Cyanide By Discrete Analyser	**S-04 - SOIL** TPH/BTEX	**S-14A - SOIL** PAH/Phenols (16 PAH - SIM)				
ES0613192-001	**EQ2 - 18 Oct 2006**	⌋	⌋								
ES0613192-002	**BH12A/6.0 - 19 Oct 2006**					⌋	⌋				
ES0613192-003	**BHB/9.0 - 19 Oct 2006**					⌋	⌋				
ES0613192-004	**BHC/6.0 - 19 Oct 2006**					⌋	⌋				
ES0613192-005	**BHE/8.4 - 19 Oct 2006**			⌋	⌋	⌋	⌋				
ES0613192-006	**BHF/8.5 - 19 Oct 2006**			⌋	⌋	⌋	⌋				
ES0613192-007	**TRIP SPIKE - 19 Oct 2006**					⌋					
ES0613192-008	**TRIP BLANK 3 - 19 Oct 2006**					⌋					
ES0613192-009	**EQ3 - 19 Oct 2006**	⌋	⌋								
ES0613192-010	**BHC1/8.0 - 20 Oct 2006**					⌋	⌋				
ES0613192-011	**BHC2/6.0 - 20 Oct 2006**					⌋	⌋				
ES0613192-012	**BHC2/8.0 - 20 Oct 2006**					⌋	⌋				
ES0613192-013	**BHD/7.0 - 20 Oct 2006**					⌋	⌋				
ES0613192-014	**BHD/8.4 - 20 Oct 2006**					⌋	⌋				
ES0613192-015	**BHG/6.0 - 20 Oct 2006**			⌋	⌋	⌋	⌋				
ES0613192-016	**BHG/7.2 - 20 Oct 2006**					⌋	⌋				
ES0613192-017	**BHG/8.1 - 20 Oct 2006**					⌋	⌋				
ES0613192-018	**TRIP SPIKE CONTROL 3 - 20 Oct 2006**					⌋					
ES0613192-019	**BH12A/9.0 - 19 Oct 2006**										
ES0613192-020	**BHB/7.2 - 19 Oct 2006**										
ES0613192-021	**BHC/3.6 - 19 Oct 2006**										
ES0613192-022	**BHE/7.2 - 19 Oct 2006**										
ES0613192-023	**BHF/9.0 - 18 Oct 2006**										
ES0613192-024	**DUP23 - 20 Oct 2006**					⌋	⌋				
	Total(s) :	**2**	**2**	**3**	**3**	**17**	**14**				

Client	: CH2M HILL PTY LTD	**Work Order**	: ES0613192
Project	: 347496 Macdonaldtown Gasworks	**ALS Quote Reference**	: ----

Requested Reports

l **MR ADAM SULLIVAN**

-	A4 - Certificate of Analysis - NEPM format	Email	adam.sullivan@ch2m.com.au
-	A4 - Interpretive Quality Control Report - NEPM format	Email	adam.sullivan@ch2m.com.au
-	A4 - Quality Control Report - NEPM format	Email	adam.sullivan@ch2m.com.au
-	ESDAT Export Format	Email	adam.sullivan@ch2m.com.au
-	ENMRG Export Format	Email	adam.sullivan@ch2m.com.au
-	A4 - Sample Receipt Notification - Comprehensive format	Email	adam.sullivan@ch2m.com.au
-	Chain of Custody Acknowledgement	Email	adam.sullivan@ch2m.com.au
-	Invoice	Email	adam.sullivan@ch2m.com.au

Sample Container(s) / Preservation Non-Compliance Log

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

l **No sample container / preservation non-compliance exist.**

ALS Environmental

CERTIFICATE OF ANALYSIS

Client	: **CH2M HILL PTY LTD**	*Laboratory*	: **ALS Environmental Sydney**	*Page*	: **1 of 5**
Contact	: **MR ADAM SULLIVAN**	*Contact*	: **Greg Vogel**	*Work Order*	: **ES0610884**
Address	: **PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515**	*Address*	: **277-289 Woodpark Road Smithfield NSW Australia 2164**		
E-mail	: **adam.sullivan@ch2m.com.au**	*E-mail*	: **Greg.Vogel@alsenviro.com**		
Telephone	: **02 9950 0200**	*Telephone*	: **+61 (02) 8784 8555**		
Facsimile	: **02 9950 0600**	*Facsimile*	: **+61 (02) 8784 8500**		
Project	: **Rebatch**	*Quote number*	: **----**	*Date received*	: **4 Sep 2006**
Order number	: **- Not provided -**			*Date issued*	: **8 Sep 2006**
C-O-C number	: **- Not provided -**			*No. of samples*	- *Received* : **8**
Site	: **- Not provided -**				*Analysed* : **8**

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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*
Peter Dickenson	**Senior Spectroscopist**	**Inorganics - NATA 825 (10911 - Sydney)**
PHALAK INTHAKESONE	**Organics Co-ordinator**	**Organics - NATA 825 (10911 - Sydney)**

ALS Environmental

Comments

This report for the ALSE reference ES0610884 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 insuffient 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.

- **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.

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID : MG01/1.8	MG02/1.8	TP10/2.0	TP06/0.25	MG04/0.5
Sample Matrix Type / Description :				TCLP LEACHATE	TCLP LEACHATE	TCLP LEACHATE	TCLP LEACHATE	TCLP LEACHATE
Sample Date / Time :				(6 Sep 2006) (12:00)	(6 Sep 2006) (12:00)	(6 Sep 2006) (12:00)	(6 Sep 2006) (12:00)	(6 Sep 2006) (12:00)
Laboratory Sample ID :				ES0610884-001	ES0610884-002	ES0610884-003	ES0610884-004	ES0610884-005
EG005C: Leachable Metals by ICPAES								
Arsenic	7440-38-2	0.1	mg/L	----	<0.1	----	----	----
Cadmium	7440-43-9	0.05	mg/L	----	<0.05	----	----	----
Lead	7439-92-1	0.1	mg/L	----	<0.1	<0.1	----	5.0
Nickel	7440-02-0	0.1	mg/L	----	<0.1	<0.1	----	<0.1
EG035C: Leachable Mercury by FIMS								
Mercury	7439-97-6	0.0010	mg/L	----	----	----	----	<0.0010
EN33: TCLP Leach								
Initial pH		0.1	pH Unit	4.8	5.7	8.9	6.7	8.8
After HCl pH		0.1	pH Unit	<0.1	1.4	1.9	1.4	1.5
Extraction Fluid Number		1	-	1	1	1	1	1
Final pH		0.1	pH Unit	4.7	4.8	5.2	4.8	5.1
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<1.9	<0.5	<0.5	<0.5
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	44.5	36.5	51.6	47.5	46.5
2-Chlorophenol-D4	93951-73-6	0.1	%	90.9	69.7	101	97.1	92.9
2.4.6-Tribromophenol	118-79-6	0.1	%	117	85.9	117	121	120
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	101	81.5	108	105	102
Anthracene-d10	1719-06-8	0.1	%	109	79.4	119	118	112
4-Terphenyl-d14	1718-51-0	0.1	%	118	82.4	126	125	119

ALS Environmental

Analytical Results

Analyte	CAS number	LOR	Units	Client Sample ID: MG06/2.0 Sample Matrix Type / Description: TCLP LEACHATE Sample Date / Time: (6 Sep 2006) (12:00) Laboratory Sample ID: ES0610884-006	Client Sample ID: MG10A/0.7 Sample Matrix Type / Description: TCLP LEACHATE Sample Date / Time: (6 Sep 2006) (12:00) Laboratory Sample ID: ES0610884-007	Client Sample ID: MG11/2.0 Sample Matrix Type / Description: TCLP LEACHATE Sample Date / Time: (6 Sep 2006) (12:00) Laboratory Sample ID: ES0610884-008		
EG005C: Leachable Metals by ICPAES								
Arsenic	7440-38-2	0.1	mg/L	----	<0.1	----		
Cadmium	7440-43-9	0.05	mg/L	----	<0.05	----		
Lead	7439-92-1	0.1	mg/L	<0.1	<0.1	<0.1		
Nickel	7440-02-0	0.1	mg/L	----	<0.1	----		
EN33: TCLP Leach								
Initial pH		0.1	pH Unit	7.4	7.1	6.1		
After HCl pH		0.1	pH Unit	1.4	1.4	1.4		
Extraction Fluid Number		1	-	1	1	1		
Final pH		0.1	pH Unit	4.8	4.8	4.8		
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5		
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	41.2	45.4	40.7		
2-Chlorophenol-D4	93951-73-6	0.1	%	81.3	92.6	82.2		
2.4.6-Tribromophenol	118-79-6	0.1	%	112	118	113		
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	96.0	103	96.3		
Anthracene-d10	1719-06-8	0.1	%	95.2	110	95.6		
4-Terphenyl-d14	1718-51-0	0.1	%	100	116	99.9		

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Surrogate Control Limits

Matrix Type: SOIL - Surrogate Control Limits ***Surrogate Control Limits***

Method name	*Analyte name*	*Lower Limit*	*Upper Limit*
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	116
	Anthracene-d10	27	133
	4-Terphenyl-d14	33	141

Margaret Valencic

FAO 4/9/06 2-45pm

From: Adam.Sullivan@ch2m.com.au
Sent: Monday, 4 September 2006 9:42 AM
To: Margaret Valencic
Subject: TCLP analysis

Hi Margaret

Regarding our recent samples from the Macdonaldtown gasworks site, (Lab Quote SY/148/06), please analyse the following samples for TCLP:

Work Order	CH2M HILL Sample ID	TCLP Analysis Required
ES0609995 S651-653	MG01/1.8 4 (1)	B(a)P
ES0610062 S661, S667-670	MG02/1.8 2 (2)	B(a)P and metals (As, Cd, Pb, Ni)
	TP10/2.0 37 (3)	B(a)P and metals (Pb, Ni)
	TP06/0.25 19 (4)	B(a)P
ES0610135 S701-703	MG04/0.5 23 (5)	B(a)P and metals (Pb, Hg, Ni)
	MG06/2.0 33 (6)	B(a)P and metals (Pb)
	MG10A/0.7 20 (7)	B(a)P and metals (As, Cd, Pb, Ni)
ES0610221 S709-S710	MG11/2.0 16 (8)	B(a)P and metals (Pb)

I request results by Friday afternoon, so please indicate if this is possible.

Regards

Adam Sullivan
Project Manager

CH2M HILL Australia Pty Ltd
PO Box 5392
Chatswood NSW 1515
Ph: +61 2 9950 0221
Mob: 0400 500 264
Fax: +61 2 9950 0600

****
This e-mail has been swept by mimesweeper through the ALS North America gateway.
****

ALS Environmental
Sydney
Work Order
ES0610884

Telephone : +61 (02) 8784 8555

ALS Environmental

QUALITY CONTROL REPORT

Client	:	**CH2M HILL PTY LTD**	**Laboratory**	:	ALS Environmental Sydney	**Page**	: **1 of 4**
Contact	:	MR ADAM SULLIVAN	**Contact**	:	Greg Vogel		
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	**Address**	:	277-289 Woodpark Road Smithfield NSW Australia 2164	**Work order**	: **ES0610884**
						Amendment No.	:
Project	:	Rebatch	**Quote number**	:	----	**Date received**	: 4 Sep 2006
Order number	:	- Not provided -				**Date issued**	: 8 Sep 2006
C-O-C number	:	- Not provided -					
Site	:	- Not provided -					
E-mail	:	adam.sullivan@ch2m.com.au	**E-mail**	:	Greg.Vogel@alsenviro.com	**No. of samples**	
Telephone	:	02 9950 0200	**Telephone**	:	+61 (02) 8784 8555	**Received**	: 8
Facsimile	:	02 9950 0600	**Facsimile**	:	+61 (02) 8784 8500	**Analysed**	: 8

This final report for the ALSE work order reference ES0610884 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

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NATA Accredited Laboratory - 825

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

Accredited for compliance with ISO/IED 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	Department
Peter Dickenson	Inorganics - NATA 825 (10911 - Sydney)
PHALAK INTHAKESONE	Organics - NATA 825 (10911 - Sydney)

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***

Laboratory Sample ID	*Client Sample ID*	*Analyte name*	*LOR*	*Original Result*	*Duplicate Result*	*RPD*
EG005C: Leachable Metals by ICPAES						
EG005C: Leachable Metals by ICPAES - (QC Lot: 268837)				**mg/L**	**mg/L**	**%**
ES0610665-001	Anonymous	Arsenic	0.1 mg/L	<0.1	<0.1	0.0
		Cadmium	0.05 mg/L	<0.05	<0.05	0.0
		Lead	0.1 mg/L	1.8	1.9	6.9
		Nickel	0.1 mg/L	<0.1	<0.1	0.0
ES0610871-002	Anonymous	Arsenic	0.1 mg/L	<0.1	<0.1	0.0
		Cadmium	0.05 mg/L	<0.05	<0.05	0.0
		Lead	0.1 mg/L	<0.1	<0.1	0.0
		Nickel	0.1 mg/L	<0.1	<0.1	0.0
EG035C: Leachable Mercury by FIMS						
EG035C: Leachable Mercury by FIMS - (QC Lot: 270167)				**mg/L**	**mg/L**	**%**
ES0610871-001	Anonymous	Mercury	0.0010 mg/L	<0.0010	<0.0010	0.0
ES0610901-010	Anonymous	Mercury	0.0010 mg/L	<0.0010	<0.0010	0.0

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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*	
			Spike concentration	*Spike Recovery*	*Dynamic Recovery Limits*	
Analyte name	*LOR*			*LCS*	*Low*	*High*
EG005C: Leachable Metals by ICPAES						
EG005C: Leachable Metals by ICPAES - (QC Lot: 268837)		mg/L	mg/L	%	%	%
Arsenic	0.1 mg/L	----	1	89.6	75.7	132
	0.1 mg/L	<0.1	----	----	----	----
Cadmium	0.05 mg/L	----	0.250	104	83.1	123
	0.05 mg/L	<0.05	----	----	----	----
Lead	0.1 mg/L	----	1	102	79.9	122
	0.1 mg/L	<0.1	----	----	----	----
Nickel	0.1 mg/L	----	1	102	85.4	125
	0.1 mg/L	<0.1	----	----	----	----
EG035C: Leachable Mercury by FIMS						
EG035C: Leachable Mercury by FIMS - (QC Lot: 270167)		mg/L	mg/L	%	%	%
Mercury	0.001 mg/L	----	0.010	108	70	130
	0.0010 mg/L	<0.0010	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 269202)		µg/L	µg/L	%	%	%
Benzo(a)pyrene	0.2 µg/L	----	2	100	63.3	117
	0.5 µg/L	<0.5	----	----	----	----

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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	
					Sample Result	Spike Recovery	Static Limits	
Analyte name	*Laboratory Sample ID*	*Client Sample ID*	*LOR*	*Spike Concentration*		*MS*	*Low*	*High*
EG005C: Leachable Metals by ICPAES								
EG005C: Leachable Metals by ICPAES - (QC Lot: 268837)				mg/L	mg/L	%	%	%
Arsenic	ES0610665-002	Anonymous	0.1 mg/L	1	<0.1	109	70	130
Cadmium			0.05 mg/L	0.250	<0.05	116	70	130
Lead			0.1 mg/L	1	1.2	113	70	130
Nickel			0.1 mg/L	1	<0.1	111	70	130
EG035C: Leachable Mercury by FIMS								
EG035C: Leachable Mercury by FIMS - (QC Lot: 270167)				mg/L	mg/L	%	%	%
Mercury	ES0610871-001	Anonymous	0.001 mg/L	0.1	<0.0010	107	70	130

ALS Environmental

INTERPRETIVE QUALITY CONTROL REPORT

Client	:	**CH2M HILL PTY LTD**	**Laboratory**	:	ALS Environmental Sydney	**Page**	: **1 of 5**
Contact	:	MR ADAM SULLIVAN	**Contact**	:	Greg Vogel		
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	**Address**	:	Smithfield NSW Australia 2164	**Work order**	: **ES0610884**
						Amendment No.	:
Project	:	Rebatch	**Quote number**	:	----	**Date received**	: 4 Sep 2006
Order number	:	- Not provided -				**Date issued**	: 8 Sep 2006
C-O-C number	:	- Not provided -					
Site	:	- Not provided -					
E-mail	:	adam.sullivan@ch2m.com.au	**E-mail**	:	Greg.Vogel@alsenviro.com	**No. of samples**	
Telephone	:	02 9950 0200	**Telephone**	:	+61 (02) 8784 8555	**Received**	: 8
Facsimile	:	02 9950 0600	**Facsimile**	:	+61 (02) 8784 8500	**Analysed**	: 8

This Interpretive Quality Control Report was issued on 8 Sep 2006 for the ALS work order reference ES0610884 and supersedes any previous reports with this reference.
This report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Type Frequency Compliance
- Summary of all Quality Control Outliers
- Brief Method Summaries

Interpretive Quality Control Report - Analysis Holding Time

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the sample aliquot was taken. Elapsed time to analysis represents time from sampling where no extraction / digestion is involved or time from extraction / digestion where this is present. For composite samples, sampling date/time is taken as that of the oldest sample contributing to that composite. Sample date/time for laboratory produced leaches are taken from the completion date/time of the leaching process. Outliers for holding time are based on USEPA SW846, APHA, AS and NEPM (1999). Failed outliers, refer to the 'Summary of Outliers'.

Matrix Type: SOIL ***Analysis Holding Time and Preservation***

Method / **Container /** Client Sample ID(s)	Date Sampled	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EG005C: Leachable Metals by ICPAES							
Clear Plastic Bottle - Nitric Acid; Unfiltered							
MG02/1.8, TP10/2.0, MG04/0.5, MG06/2.0, MG10A/0.7, MG11/2.0		**7 Sep 2006**	----		**7 Sep 2006**	----	
EG035C: Leachable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered							
MG04/0.5		----	----	----	**8 Sep 2006**	----	
EP075(SIM): PAH/Phenols (GC/MS - SIM)							
Amber Glass Bottle - Unpreserved							
MG01/1.8, MG02/1.8, TP10/2.0, TP06/0.25, MG04/0.5, MG06/2.0, MG10A/0.7, MG11/2.0	**6 Sep 2006**	**7 Sep 2006**	13 Sep 2006	Pass	**8 Sep 2006**	18 Oct 2006	Pass

Interpretive Quality Control Report - Frequency of Quality Control Samples

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which this work order was processed. Actual rate should be greater than or equal to the expected rate.

Matrix Type: WATER ***Frequency of Quality Control Samples***

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
EG005C: Leachable Metals by ICPAES	2	19	**10.5**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035C: Leachable Mercury by FIMS	2	11	**18.2**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Laboratory Control Samples (LCS)					
EG005C: Leachable Metals by ICPAES	1	19	**5.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035C: Leachable Mercury by FIMS	1	11	**9.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (GC/MS - SIM)	1	18	**5.6**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Method Blanks (MB)					
EG005C: Leachable Metals by ICPAES	1	19	**5.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035C: Leachable Mercury by FIMS	1	11	**9.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (GC/MS - SIM)	1	18	**5.6**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Matrix Spikes (MS)					
EG005C: Leachable Metals by ICPAES	1	19	**5.3**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EG035C: Leachable Mercury by FIMS	1	11	**9.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement

Interpretive Quality Control Report - Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged on the 'Quality Control Report'. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). 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. - Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot.

Non-surrogates

- **For all matrices, no RPD recovery outliers occur for the duplicate analysis.**
- **For all matrices, no method blank result outliers occur.**
- **For all matrices, no laboratory spike recoveries breaches occur.**
- **For all matrices, no matrix spike recoveries breaches occur.**

Surrogates

- **For all matrices, no surrogate recovery outliers occur.**

Outliers : Analysis Holding Time

The following report highlights outliers within this 'Interpretive Quality Control Report - Analysis Holding Time'.

Method / **Container /** Client Sample ID(s)	**Date Sampled**	**Extraction / Preparation**			**Analysis**		
		Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EG005C: Leachable Metals by ICPAES							
Clear Plastic Bottle - Nitric Acid; Unfiltered MG02/1.8, TP10/2.0, MG04/0.5, MG06/2.0, MG10A/0.7, MG11/2.0		**7 Sep 2006**	----		**7 Sep 2006**	----	
Method / **Container /** Client Sample ID(s)	**Date Sampled**	**Extraction / Preparation**			**Analysis**		
		Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EG035C: Leachable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered MG04/0.5		----	----	----	**8 Sep 2006**	----	

- **No holding time outliers occur.**

Outliers : Frequency of Quality Control Samples

The following report highlights outliers within this 'Interpretive Quality Control Report - Frequency of Quality Control Samples'.

- **No frequency outliers occur.**

Method Reference Summary

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.

Matrix Type: TCLP LEACHATE ***Method Reference Summary***

Preparation Methods

EN25C : Digestion for Total Recoverable Metals - USEPA SW846-3005 Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

ORG14 : Separatory Funnel Extraction of Liquids - USEPA SW 846 - 3510B 500 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2). ALS default excludes sediment which may be resident in the container.

Analytical Methods

EG005C : Leachable Metals by ICPAES - APHA 20th ed., 3120; USEPA SW 846 - 6010 The ICPAES technique ionises leachate sample atoms emitting a characteristic spectrum. This spectrum is then compared against matrix matched standards for quantification. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

EG035C : Leachable Mercury by FIMS - AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the TCLP solution. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

EN33 : TCLP for Non and Semivolatile Analytes - (USEPA SW846-1311, ALS QWI-EN/33) The TCLP procedure is designed to determine the mobility of both organic and inorganic analytes present in wastes. The standard TCLP leach is for non-volatile and Semivolatile test parameters. Extraction Fluid #1 pH 4.88 - 4.98. Extraction Fluid #2 pH 2.83 - 2.93.

EP075(SIM) : PAH/Phenols (GC/MS - SIM) - USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

AUSTRALIAN LABORATORY SERVICES PTY LTD ABN 84 009 936 029
Smithfield NSW 2164 Australia
Telephone: +61 (02) 8784 8555 Facsimile: +61 (02) 8784 8500 http://www.alsenviro.com/

ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive report

Client Details

Client	:	**CH2M HILL PTY LTD**
Contact	:	**MR ADAM SULLIVAN**
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515
Project	:	**- Not provided -**
Order number	:	**REBATCH OF ES0609995**
C-O-C Number	:	**- Not provided -**
Site	:	**- Not provided -**
Sampler	:	**- Not provided -**
E-mail	:	adam.sullivan@ch2m.com.au
Telephone	:	02 9950 0200
Facsimile	:	02 9950 0600

Laboratory Details

Laboratory	:	**ALS Environmental Sydney**
Manager	:	**Greg Vogel**
Address	:	Smithfield NSW Australia 2164
Quote number	:	ES20050033
Work order	:	**ES0610884**
E-mail	:	Greg.Vogel@alsenviro.com
Telephone	:	+61 (02) 8784 8555
Facsimile	:	+61 (02) 8784 8500

Dates

Date Samples Received	:	4 Sep 2006	**SRA Issue Date**	:	4 Sep 2006
Scheduled Reporting Date	:	**8 Sep 2006**	**Client Requested Date**	:	8 Sep 2006

Delivery Details

Mode of Delivery	:	Carrier.	**Temperature**		:	AMBIENT
No. of coolers/boxes	:	REBATCH	**No. of samples**	**- Received**		8
Security Seal	:	Intact.		**- Analysed**		8

Comments

- **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).**

- Analytical work for this work order will be conducted at ALSE Sydney.
- 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 Nazeeh Aoun.
- 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'.

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.

Client	: CH2M HILL PTY LTD	**Work Order**	: ES0610884
Project	: - Not provided -	**ALS Quote Reference**	: ES20050033

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

Some items described below may be part of a laboratory process neccessary 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**									
		EG005C - WATER Leachable Metals by ICPAES	**EG035C - WATER** Leachable Mercury by FIMS	**EP075 SIM PAH only - WATER** SIM - PAH only	**TCLP - WATER** TCLP Leach	**TCLP - SOIL** TCLP Leach	**TCLP - WATER** TCLP Leach	**TCLP - SOIL** TCLP Leach	**TCLP - WATER** TCLP Leach		
ES0610884-001	**MG01/1.8 - 4 Sep 2006**			⌋	⌋	⌋	⌋	⌋	⌋		
ES0610884-002	**MG02/1.8 - 4 Sep 2006**	⌋		⌋	⌋	⌋	⌋	⌋	⌋		
ES0610884-003	**TP10/2.0 - 4 Sep 2006**	⌋		⌋	⌋	⌋	⌋	⌋	⌋		
ES0610884-004	**TP06/0.25 - 4 Sep 2006**			⌋	⌋	⌋	⌋	⌋	⌋		
ES0610884-005	**MG04/0.5 - 4 Sep 2006**	⌋	⌋	⌋	⌋	⌋	⌋	⌋	⌋		
ES0610884-006	**MG06/2.0 - 4 Sep 2006**	⌋		⌋	⌋	⌋	⌋	⌋	⌋		
ES0610884-007	**MG10A/0.7 - 4 Sep 2006**	⌋		⌋	⌋	⌋	⌋	⌋	⌋		
ES0610884-008	**MG11/2.0 - 4 Sep 2006**	⌋		⌋	⌋	⌋	⌋	⌋	⌋		
	Total(s) :	**6**	**1**	**8**	**8**	**8**	**8**	**8**	**8**		

Client	: CH2M HILL PTY LTD	**Work Order**	: ES0610884
Project	: - Not provided -	**ALS Quote Reference**	: ES20050033

Requested Reports

l **MR ADAM SULLIVAN**

-	A4 - Certificate of Analysis - NEPM format	Email	adam.sullivan@ch2m.com.au
-	A4 - Quality Control Report - NEPM format	Email	adam.sullivan@ch2m.com.au
-	A4 - Interpretive Quality Control Report - NEPM format	Email	adam.sullivan@ch2m.com.au
-	ENMRG Export Format	Email	adam.sullivan@ch2m.com.au
-	ESDAT Export Format	Email	adam.sullivan@ch2m.com.au
-	Chain of Custody Acknowledgement	Email	adam.sullivan@ch2m.com.au
-	A4 - Sample Receipt Notification - Comprehensive format	Email	adam.sullivan@ch2m.com.au
-	Invoice	Email	adam.sullivan@ch2m.com.au

Sample Container(s) / Preservation Non-Compliance Log

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

l **No sample container / preservation non-compliance exist.**

ALS Environmental

CERTIFICATE OF ANALYSIS

Client	: CH2M HILL PTY LTD	Laboratory	: ALS Environmental Sydney	Page	: 1 of 4
Contact	: MR ADAM SULLIVAN	Contact	: Greg Vogel	Work Order	: ES0613357
Address	: PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164		
E-mail	: adam.sullivan@ch2m.com.au	E-mail	: Greg.Vogel@alsenviro.com		
Telephone	: 02 9950 0200	Telephone	: +61 (02) 8784 8555		
Facsimile	: 02 9950 0600	Facsimile	: +61 (02) 8784 8500		
Project	: 347496	Quote number	: ----	Date received	: 25 Oct 2006
Order number	: REBATCH OF ES0612955			Date issued	: 1 Nov 2006
C-O-C number	: - Not provided -			No. of samples	- Received : 1
Site	: MACDONALDTOWN GASWORKS				Analysed : 1

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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
PHALAK INTHAKESONE	Organics Co-ordinator	Organics - NATA 825 (10911 - Sydney)

ALS Environmental

Comments

This report for the ALSE reference ES0613357 supersedes any previous reports with this reference. Results apply to the sample 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 insuffient 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.

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Analytical Results

	Client Sample ID :	BHA1/7.0				
	Sample Matrix Type / Description :	ZHE LEACHATE				
	Sample Date / Time :	31 Oct 2006 11:30				
	Laboratory Sample ID :	ES0613357-001				
Analyte	CAS number	LOR	Units			
EP080: BTEX						
Benzene	71-43-2	1	µg/L	<1		
Toluene	108-88-3	2	µg/L	<2		
Ethylbenzene	100-41-4	2	µg/L	<2		
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2		
ortho-Xylene	95-47-6	2	µg/L	<2		
EP080S: TPH(V)/BTEX Surrogates						
1.2-Dichloroethane-D4	17060-07-0	0.1	%	107		
Toluene-D8	2037-26-5	0.1	%	104		
4-Bromofluorobenzene	460-00-4	0.1	%	102		

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Surrogate Control Limits

Matrix Type: SOIL - Surrogate Control Limits ***Surrogate Control Limits***

Method name	*Analyte name*	*Lower Limit*	*Upper Limit*
EP080: TPH Volatiles/BTEX			
EP080S: TPH(V)/BTEX Surrogates	1,2-Dichloroethane-D4	80	120
	Toluene-D8	88	110
	4-Bromofluorobenzene	86	115

3268 - 269

TAsi 25/10/16 2.50pm

Fadi Soro

From: Nanthini Coilparampil
Sent: Wednesday, 25 October 2006 2:40 PM
To: Samples Sydney
Subject: FW: Additional analysis

es0612955_coc.pdf

Hi Fadi

Please follow the E-mail

From: Adam.Sullivan@ch2m.com.au [mailto:Adam.Sullivan@ch2m.com.au]
Sent: Wednesday, 25 October 2006 2:22 PM
To: Nanthini Coilparampil
Subject: Additional analysis

Nanthini

Please reschedule our sample ID BHA1/7.0 for TCLP and neutral water leach analysis for BTEX. Please do so in accordance with our project quote SY/148/06.

Regards

Adam

****

This e-mail has been swept by mimesweeper
through the ALS North America gateway.

****

ALS Environmental
Sydney
Work Order
ES0613357
Telephone : +61 (02) 8784 8555

ALS Environmental

QUALITY CONTROL REPORT

Client	:	**CH2M HILL PTY LTD**	**Laboratory**	: ALS Environmental Sydney	**Page**	:	**1 of 4**
Contact	:	MR ADAM SULLIVAN	**Contact**	: Greg Vogel			
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	**Address**	: 277-289 Woodpark Road Smithfield NSW Australia 2164	**Work order**	:	**ES0613357**
					Amendment No.	:	
Project	:	347496	**Quote number**	: ----	**Date received**	:	25 Oct 2006
Order number	:	REBATCH OF ES0612955			**Date issued**	:	1 Nov 2006
C-O-C number	:	- Not provided -					
Site	:	MACDONALDTOWN GASWORKS					
E-mail	:	adam.sullivan@ch2m.com.au	**E-mail**	: Greg.Vogel@alsenviro.com	**No. of samples**		
Telephone	:	02 9950 0200	**Telephone**	: +61 (02) 8784 8555	**Received**	:	1
Facsimile	:	02 9950 0600	**Facsimile**	: +61 (02) 8784 8500	**Analysed**	:	1

This final report for the ALSE work order reference ES0613357 supersedes any previous reports with this reference.

Results apply to the sample 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

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NATA Accredited Laboratory - 825

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

Accredited for compliance with ISO/IED 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	Department
PHALAK INTHAKESONE	Organics - NATA 825 (10911 - Sydney)

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***

Laboratory Sample ID	*Client Sample ID*	*Analyte name*	*LOR*	*Original Result*	*Duplicate Result*	*RPD*
EP080: BTEX						
EP080: BTEX - (QC Lot: 298413)				µg/L	µg/L	%
ES0613573-019	Anonymous	Benzene	1 µg/L	<1	<1	0.0
		Toluene	2 µg/L	<2	<2	0.0
		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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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*	
			Spike concentration	*Spike Recovery*	*Dynamic Recovery Limits*	
Analyte name	*LOR*			*LCS*	*Low*	*High*
EP080: BTEX						
EP080: BTEX - (QC Lot: 298413)		µg/L	µg/L	%	%	%
Benzene	1 µg/L	----	10	102	76.2	124
	1 µg/L	<1	----	----	----	----
Ethylbenzene	2 µg/L	----	10	102	76.1	122
	2 µg/L	<2	----	----	----	----
meta- & para-Xylene	2 µg/L	----	10	104	75.7	123
	2 µg/L	<2	----	----	----	----
ortho-Xylene	2 µg/L	----	10	104	77.9	121
	2 µg/L	<2	----	----	----	----
Toluene	2 µg/L	----	10	105	74.4	124
	2 µg/L	<2	----	----	----	----

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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	
					Sample Result	Spike Recovery	Static Limits	
Analyte name	*Laboratory Sample ID*	*Client Sample ID*	*LOR*	*Spike Concentration*		*MS*	*Low*	*High*
EP080: BTEX								
EP080: BTEX - (QC Lot: 298413)				µg/L	µg/L	%	%	%
Benzene	ES0613573-019	Anonymous	1 µg/L	25	<1	96.2	70	130
Toluene			2 µg/L	25	<2	86.1	70	130
Ethylbenzene			2 µg/L	25	<2	102	70	130
meta- & para-Xylene			2 µg/L	25	<2	101	70	130
ortho-Xylene			2 µg/L	25	<2	101	70	130

ALS Environmental

INTERPRETIVE QUALITY CONTROL REPORT

Client	:	**CH2M HILL PTY LTD**	**Laboratory**	:	ALS Environmental Sydney	**Page**	: **1 of 5**
Contact	:	MR ADAM SULLIVAN	**Contact**	:	Greg Vogel		
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	**Address**	:	Smithfield NSW Australia 2164	**Work order**	: **ES0613357**
						Amendment No.	:
Project	:	347496	**Quote number**	:	----	**Date received**	: 25 Oct 2006
Order number	:	REBATCH OF ES0612955				**Date issued**	: 1 Nov 2006
C-O-C number	:	- Not provided -					
Site	:	MACDONALDTOWN GASWORKS					
E-mail	:	adam.sullivan@ch2m.com.au	**E-mail**	:	Greg.Vogel@alsenviro.com	**No. of samples**	
Telephone	:	02 9950 0200	**Telephone**	:	+61 (02) 8784 8555	**Received**	: 1
Facsimile	:	02 9950 0600	**Facsimile**	:	+61 (02) 8784 8500	**Analysed**	: 1

This Interpretive Quality Control Report was issued on 1 Nov 2006 for the ALS work order reference ES0613357 and supersedes any previous reports with this reference.
This report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Type Frequency Compliance
- Summary of all Quality Control Outliers
- Brief Method Summaries

Interpretive Quality Control Report - Analysis Holding Time

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the sample aliquot was taken. Elapsed time to analysis represents time from sampling where no extraction / digestion is involved or time from extraction / digestion where this is present. For composite samples, sampling date/time is taken as that of the oldest sample contributing to that composite. Sample date/time for laboratory produced leaches are taken from the completion date/time of the leaching process. Outliers for holding time are based on USEPA SW846, APHA, AS and NEPM (1999). Failed outliers, refer to the 'Summary of Outliers'.

Matrix Type: SOIL

Analysis Holding Time and Preservation

Method / **Container /** Client Sample ID(s)	**Date Sampled**	**Extraction / Preparation**			**Analysis**		
		Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EP080: TPH Volatiles/BTEX							
Amber VOC Vial - HCl or NaHSO4							
BHA1/7.0	**31 Oct 2006**	**----**	----	----	**31 Oct 2006**	14 Nov 2006	Pass

Interpretive Quality Control Report - Frequency of Quality Control Samples

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which this work order was processed. Actual rate should be greater than or equal to the expected rate.

Matrix Type: WATER ***Frequency of Quality Control Samples***

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	**Actual**	**Expected**	
Laboratory Duplicates (DUP)					
EP080: TPH Volatiles/BTEX	1	9	**11.1**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Laboratory Control Samples (LCS)					
EP080: TPH Volatiles/BTEX	1	9	**11.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Method Blanks (MB)					
EP080: TPH Volatiles/BTEX	1	9	**11.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Matrix Spikes (MS)					
EP080: TPH Volatiles/BTEX	1	9	**11.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement

Interpretive Quality Control Report - Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged on the 'Quality Control Report'. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). 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. - Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot.

Non-surrogates

- **For all matrices, no RPD recovery outliers occur for the duplicate analysis.**
- **For all matrices, no method blank result outliers occur.**
- **For all matrices, no laboratory spike recoveries breaches occur.**
- **For all matrices, no matrix spike recoveries breaches occur.**

Surrogates

- **For all matrices, no surrogate recovery outliers occur.**

Outliers : Analysis Holding Time

The following report highlights outliers within this 'Interpretive Quality Control Report - Analysis Holding Time'.

- **No holding time outliers occur.**

Outliers : Frequency of Quality Control Samples

The following report highlights outliers within this 'Interpretive Quality Control Report - Frequency of Quality Control Samples'.

- **No frequency outliers occur.**

Method Reference Summary

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.

Matrix Type: ZHE LEACHATE ***Method Reference Summary***

Analytical Methods

EP080 : TPH Volatiles/BTEX - USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

AUSTRALIAN LABORATORY SERVICES PTY LTD ABN 84 009 936 029
277-289 Woodpark Road Smithfield NSW 2164 Australia
Telephone: +61 (02) 8784 8555 Facsimile: +61 (02) 8784 8500 http://www.alsenviro.com/

ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive report

Client Details

Client	:	**CH2M HILL PTY LTD**
Contact	:	**MR ADAM SULLIVAN**
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515
Project	:	**347496**
Order number	:	**REBATCH OF ES0612955**
C-O-C Number	:	**- Not provided -**
Site	:	**MACDONALDTOWN GASWORKS**
Sampler	:	**- Not provided -**
E-mail	:	adam.sullivan@ch2m.com.au
Telephone	:	02 9950 0200
Facsimile	:	02 9950 0600

Laboratory Details

Laboratory	:	**ALS Environmental Sydney**
Manager	:	**Greg Vogel**
Address	:	277-289 Woodpark Road Smithfield NSW Australia 2164
Quote number	:	----
Work order	:	**ES0613357**
E-mail	:	Greg.Vogel@alsenviro.com
Telephone	:	+61 (02) 8784 8555
Facsimile	:	+61 (02) 8784 8500

Dates

Date Samples Received	:	25 Oct 2006	**SRA Issue Date**	:	25 Oct 2006
Scheduled Reporting Date	:	**1 Nov 2006**	**Client Requested Date**	:	1 Nov 2006

Delivery Details

Mode of Delivery	:	Carrier.	**Temperature**	:	AMBIENT
No. of coolers/boxes	:	REBATCH	**No. of samples** - **Received**		1
Security Seal	:	Intact.	- **Analysed**		1

Comments

- **Samples received in appropriately pretreated and preserved containers.**
- **This is a rebatch of ES0612955.**
- **This is a TCLP analysis only. Neutral (ASTM) Leach analysis to be conducted in work order ES0613375.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**

- Analytical work for this work order will be conducted at ALSE Sydney.
- 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 Nanthini Coilparampil
- 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'.

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.

Client	: CH2M HILL PTY LTD	**Work Order**	: ES0613357
Project	: 347496	**ALS Quote Reference**	: ----

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

Some items described below may be part of a laboratory process neccessary 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**									
		EP080 - WATER BTEX	**TCLP-ZHE - WATER** TCLP ZHE Leach	**TCLP-ZHE - SOIL** TCLP ZHE Leach							
ES0613357-001	**BHA1/7.0 - 13 Oct 2006**	]	]	]							
	Total(s) :	**1**	**1**	**1**							

Client	: CH2M HILL PTY LTD	**Work Order**	: ES0613357
Project	: 347496	**ALS Quote Reference**	: ----

Requested Reports

- **ALL ACCOUNTS**
  - Invoice — Email — mogibu.rahman@ch2m.com.au
- **MR ADAM SULLIVAN**
  - A4 - Certificate of Analysis - NEPM format — Email — adam.sullivan@ch2m.com.au
  - A4 - Quality Control Report - NEPM format — Email — adam.sullivan@ch2m.com.au
  - A4 - Interpretive Quality Control Report - NEPM format — Email — adam.sullivan@ch2m.com.au
  - ENMRG Export Format — Email — adam.sullivan@ch2m.com.au
  - ESDAT Export Format — Email — adam.sullivan@ch2m.com.au
  - Chain of Custody Acknowledgement — Email — adam.sullivan@ch2m.com.au
  - A4 - Sample Receipt Notification - Comprehensive format — Email — adam.sullivan@ch2m.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.**

ALS Environmental

CERTIFICATE OF ANALYSIS

Client	: CH2M HILL PTY LTD	Laboratory	: ALS Environmental Sydney	Page	: 1 of 4
Contact	: MR ADAM SULLIVAN	Contact	: Greg Vogel	Work Order	: ES0613375
Address	: PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164		
E-mail	: adam.sullivan@ch2m.com.au	E-mail	: Greg.Vogel@alsenviro.com		
Telephone	: 02 9950 0200	Telephone	: +61 (02) 8784 8555		
Facsimile	: 02 9950 0600	Facsimile	: +61 (02) 8784 8500		
Project	: ES0612955	Quote number	: ----	Date received	: 25 Oct 2006
Order number	: REBATCH OF ES0612955			Date issued	: 1 Nov 2006
C-O-C number	: - Not provided -			No. of samples	- Received : 1
Site	: - Not provided -				Analysed : 1

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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
Pabi Subba		Organics - NATA 825 (10911 - Sydney)
PHALAK INTHAKESONE	Organics Co-ordinator	Organics - NATA 825 (10911 - Sydney)

ALS Environmental

Comments

This report for the ALSE reference ES0613375 supersedes any previous reports with this reference. Results apply to the sample 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 insuffient 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.

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Analytical Results

			Client Sample ID :	BHA1/7.0				
			Sample Matrix Type / Description :	ASTM LEACHATE				
			Sample Date / Time :	(31 Oct 2006) (11:34)				
			Laboratory Sample ID :	ES0613375-001				
Analyte	*CAS number*	*LOR*	*Units*					
EP080: BTEX								
Benzene	71-43-2	1	µg/L	<1				
Toluene	108-88-3	2	µg/L	<2				
Ethylbenzene	100-41-4	2	µg/L	<2				
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2				
ortho-Xylene	95-47-6	2	µg/L	<2				
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	107				
Toluene-D8	2037-26-5	0.1	%	102				
4-Bromofluorobenzene	460-00-4	0.1	%	101				

ALS Environmental

Surrogate Control Limits

Matrix Type: SOIL - Surrogate Control Limits ***Surrogate Control Limits***

Method name	*Analyte name*	*Lower Limit*	*Upper Limit*
EP080: TPH Volatiles/BTEX			
EP080S: TPH(V)/BTEX Surrogates	1,2-Dichloroethane-D4	80	120
	Toluene-D8	88	110
	4-Bromofluorobenzene	86	115

3268 - 269

Fadi Soro

FADI 25/10/16 2.55pm

From: Nanthini Coilparampil
Sent: Wednesday, 25 October 2006 2:40 PM
To: Samples Sydney
Subject: FW: Additional analysis

es0612955_coc.pdf

CONTRACT WORK
WO: ES0613357
LAB: Sydney
DATE:
SPLIT: from batch - ASTM

Hi Fadi

Please follow the E-mail

From: Adam.Sullivan@ch2m.com.au [mailto:Adam.Sullivan@ch2m.com.au]
Sent: Wednesday, 25 October 2006 2:22 PM
To: Nanthini Coilparampil
Subject: Additional analysis

Nanthini

(1)

Please reschedule our sample ID BHA1/7.0 for TCLP and neutral water leach analysis for BTEX. Please do so in accordance with our project quote SY/148/06.

Regards

Adam

****

This e-mail has been swept by mimesweeper

through the ALS North America gateway.

****

ALS Environmental
Sydney
Work Order
ES0613375

Telephone : +61 (02) 8784 8555

ALS Environmental

QUALITY CONTROL REPORT

Client	:	**CH2M HILL PTY LTD**	**Laboratory**	: ALS Environmental Sydney	**Page**	:	**1 of 4**
Contact	:	MR ADAM SULLIVAN	**Contact**	: Greg Vogel			
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	**Address**	: 277-289 Woodpark Road Smithfield NSW Australia 2164	**Work order**	:	**ES0613375**
					Amendment No.	:	
Project	:	ES0612955	**Quote number**	: ----	**Date received**	:	25 Oct 2006
Order number	:	REBATCH OF ES0612955			**Date issued**	:	1 Nov 2006
C-O-C number	:	- Not provided -					
Site	:	- Not provided -					
E-mail	:	adam.sullivan@ch2m.com.au	**E-mail**	: Greg.Vogel@alsenviro.com	**No. of samples**		
Telephone	:	02 9950 0200	**Telephone**	: +61 (02) 8784 8555	**Received**	:	1
Facsimile	:	02 9950 0600	**Facsimile**	: +61 (02) 8784 8500	**Analysed**	:	1

This final report for the ALSE work order reference ES0613375 supersedes any previous reports with this reference.

Results apply to the sample 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

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NATA Accredited Laboratory - 825

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

Accredited for compliance with ISO/IED 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	Department
Pabi Subba	Organics - NATA 825 (10911 - Sydney)
PHALAK INTHAKESONE	Organics - NATA 825 (10911 - Sydney)

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***

Laboratory Sample ID	*Client Sample ID*	*Analyte name*	*LOR*	*Original Result*	*Duplicate Result*	*RPD*
EP080: BTEX						
EP080: BTEX - (QC Lot: 298413)				µg/L	µg/L	%
ES0613573-019	Anonymous	Benzene	1 µg/L	<1	<1	0.0
		Toluene	2 µg/L	<2	<2	0.0
		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

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*	
			Spike concentration	*Spike Recovery*	*Dynamic Recovery Limits*	
Analyte name	*LOR*			*LCS*	*Low*	*High*
EP080: BTEX						
EP080: BTEX - (QC Lot: 298413)		µg/L	µg/L	%	%	%
Benzene	1 µg/L	<1	----	----	----	----
	1 µg/L	----	10	102	76.2	124
Ethylbenzene	2 µg/L	<2	----	----	----	----
	2 µg/L	----	10	102	76.1	122
meta- & para-Xylene	2 µg/L	<2	----	----	----	----
	2 µg/L	----	10	104	75.7	123
ortho-Xylene	2 µg/L	<2	----	----	----	----
	2 µg/L	----	10	104	77.9	121
Toluene	2 µg/L	<2	----	----	----	----
	2 µg/L	----	10	105	74.4	124

ALS Environmental

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	
					Sample Result	Spike Recovery	Static Limits	
Analyte name	*Laboratory Sample ID*	*Client Sample ID*	*LOR*	*Spike Concentration*		*MS*	*Low*	*High*
EP080: BTEX								
EP080: BTEX - (QC Lot: 298413)				µg/L	µg/L	%	%	%
Benzene	ES0613573-019	Anonymous	1 µg/L	25	<1	96.2	70	130
Toluene			2 µg/L	25	<2	86.1	70	130
Ethylbenzene			2 µg/L	25	<2	102	70	130
meta- & para-Xylene			2 µg/L	25	<2	101	70	130
ortho-Xylene			2 µg/L	25	<2	101	70	130

ALS Environmental

INTERPRETIVE QUALITY CONTROL REPORT

Client	:	**CH2M HILL PTY LTD**	**Laboratory**	:	ALS Environmental Sydney	**Page**	: **1 of 5**
Contact	:	MR ADAM SULLIVAN	**Contact**	:	Greg Vogel		
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	**Address**	:	Smithfield NSW Australia 2164	**Work order**	: **ES0613375**
						Amendment No.	:
Project	:	ES0612955	**Quote number**	:	----	**Date received**	: 25 Oct 2006
Order number	:	REBATCH OF ES0612955				**Date issued**	: 1 Nov 2006
C-O-C number	:	- Not provided -					
Site	:	- Not provided -					
E-mail	:	adam.sullivan@ch2m.com.au	**E-mail**	:	Greg.Vogel@alsenviro.com	**No. of samples**	
Telephone	:	02 9950 0200	**Telephone**	:	+61 (02) 8784 8555	**Received**	: 1
Facsimile	:	02 9950 0600	**Facsimile**	:	+61 (02) 8784 8500	**Analysed**	: 1

This Interpretive Quality Control Report was issued on 1 Nov 2006 for the ALS work order reference ES0613375 and supersedes any previous reports with this reference.
This report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Type Frequency Compliance
- Summary of all Quality Control Outliers
- Brief Method Summaries

ALS Environmental

Interpretive Quality Control Report - Analysis Holding Time

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the sample aliquot was taken. Elapsed time to analysis represents time from sampling where no extraction / digestion is involved or time from extraction / digestion where this is present. For composite samples, sampling date/time is taken as that of the oldest sample contributing to that composite. Sample date/time for laboratory produced leaches are taken from the completion date/time of the leaching process. Outliers for holding time are based on USEPA SW846, APHA, AS and NEPM (1999). Failed outliers, refer to the 'Summary of Outliers'.

Matrix Type: SOIL

Analysis Holding Time and Preservation

Method / **Container /** Client Sample ID(s)	**Date Sampled**	**Extraction / Preparation**			**Analysis**		
		Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EP080: TPH Volatiles/BTEX							
Amber VOC Vial - HCl or NaHSO4							
BHA1/7.0	**31 Oct 2006**	**----**	----	----	**31 Oct 2006**	14 Nov 2006	Pass

Interpretive Quality Control Report - Frequency of Quality Control Samples

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which this work order was processed. Actual rate should be greater than or equal to the expected rate.

Matrix Type: WATER ***Frequency of Quality Control Samples***

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	**Actual**	**Expected**	
Laboratory Duplicates (DUP)					
EP080: TPH Volatiles/BTEX	1	9	**11.1**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Laboratory Control Samples (LCS)					
EP080: TPH Volatiles/BTEX	1	9	**11.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Method Blanks (MB)					
EP080: TPH Volatiles/BTEX	1	9	**11.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Matrix Spikes (MS)					
EP080: TPH Volatiles/BTEX	1	9	**11.1**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement

Interpretive Quality Control Report - Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged on the 'Quality Control Report'. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). 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. - Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot.

Non-surrogates

- **For all matrices, no RPD recovery outliers occur for the duplicate analysis.**
- **For all matrices, no method blank result outliers occur.**
- **For all matrices, no laboratory spike recoveries breaches occur.**
- **For all matrices, no matrix spike recoveries breaches occur.**

Surrogates

- **For all matrices, no surrogate recovery outliers occur.**

Outliers : Analysis Holding Time

The following report highlights outliers within this 'Interpretive Quality Control Report - Analysis Holding Time'.

- **No holding time outliers occur.**

Outliers : Frequency of Quality Control Samples

The following report highlights outliers within this 'Interpretive Quality Control Report - Frequency of Quality Control Samples'.

- **No frequency outliers occur.**

Method Reference Summary

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.

Matrix Type: ASTM LEACHATE ***Method Reference Summary***

Analytical Methods

EP080 : TPH Volatiles/BTEX - USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

AUSTRALIAN LABORATORY SERVICES PTY LTD ABN 84 009 936 029
277-289 Woodpark Road Smithfield NSW 2164 Australia
Telephone: +61 (02) 8784 8555 Facsimile: +61 (02) 8784 8500 http://www.alsenviro.com/

ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive report

Client Details

Client	:	**CH2M HILL PTY LTD**
Contact	:	**MR ADAM SULLIVAN**
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515
Project	:	**ES0612955**
Order number	:	**REBATCH OF ES0612955**
C-O-C Number	:	**- Not provided -**
Site	:	**- Not provided -**
Sampler	:	**- Not provided -**
E-mail	:	adam.sullivan@ch2m.com.au
Telephone	:	02 9950 0200
Facsimile	:	02 9950 0600

Laboratory Details

Laboratory	:	**ALS Environmental Sydney**
Manager	:	**Greg Vogel**
Address	:	277-289 Woodpark Road Smithfield NSW Australia 2164
Quote number	:	----
Work order	:	**ES0613375**
E-mail	:	Greg.Vogel@alsenviro.com
Telephone	:	+61 (02) 8784 8555
Facsimile	:	+61 (02) 8784 8500

Dates

Date Samples Received	:	25 Oct 2006	**SRA Issue Date**	:	26 Oct 2006
Scheduled Reporting Date	:	**1 Nov 2006**	**Client Requested Date**	:	1 Nov 2006

Delivery Details

Mode of Delivery	:	Carrier.	**Temperature**	:	AMBIENT
No. of coolers/boxes	:	REBATCH	**No. of samples** - **Received**		1
Security Seal	:	Intact.	- **Analysed**		1

Comments

- **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).**

- Analytical work for this work order will be conducted at ALSE Sydney.
- 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 Nanthini Coilparampil
- 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'.

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Client	: CH2M HILL PTY LTD	**Work Order**	: ES0613375
Project	: ES0612955	**ALS Quote Reference**	: ----

ALS Environmental

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

Some items described below may be part of a laboratory process neccessary 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**									
		EN60Z-DI - WATER DI Water Leach ZHE	**EP080 - WATER** BTEX	**EN60Z-DI - SOIL** DI Water Leach ZHE							
ES0613375-001	**BHA1/7.0 - 25 Oct 2006**	]	]	]							
	Total(s) :	**1**	**1**	**1**							

Client	: CH2M HILL PTY LTD	**Work Order**	: ES0613375
Project	: ES0612955	**ALS Quote Reference**	: ----

Requested Reports

l **ALL ACCOUNTS**

- Invoice	Email	mogibu.rahman@ch2m.com.au

l **MR ADAM SULLIVAN**

- A4 - Certificate of Analysis - NEPM format	Email	adam.sullivan@ch2m.com.au
- A4 - Quality Control Report - NEPM format	Email	adam.sullivan@ch2m.com.au
- A4 - Interpretive Quality Control Report - NEPM format	Email	adam.sullivan@ch2m.com.au
- ENMRG Export Format	Email	adam.sullivan@ch2m.com.au
- ESDAT Export Format	Email	adam.sullivan@ch2m.com.au
- Chain of Custody Acknowledgement	Email	adam.sullivan@ch2m.com.au
- A4 - Sample Receipt Notification - Comprehensive format	Email	adam.sullivan@ch2m.com.au

Sample Container(s) / Preservation Non-Compliance Log

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

l **No sample container / preservation non-compliance exist.**

ALS Environmental

CERTIFICATE OF ANALYSIS

Client	: CH2M HILL PTY LTD	Laboratory	: ALS Environmental Sydney	Page	: 1 of 5
Contact	: MR ADAM SULLIVAN	Contact	: Greg Vogel	Work Order	: ES0613650
Address	: PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164		
E-mail	: adam.sullivan@ch2m.com.au	E-mail	: Greg.Vogel@alsenviro.com		
Telephone	: 02 9950 0200	Telephone	: +61 (02) 8784 8555		
Facsimile	: 02 9950 0600	Facsimile	: +61 (02) 8784 8500		
Project	: 347496 Macdonaldtown Gasworks	Quote number	: EN/006/06	Date received	: 1 Nov 2006
Order number	: REBATCH OF ES0613192			Date issued	: 8 Nov 2006
C-O-C number	: - Not provided -			No. of samples	- Received : 2
Site	: - Not provided -				Analysed : 2

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NATA Accredited Laboratory 825

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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	Position	Department
EDWANDY FADJAR		Organics - NATA 825 (10911 - Sydney)
Pabi Subba		Organics - NATA 825 (10911 - Sydney)
Peter Dickenson	Senior Spectroscopist	Inorganics - NATA 825 (10911 - Sydney)

ALS Environmental

Comments

This report for the ALSE reference ES0613650 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 insuffient 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 **ES0613650**

EP075(SIM):Particular samples required dilution due to the presence of high level contaminants. LOR values have been adjusted accordingly.

ALS Environmental

Analytical Results

			Client Sample ID :	BHF/8.5M				
			Sample Matrix Type / Description :	TCLP LEACHATE				
			Sample Date / Time :	1 Nov 2006 11:00				
			Laboratory Sample ID :	ES0613650-002				
Analyte	CAS number	LOR	Units					
EN33: TCLP Leach								
Initial pH		0.1	pH Unit	4.9				
Extraction Fluid Number		1	-	1				
Final pH		0.1	pH Unit	4.9				
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1	µg/L	101.8				
Acenaphthylene	208-96-8	1.0	µg/L	<1.8				
Acenaphthene	83-32-9	1.0	µg/L	10.9				
Fluorene	86-73-7	1.0	µg/L	29.9				
Phenanthrene	85-01-8	1.0	µg/L	20.1				
Anthracene	120-12-7	1.0	µg/L	4.4				
Fluoranthene	206-44-0	1.0	µg/L	2.4				
Pyrene	129-00-0	1.0	µg/L	2.0				
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.8				
Chrysene	218-01-9	1.0	µg/L	<1.8				
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.8				
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.8				
Benzo(a)pyrene	50-32-8	0.5	µg/L	<1.8				
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.8				
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.8				
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.8				
EP080/071: Total Petroleum Hydrocarbons								
C10 - C14 Fraction		50	µg/L	4100				
C15 - C28 Fraction		100	µg/L	500				
C29 - C36 Fraction		50	µg/L	<50				
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	22.8				
2-Chlorophenol-D4	93951-73-6	0.1	%	65.5				
2.4.6-Tribromophenol	118-79-6	0.1	%	57.8				
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	78.7				
Anthracene-d10	1719-06-8	0.1	%	70.8				
4-Terphenyl-d14	1718-51-0	0.1	%	78.6				

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Analytical Results

				Client Sample ID :	BHD/8.4M	BHF/8.5M			
				Sample Matrix Type / Description :	ZHE LEACHATE	ZHE LEACHATE			
				Sample Date / Time :	2 Nov 2006 13:00	20 Oct 2006 10:00			
				Laboratory Sample ID :					
Analyte	*CAS number*	*LOR*	*Units*		ES0613650-001	ES0613650-002			
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction		20	µg/L		----	600			
EP080: BTEX									
Benzene	71-43-2	1	µg/L		12	1			
Toluene	108-88-3	2	µg/L		<2	2			
Ethylbenzene	100-41-4	2	µg/L		<2	106			
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		6	265			
ortho-Xylene	95-47-6	2	µg/L		3	383			
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		108	90.4			
Toluene-D8	2037-26-5	0.1	%		107	94.7			
4-Bromofluorobenzene	460-00-4	0.1	%		114	89.9			

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Surrogate Control Limits

Matrix Type: SOIL - Surrogate Control Limits ***Surrogate Control Limits***

Method name	*Analyte name*	*Lower Limit*	*Upper Limit*
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	116
	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

545-426

Fadi Soro

FADI 1/4/06 9am

From: Nanthini Coilparampil
Sent: Tuesday, 31 October 2006 6:16 PM
To: Samples Sydney
Subject: FW: Additional analysis

es0613192_coc.pdf

Please re-batch according to the E-mail

From: Adam.Sullivan@ch2m.com.au [mailto:Adam.Sullivan@ch2m.com.au]
Sent: Tuesday, 31 October 2006 5:00 PM
To: Nanthini Coilparampil
Subject: Additional analysis

Hi Nanthini

Are you able to analyse the following samples for TCLP and neutral leach (from attached COC):

(1) • 14 BHD/8.4m – BTEX;
(2) • 6 BHF/8.5m – BTEX, TPH and PAH (including B(a)P).

Regards

Adam

****

This e-mail has been swept by mimesweeper

through the ALS North America gateway.

****

ALS Environmental
Sydney
Work Order
ES0613650

Telephone : +61 (02) 8784 8555

ALS Environmental

QUALITY CONTROL REPORT

Client	:	**CH2M HILL PTY LTD**	**Laboratory**	: ALS Environmental Sydney	**Page**	:	**1 of 6**
Contact	:	MR ADAM SULLIVAN	**Contact**	: Greg Vogel			
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	**Address**	: 277-289 Woodpark Road Smithfield NSW Australia 2164	**Work order**	:	**ES0613650**
					Amendment No.	:	
Project	:	347496 Macdonaldtown Gasworks	**Quote number**	: EN/006/06	**Date received**	:	31 Oct 2006
Order number	:	REBATCH OF ES0613192			**Date issued**	:	8 Nov 2006
C-O-C number	:	- Not provided -					
Site	:	- Not provided -					
E-mail	:	adam.sullivan@ch2m.com.au	**E-mail**	: Greg.Vogel@alsenviro.com	**No. of samples**		
Telephone	:	02 9950 0200	**Telephone**	: +61 (02) 8784 8555	**Received**	:	2
Facsimile	:	02 9950 0600	**Facsimile**	: +61 (02) 8784 8500	**Analysed**	:	2

This final report for the ALSE work order reference ES0613650 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

EP075(SIM):Particular samples required dilution due to the presence of high level contaminants. LOR values have been adjusted accordingly.

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

Accredited for compliance with ISO/IED 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	Department
* Not Entered *	Organics - NATA 825 (10911 - Sydney)
EDWANDY FADJAR	Organics - NATA 825 (10911 - Sydney)
Pabi Subba	Organics - NATA 825 (10911 - Sydney)
Peter Dickenson	Inorganics - NATA 825 (10911 - Sydney)

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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***

Laboratory Sample ID	*Client Sample ID*	*Analyte name*	*LOR*	*Original Result*	*Duplicate Result*	*RPD*
EP080/071: Total Petroleum Hydrocarbons						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 299867)				**µg/L**	**µg/L**	**%**
ES0613706-005	Anonymous	C6 - C9 Fraction	20 µg/L	<20	<20	0.0
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 302483)				**µg/L**	**µg/L**	**%**
ES0613650-002	BHF/8.5M	C6 - C9 Fraction	20 µg/L	600	600	0.0
EP080: BTEX						
EP080: BTEX - (QC Lot: 299867)				**µg/L**	**µg/L**	**%**
ES0613706-005	Anonymous	Benzene	1 µg/L	<1	<1	0.0
		Toluene	2 µg/L	<2	<2	0.0
		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
EP080: BTEX - (QC Lot: 302483)				**µg/L**	**µg/L**	**%**
ES0613650-002	BHF/8.5M	Benzene	1 µg/L	1	<1	0.0
		Toluene	2 µg/L	2	2	0.0
		Ethylbenzene	2 µg/L	106	109	2.5
		meta- & para-Xylene	2 µg/L	265	266	0.4
		ortho-Xylene	2 µg/L	383	386	0.8

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*	
			Spike concentration	*Spike Recovery*	*Dynamic Recovery Limits*	
Analyte name	*LOR*			*LCS*	*Low*	*High*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 299535)		µg/L	µg/L	%	%	%
Acenaphthene	0.2 µg/L	----	2	85.3	62.2	113
	0.5 µg/L	<0.5	----	----	----	----
Acenaphthylene	0.2 µg/L	----	2	86.6	63.6	114
	0.5 µg/L	<0.5	----	----	----	----
Anthracene	0.2 µg/L	----	2	84.6	64.3	116
	0.5 µg/L	<0.5	----	----	----	----
Benz(a)anthracene	0.2 µg/L	----	2	87.5	64.1	117
	0.5 µg/L	<0.5	----	----	----	----
Benzo(a)pyrene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	85.2	63.3	117
Benzo(b)fluoranthene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	90.3	61.7	119
Benzo(g,h,i)perylene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	86.4	59.1	118
Benzo(k)fluoranthene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	79.1	61.7	117
Chrysene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	81.0	62.5	116
Dibenz(a,h)anthracene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	86.9	61.2	117
Fluoranthene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	85.0	63.6	118
Fluorene	0.2 µg/L	----	2	86.0	63.9	115
	0.5 µg/L	<0.5	----	----	----	----
Indeno(1,2,3,cd)pyrene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	86.9	59.9	118

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Matrix Type: WATER

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)B: Polynuclear Aromatic Hydrocarbons - continued						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 299535) - continued		µg/L	µg/L	%	%	%
Naphthalene	0.2 µg/L	----	2	88.2	62.4	114
	0.5 µg/L	<0.5	----	----	----	----
Phenanthrene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	85.8	62.6	116
Pyrene	0.2 µg/L	----	2	86.2	63.1	118
	0.5 µg/L	<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 299533)		µg/L	µg/L	%	%	%
C10 - C14 Fraction	50 µg/L	----	200	102	58.9	131
	50 µg/L	<50	----	----	----	----
C15 - C28 Fraction	100 µg/L	----	200	124	73.9	138
	100 µg/L	<100	----	----	----	----
C29 - C36 Fraction	50 µg/L	----	200	77.5	62.7	131
	50 µg/L	<50	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 299867)		µg/L	µg/L	%	%	%
C6 - C9 Fraction	20 µg/L	<20	----	----	----	----
	20 µg/L	----	260	115	75	127
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 302483)		µg/L	µg/L	%	%	%
C6 - C9 Fraction	20 µg/L	<20	----	----	----	----
	20 µg/L	----	260	92.5	75	127
EP080: BTEX						
EP080: BTEX - (QC Lot: 299867)		µg/L	µg/L	%	%	%
Benzene	1 µg/L	<1	----	----	----	----
	1 µg/L	----	10	97.1	76.2	124
Ethylbenzene	2 µg/L	<2	----	----	----	----
	2 µg/L	----	10	97.3	76.1	122
meta- & para-Xylene	2 µg/L	<2	----	----	----	----
	2 µg/L	----	10	89.2	75.7	123

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Matrix Type: WATER

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*
EP080: BTEX - continued						
EP080: BTEX - (QC Lot: 299867) - continued		µg/L	µg/L	%	%	%
ortho-Xylene	2 µg/L	<2	----	----	----	----
	2 µg/L	----	10	97.3	77.9	121
Toluene	2 µg/L	----	10	97.5	74.4	124
	2 µg/L	<2	----	----	----	----
EP080: BTEX - (QC Lot: 302483)		µg/L	µg/L	%	%	%
Benzene	1 µg/L	<1	----	----	----	----
	1 µg/L	----	10	94.4	76.2	124
Ethylbenzene	2 µg/L	----	10	103	76.1	122
	2 µg/L	<2	----	----	----	----
meta- & para-Xylene	2 µg/L	<2	----	----	----	----
	2 µg/L	----	10	99.8	75.7	123
ortho-Xylene	2 µg/L	<2	----	----	----	----
	2 µg/L	----	10	101	77.9	121
Toluene	2 µg/L	----	10	98.9	74.4	124
	2 µg/L	<2	----	----	----	----

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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	
					Sample Result	Spike Recovery	Static Limits	
Analyte name	*Laboratory Sample ID*	*Client Sample ID*	*LOR*	*Spike Concentration*		*MS*	*Low*	*High*
EP080/071: Total Petroleum Hydrocarbons								
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 299867)				µg/L	µg/L	%	%	%
C6 - C9 Fraction	ES0613706-005	Anonymous	20 µg/L	250	<20	108	70	130
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 302483)				µg/L	µg/L	%	%	%
C6 - C9 Fraction	ES0613650-002	BHF/8.5M	20 µg/L	250	600	113	70	130
EP080: BTEX								
EP080: BTEX - (QC Lot: 299867)				µg/L	µg/L	%	%	%
Benzene	ES0613706-005	Anonymous	1 µg/L	25	<1	92.0	70	130
Toluene			2 µg/L	25	<2	78.1	70	130
Ethylbenzene			2 µg/L	25	<2	91.0	70	130
meta- & para-Xylene			2 µg/L	25	<2	81.9	70	130
ortho-Xylene			2 µg/L	25	<2	93.3	70	130
EP080: BTEX - (QC Lot: 302483)				µg/L	µg/L	%	%	%
Benzene	ES0613650-002	BHF/8.5M	1 µg/L	25	1	81.0	70	130
Toluene			2 µg/L	25	2	81.9	70	130
Ethylbenzene			2 µg/L	25	106	* Not Determined	70	130
meta- & para-Xylene			2 µg/L	25	265	* Not Determined	70	130
ortho-Xylene			2 µg/L	25	383	* Not Determined	70	130

ALS Environmental

INTERPRETIVE QUALITY CONTROL REPORT

Client	:	**CH2M HILL PTY LTD**	**Laboratory**	:	ALS Environmental Sydney	**Page**	: **1 of 5**
Contact	:	MR ADAM SULLIVAN	**Contact**	:	Greg Vogel		
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	**Address**	:	Smithfield NSW Australia 2164	**Work order**	: **ES0613650**
						Amendment No.	:
Project	:	347496 Macdonaldtown Gasworks	**Quote number**	:	EN/006/06	**Date received**	: 1 Nov 2006
Order number	:	REBATCH OF ES0613192				**Date issued**	: 8 Nov 2006
C-O-C number	:	- Not provided -					
Site	:	- Not provided -					
E-mail	:	adam.sullivan@ch2m.com.au	**E-mail**	:	Greg.Vogel@alsenviro.com	**No. of samples**	
Telephone	:	02 9950 0200	**Telephone**	:	+61 (02) 8784 8555	**Received**	: 2
Facsimile	:	02 9950 0600	**Facsimile**	:	+61 (02) 8784 8500	**Analysed**	: 2

This Interpretive Quality Control Report was issued on 8 Nov 2006 for the ALS work order reference ES0613650 and supersedes any previous reports with this reference.
This report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Type Frequency Compliance
- Summary of all Quality Control Outliers
- Brief Method Summaries

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Interpretive Quality Control Report - Analysis Holding Time

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the sample aliquot was taken. Elapsed time to analysis represents time from sampling where no extraction / digestion is involved or time from extraction / digestion where this is present. For composite samples, sampling date/time is taken as that of the oldest sample contributing to that composite. Sample date/time for laboratory produced leaches are taken from the completion date/time of the leaching process. Outliers for holding time are based on USEPA SW846, APHA, AS and NEPM (1999). Failed outliers, refer to the 'Summary of Outliers'.

Matrix Type: SOIL ***Analysis Holding Time and Preservation***

Method / **Container /** Client Sample ID(s)	**Date Sampled**	**Extraction / Preparation**			**Analysis**		
		Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EP071: TPH - Semivolatile Fraction							
Amber Glass Bottle - Unpreserved							
BHF/8.5M	**1 Nov 2006**	**2 Nov 2006**	8 Nov 2006	Pass	**2 Nov 2006**	12 Dec 2006	Pass
EP075(SIM): PAH/Phenols (GC/MS - SIM)							
Amber Glass Bottle - Unpreserved							
BHF/8.5M	**1 Nov 2006**	**2 Nov 2006**	8 Nov 2006	Pass	**3 Nov 2006**	12 Dec 2006	Pass
EP080: TPH Volatiles/BTEX							
Amber VOC Vial - HCl or NaHSO4							
BHD/8.4M	**2 Nov 2006**	**----**	----	----	**3 Nov 2006**	16 Nov 2006	Pass
Amber VOC Vial - HCl or NaHSO4							
BHF/8.5M	**20 Oct 2006**	**----**	----	**----**	**8 Nov 2006**	3 Nov 2006	**Fail by 5 days**

Interpretive Quality Control Report - Frequency of Quality Control Samples

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which this work order was processed. Actual rate should be greater than or equal to the expected rate.

Matrix Type: WATER ***Frequency of Quality Control Samples***

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
EP080: TPH Volatiles/BTEX	2	10	**20.0**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Laboratory Control Samples (LCS)					
EP071: TPH - Semivolatile Fraction	1	8	**12.5**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (GC/MS - SIM)	1	5	**20.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	2	10	**20.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Method Blanks (MB)					
EP071: TPH - Semivolatile Fraction	1	8	**12.5**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (GC/MS - SIM)	1	5	**20.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	2	10	**20.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Matrix Spikes (MS)					
EP080: TPH Volatiles/BTEX	2	10	**20.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement

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Interpretive Quality Control Report - Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged on the 'Quality Control Report'. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). 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. - Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot.

Non-surrogates

ALS QC Lot	Matrix Type	Laboratory Sample ID	Client Sample ID	Analyte	Data	Limits	Comment
Matrix Spikes (MS)							
EP080: BTEX	WATER	ES0613650-002	BHF/8.5M	Ethylbenzene	ND	----	MS recovery not determined, background level greater than or equal to 4x spike level.
				meta- & para-Xylene	ND	----	MS recovery not determined, background level greater than or equal to 4x spike level.
				ortho-Xylene	ND	----	MS recovery not determined, background level greater than or equal to 4x spike level.

- **For all matrices, no RPD recovery outliers occur for the duplicate analysis.**
- **For all matrices, no method blank result outliers occur.**
- **For all matrices, no laboratory spike recoveries breaches occur.**

Surrogates

- **For all matrices, no surrogate recovery outliers occur.**

Outliers : Analysis Holding Time

The following report highlights outliers within this 'Interpretive Quality Control Report - Analysis Holding Time'.

Method / **Container /** Client Sample ID(s)	**Date Sampled**	**Extraction / Preparation**			**Analysis**		
		Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EP080: TPH Volatiles/BTEX							
Amber VOC Vial - HCl or NaHSO4 BHF/8.5M	**20 Oct 2006**	**----**	----	**----**	**8 Nov 2006**	3 Nov 2006	**Fail by 5 days**

Outliers : Frequency of Quality Control Samples

The following report highlights outliers within this 'Interpretive Quality Control Report - Frequency of Quality Control Samples'.

- **No frequency outliers occur.**

Method Reference Summary

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.

Matrix Type: TCLP LEACHATE ***Method Reference Summary***

Preparation Methods

ORG14 : Separatory Funnel Extraction of Liquids - USEPA SW 846 - 3510B 500 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2). ALS default excludes sediment which may be resident in the container.

Analytical Methods

EN33 : TCLP for Non and Semivolatile Analytes - (USEPA SW846-1311, ALS QWI-EN/33) The TCLP procedure is designed to determine the mobility of both organic and inorganic analytes present in wastes. The standard TCLP leach is for non-volatile and Semivolatile test parameters. Extraction Fluid #1 pH 4.88 - 4.98. Extraction Fluid #2 pH 2.83 - 2.93.

EP071 : TPH - Semivolatile Fraction - USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

EP075(SIM) : PAH/Phenols (GC/MS - SIM) - USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

Matrix Type: ZHE LEACHATE ***Method Reference Summary***

Analytical Methods

EP080 : TPH Volatiles/BTEX - USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

AUSTRALIAN LABORATORY SERVICES PTY LTD ABN 84 009 936 029
277-289 Woodpark Road Smithfield NSW 2164 Australia
Telephone: +61 (02) 8784 8555 Facsimile: +61 (02) 8784 8500 http://www.alsenviro.com/

ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive report

Client Details

Client	:	**CH2M HILL PTY LTD**
Contact	:	**MR ADAM SULLIVAN**
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515
Project	:	**347496 MACDONALDTOWN GASWORK**
Order number	:	**REBATCH OF ES0613192**
C-O-C Number	:	**- Not provided -**
Site	:	**- Not provided -**
Sampler	:	**- Not provided -**
E-mail	:	adam.sullivan@ch2m.com.au
Telephone	:	02 9950 0200
Facsimile	:	02 9950 0600

Laboratory Details

Laboratory	:	**ALS Environmental Sydney**
Manager	:	**Greg Vogel**
Address	:	277-289 Woodpark Road Smithfield NSW Australia 2164
Quote number	:	----
Work order	:	**ES0613650**
E-mail	:	Greg.Vogel@alsenviro.com
Telephone	:	+61 (02) 8784 8555
Facsimile	:	+61 (02) 8784 8500

Dates

Date Samples Received	:	1 Nov 2006	**SRA Issue Date**	:	1 Nov 2006
Scheduled Reporting Date	:	**8 Nov 2006**	**Client Requested Date**	:	8 Nov 2006

Delivery Details

Mode of Delivery	:	Carrier.	**Temperature**	:	AMBIENT
No. of coolers/boxes	:	REBATCH	**No. of samples** - **Received**		2
Security Seal	:	Intact.	- **Analysed**		2

Comments

- **Samples received in appropriately pretreated and preserved containers.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **This is a rebatch of ES0613192.**
- **Neutral leach analysis to be conducted in work order ES0613652.**

- Analytical work for this work order will be conducted at ALSE Sydney.
- 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 Nanthini Coilparampil
- 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'.

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.

Client	: CH2M HILL PTY LTD	**Work Order**	: ES0613650
Project	: 347496 MACDONALDTOWN GASWORKS	**ALS Quote Reference**	: ----

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

Some items described below may be part of a laboratory process neccessary 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**									
		EP080 - WATER BTEX	**TCLP - WATER** TCLP Leach	**TCLP-ZHE - WATER** TCLP ZHE Leach	**W-07 - WATER** TPH/BTEX/PAH	**TCLP - SOIL** TCLP Leach	**TCLP-ZHE - SOIL** TCLP ZHE Leach				
ES0613650-001	**BHD/8.4M - 20 Oct 2006**	⌋		⌋			⌋				
ES0613650-002	**BHF/8.5M - 20 Oct 2006**		⌋	⌋	⌋	⌋	⌋				
	Total(s) :	**1**	**1**	**2**	**1**	**1**	**2**				

Client	: CH2M HILL PTY LTD	**Work Order**	: ES0613650
Project	: 347496 MACDONALDTOWN GASWORKS	**ALS Quote Reference**	: ----

Requested Reports

l **ALL ACCOUNTS**

-	Invoice	Email	mogibu.rahman@ch2m.com.au

l **MR ADAM SULLIVAN**

-	A4 - Certificate of Analysis - NEPM format	Email	adam.sullivan@ch2m.com.au
-	A4 - Quality Control Report - NEPM format	Email	adam.sullivan@ch2m.com.au
-	A4 - Interpretive Quality Control Report - NEPM format	Email	adam.sullivan@ch2m.com.au
-	ENMRG Export Format	Email	adam.sullivan@ch2m.com.au
-	ESDAT Export Format	Email	adam.sullivan@ch2m.com.au
-	Chain of Custody Acknowledgement	Email	adam.sullivan@ch2m.com.au
-	A4 - Sample Receipt Notification - Comprehensive format	Email	adam.sullivan@ch2m.com.au

Sample Container(s) / Preservation Non-Compliance Log

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

l **No sample container / preservation non-compliance exist.**

ALS Environmental

CERTIFICATE OF ANALYSIS

Client	: CH2M HILL PTY LTD	Laboratory	: ALS Environmental Sydney	Page	: 1 of 5
Contact	: MR ADAM SULLIVAN	Contact	: Greg Vogel	Work Order	: ES0613652
Address	: PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164		
E-mail	: adam.sullivan@ch2m.com.au	E-mail	: Greg.Vogel@alsenviro.com		
Telephone	: 02 9950 0200	Telephone	: +61 (02) 8784 8555		
Facsimile	: 02 9950 0600	Facsimile	: +61 (02) 8784 8500		
Project	: 347496 Macdonaldtown Gasworks	Quote number	: EN/006/06	Date received	: 1 Nov 2006
Order number	: Rebatch Of ES0613192			Date issued	: 8 Nov 2006
C-O-C number	: - Not provided -			No. of samples	- Received : 2
Site	: - Not provided -				Analysed : 2

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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
EDWANDY FADJAR		Organics - NATA 825 (10911 - Sydney)
Pabi Subba		Organics - NATA 825 (10911 - Sydney)
Peter Dickenson	Senior Spectroscopist	Inorganics - NATA 825 (10911 - Sydney)
PHALAK INTHAKESONE	Organics Co-ordinator	Organics - NATA 825 (10911 - Sydney)

ALS Environmental

Comments

This report for the ALSE reference ES0613652 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 insuffient 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 **ES0613652**

Insufficient sample volume BHF/8.5M for ZHE BTEX analysis.
EP075(SIM): Sample required dilution due to the presence of high level contaminants. LOR values have been adjusted accordingly.

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Analytical Results

			Client Sample ID :	BHF/8.5M				
			Sample Matrix Type / Description :	ASTM LEACHATE				
			Sample Date / Time :	6 Nov 2006 12:00				
			Laboratory Sample ID :	ES0613652-002				
Analyte	CAS number	LOR	Units					
EN60-DI: Bottle Leaching Procedure								
Final pH		0.1	pH Unit	4.9				
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1.0	µg/L	3130				
Acenaphthylene	208-96-8	1.0	µg/L	2.4				
Acenaphthene	83-32-9	1.0	µg/L	13.5				
Fluorene	86-73-7	1.0	µg/L	34.6				
Phenanthrene	85-01-8	1.0	µg/L	21.3				
Anthracene	120-12-7	1.0	µg/L	5.4				
Fluoranthene	206-44-0	1.0	µg/L	2.5				
Pyrene	129-00-0	1.0	µg/L	1.9				
Benz(a)anthracene	56-55-3	1.0	µg/L	<1.0				
Chrysene	218-01-9	1.0	µg/L	<1.0				
Benzo(b)fluoranthene	205-99-2	1.0	µg/L	<1.0				
Benzo(k)fluoranthene	207-08-9	1.0	µg/L	<1.0				
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5				
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L	<1.0				
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L	<1.0				
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L	<1.0				
EP080/071: Total Petroleum Hydrocarbons								
C10 - C14 Fraction		50	µg/L	6990				
C15 - C28 Fraction		100	µg/L	600				
C29 - C36 Fraction		50	µg/L	<50				
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	34.1				
2-Chlorophenol-D4	93951-73-6	0.1	%	69.6				
2.4.6-Tribromophenol	118-79-6	0.1	%	79.5				
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	73.5				
Anthracene-d10	1719-06-8	0.1	%	75.5				
4-Terphenyl-d14	1718-51-0	0.1	%	77.0				

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Analytical Results

			Client Sample ID :	BHD/8.4M				
			Sample Matrix Type / Description :	TCLP LEACHATE				
			Sample Date / Time :	2 Nov 2006 13:00				
			Laboratory Sample ID :	ES0613652-001				
Analyte	*CAS number*	*LOR*	*Units*					
EP080: BTEX								
Benzene	71-43-2	1	µg/L	10				
Toluene	108-88-3	2	µg/L	<2				
Ethylbenzene	100-41-4	2	µg/L	<2				
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	3				
ortho-Xylene	95-47-6	2	µg/L	2				
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	101				
Toluene-D8	2037-26-5	0.1	%	100				
4-Bromofluorobenzene	460-00-4	0.1	%	105				

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Surrogate Control Limits

Matrix Type: SOIL - Surrogate Control Limits ***Surrogate Control Limits***

Method name	*Analyte name*	*Lower Limit*	*Upper Limit*
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	116
	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

545-426

FYDI 1/11/06 9am

Fadi Soro

From: Nanthini Coilparampil
Sent: Tuesday, 31 October 2006 6:16 PM
To: Samples Sydney
Subject: FW: Additional analysis

es0613192_coc.pdf

CONTRACT WORK
WO: .....
LAB: .....
DATE: .....
SPLIT: from ES0613650. TC4
..... Neutral leach -

Please re-batch according to the E-mail

From: Adam.Sullivan@ch2m.com.au [mailto:Adam.Sullivan@ch2m.com.au]
Sent: Tuesday, 31 October 2006 5:00 PM
To: Nanthini Coilparampil
Subject: Additional analysis

Hi Nanthini

Are you able to analyse the following samples for TCLP and neutral leach (from attached COC):

1. • 14 BHD/8.4m – BTEX;
2. • 6 BHF/8.5m – BTEX, TPH and PAH (including B(a)P).

Regards

Adam

****

This e-mail has been swept by mimesweeper

through the ALS North America gateway.

****

ALS Environmental
Sydney
Work Order
ES0613652
Telephone : +61 (02) 8784 8555

ALS Environmental

QUALITY CONTROL REPORT

Client	:	**CH2M HILL PTY LTD**	**Laboratory**	:	ALS Environmental Sydney	**Page**	: **1 of 5**
Contact	:	MR ADAM SULLIVAN	**Contact**	:	Greg Vogel		
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	**Address**	:	277-289 Woodpark Road Smithfield NSW Australia 2164	**Work order**	: **ES0613652**
						Amendment No.	:
Project	:	347496 Macdonaldtown Gasworks	**Quote number**	:	EN/006/06	**Date received**	: 31 Oct 2006
Order number	:	Rebatch Of ES0613192				**Date issued**	: 8 Nov 2006
C-O-C number	:	- Not provided -					
Site	:	- Not provided -					
E-mail	:	adam.sullivan@ch2m.com.au	**E-mail**	:	Greg.Vogel@alsenviro.com	**No. of samples**	
Telephone	:	02 9950 0200	**Telephone**	:	+61 (02) 8784 8555	**Received**	: 2
Facsimile	:	02 9950 0600	**Facsimile**	:	+61 (02) 8784 8500	**Analysed**	: 2

This final report for the ALSE work order reference ES0613652 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

Insufficient sample volume BHF/8.5M for ZHE BTEX analysis.

EP075(SIM): Sample required dilution due to the presence of high level contaminants. LOR values have been adjusted accordingly.

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

Accredited for compliance with ISO/IED 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	Department
* Not Entered *	Organics - NATA 825 (10911 - Sydney)
EDWANDY FADJAR	Organics - NATA 825 (10911 - Sydney)
Pabi Subba	Organics - NATA 825 (10911 - Sydney)
Peter Dickenson	Inorganics - NATA 825 (10911 - Sydney)
PHALAK INTHAKESONE	Organics - NATA 825 (10911 - Sydney)

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***

Laboratory Sample ID	*Client Sample ID*	*Analyte name*	*LOR*	*Original Result*	*Duplicate Result*	*RPD*
EP080/071: Total Petroleum Hydrocarbons						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 299867)				**µg/L**	**µg/L**	**%**
ES0613706-005	Anonymous	C6 - C9 Fraction	20 µg/L	<20	<20	0.0
EP080: BTEX						
EP080: BTEX - (QC Lot: 299867)				**µg/L**	**µg/L**	**%**
ES0613706-005	Anonymous	Benzene	1 µg/L	<1	<1	0.0
		Toluene	2 µg/L	<2	<2	0.0
		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

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*	
			Spike concentration	*Spike Recovery*	*Dynamic Recovery Limits*	
Analyte name	*LOR*			*LCS*	*Low*	*High*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 301224)		µg/L	µg/L	%	%	%
Acenaphthene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	84.8	62.2	113
Acenaphthylene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	89.2	63.6	114
Anthracene	0.2 µg/L	----	2	86.9	64.3	116
	0.5 µg/L	<0.5	----	----	----	----
Benz(a)anthracene	0.2 µg/L	----	2	87.4	64.1	117
	0.5 µg/L	<0.5	----	----	----	----
Benzo(a)pyrene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	87.2	63.3	117
Benzo(b)fluoranthene	0.2 µg/L	----	2	84.2	61.7	119
	0.5 µg/L	<0.5	----	----	----	----
Benzo(g,h,i)perylene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	83.5	59.1	118
Benzo(k)fluoranthene	0.2 µg/L	----	2	89.5	61.7	117
	0.5 µg/L	<0.5	----	----	----	----
Chrysene	0.2 µg/L	----	2	88.4	62.5	116
	0.5 µg/L	<0.5	----	----	----	----
Dibenz(a,h)anthracene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	81.2	61.2	117
Fluoranthene	0.2 µg/L	----	2	88.3	63.6	118
	0.5 µg/L	<0.5	----	----	----	----
Fluorene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	88.2	63.9	115
Indeno(1,2,3,cd)pyrene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	82.8	59.9	118

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Matrix Type: WATER

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)B: Polynuclear Aromatic Hydrocarbons - continued						
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - (QC Lot: 301224) - continued		µg/L	µg/L	%	%	%
Naphthalene	0.2 µg/L	----	2	80.1	62.4	114
	0.5 µg/L	<0.5	----	----	----	----
Phenanthrene	0.5 µg/L	<0.5	----	----	----	----
	0.2 µg/L	----	2	87.4	62.6	116
Pyrene	0.2 µg/L	----	2	101	63.1	118
	0.5 µg/L	<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons						
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 299867)		µg/L	µg/L	%	%	%
C6 - C9 Fraction	20 µg/L	----	260	115	75	127
	20 µg/L	<20	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 301223)		µg/L	µg/L	%	%	%
C10 - C14 Fraction	50 µg/L	----	200	81.0	58.9	131
	50 µg/L	<50	----	----	----	----
C15 - C28 Fraction	100 µg/L	<100	----	----	----	----
	100 µg/L	----	200	96.0	73.9	138
C29 - C36 Fraction	50 µg/L	<50	----	----	----	----
	50 µg/L	----	200	81.0	62.7	131
EP080: BTEX						
EP080: BTEX - (QC Lot: 299867)		µg/L	µg/L	%	%	%
Benzene	1 µg/L	----	10	97.1	76.2	124
	1 µg/L	<1	----	----	----	----
Ethylbenzene	2 µg/L	----	10	97.3	76.1	122
	2 µg/L	<2	----	----	----	----
meta- & para-Xylene	2 µg/L	----	10	89.2	75.7	123
	2 µg/L	<2	----	----	----	----
ortho-Xylene	2 µg/L	<2	----	----	----	----
	2 µg/L	----	10	97.3	77.9	121
Toluene	2 µg/L	<2	----	----	----	----
	2 µg/L	----	10	97.5	74.4	124

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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	
					Sample Result	Spike Recovery	Static Limits	
Analyte name	*Laboratory Sample ID*	*Client Sample ID*	*LOR*	*Spike Concentration*		*MS*	*Low*	*High*
EP080/071: Total Petroleum Hydrocarbons								
EP080/071: Total Petroleum Hydrocarbons - (QC Lot: 299867)				µg/L	µg/L	%	%	%
C6 - C9 Fraction	ES0613706-005	Anonymous	20 µg/L	250	<20	108	70	130
EP080: BTEX								
EP080: BTEX - (QC Lot: 299867)				µg/L	µg/L	%	%	%
Benzene	ES0613706-005	Anonymous	1 µg/L	25	<1	92.0	70	130
Toluene			2 µg/L	25	<2	78.1	70	130
Ethylbenzene			2 µg/L	25	<2	91.0	70	130
meta- & para-Xylene			2 µg/L	25	<2	81.9	70	130
ortho-Xylene			2 µg/L	25	<2	93.3	70	130

ALS Environmental

INTERPRETIVE QUALITY CONTROL REPORT

Client	:	**CH2M HILL PTY LTD**	**Laboratory**	:	ALS Environmental Sydney	**Page**	: **1 of 5**
Contact	:	MR ADAM SULLIVAN	**Contact**	:	Greg Vogel		
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515	**Address**	:	Smithfield NSW Australia 2164	**Work order**	: **ES0613652**
						Amendment No.	:
Project	:	347496 Macdonaldtown Gasworks	**Quote number**	:	EN/006/06	**Date received**	: 1 Nov 2006
Order number	:	Rebatch Of ES0613192				**Date issued**	: 8 Nov 2006
C-O-C number	:	- Not provided -					
Site	:	- Not provided -					
E-mail	:	adam.sullivan@ch2m.com.au	**E-mail**	:	Greg.Vogel@alsenviro.com	**No. of samples**	
Telephone	:	02 9950 0200	**Telephone**	:	+61 (02) 8784 8555	**Received**	: 2
Facsimile	:	02 9950 0600	**Facsimile**	:	+61 (02) 8784 8500	**Analysed**	: 2

This Interpretive Quality Control Report was issued on 8 Nov 2006 for the ALS work order reference ES0613652 and supersedes any previous reports with this reference.
This report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Type Frequency Compliance
- Summary of all Quality Control Outliers
- Brief Method Summaries

ALS Environmental

Interpretive Quality Control Report - Analysis Holding Time

The following report summarises extraction / preparation and analysis times and compares with recommended holding times. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. Information is also provided re the sample container (preservative) from which the sample aliquot was taken. Elapsed time to analysis represents time from sampling where no extraction / digestion is involved or time from extraction / digestion where this is present. For composite samples, sampling date/time is taken as that of the oldest sample contributing to that composite. Sample date/time for laboratory produced leaches are taken from the completion date/time of the leaching process. Outliers for holding time are based on USEPA SW846, APHA, AS and NEPM (1999). Failed outliers, refer to the 'Summary of Outliers'.

Matrix Type: SOIL ***Analysis Holding Time and Preservation***

Method / **Container /** Client Sample ID(s)	**Date Sampled**	**Extraction / Preparation**			**Analysis**		
		Date extracted	Due for extraction	Pass?	Date analysed	Due for analysis	Pass?
EP071: TPH - Semivolatile Fraction							
Amber Glass Bottle - Unpreserved							
BHF/8.5M	**6 Nov 2006**	**6 Nov 2006**	13 Nov 2006	Pass	**6 Nov 2006**	16 Dec 2006	Pass
EP075(SIM): PAH/Phenols (GC/MS - SIM)							
Amber Glass Bottle - Unpreserved							
BHF/8.5M	**6 Nov 2006**	**6 Nov 2006**	13 Nov 2006	Pass	**6 Nov 2006**	16 Dec 2006	Pass
EP080: TPH Volatiles/BTEX							
Amber VOC Vial - HCl or NaHSO4							
BHD/8.4M	**2 Nov 2006**	**----**	----	----	**3 Nov 2006**	16 Nov 2006	Pass
Amber VOC Vial - HCl or NaHSO4							
BHF/8.5M	**8 Nov 2006**	**----**	----	----	**8 Nov 2006**	22 Nov 2006	Pass

ALS Environmental

Interpretive Quality Control Report - Frequency of Quality Control Samples

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which this work order was processed. Actual rate should be greater than or equal to the expected rate.

Matrix Type: WATER ***Frequency of Quality Control Samples***

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
EP080: TPH Volatiles/BTEX	2	10	**20.0**	**10.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Laboratory Control Samples (LCS)					
EP071: TPH - Semivolatile Fraction	1	2	**50.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (GC/MS - SIM)	1	1	**100.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	2	10	**20.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Method Blanks (MB)					
EP071: TPH - Semivolatile Fraction	1	2	**50.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP075(SIM): PAH/Phenols (GC/MS - SIM)	1	1	**100.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
EP080: TPH Volatiles/BTEX	2	10	**20.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement
Matrix Spikes (MS)					
EP080: TPH Volatiles/BTEX	2	10	**20.0**	**5.0**	NEPM 1999 Schedule B(3) and ALSE QCS3 requirement

Interpretive Quality Control Report - Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged on the 'Quality Control Report'. Surrogate recovery limits are static and based on USEPA SW846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). 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. - Anonymous - Client Sample IDs refer to samples which are not specifically part of this work order but formed part of the QC process lot.

Non-surrogates

- **For all matrices, no RPD recovery outliers occur for the duplicate analysis.**
- **For all matrices, no method blank result outliers occur.**
- **For all matrices, no laboratory spike recoveries breaches occur.**
- **For all matrices, no matrix spike recoveries breaches occur.**

Surrogates

- **For all matrices, no surrogate recovery outliers occur.**

Outliers : Analysis Holding Time

The following report highlights outliers within this 'Interpretive Quality Control Report - Analysis Holding Time'.

- **No holding time outliers occur.**

Outliers : Frequency of Quality Control Samples

The following report highlights outliers within this 'Interpretive Quality Control Report - Frequency of Quality Control Samples'.

- **No frequency outliers occur.**

Method Reference Summary

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.

Matrix Type: ASTM LEACHATE ***Method Reference Summary***

Preparation Methods

ORG14 : Separatory Funnel Extraction of Liquids - USEPA SW 846 - 3510B 500 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2). ALS default excludes sediment which may be resident in the container.

Analytical Methods

EN60-DI : Deionized Water Leach - AS4439.3 Preparation of Leachates. Using deionised water as the leaching fluid

EP071 : TPH - Semivolatile Fraction - USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

EP075(SIM) : PAH/Phenols (GC/MS - SIM) - USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

Matrix Type: TCLP LEACHATE ***Method Reference Summary***

Analytical Methods

EP080 : TPH Volatiles/BTEX - USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (1999) Schedule B(3) (Appdx. 2)

AUSTRALIAN LABORATORY SERVICES PTY LTD ABN 84 009 936 029
277-289 Woodpark Road Smithfield NSW 2164 Australia
Telephone: +61 (02) 8784 8555 Facsimile: +61 (02) 8784 8500 http://www.alsenviro.com/

ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Comprehensive report

Client Details

Client	:	**CH2M HILL PTY LTD**
Contact	:	**MR ADAM SULLIVAN**
Address	:	PO BOX 5392 CHATSWOOD NSW AUSTRALIA 1515
Project	:	**347496 MACDONALDTOWN GASWORK**
Order number	:	**REBATCH OF ES0613192**
C-O-C Number	:	**- Not provided -**
Site	:	**- Not provided -**
Sampler	:	**- Not provided -**
E-mail	:	adam.sullivan@ch2m.com.au
Telephone	:	02 9950 0200
Facsimile	:	02 9950 0600

Laboratory Details

Laboratory	:	**ALS Environmental Sydney**
Manager	:	**Greg Vogel**
Address	:	277-289 Woodpark Road Smithfield NSW Australia 2164
Quote number	:	----
Work order	:	**ES0613652**
E-mail	:	Greg.Vogel@alsenviro.com
Telephone	:	+61 (02) 8784 8555
Facsimile	:	+61 (02) 8784 8500

Dates

Date Samples Received	:	1 Nov 2006	**SRA Issue Date**	:	1 Nov 2006
Scheduled Reporting Date	:	**8 Nov 2006**	**Client Requested Date**	:	8 Nov 2006

Delivery Details

Mode of Delivery	:	Carrier.	**Temperature**	:	AMBIENT
No. of coolers/boxes	:	REBATCH	**No. of samples** - **Received**		2
Security Seal	:	Intact.	- **Analysed**		2

Comments

- **Samples received in appropriately pretreated and preserved containers.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- **This is a rebatch of ES0613192.**
- **TCLP analysis to be conducted in work order ES0613650.**

- Analytical work for this work order will be conducted at ALSE Sydney.
- 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 Nanthini Coilparampil
- 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'.

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.

Client	: CH2M HILL PTY LTD	**Work Order**	: ES0613652
Project	: 347496 MACDONALDTOWN GASWORKS	**ALS Quote Reference**	: ----

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

Some items described below may be part of a laboratory process neccessary 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**									
		EN60-DI Suite - WATER Deionised Water Leach	**EN60Z-DI - WATER** DI Water Leach ZHE	**EP080 - WATER** BTEX	**W-07 - WATER** TPH/BTEX/PAH	**EN60-DI Suite - SOIL** Deionised Water Leach	**EN60Z-DI - SOIL** DI Water Leach ZHE				
ES0613652-001	**BHD/8.4M - 20 Oct 2006**		⌋	⌋			⌋				
ES0613652-002	**BHF/8.5M - 20 Oct 2006**	⌋	⌋		⌋	⌋	⌋				
	Total(s) :	**1**	**2**	**1**	**1**	**1**	**2**				

Client	: CH2M HILL PTY LTD	**Work Order**	: ES0613652
Project	: 347496 MACDONALDTOWN GASWORKS	**ALS Quote Reference**	: ----

Requested Reports

l **ALL ACCOUNTS**

-	Invoice	Email	mogibu.rahman@ch2m.com.au

l **MR ADAM SULLIVAN**

-	A4 - Certificate of Analysis - NEPM format	Email	adam.sullivan@ch2m.com.au
-	A4 - Interpretive Quality Control Report - NEPM format	Email	adam.sullivan@ch2m.com.au
-	A4 - Quality Control Report - NEPM format	Email	adam.sullivan@ch2m.com.au
-	ENMRG Export Format	Email	adam.sullivan@ch2m.com.au
-	ESDAT Export Format	Email	adam.sullivan@ch2m.com.au
-	Chain of Custody Acknowledgement	Email	adam.sullivan@ch2m.com.au
-	A4 - Sample Receipt Notification - Comprehensive format	Email	adam.sullivan@ch2m.com.au

Sample Container(s) / Preservation Non-Compliance Log

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

l **No sample container / preservation non-compliance exist.**

AgriQuality Limited
Huarangi

Wellington Laboratory
P.O. Box 31 242
Lower Hutt, NZ

Phone: 64 4 5708800
Facsimile: 64 4 5708176

15 March 2007

Certificate of Analysis

Client:	CH2M Hill Australia Pty Ltd Level 7, 9 Help Street Chatswood NSW 2067 Australia
Attention:	Adam Sullivan
Date Received:	27 Feb 2007
AgriQuality Lab. Reference:	23154
Sample Type(s):	Solid
Analysis:	**Polychlorinated dibenzo-p-dioxins (PCDDs)** **Polychlorinated dibenzofurans (PCDFs)**
Method:	Based on USEPA Method 1613B (Isotope Dilution)

Results are reported in picograms per gram (pg/g), equivalent to ppt, on an as received basis to three significant figures. The DL value is reported to three significant figures. Results have been corrected for recoveries. The sum of PCDDs and PCDFs is calculated and reported to three significant figures as a lower, medium, and upper bound.

The total toxic equivalence (TEQ) was calculated for each sample using both WHO toxic equivalency factors (WHO-TEFs; Van den Berg et al., 2005) and international toxic equivalency factors (I-TEFs; Kutz et al., 1990). The total WHO-TEQ and I-TEQ level is reported as a lower, medium, and upper bound to three significant figures.

Unless requested, samples will be disposed of three months from the date of this report.

Comments:

Phil Bridgen
Team Leader - Dioxins
AgriQuality Limited

THIS REPORT MUST ONLY BE REPRODUCED IN ITS ENTIRETY

Results: USEPA Method 1613B

Laboratory Reference: **23154-1**

Sample Identification: **SOLID TAR/SYDNEY**

Date Received: 27 Feb 2007 Date Analysed U2: 13 Mar 2007

Date Extracted: 07 Mar 2007 Date Analysed SP2331: Not applicable

Analyte	† Conc. (pg/g)	DL	EMPC	^{13}C%RE	LCL-UCL	Qualifiers
2378 TCDF	ND	0.439		126	24 - 169	
Total TCDF	ND	0.439				
2378 TCDD	ND	0.996		75	25 - 164	
Total TCDD	ND	0.996				
37Cl4 TCDD				99	35 - 197	
12378 PeCDF	ND	0.296		63	24 - 185	
23478 PeCDF	ND	0.279		53	21 - 178	
Total PeCDF	ND	0.296				
12378 PeCDD	ND	0.522		78	25 - 181	
Total PeCDD	1.32					
123478 HxCDF	ND	0.388		91	26 - 152	
123678 HxCDF	ND	0.447		88	26 - 123	
234678 HxCDF	ND	0.355		103	28 - 136	
123789 HxCDF	ND	0.583		108	29 - 147	
Total HxCDF	ND	0.583				
123478 HxCDD	ND	0.871		87	32 - 141	
123678 HxCDD	ND	0.997		82	28 - 130	
123789 HxCDD	ND	0.891				
Total HxCDD	2.14					
1234678 HpCDF	ND	0.686		89	28 - 143	
1234789 HpCDF	ND	0.856		138	26 - 138	
Total HpCDF	ND	0.856				
1234678 HpCDD	1.72			94	23 - 140	
Total HpCDD	3.42					
OCDF	ND	4.87				
OCDD	78.9			47	17 - 157	

	Lower Bound	Medium Bound	Upper Bound	Units
Sum of congeners:	85.8	89.8	93.8	pg/g
Total I-TEQ:	0.0961	1.06	2.02	pg/g
Total WHO-TEQ:	0.0409	1.10	2.17	pg/g

† = Results are reported on an as received basis

ND = Not Detected

DL: Sample Specific Estimated Detection Limit

EMPC: Estimated Maximum Possible Concentration

^{13}C %RE: Labelled Compound Recovery

LCL-UCL: Lower Control Limit - Upper Control Limit

$^{37}Cl_4$TCDD: Clean-up recovery spike

Lab Analyst: TG Data Analyst: PB Authorised: Phil Bridgen

THIS REPORT MUST ONLY BE REPRODUCED IN ITS ENTIRETY

Results: USEPA Method 1613B

Laboratory Reference: **23154 BLANK**

Sample Identification: **Laboratory Blank**

Date Received: Not applicable

Date Analysed U2: 13 Mar 2007

Date Extracted: 07 Mar 2007

Date Analysed SP2331: Not applicable

Analyte	Conc.† (pg/g)	DL	EMPC	^{13}C%RE	LCL-UCL	Qualifiers
2378 TCDF	ND	0.209		67	24 - 169	
Total TCDF	ND	0.209				
2378 TCDD	ND	0.388		74	25 - 164	
Total TCDD	ND	0.388				
37Cl4 TCDD				80	35 - 197	
12378 PeCDF	ND	0.226		82	24 - 185	
23478 PeCDF	ND	0.205		90	21 - 178	
Total PeCDF	ND	0.226				
12378 PeCDD	ND	0.422		74	25 - 181	
Total PeCDD	ND	0.422				
123478 HxCDF	ND	0.474		89	26 - 152	
123678 HxCDF	ND	0.455		93	26 - 123	
234678 HxCDF	ND	0.445		101	28 - 136	
123789 HxCDF	ND	0.759		105	29 - 147	
Total HxCDF	ND	0.759				
123478 HxCDD	ND	0.492		96	32 - 141	
123678 HxCDD	ND	0.525		95	28 - 130	
123789 HxCDD	ND	0.504				
Total HxCDD	ND	0.525				
1234678 HpCDF	ND	0.634		90	28 - 143	
1234789 HpCDF	ND	0.951		106	26 - 138	
Total HpCDF	ND	0.951				
1234678 HpCDD	ND	0.758		89	23 - 140	
Total HpCDD	ND	0.758				
OCDF	ND	1.09				
OCDD	ND	1.32		68	17 - 157	

	Lower Bound	Medium Bound	Upper Bound	Units
Sum of congeners:	0	3.32	6.65	pg/g
Total I-TEQ:	0	0.562	1.12	pg/g
Total WHO-TEQ:	0	0.644	1.29	pg/g

† = Results are calculated using the average weight of samples in this batch

ND = Not Detected

DL: Sample Specific Estimated Detection Limit

EMPC: Estimated Maximum Possible Concentration

^{13}C %RE: Labelled Compound Recovery

LCL-UCL: Lower Control Limit - Upper Control Limit

$^{37}Cl_4$TCDD: Clean-up recovery spike

Lab Analyst: TG Data Analyst: PB Authorised: Phil Bridgen

THIS REPORT MUST ONLY BE REPRODUCED IN ITS ENTIRETY