Validation Report - RZNRA

LANDCOM

Zouch Rd, Edmondson Park, NSW

24 September 2013
JBS 41945 – 53480 (Rev 0)

Validation Report

Residential Zone North Rail Alignment

Landcom

Landcom Project 12619

Zouch Road, Edmondson Park, NSW

24 September 2013
JBS41945 - 53480
JBS Environmental Pty Ltd

Table of Contents

List of Abbreviations v
1 Introduction 1
1.1 Introduction 1
1.2 Goals and Objectives 1
1.3 Scope of Works 2
2 Background Information 3
2.1 Site Identification 3
2.2 Proposed Development and Site Use 3
2.3 Site Condition Prior to Works 3
2.4 Surrounding Landuse 4
2.5 Topography 5
2.6 Geology 5
2.7 Acid Sulfate Soils 5
2.8 Hydrology 5
2.9 Hydrogeology 6
2.10 Meteorology 7
3 Summary Site History 8
4 Site Contamination Status 10
4.1 Summary of Known Contamination Impact 10
4.2 Remediation Strategy 13
5 Data Quality Objectives 15
5.1 State the Problem 15
5.2 Identify the Decision 15
5.3 Identify Inputs to the Decision 16
5.4 Define the Study Boundaries 16
5.5 Develop a Decision Rule 16
5.6 Specify Limits of Decision Error 18
5.7 Optimise the Design for Obtaining Data – Soil Validation/Characterisation Data 20
5.8 Optimise the Design for Obtaining Data – Groundwater Data 22
6 Assessment Methodology 23
6.1 Soil Sampling Methodology 23
6.2 Groundwater Sampling 24
6.3 Laboratory Analyses 25

© 2013 JBS Environmental Pty Ltd

7 Soil Assessment Criteria 26
7.1 Soil Assessment Criteria 26
7.2 Groundwater Assessment Criteria 28
7.3 Application of Groundwater Criteria 29
8 Summary of Remediation / Validation Works 30
8.1 Soil Remediation Works – AOC1 30
8.2 Stockpile 6 Removal and Footprint Validation 33
8.3 Soil Remediation Works – AOC2 UXO and SAA Clearance Activities 33
8.4 Soil Remediation Works – AOC4 Lead Particulate Material 34
8.5 Soil Remediation Works – Unexpected Find 04 34
8.6 Off-site Disposal of Materials 35
8.7 Groundwater 35
9 Laboratory Validation Results 36
9.1 QA/QC Assessment 36
9.2 Soil Validation Works – AOC1 36
9.3 Soil Validation Works – AOC4 Lead Particulate Material 36
9.4 Soil Remediation Works – Unexpected Find UF4 37
10 Site Characterisation 38
11 Conclusions 41
11.1 Conclusions 41
12 Limitations 42

Figures

Figure 1 – Site Location and Current Cadastral Boundaries
Figure 2 – Proposed Site Layout and Development Areas
Figure 3 – Pre-remediation Site Layout and Areas of Environmental Concern
Figure 4 – Areas of Environmental Concern (Golder 2011)
Figure 5 – Remedial Works Locations Overview
Figure 6 – Lead Particulate Validation Sample Location Plan

Tables

Table A – Sample Register
Table B – Summary of Laboratory Analysis Results – Clean Stockpile Validation
Table C – Summary of Laboratory Analysis Results – Additional Stockpile Validation
Table D – Summary of Laboratory Analysis Results – Former Stockpile Footprint Validation
Table E – Summary of Laboratory Analysis Results – Lead Particulate Excavation Validation
Table F – Summary of Laboratory Analysis Results – Unexpected Find 04 Validation

© 2013 JBS Environmental Pty Ltd

Appendices

Appendix A – Previous Site Investigation Location Plans
Appendix B – Site Photographs
Appendix C - Clean Stockpile Characterisation Assessment Report
Appendix D – EMS Weapons Pit Clearance and Backfill Documentation
Appendix E – Unexpected Find/Additional Stockpiled Material Assessment Report
Appendix F – Hygienist (Pacific Environmental) Clearance Documents
Appendix G - Landfill Disposal Dockets
Appendix H – G-tek Release Area Documentation
Appendix I – Groundwater Monitoring Event Documentation
Appendix J – Field Documentation
Appendix K - Laboratory Reports and Chain of Custody Documentation
Appendix L – Summary of Statistical Calculation Sheets

© 2013 JBS Environmental Pty Ltd

List of Abbreviations

A list of the common abbreviations used throughout this report is provided below.

ACM	Asbestos Containing Material
AOC	Area of Concern
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
B(a)P	Benzo(a)pyrene
CA	Conservation Agreement
Contact	A metallic object of military firearm origin, greater than 25 mm in length
CZSRA	Conservation Zone (Regional Park) South of Rail Alignment
DPI	NSW Department of Planning and Infrastructure
DQI	Data Quality Indicators
DQO	Data Quality Objectives
DP	Deposited Plan
DSI	Detailed Site Investigation
DWE	NSW Department of Water and Energy (now NOW)
EMP	Environmental Management Plan
EPA	New South Wales Environment Protection Authority
ha	Hectare
HIL	Health Based Investigation Level
LOR	Limit of Reporting
NEPM	National Environmental Protection (Assessment of Site Contamination) Measure
NOW	NSW Office of Water
OCP	Organochlorine Pesticide
OEH	Office of Environment and Heritage (including EPA)
PAH	Polycyclic Aromatic Hydrocarbons
Pb	Lead
PID	Photoionisation detector
PIL	Phytotoxicity Based Investigation Level
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RAP	Remediation Action Plan
RC	Rail Corridor
RPD	Relative Percentage Difference
RRZW	Rural Residential Zone West
RZNRA	Residential Zone North Rail Alignment
SA	Site Auditor
SAA	Small Arms Ammunition
SAQP	Sampling Analysis Quality Plan
SAR	Site Audit Report
SAS	Site Audit Statement
SEPP	State Environmental Planning Policy
SMP	Site Management Plan
SP	Stockpile
SWRL	South West Rail Link
TCA	Transport Construction Authority
TCLP	Toxicity Characteristic Leachate Procedure
TPH	Total Petroleum Hydrocarbons (C_6-C_9 and C_{10}-C_{36})
UCL	Upper Confidence Limit
UXO	Unexploded Ordinance
VOCs	Volatile Organic Compounds

© 2013 JBS Environmental Pty Ltd

1 Introduction

1.1 Introduction

JBS Environmental Pty Ltd was engaged by Landcom to act as remediation consultant during redevelopment of the land known as Landcom Project 12619 located at Zouch Road, Edmondson Park, NSW. The entire parcel is formally identified as part Lot 7 and Lot 8 DP1127652 as shown in **Figure 1**, noting that Lots 1 and 2 DP1127652 comprises a railway easement that has been excluded from the contract. For the purposes of the remediation contract, the project site has been divided into a number of development areas as shown in **Figure 2**.

This report documents the validation of the northern portions of Lot 7 and Lot 8 DP1127652, known as the Residential Zone North of the Railway Alignment (RZNRA). This area, herein known as 'the RZNRA site', has an area of approximately 43 hectares (ha).

As documented in a remedial action plan (RAP) prepared by Golder (2005b[1] and updated as 2011[2]) for the Project 12619 site, previous site assessment activities (Golder 2005a[3] and PB 2004[4]) identified that remediation / management of contamination impacts associated with historical use was necessary for the Site to be considered suitable for the proposed future residential, commercial and public open space land uses. As the subdivision plans are not yet the subject of final planning approval, the entire RZNRA footprint will be remediated and validated to a standard suitable for residential with accessible soils as the most conservative proposed land use.

The RAP has previously been reviewed by the appointed project site auditor, Graeme Nyland of Environ Corp (Environ, 2006[5] and 2011[6]). Prior to the commencement of remediation works at the Site, JBS completed a validation Sampling, Analysis and Quality Plan (SAQP) (JBS 2012a[7]) documenting activities required to be completed to demonstrate that the site has been made suitable for the proposed land use. This was also reviewed by the auditor prior to the commencement of works.

This document documents the results of additional assessment and validation activities undertaken to satisfy the requirements of the RAP (Golder 2011). This validation assessment has been undertaken in accordance with guidelines made or approved by the NSW Environmental Protection Authority (EPA).

1.2 Goals and Objectives

The goal of the remediation activities is to enable validation of the RZNRA Site as not posing an unacceptable risk to the environment and so suitable for the proposed mixed residential, commercial and open space land use.

The objectives of the validation were to:

- record the activities undertaken during remediation of the RZNRA Site;
- obtain sufficient data to demonstrate the suitability of the RZNRA Site for the proposed residential use with accessible soils (as the most sensitive of the proposed land uses); and

[1] *Remediation Action Plan, Landcom Project No: 12619, Zouch Road, Edmondson Park, NSW*. Golder Associates Pty Ltd (Golder 2005b)
[2] *Landcom Project 12619 – Zouch Road, Edmondson Park, NSW, Remediation Action Plan*. Golder Associates Pty Ltd (Golder 2011)
[3] *Detailed Contamination Site Investigation Report. Landcom Project No. 12619, Zouch Road, Edmondson Park, NSW*. Golder Associates Pty Ltd (Golder 2005a)
[4] *Sampling, Analysis and Quality Plan for Detailed Site Assessment*. Parsons Brinkerhoff Australia Pty Ltd (PB 2004)
[5] Interim *Advice #4 – Zouch Road, Edmondson Park, NSW, Remediation Action Plan*. Environ Australia Pty Ltd (Environ 2006)
[6] Interim Advice #5 – Zouch Road, Edmondson Park, NSW, Revised Remediation Action Plan. Environ Australia Pty Ltd, draft issue, 24 February 2011 (Environ 2011)
[7] *Validation Sampling, Analysis and Quality Plan, Landcom Project 12619, Zouch Road, Edmondson Park, NSW*. JBS Environmental Pty Ltd, February 2012 (JBS 2012a)

© 2013 JBS Environmental Pty Ltd

- document them in a validation report.

1.3 Scope of Works

The following scope of works was undertaken:

- Inspection, validation sampling and subsequent laboratory analysis of representative samples of stockpiled materials proposed for beneficial reuse;
- Inspection, validation sampling and subsequent laboratory analysis of representative surface soil samples following removal of waste material stockpiles;
- Inspection, validation sampling and subsequent laboratory analysis of samples following excavation of the lead impacted soil material;
- Inspection, validation sampling and subsequent analysis of previously unidentified areas/materials of potential concern to provide recommendations for management of materials;
- Observe and complete independent quality assurance checks on unexploded ordnance (UXO) clearance works completed by the UXO consultant;
- Observe and complete independent quality assurance checks of hygienist clearance works during asbestos removal activities, including collection of representative surface soil samples for analysis to validate asbestos removal areas;
- Inspection, characterisation sampling and subsequent laboratory analysis of representative samples of fill material proposed to be imported onto the RZNRA site from within the 12619 project site to backfill excavations generated during site works including weapons pit clearances, tree removal, etc;
- Review material validation documentation where soil is to be imported onto the 12619 project site, including the RZNRA site to backfill excavations;
- Review and summarise the Principal Contractor's (TRNs) works completion report documenting the UXO and asbestos clearance activities completed during site activities; and
- Preparation of a report detailing the remediation and validation works in general accordance with relevant NSW EPA Guidelines and relevant endorsed documents.

© 2013 JBS Environmental Pty Ltd

2 Background Information

2.1 Site Identification

The Site details are summarised in **Table 2.1** and shown in **Figures 1** and **3** and described in detail in the following sections.

Table 2.1 Summary Site Details

Lot/DP	Part Lot 7 and Lot 8 in DP1127652 (formerly Lot 1 in DP807460 and Lot 2 in DP807461)
RZNRA Site Area	Approximately 43 ha (43 000m^3)
Geographical Coordinates (MGA 56):	N: 301546 E: 6239574 (approx centre of RZNRA Site)
Local Government Authority:	Liverpool City Council
Current Zoning:	R1 - General Residential R3 – Medium Density Residential RE1 – Public Recreation SP2 – Infrastructure (public road) B2 – Local Centre (SEPP Major Projects 2005[8] as shown in LCC 2008)
Previous use:	Former military training area and bushland
Current use:	Mix of vacant land and bushland
Proposed use:	Mixed residential, commercial, infrastructure, public open space and regional park.

2.2 Proposed Development and Site Use

The approved concept plan for future development of the RZNRA Site includes provision for R1 General Residential use but also including a school, public open space and mixed use development in the proposed town centre zone. The proposed staging will include development of this area in conjunction with the Town Centre area. The school site will be developed first, followed by the remaining residential areas.

The approved concept plan showing proposed division of the Site and proposed land uses is presented as **Figure 2**.

2.3 Site Condition Prior to Works

Prior to commencement of site remedial activities, site conditions can be summarised by the following points:

- The RZNRA Site is fenced along the eastern and northern boundaries with a combination of cyclone wire mesh fencing and wire fencing comprising star pickets and wire. The southern boundary, joining the rail corridor was marked with survey pegs and in some instances wire fencing comprising star pickets and wire;
- Access to the site was via a temporary access point across the railway easement from the southern portion of the Project 12619 site, in the north-western portion of the RNZRA site. From this point, an unsealed track extends adjacent to the northern boundary fence line as shown in **Figure 3**;
- Indications of the former use of the Site for military (infantry) training purposes comprised features including training pits, star pickets with barbed wire fencing, concertina wire, concrete slabs (former structures/building foundations), trenches and small arms ammunition (SAA) debris in various areas of the RZNRA site.
- Several sections of moderate vegetative cover occurred in the western, central north-east and eastern most sections of the RZNRA Site. The remainder of the site generally comprised grassed open space with scattered trees.

[8] State Environmental Planning Policy (Major Development) 2005, http://www.legislation.nsw.gov.au/maintop/view/inforce/epi+194+2005+cd+0+N

© 2013 JBS Environmental Pty Ltd

- An open trench approximately 1.5 to 2.0 m in depth and filled with waste materials was identified adjacent to the northern boundary (**Figure 3**) in the western portion of the RZNRA. Observed waste materials included scrap metal, concertina wire and building/general waste including bricks and white-goods. Former military use of this area was understood to include an armoured assault training area with the trench used as an obstacle for tanks and other vehicles.
- Immediately to the west of the open trench a stockpile of soil comprising approximately 30 m^3 (SP5) was apparent. A second stockpile (SP6) was noted to occur to the east of the trench as shown in **Figure 4**.
- Six concertina wire obstacles each approximately 20 – 30 m in length and facing north to south in orientation were located to the west of the training area noted above.
- Several concrete slabs possibly associated with historical facilities were located within the RZNRA site as identified in **Figure 4**. A site feature noted as a command post was located in the central portion of the RZNRA.
- One dam was located in the eastern portion of the site, associated with a natural drainage depression as shown in **Figure 4**.
- A former command post, comprising an excavation approximately 2 m deep with sheet metal walls was located in the central northern portion of the Site as shown in **Figure 4**. This excavation was surrounded by star pickets and barbed wire and at the time of the Golder inspection of March 2010 was filled with water.
- Four former grenade ranges (shown in **Figure 4** as REM1 to REM3) and additional areas (shown in **Figure 4** as REM4 and REM5) were previously identified at the Site and remedial works comprising UXO works were completed These areas were subsequently re-vegetated and were noted by Golder personnel in March 2010 to be characterised by tall grass, shrubs and eucalyptus trees.
- Several areas of Blackberry inundation previously characterised the Site, and were generally situated along drainage/creek lines. As such, these areas have had limited opportunity to complete assessment of ground conditions in these areas. These areas are shown in **Figure 4**.
- Typically small stockpiles were noted in the vicinity of training pits, anticipated to comprise material excavated from the pit envelope. Several stockpiles not able to be associated with nearby excavations were observed at locations as shown in **Figure 4**. In general, these mounds at the time of the inspection, were heavily vegetated with grass.

2.4 Surrounding Landuse

The RZNRA Site is located within a semi-rural and residential area of Edmondson Park and is accessed from the remainder of the 12619 Project site via a haul route in the north-west corner of the RZRNA site. The current land uses of properties adjacent to the RZNRA site are summarised below:

- North – a series of semi-rural / residential properties comprising residential dwellings and grazing areas for cattle, goats and horses in addition to a chicken farm. Jardine Drive is located beyond these properties;
- East – a series of rural properties comprising grazing land for cattle, goats and horses. Croatia Avenue is located beyond these properties; and
- South-west – works site associated with the proposed south-west railway line extension, comprising a corridor with exposed clay soils where at the time of the site works, preliminary earthworks were establishing site levels. The rail corridor was previously vacant bushland and a former military training area, consistent with the RZNRA. Beyond the rail corridor was the southern portion of the 12619.

© 2013 JBS Environmental Pty Ltd

2.5 Topography

As documented in Golder (2011), a review of the 1:25 000 Liverpool Topography Map (9030-ill-S, 1983) indicates the RZNRA Site has an elevation of between 50 m and 70 m AHD with the highest portion of the Site being located in the central north-western corner portion where an elevated ridgeline crosses the Site. Land to the north-west of the ridgeline slopes away to toward the north-west, whilst land to the east of the ridgeline slopes away toward the east and south-east. The majority of the undulating ground slopes within the Site ranged in gradient from 2° to 3° with steep slopes apparent along the drainage lines and in areas of anthropogenic disturbance.

2.6 Geology

Golder (2011) reported that the Penrith Geological Series Sheet (9030 Ed 1, 1991) shows the RZNRA Site is underlain by Bringelly Shale of the Wianamatta group. This formation typically comprises shale, carbonaceous claystone, claystone, laminate, fine to medium grained lithic sandstone, rare coal and tuff. Outcrops of weathered Bringelly Shale have previously been observed in the south-west corner of the Site. Quaternary aged alluvial deposits of medium grained sand, clay and silt occur in low lying drainage areas to the east and west of the site.

Review of the Penrith Soil Landscape Series Sheet (9030, 1989) indicates the majority of the RZNRA Site is associated with the Blacktown soil landscape. This residual landscape typically occurs on gently undulating Wianamatta Group Shales. The soils are anticipated to be shallow to moderately deep (<1.0 m), hard setting with mottled texture. Red to brown podzolic soils are expected to be present on crests grading to yellow on lower slopes and within drainage lines.

Luddenham soils may occur to a limited extent in the south-east corner of the RZNRA Site. These soils occur typically on undulating to rolling low hills on Hawkesbury Sandstone. In these landscapes the local relief may vary by as much as 20 to 80 m with slopes of 10 to 25 %. The formation is characterised by broad convex crests, moderately inclined side slopes with wide benches and localised rock outcrops. The soils typically comprise shallow dark podzolic soils on crests to moderately deep red to yellow podozolic soil profiles on lower slopes and drainage lines. The soils are characterised by high soil erosion hazard, moderately reactive soils and localised impermeable highly plastic subsoils.

South Creek Soils may occur in isolated areas of the Site adjacent to Cabramatta Creek, located beyond the north-western corner of the RZNRA Site on adjoining land. South Creek soils are typically characterised by flat to gently sloping alluvial plains with occasional terraces. This is a fluvial landscape and includes often very deep layered sediments. Where soil formation processes have occurred, developed soils include sandy to sandy clay loams, clay loams and brown clays. These soils are typically of low fertility, may be of moderate reactivity and are subject to waterlogging.

2.7 Acid Sulfate Soils

Review of the Acid Sulfate Soil Risk Map for Liverpool[9] indicates that the RZNRA Site is located within an area of 'no known occurrence of Acid Sulfate Soils'. Acid sulfate soils are not known or expected to occur in areas having this classification and as such, management of development activities in these areas is not required to address the potential for impact on acid sulfate soils.

2.8 Hydrology

Surface water features within the RZNRA Site as documented in Golder (2011) and shown in **Figures 3** and **4** comprise:

[9] *Acid Sulfate Soil Risk Map – Liverpool,* Edition 2, 1995 1:25 000 Ref: 90 30S2. NSW DLWC (1995)

© 2013 JBS Environmental Pty Ltd

- An unnamed creek transecting the south-east portion of the Site flowing in a north-easterly direction. A minor drainage swale extends in a south-easterly direction across the central east section of the Site upon which Dam 1 is located. During the site works, both the creek and Dam 1 were observed to contain flowing water.
- A minor drainage swale is located in the north-west corner of the Site, flowing in a westerly direction to join Cabramatta Creek beyond the Site boundary, which flows away from the Site in a north-easterly direction.
- Minor depressions and drainage swales operate in both the eastern and western parts of the Site directing surface water run-off toward the Site creeklines and dam, eventually flowing off-site.

Prior to the commencement of remediation works, the Site was generally surfaced with grass cover in cleared areas and mulch or understorey vegetation in areas of more dense vegetation. Minor portions of the Site, including those in the vicinity of the perimeter access track, training pits, etc had previously been the subject of vegetation clearance and associated surface soil compaction.

Upon completion of the remediation works, all trees had been removed from the Site apart from those located within the proposed local open space in the central northern portion of the RZNRA Site and along the riparian zone at the south-east of the Site. The grass cover had also been clipped short to facilitate asbestos and UXO clearance works. In areas where tree cover previously prevented the growth of a ground cover and/or areas subject to backfilling following weapons pits, UXO, stockpiled material removal, etc the groundwater surface comprised silty clay soil.

Based on the Site characteristics as noted above, it is anticipated that in the first instance water falling on the Site will infiltrate the soil surface at a rate reflective of the clayey topsoil permeability. During periods of heavy or extended rainfall it is anticipated that surface soils will become waterlogged and excess water will subsequently drain toward the dams and drainage lines following ground surface gradients.

Regional surface water movement occurs toward Bunbury Curran Creek located approximately 2.3 km to the south-east of the Site. This Creek intersects with the Georges River approximately 5 km to the east of the Site.

2.9 Hydrogeology

A pre-remediation groundwater monitoring event was completed across the 16219 Project site using monitoring wells installed during Golder (2005a) site investigation works. Groundwater monitoring in February 2012 reported standing water levels of between 5.6 m and 7.28 m below ground level. This corresponds to standing water elevations of between 46.7 m AHD in the north-west section of the Site and 62 m AHD in the southern portion of the Site. Based on the reported standing water level elevations, groundwater at the Site is generally moving in a northerly direction.

Regional groundwater is expected to be present in cracks and fissures within the underlying Ashfield Shale and Hawkesbury Sandstone bedrock formations at greater depths than the Bringelly Shale. Regional groundwater is anticipated to flow in an easterly direction toward the Georges River, although Cabramatta Creek may locally influence groundwater conditions beneath the western portion of the Site.

© 2013 JBS Environmental Pty Ltd

2.10 Meteorology

A review of average climatic data for the nearest Bureau of Meteorology monitoring location (Badgerys Creek AWS[10]) indicates that the RZNRA Site is located within the following metrological setting:

- Average minimum temperatures vary from 4.2 °C in July to 17.1°C in February;
- Average maximum temperatures vary from 17.2°C in June to 29.9°C in January;
- The average annual rainfall is approximately 654 mm with rainfall greater than 1 mm occurring on an average of 67 days per year; and
- Monthly rainfall varies from 25.5 mm in July to 101.6 mm in February.

[10] http://www.bom.gov.au/climate/averages/tables/cw_067108.shtml Commonwealth of Australia, 2010 Bureau of Meteorology, Product IDCJCM0028 prepared at 12 January 2012 and accessed by JBS on 23 January 2012.

© 2013 JBS Environmental Pty Ltd

3 Summary Site History

An assessment of site history for the 12619 project Site, of which the RZNRA site comprises the northern portion, has been presented in Golder (2011) and is summarised in **Table 3.1** below.

Table 3.1 Summary of Historical Site Use Information

Period	Activity	Source
1819	Part of land parcel granted to Mr Henry Kitchen	Land Title Records
1821	Land transferred to Mr Charles Throbs.	Land Title Records
1863	Land leased to Mr Matthew Sewell.	Land Title Records
late 1800s	Land sold to Mrs Annie Sheppard	Land Title Records
1939	Site commenced use as a Military base, primarily comprising an infantry training camp.	Milsearch (2005) Stage 1 UXO assessment
1945	Portion of Land sold to Mr Harold Alfred Swane	Land Title Records
1953	Both portions of land purchased by Commonwealth of Australia	Land Title Records
1956	Miniature Rifle Range apparent in south-west section of the Site. A surface water drain was apparent in this area draining toward a dam/holding pond. In addition, ground disturbance was apparent in the central/eastern site portions, comprising the grenade throwing bay and impact zone.	Historical Aerial Photographs
1961	Three dams were apparent at the Site, located within the eastern, southern and western portions of the Site. There was also an area of apparent ground disturbance located to the north of the Miniature Rifle Range.	Historical Aerial Photographs
Late 1970s	The miniature rifle ranges were reorientated with surplus stop butt material distributed in the general area and used as fill within an access track at the north-west and south-east areas .of the Site	Anecdotal Site Information
1978	The former miniature range had been reconfigured to one large range (stop butt) with firing from the north in a southerly direction.	Historical Aerial Photographs
1986	Ground disturbance comprising three trenches excavated in a east-west orientation were apparent in the central part of the Site. A second area of ground disturbance was also noted in the north-west of the Site.	Historical Aerial Photographs
1990	Ownership transferred to NSW Land & Housing Corporation (Landcom)	Land Title Records

The Site is noted to be part of a larger military base, formerly comprising the infantry training area. Facilities at the 12619 project Site previously included:

- A miniature rifle range in the south-western area. In the last 1970s, this facility was re-orientated to form one larger rifle range with firing toward the south.
- Several grenade ranges located in the central and north-eastern portions of the Site.
- Obstacle courses including concertina wire and star picket features.
- Weapons pits and small training structures (anti-tank assault area, prisoner of war camp and command posts).
- Waste burial pits within the central portion of the Site.

Information identified in former UXO investigations identified that live fire exercise within the Site were unlikely to have occurred in areas beyond the rifle range due to the proximity of living quarters and camp infrastructure adjoining the training area.

© 2013 JBS Environmental Pty Ltd

Former grenade ranges, obstacle courses and weapons pits were identified as being located within the RZNRA Site as part of the larger 12619 project site.

© 2013 JBS Environmental Pty Ltd

4 Site Contamination Status

4.1 Summary of Known Contamination Impact

The Golder (2005a) Site investigation works included 435 sampling locations within the RZNRA site as part of a total of 760 soil sampling locations completed on a systematic grid across the 12619 project Site. Two groundwater monitoring wells of a total of six across the 12619 project Site were installed within the RZNRA. As part of site contamination assessment activities completed during the Golder (2005a) works, remediation of potential UXO and SAA within the former grenade range areas, REM1, REM2, REM4 and portions of REM3 and REM5 were completed within the central east portion of the RZNRA Site.

Based on the Golder 2005a assessment results, the following contamination issues were identified as warranting remediation and/or management to render the Site suitable for the proposed residential, open space and commercial land uses:

- Stockpiled excavated materials placed across the site during historical site activities;
- Lead particulate impacted fill material placed during construction of the access road in the northern portion of the RZNRA site during the 1970s;
- The potential for asbestos containing material (ACM) impacts on the ground surface and buried in waste pits in various areas of the Site;
- Timber, general waste and steel materials buried in weapons pits/trenches in addition to current concrete slabs present at the Site requiring removal prior to the commencement of residential development activities; and
- Clearance of residual UXO/SAA items across the Site.

The site contamination investigation plans and identified areas of contamination drawn from previous site assessment reports are included as **Appendix A**.

Based upon the identified impacts, remediation/management works proposed to be completed at the RZNRA Site included:

- Visual inspection and removal of all military associated objects, including concertina wire, training pits, former structures/concrete slabs, general rubbish, scrap metal and ACM fragments;
- Clearance of vegetation to facilitate a 100 % UXO search and removal of SAA apart from trees within the riparian zone and northern public open space footprints, shown as highlighted areas of proposed local open space in **Figure 3;**
- Visual inspection and removal of identified SAA within the areas of proposed local open space;
- Remediation of lead impacted material associated with the former rifle range stop butt within the RZNRA including excavation of the lead impacted material placed along the northern access road, transportation to the proposed containment cell location within the CZSA located in the southern portion of the 12619 project site and reinstatement of the access road;
- Identification of surface ACM fragments and/or ACM impacted soil within the RZNRA Site and subsequent emu-picking/excavation of materials followed by transportation to the proposed containment cell location within the CZSA located in the southern portion of the 12619 project site;

Each area of concern (AoC) requiring remediation is discussed in further detail in the following sections. The indicative location/extent of each AoC is shown on **Figure 4**.

4.1.1 AoC1 – Military Items and General Waste

General waste associated with former military use of the Site has been identified at numerous locations across the Site on the ground surface and within open and buried

© 2013 JBS Environmental Pty Ltd

trenches/pits. Previously identified locations of these items are shown in **Figure 4**. These items/features include, but are not limited to:

- concertina wire, star pickets, sheet metal, *etc* including material in the vicinity of the former infantry trenches in the north-west of the RZNRA Site (M4 and M5), a waste disposal trench at the east of the Site (M14), general rubbish stockpile (R3) in the south;
- steel star pickets and scrap metal located within training/weapons pits scattered across the Site;
- a former command post (located to the north-west of R3);
- concrete slabs associated with former buildings (M7 and B8), former latrines and a building facade (M13); and
- ACM pipes (R1) located in the eastern section of the Site (discussed as AoC5).

It was anticipated that further instances of materials, including scrap metal, star pickets, SAA/UXO, rubbish and stockpiled soil would be identified during/following vegetation clearance works.

There are a significant number of stockpiles including those shown as SP4, SP5, SP6, SP14 and SP15 in **Figures 4** and **5**. The stockpiles were generally considered to be associated with excavation works for trenches, weapons/training pits, etc. Previous investigation activities generally identified the material as suitable for off-site disposal or, possibly beneficial reuse, dependent upon final validation to backfill excavations. However, several stockpiles within the 12619 project site had been identified as unacceptable for beneficial reuse within the Site, and these included SP6 located within the north-west corner portion of the RZNRA site which was reported to contain asbestos fibre impacted soil and therefore required off-site disposal to a waste facility lawfully able to accept the waste material.

4.1.2 AoC2 and AoC3 – UXO and SAA in Site Residential Areas

Previous Site rehabilitation works has included the clearance of UXOs from limited areas of the RZNRA Site including the former grenade throwing and impact areas in the central east section of the RZNRA Site (REM1, REM2, REM4 and parts of REM 3 and REM5). Expended SAA was observed with a much broader distribution across the RZNRA Site, generally more concentrated within identified primary training areas including the training pits and military obstacle courses.

Based on a review of previous SAA observations during Golder (2005a) assessment activities, the estimated quantity of SAA in the concentrated areas may have ranged from 50 to 2500 contacts/ ha, with an average of approximately 700 contacts / ha. Beyond the concentrated areas, frequencies of SAA in the remainder of the Site were estimated to occur within the range of 5 to 500 contacts / ha, with an average of approximately 250 contacts / ha.

Several areas of the Site were infested with blackberry bushes, in particular in the riparian zone in the east portion of the RZNRA as shown in **Figure 4**. The identified footprint of the infestation is approximately 1.3 ha. Given that the plants are a noxious weed and so slashing could not be completed to provide access to the areas, no assessment had previously been completed of the potential occurrence of SAA and/or UXO. As part of remediation works, these infestations would be appropriately removed to facilitate SAA/UXO clearance works.

4.1.3 AoC4– Lead Particulate Material

Lead particulate impacted clay fill material originating from the former rifle range in the south portion of the 12619 project site was placed in the northern portion of the RZNRA Site in the 1970s during construction of the northern access road as shown in **Figures 3**, **4** and **5**. The lead particulates were expected to comprise lead shot and bullet fragments between 5 mm and 10 mm in diameter.

© 2013 JBS Environmental Pty Ltd

During the Golder (2005a) assessment works, the extent of the lead particulate impacted material was estimated based on the extent of fill material identified during site investigation sampling. Initial borehole and test pit locations (BH2 and TP3 to TP17) were completed on systematic grid spacing of approximately 30 m centres. Additional test pits TP719 to TP722 and TP731 were subsequently completed within this area and field sieving tests to evaluate the quantity of lead were then completed at locations PSD1, PSD2 and PSD3 as reported in Golder (2005a) (refer to plans included in **Attachment B**). Chemical analysis of fill material and natural silty clay samples collected from twenty one sampling locations identified total soil lead concentrations were less than the adopted site assessment criterion. However, toxicity characteristic leaching procedure (TCLP) tests completed on samples of soil containing lead particulate identified the potential for the lead particulates to leach lead into the soil, or the occurrence of historical leachate impacts on the soil. On this basis there was considered to be an unacceptable risk of future soil and groundwater impacts at the Site.

Review of the investigation logs presented in Golder (2005a) indicated that the fill material generally comprised silty clay or clayey silt soil extending to depths of 0.1 m to 0.35 m below ground level (bgl). However, fill material extended to increased depths in BH2 (1.55 m), TP11 (0.7 m), TP12 (0.5 m) and PSD1 (0.7 m) in limited portions of the identified lead impact area. The placed material was found to be underlain by a combination of natural silty clay soil and shale/siltstone bedrock.

4.1.4 AoC5– Asbestos Containing Materials (ACM)

Asbestos containing materials (ACM) have been documented in a number of locations within the RZNRA site (Golder 2011), including:

- ACM pipes stockpiled in the vicinity of sampling location TP348 in the eastern portion of the Site (R1); and
- chrysotile asbestos detected in soil samples collected from stockpile SP6.

The locations of these finds are presented in **Figure 4**.

There was considered to be a high probability that additional surface ACM fragment impacts would be identified during clearance activities at the RNZRA site were to be managed via implementation of an unexpected finds protocol (UFP) as discussed further in **Section 4.1.5** below.

4.1.5 Unknown Extent

Typical of all remediation works based on point source data which have been spatially interpreted between previous sampling points, the precise extent of particular aspects of the remedial works were not defined until successful validation data had been obtained.

In particular, the following aspects of the remediation works were considered to be unknown at the 12619 Project site prior to the commencement of works:

- The potential for impacted fill material and/or natural soils to occur at the Site beyond the identified extent or underlying areas of the Site which were required to be retained, including in the vicinity of the areas of protected vegetation;
- Historically the Site was used for rural purposes prior to commencement of military activities. Existing military records reviewed during past investigation activities, including Milsearch (2002), indicated that use of live rounds had been limited to the rifle range(s) and that ammunition used during training exercises were 'blank' rounds. In addition, Golder (2011) considered it unlikely for live fire exercises to have been completed at the Site as a result of the close proximity of living quarters to the exercise areas. However, as it had not been confirmed without a doubt that there were no live rounds present on the site, contingency plans were required in relation to management of UXO during implementation of remedial activities; and

© 2013 JBS Environmental Pty Ltd

- The potential for occurrence of unrecorded buried waste materials, infrastructure associated with former Site activities. This may have resulted in localised soil or groundwater contamination in the vicinity of such items.

These issues were addressed by implementation of the UFP during the broad scale removal of vegetation to complete the UXO/SAA clearance works at the Site and during all excavation activities associated with known contamination concerns at the Site.

4.2 Remediation Strategy

Consideration of appropriate remedial strategies during development of the RAP (Golder 2011) resulted in division of the Site into various AoCs for remediation purposes as discussed following sections and shown in **Figure 5**.

4.2.1 AoC1 – Military Items and General Waste

Residual military items other than UXO and SAA, comprising concertina wire, star pickets, sheet metal, training pits, demolition waste and house hold items were identified on the ground surface, within open excavations and in several instances in buried waste pits.

The preferred management strategy for these occurrences was for the appointed Remediation Contractor to collect the materials and dispose of them to an appropriately licensed facility for recycling, processing and/or waste disposal. It is noted that all ACM identified during Site works required appropriate management/disposal by a Class A or B licensed contractor in accordance with WorkCover requirements, depending on the type and quantity of asbestos/ACM.

Stockpiled materials were designated as requiring either removal from Site to an appropriate facility, or alternatively validation as being suitable for beneficial reuse within the Site. In this instance the material was destined to be used as backfill to reinstate excavations within the Site. The asbestos contaminated material (SP6) stockpile was required to be removed from the RZNRA site, to either the proposed containment cell within the southern portion of the 12619 project site, or alternatively to an off-site facility lawfully able to accept the asbestos impacted material.

Excavations resulting from remedial works were required to be backfilled with validated material sourced from within the 12619 project Site, or alternatively pre-validated material considered suitable to be imported onto the RZNRA Site.

4.2.2 AoC2 and AoC3 – UXO and SAA in Site Residential Areas

The preferred remedial strategy for AoC2 within the RZNRA comprised:

1. Removal of former military items other than SAA (AoC1) from all areas of the RZNRA Site by visual inspection;
2. Vegetation reduction to a height of not more than 0.1 m above ground level in accordance with a Vegetation Management Plan (VMP) approved under a Section 91 permit issued by the NSW EOH;
3. Completion of a shallow search using a Minelab F3 Metal Detector (or similar) with a penetration depth of no less than 0.3 m. The search was required to be completed via:
    - Division of the AoC2 portion using 100 m by 100 m grid squares to create workable blocks 1 ha in size with each boundary identified using differential GPS;
    - Scanning of each grid square by a two man team using a line spacing of 1 metre;
    - Investigation, documentation and removal of each SAA contact identified by the detector;
    - In the event any suspected live ordinance was identified, the contact would be identified in accordance with UXO Standard Operating Procedures. The Client

© 2013 JBS Environmental Pty Ltd

and Department of Defence (DoD) would be advised of the find and instructions requested for appropriate action and/or removal of the object. It would be required that the UXO Site Manager stay with the UXO at all times prior to retrieval from the Site by the appropriate authorities;

- All free from explosive (FFE) and explosive ordinance waste (EOW) identified and collected from the AoC was required to be certified and appropriately stored near the Site until appropriately disposed of;
- At the completion of each 1 ha grid square, validation of the search was required to be carried out by a repeat search of 10 % of the grid footprint. Where UXO/SAA were identified during the 10 % validation, the entire grid footprint would be required to be re-investigated. Where no SAA/UXO was identified during the 10 % check, validation of the grid was considered successful;

4. A report detailing the methodology, results, validation and certification of the residential areas as being free of UXO/SAA was required to be prepared by the specialist contractor for review and inclusion in the validation report.

Where areas of the Site were identified to have been infested with blackberry bushes, the vegetation was required to be removed by a qualified arborist prior to implementation of the above procedure.

Following completion of this process, a Site Management Plan (SMP) will be prepared if appropriate and subsequently implemented to cover the potential for residual UXO/SAA that may not have been identified during visual inspection.

4.2.3 AoC4 and AoC5 – Lead Particulate Material and Asbestos Containing Materials (ACM)

The preferred option for remediation of the lead particulate and ACM material impacts identified at the RZNRA Site was to transport the material from within the RZNRA site to the southern portion of the 12619 project site for placement within a designated capped area as nominated in Golder (2011).

The capped area was designed as a sealed layer at the ground surface precluding access to the impacted material by future Site users and minimising surface water infiltration and recharge rates to the contained material, thereby minimising the potential for migration of the contamination.

As such, the preferred methodology for remediation of the ACM and lead particulate impacted material within the RZNRA comprised:

- Identification, excavation, transport and stockpiling of lead particulate impacted fill material within the proposed containment cell footprint in the southern portion of the 12619 project site;
- Identification, emu-picking and appropriate wrapping of ACM fragments/pipes and transport to the proposed containment cell footprint; and
- Validation of the resulting footprints and/or excavations as appropriate to document the successful remediation of the various areas of the RZNRA prior to reinstatement with suitable backfill material.

Construction, validation and documentation of the containment cell portion of the remedial works will be documented within a separate validation assessment and so details are considered not to require presentation in this document.

© 2013 JBS Environmental Pty Ltd

5 Data Quality Objectives

5.1 State the Problem

The RZNRA Site comprises a portion of the former Ingleburn Military Camp which has been rezoned for urban development. Proposed development of the RZNRA Site will result in a mixture of uses including residential, educational, public open space and commercial land uses.

Previous assessment activities at the RZNRA Site undertaken by Golder and others as documented in the RAP (Golder 2011) have identified that, prior to commencement of development activities, remediation of impacts associated with the former military use is required. Preliminary UXO and SAA remedial works, including rehabilitation of the former grenade range has previously been completed, however, there remains the potential for additional UXO and SAA impacts at the RZNRA Site. Remaining localised impacts, including lead particulates, ACM, buried waste and SAA require to be addressed.

The proposed remedial works required within the RZNRA included excavation and a combination of placement within a capped cell (lead and ACM impacted materials) beyond the RZNRA in the southern portion of the 12619 Site and off-site disposal to a landfill or reprocessing facility (residual military waste, demolition waste, *etc*).

During the proposed remediation activities, sufficient additional investigations and validation documentation of site activities was required to demonstrate that the identified environmental and health based risks to future use(s) of the RZNRA Site had been adequately managed to render the site suitable for the proposed land uses.

5.2 Identify the Decision

The decisions required to be made are as follows:

- Do contaminant concentrations occur in soils to be retained within the RNZRA Site at concentrations above the adopted site validation criteria?
- Have all aesthetic issues been addressed?
- Have physical objects, including SAA/UXO and ACM been appropriately cleared from the RZNRA Site to the standard outlined in the RAP?
- Are there any materials removed from the RZNRA Site that have not been appropriately characterised and disposed of during the remediation works?
- Where impacted materials are to remain within the RZNRA Site, are the identified contaminants suitable to be encapsulated on-site (within a containment cell in the CZSRA) in a manner which is adequately protective of human health and the environment, including groundwater?
- Has the potential migration of contaminants from the RZNRA Site been appropriately addressed?
- Where 12619 Project Site and imported materials have been re-used within the RZNRA Site during remediation works, has this been limited to use of materials appropriately validated as suitable for the proposed end use?
- Are there any additional residual contamination (*i.e.*, impacted fill material and/or natural soil) issues on completion of the remediation works that are required to be documented within a RZNRA Site EMP?
- Have remediation works at the RZNRA Site been completed in accordance with the requirements of the RAP (Golder 2011) or where applicable, have variations to the works required by the RAP been completed appropriately to meet the objectives of the RAP?
- Is the RZNRA Site suitable for the proposed uses?

© 2013 JBS Environmental Pty Ltd

5.3 Identify Inputs to the Decision

The following inputs are required in order to make the stated decisions:

- Field observations in relation to inspection of all excavation bases, walls, stockpiles for odours, sheen, discolouration, and other indicators of potential contamination;
- Soil/bedrock validation analysis data collected from the base, walls and of remedial excavations;
- Pre and post remediation works groundwater analytical data;
- Waste classification and material characterisation data obtained during assessment of fill material and disturbed natural soils prior to and during remediation works;
- Survey information on the extent of excavation works within the RZNRA Site to identify the occurrence of potentially, or known, impacted materials to be retained within the RZNRA Site;
- Disposal documents in relation to appropriate disposal of material to be removed from the 12619 project Site as part of the remediation works (landfill records, beneficial reuse/recycling dockets, trade waste disposal, *etc*);
- Documentation of the characterisation, removal and check validation of UXO/SAA clearance works completed within the RZNRA Site; and
- Documentation of the collection, wrapping, clearance validation and material tracking of ACM completed at the RZNRA Site.

5.4 Define the Study Boundaries

The study boundary for the defined 12619 project Site is shown schematically in **Figure 1**, with the RZNRA site shown in **Figure 2**. The RZNRA site is shown as an overlay of the proposed development plan in **Figure 3**. The Site is formally defined as part Lot 7 and part Lot 8 DP111127652 comprising approximately 43 ha. As shown in **Figures 1** and **2**, the extent of the RZNRA Site comprises:

- North – the existing fence line marking the northern extent of Lot 8 (that portion north of the RC) across the majority of the Site, with the northern extent of Lot 7 (north of the RC) comprising the east most portion of the Site's extent;
- South-west – the extent of Lots 7 and 8 along the respective boundary with Lots 1 and 2, comprising the northern extent of the proposed rail corridor and future ancillary parking facilities soon to be remediated under a separate agreement between TWA and Landcom;
- East – the existing fence line marking the extent of Lot 7.

Based on existing RZNRA Site assessment data, the maximum vertical extent of the investigation was not anticipated to exceed the depth of weathered bedrock located at the RZNRA site. In practice the lateral and vertical extent was determined within each AoC at the Site by validation samples that satisfy the criteria specified in **Section 6.1.2**.

Due to the nature of potential contaminants identified, with the exception of the groundwater assessment, seasonality and other temporal variables were not assessed as part of this validation. The temporal boundaries of this investigation were limited to the period of field validation assessment works that extended from February to September 2012.

5.5 Develop a Decision Rule

A summary of the decision rules for the assessment are presented in **Table 5.1.**

© 2013 JBS Environmental Pty Ltd

Table 5.1 Summary of Decision Rules

Decision Required to be Made	Decision Rule
1. Are contaminant concentrations in soil to remain on site above the adopted site validation criteria?	Soil analytical data was compared against EPA endorsed criteria as established in the RAP as validation criteria. For each validation data set, samples collected from consistent horizons, stratigraphy or material type with sufficient sample numbers were subject to statistical analysis in accordance with relevant guidance documents, as appropriate, to facilitate the decisions. The following statistical criteria were adopted with respect to each sample set: Either: the reported concentrations will all be below the site criteria; Or: the average site concentration for each analyte will be below the adopted health based site criterion; no single analyte concentration exceeds 250% of the adopted health based site criterion; and the standard deviation of the results will be less than 50% of the site health based criterion. And: the 95% upper confidence limit (UCL) of the average concentration for each analyte will be below the adopted health based site criterion. Where samples are required to be assessed via comparison with the ecological investigation criteria, each individual reported concentration is required to be below the ecological investigation levels. If the statistical criteria stated above are satisfied, the answer to the decision was No. If the statistical criteria were not satisfied, the answer to the decision was Yes.
2. Are there any aesthetic issues remaining following remediation works?	If there were any remaining unacceptable odours, soil inclusions or soil discolouration, the answer to the decision was Yes. Otherwise, the decision was No.
3. Are there physical objects, including SAA/UXO and ACM remaining at levels above those stipulated in the RAP?	Records of UXO/SAA and ACM clearance works produced by the appointed remediation contractor and associated specialist subcontractors were reviewed in a qualitative manner. If the documentation was considered complete and appropriate, the answer to the decision was No. Otherwise, the answer to the decision was Yes.
4. Are there any materials removed from the site that have not been appropriately characterised and disposed of during the remediation works?	A qualitative assessment of material disposal records was undertaken following completion of remediation works with respect to the waste classification provided in the RAP and/or those provided during remediation works. Were there any inconsistencies within the off-site disposal records provided by the remediation contractor with respect to the material classifications (VENM, General Solid Waste [GSW], Special, *etc*) provided as part of the remediation works? If the documentation was considered complete and appropriate, the answer to the decision was No. Otherwise, the answer to the decision was Yes.
5. In the event that impacted materials are to remain within the RZNRA Site, are there any outstanding issues identified in relation to the adoption of a cap and containment strategy based on physical separation?	In the event that the answer to question 1 was Yes: Validation sample and fill characterisation contaminant data for materials within the capped area of the Site was assessed by comparison with the contaminant property requirements ANZECC (1999[11]) and EPA endorsed documents as appropriate. If the contaminants identified as remaining at the site were considered to have been appropriately managed via installation of a capping system based on physical separation, the answer to the decision was No. If the contaminants were considered to still represent a potential risk in relation to future site users following installation of a physical separation layer, then the answer to the decision was Yes.
6. Has the potential for migration of contaminants from the Site been appropriately addressed?	Site monitoring and clearance reports prepared by remediation subcontractors during works were reviewed during preparation of the validation report to verify that appropriate control measures were implemented to resolve residual potential risks associated with migration of ACM and lead at the Site. In addition, groundwater analytical data collected prior to and following the completion of remediation works at the Site was compared to the previously adopted assessment criteria with respect to human health and/or ecological receptors as per guidance provided in ANZECC/ARMCANZ 2000 and NEPC 1999. Based on conclusions of this assessment, if the concentrations were considered to represent an increased risk, the answer to the decision was Yes. Otherwise, the answer to the decision was No.

[11] ANZECC (1999) *Guidelines for the Assessment of On-site Containment of Contaminated Soil*. Australian and New Zealand Environment and Conservation Council, September 1999

© 2013 JBS Environmental Pty Ltd

Decision Required to be Made	Decision Rule
7. Where material has been used for backfilling excavations, are there any outstanding issues identified in relation to documentation of the material's suitability for use?	Documentation of visual inspection results were reviewed in addition to comparison of soil analytical data against EPA endorsed criteria established in the RAP as validation criteria. Samples from each source were compared using individual sample concentrations (rather than statistics, given the limited anticipated sample numbers) to facilitate the decision. If the individual concentrations were all less than the relevant adopted criterion, the answer to the decision was No. If the concentrations exceed the adopted criterion for one or more analytes, the answer to the decision was Yes.
8. Is the EMP required to address management of any residual potential contamination at the Site?	Was the answer to any of the above decisions Yes? If yes, the issues were required to be documented within a Site Environmental Management Plan (SMP) to be prepared for the RZNRA Site to address outstanding contamination issues. If no, specific mention of issues was not required within a SMP to be prepared for the RZNRA Site in relation to the encapsulation area.
9. Have remediation works been completed in general accordance with the RAP requirements, or where varied completed in accordance with the RAP objectives?	Comparison of the RAP requirements with the completed scope of remediation works was undertaken on a qualitative basis. If the works completed were consistent with the RAP requirements, the answer to the decision was Yes. In the event that works were not completed in accordance with the requirements, evaluation of the completed works in accordance with the objectives of the RAP were completed. If the works were completed in accordance with the RAP objectives, the answer was also Yes. Otherwise, the answer to the decision was No.
9. Is the RZNRA Site considered suitable for the proposed use?	Was the answer to any of the above decisions Yes? If yes, were the outstanding issues appropriately addressed by implementation of an SMP? If the issues were appropriately addressed by the SMP, the answer to the decision was Yes. Otherwise, the answer to the decision was No and the requirements for further remediation of the Site was required to be documented.

5.6 Specify Limits of Decision Error

Specific limits for this project have been adopted in accordance with the appropriate guidance from the NSW EPA, NEPC (1999), ANZECC/ARMCANZ (2000), DEC (2007), appropriate indicators of data quality (DQIs used to assess quality assurance / quality control) and standard JBS Environmental procedures for field sampling and handling.

AS4482.1-2005[12] nominates two types of errors that require assessment:

a) Deciding that the site is acceptable when it actually is not; and

b) Deciding that the site is unacceptable when actually it is.

It is recommended in AS4482.1 that limits of 5% probability for type a) errors and 20% probability for type b) errors be set during environmental assessments. These recommendations have been adopted for this validation assessment.

The sources of decision error are considered to comprise a combination of sampling errors and measurement errors. By implementation of continuous review of procedures and data assessment modifications will be made to the remediation plan and validation sampling strategy to ensure the potential for unacceptable is kept to a minimum and within the above adopted limits.

The pre-determined Data quality indicators (DQIs) adopted for this assessment using the precision, accuracy, representativeness, comparability, completeness and sensitivity (PARCCS) parameters will provide a semi-quantitative assessment of compliance with limits on the decision error.

- **Precision** - measures the reproducibility of measurements under a given set of conditions. The precision of the laboratory data and sampling techniques is

[12] *AS4432.1-2005 Guide to the investigation and sampling of sites with potentially contaminated soil. Part 1: Non-volatile and semi-volatile compounds*.

© 2013 JBS Environmental Pty Ltd

assessed by calculating the Relative Percent Difference (RPD)[13] of duplicate samples.

- **Accuracy** - measures the bias in a measurement system. The accuracy of the laboratory data that is generated during this study is a measure of the closeness of the analytical results obtained by a method to the 'true' value. Accuracy is assessed by reference to the analytical results of laboratory control samples, laboratory spikes and analyses against reference standards.
- **Representativeness** –expresses the degree which sample data accurately and precisely represents a characteristic of a population or an environmental condition. Representativeness is achieved by collecting samples on a representative basis across the site, and by using an adequate number of sample locations to characterise the site to the required accuracy.
- **Comparability** - expresses the confidence with which one data set can be compared with another. This is achieved through maintaining a level of consistency in techniques used to collect samples; ensuring analysing laboratories use consistent analysis techniques and reporting methods.
- **Completeness** – is defined as the percentage of measurements made which are judged to be valid measurements. The completeness goal is set at there being sufficient valid data generated during the study.
- **Sensitivity** – expresses the appropriateness of the chosen laboratory methods, including the limits of reporting, in producing reliable data in relation to the adopted site assessment criteria.

DQIs for the validation program in general accordance with DQIs presented in the Golder (2011) RAP are included in **Table 5.2** below.

Table 5.2: Summary of Data Quality Indicators for Validation Program

Data Quality Objective	Frequency	Data Quality Indicator
Precision		
Blind duplicates (intra laboratory)	1 / 20 samples for TPH, PAHs, 8 metals, asbestos	<50% RPD[1] where conc > 10*PQL
Split duplicates (inter laboratory)	1 / 20 samples for TPH, PAHs, 8 metals, asbestos	<50% RPD[1] where conc > 10*PQL
Laboratory duplicates	1 / batch	<50% RPD[1] where conc > 5*PQL
Trip (storage) blank	1 / media[2]	<LOR
Rinsate blank (re-useable sampling equipment)	1 / 20 samples for TPH, PAHs, 8 metals, or minimum of one/day where sampling for these analyst.	<LOR
Trip spike	1 / media[2]	70 - 130 %
Accuracy		
Surrogate spikes	All organic analytes	60-140 % organics
Lab control samples	1 per lab batch	70-130% metals 60-140 % organics
Matrix spikes	1 per lab batch	70-130% metals 60-140 % organics
Representativeness		
Sampling appropriate for media and analytes	All media / analytes	-
Laboratory blanks	1 per lab batch	<LOR[2]

[13] $$RPD(\%) = \frac{|C_o - C_d|}{C_o + C_d} \times 200$$

Where C_0 is the analyte concentration of the original sample
C_d is the analyte concentration of the duplicate sample

© 2013 JBS Environmental Pty Ltd

Data Quality Objective	Frequency	Data Quality Indicator
Samples extracted and analysed within holding times.	All samples	Soil: 14 days for organics, 6 months for metals, asbestos Water: sTPH/PAHs 7 days to extract'n, VOCs/ vTPH – 14 days, 6 months for metals
Comparability		
Standard operating procedures for sample collection & handling	All Samples	All samples
Standard analytical methods used for all analyses	All Samples	All samples
Consistent field conditions, sampling staff and laboratory analysis	All Samples	All samples
Completeness		
Sample description and COCs completed and appropriate	All Samples	All samples
Appropriate documentation	All Samples	All samples
Satisfactory frequency and result for QC samples	All QA/QC samples	95%
Data from critical samples is considered valid	All samples	Critical samples valid
Sensitivity		
Limits of reporting appropriate and consistent	All Samples	All samples

(1) If the RPD between duplicates is greater than the pre-determined data quality indicator, a judgement will be made as to whether the excess is critical in relation to the validation of the data set or unacceptable sampling error is occurring in the field.

(2) Only required where volatile substances (TPH C_6-C_9 and BTEX) analysed.

5.7 Optimise the Design for Obtaining Data – Soil Validation/Characterisation Data

The purpose of this step is to identify a resource-effective field validation sampling design that generates data that are expected to satisfy the decision performance criteria, as specified in the preceding steps of the DQO Process. The output of this step is the sampling design that will guide development of the field sampling analytical and quality plan (JBS 2012a). This step provides a general description of the activities necessary to generate and select data collection designs that satisfy decision performance criteria.

The remediation validation and subsequent laboratory analysis program as outlined in the following sections will be implemented during site remediation activities to demonstrate the successful completion of works in compliance with the RAP goals (Golder 2011).

5.7.1 AoC1– Military Items and General Waste including Stockpiled Materials

Existing waste materials previously identified at the Site associated with historical use of the site (excluding clean soil stockpiles) was removed from the site to landfill (SP6), for beneficial reuse off-site or validated prior to beneficial reuse on-site during remediation works.

In general, further assessment of the materials was not required prior to commencement of works, with the exception of materials identified as potentially suitable for beneficial reuse within the Site where the requirements of **Section 5.7.4** were required to be completed.

Following removal of stockpiled materials, the following footprint validation procedures were required to b implemented:

- SP06 (ACM impacted material): visual inspection and collection of one sample from the underlying soil for laboratory analysis for 8 metals, TPH, BTEX, PAHs and asbestos; and
- Remaining stockpiles containing demolition waste: visual inspection was completed of the former footprint and observations recorded. Where there were potential contamination indicators (odour, staining, residual waste material, *etc*) validation sampling was required to assess the potential management/ remediation requirements. Samples were required to be collected at a minimum

© 2013 JBS Environmental Pty Ltd

of one sample per 100 m^2 and analysed for 8 metals, TPH/BTEX, PAHs and asbestos.

In general, validation of the soil stockpile footprints for material considered suitable for beneficial reuse on-site was not required.

5.7.2 AoC2 and AoC3– UXO and SAA in Site Residential and Conservation Areas

Remediation of AoC2 and AoC3 comprised physical scanning by the UXO removal subcontractor, using visual and metal detection (AoC2) and visual only (AoC3) techniques across 100 m by 100 m grid (1 ha) squares. The remediation contractors were required to document the results of each sweep, including all contacts identified/removed. For the purpose of these works, a contact was identified as a metal fragment of military firearm origin greater than 25 mm in length. The RZNRA site included two separate areas where the AoC3 visual sweep was required and the extent of these is shown in **Figure 3**.

Validation of these works included a repeat sweep of 10 % of each grid square, representative of conditions across the square, by the UXO removal Site Manager using the same technique as the initial works.

Validation was considered successful where no contacts were identified by the 10 % check.

In the event the 10 % check identified the presence of one or more contacts, the clearance process was to be completed for the entire grid square as appropriate to meet the AoC2 or AoC3 requirements.

5.7.3 AoC4 and AoC5 – Lead Particulate Material and Asbestos Containing Materials (ACM)

Following advice from the appointed Remediation Contractor and their subcontracted hygienist that all ACM had been removed from the area, JBS validation of areas identified as being impacted with lead and/or ACM beyond the final capped area was required. This was completed as a two stage process:

- inspection of the exposed excavation faces to confirm the absence of visually identifiable lead and/or ACM fragments; and
- collection of soil samples at the lateral and vertical extent of the excavation on a 10 m grid with subsequent laboratory analysis for lead and/or the presence of asbestos fibres.

5.7.4 Fill Material Sourced from Within the Site

Fill material was required to be sourced for backfilling of weapons/training pits and other remedial excavation works across the Site. The required fill material was generally sourced from a combination of existing stockpiled materials and virgin excavated natural material (VENM) within the Site.

Prior to Site materials being used as backfill, the material will require validation to ensure the material is fit for use. This comprised:

- inspection of the exposed excavation faces to confirm the absence of visually identifiable impacted material (anthropogenic inclusions, stained, odorous, the presence of stressed vegetation, *etc*). Organic matter should be absent from materials apart from topsoil.
- for in-situ VENM and previously assessed stockpiles, existing data collected during previous Site assessment works was reviewed to evaluate the potential suitability of the material in relation to the validation criteria.
- where the visual inspection and existing data indicates the material is anticipated to be suitable for the proposed use, a check program of sampling and laboratory analysis was completed at the following frequency:
    - VENM – 1 sample per 250 m^3 was collected and submitted for laboratory analysis for TPH, BTEX, PAHs, Metals and OCPs; and

© 2013 JBS Environmental Pty Ltd

- Stockpiled ‘clean’ material – 1 sample per stockpile was collected and submitted for laboratory analysis for TPH, BTEX, PAHs, Metals, OCPs and asbestos fibres.

- Where potential contamination indicators were identified during inspection of the excavation/material or insufficient data was available from previous investigations, further assessment and characterisation of the material was necessary to establish the suitability of the material for use as backfill. This included sampling of the stockpiled material at a frequency of 1 sample per 50 m^3 and laboratory analysis for TPH, BTEX, PAHs, Metals, OCPs, PCBs and asbestos. In the event that initial contaminant concentrations indicated concentrations exceeded Site validation criteria, additional TCLP analysis was completed as appropriate to provide sufficient data to provide a waste classification for off-site disposal.

5.8 Optimise the Design for Obtaining Data – Groundwater Data

During previous Site assessment activities (Golder 2005a) groundwater monitoring wells were installed at a total of 6 locations within the 12619 project Site (BH2, BH291, BH521, B558, BH608, and BH675) including BH2 and BH291 within the RZNRA site. The wells were installed to depths of between 8 m and 15.6 m (it is noted that the monitoring well location BH640 is situated beyond the defined site boundary and so has not been included in this assessment). Given the identified low risk of contaminant migration via groundwater migration, assessment/validation of groundwater conditions was required pre and post remediation works to confirm groundwater conditions.

The groundwater monitoring works included purging and sampling of the existing monitoring wells installed at the Site prior to the commencement of remediation works associated with the lead particulate impacted material. Following completion of the on-site containment cell (CZSRA site), a final post-remediation groundwater monitoring event was required to be completed to compare groundwater conditions pre- and post-remediation. As a result of remediation works, groundwater monitoring wells BH521 within the RRZW site and BH608 within the CZSRA site were destroyed/removed. With due consideration to the objectives of the remediation work, the scope of works completed as part of the remediation program and budget constraints, a decision was made to not reinstall BH521 following completion of the remediation works.

© 2013 JBS Environmental Pty Ltd

6 Assessment Methodology

The specific validation requirements for various aspects of the proposed remediation works are outlined in **Section 5.7**. Specific aspects of characterisation, validation and monitoring works to be completed during the project are described in the following sections.

6.1 Soil Sampling Methodology

6.1.1 Excavations

Samples were collected by one of JBS Environmental's appropriately trained and experienced environmental scientists/engineers directly from the excavator bucket or by the use of a hand trowel at the required densities nominated for each AoC discussed in **Section 5.7**. Samples were obtained following instruction from the Remediation Contractor that the remediation works within the excavation were considered to have been completed. For samples anticipated to not have volatile contaminants, samples were collected from the surface of the exposed face to a depth of approximately 0.05 m. For samples potentially associated with volatile contaminants, samples were obtained from a depth at least 100mm below the current excavation face to minimise the potential for loss of volatile contaminants as a result of disturbance.

Where deeper soil samples were required on excavation walls, or where rock samples were required, these were collected using an excavator. Samples were collected from the centre of the excavator bucket ensuring that no part of the sample has contacted the sides of the excavator bucket.

Following collection of each sample, the hand trowel or other appropriate re-usable sampling equipment, where used, was decontaminated as discussed in **Section 6.1.6**.

6.1.2 Stockpiles

Samples of stockpiled material were obtained as necessary for characterisation of material for off-site disposal, reuse on-site, *etc*. As for the excavations, samples were obtained by appropriately trained and experienced personnel by the use of hand trowel, hand auger, shovel or excavator bucket as appropriate.

For stockpile sampling, material was obtained from a minimum depth of 0.2m below the surface of the stockpile at the time of sampling. Following each sample, the hand trowel/hand auger/shovel blade was decontaminated as discussed in **Section 6.1.6**.

During the collection of soil samples, features such as seepage, discolouration, staining, odours and other indications of contamination were noted on the field documentation and a PID was used to assess the potential occurrence of volatile compounds.

6.1.3 Field PID Screening

Where there was the potential for volatile organic contaminant (VOC) impact, soil validation samples were screened on site during works using a photo-ionisation detector (PID) to assess the presence of VOCs including petroleum hydrocarbons. Samples obtained for PID screening were placed in a sealed plastic bag for a period of approximately 5 minutes to equilibrate prior to a PID being attached to the bag. Readings were then monitored for a period of approximately 1 minute or until values stabilised and the stabilised/highest reading was recorded. The field unit was check calibrated prior to commencement of field screening activities.

6.1.4 Sample Handling

Collected soil samples were immediately transferred to sample containers of appropriate composition (glass jars for chemical analysis, plastic bags for asbestos). Sample labels recorded: job number; sample identification number; and date of sampling.

© 2013 JBS Environmental Pty Ltd

Sample containers were transferred to a chilled ice box for sample preservation prior to and during shipment to the testing laboratory. A chain-of-custody form was completed and forwarded with the samples to the testing laboratory.

6.1.5 Soil Duplicate and Triplicate Sample Preparation

Field soil duplicate and triplicate samples were obtained using the methodology outlined above at a frequency of 1 in 20 primary samples for both field intra-laboratory duplicates and field inter-laboratory duplicates. The soil samples were divided laterally into three samples with minimal disturbance to reduce the potential for loss of volatiles and placed in three clean glass jars and asbestos bags as relevant. All jars were filled with no headspace to reduce the potential for loss of volatiles and both the jars and bags were separately labelled as primary, duplicate and triplicate samples before being placed in the same chilled esky for laboratory transport.

6.1.6 Soil Sampling Equipment Decontamination

The following procedure was employed to clean non-disposable equipment, including the trowel, shovel blade and hand auger head prior to the collection of each sample:

- Scrubbing with a wire brush to remove gross contamination;
- Pressure spray with Decon 90 detergent and tap water mix;
- Pressure spray rinse with tap water; and
- Air drying.

Rinsate samples were obtained during the field decontamination procedures at regular intervals (1 in 20 samples, with at least one per day) during sampling events. The rinsate samples were obtained by rinsing the trowel with laboratory grade demineralised water following the decontamination procedure. The water sample were appropriately preserved and stored with the site soil samples prior to transport to the laboratory for analytical analysis.

6.2 Groundwater Sampling

Prior to and following completion of the proposed remediation works, groundwater sampling events were completed using the existing monitoring wells installed at the Site.

Given the depth of the monitoring wells, groundwater sampling was completed using a low flow Micropurge pump system with small diameter, single use tubing. Monitoring wells were purged at the highest possible flow-rate while ensuring that minimal fluctuations in depth to water occur. A flow cell was employed to monitor water quality parameters of: Electrical conductivity (EC); Redox potential (Eh); pH; Dissolved oxygen (DO); and Temperature during purging and sampling.

Where insufficient inflow is observed at the well locations to facilitate steady state conditions, the monitoring wells were purged ‘dry’ prior to samples being collected following recharge. Samples were subsequently collected of recharge using a new single use disposable bailer or the micropurge unit.

6.2.1 Groundwater Sample Handling

All samples for dissolved metal analysis were field filtered. All groundwater samples were placed into laboratory supplied bottles/vials with appropriate preservatives (where required). Each of the sample bottles was labelled with the project ID, date, sampler’s initials and unique monitoring well ID (or QC sample name), using permanent ink marker on labels affixed to the sides of the bottles by the laboratory. In addition, the sample ID (i.e., the monitoring well ID) was also be replicated on the lid of the bottles/vials in the event that the labels became detached from the bottles during transport.

Bottles were placed directly into a pre-chilled ice chest, for transport to the testing laboratories under chain of custody conditions. COC documentation was completed for samples relinquished to the laboratory and included: sample ID; number of bottles/vials; media type (i.e., water); project ID; name; date of sampling and relinquishment.

© 2013 JBS Environmental Pty Ltd

6.2.2 Groundwater Sampling Equipment Decontamination

At the completion of sampling at each location, single use sampling equipment was disposed of and re-useable equipment including the pump head, flow cell and interface probe was decontaminated as follows:

- Pressure spray with Decon 90 detergent and potable water mix;
- Pressure spray rinse with potable water; and
- Air drying.

The completed activities were documented on groundwater monitoring and calibration/decontamination record forms included in the final report. Rinsate samples wre obtained during the field decontamination procedures at a frequency of one per sampling event. The rinsate sample was obtained by rinsing the interface probe and flow cell with laboratory grade demineralised water following the decontamination procedure. The water sample(s) was then appropriately preserved and stored with the site water samples prior to transport to the laboratory for chemical analysis.

6.3 Laboratory Analyses

JBS Environmental engaged Envirolab Services Pty Ltd (Envirolab) at Chatswood, NSW as the primary laboratory for the required analyses. The secondary laboratories used for the works were SGS Environmental (SGS) at Alexandria, NSW for chemical analysis and Pickford & Rhyder at Lane Cove, NSW for asbestos analysis. All laboratories were NATA registered for the analyses requested at the relevant laboratory. In addition, the laboratories were required to meet JBS Environmental's internal QA/QC requirements.

Laboratory analysis methods for relevant soil and groundwater contaminants are identified in **Tables 7.1** and **7.2**.

© 2013 JBS Environmental Pty Ltd

7 Soil Assessment Criteria

7.1 Soil Assessment Criteria

7.1.1 Rationale

The proposed site use comprises development for a variety of land uses including low to medium density residential, commercial, public open space, education and regional parks use. Given the broad range of potential uses currently proposed in various areas of the Site and the potential for future amendments to approved land uses via formal planning processes during development staging, a conservative approach has been adopted during development of the Site validation criteria.

The remediation acceptance criteria derived in the RAP (Golder 2011) are based on EPA endorsed investigation levels which, while being used as clean-up levels instead of site-specific criteria derived through a process of risk assessment, are considered adequately conservative for the purposes of validating the site.

Adopting a conservative approach across the Site and with consideration to the decision process for assessment of urban redevelopment sites (DEC 2006), for the purposes of site validation, concentrations of contaminants in the soil will be compared against levels presented in **Table 7.1**:

- 'parks and recreational use' (Health based Investigation Levels) criteria (HIL-E) for land within the regional park footprint;
- 'residential use with accessible soils' criteria (HIL - A) for all other areas of the Site;
- threshold concentrations listed in EPA (1994) for petroleum hydrocarbon compounds in the absence of HILs for TPH and BTEX compounds; and
- phyto-toxicity based investigation levels (Ecological Investigation levels, EILs).

It is noted that there are limitations on the application of ecological based soil criteria provided in this table, and that they require consideration only for soils to be used as growing medium in vegetated areas. However, with due consideration to the preliminary nature of site development plans and the potential for future earthworks, it is proposed that all data will be assessed against the ecological criteria.

Where there are no NSW EPA endorsed criteria for the identified substance (*i.e.* asbestos), an assessment of the risk posed by the substance is required to be undertaken by a suitably qualified environmental consultant in accordance with guidelines made or approved by the NSW EPA under s.105 of the *Contaminated Land Management Act 1997*. For the purposes of this assessment **Table 7.1** presents the laboratory limit of reporting (LOR) for such compounds as a screening value, above which results will be considered in greater detail.

© 2013 JBS Environmental Pty Ltd

Table 7.1 Soil Criteria (all units in mg/kg) for Residential Use with Accessible Soils

	Limit of Reporting	Laboratory Method	Health-Based Investigation Criteria (residential) (HIL – A)[1]	Health-Based Investigation Criteria (parks, open space) (HIL – E)[4]	Phytotoxicity-Based Ecological Investigation Levels (EIL)
METALS					
Arsenic	4	ICP-AES (USEPA 200.7)	100	200	20
Cadmium	0.5	ICP-AES (USEPA 200.7)	20	40	3
Chromium (total)	1	ICP-AES (USEPA 200.7)	12 %	24 %	400
Copper	1	ICP-AES (USEPA 200.7)	1000	2000	100
Lead	1	ICP-AES (USEPA 200.7)	300	600	600
Mercury (inorganic)	0.1	ICP-AES (USEPA 200.7)	15	30	1
Nickel	1	ICP-AES (USEPA 200.7)	600	600	60
Zinc	1	ICP-AES (USEPA 200.7)	7000	14 000	200
TOTAL PETROLEUM HYDROCARBONS					
C6-C9 Fraction	25	Purge Trap-GCMS (USEPA8260)	65[2]	65[2]	-
C10 – C36 Fraction	250	Purge Trap-GCFID (USEPA8000)	1000[2]	1000[2]	-
MONOCYCLIC AROMATIC HYDROCARBONS (BTEX)					
Benzene	1.0	Purge Trap-GCMS (USEPA8260)	1.0[2]	1.0[2]	-
Toluene	1.0	Purge Trap-GCMS (USEPA8260)	1.4[2]	1.4[2]	-
Ethyl benzene	1.0	Purge Trap-GCMS (USEPA8260)	3.1[2]	3.1[2]	-
Total Xylenes	3.0	Purge Trap-GCMS (USEPA8260)	14[2]	14[2]	-
POLYCYCLIC AROMATIC HYDROCARBONS (PAHs)					
Benzo(a) pyrene	0.05	GCMS (USEPA8270)	1	2	-
Total PAHs	1.55	GCMS (USEPA8270)	20	40	-
ORGANOCHLORINE PESTICIDES					
Aldrin + Dieldrin	0.2	GCECD (USEPA8140,8080)	10	20	-
Chlordane	0.2	GCECD (USEPA8140,8080)	50	100	-
Heptachlor	0.1	GCECD (USEPA8140,8080)	10	20	-
DDT + DDD + DDE	0.3	GCECD (USEPA8140,8080)	200	400	-
POLYCHLORINATED BIPHENYLS					
Total PCBs	0.6	GCECD (USEPA8140,8080)	10	20	-
OTHER					
Asbestos	0.1 g/kg	PLM / Dispersion Staining	0.1[3] g/kg	0.1[3] g/kg	-

Notes:
(1) DEC (2006) *Contaminated Sites: Guidelines for the NSW Site Auditor Scheme 2nd edition*. Residential with accessible soil is the most sensitive land use criteria presented in these guidelines.
(2) *Contaminated Sites: Guidelines for Assessing Service Station Sites,* NSW EPA, 1994 (EPA 1994)
(3) No endorsed criteria. The LOR is proposed as the screening level criteria in the absence of Site specific criteria.
(4) DEC (2006) *Contaminated Sites: Guidelines for the NSW Site Auditor Scheme 2nd edition*. Parks, recreational open space and playing fields.

7.1.2 Application of Soil Criteria

Within the remedial excavations, for soils to be considered as validated (i.e., not posing an unacceptable risk), the following statistical criteria were adopted:

Either:

- All validation samples have reported contaminant concentrations less than the validation criteria;

Or (for health based criterion only):

- the upper 95% confidence limit on the average concentration for each analyte (calculated for samples collected from consistent soil horizons, stratigraphy or material types and with a sufficient number of samples to calculate a meaningful UCL value) must be below the adopted criterion;
- no single analyte concentration shall exceed 250% of the adopted criterion; and
- the standard deviation of the results must be less than 50% of the criterion.

In addition, it is anticipated that the following will be considered within the remediation areas:

© 2013 JBS Environmental Pty Ltd

- there shall be no visible asbestos in addition to laboratory analyses results; and
- consideration shall be given to odorous and/or discoloured soils (caused by contamination).

7.1.3 Waste Classification Criteria

Assessment of material to be excavated and disposed of from the Site was completed as required in accordance with the total soil contaminant concentration (SCC) and toxicity characteristic leaching procedure (TCLP) criteria (as required) presented in the NSW DECCW (2009) *Waste Classification Guidelines Part 1: Classifying Waste*.

7.2 Groundwater Assessment Criteria

Assessment of groundwater conditions was required to verify that there have been no impacts upon groundwater conditions from the remedial works at the Site. The RAP does not provide validation criteria relating to groundwater. The adopted criteria as shown in **Table 7.2** include values derived from the following documents:

- *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. ANZECC/ARMCANZ (2000);
- *Australian Drinking Water Guidelines* (NHMRC/NRMMC 2004); and
- *Circular on Target Values and Intervention Values for Soil Remediation*. Netherlands Ministry of Housing, Spatial Planning and the Environment (VROM, 2000) – Adopted as TPH screening levels in the absence of NSW EPA endorsed guideline values.

Table 7.2 Adopted Groundwater Assessment Criteria

	Limit of Reporting	Laboratory Method	Adopted Health Based Criteria[1] (all units in µg/l unless stated)	Adopted Ecological Criteria[2] (all units in µg/l unless stated)
HEAVY METALS				
Arsenic	1.0	ICP-AES (USEPA 200.8, 6020A)	7	24
Cadmium	0.1	ICP-AES (USEPA 200.8, 6020A)	2	0.2
Chromium	1.0	ICP-AES (USEPA 200.8, 6020A)	5	3.3[5,6]
Copper	1.0	ICP-AES (USEPA 200.8, 6020A)	2000	1.4
Lead	1.0	ICP-AES (USEPA 200.8, 6020A)	10	3.4
Mercury	0.1	ICP-AES (USEPA 200.8, 6020A)	1	0.1[4]
Nickel	1.0	ICP-AES (USEPA 200.8, 6020A)	20	11
Zinc	1.0	ICP-AES (USEPA 200.8, 6020A)	3000	8
PETROLEUM HYDROCARBONS				
TPH C_{10}-C_{36}	250	GC/FID (USEPA 8000)	-	600[8]
PAHs				
Naphthalene	0.1	GCMS (USEPA8270)	-	16[7]
Anthracene	0.1	GCMS (USEPA8270)	-	0.1 [4,5,6,9]
Phenanthrene	0.1	GCMS (USEPA8270)	-	0.6[5,6,9]
Flouranthene	0.1	GCMS (USEPA8270)	-	1[5,6,9]
Benzo(a)pyrene	0.1	GCMS (USEPA8270)	0.1[4]	0.1[5,6,9]
BTEX				
Benzene	1.0	P&T GC/MS (USEPA 8020A)	1	500
Toluene	1.0	P&T GC/MS (USEPA 8020A)	800	180[5]
Ethyl benzene	1.0	P&T GC/MS (USEPA 8020A)	300	5[5]
o-Xylene	1.0	P&T GC/MS (USEPA 8020A)		350
m-Xylene	1.0	P&T GC/MS (USEPA 8020A)	600[3]	75
p-Xylene	1.0	P&T GC/MS (USEPA 8020A)		200

Notes
(1) Australian Drinking Water Guidelines (NHMRC/NRMMC 2004)
(2) 95% Protection Trigger Values for Fresh Water (ANZECC/ARMCANZ 2000)
(3) Total Xylenes (sum of individual Xylene compounds)
(4) Laboratory limit of reporting is less than the adopted criterion, hence the laboratory LOR is adopted as the criterion for the purposes of this assessment.
(5) Low reliability Trigger Value for Freshwater Protection (ANZECC/ARMCANZ 2000)
(6) 99% Protection Level used, as recommended by ANZECC/ARMCANZ (2000)
(7) Moderate Reliability value in fresh water.

© 2013 JBS Environmental Pty Ltd

(8) Dutch intervention value adopted in absence of NSW EPA endorsed value.
(9) Indicative Interim Working Level (ANZECC/ARMCANZ 2000)

7.3 Application of Groundwater Criteria

The adopted groundwater criteria were applied at each monitoring well location within the 12619 Project Site (BH2, BH291, BH521, BH558, BH608 and BH675) as shown in plans included in **Appendix A**.

Where both human health and ecosystem criteria have been nominated for a contaminant in **Table 7.2** above, the more sensitive criteria has been adopted (ie. 7 μg/l arsenic health level in preference to the 24 μg/l ecosystem based criterion) as the site assessment criteria for groundwater validation purposes.

© 2013 JBS Environmental Pty Ltd

8 Summary of Remediation / Validation Works

8.1 Soil Remediation Works – AOC1

Remedial works within the RZNRA site associated with AOC1 included:

- Characterisation/validation and removal of fill stockpiles;
- Removal of surface debris including barbed wire and construction and demolition waste;
- Removal of concrete slabs associated with historical site activities;
- Excavation and off-site disposal of materials associated with former weapons pits and subsequent backfill of the excavations; and
- Validation of the SP6 stockpile footprint following removal.

8.1.1 Clean Stockpiles

Stockpiles SP4, SP5, SP14 and SP15 located within the RZNRA site were inspected and validation samples collected on 14 March 2013. Validation of these stockpiles as fully documented in earlier advice, included as **Appendix C**, confirmed the absence of aesthetic concerns including discoloured, stained and/or odorous soils or the presence of ACM fragments within the stockpiles. Indicative photos of a number of the stockpiles are presented in **Appendix B**.

As reported in the EMS weapons pit documentation, included as **Appendix D**, approximately 118.2 tonnes of material from SP14 was used to backfill weapons pits within the RZNRA site. The stockpiled materials were inspected during transportation and placement of the material for reuse in backfilling the locations to ensure the materials were consistent with those identified in the validation assessment activities as documented in **Appendix C**.

SP5 was used to infill the adjoining excavation following removal of rubbish from the infantry trench (M5) located as shown in **Figure 4**.

The remaining clean stockpiles were spread on the surrounding ground surface to facilitate completion of the UXO survey within the former stockpile footprints following a project direction that the lead particulate excavation would not be backfilled. As for the stockpiles used to backfill the weapons pits, JBS&G completed inspection of the material during these activities to ensure the materials were consistent with those previously documented.

8.1.2 Additional Soil Stockpiles Identified During Works

During site vegetation clearance activities a number of additional stockpiles of soil were identified within the site. These materials were minor in volume and similar in character to the previously identified materials. The stockpile details are summarised in **Table 8.1**.

Table 8.1 Additional Stockpile Details

Stockpile ID	Estimated Volume (m^3)	Date Inspected	Notes
UFSP01 (SP18)	30	4/4/2012	Crescent shaped stockpile, light brown to dark brown silty clay and sandy clay fill with sandstone and shale gravel inclusions. No staining, odorous, discolouration or anthropogenic inclusions noted in material
UFSP02 (SP19)	10	4/4/2012	Crescent shaped stockpile, light brown to dark brown silty clay and sandy clay fill with sandstone and shale gravel inclusions. No staining, odorous, discolouration or anthropogenic inclusions noted in material
UFSP04	24	11/4/2012	Round stockpile, silty sandy clay fill, dark brown with a trace of ironstone gravel, glass and tile fragments
UFSP05	12	11/4/2012	Round stockpile, brown silty clay fill material with trace of sandstone and igneous gravel and several bullet/SAA fragments

© 2013 JBS Environmental Pty Ltd

Stockpile ID	Estimated Volume (m^3)	Date Inspected	Notes
UFSP06	70	11/4/2012	Round stockpile, light brown with sandstone gravel inclusions and a trace of scrap metal, SAA fragments and glass fragments
UFSP07	10	11/4/2012	Crescent shaped stockpile, silty clay fill material, orange brown in colour with trace ironstone gravel and SAA fragment inclusions
UFSP08	10	11/4/2012	Crescent shaped stockpile, silty clay fill material, orange brown in colour with traces of ironstone and siltstone gravel inclusions. No potential contamination indicators observed.
UFSP09	2	01/05/2012	Round stockpile, silty clay topsoil/fill material, brown with traces of sandstone and igneous gravel. No potential contamination indicators observed.
UFSP010 (refer to S.8.1.3)	16	01/05/2012	Ovoid shaped, silty clay fill material, orange brown with a trace of concrete and brick fragments.

A photographic record of stockpiles has been included in **Appendix B**. Vegetation clearance activities were completed for these stockpiles and JBS completed assessment of the suitability of the materials for reuse in a manner consistent with characterisation/ validation of the clean stockpiles. A standalone report issued to Landcom is included as **Appendix E**.

Based on the observations and laboratory analysis results as documented in **Appendix E**, the additional stockpiles in the RZNRA site, UFSP01, UFSP02, UFSP08 and UFSP09 were considered suitable for beneficial reuse within the site. It is understood that these stockpiles were spread out across the ground surface in the vicinity of the stockpile locations to facilitate the UXO clearance.

As a result of anthropogenic inclusions within the soil, stockpiled materials UFSP04, UFSP05, UFSP06, UFSP07 and UFSP10 were considered to contain material of concern with respect to either aesthetic considerations or SAA including bullets. Given the small volume, the material was excavated and transported for placement within the encapsulation cell in the CZSRA portion of the site. Subsequent inspections by JBS confirmed the successful removal of material of aesthetic concern on the ground surface within the relevant stockpile footprints following removal of the stockpiles. Subsequent clearance by the UXO removal contractor of the RZNRA site site included the stockpile footprints were successfully cleared of SAA.

8.1.3 Clearance of Concrete Slabs and Waste Stockpiles

Various features associated with former training activities had previously been identified at the site, including the following features at locations identified in **Figure 4**:

- L1 – concrete slab;
- M13 – building facade;
- command post;
- R3 – general rubbish stockpile;
- M7 – raised platform/structure; and
- R1 – general rubbish stockpile and asbestos pipes.

Site clearance activities by the remediation contractor included the demolition of the former structures and concrete slabs and subsequent removal from the site of demolition waste from the site in addition to the identified general rubbish stockpiles as further discussed in **Section 8.6** below.

The asbestos pipes stockpiled at location R1 were collected and transferred for placement in the asbestos encapsulation area within the CZSRA portion of the 12619 project site. JBS inspected the footprint on 1 May 2012 and confirmed all ACM pipework had been removed from this area (**Appendix B** photo log).

Following clearance of the locations, JBS inspected the former footprints to confirm the absence of potential contamination indications such as fill material, discoloured/stained or odorous soils or anthropogenic inclusions. With the exception of the M7 location, the

© 2013 JBS Environmental Pty Ltd

footprint of all areas were confirmed via inspection to be free of indicators of potential contamination.

Following removal of the raised platform at M7, fill material was identified on the ground surface with inclusions of building waste including bricks, metal and concrete fragments. The fill material at this location was identified as UFSP10 for assessment as discussed in **Section 8.1.2** above. Photographs taken during the assessment are included in **Appendix B**.

An additional, previously unrecorded concrete slab was identified in the central north portion of the site (CS1, **Figure 4**) within an area with a number of former weapons pit excavations. The concrete slab comprised a pavement approximately 6 m by 10 m in lateral extent and was approximately 200 mm thick. Following demolition and removal by TRN, inspection by JBS on 15 May 2012 of the underlying soil identified natural silty clay topsoil with no potential contamination indicators such as discolouration/staining, odour or anthropogenic inclusions.

8.1.4 Weapons Pit and Infantry Trench Clearance Activities

A total of 104 site features known as 'weapons pits' were identified within the RZNRA site during remediation works, located as shown on the survey plan included in **Appendix F**. The condition of the pits varied as shown in indicative photographs presented in **Appendix B**. Works at each location comprised the excavation and clean out of anthropogenic materials, which typically comprised sheet metal, wire, stakes, vehicle tyres, timber, wire or rope mesh, camouflage netting and occasionally concrete. These separated materials were subsequently removed from site as further discussed in **Section 8.6** below.

Confirmation of hygienist clearance is included in addition to photographs of each completed pit in **Appendix F**. The hygienist reported that each pit was inspected for the presence of timber, steel, potential ACM, disturbed soil and SAA with all recorded as being clear of these inclusions. As noted in documentation included in **Appendix F**, the weapons pits were then backfilled with validated material from SP14.

The former infantry trench (M4) located as shown in **Figure 4** was cleared of tree debris and inspected by JBS personnel on 1 May 2012. Inspection identified a 0.4 m deep depression approximately 10 m in length and 1.5 m in width. Inspection identified the absence of indicators of potential concern including discoloured/stained soil, odorous material or anthropogenic inclusions. The depression was subsequently backfilled by pushing the raised lip of the trench into the depression as shown in a photograph included in **Appendix B**.

Following removal of general rubbish including scrap metal and tree debris the former infantry trench identified as M5 (**Figure 4**) was inspected by JBS personnel on 1 May 2012. The resulting excavation covered an area of approximately 15 m north to south and 2 m east to west with a depth of approximately 1 m. The inspection noted the absence of rubbish within the excavation in addition to the absence of any indicators of potential contamination, including discoloured/stained soil, odorous material or anthropogenic inclusions. Subsequent to clearance of the excavation, material from the adjoining SP5 clean stockpile was used to reinstate the excavation as shown in photographs included in **Appendix B**.

Following the completion of general clearance activities in the RZNRA site, the UXO survey/removal contractors identified the presence of an additional weapons pit on 27 November 2012. It appeared that the pit had previously been backfilled and survey by the UXO contractor identified the presence of metallic features buried at this location. Subsequent excavation to identify the source resulted in the identification of the former pit which comprised a 2 m by 3 m area of disturbance to a depth of approximately 0.7 m. A soil stockpile containing silty clay fill material dark brown and orange brown in colour with wire debris, timber and star pickets was adjacent to the excavation at the time of the JBS inspection as shown in photographs included in **Appendix B**. The excavation was inspected to confirm the absence of visible ACM or other indicators of potential contaminant impact including discolouration/staining or odorous soil conditions.

© 2013 JBS Environmental Pty Ltd

8.2 Stockpile 6 Removal and Footprint Validation

As required by the RAP (Golder 2011), stockpile 6 (SP6) located as shown in **Figure 4** had previously been identified as being soil with ACM fragment inclusions. This stockpile was removed from the site to a licensed waste facility on 21 March 2012 as discussed in **Section 8.6** below.

Following removal of the stockpile, JBS completed an inspection of the former stockpile footprint and collected a representative sample of surface soils within the footprint on 4 April 2012. The analysis results for the validation are presented in **Table D**. The project hygienist reported that a visual clearance of the SP5 and SP6 area was completed on 15th May 2012 (**Appendix F**) to confirm the absence of residual ACM fragments or other foreign materials. JBS completed validation sampling as per the Golder (2011) RAP.

8.3 Soil Remediation Works – AOC2 UXO and SAA Clearance Activities

G-tek Australia Pty Ltd were separately engaged as the specialist UXO subcontractor for the remediation works. The field survey and associated UXO/SAA removal program for the RZNRA site was completed during the period between 1 May to 26 November 2012.

The works methodology and daily records documenting the survey works, including the location of identified UXO and where appropriate, off-site disposal of finds are documented in the standalone report, *Post Activity Report, Unexploded Ordnance, Search and Clearance, Edmondson Park, NSW*, Ref: 11076TRNG, 24 January 2013 (G-tek 2013).

As documented in this report, a shallow instrumented search was completed by qualified and experienced personnel using Minelab F3 equipment fitted with Black Cap across the proposed residential sections of the RZNRA. Field differential GPS (dGPS) units were employed to define 100 m by 100 m survey areas which were then subdivided into four 50 m by 50 m sections and then into 1 m wide lanes marked by surveyors string as shown in photographs included as **Appendix B**. The instrumented search was then implemented for each 1 m 'lane' and any finds removed via digging and separation. The frequency of finds was recorded by lane as a 'dig' with a subsequent description of the item identified as being the metallic source. Where potential explosive ordnance (EO) was identified, the co-ordinates of the specific find were recorded in addition to being identified by lane. A total of 159 full or partial 50 x 50 m sections were completed for the RNZRA site.

For the two proposed local open space areas as shown in **Figure 3**, the search was limited to visual clearance using operators walking 1 m apart in lanes scanning immediately in front of them several. Identifiable items of concern were removed from the search lane during completion of that lane. G-tek noted that, in some instances the vegetation characteristics may have limited the successful identification of finds. A total of 35 full or partial 50 x 50 m sections comprising a total of 4.37 Ha were completed via visual assessment.

Validation of the survey/removal process was completed via implementation of a repeat of the survey process on 10 % of lanes each day. JBS personnel accompanied the UXO technician during several of the QA inspections to verify the process and the outcomes. Completion of the 10 % check is provided on the daily sheets included in G-teck (2013). The implemented works methodology was designed to result in the 100 % clearance of UXO/SAA from the surveyed area.

In brief, the works which included both the instrumented and visual search areas for UXO resulted in the removal of:

- 1 x 81 mm practice mortar shells;
- 3 x mortar shell components (fragments);
- 2 x SMK grenades;
- 13 x 36 mm practice hand grenades;
- 109 x 36 mm hand grenade component (removed by defence);
- 1 x 40 mm hand grenade;
- 930 (approx) x grenade components;

© 2013 JBS Environmental Pty Ltd

- 307 x trip flare components;
- 16 x 3.5 in (89 mm) rocket components and 1 66 mm rocket component;
- 1698 x rocket components (unknown diameter);
- 3 x 303 Blanks;
- Numerous, small arms ammunition cartridge case projectiles; and
- Scrap metal.

One live 36 mm hand grenade was identified at the RZNRA, this in addition to several practice grenades identified on 29-30 August and 18 September 2012 were removed from site and destroyed by Defence personnel. One 81 mm practice mortar, 11 36mm practice hand grenades, live SAA and flare components identified within the RZNRA were held in a store onsite prior to transfer to defence for disposal.

Additional metal objects including small arms ammunition cartridges and ammunition projectiles, were also provided to TRN for off-site disposal. The incidental metal objects included large quantities of star pickets, barbed wire, corrugated iron, car parts, can and various other pieces of discarded metallic waste.

G-tek, upon completion of the field works provided a UXO Works Area Release for RZNRA stating "*it is considered that this Site is safe for the conduct of required use as a residential subdivision*". A copy of this release is included as **Appendix H**.

8.4 Soil Remediation Works – AOC4 Lead Particulate Material

Lead particulate impacted material requiring remediation was identified in the RAP (Golder 2011) as being located in the north-west section of the site as shown in **Figure 4**. The impacted material had been placed in construction of a site access road extending from the north-west site corner along the northern site boundary approximately 400 m.

The extent of lead impacted material was identified during remediation works via reference to the Golder (2011) site plan, inspection of the exposed soils and field screening by G-tek using the UXO metal detectors. TRN subsequently excavated the fill material as shown in photographs included in **Appendix B**. This comprised the stripping of fill material to depths of approximately 0.3 m to 0.5m below former ground levels, resulting in exposure of the natural clayey soils.

Following excavation of the impacted material an inspection of the margins was completed to verify the absence of identifiable lead particulate in addition to field survey using an X-ray fluorescence (XRF) unit. Validation samples were then collected of representative soils at the lateral extent of the excavation at 90 locations (LPN-V001 to LPN-V0822 and LPN-V085 to LPN-V092). In addition a total of 65 excavation base samples were collected (LPN-VB001 to LPN-VB063, and LPN-VB083 to LPN-VB084) as shown in **Figure 6**. The laboratory analytical results are included in **Table E**.

As a result of access limitations associated with construction activities within rail corridor, the lead particulate excavation was not backfilled following completion of the works. Minor re-grading was completed for surface water management.

8.5 Soil Remediation Works – Unexpected Find 04

Tree felling activities on 30 May 2012 identified the presence of suspected ACM fragments in a small pocket of fill material in the RZNRA site as shown in **Figure 4**. JBS inspection documented the area as unexpected find (UF) 04. The material comprised approximately 5 m^3 of gravelly clayey fill material with concrete gravel and asbestos fragment inclusions as shown in photographs included in **Appendix B**.

Following transport of the impacted fill material to the encapsulation area within the CZSRA, a validation inspection was completed on 21 August 2012. The impacted fill material had been scraped back to the extent shown in **Appendix B**. Inspection of the former footprint and surrounds did not identify the presence of visually identifiable ACM in this area of the site. Three validation samples, UF04-V01, UF04-V02 and UF04-V03 were collected of the exposed surface soils and the laboratory analysis results are documented in **Table F**.

© 2013 JBS Environmental Pty Ltd

The project hygienist documented clearance of a former rubble pile for ACM on 24 August 2012 (**Appendix E**).

8.6 Off-site Disposal of Materials

Waste materials retrieved during the remedial works discussed above were placed in bins/stockpiles and removed from the Project 12619 site in conjunction with works completed within the RRZW and CZSRA sites. Details of materials removed are summarised in **Table 8.2** below.

Table 8.2 Summary of Waste Types, Disposal Locations and Dates

Material Type	Waste Facility		Date Range	Total Quantity
	Name	EPL Reference		
Concrete (building and demolition waste)	Botany Building Recyclers Pty Ltd, Banksmeadow	12857 – Waste storage, waste processing (non-thermal treatment)	16/7/2012 - 24/8/2012	374.4 tonnes
Scrap Metal	Complete Metal Industries (CMI), 38 York Rd, Ingleburn	N/A	7/06/2012	112.96 tonnes
Mixed Construction and Demolition Waste	Brandown Pty Ltd, Kemps Creek	12618 – composting, waste storage, resource recovery.	16/03/2012, 06/08/2012 and 31/08/2012	94.135 tonnes
Tyres	Brandown Pty Ltd, Kemps Creek	5186 – waste disposal (application to land)	06/08/2012	163
Asbestos Waste (SP6) - RZNRA	Sita Australia Pty Ltd, Kemps Creek	4068 – waste disposal (application to land)	21/03/2012 ACM	61.14 tonnes
General Solid Waste (PAH impacted material)	Sita Australia Pty Ltd, Kemps Creek	4068 – waste disposal (application to land)	30/5/2012 GSW (PAHs)	92.46 tonnes

The landfill disposal dockets and summaries documenting disposal of the waste material is provided in **Appendix G**.

A portion of the concrete, mixed construction and demolition waste removed as detailed above was collected from within the RZNRA site, including weapons pit construction material, former concrete slabs, and surface waste materials. ACM impacted soil identified as SP6 was also disposed of to landfill during the remediation process.

Waste metal collected during the UXO clearance works was disposed of under the 'mixed construction and demolition waste' category in August 2012. The balance of the waste materials, including the General Solid Waste (PAH impacted material) was collected from other portions of the 12619 project site beyond the RZNRA boundary.

8.7 Groundwater

Prior to the commencement of site remediation works a groundwater monitoring event was completed using existing groundwater monitoring wells. Details of the monitoring event are provided in correspondence included as **Appendix G**.

Following the completion of site remediation works a second groundwater monitoring event was completed for remaining groundwater wells. This second monitoring event is also documented in a stand alone report included in **Appendix G**.

© 2013 JBS Environmental Pty Ltd

9 Laboratory Validation Results

Validation sampling locations for remedial areas are shown in **Figures 6** to **11**. A sample register is presented as Table A, whilst the analytical results for all samples are summarised in **Tables B** to **H**. Laboratory reports and associated documentation is provided in **Appendix E**.

9.1 QA/QC Assessment

Reference is made to the standalone document JBS (2013) titled *Data Quality Indicator Compliance Assessment, Validation Assessment, Landcom Project 12619 Zouch Road, Edmondson Park, NSW* that presents the completed QA/QC assessment for all validation works completed across the 12619 project site, including those completed for the RZNRA area.

As documented in this separate report, the results of the field and laboratory QA/QC program indicate the collected data meets the DQI project requirements and as such the validation data is considered reliable for the purposes of making decisions with respect to the suitability of the land for proposed residential uses.

9.2 Soil Validation Works – AOC1

9.2.1 Validation of Clean Stockpiles

Validation samples were collected at a rate of one per stockpile from SP4, SP5, SP14 and SP15 on 14 March 2013. The laboratory analysis results for these samples are summarised in **Table B**. Concentrations of all contaminants in the four samples were less than the adopted site validation criteria.

9.2.2 Validation of Additional (unexpected find) Stockpiles

Characterisation/validation samples for additional stockpiles UFSP01, UFSP02, UFSP04, UFSP05, UFSP06, UFSP07, UFSP08, UFSP09 and UFSP10 were collected during the period from 4 April to 1 May 2012. The laboratory analysis results for these samples are summarised in **Table C**. Concentrations of all organic contaminants (TPH, BTEX, PAHs, and OCPs) were all less than the adopted site validation criteria.

Individual heavy metal concentrations in each of the validation samples were less than the adopted health based validation criteria. The zinc concentration reported in one sample UFSP06-1, exceeded the adopted ecological investigation criteria of 200 mg/kg with a concentration of 240 mg/kg. All other individual heavy metal concentrations were less than the adopted ecological investigation criteria.

9.2.3 Validation of Former Stockpile SP6 Footprint

Following removal of the SP6 stockpile from the site, a validation sample was collected of the underlying soil within the footprint. Subsequent laboratory analysis results as presented in **Table D** reported contaminant concentrations less than the adopted health based and ecological validation criteria.

9.3 Soil Validation Works – AOC4 Lead Particulate Material

A total of 90 wall validation samples and 65 base validation samples were collected from the lead particulate remediation area in the RZNRA site as described in **Section 8.4**. Lead in soil analysis results for these samples are summarised in **Table E**. Lead concentrations in all base and wall validation samples were significantly less than the adopted validation criterion of
300 mg/kg with a reported population 95% UCL of the mean of 40 mg/kg and a wall sample 95% UCL value of 19 mg/kg.

A summary of the statistical calculation outcomes are included as **Appendix L**.

© 2013 JBS Environmental Pty Ltd

9.4 Soil Remediation Works – Unexpected Find UF4

ACM fragment impacted soil identified as UF4 was validated via inspection and subsequent laboratory analysis of validation samples for asbestos fibres as presented in **Table F**. Three samples, UF04-V1 to UF040-V3 were reported to have asbestos fibre concentrations less than the laboratory limit of reporting, adopted as the site validation criterion.

© 2013 JBS Environmental Pty Ltd

10 Site Characterisation

Based on the decisions required to be made to validate the Site, as discussed in **Section 5**, the outcomes of the remediation/validation works as they relate to Site characterisation are discussed below.

Do contaminant concentrations occur in soils to be retained on site at concentrations above the adopted site validation criteria?

Following completion of remedial works as documented in this validation report and accompanying documentation, site validation has been successfully achieved for UXO and ACM. In addition, validation samples representative of soils retained on site have confirmed contaminant concentrations less than the adopted validation criteria in all instances.

Have all aesthetic issues been addressed?

Aesthetic issues identified at the RZNRA site as reported in Golder (2011) included stockpiled waste materials, remnant lead particulate and other scrap metal within the soil profile and remains of former structures and facilities including raised platforms, concrete slabs and weapons pits.

Based on the results of the clearance activities reported by the UXO and hygienist validation assessments in addition to JBS validation inspections, the aesthetic concerns, including scrap metals, waste materials and former features have been removed from the site. Site UXO removal works have been completed to the standard nominated in the RAP (Golder 2011) for the various portions of the site as discussed below.

Excavation and validation activities have confirmed the absence of significant discoloured, stained and/or odorous soil conditions at the RZNRA site.

Have physical objects, including SAA/UXO and ACM been appropriately cleared from the RZNRA Site to the standard outlined in the RAP?

All waste materials identified during clearance of the RZNRA site have been removed. Stockpiled soil materials were the subject of either landfill disposal (SP6), beneficial reuse backfilling former weapons pits or spread across the ground surface such that they are considered to have been appropriately resolved.

Instrumental UXO clearance has been completed for the RZNRA site footprint other than the proposed local open space areas in the central north of the site and associated with the riparian corridor at the east of the RZNRA (G-tek 2013). A visual clearance of the two local open space areas of the RZNRA has been completed in accordance with Golder (2011). The site footprint has been cleared of SAA/UXO in accordance with the methodology outlined in the RAP and subsequently validated.

Identified areas of ACM impact including SP6, ACM pipework formerly stockpiled at the east extent of the RZNRA site and UF04 were removed from site and the resulting footprint validated.

Are there any materials removed from the RZNRA Site that have not been appropriately characterised and disposed of during the remediation works?

Material removed from the RZNRA site included scrap metal, construction and demolition waste, tyres, lead impacted fill material, ACM impacted fill material, UXO/SAA and timber.

Waste dockets provided by the remediation contractor confirm the off-site disposal of the construction and demolition waste, tyres and scrap metal to appropriately licensed resource recovery facilities. The UXO contractor provided confirmation of the appropriate removal from the site of explosive ordnance by authorised Defence personnel.

Material tracking records and JBS inspections confirm the appropriate transport of ACM impacted material either to the CZSRA site and placement within the stockpile later placed in the encapsulation cell or alternatively transported from the site to a lawful waste facility.

© 2013 JBS Environmental Pty Ltd

Lead impacted material was transported from the RZNRA to the CZSRA and stockpiled for subsequent placement within the encapsulation cell and associated capping footprint.

Where impacted materials are to remain within the RZNRA Site, are the identified contaminants suitable to be encapsulated on-site within a manner which is adequately protective of human health and the environment, including groundwater?

As noted above, validation of the RZNRA site has demonstrated the successful clearance of contaminated soil conditions within the RZNRA site. However, given the UXO removal works were limited in scope within the two proposed local open space areas to a visual inspection of current ground conditions, there is the potential for buried UXO/SAA to remain within these areas.

Has the potential migration of contaminants from the RZNRA Site been appropriately addressed?

Assessment of groundwater conditions at the 12619 project site prior to the commencement of remediation works comprised the installation and sampling of monitoring wells at a broad spacing across the site. Golder (2011) indicated that groundwater in the RZNRA section comprising the northern part of the 12619 project site is situated within the shale/sandstone formation underlying the site and flows in a westerly to north-westerly direction.

The groundwater across the 12619 project site including at two monitoring locations within the RZNRA (BH2 and BH291) prior to remediation of the site was found to have heavy metal concentrations above the adopted ecological assessment criteria (ANZECC 2000 thresholds) during sampling events documented in Golder (2011) and JBS (2012b). However, these were considered to be indicative of background concentrations known to occur within Wianamatta Shale formations rather than a result of historical site activities.

Further sampling of groundwater following the completion of remediation works included sampling of both BH2 at the north-west extent of the RZNRA and BH291 in the central east of the RZNRA. Groundwater contaminant conditions at both sampling locations were generally consistent with those reported prior to the remediation works. These conditions are considered to be representative of regional background conditions. A qualitative assessment of the potential risk of contaminant migration via groundwater has identified the following:

- There was no indication of significant groundwater impacts within the RZNRA site from historical site activities prior to the commencement of remediation works and none have been identified as two monitoring locations representative of conditions at the down-gradient extents of the site;
- Remediation works completed at the site included the removal of contaminant sources including lead impacted surface soils, waste metal debris from the ground surface and buried within former weapons pits, stockpiled waste material from various areas within the Project 12619 site thereby reducing potential contaminant mass sources from the RZNRA site;
- Remedial works included the removal of approximately 104 weapons pits, many of which contained anthropogenic materials and were filled with surface water following wet weather conditions. Removal activities included excavation of anthropogenic materials and appropriate backfilling of the pits with engineered fill such that infiltration of potentially impacted surface water is reduced; and
- The site soils in the vicinity of the CZSRA containment cell and in areas of significant remedial excavations in the CZSRA and RZNRA portions of the site consistent of heavy silty clay of low permeability. Groundwater seepage has been observed at the shale-weathered soil profile and within discontinuities within the deeper shale bedrock. On this basis, the migration of contaminants from the ground surface or relatively near surface material via infiltration and lateral migration is anticipated to occur at very low levels so as to not represent a significant contaminant loading mechanism for the identified heavy metals as contaminants of primary concern with respect to migration.

© 2013 JBS Environmental Pty Ltd

On this basis, there are no unacceptable risks associated with migration of contamination from the RZNRA site following completion of the remediation works.

Where 12619 Project Site and imported materials have been re-used within the RZNRA Site during remediation works, has this been limited to use of materials appropriately validated as suitable for the proposed end use?

Material employed for backfilling remedial excavations and former weapons pits comprised validated, formerly stockpiled site soils sourced from within the RZNRA. Validation to demonstrate the suitability of the material included inspection and complementary laboratory analysis results.

Are there any additional residual contamination (i.e., impacted fill material and/or natural soil) issues on completion of the remediation works that are required to be documented within a RZNRA Site EMP?

There are considered not to be any outstanding issues with respect to site chemical contamination that will require ongoing management under a Site EMP.

As documented in the RAP (Golder 2011) implementation of the limited UXO/SAA clearance within the local open space to conserve the Cumberland bushland vegetation will result in a residual risk of buried UXO/SAA at the site. Management will be limited to potential ground disturbance activities to ensure stakeholders are aware of the potential presence of UXO/SAA which may require clearance prior to ground penetration activities within the two local open space areas which consist of the riparian zone at the east of the RZNRA and the park in the central north section of the RZNRA site as shown in **Figure 2**.

Have remediation works at the RZNRA Site been completed in accordance with the requirements of the RAP (Golder 2011) or where applicable, have variations to the works required by the RAP been completed appropriately to meet the objectives of the RAP?

The requirements of the RAP (Golder 2011) with respect to site remediation and validation works of the RZNRA Site are considered to have been appropriately and successfully completed. In addition, where contamination not previously identified in the RAP was encountered in additional areas of the site, including additional weapons pits, asbestos finds, etc during remediation activities, implementation of appropriate additional assessment, remedial actions and validation was successfully implemented such that objectives of the RAP with respect to the RZNRA have been achieved.

Is the RZNRA Site suitable for the proposed uses?

Based on the results of the observations, analytical results for validation samples and subject to the limitations presented in **Section 12**, it is concluded that the RZNRA site is suitable for the proposed residential use with accessible soils subject to implementation of an environmental management plan (EMP) for those portions of the RZNRA site where UXO/SAA clearance was limited to a visual inspection as shown in **Figure 3**.

© 2013 JBS Environmental Pty Ltd

11 Conclusions

11.1 Conclusions

Based on the results of the observations and analytical results and subject to the limitations presented in **Section 12,** it is concluded that successful completion of the pending works, the Site has been remediated and validated in general accordance with the RAP (JBS 2011b). The Site is therefore suitable for the proposed residential use with accessible soils use contingent upon the application of the Site Environmental Management Plan (EMP) to address residual buried UXO/SAA risks within two bushland conservation/local open space areas (as shown on **Figure 3**) at the RZNRA site.

© 2013 JBS Environmental Pty Ltd

12 Limitations

This report has been prepared for use by the client who commissioned the works in accordance with the project brief only, and has been based in part on information obtained from the client and other parties. The report has been prepared specifically for the client for the purposes of the commission. No warranties, express or implied, are offered to any third parties and no liability will be accepted for use or interpretation of this report by any third party.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose. This report should not be reproduced without prior approval by the client, or amended in any way without prior approval by JBS Environmental Pty Ltd.

Limited sampling and laboratory analyses were undertaken as part of the investigations reviewed, as described herein. Ground conditions between sampling locations and media may vary, and this should be considered when extrapolating between sampling points. Chemical analytes are based on the information detailed in the site history. Further chemicals or categories of chemicals may exist at the site, which were not identified in the site history and which may not be expected at the site.

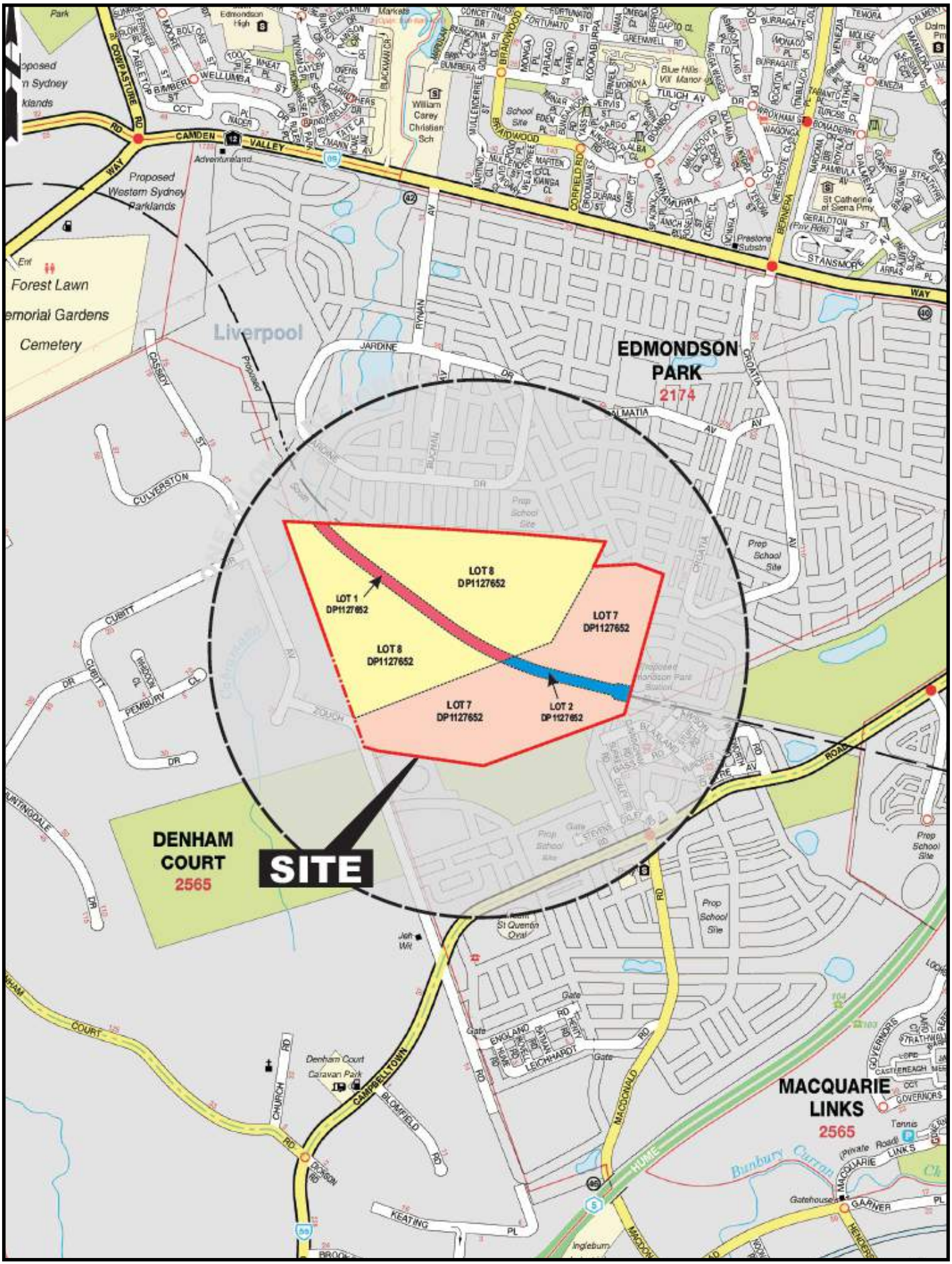
Changes to the subsurface conditions may occur subsequent to the investigations described herein, through natural processes or through the intentional or accidental addition of contaminants. The conclusions and recommendations reached in this report are based on the information obtained at the time of the investigations.

This report does not provide a complete assessment of the environmental status of the site, and it is limited to the scope defined herein. Should information become available regarding conditions at the site including previously unknown sources of contamination, JBS Environmental Pty Ltd reserves the right to review the report in the context of the additional information.

© 2013 JBS Environmental Pty Ltd

Figures

© 2013 JBS Environmental Pty Ltd



Source: © Golder Associates Pty Ltd, Project No 107623047, Doc No 001, Figure No F0001, Rev No 0, 27-08-2010

© 2013 JBS Environmental Pty Ltd

0 200 400 800 m

Scale: Approximate

Datum: MGA94 Zone 56 - AHD

Rev	Description	Drn.	Date
A4			
A	Original Issue - R02	SE	05-03-2013

Legend:

Approximate Site Boundary

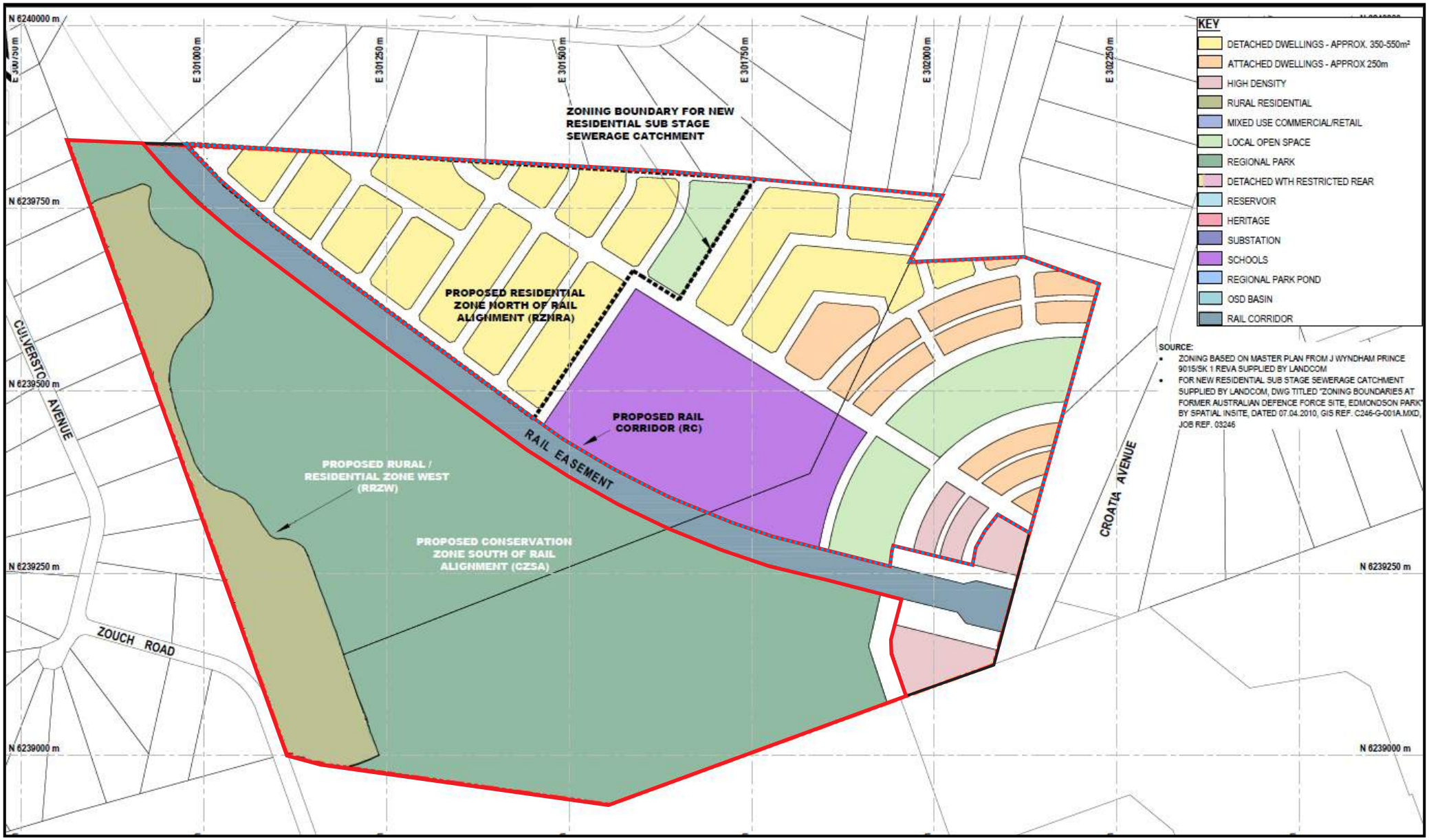
JBS ENVIRONMENTAL

Figure 1: Site Location and Current Cadastral Boundaries

Client: Landcom

Project: Zouch Rd, Edmondson Park Remediation

Job No: 41945 File Name: 41945_01



Source: Base Image - © Golder Associates Pty Ltd, Project No 107623047, Doc No 001, Figure No F0002, Rev No 0, 27-08-2010

© 2013 JBS Environmental Pty Ltd

0 75 150 300 m

Scale: Approximate

Datum: MGA94 Zone 56 - AHD

Rev	Description	Drn.	Date
A4			
A	Original Issue - R02	SE	05-03-2013

Legend:

- Approximate Project Site Boundary (Rail Easement Excluded)
- RZNRA Boundary

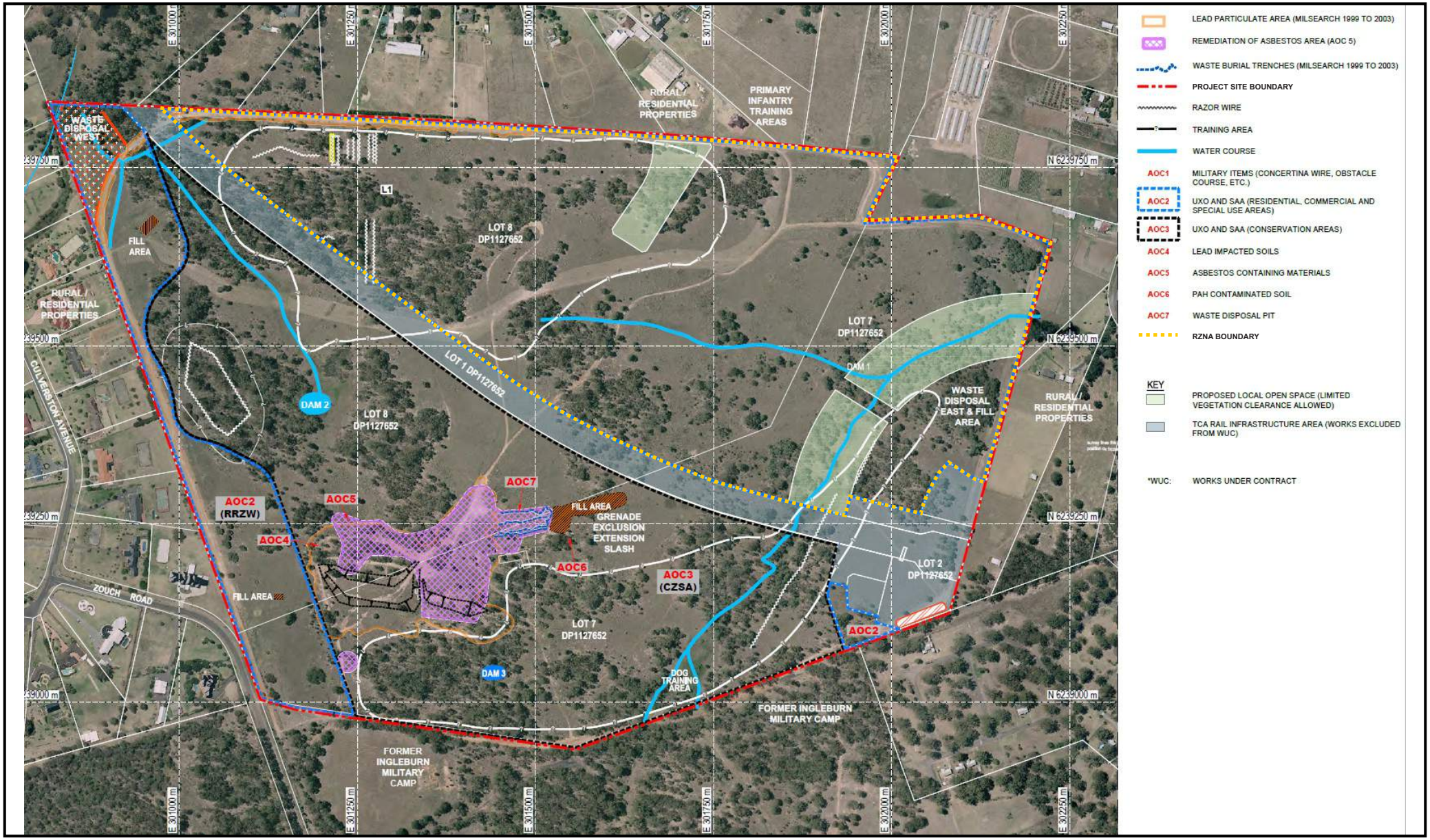
JBS ENVIRONMENTAL

Figure 2: Proposed Site Layout and Development Areas

Client: Landcom

Project: Zouch Rd, Edmondson Park Remediation

Job No: 41945 File Name: 41945_02



Source: Base Image - © Golder Associates Pty Ltd, Project No 107623047, Doc No 600_001, Figure No F0001, Rev No 0, 20-09-2010

© 2013 JBS Environmental Pty Ltd

0 75 150 300 m
Scale: Approximate

Datum: MGA94 Zone 56 - AHD

Rev	Description	Drn.	Date
A4			
A	Original Issue - R02	SE	05-03-2013

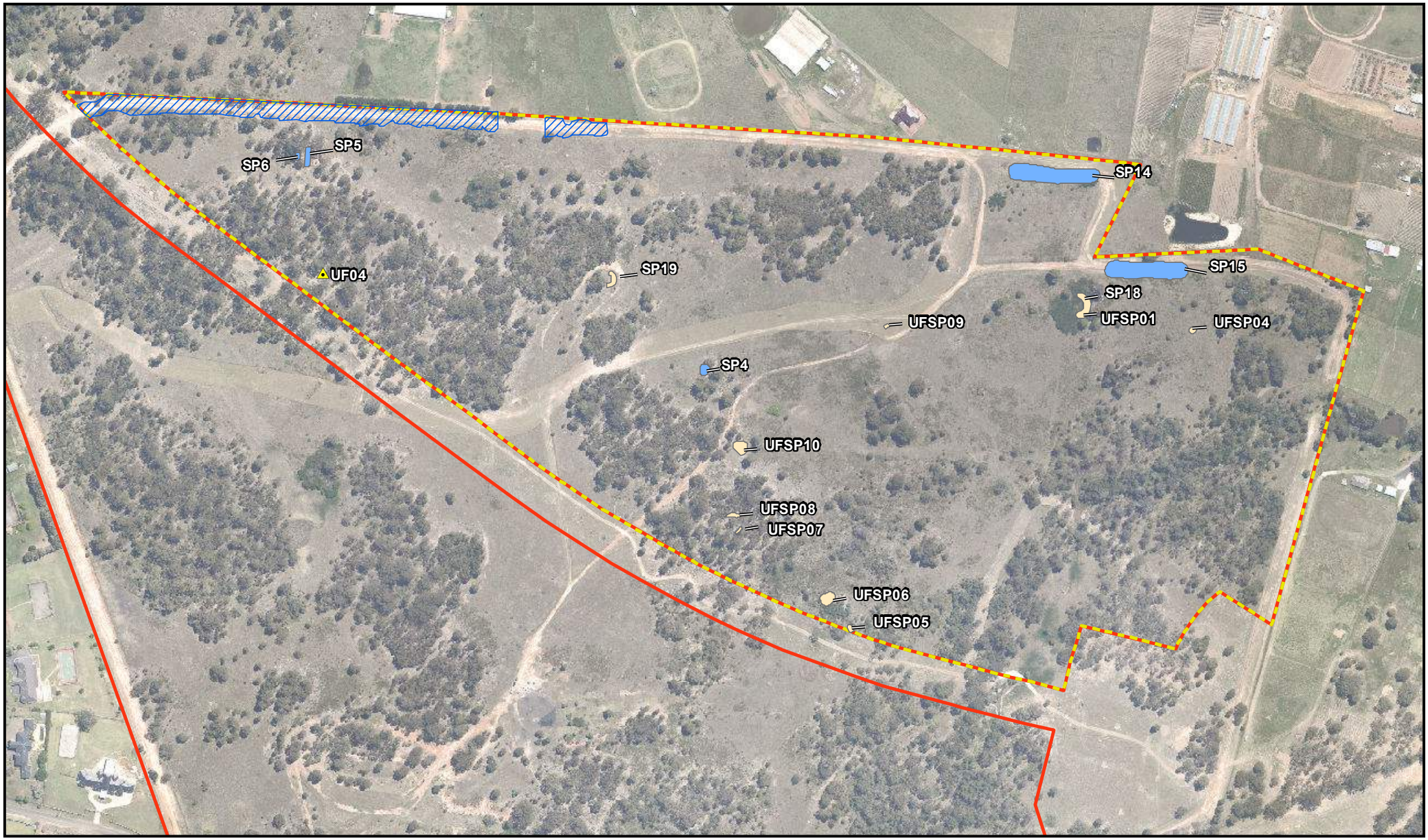
JBS ENVIRONMENTAL

Figure 3: Pre-remediation Site Layout and Areas of Environmental Concern

Client: Landcom

Project: Zouch Rd, Edmondson Park Remediation

Job No: 41945 File Name: 41945_03



Source: Base Image: Hypertiles - Nearmap 23-10-2011

© 2013 JBS Environmental Pty Ltd

0 50 100 200 m

Scale: 1:6,000

Datum: MGA94 Zone 56 - AHD

Rev	Description	Drn.	Date:
A4			
A	Original Issue - R02	SE	18-03-2013

Legend:

- Approximate Project Boundary
- Approximate RZNRA Boundary
- Clean Stockpile Location
- Additional Stockpile Location
- Approximate Lead Particulate Norht Remediation Extent
- Unnexpected Find Location

JBS ENVIRONMENTAL

Figure 5: Remeidal Works Location Overview

Client: Landcom

Project: Landcom, 12619 Zouch Rd, Edmondson Park, NSW

Job No: 41945 File Name: 41945_05

Source: Base Image: Hypertiles - Nearmap 23-10-2011

© 2013 JBS Environmental Pty Ltd

0 10 20 40 m

Scale: 1:6,000

Datum: MGA94 Zone 56 - AHD

Rev	Description	Drn.	Date:
A4			
A	Original Issue - R02	SE	18-03-2013

Legend:

- Approximate Project Boundary
- Approximate RZNRA Boundary
- Approximate Lead Particulate Norht Remediation Extent
- Lead Particualte Excavation Validation Sample Locations

JBS ENVIRONMENTAL

Figure 6: Lead Particulate Excavation Validation Sample Locatoins

Client: Landcom

Project: Landcom, 12619 Zouch Rd, Edmondson Park, NSW

Job No: 41945 File Name: 41945_06

Tables

© 2013 JBS Environmental Pty Ltd

Landcom
Job Number: 41945
Zouch Road, Edmondson Park, NSW
RZNRA Site Validation Assessment
Table A: Primary Sample Register

							Soil												Water					
							TPH (C6-C9)	TPH (C10-C36)	BTEX Compounds	Lead	PAHs	8 Heavy Metals	OPPs	OCPs	Asbestos	PCBs	Total Phenols	TCLP (PAH)	TPH (C6-C9)	TPH (C10-C36)	BTEX Compounds	PAHs	Heavy Metals	Lead
Sample Identification	**Site Location**	**Sample Date**	**Matrix Type**	**Matrix Description**	**Sample Purpose**	**Lab Rpt Ref**																		
Pre-remediation GME																								
BH558	CZSA	10/02/2012	Water	-	pre-remediation GME	68855													X		X			
BH608	CZSA	10/02/2012	Water	-	pre-remediation GME	68855														X	X	X	X	
BH291	RZNRA	9/02/2012	Water	-	pre-remediation GME	68855														X	X	X	X	
BH521	RRZW	9/02/2012	Water	-	pre-remediation GME	68855														X	X	X	X	
BH2	RZNRA	10/02/2012	Water	-	pre-remediation GME	68855														X	X	X	X	
PSW1	Rail Corridor	26/03/2012	Water	-	Pooled surface water	70910													X	X	X		X	
BH2	RZNRA	26/03/2012	Water	-	GW resample	70910													X	X	X		X	
Stockpile Characterisation Sampling																								
SP4-1	RZNRA	14/03/2012	Soil	Silty clay	Characterisation	70384	X	X	X		X	X		X	X									
SP5-1	RZNRA	14/03/2012	Soil	Silty clay	Characterisation	70384	X	X	X		X	X		X	X									
SP14-1	RZNRA	14/03/2012	Soil	Silty clay	Characterisation	70384	X	X	X		X	X		X	X									
SP15-1	RZNRA	14/03/2012	Soil	Silty clay	Characterisation	70384	X	X	X		X	X		X	X									
Additional (Unexpected Find) Stockpiles																								
SP19-1 (UFSP02)	RZNRA	4/04/2012	Soil	Silty clay	UFSP characterisation	71443	X	X	X		X	X		X	X									
SP18-3 (UFSP01)	RZNRA	4/04/2012	Soil	Silty clay	UFSP characterisation	71443	X	X	X		X	X		X	X									
UFSP04-1 (0.5m)	RZNRA	11/04/2012	Soil	Silty sandy clay	UFSP characterisation	71679	X	X	X		X	X		X	X									
UFSP05-1 (1.0m)	RZNRA	11/04/2012	Soil	Silty clay	UFSP characterisation	71679	X	X	X		X	X		X	X									
UFSP06-1 (1.0m)	RZNRA	11/04/2012	Soil	Silty clay	UFSP characterisation	71679	X	X	X		X	X		X	X									
UFSP06-2 (1.0m)	RZNRA	11/04/2012	Soil	Silty clay	UFSP characterisation	71679	X	X	X		X	X		X	X									
UFSP07-1 (0.4m)	RZNRA	11/04/2012	Soil	Silty clay	UFSP characterisation	71679	X	X	X		X	X		X	X									
UFSP08-1 (0.4m)	RZNRA	11/04/2012	Soil	Silty clay	UFSP characterisation	71679	X	X	X		X	X		X	X									
UFSP10-1 (0.5m)	RZNRA	1/05/2012	Soil	Silty clay	UFSP characterisation	72549	X	X	X		X	X		X	X									
UFSP09-1 (0.3m)	RZNRA	1/05/2012	Soil	Silty clay	UFSP characterisation	72549	X	X	X		X	X		X	X									
Stockpile Footprint Validation Sample																								
SP6-V1	RZNRA	4/04/2012	Soil	Silty clay	SP6 footprint validation	71442	X	X	X		X	X			X									
Lead Particulate North validation																								
LPN-V001	RZNRA	7/05/2012	Soil	Silty clay	Lead Particulate North Validation	72895				X														
LPN-VB001	RZNRA	7/05/2012	Soil	Silty clay	Lead Particulate North Validation	72895				X														
LPN-VB002	RZNRA	7/05/2012	Soil	Silty clay	Lead Particulate North Validation	72895				X														
LPN-V002	RZNRA	7/05/2012	Soil	Silty clay	Lead Particulate North Validation	72895				X														
LPN-V003	RZNRA	7/05/2012	Soil	Silty clay	Lead Particulate North Validation	72895				X														
LPN-VB003	RZNRA	7/05/2012	Soil	Silty clay	Lead Particulate North Validation	72895				X														
LPN-V004	RZNRA	7/05/2012	Soil	Silty clay	Lead Particulate North Validation	72895				X														
LPN-VB004	RZNRA	8/05/2012	Soil	Silty clay	Lead Particulate North Validation	72958				X														
LPN-VB006	RZNRA	8/05/2012	Soil	Silty clay	Lead Particulate North Validation	72958				X														
LPN-V006	RZNRA	8/05/2012	Soil	Silty clay	Lead Particulate North Validation	72958				X														
LPN-V008	RZNRA	8/05/2012	Soil	Silty clay	Lead Particulate North Validation	72958				X														
LPN-V009	RZNRA	8/05/2012	Soil	Silty clay	Lead Particulate North Validation	72958				X														
LPN-V010	RZNRA	9/05/2012	Soil	Silty clay	Lead Particulate North Validation	73031				X														
LPN-V012	RZNRA	9/05/2012	Soil	Silty clay	Lead Particulate North Validation	73031				X														
LPN-V013	RZNRA	9/05/2012	Soil	Silty clay	Lead Particulate North Validation	73031				X														
LPN-V014	RZNRA	9/05/2012	Soil	Silty clay	Lead Particulate North Validation	73031				X														
LPN-V015	RZNRA	9/05/2012	Soil	Silty clay	Lead Particulate North Validation	73031				X														
LPN-V016	RZNRA	9/05/2012	Soil	Silty clay	Lead Particulate North Validation	73031				X														
LPN-V017	RZNRA	10/05/2012	Soil	Silty clay	Lead Particulate North Validation	73031				X														
LPN-V018	RZNRA	10/05/2012	Soil	Silty clay	Lead Particulate North Validation	73031				X														
LPN-V019	RZNRA	10/05/2012	Soil	Silty clay	Lead Particulate North Validation	73031				X														
LPN-V020	RZNRA	10/05/2012	Soil	Silty clay	Lead Particulate North Validation	73031				X														
LPN-V021	RZNRA	10/05/2012	Soil	Silty clay	Lead Particulate North Validation	73031				X														
LPN-VB013	RZNRA	11/05/2012	Soil	Silty clay	Lead Particulate North Validation	73229				X														
LPN-VB014	RZNRA	11/05/2012	Soil	Silty clay	Lead Particulate North Validation	73229				X														
LPN-VB015	RZNRA	11/05/2012	Soil	Silty clay	Lead Particulate North Validation	73229				X														
LPN-VB016	RZNRA	11/05/2012	Soil	Silty clay	Lead Particulate North Validation	73229				X														
LPN-VB017	RZNRA	11/05/2012	Soil	Silty clay	Lead Particulate North Validation	73229				X														
LPN-VB018	RZNRA	12/05/2012	Soil	Silty clay	Lead Particulate North Validation	73229				X														
LPN-VB019	RZNRA	12/05/2012	Soil	Silty clay	Lead Particulate North Validation	73229				X														
LPN-VB020	RZNRA	12/05/2012	Soil	Silty clay	Lead Particulate North Validation	73229				X														
LPN-VB021	RZNRA	12/05/2012	Soil	Silty clay	Lead Particulate North Validation	73229				X														
LPN-VB022	RZNRA	12/05/2012	Soil	Silty clay	Lead Particulate North Validation	73229				X														
LPN-VB023	RZNRA	12/05/2012	Soil	Silty clay	Lead Particulate North Validation	73229				X														
LPN-V005	RZNRA	10/05/2012	Soil	Silty clay	Lead Particulate North Validation	73147				X														
LPN-V007	RZNRA	10/05/2012	Soil	Silty clay	Lead Particulate North Validation	73147				X														
LPN-VB005	RZNRA	10/05/2012	Soil	Silty clay	Lead Particulate North Validation	73147				X														
LPN-VB007	RZNRA	10/05/2012	Soil	Silty clay	Lead Particulate North Validation	73147				X														
LPN-V011	RZNRA	10/05/2012	Soil	Silty clay	Lead Particulate North Validation	73147				X														
LPN-VB008	RZNRA	10/05/2012	Soil	Silty clay	Lead Particulate North Validation	73147				X														
LPN-VB009	RZNRA	10/05/2012	Soil	Silty clay	Lead Particulate North Validation	73147				X														
LPN-V022	RZNRA	10/05/2012	Soil	Silty clay	Lead Particulate North Validation	73147				X														
LPN-VB010	RZNRA	10/05/2012	Soil	Silty clay	Lead Particulate North Validation	73147				X														
LPN-VB011	RZNRA	10/05/2012	Soil	Silty clay	Lead Particulate North Validation	73147				X														
LPN-VB012	RZNRA	10/05/2012	Soil	Silty clay	Lead Particulate North Validation	73147				X														
LPN-V023	RZNRA	14/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-V024	RZNRA	14/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-V025	RZNRA	14/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-VB025	RZNRA	14/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-VB024	RZNRA	14/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-V026	RZNRA	14/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-V027	RZNRA	14/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-V028	RZNRA	14/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-V029	RZNRA	14/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-V030	RZNRA	14/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-V031	RZNRA	14/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-V032	RZNRA	14/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-VB026	RZNRA	15/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-V034	RZNRA	15/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-V035	RZNRA	15/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-V036	RZNRA	15/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-VB027	RZNRA	15/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-VB028	RZNRA	15/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-VB029	RZNRA	15/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-V037	RZNRA	15/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-V038	RZNRA	15/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-V039	RZNRA	15/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-VB030	RZNRA	15/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-VB031	RZNRA	15/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-V040	RZNRA	15/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-V041	RZNRA	15/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-VB032	RZNRA	15/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-VB033	RZNRA	15/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-VB034	RZNRA	15/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-VB035	RZNRA	15/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-V042	RZNRA	15/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-V043	RZNRA	15/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-V044	RZNRA	15/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-V045	RZNRA	15/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-V046	RZNRA	15/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-V053	RZNRA	16/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-V054	RZNRA	16/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-VB036	RZNRA	16/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-VB037	RZNRA	16/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-V056	RZNRA	16/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-V055	RZNRA	16/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-VB038	RZNRA	16/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-V033	RZNRA	16/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-V057	RZNRA	16/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-V058	RZNRA	16/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-V059	RZNRA	16/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-V047	RZNRA	16/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-V048	RZNRA	16/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-V049	RZNRA	16/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-V050	RZNRA	16/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-V051	RZNRA	16/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-V052	RZNRA	16/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-V060	RZNRA	16/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-V061	RZNRA	16/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-VB039	RZNRA	16/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-V062	RZNRA	16/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														

Landcom
Job Number: 41945
Zouch Road, Edmondson Park, NSW
RZNRA Site Validation Assessment
Table A: Primary Sample Register

							Soil												Water					
							TPH (C6-C9)	TPH (C10-C36)	BTEX Compounds	Lead	PAHs	8 Heavy Metals	OPPs	OCPs	Asbestos	PCBs	Total Phenols	TCLP (PAH)	TPH (C6-C9)	TPH (C10-C36)	BTEX Compounds	PAHs	Heavy Metals	Lead
Sample Identification	**Site Location**	**Sample Date**	**Matrix Type**	**Matrix Description**	**Sample Purpose**	**Lab Rpt Ref**																		
LPN-V063	RZNRA	16/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-VB040	RZNRA	16/05/2012	Soil	Silty clay	Lead Particulate North Validation	73437				X														
LPN-VB041	RZNRA	17/05/2012	Soil	Silty clay	Lead Particulate North Validation	73480				X														
LPN-VB042	RZNRA	17/05/2012	Soil	Silty clay	Lead Particulate North Validation	73480				X														
LPN-V064	RZNRA	17/05/2012	Soil	Silty clay	Lead Particulate North Validation	73480				X														
LPN-V065	RZNRA	17/05/2012	Soil	Silty clay	Lead Particulate North Validation	73480				X														
LPN-VB043	RZNRA	17/05/2012	Soil	Silty clay	Lead Particulate North Validation	73480				X														
LPN-VB044	RZNRA	17/05/2012	Soil	Silty clay	Lead Particulate North Validation	73480				X														
LPN-V066	RZNRA	17/05/2012	Soil	Silty clay	Lead Particulate North Validation	73480				X														
LPN-V067	RZNRA	17/05/2012	Soil	Silty clay	Lead Particulate North Validation	73480				X														
LPN-VB045	RZNRA	17/05/2012	Soil	Silty clay	Lead Particulate North Validation	73480				X														
LPN-V068	RZNRA	17/05/2012	Soil	Silty clay	Lead Particulate North Validation	73480				X														
LPN-V069	RZNRA	17/05/2012	Soil	Silty clay	Lead Particulate North Validation	73480				X														
LPN-VB046	RZNRA	17/05/2012	Soil	Silty clay	Lead Particulate North Validation	73480				X														
LPN-V070	RZNRA	17/05/2012	Soil	Silty clay	Lead Particulate North Validation	73480				X														
LPN-V071	RZNRA	17/05/2012	Soil	Silty clay	Lead Particulate North Validation	73480				X														
LPN-V072	RZNRA	17/05/2012	Soil	Silty clay	Lead Particulate North Validation	73607				X														
LPN-V073	RZNRA	17/05/2012	Soil	Silty clay	Lead Particulate North Validation	73607				X														
LPN-V075	RZNRA	17/05/2012	Soil	Silty clay	Lead Particulate North Validation	73607				X														
LPN-V077	RZNRA	18/05/2012	Soil	Silty clay	Lead Particulate North Validation	73607				X														
LPN-V078	RZNRA	18/05/2012	Soil	Silty clay	Lead Particulate North Validation	73607				X														
LPN-V080	RZNRA	21/05/2012	Soil	Silty clay	Lead Particulate North Validation	73702				X														
LPN-V081	RZNRA	21/05/2012	Soil	Silty clay	Lead Particulate North Validation	73702				X														
LPN-V082	RZNRA	21/05/2012	Soil	Silty clay	Lead Particulate North Validation	73702				X														
LPN-VB083	RZNRA	21/05/2012	Soil	Silty clay	Lead Particulate North Validation	73702				X														
LPN-VB084	RZNRA	21/05/2012	Soil	Silty clay	Lead Particulate North Validation	73702				X														
LPN-V085	RZNRA	21/05/2012	Soil	Silty clay	Lead Particulate North Validation	73702				X														
LPN-V086	RZNRA	21/05/2012	Soil	Silty clay	Lead Particulate North Validation	73702				X														
LPN-V087	RZNRA	21/05/2012	Soil	Silty clay	Lead Particulate North Validation	73702				X														
LPN-V088	RZNRA	21/05/2012	Soil	Silty clay	Lead Particulate North Validation	73702				X														
LPN-V090	RZNRA	21/05/2012	Soil	Silty clay	Lead Particulate North Validation	73702				X														
LPN-V092	RZNRA	21/05/2012	Soil	Silty clay	Lead Particulate North Validation	73702				X														
LPN-VB047	RZNRA	21/05/2012	Soil	Silty clay	Lead Particulate North Validation	73702				X														
LPN-VB048	RZNRA	21/05/2012	Soil	Silty clay	Lead Particulate North Validation	73702				X														
LPN-VB049	RZNRA	21/05/2012	Soil	Silty clay	Lead Particulate North Validation	73702				X														
LPN-V089	RZNRA	21/05/2012	Soil	Silty clay	Lead Particulate North Validation	73701				X														
LPN-V091	RZNRA	21/05/2012	Soil	Silty clay	Lead Particulate North Validation	73701				X														
LPN-VB052	RZNRA	21/05/2012	Soil	Silty clay	Lead Particulate North Validation	73701				X														
LPN-VB053	RZNRA	21/05/2012	Soil	Silty clay	Lead Particulate North Validation	73701				X														
LPN-VB054	RZNRA	21/05/2012	Soil	Silty clay	Lead Particulate North Validation	73701				X														
LPN-VB055	RZNRA	21/05/2012	Soil	Silty clay	Lead Particulate North Validation	73701				X														
LPN-VB056	RZNRA	21/05/2012	Soil	Silty clay	Lead Particulate North Validation	73701				X														
LPN-VB057	RZNRA	21/05/2012	Soil	Silty clay	Lead Particulate North Validation	73701				X														
LPN-VB058	RZNRA	21/05/2012	Soil	Silty clay	Lead Particulate North Validation	73701				X														
LPN-VB050 (51)	RZNRA	21/05/2012	Soil	Silty clay	Lead Particulate North Validation	73701				X														
LPN-V076	RZNRA	21/05/2012	Soil	Silty clay	Lead Particulate North Validation	73701				X														
LPN-V074	RZNRA	21/05/2012	Soil	Silty clay	Lead Particulate North Validation	73701				X														
LPN-VB061	RZNRA	21/05/2012	Soil	Silty clay	Lead Particulate North Validation	73701				X														
LPN-VB062	RZNRA	21/05/2012	Soil	Silty clay	Lead Particulate North Validation	73701				X														
LPN-VB063	RZNRA	21/05/2012	Soil	Silty clay	Lead Particulate North Validation	73701				X														
LPN-VB059	RZNRA	21/05/2012	Soil	Silty clay	Lead Particulate North Validation	73701				X														
LPN-VB060	RZNRA	21/05/2012	Soil	Silty clay	Lead Particulate North Validation	73701				X														
LPN-VB050	RZNRA	22/05/2012	Soil	Silty clay	Lead Particulate North Validation	73843				X														
LPN-V079	RZNRA	22/05/2012	Soil	Silty clay	Lead Particulate North Validation	73843				X														
UF04 - Asbestos Find Validation																								
UF04-V1	RZNRA	21/08/2012	Soil	Silty clay	Validation samples	77808									X									
UF04-V2	RZNRA	21/08/2012	Soil	Silty clay	Validation samples	77808									X									
UF04-V3	RZNRA	21/08/2012	Soil	Silty clay	Validation samples	77808									X									
Post-remediation GME																								
BH558	CZSA	16/10/2012	Water	-	post-remediation GME	68855													X		X		X	
BH2	RZNRA	16/10/2012	Water	-	post-remediation GME	68855													X	X	X	X	X	
BH291	RZNRA	16/10/2012	Water	-	post-remediation GME	68855													X	X	X	X	X	
Number of Primary Samples Analysed							**15**	**15**	**15**	**155**	**15**	**15**	**0**	**14**	**18**	**0**	**0**	**0**	**6**	**8**	**10**	**6**	**9**	**0**

Landcom
Job Number: 41945
Zouch Road, Edmondson Park, NSW
RZNRA Site Validation Assessment
Table B: Summary of Laboratory Analysis Results - Clean Stockpile Validation

Refer to Text Section 7.1 for Source of Validation Criteria
10 Value Exceeds Validation Criterion - Interim Urban Ecological Investigation Levels
100 Value Exceeds Validation Criterion - Health Based (Residential with Accessible Soil)

			Metals								BTEX				TPH					PAHs		Organochlorine Pesticides															
			Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc	Benzene	Ethylbenzene	Toluene	Xylene Total	C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of total)	Benzo(a)pyrene	Total PAHs	a-BHC	Aldrin + Dieldrin	b-BHC	Chlordane (cis + trans)	d-BHC	DDT+DDE+DDD	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Methoxychlor	Asbestos In Soil
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	g/kg
EQL			4	0.5	1	1	1	0.1	1	1	0.2	1	0.5		25	50	100	100		0.05	1.55	0.1		0.1	0.2	0.1		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1) Assessment Criteria - Health Based (residential)			100	20	12%	1000	300	15	600	7000										1	20		10		50		200							10			0.1
2) Assessment Criteria - Phytotoxicity Based			20	3	400	100	600	1	60	200																										
3) Assessment Criteria - Service Station Guidelines (EPA 1994)							300				1	50	130	25	65				1000																	
Field_ID	**Sampled_Date**	**Matrix_Description**																																			
SP4-1	14/03/2012	Silty Clay	6	<0.5	13	27	20	<0.1	9	49	<0.2	<1	<0.5	<3	<25	<50	<100	<100	<250	<0.05	<1.55	<0.1	<0.2	<0.1	<0.2	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
SP5-1	14/03/2012	Silty Clay	6	<0.5	17	16	20	<0.1	7	33	<0.2	<1	<0.5	<3	<25	<50	<100	<100	<250	<0.05	<1.55	<0.1	<0.2	<0.1	<0.2	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
SP14-1	14/03/2012	Silty Clay	7	<0.5	15	22	14	<0.1	5	26	<0.2	<1	<0.5	<3	<25	<50	<100	<100	<250	<0.05	<1.55	<0.1	<0.2	<0.1	<0.2	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
SP15-1	14/03/2012	Silty Clay	8	<0.5	18	16	23	<0.1	8	32	<0.2	<1	<0.5	<3	<25	<50	<100	<100	<250	<0.05	<1.55	<0.1	<0.2	<0.1	<0.2	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Landcom
Job Number: 41945
Zouch Road, Edmondson Park, NSW
RZNRA Site Validation Assessment
Table C: Summary of Laboratory Analysis Results - Additional Stockpile Validations

Refer to Text Section 7.1 for Source of Validation Criteria

10	Value Exceeds Validation Criterion - Interim Urban Ecological Investigation Levels
100	Value Exceeds Validation Criterion - Health Based (Residential with Accessible Soil)

				Metals								**BTEX**				**TPH**					**PAHs**		**Organochlorine Pesticides**																		
				Arsenic	**Cadmium**	**Chromium (III+VI)**	**Copper**	**Lead**	**Mercury**	**Nickel**	**Zinc**	**Benzene**	**Ethylbenzene**	**Toluene**	**Xylene Total**	**C6 - C9**	**C10 - C14**	**C15 - C28**	**C29-C36**	**+C10 - C36 (Sum of total)**	**Benzo(a)pyrene**	**Total PAHs**	**a-BHC**	**Aldrin + Dieldrin**	**b-BHC**	**Chlordane (cis + trans)**	**d-BHC**	**DDT+DDE+DDD**	**Endosulfan I**	**Endosulfan II**	**Endosulfan sulphate**	**Endrin**	**Endrin aldehyde**	**g-BHC (Lindane)**	**Heptachlor**	**Heptachlor epoxide**	**Methoxychlor**	**Asbestos In Soil**
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	g/kg
EQL				4	0.5	1	1	1	0.1	1	1	0.2	1	0.5		25	50	100	100		0.05	1.55	0.1		0.1	0.2	0.1		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1) Assessment Criteria - Health Based (residential)				100	20	12%	1000	300	15	600	7000										1	20		10		50		200							10			0.1
2) Assessment Criteria - Phytotoxicity Based				20	3	400	100	600	1	60	200																												
3) Assessment Criteria - Service Station Guidelines (EPA 1994)								300				1	50	130	25	65				1000																			
Field_ID	**Sample Depth (m)**	**Sampled_Date**	**Matrix_Description**																																				
SP18-3 (UFSP01)	0.6	4/04/2012	Silty clay	9	<0.5	16	15	22	<0.1	8	27	<0.2	<1	<0.5	<3	<25	<50	<100	<100	<250	<0.05	<1.55	<0.1	<0.2	<0.1	<0.2	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
SP19-1 (UFSP02)	0.3	4/04/2012	Silty clay	<4	<0.5	7	5	12	<0.1	4	17	<0.2	<1	<0.5	<3	<25	<50	<100	<100	<250	<0.05	<1.55	<0.1	<0.2	<0.1	<0.2	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
UFSP04-1	0.5	11/04/2012	Silty sandy clay	<4	<0.5	6	23	50	<0.1	4	44	<0.2	<1	<0.5	<3	<25	<50	<100	<100	<250	<0.05	0.46	<0.1	<0.2	<0.1	<0.2	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
UFSP05-1	1.0	11/04/2012	Silty clay	6	<0.5	17	17	26	<0.1	7	160	<0.2	<1	<0.5	<3	<25	<50	<100	<100	<250	<0.05	<1.55	<0.1	<0.2	<0.1	<0.2	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
UFSP06-1	1.0	11/04/2012	Silty clay	6	<0.5	20	15	29	<0.1	7	**240**	<0.2	<1	<0.5	<3	<25	<50	<100	<100	<250	<0.05	<1.55	<0.1	<0.2	<0.1	<0.2	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
UFSP06-2	1.0	11/04/2012	Silty clay	6	<0.5	20	15	29	<0.1	7	180	<0.2	<1	<0.5	<3	<25	<50	<100	<100	<250	<0.05	<1.55	<0.1	<0.2	<0.1	<0.2	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
UFSP07-1	0.4	11/04/2012	Silty clay	<4	<0.5	15	16	20	<0.1	8	33	<0.2	<1	<0.5	<3	<25	<50	<100	<100	<250	<0.05	<1.55	<0.1	<0.2	<0.1	<0.2	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
UFSP08-1	0.4	11/04/2012	Silty clay	<4	<0.5	16	17	20	<0.1	8	34	<0.2	<1	<0.5	<3	<25	<50	<100	<100	<250	<0.05	<1.55	<0.1	<0.2	<0.1	<0.2	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
UFSP10-1 (0.5m)	1	1/05/2012	Silty clay	8	<0.5	15	20	74	<0.1	12	55	<0.2	<1	<0.5	<3																								<0.1
UFSP09-1 (0.3m)	1	1/05/2012	Silty clay	6	<0.5	17	18	23	<0.1	9	56	<0.2	<1	<0.5	<3																								<0.1

Landcom
Job Number: 41945
Zouch Road, Edmondson Park, NSW
RZNRA Site Validation Assessment
Table D: Summary of Laboratory Analysis Results - Stockpile Footprint Validation Samples

Refer to Text Section 7.1 for Source of Validation Criteria

10 Value Exceeds Validation Criterion - Interim Urban Ecological Investigation Levels

100 Value Exceeds Validation Criterion - Health Based (Residential with Accessible Soil)

				Metals							BTEX				TPH					PAHs		
				Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc	Benzene	Ethylbenzene	Toluene	Xylene Total	C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of total)	Benzo(a)pyrene	Total PAHs	Asbestos In Soil
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	g/kg
EQL				4	0.5	1	1	1	0.1	1	1	0.2	1	0.5		25	50	100	100		0.05	1.55	0.1
1) Assessment Criteria - Health Based (residential)				100	20	12%	1000	300	15	600	7000										1	20	0.1
2) Assessment Criteria - Phytotoxicity Based				20	3	400	100	600	1	60	200												
3) Assessment Criteria - Service Station Guidelines (EPA 1994)								300				1	50	130	25	65				1000			
Field_ID	**Sampled_Date**	**Matrix_Description**																					
SP6-V1	4/04/2012	Silty Clay		7	0.5	20	19	24	<0.1	12	46	<0.2	<1	<0.5	<3	<25	<50	<100	<100	<250	<0.05	<1.55	<0.1

Landcom
Job Number: 41945
Zouch Road, Edmondson Park, NSW
RZNRA Site Validation Assessment
Table E - Summary Laboratory Analysis Results - Lead Particulate Area Adjacent to Northern Boundary

Notes:
Refer to Text Section 7.1 for Source of Validation Criteria

Bold	Value Exceeds Validation Criterion - Health Based (Residential)
Bold	Value Exceeds Validation Criterion - Interim Urban Ecological Investigation Levels

		Lead
		mg/kg
LOR		1
Assessment Criterion (JBS 2012a) - Health		300
Assessment Criterion (JBS 2012a) - Ecological		600
Sample ID	**Date**	
Excavation Walls		
LPN-V001	7/05/2012	100
LPN-V002	7/05/2012	20
LPN-V003	7/05/2012	77
LPN-V004	7/05/2012	23
LPN-V005	10/05/2012	24
LPN-V006	8/05/2012	18
LPN-V007	10/05/2012	17
LPN-V008	8/05/2012	7
LPN-V009	8/05/2012	19
LPN-V010	9/05/2012	38
LPN-V011	10/05/2012	58
LPN-V012	9/05/2012	14
LPN-V013	9/05/2012	19
LPN-V014	9/05/2012	20
LPN-V015	9/05/2012	25
LPN-V016	9/05/2012	11
LPN-V017	9/05/2012	15
LPN-V018	9/05/2012	17
LPN-V019	9/05/2012	16
LPN-V020	9/05/2012	17
LPN-V021	9/05/2012	31
LPN-V022	10/05/2012	140
LPN-V023	14/05/2012	22
LPN-V024	14/05/2012	15
LPN-V025	14/05/2012	24
LPN-V026	14/05/2012	29
LPN-V027	14/05/2012	7
LPN-V028	14/05/2012	14
LPN-V029	14/05/2012	15
LPN-V030	14/05/2012	22
LPN-V031	14/05/2012	26
LPN-V032	14/05/2012	16
LPN-V033	16/05/2012	28
LPN-V034	15/05/2012	25
LPN-V035	15/05/2012	32
LPN-V036	15/05/2012	19
LPN-V037	15/05/2012	18
LPN-V038	15/05/2012	20
LPN-V039	15/05/2012	20
LPN-V040	15/05/2012	24
LPN-V041	15/05/2012	19
LPN-V042	15/05/2012	25
LPN-V043	15/05/2012	16
LPN-V044	15/05/2012	26
LPN-V045	15/05/2012	24
LPN-V046	16/05/2012	25
LPN-V047	16/05/2012	35
LPN-V048	16/05/2012	23
LPN-V049	16/05/2012	47
LPN-V050	16/05/2012	37
LPN-V051	16/05/2012	71
LPN-V052	16/05/2012	70
LPN-V053	16/05/2012	29
LPN-V054	16/05/2012	17
LPN-V055	16/05/2012	22
LPN-V056	16/05/2012	22
LPN-V057	16/05/2012	61
LPN-V058	16/05/2012	66
LPN-V059	16/05/2012	22
LPN-V060	16/05/2012	25
LPN-V061	16/05/2012	13
LPN-V062	16/05/2012	23
LPN-V063	16/05/2012	15
LPN-V064	17/05/2012	21
LPN-V065	17/05/2012	17
LPN-V066	17/05/2012	26
LPN-V067	17/05/2012	21
LPN-V068	17/05/2012	32
LPN-V069	17/05/2012	27
LPN-V070	17/05/2012	35
LPN-V071	17/05/2012	18
LPN-V072	17/05/2012	39
LPN-V073	17/05/2012	41
LPN-V074	21/05/2012	85
LPN-V075	17/05/2012	77
LPN-V076	21/05/2012	53
LPN-V077	18/05/2012	45
LPN-V078	18/05/2012	23
LPN-V079	22/05/2012	26
LPN-V080	21/05/2012	29
LPN-V081	21/05/2012	57
LPN-V082	21/05/2012	33
LPN-V085	21/05/2012	16
LPN-V086	21/05/2012	21
LPN-V087	21/05/2012	19
LPN-V088	21/05/2012	17
LPN-V089	21/05/2012	15
LPN-V090	21/05/2012	14
LPN-V091	21/05/2012	19
LPN-V092	21/05/2012	15

		Lead
		mg/kg
LOR		1
Assessment Criterion (JBS 2012a) - Health		300
Assessment Criterion (JBS 2012a) - Ecological		600
Sample ID	**Date**	
Excavation Base		
LPN-VB001	7/05/2012	18
LPN-VB002	7/05/2012	19
LPN-VB003	7/05/2012	15
LPN-VB004	8/05/2012	10
LPN-VB005	10/05/2012	14
LPN-VB006	8/05/2012	17
LPN-VB007	10/05/2012	10
LPN-VB008	10/05/2012	13
LPN-VB009	10/05/2012	15
LPN-VB010	10/05/2012	12
LPN-VB011	10/05/2012	18
LPN-VB012	10/05/2012	10
LPN_VB013	11/05/2012	16
LPN_VB014	11/05/2012	19
LPN_VB015	11/05/2012	18
LPN_VB016	11/05/2012	17
LPN_VB017	11/05/2012	27
LPN_VB018	12/05/2012	17
LPN_VB019	12/05/2012	17
LPN_VB020	12/05/2012	20
LPN_VB021	12/05/2012	19
LPN_VB022	12/05/2012	18
LPN_VB023	12/05/2012	12
LPN-VB024	14/05/2012	26
LPN-VB025	14/05/2012	18
LPN-VB026	15/05/2012	19
LPN-VB027	15/05/2012	17
LPN-VB028	15/05/2012	27
LPN-VB029	15/05/2012	12
LPN-VB030	15/05/2012	14
LPN-VB031	15/05/2012	15
LPN-VB032	15/05/2012	12
LPN-VB033	15/05/2012	22
LPN-VB034	15/05/2012	17
LPN-VB035	15/05/2012	15
LPN-VB036	16/05/2012	12
LPN-VB037	16/05/2012	17
LPN-VB038	16/05/2012	13
LPN-VB039	16/05/2012	16
LPN-VB040	16/05/2012	18
LPN-VB041	17/05/2012	14
LPN-VB042	17/05/2012	19
LPN-VB043	17/05/2012	17
LPN-VB044	17/05/2012	25
LPN-VB045	17/05/2012	20
LPN-VB046	17/05/2012	27
LPN-VB047	21/05/2012	20
LPN-VB048	21/05/2012	19
LPN-VB049	21/05/2012	11
LPN-VB050	22/05/2012	12
LPN-VB051	21/05/2012	16
LPN-VB052	21/05/2012	36
LPN-VB053	21/05/2012	18
LPN-VB054	21/05/2012	19
LPN-VB055	21/05/2012	16
LPN-VB056	21/05/2012	23
LPN-VB057	21/05/2012	25
LPN-VB058	21/05/2012	17
LPN-VB59	21/05/2012	19
LPN-VB60	21/05/2012	18
LPN-VB061	21/05/2012	18
LPN-VB062	21/05/2012	22
LPN-VB063	21/05/2012	24
LPN-VB083	21/05/2012	15
LPN-VB084	21/05/2012	17

Landcom
Job Number: 41945
Zouch Road, Edmondson Park, NSW
RZNRA Site Validation Assessment
Table F- Summary Laboratory Analysis Results - Unexpected Find 04 Validation

Notes:
Refer to Text Section 7.1 for Source of Validation Criteria

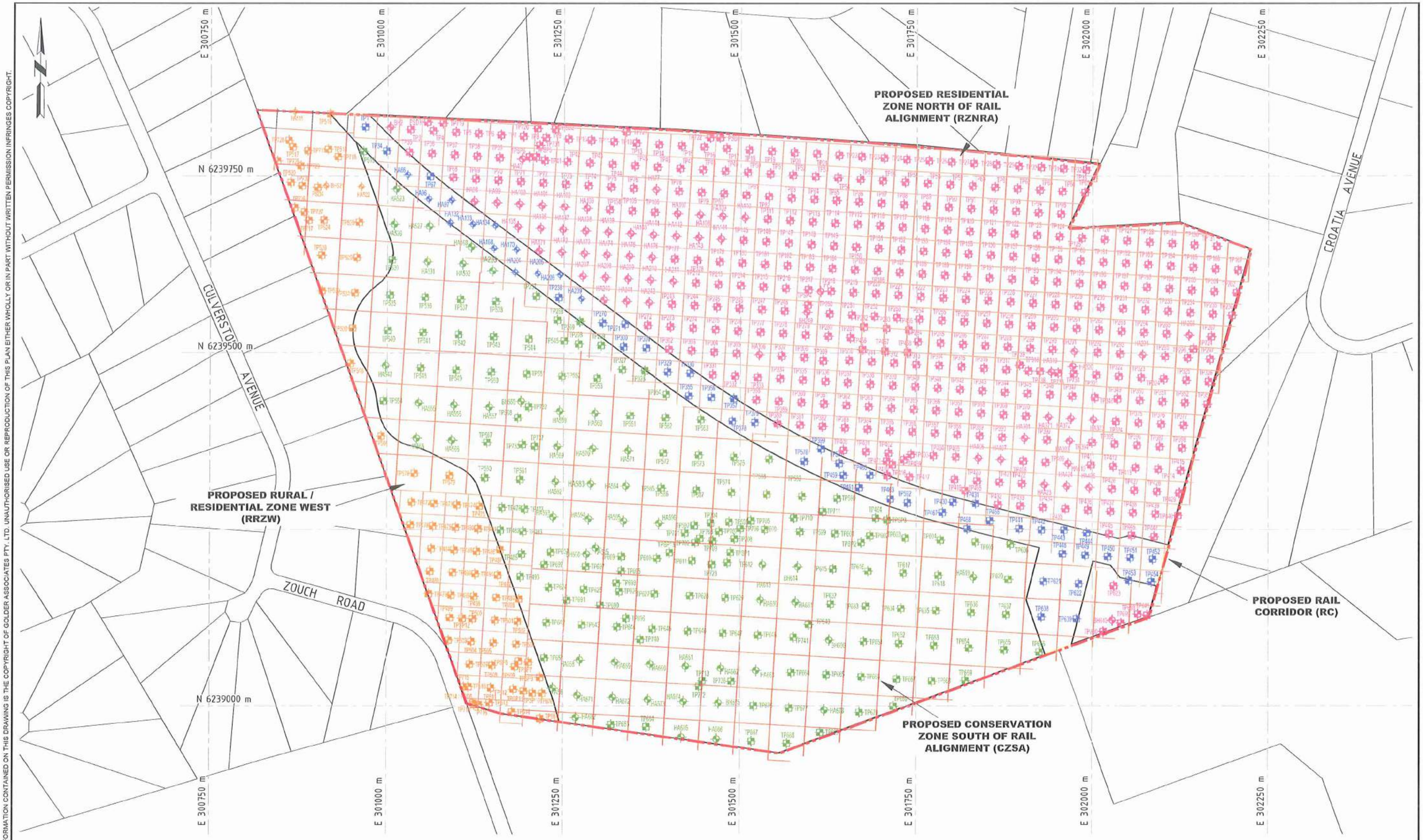
Bold Value Exceeds Validation Criterion - Health Based (Residential)

		Asbestos
		g/kg
LOR		0.1
Assessment Criterion (JBS 2012a) - Health		0.1
Sample ID	**Date**	
Excavation Walls		
UF04-V1	21/08/2012	<0.1
UF04-V2	21/08/2012	<0.1
UF04-V3	21/08/2012	<0.1

Appendix A – Previous Site Investigation Location Plans

© 2013 JBS Environmental Pty Ltd

© GOLDER ASSOCIATES PTY. LTD. INFORMATION CONTAINED ON THIS DRAWING IS THE COPYRIGHT OF GOLDER ASSOCIATES PTY. LTD. UNAUTHORISED USE OR REPRODUCTION OF THIS PLAN EITHER WHOLLY OR IN PART WITHOUT WRITTEN PERMISSION INFRINGES COPYRIGHT.



LEGEND

- SITE BOUNDARY
- BOREHOLE AND TEST PIT LOCATIONS, 2005 [PROPOSED RURAL / RESIDENTIAL ZONE WEST (RRZW)]
- BOREHOLE AND TEST PIT LOCATIONS, 2005 [PROPOSED RESIDENTIAL ZONE NORTH OF RAIL ALIGNMENT (RZNRA)]
- BOREHOLE AND TEST PIT LOCATIONS, 2005 [PROPOSED RAIL CORRIDOR (RC)]
- BOREHOLE AND TEST PIT LOCATIONS, 2005 [CONSERVATION ZONE SOUTH OF RAIL ALIGNMENT (CZSA)]
- SAMPLING GRID @ 32 x 32m
- SAMPLING GRID @ 50 x 50m

1:5,000

0 100 200 300m

ADAPTED FROM DIGITAL CADASTRE DATABASE, NSW DEPARTMENT OF LANDS, 2004, ZONE 56 MGA COORDINATES

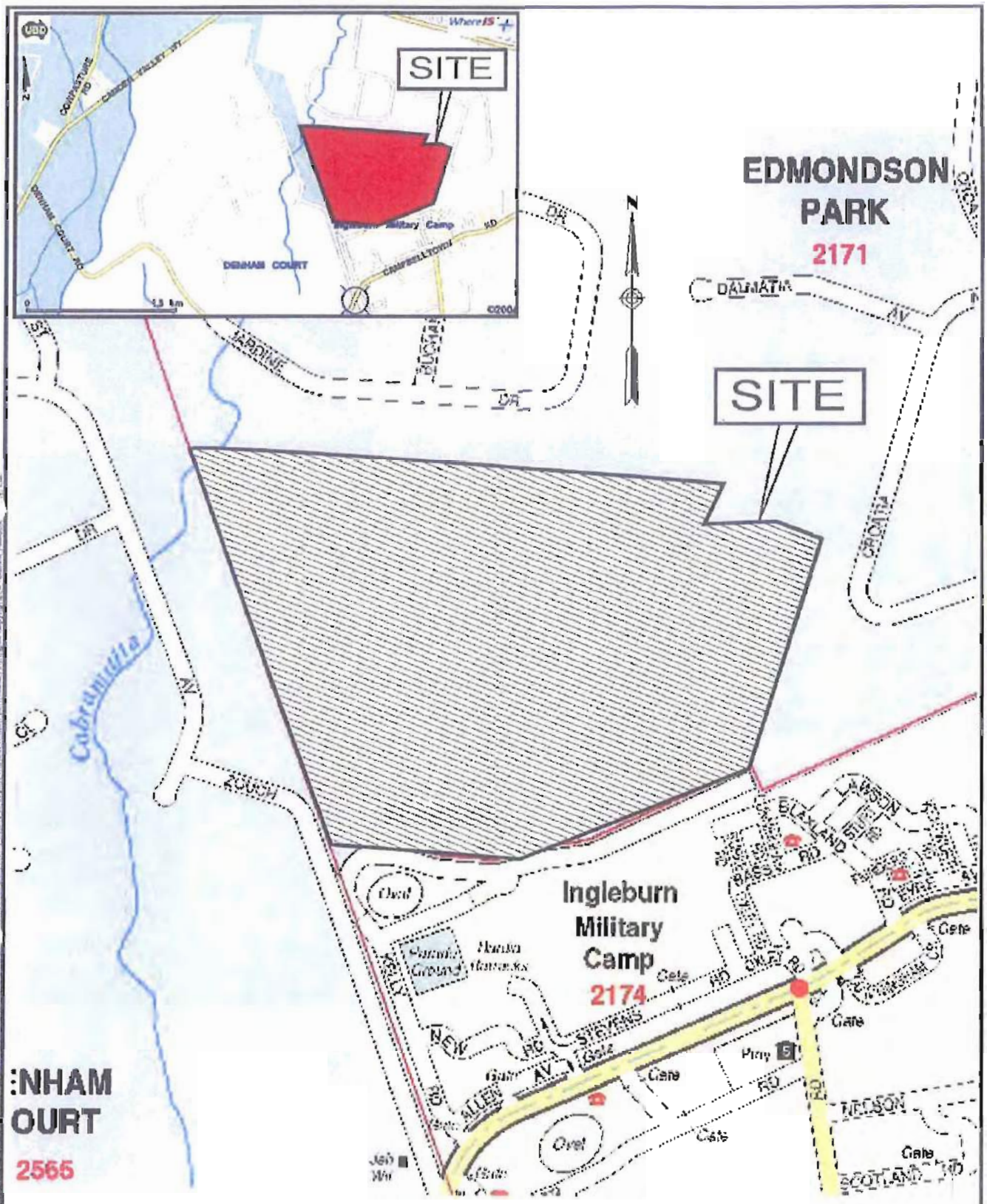
Golder Associates

www.golder.com
GOLDER ASSOCIATES PTY LTD

CLIENT: LANDCOM		PROJECT: REMEDIATION ACTION PLAN - ZOUCH ROAD, EDMONDSON PARK	
DRAWN BY: HC	DATE: 27.08.2010	DRAWING TITLE: PREVIOUS INVESTIGATION LOCATIONS	
CHECKED BY: GJF	DATE: 12.05.2010		
SCALE: 1:5000	SHEET SIZE: A3	PROJECT No: 107623047	DOC No: 001 / DOC TYPE: R / FIGURE No: F0004 / REVISION: 0

FIGURE 4

Plot Date: 27 August 2010 Time:9:38:12 AM By: Campbell, Helen Path: J:\env\2010\107623047_Landcom_Edmondson Park\Technical Doc\CADD\FIGURES - File Name:107623047_001_R_F0004_REV0.dwg
Xref: GAP_LOGO-A3.dwg;

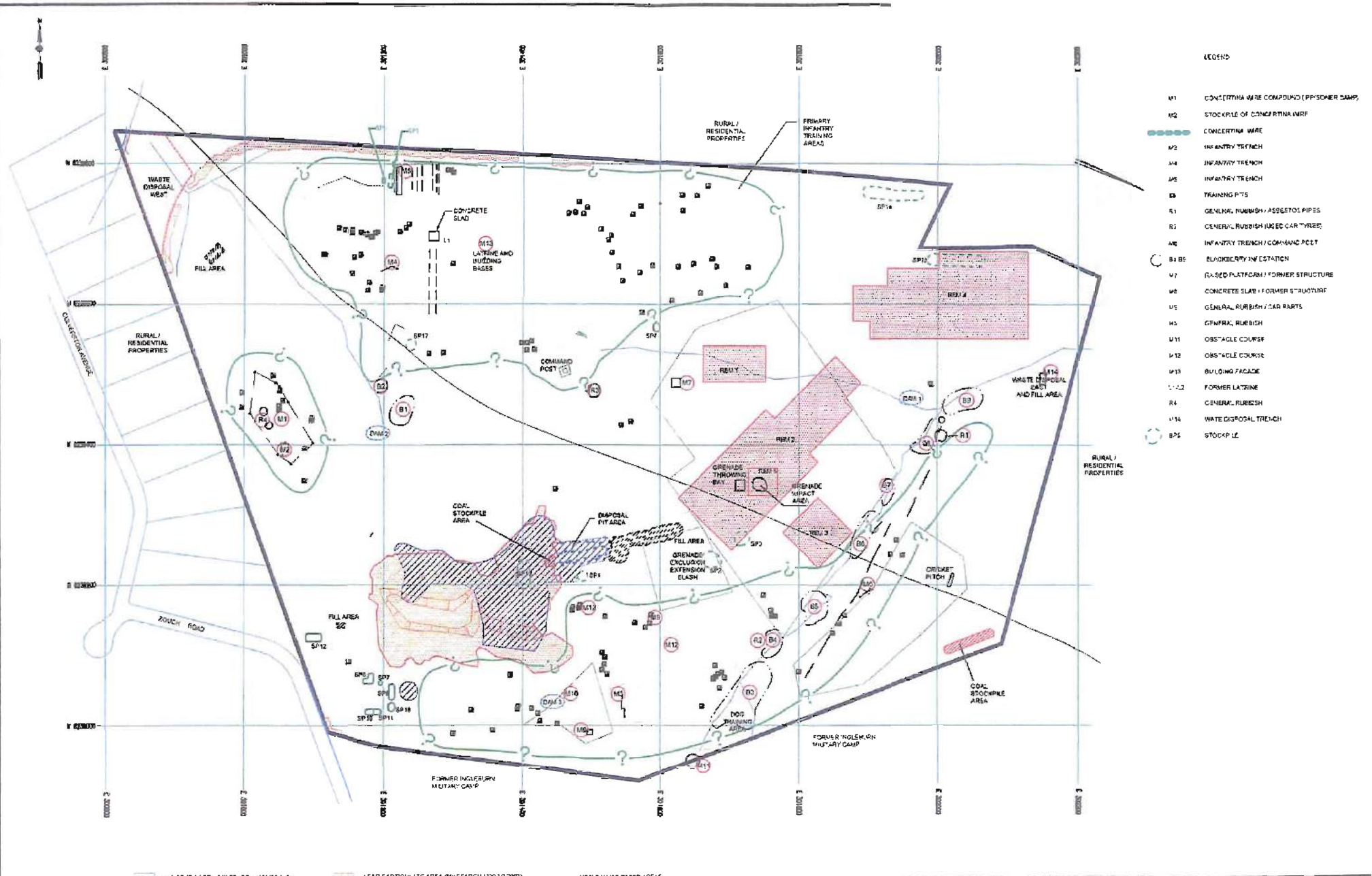


SOURCE: SYDNEY UBD AND INSET FROM WHEREIS.COM.A - WITH PERMISSION

Golder Associates	CLIENT: Landcom	PROJECT: Zouch Road Edmondson Park NSW	
	DRAWN: RT / DATE: 5 April 2005	TITLE: SITE LOCALITY PLAN	
	CHECKED: / DATE:		
	SCALE: NTS	PROJECT No: 04623119_12 / FIGURE No: 1	REV No: 0 / A4

Information contained on this drawing is the copyright of Golder Associates Pty Ltd. Unauthorised use of this drawing in any form whatsoever is prohibited. © Golder Associates Pty Ltd

File Location: S:\04 UBD 13\Drawings\ Report 04623119 12\ 04623119-12 Fig 1.v9.CDR



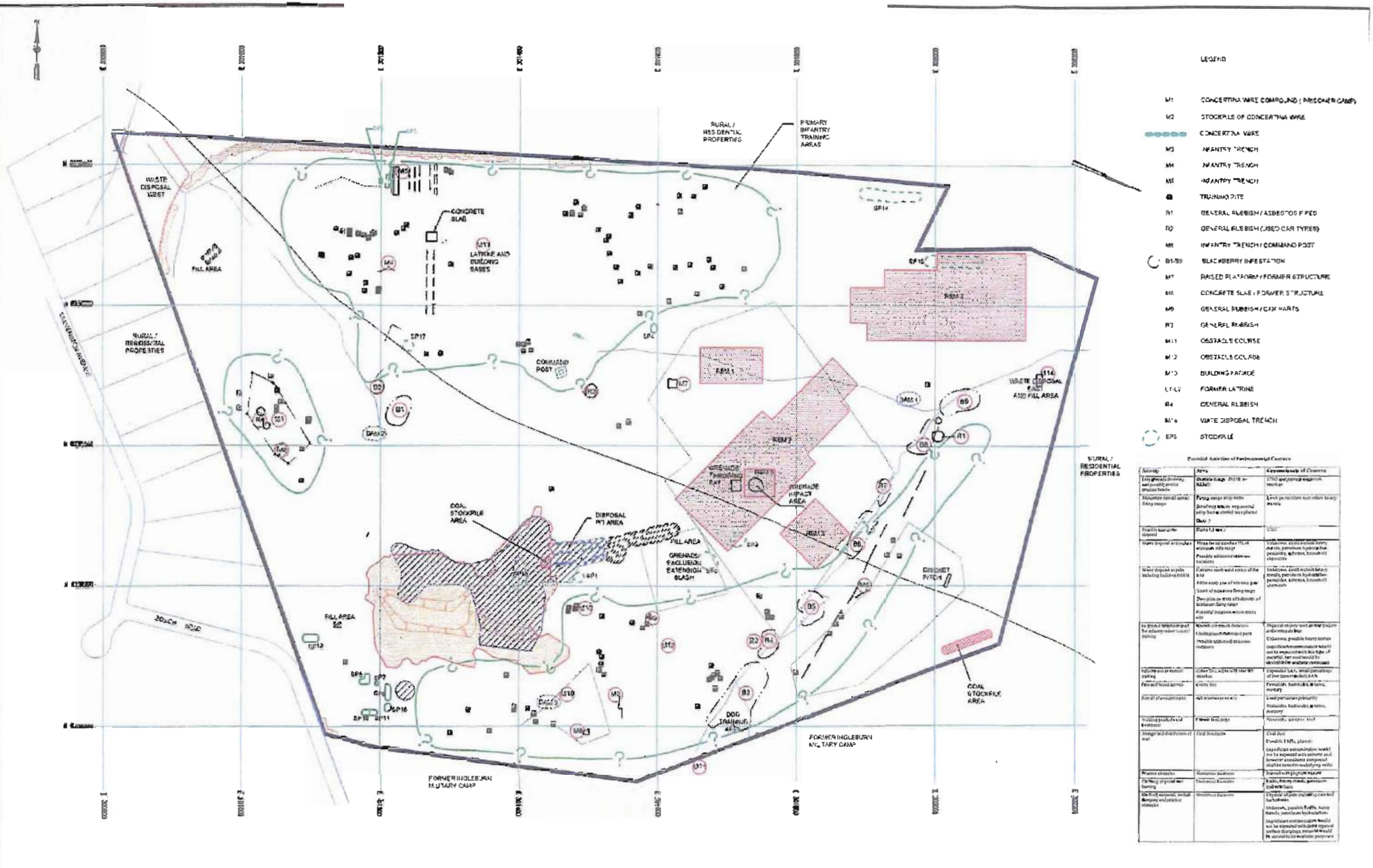
Information contained on this drawing is the copyright of Golder Associates Pty Ltd. Unauthorised use or reproduction of this plan other wholly or in part without written permission infringes copyright. © Golder Associates Pty Ltd

CLIENT	Landcom	PROJECT	Zouch Road Edmondson Park NSW
DRAWN	SL	DATE	03 August 2005
CHECKED	GJF*	DATE	04 August 2005
TITLE	SITE PLAN / SITE FEATURE		
SCALE	1:5000	PROJECT No	04623119/012
FIGURE No	2	REV No	1
		A3	

Golder Associates

J:\04Proj\101-1500\04623119_Landcom_Edmondson Park\Drawings_Report 050408\Rev 1\04623119_12 Fig 2 Thursday Aug 12, 2005 - 3:29pm

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



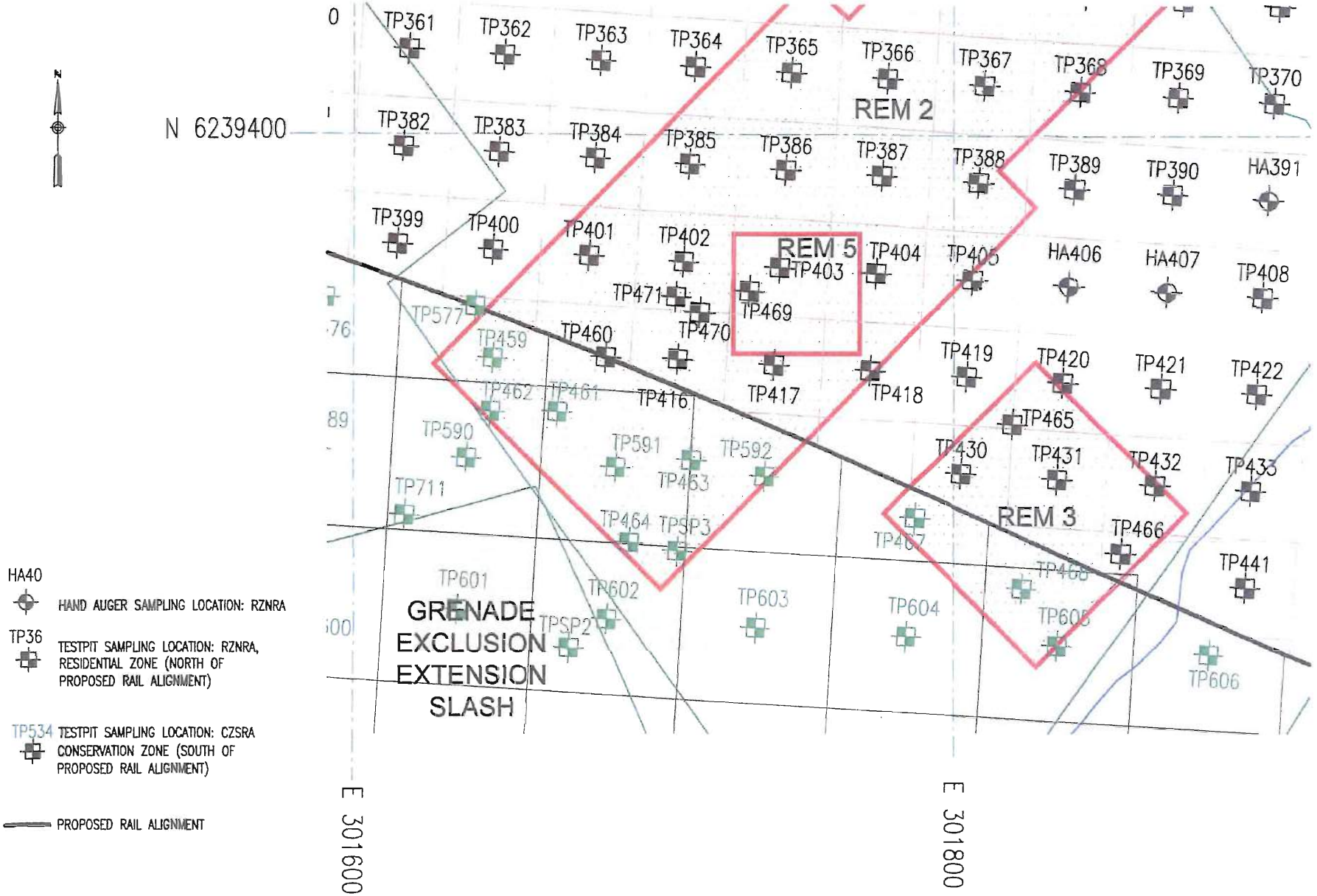
Potential Activities of Environmental Concern

Activity	Area	Key compounds of Concern
Live grenade throwing and possibly similar practice tasks	Grenade Range (NEAR)	UXO and normal explosive residue
Weapons (small arms) firing range	Firing range stop butts Small firing tasks on ground, may have existed any where Bay 2	Lead, petroleum and other heavy metals
Possible burn pit / disposal	Point 1 and 2	Ash
Waste disposal activities	Three (or so) landfill / rubbish dump site range Possible additional unknown locations	Unknown, could include heavy metals, petroleum hydrocarbons, pesticides, asbestos, household chemicals
Waste disposal as pits including building debris	Extreme north west corner of the site Within easy use of entrance gate South of explosive firing range Two piles on west side of bunker firing range Potential disposal across entire site	Unknown, could include heavy metals, petroleum hydrocarbons, pesticides, asbestos, household chemicals
Ex Grenade impact pad for ordnance clean up and training	Mounds on south boundary Underground fuel depot pits Possible additional unknown locations	Physical injury such as sharp objects and remnants like Unknown, possible heavy metals (significant contamination would not be expected with this type of material, but would be identified in analytical samples)
Asbestos use in manufacturing	Golder Site, adjacent to new RFI trenches	Unknown, but, small percentage of live ammunition is UXO
Petroleum storage	Centre Site	Petroleum, herbicides, arsenic, mercury
Aircraft pre-operations	Air movement activity	Lead particulate primarily Pesticides, herbicides, arsenic, mercury
Possible pesticide and herbicide	Parade ground area	Pesticides, arsenic, lead
Storage and distribution of coal	Coal Stockpile	Coal dust Possible PAHs, phenols Significant contamination would not be expected with current and however considered commercial shipping terms for underlying soils
Petrol activities	Numerous locations	Normal petroleum hydrocarbons
Pathway disposal and burning	Numerous locations	Ash, heavy metals, petroleum hydrocarbons
Site fill material, landfill dumping and possible examples	Numerous locations	Physical injuries including cuts and lacerations Unknown, possibly PAHs, heavy metals, petroleum hydrocarbons Significant contamination would not be expected with some types of surface dumpings encountered would be identified by analytical purposes

CLIENT	Landcom	PROJECT	Zouch Road Edmondson Park NSW
DRAWN	SL	DATE	03 August 2005
ENCLOSED	GJF*	DATE	04 August 2005
SCALE	1:5000	PROJECT No.	04623119/012
TITLE	SITE PLAN / AREAS OF ENVIRONMENTAL CONCERN	FIGURE No.	3
REVISION	1	A3	

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

Information contained on this drawing is the copyright of Golder Associates Pty. Ltd. Unauthorised use or reproduction of this drawing in any manner whatsoever without the written permission of Golder Associates Pty. Ltd. © Golder Associates Pty. Ltd.

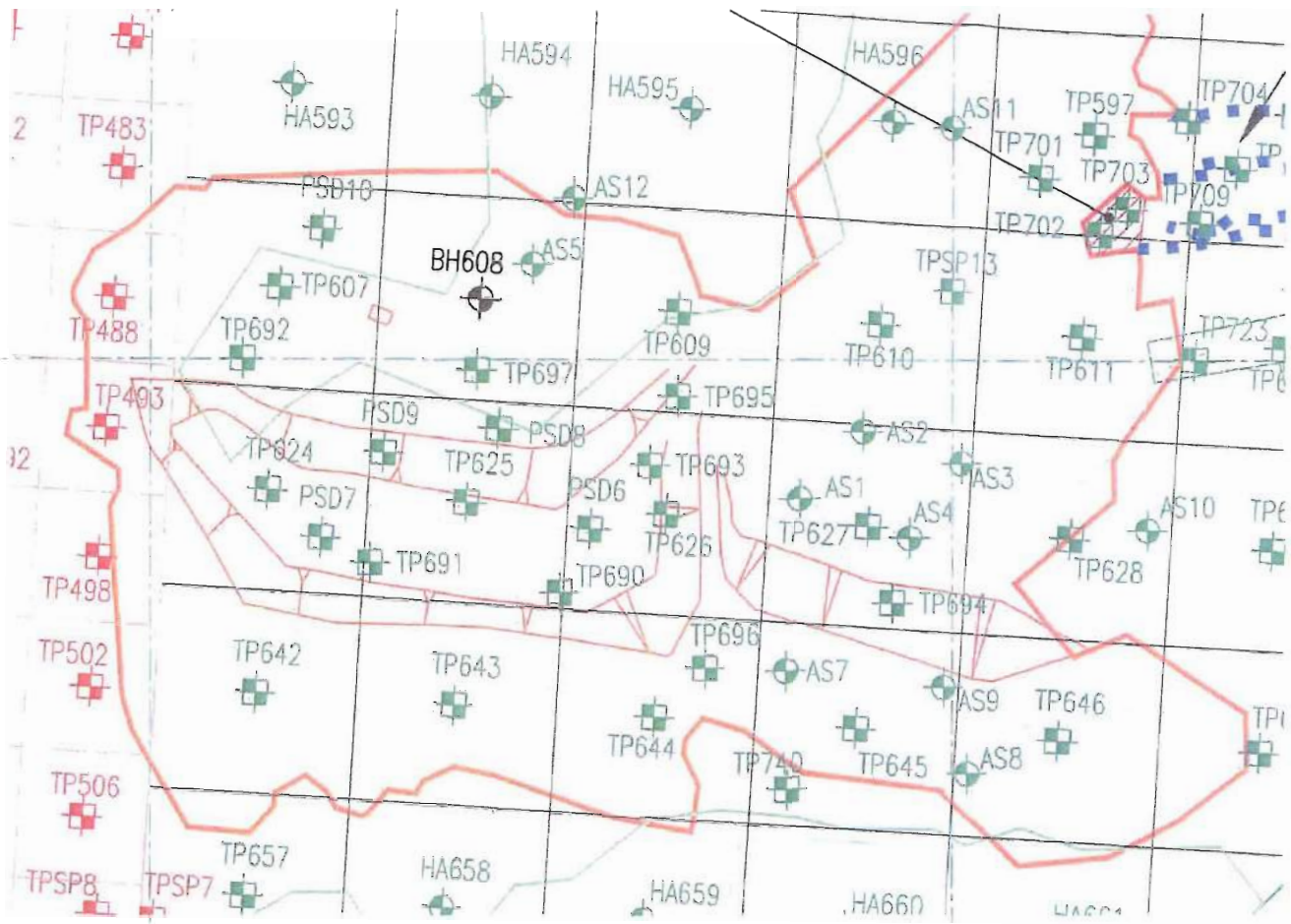


CLIENT	Landcom	PROJECT	Zouch Road Edmondson Park NSW
DRAWN SL	DATE 03 August 2005	TITLE	SAMPLE LOCATIONS – REM 2, 3 & 5
CHECKED GJF*	DATE 04 August 2005		
SCALE 1:1250		PROJECT No 04623119/012	FIGURE No 4A REV No 1 A3

Information contained on this drawing is the copyright of Golder Associates Pty. Ltd. Unauthorised use or reproduction of this plan either wholly or in part without written permission infringes copyright. © Golder Associates Pty. Ltd.

J:\04Proj\101-150\04623119_Landcom_Edmondson Park\Drawings_Report 050406\Rev 1\04623119_12 Fig 4 r1.dwg Aug 12, 2005 - 3:26pm

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



LEGEND:

BH650 — MONITORING WELL LOCATION

HA583 — HAND AUGER SAMPLING LOCATION: CZSRA

TP472 — TESTPIT SAMPLING LOCATION: RZSWC, RESIDENTIAL ZONE (SOUTH WEST CORNER)

TP534 — TESTPIT SAMPLING LOCATION: CZSRA CONSERVATION ZONE (SOUTH OF PROPOSED RAIL ALIGNMENT)

LEAD PARTICULATE AREA (MILSEARCH 1999 TO 2003)

WASTE BURIAL TRENCHES (MILSEARCH 1999 TO 2003)

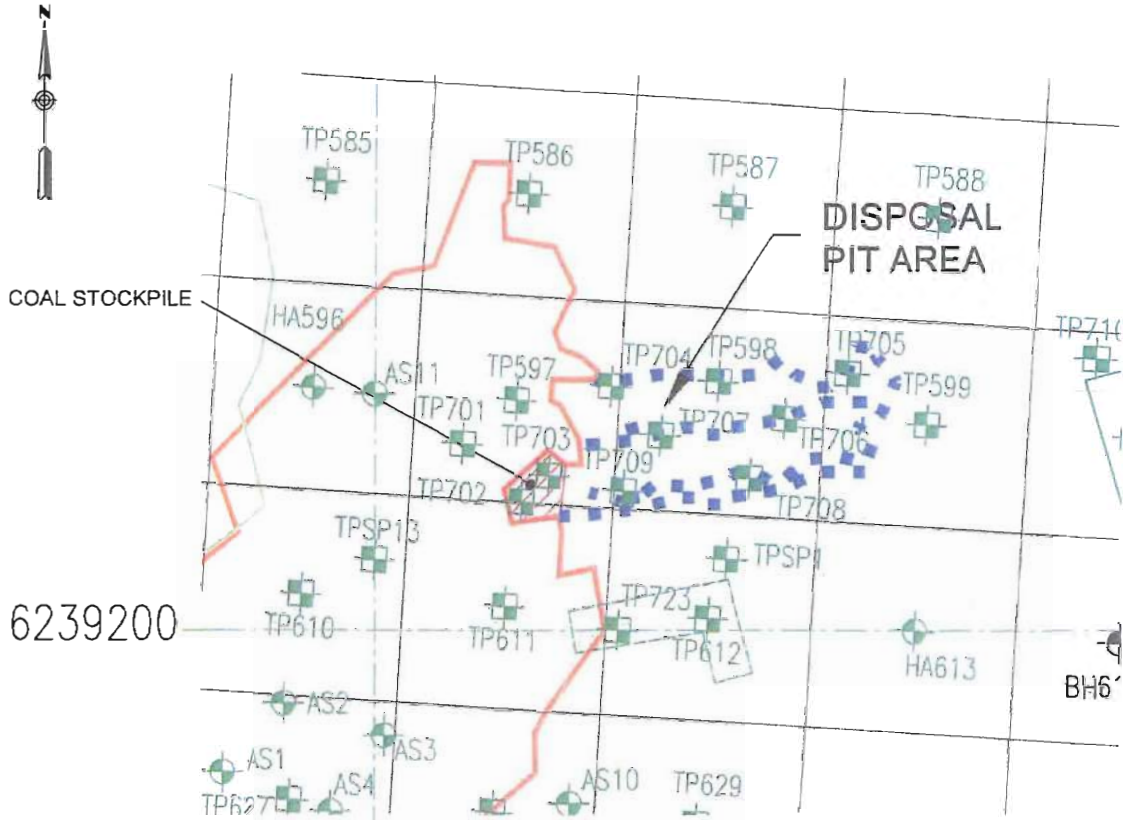
*REFER TO FIGURE 4 FOR FURTHER INFORMATION

Golder Associates	CLIENT: Landcom	PROJECT: Zouch Road Edmondson Park NSW	
	DRAWN: SL — DATE: 03 August 2005	TITLE: SAMPLE LOCATIONS – RIFLE RANGE AREA	
	CHECKED: GJF* — DATE: 04 August 2005		
	SCALE: 1:1250	PROJECT No: 04623119/012	FIGURE No: 4B — REV No: 1 — A3

NOTE: THE * BESIDE THE NAME/ INITIALS DENOTES THE ORIGINAL DRAWING ISSUE WAS SIGNED OR INITIALLED BY THAT RESPECTIVE PERSON

J:\04Proj\101-150\04623119_Landcom_Edmondson Park\Drawings_Report 050426\Rev 1\04623119_12 Fig 4 r1.dwg Aug 12, 2005 - 3:26pm

Information contained on this drawing is the copyright of Golder Associates Pty. Ltd. Unauthorised use or reproduction of this plan either wholly or in part without written permission infringes copyright. © Golder Associates Pty. Ltd.



LEGEND:

HA583 HAND AUGER SAMPLING LOCATION: CZSRA

TP534 TESTPIT SAMPLING LOCATION: CZSRA

CONSERVATION ZONE (SOUTH OF PROPOSED RAIL ALIGNMENT)

LEAD PARTICULATE AREA (MILSEARCH 1999 TO 2003)

WASTE BURIAL TRENCHES (MILSEARCH 1999 TO 2003)

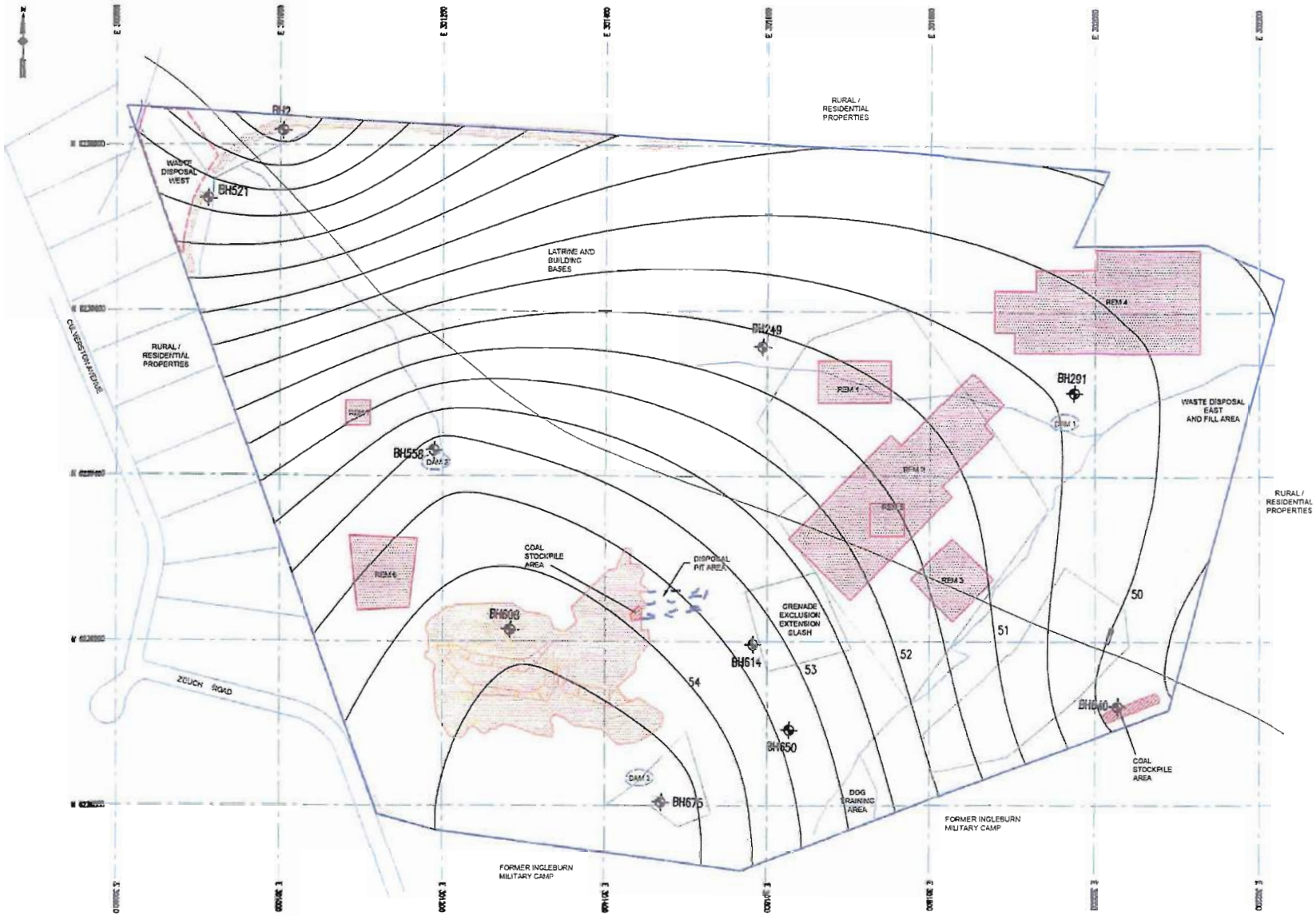
*REFER TO FIGURE 4 FOR FURTHER INFORMATION

Golder Associates	CLIENT: Landcom	PROJECT: Zouch Road Edmondson Park NSW	
	DRAWN: SL DATE: 03 August 2005	TITLE: SAMPLE LOCATIONS -- DISPOSAL PIT	
	CHECKED: GJF* DATE: 04 August 2005		
	SCALE: 1:1250	PROJECT No: 04623119/012	FIGURE No: 4C REV No: 1 A3

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

Information contained on this drawing is the copyright of Golder Associates Pty Ltd. Unauthorised use or reproduction of this plan either wholly or in part without written permission infringes copyright © Golder Associates Pty Ltd

J:\04Proj\101-150\04623119_landcom_edmondson park\Drawings_Report 05\04dlb\Rev 1\04623119_02 Fig 4 rt.dwg Aug 12, 2005 - 3:46pm

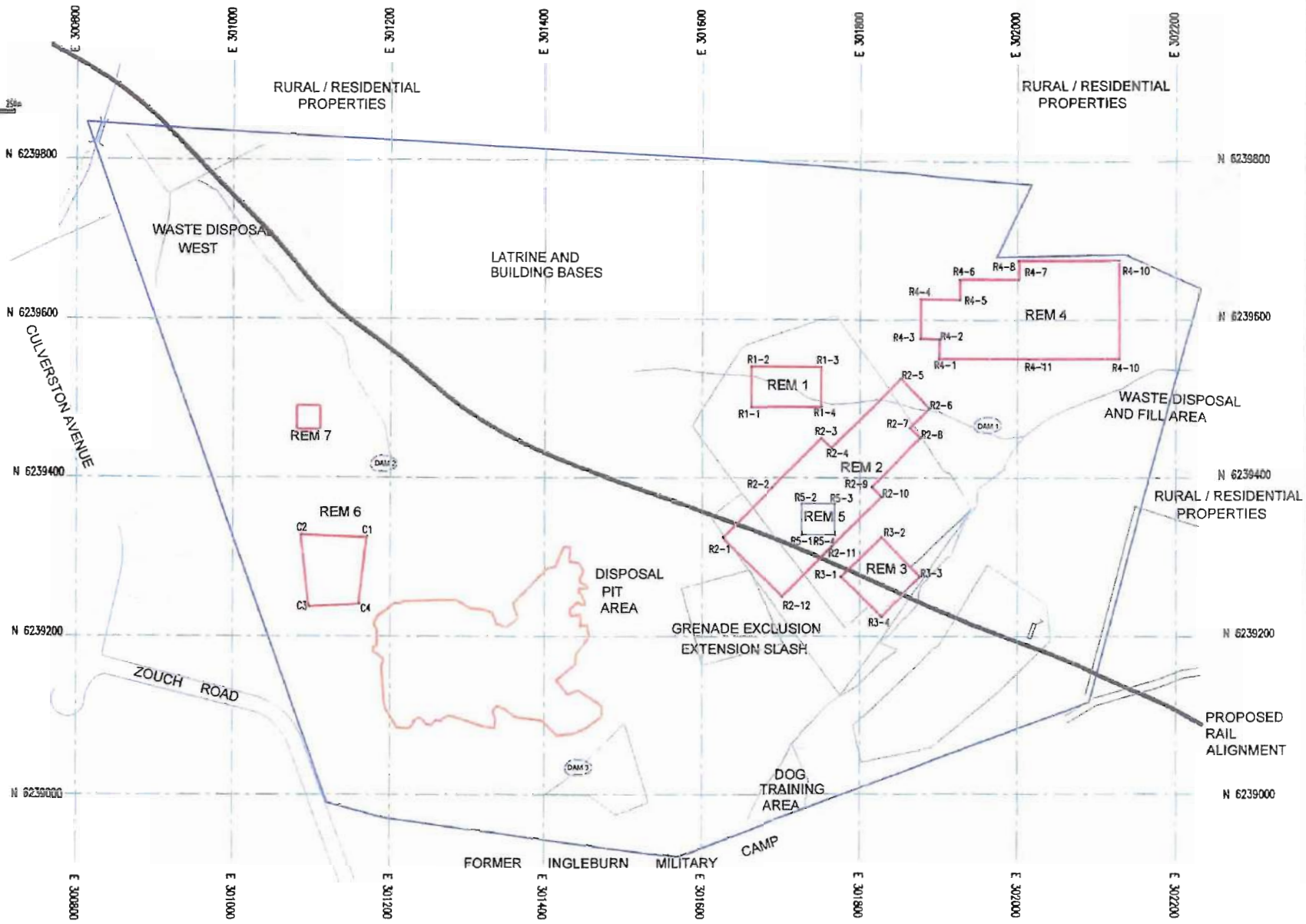


Information contained on this drawing is the copyright of Golder Associates Pty. Ltd. Unauthorised use or reproduction of this plan either wholly or in part without written permission infringes copyright. © Golder Associates Pty. Ltd.

CLIENT	Landcom	PROJECT	Zouch Road Edmondson Park NSW
DRAWN: SL	DATE: 03 August 2005	TITLE	GROUND WATER CONTOURS
CHECKED: GJF*	DATE: 04 August 2005		
SCALE	1:5000	PROJECT No: 04623119/012	FIGURE No: 5 REV No: 1 A

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

J:\04xxx\101-150\04623119_Landcom_Edmondson Park\Drawings_Report 0504DB\Rev 1\04623119_12 Fig 5 r1.dwg Aug 12, 2005 - 3:26pm



REM 1		
Corner	Eastings	Northings
R1–1	301662.0	6239489.91
R1–2	301662.0	6239540.77
R1–3	301751.0	6239540.64
R1–4	301752.0	6239489.98

REM 2		
Corner	Eastings	Northings
R2–1	301627.0	6239324.76
R2–2	301689.0	6239387.58
R2–3	301752.0	6239450.39
R2–4	301765.0	6239438.18
R2–5	301852.0	6239525.99
R2–6	301889.0	6239488.23
R2–7	301864.0	6239463.51
R2–8	301877.0	6239450.90
R2–9	301815.0	6239388.00
R2–10	301827.0	6239376.40
R2–11	301765.0	6239313.54
R2–12	301703.0	6239250.60

REM 3		
Corner	Eastings	Northings
R3–1	301777.0	6239275.71
R3–2	301827.0	6239325.33
R3–3	301877.0	6239275.94
R3–4	301827.0	6239225.03

REM 4		
Corner	Eastings	Northings
R4–1	301902.0	6239551.16
R4–2	301902.0	6239575.91
R4–3	301878.0	6239576.41
R4–4	301877.0	6239626.41
R4–5	301927.0	6239626.20
R4–6	301927.0	6239651.69
R4–7	302002.0	6239651.34
R4–8	302002.0	6239675.37
R4–9	302129.0	6239675.39
R5–4	301769.0	6239338.18
R4–10	302128.0	6239550.85
R4–11	302015.0	6239551.00

REM 5		
Corner	Eastings	Northings
R5–1	301727.0	6239328.18
R5–2	301727.0	6239367.45
R5–3	301769.0	6239367.45
R5–4	301769.0	6239328.18

REM 6		
Corner	Eastings	Northings
C1	301170.65	6239324.96
C2	301087.20	6239328.07
C3	301160.56	6239241.10
C4	301097.15	6239237.63

NOTE:
COORDINATES FOR REM 7 NOT OBTAINED DUE TO NO SATELITE RECEPTION FOR GPS

UXO STUDY AREA (MILSEARCH 1999 TO 2003)
UXO REMEDIATION AREA (GOLDER 2005)
LEAD PARTICULATE AREA (MILSEARCH 1999 TO 2003)
SITE BOUNDARY
* HEAVILY VEGITATED AREAS

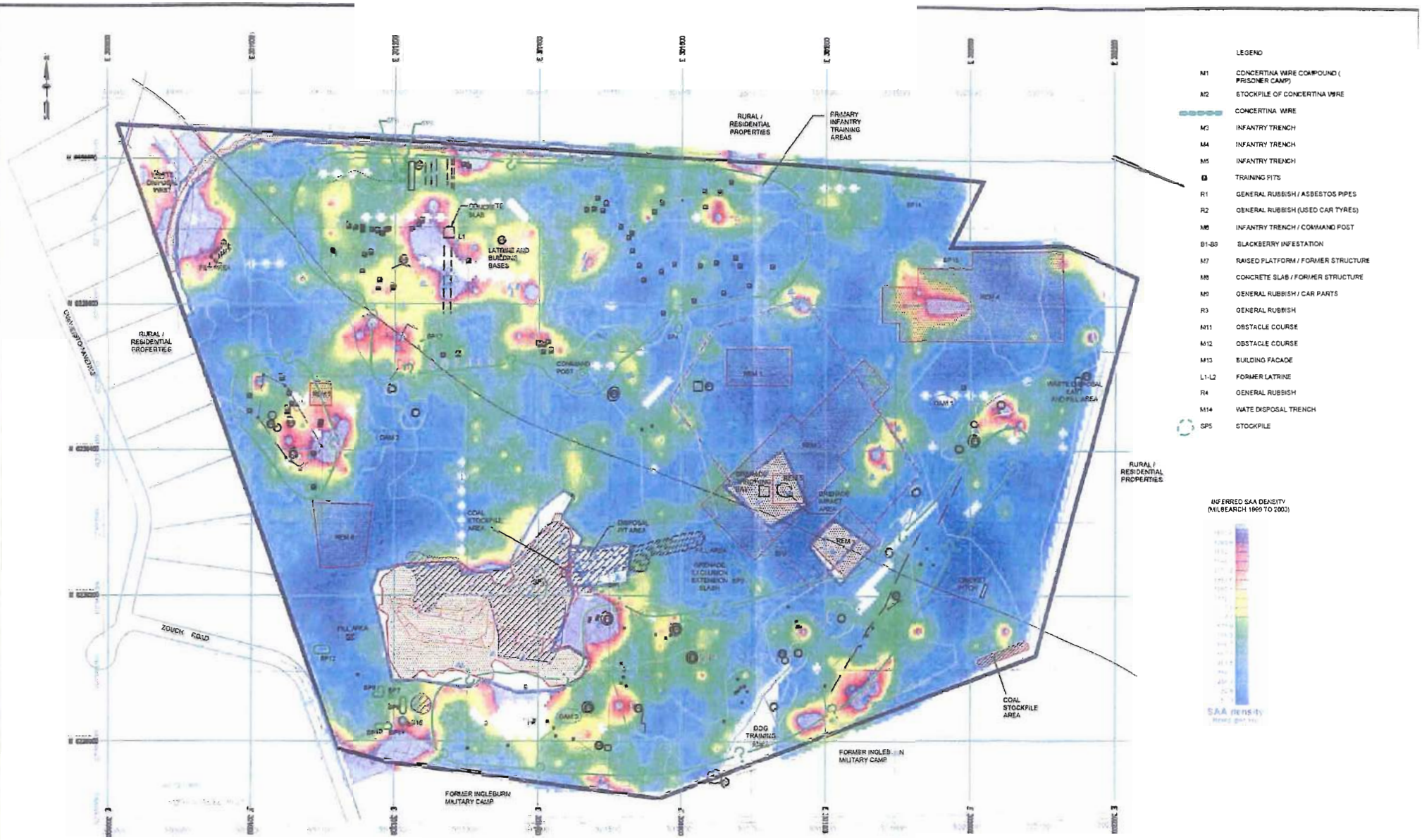
SOURCE: FIGURE 5 - PROPOSED GRIDBASED SAMPLING LOCATIONS
MILSEARCH - LANDCOM ZOUCH STAGE 2, 10 JUNE 2003

CLIENT	Landcom	PROJECT	Zouch Road, Edmondson Park, NSW
DRAWN	RT	DATE 4 August 2005	TITLE REM 1 to REM 7 LOT CORNER COORDINATES
CHECKED	GJF*	DATE 4 August 2005	
SCALE	1:5000	PROJECT No 046623119/012	FIGURE No 6 REV No 1 A3

J:\Projects\101-150\04623119_Landcom_Edmondson Park\Drawings_Report 050406\Rev 1\04623119_12 Fig 6 r1.dwg Aug 12, 2005 - 3:26pm

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

Information contained on this drawing is the copyright of Golder Associates Pty. Ltd. Unauthorised use or reproduction of this plan either wholly or in part without written permission infringes copyright. © Golder Associates Pty. Ltd.



UXO STUDY AREA (MILSEARCH 1999 TO 2003)

UXO REMEDIATION AREA (GOLDER 2005)

LEAD PARTICULATE AREA (MILSEARCH 1999 TO 2003)

SITE BOUNDARY

ASBESTOS AREA

HEAVILY VEGITATED AREAS

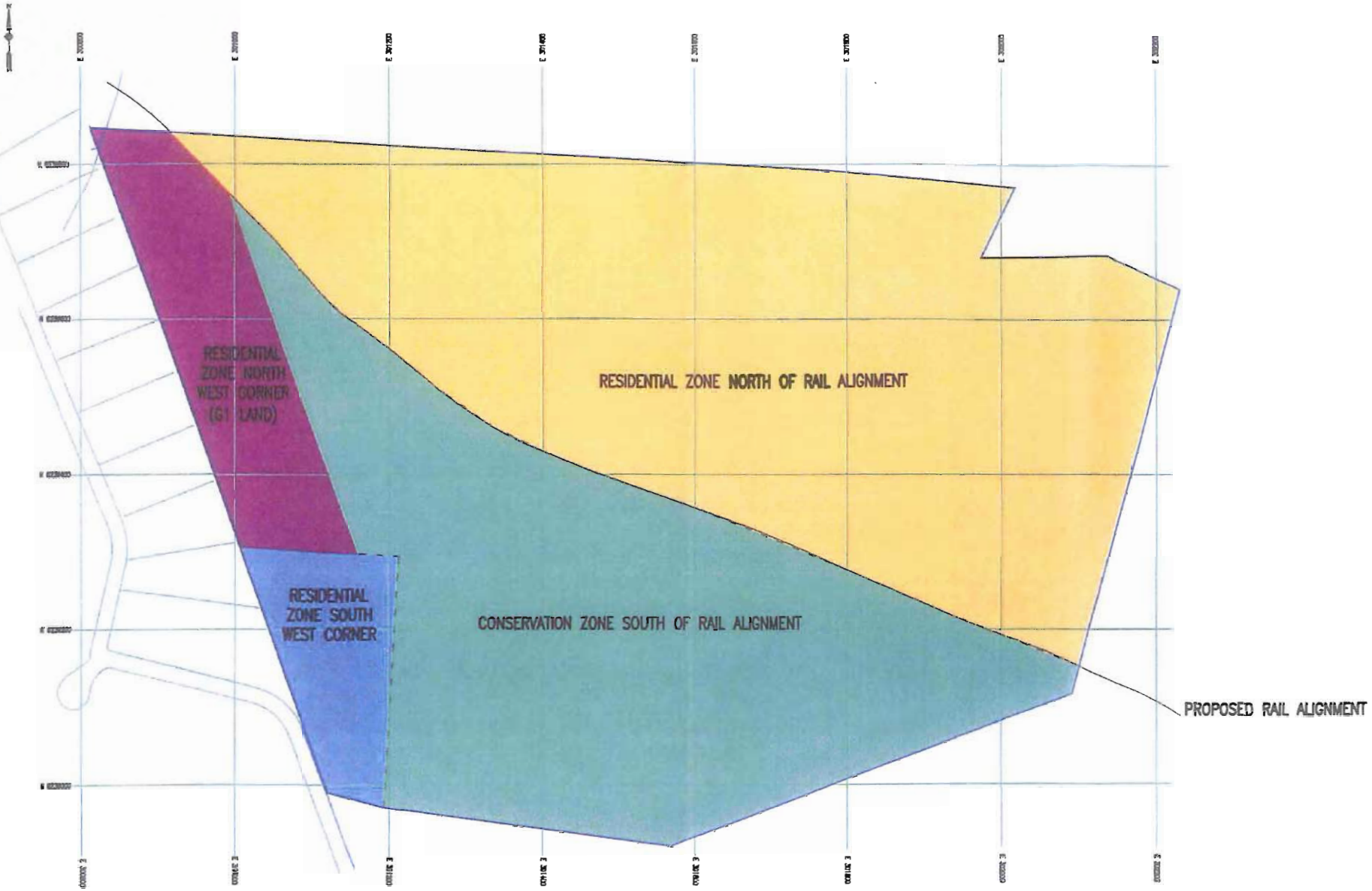
WASTE BURIAL TRENCHES (MILSEARCH 1999 TO 2003)

CLIENT: Landcom		PROJECT: Zouch Road Edmondson Park NSW	
DRAWN: SL	DATE: 03 August 2005	TITLE: SITE FEATURE & METALLIC ANOMALIES	
CHECKED: GJF*	DATE: 04 August 2005		
SCALE: 1:5000		PROJECT No: 04623119/012	FIGURE No: 7 REV: 1 A3

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

J:\04Proj\04623119_Landcom_Edmondson Park\Drawings_Report 050408\Rev 1\04623119_12 fig 7 v1.dwg Aug 12, 2005 - 3:24pm

Information contained on this drawing is the copyright of Golder Associates Pty Ltd. Unauthorised use or reproduction of this drawing in any form without written permission is prohibited. © Golder Associates Pty Ltd



LEGEND

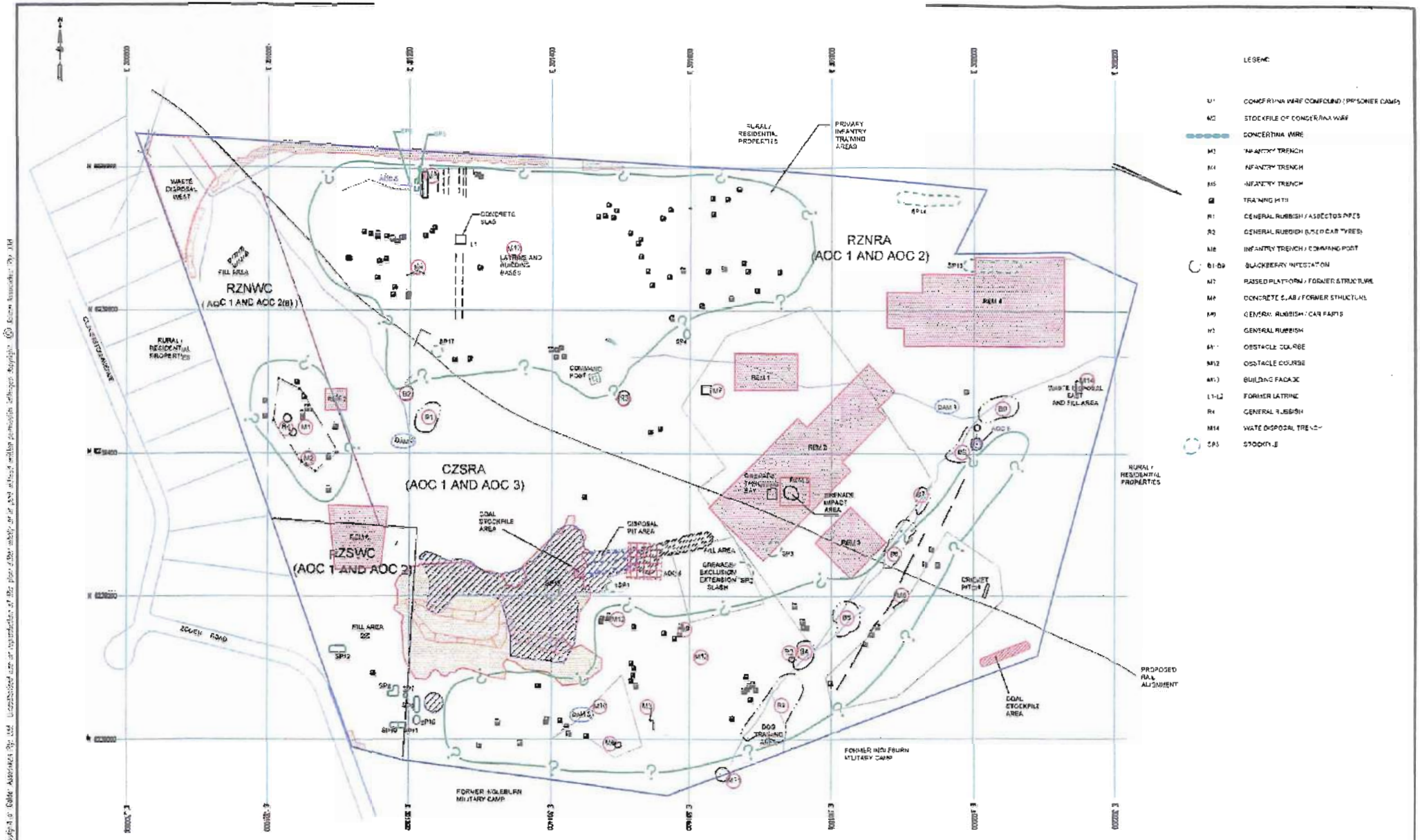
SITE BOUNDARY

CLIENT	Landcom	PROJECT	Zouch Road Edmondson Park NSW
DRAWN SL	DATE 03 August 2005	TITLE	PROPOSED LAND USE
CHECKED GJF*	DATE 04 August 2005		
SCALE	1:5000	PROJECT No 04623119/012	FIGURE No 8 REV No 1 A3

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

Information contained on this drawing is the copyright of Golder Associates Pty. Ltd. Unauthorised use or reproduction of this plan either wholly or in part without written permission infringes copyright. © Golder Associates Pty Ltd.

J:\04Proj\101-150\04623119_Landcom_Edmondson Park\Drawings_Report 050406\Rev 1\04623119_12 Fig 8 11.dwg Aug 12, 2005 - 3:29pm



Golder Associates

CLIENT	Landcom	PROJECT	Zouch Road Edmondson Park NSW
DRAWN	SL	DATE 03 August 2005	TITLE SITE PLAN / AREAS OF CONCERN (REMEDIATION AREAS)
CHECKED	GJF*	DATE 04 August 2005	
SCALE	1:5000	PROJECT No. 04623119/012	FIGURE No. 9 REV. 1 A3

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

This drawing is the copyright of Golder Associates Pty Ltd. Unauthorised use or reproduction of this plan in any way or in any form without permission infringes copyright. © Golder Associates Pty Ltd

Appendix B – Site Photographs

© 2013 JBS Environmental Pty Ltd

Examples of Weapons Pit Conditions Prior to and During Removal Activities March-April 2012

© 2013 JBS Environmental

Source:
JBS Personnel, various dates as noted

Rev	Description	Drn.	Date
0	Original Issue - R03	JR	

JBS ENVIRONMENTAL

Appendix: B Photographic Log

Client: Landcom

Project: Validation Assessment, RRZW, Zouch Rd, Edmondson Park

Job No: 41945 File Name: 41945_R03_App B

Additional Stockpile UFSP3 identified during site clearance activities, inspection 11 April 2012

Additional Stockpile UFSP4 identified during site clearance activities, inspection 11 April 2012

Additional Stockpile UFSP6 identified inclusions, SAA and glass fragments.

Additional Stockpile UFSP7, inspected 11 April 2012.

Additional Stockpile UFSP6.

Additional Stockpile UFSP8 inspected 11 April 2012.

Additional Stockpile UFSP10 and M7 location.

Test Pit and spoil of UFSP10 material.

Additional Stockpile UFSP09

Test Pit and spoil of UFSP09material.

Former infantry Trench M5 location looking east. Mulch stockpiles in background.

Former ACM Pipe stockpile (R1) following their removal.

© 2013 JBS Environmental

Source:
JBS Personnel, various dates as noted

Rev	Description	Drn.	Date
0	Original Issue - R03	JR	

JBS ENVIRONMENTAL

Appendix: B Photographic Log

Client: Landcom

Project: Validation Assessment, RRZW, Zouch Rd, Edmondson Park

Job No: 41945 File Name: 41945_R03_App B

Lead particulate remedial excavation works.

Examples of visual validation assessment failure, lead particulate exposed on the edge of the excavation and on the excavation base.

Examples of Excavated lead particulate material.

Limit of excavation and northern site boundary Beyond marked by fence line. North-west extent of remedial excavation.

Validated excavation central section of excavation Looking eastward.

© 2013 JBS Environmental

Source:
JBS Personnel, various dates as noted

Rev	Description	Drn.	Date
0	Original Issue - R03	JR	

Additional Stockpile UFSP3 identified during site clearance activities, inspection 11 April 2012

JBS ENVIRONMENTAL

Appendix: B Photographic Log

Client: Landcom

Project: Validation Assessment, RRZW, Zouch Rd, Edmondson Park

Job No: 41945 File Name: 41945_R03_App B

Examples (above and below) of former weapons pits during excavation (15/03/2012)

M5 Trench prior to excavation

Former building footprint adjacent to M13 location including surface soil detail.

Former M5 Trench location , looking south-east With mulch stockpiles in the background.

Weapons Pit adjacent to former Command Post prior to excavation.

Former infantry trench M4 footprint. Looking south-east with rail corridor marked by pegs.

Clean stockpile SP15 prior to removal of vegetation

Waste materials from weapons pits stockpiled prior to off-site removal (23 April 2012)

© 2013 JBS Environmental

Source:
JBS Personnel, various dates as noted

Rev	Description	Drn.	Date
0	Original Issue - R03	JR	

Appendix: B Photographic Log

Client: Landcom

Project: Validation Assessment, RRZW, Zouch Rd, Edmondson Park

Job No: 41945 File Name: 41945_R03_App B

General Site Conditions During Vegetation and Waste Material Removal Activities (23 April 2012)

Cleared areas to west of riparian zone (marked by red-yellow mesh)

Examples of former weapons materials. SP5 is apparent in the background

Weapons pit location to the east of local open Space in the north-east of the site. Note, yellow and red mesh marks extent of conservation, with trees on the right later removed.

Tree clearing works in progress in central portion of the site.

West most portion of the site and boundary track following initial tree clearance (track comprises lead particulate zone prior to remediation.

© 2013 JBS Environmental

Source:
JBS Personnel, various dates as noted

Rev	Description	Drn.	Date
0	Original Issue - R03	JR	

JBS ENVIRONMENTAL

Appendix: B Photographic Log

Client: Landcom

Project: Validation Assessment, RRZW, Zouch Rd, Edmondson Park

Job No: 41945 File Name: 41945_R03_App B

Unexpected Find UF04 Documentation 31-05-2012. Concrete rubble and Non-friable Asbestos Fragments in surface material identified during Vegetation Clearance

Unexpected Find UF04 Validation 21 August 2013.

Unexpected Find UF04 Validation 21 August 2013.

Unexpected Find UF04 Validation 21 August 2013.

Excavation of backfilled former weapons pit identified during UXO survey, November 2012

Looking toward the north-west, north-east and east across the rail corridor to RZNRA from the access track in the central section of the Conservation Zone south of the rail alignment (November 2012).

© 2013 JBS Environmental

Source:
JBS Personnel, various dates as noted

Rev	Description	Drn.	Date
0	Original Issue - R03	JR	

JBS ENVIRONMENTAL

Appendix: B Photographic Log

Client: Landcom

Project: Validation Assessment, RRZW, Zouch Rd, Edmondson Park

Job No: 41945 File Name: 41945_R03_App B

Photos of UXO clearance activities – May 2012 (RZNRA)

© 2013 JBS Environmental

Source:
JBS Personnel, various dates as noted

Rev	Description	Drn.	Date
0	Original Issue - R03	JR	

JBS ENVIRONMENTAL

Appendix: B Photographic Log

Client: Landcom

Project: Validation Assessment, RRZW, Zouch Rd, Edmondson Park

Job No: 41945 File Name: 41945_R03_App B

Appendix C –Clean Stockpile Characterisation Report

© 2013 JBS Environmental Pty Ltd

JBS41945-50413

5 April 2012

David Schofield
Landcom
Via email:(dschofield@landcom.nsw.gov.au)

(cc. David Riddell, Aver: driddell@aver.com.au
Graeme Nyland, Environ: gnyland@environ.com.au)
Rowena Salmon, Environ: rsalmon@environ.com.au)

Stockpile Characterisation Advice

Landcom Project 12619 Zouch Road, Edmondson Park

Dear David,

1. Introduction and Background

JBS Environmental Pty Ltd was engaged by Landcom to act as remediation consultant during redevelopment of the land known as Landcom Project 12619 located at Zouch Road, Edmondson Park, NSW herein referred to as 'the Site'. The Site is formally identified as part lot 7 and lot 8 DP1127652, as shown in **Figure 1** (**Attachment 2**) and comprises a total area of approximately 86 hectares (ha). It is noted that the Site is bisected by the proposed rail corridor comprising part Lots 1 and 2 DP1127652, of approximately 8 ha which is excluded from the Site.

Previous assessment of Site contamination conditions completed previously by others identified the presence of soil contamination conditions requiring remediation prior to commencement of urban development works. The previous Site assessment and remediation plan documents include:

- *Detailed Contamination Site Investigation Report. Landcom Project No. 12619, Zouch Road, Edmondson Park, NSW*. Golder Associates Pty Ltd (Golder 2005a);
- *Remediation Action Plan, Landcom Project No: 12619, Zouch Road, Edmondson Park, NSW*. Golder Associates Pty Ltd (Golder 2005b); and
- *Landcom Project 12619 – Zouch Road, Edmondson Park, NSW, Remediation Action Plan*. Golder Associates Pty Ltd (Golder 2011).

In addition, the appointed independent contaminated Site Auditor has issued the following interim advice with respect to the suitability of the assessment works and remedial action plan (RAP):

- Interim *Advice #4 – Zouch Road, Edmondson Park, NSW, Remediation Action Plan*. Environ Australia Pty Ltd (Environ 2006)
- *Interim Advice #5 – Zouch Road, Edmondson Park, NSW, Revised Remediation Action Plan*. Environ Australia Pty Ltd, draft issue, 24 February 2011 (Environ 2011).

Following appointment as the remediation consultant, JBS has prepared a Validation Sampling Analysis and Quality Plan (JBS 2012a[1]) to guide the validation works during remediation activities.

During the remediation activities additional material will be require to be sourced for backfilling of weapon/training pits and other remedial activities.

Existing assessment of the site identified 15 'clean' stockpiles across the Site. As required by the RAP (Golder 2011), additional assessment of the 'clean' stockpiles is necessary to verify the absence of contaminated material prior to use as backfill on the site. This letter presents the results of the stockpile characterisation assessment completed by JBS in March 2012.

[1] *Validation Sampling, Analysis and Quality Plan, Landcom Project 12619, Zouch Road, Edmondson Park, NSW*. JBS Environmental Pty Ltd, February 2012 (JBS 2012a)

128 O'Riordan St Mascot NSW I 50 Margaret St Sydney NSW
Tel: 02 8338 1011 I Fax: 02 8338 1700 www.jbsgroup.com.au

2. Objectives and Scope of Works

The objective of the sampling activities was to assess and further characterise previously identified stockpiles for possible re-use on the Site.

The scope of works comprised:

- Review of stockpile information presented in the existing RAP (Golder, 2011);
- Identification, inspection and sampling of existing stockpiles within the Site (**Figure 2, Attachment 2**);
- Laboratory analysis of collected samples and QA/QC samples for a range of contaminants of potential concern (COPC); and
- Assessment and characterisation of stockpiles for potential re-use on the Site as backfill.

3. Review of Existing Stockpile Data

Previous site assessment activities (Golder 2005a) comprised installation of test pits during March 2005 into 17 stockpiles across the Site. The 15 stockpiles identified in the Golder (2011) RAP as potentially suitable for re-use on the Site are shown in **Figure 2** (**Attachment 2**). Stockpile test pit log descriptions as reported in Golder (2005a) are included in **Attachment 3**.

To assess potential stockpile contamination, samples were collected from each of the 15 stockpiles during the Golder (2005a) assessment activities and subsequently analysed for a range of COPCs including heavy metals, total petroleum hydrocarbons (TPH), monocyclic aromatic hydrocarbon (BTEX) compounds, polycyclic aromatic hydrocarbon (PAH) compounds, organochlorine pesticides (OCPs), organophosphate pesticides (OPPs), polychlorinated biphenyls (PCBs) and asbestos. Analysis results were compared to adopted assessment criteria as presented in **Table 6.1** of this correspondence.

The laboratory analysis results reported in Golder (2005a) are summarised in tables presented in **Attachment 3**. Results of the laboratory analysis were below the adopted on site criteria.

4. Data Quality Objectives

Data Quality Objectives (DQOs) were established for the assessment works, as described in the following sections, in keeping with JBS (2012a) SAQP.

4.1. State the Problem

Previously identified clean stockpiles have been identified as potentially suitable for re-use on site for backfilling weapons/training pits and other remedial excavations. Existing assessment of the Site did not identify any contamination impacts within the stockpiles. As required by the RAP (Golder 2011), additional assessment of these stockpiles is necessary to verify the absence of contaminated material prior to use as backfill on the Site.

4.2. Identify the Decision

For this stockpile characterisation sampling, the primary decision required to be made comprises:

- Are stockpile soil conditions below the adopted site assessment criteria?
- Are stockpiles absent of any visually identifiable impacted material?

4.3. Identify Inputs to the Decision

Inputs to the decisions are:

- Contamination data and observations collected during the previous site investigation;
- Stockpile soil data and observations collected during the current stockpile sampling event completed by JBS; and
- Adopted soil criteria as per the Golder (2011) RAP.

Specifically, sufficient data was required to be collected from the identified potentially impacted media (stockpiles) in the identified areas of environmental concern for the associated potential contaminants of concern.

4.4. Define the Study Boundaries

The study boundary for the defined Site is shown schematically in **Figure 1** (**Attachment 2**) and in more detail with stockpile locations in **Figure 2** (**Attachment 2**). The Site is formally defined as part lot 7 and lot 8 DP111127652 comprising approximately 86 ha. As shown in **Figures 1** and **2** (**Attachment 2**), the extent of the Site comprises:

128 O'Riordan St Mascot NSW I 50 Margaret St Sydney NSW
Tel: 02 8338 1011 I Fax: 02 8338 1700 www.jbsgroup.com.au

- North – the existing fence line marking the northern extent of Lot 8 (that portion north of the Rail Corridor) across the majority of the Site, with the northern extent of Lot 7 (north of the RC) comprising the east most portion of the Site's extent;
- West – the existing fence line marking the northern extent of Lot 8, the southern portion of which faces Zouch Road;
- South – the existing fence line marking the extent of Lot 8 in the western portion of the Site and of Lot 7 across the majority of the Site;
- East – the existing fence line marking the extent of Lot 7; and
- Internally – the extent of Lots 7 and 8 in relation to Lots 1 and 2 comprising the proposed rail corridor and future ancillary parking facilities soon to be remediated under a separate agreement between TWA and Landcom.

4.5. Develop a Decision Rule

Stockpile soil analytical data were assessed against site assessment criteria presented in **Section 6** as documented in the SAQP (JBS 2012a) derived from NSW EPA endorsed guidance including. Decision rules used to expand on the decisions in **Section 3.2** are outlined in **Table 3.1**.

Table 3.1 Summary of Decision Rules

Decision Required to be Made	Decision Rule
Are stockpile soil conditions below the adopted site assessment criteria?	Stockpile soil laboratory results were compared against adopted site assessment criteria derived from the EPA endorsed criteria. Where contaminant concentrations in stockpiles were greater than the adopted assessment criteria, the answer was no. Where contaminant concentrations in stockpile were less than the adopted assessment criteria, the answer was yes.
Are stockpiles absent of any visually identifiable impacted material?	Each stockpile was visually assessed to identify any potential impacted material. Where visually identifiable impacted material was present on the stockpiles, the answer was yes. Where visually identifiable impacted material was absent from stockpiles, the answer was no.

4.6. Specify Limits on Decision Errors

To assess the usability of the data prior to making decisions, the data were assessed against pre-determined Data Quality Indicators (DQIs) for precision, accuracy, representativeness, completeness, comparability and sensitivity (PARCCS parameters) as discussed in the validation SAQP (JBS 2012a). The acceptable limit on decision error is a minimum of 95% compliance with DQIs.

The pre-determined Data Quality Indicators (DQIs) established for the project are shown in **Table 3.1**.

Table 3.1 Summary of Quality Assurance / Quality Control Program

Data Quality Indicators	Frequency	Data Quality Criteria
Precision		
Split duplicates (intra laboratory)	1 / 20 samples	<50% RPD[1] where conc > 10 x LOR/ PQL
Blind duplicates (inter laboratory)	1 / 20 samples	<50% RPD where conc > 10 x LOR
Laboratory Duplicates	1 / 20 samples	<50% RPD where conc > 10 x LOR
Accuracy		
Surrogate spikes	All organic analytes	60-140%
Laboratory control samples	1 per lab batch	70-130% metals, 60-140 % organics
Matrix spikes	1 per lab batch	70-130% metals, 60-140 % organics

128 O'Riordan St Mascot NSW I 50 Margaret St Sydney NSW
Tel: 02 8338 1011 I Fax: 02 8338 1700 www.jbsgroup.com.au

Data Quality Indicators	Frequency	Data Quality Criteria
Representativeness		
Sampling appropriate for media and analytes	1 / stockpile	-
Samples extracted and analysed within holding times.	All samples	Soil: 14 days for organics, 6 months for metals, asbestos Water: sTPH/PAHs 7 days to extraction, VOCs/vTPH – 14 days, 6 months for metals
Trip spike (volatiles only)	1 per sampling event	70-130% recovery
Rinsate	1 / 20 samples for TPH, PAHs, 8 metals, or minimum of one/day where sampling for these analyst.	<LOR
Storage blank	1 / media	<LOR
Comparability		
Standard operating procedures for sample collection & handling	All Samples	All samples
Standard analytical methods used for all analyses	All Samples	All samples
Consistent field conditions, sampling staff and laboratory analysis	All Samples	All samples
Limits of reporting appropriate and consistent	All Samples	All samples
Completeness		
Soil description and COCs completed and appropriate	All Samples	- All samples
Appropriate documentation	All Samples	- All samples
Satisfactory frequency and result for QC samples	All QA/QC samples	-
Data from critical samples is considered valid	All Samples	Critical samples valid
Sensitivity		
Analytical methods and limits of recovery appropriate for media and adopted Site assessment criteria	All Samples	LOR< = Site assessment criteria

(1) If the RPD between duplicates is greater than the pre-determined data quality indicator, a judgement will be made as to whether the excess is critical in relation to the validation of the data set or unacceptable sampling error is occurring in the field.

4.7. Optimise the Design for Obtaining Data

Previous site assessment activities (Golder 2005a) comprised installation of test pits into 17 stockpiles across the Site. Golder (2011) identified 15 of the stockpiles (SP1, SP2, SP3, SP4, SP5, SP7, SP8, SP9, SP10, SP11, SP12, SP14, SP15, SP16 and SP17) as suitable for re-use on Site. As required by the RAP (Golder 2011), additional assessment of these stockpiles is necessary to verify the absence of contaminated material prior to re-use as backfill on the Site.

Stockpile sampling involved collection of a sample from each stockpile prior to the re-use of the stockpile as backfill on the Site, as per the JBS (2012a) SAQP.

5. Investigation Methodology

5.1. Stockpile Sampling Methodology

As specified in the RAP (Golder, 2011) a single soil sample was collected using a shovel from each stockpile at depths greater than 0.2 m below the stockpile surface at time of sampling. Prior to the collection of each sample the shovel was decontaminated.

All soil samples were placed into laboratory supplied jars/bags. Each of the sample jars/bags were labelled with the project ID, date, sampler's initials and unique stockpile ID (or QC sample name), using permanent ink marker on labels affixed to the sides of the jars/bags by the laboratory. In addition, the sample ID (i.e., the stockpile ID) was also replicated on the lid of the jars in the event that the labels became detached from the jars during transport.

The jars/bags were placed directly into a pre-chilled ice chest, for transport to the testing laboratories under chain of custody conditions. COC documentation was completed for samples relinquished to the laboratory and included: sample ID; depth; number of jars/bags; media type (i.e., soil); project ID; name; date of sampling and relinquishment.

The completed activities were documented on borehole and calibration/decontamination record forms as included as **Attachment 4**. One rinsate sample was obtained during the field decontamination procedures by rinsing the shovel with laboratory grade demineralised water following the decontamination procedure. The water sample was then appropriately preserved and stored with the site jar/bag samples prior to transport to the laboratory for chemical analysis.

128 O'Riordan St Mascot NSW I 50 Margaret St Sydney NSW
Tel: 02 8338 1011 I Fax: 02 8338 1700 www.jbsgroup.com.au

5.2. Laboratory Analysis Methodology

JBS Environmental engaged Envirolab Services Pty Ltd (Envirolab) at Chatswood, NSW as the primary laboratory for the required analyses. The secondary laboratories used for the works were SGS Environmental (SGS) at Alexandria, NSW and Pickford & Rhyder Consulting Pty Ltd (Pickford & Rhyder) at Lane Cove, NSW. All laboratories were NATA registered for the required analyses. In addition, the laboratories were required to meet JBS Environmental's internal QA/QC requirements.

Laboratory analysis methods for relevant soil contaminants are identified in **Table 6.1**.

6. Assessment Criteria

Assessment of stockpile soil conditions is required to verify the absence of contaminated material prior to re-use as backfill on the Site. The adopted criteria presented in **Table 6.1** were derived during the development of the validation SAQP (JBS 2012a) and include values derived from the following documents:

- Department of Environment and Climate Change (DECC) (2006) *Contaminated Sites: Guidelines for the NSW Site Auditor Scheme 2nd edition:*
    - Residential with accessible soil is the most sensitive land use criteria presented in these guidelines.
    - Parks, recreational open space and playing fields.
    - Phytotoxicity-based ecological investigation levels.
- *Contaminated Sites: Guidelines for assessing Service Station Sites,* New South Wales Environment and Protection Authority, 1994 (EPA 1994)

Table 6.1 Adopted Soil Criteria (all units in mg/kg) for Residential Use with Accessible Soils

	Limit of Reporting	Laboratory Method	Health-Based Investigation Criteria (residential) (HIL – A)[1]	Health-Based Investigation Criteria (parks, open space) (HIL – E)[4]	Phytotoxicity-Based Ecological Investigation Levels (EIL)
METALS					
Arsenic	4	ICP-AES (USEPA 200.7)	100	200	20
Cadmium	0.5	ICP-AES (USEPA 200.7)	20	40	3
Chromium (total)	1	ICP-AES (USEPA 200.7)	12 %	24 %	400
Copper	1	ICP-AES (USEPA 200.7)	1000	2000	100
Lead	1	ICP-AES (USEPA 200.7)	300	600	600
Mercury (inorganic)	0.1	ICP-AES (USEPA 200.7)	15	30	1
Nickel	1	ICP-AES (USEPA 200.7)	600	600	60
Zinc	1	ICP-AES (USEPA 200.7)	7000	14 000	200
PETROLEUM HYDROCARBONS					
C6-C9 Fraction	25	Purge Trap-GCMS (USEPA8260)	65[2]	65[2]	-
C10 – C36 Fraction	250	Purge Trap-GCFID (USEPA8000)	1000[2]	1000[2]	-
PETROLEUM HYDROCARBONS					
Benzene	1.0	Purge Trap-GCMS (USEPA8260)	1.0[2]	1.0[2]	-
Toluene	1.0	Purge Trap-GCMS (USEPA8260)	1.4[2]	1.4[2]	-
Ethyl benzene	1.0	Purge Trap-GCMS (USEPA8260)	3.1[2]	3.1[2]	-
Total Xylenes	3.0	Purge Trap-GCMS (USEPA8260)	14[2]	14[2]	-
POLYCYCLIC AROMATIC HYDROCARBONS					
Benzo(a) pyrene	0.05	GCMS (USEPA8270)	1	2	-
Total PAHs	1.55	GCMS (USEPA8270)	20	40	-
ORGANOCHLORINE PESTICIDES					
Aldrin + Dieldrin	0.2	GCECD (USEPA8140,8080)	10	20	-
Chlordane	0.2	GCECD (USEPA8140,8080)	50	100	-
Heptachlor	0.1	GCECD (USEPA8140,8080)	10	20	-
DDT + DDD + DDE	0.3	GCECD (USEPA8140,8080)	200	400	-
POLYCHLORINATED BIPHENYLS					
Total PCBs	0.6	GCECD (USEPA8140,8080)	10	20	-
OTHER					
Asbestos	0.1 g/kg	PLM / Dispersion Staining	0.1[3] g/kg	0.1[3] g/kg	-

128 O'Riordan St Mascot NSW I 50 Margaret St Sydney NSW
Tel: 02 8338 1011 I Fax: 02 8338 1700 www.jbsgroup.com.au

Notes:
(1) DEC (2006) *Contaminated Sites: Guidelines for the NSW Site Auditor Scheme 2nd edition*. Residential with accessible soil is the most sensitive land use criteria presented in these guidelines.
(2) *Contaminated Sites: Guidelines for Assessing Service Station Sites,* NSW EPA, 1994 (EPA 1994)
(3) No endorsed criteria. The LOR is proposed as the screening level criteria in the absence of Site specific criteria.
(4) DEC (2006) *Contaminated Sites: Guidelines for the NSW Site Auditor Scheme 2nd edition*. Parks, recreational open space and playing fields.

The adopted soil criteria were applied at stockpile locations across the Site (SP1, SP2, SP3, SP4, SP5, SP7, SP8, SP9, SP10, SP11, SP12, SP14, SP15, SP16 and SP17) as shown in **Figure 2**.

Where both human health and ecosystem criteria have been nominated for a contaminant in **Table 6.1** above, the more sensitive criteria has been adopted (i.e. 20 mg/kg arsenic ecosystem level in preference to the 100 mg/kg health based criterion) as the site assessment criteria for stockpile validation purposes.

7. Quality Assurance / Quality Control

7.1. Results

The QA/QC results are summarised in **Table 7.1** and discussed in **Section 7.2** below. Detailed QA/QC results are included with the laboratory reports in **Attachment 5.** The QA/QC results of the rinsate, trip spike and trip blank sample are not included in the QA/QC checker summary in **Attachment 5**, however they are in laboratory reports presented in **Attachment 6** and discussed below.

Table 7.1 Summary of Results of Quality Assurance / Quality Control Program

Data Quality Objective	Frequency/Criterion	Results	DQO met?
Precision			
Blind duplicate (intra-lab)	>1/20 samples RPDs<50% where conc > 10 x LOR	Duplicate samples were obtained and analysed at an appropriate density (1 duplicate, 15 primary samples). All results were within the adopted RPD% acceptance criteria.	Yes
Split duplicate (inter-lab)	>1/20 samples RPDs<50% where conc > 10 x LOR	Duplicate samples were obtained and analysed at an appropriate density (1 duplicate, 15 primary samples). All results were within the adopted RPD% acceptance criteria.	Yes
Laboratory Duplicate analysis	>1/20 samples RPDs<50% where conc > 5 x LOR	Laboratory duplicate samples were obtained and analysed at an appropriate density (1 duplicate, 15 primary samples), All results were within the adopted RPD% acceptance criteria.	Yes
Accuracy			
Surrogate spikes	All organic samples 60-140%	All samples analysed. Recoveries in range of 75 – 140 %, within the acceptance criteria.	Yes
Laboratory control samples	1 per lab batch 70-130% metals, 60-140 % organics	Lab control sample analysis results reported for 1 sample from batch. Results in range of 80 to 140 %, within the acceptance criteria.	Yes
Matrix spikes	1 per lab batch 70-130% metals, 60-140 % organics	Matrix spike analyses results reported for 1 sample from batch. Results in range of 80 to 140%, within the acceptance criteria.	Yes
Representativeness			
Sampling appropriate for media and analytes	All media / analytes	All sampling conducted in accordance with JBS procedures	Yes
Trip spike (volatiles)	1 / media / per sampling event 70-130% recovery	A trip spike was carried for the sampling event and subsequently analysed for BTEX. Recoveries of 99 to 105 % were within the acceptable range.	Yes
Storage Blank	1 / media / per sampling event Results <LOR	One storage blank was carried for the sampling event and subsequently analysed for BTEX. Reported BTEX concentrations were all less than the LOR.	Yes
Rinsate	1 / 20 samples / PAHs, TPH and 8 metals Results <LOR	One rinsate sample was prepared during the field works and submitted for analysis. The results for all analyses were less than the LOR.	Yes

128 O'Riordan St Mascot NSW I 50 Margaret St Sydney NSW
Tel: 02 8338 1011 I Fax: 02 8338 1700 www.jbsgroup.com.au

Data Quality Objective	Frequency / Criterion	Results	DQO met?
Samples extracted and analysed within holding times.	All samples	Samples for chemical analysis were submitted, extracted and analysed within holding times.	Yes
Comparability			
Standard operating procedures for sample collection & handling	All Samples	JBS field staff used the same standard operating procedures throughout works.	Yes
Standard analytical methods used for all analyses	All Samples	Standard analytical methods used as presented in the laboratory reports included as **Attachment 6**.	Yes
Consistent field conditions, sampling staff and laboratory analysis	All Samples	All sampling was completed by experienced JBS personnel. Field staff carried out the work in accordance with JBS operating procedures. One primary and two secondary laboratories completed the analysis for the sampling event.	Yes
Completeness			
Test pit logs, Notes and COCs completed and appropriate	All Samples	Test pit logs and COCs were completed appropriately.	Yes
Appropriate documentation	All Samples	Appropriate field documentation is included in **Attachment 4**.	Yes
Satisfactory frequency and result for QC samples	All QA/QC samples	QC samples were collected at an appropriate frequency	Yes
Data from critical samples is considered valid	All samples	The collected data presented in this report is considered valid.	Yes
Sensitivity			
Analytical methods and limits of recovery appropriate for media and adopted site assessment criteria	All samples	Appropriate laboratory analysis methods and detection limits were considered to have been achieved during the field and laboratory phases of this investigation.	Yes

7.2. Discussion of QA / QC Results

Precision

Intra and inter-laboratory duplicates for stockpile soil samples were collected at rates exceeding 1 per 20 samples (5%) analysed. The primary sample comprised SP14-1 with the intra-lab sample labelled as QC02 and the intra-lab duplicate as QA02 in the SGS report. The results for both intra- and inter-laboratory sample analyses were within the nominated range specified in the data quality indicators.

A laboratory duplicate sample was reported for one sample from the batch and analysed for heavy metals, TPH/BTEX, OCPs and PAHs. The laboratory duplicate sample results were within the nominate range specified in the data quality indicators.

Accuracy

Surrogate and matrix spike and laboratory control sample analyses were completed at a suitable frequency and reported results within the acceptable range.

Representativeness

The stockpile sampling methods were considered appropriate for the media and the analytes targeted. Stockpile soil samples were collected using a shovel. The stockpile sampling was completed by collecting soil directly from the shovel and filling of new laboratory prepared jars/bags.

All primary and duplicate soil sample extractions and analyses were completed within the recommended holding times.

Rinsate samples, a trip spike and storage blank were analysed with the batch of samples but were reported on a separate laboratory report (Report No. 70383) compared to the stockpile samples (Report No. 70384). The lab reports are presented in **Attachment 6**. All levels of analytes in these samples were below the laboratory limit of recovery for each analyte, and the recoveries for the trip spike were within the limits specified in the representative DQIs.

128 O'Riordan St Mascot NSW I 50 Margaret St Sydney NSW
Tel: 02 8338 1011 I Fax: 02 8338 1700 www.jbsgroup.com.au

Water matrices were used for trip spike and storage blank samples as JBS has identified poor laboratory preparation of soil trip spikes samples in the past which have consequently resulted in inaccurate recoveries.

Comparability

The primary and secondary laboratories were NATA accredited for all methods undertaken during this assessment. The JBS field scientist completed the sampling for this assessment using the documented sampling methodology consistent JBS with sampling protocols. All required field forms and bore log sampling forms were appropriately completed by the sampling personnel. The assessment results indicate that significant bias of the data as a result of sampling or laboratory methods has not occurred.

Completeness

With the exception of identification of matrices for the quality control samples as soil rather than water, all documentation was generally completed to the required standard and are included in **Attachment 4**. Given that the samples were correctly identified by the laboratory and documented in the laboratory reports, this was considered not to be a critical error.

Sensitivity

Appropriate laboratory analysis methods and detection limits were considered to have been achieved during the field and laboratory phases of this investigation.

7.3. QA/QC Assessment

The results of the field and laboratory QA/QC program indicate that the data obtained from this investigation generally met the predetermined Data Quality Indicators (DQIs). As such the data are considered to be of adequate quality to be relied on for the purposes of assessing the environmental condition at the Site.

8. Results

Observations during field works have been recorded in field notes included in **Attachment 4**. Sample locations are shown on **Figure 2** in **Attachment 2**. Detailed laboratory reports and chain of custody documentation is presented in **Attachment 6**. An assessment of data quality has found that the data are of a suitable quality for the intended purposes (**Attachment 5**). A summary of stockpile suitability for re-use on site is presented in **Table 10.1**.

8.1. Site Observations

With the exception of SP1 and SP8, observations of the stockpiles were consistent with Golders (2005a) investigation and indicated that the material was absent of visually identifiable impacted material (anthropogenic inclusions, staining, odours, the presence of stressed vegetation, etc). Two pieces of Asbestos Containing Material (ACM) were identified on the stockpile surface of SP1 and a small piece of steel was observed sub-surface within SP8.

8.2. Stockpile Soil Results

The laboratory analysis results completed for this stockpile assessment is presented in **Table A** included as **Attachment 7**. The following comments summarise the results for the contaminants of concern:

- Heavy metals concentrations reported were all below the adopted site criteria.
- PAH concentrations reported were all below LOR and below the adopted site assessment criteria.
- OCP concentrations reported were all below LOR and below the adopted site assessment criteria.
- vTPH (C_6-C_9) and BTEX concentration reported were all below LOR and the adopted site assessment criteria.
- sTPH (C_{10}-C_{36}) concentrations reported were all below LOR and below the adopted site assessment criteria.
- No asbestos was identified above the LOR and no respirable fibres were detected in the soil samples.

9. Discussion of Results and Observations

Review of the Golder (2005a) reported stockpile observations indicates that stockpiles were absent of any visually identifiable impacted material, with the exception of SP1 and SP8 the recent characterisation of the stockpiles were consistent with those previously documented. Two pieces of bonded ACM were identified on the surface of SP1 and some scrap metal (steel) was identified sub-surface within SP8.

Analytical results for all stockpile samples revealed some concentrations below the relevant LOR and all concentrations below the adopted site criteria.

128 O'Riordan St Mascot NSW I 50 Margaret St Sydney NSW
Tel: 02 8338 1011 I Fax: 02 8338 1700 www.jbsgroup.com.au

10. Conclusions and Recommendations

Table 10.1 Summary of Stockpile Suitability for Re-use on the Site

Stockpile	Location (centre of stockpile)		Conclusion
Identification	Easting	Northing	Suitable for re-use on site?
SP1	301483.44	6239218.04	NO - ACM noted on surface (see recommendations below)
SP2	301667.56	6239242.31	YES
SP3	301711.35	6239272.60	YES
SP4	301589.21	6239569.66	YES
SP5	301207.18	6239774.79	YES
SP7	301195.97	6239066.11	YES
SP8	301179.98	6239071.94	YES – Subject to removal of visible steel
SP9	301211.91	6239054.48	YES
SP10	301180.49	6239026.03	YES
SP11	301191.23	6239026.07	YES
SP12	301100.86	6239130.59	YES
SP14	301923.98	6239757.75	YES
SP15	302014.96	6239665.54	YES
SP16	301211.80	6239033.08	YES

Based on the findings of this investigation and subsequent to the limitations in **Attachment 1**, the following conclusions have been reached:

- Laboratory results and visual observations indicated that the stockpiles are suitable for re-use on site, with the exception of SP1 (**Table 10.1**). Excavation of the all the stockpiles is to be observed by JBS to confirm the absence of visually identifiable impacted material within the stockpiles that may not have been exposed during the sampling completed.

It is recommended that an asbestos consultant/hygienist inspect SP1 and immediate surrounds, pick visible ACM for removal to the encapsulation area or disposal, and provide appropriate documentation of the clearance. If the extent of the ACM appears greater than anticipated the hygienist should advise if the material in SP1 should now be considered ACM impacted soil, and the material would then require management as such.

If you require any further assistance, please do not hesitate to contact me on (02) 8338 1011 or by email jrosner@jbsgroup.com.au .

Prepared by:

Alex Boardman
Environmental Scientist
JBS Environmental Pty Ltd

Reviewed/Approved by:

Matthew Bennett
Principal Contaminated Land
JBS Environmental Pty Ltd

Attachments: (1) Limitations
(2) Figures
(3) Golder (2005a) Test Pit and Laboratory Summary Tables
(4) Stockpile sampling field forms
(5) QA/QC Checker Summary
(6) Laboratory Analysis Reports and Chain of Custody Information
(7) Summary Tables - Stockpile Sample Analytical Results

128 O'Riordan St Mascot NSW I 50 Margaret St Sydney NSW
Tel: 02 8338 1011 I Fax: 02 8338 1700 www.jbsgroup.com.au

Attachment 1 – Limitations

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only, and has been based in part on information obtained from the client and other parties.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

JBS Environmental Pty Ltd accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced without prior approval by the client, or amended in any way without prior approval by JBS Environmental Pty Ltd, and should not be relied upon by other parties, who should make their own enquires.

Sampling and chemical analysis of environmental media is based on appropriate guidance documents made and approved by the relevant regulatory authorities. Conclusions arising from the review and assessment of environmental data are based on the sampling and analysis considered appropriate based on the regulatory requirements.

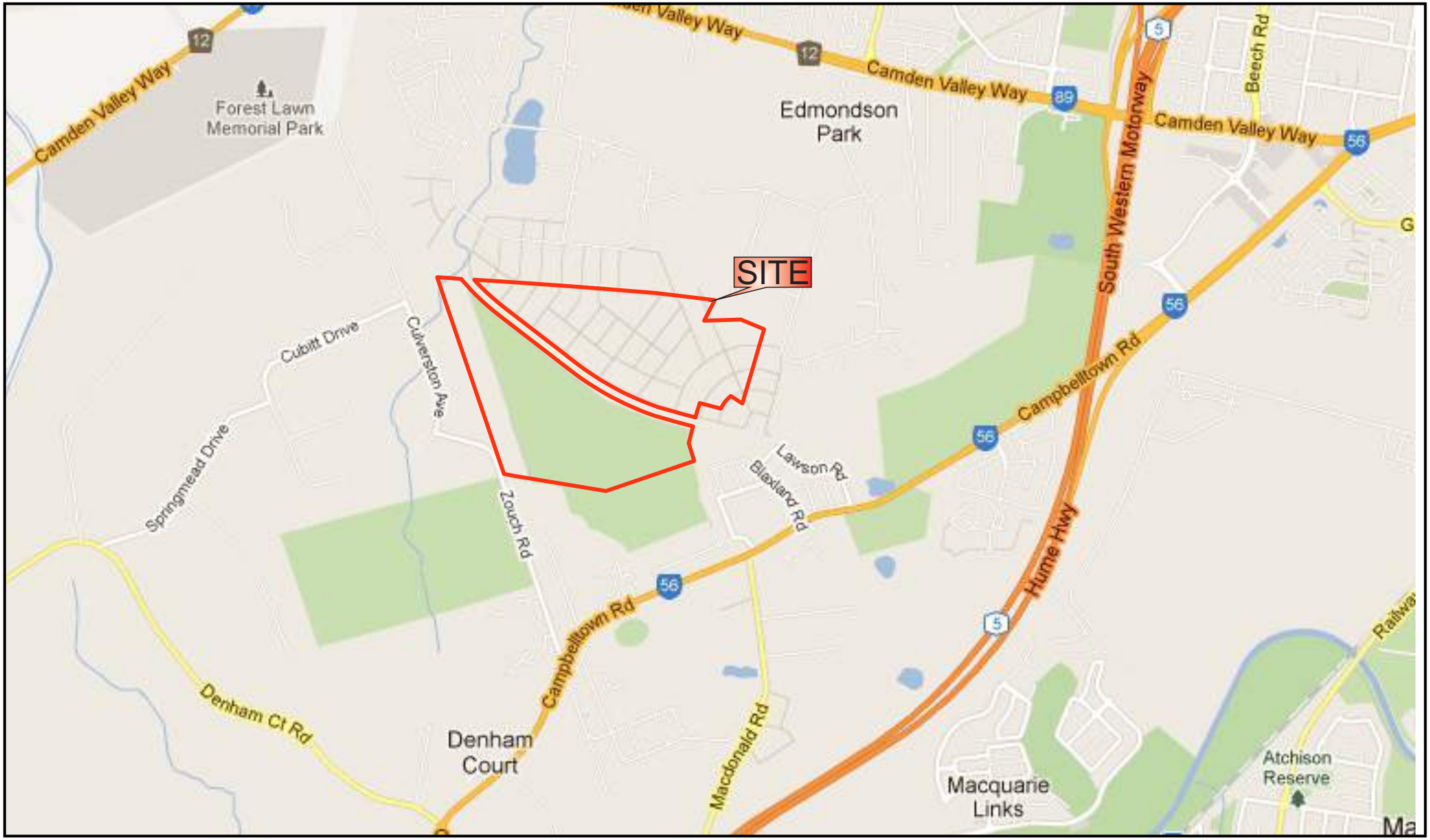
Limited sampling and laboratory analyses were undertaken as part of the investigations undertaken, as described herein. Ground conditions between sampling locations and media may vary, and this should be considered when extrapolating between sampling points. Chemical analytes are based on the information detailed in the site history. Further chemicals or categories of chemicals may exist at the site, which were not identified in the site history and which may not be expected at the site.

Changes to the subsurface conditions may occur subsequent to the investigations described herein, through natural processes or through the intentional or accidental addition of contaminants. The conclusions and recommendations reached in this report are based on the information obtained at the time of the investigations.

This report does not provide a complete assessment of the environmental status of the site, and it is limited to the scope defined herein. Should information become available regarding conditions at the site including previously unknown sources of contamination, JBS Environmental Pty Ltd reserves the right to review the report in the context of the additional information.

128 O'Riordan St Mascot NSW I 50 Margaret St Sydney NSW
Tel: 02 8338 1011 I Fax: 02 8338 1700 www.jbsgroup.com.au

Attachment 2 – Figures



Source: Base Image - Google Maps www.maps.google.com 20-03-2012

© 2012 JBS Environmental Pty Ltd

0 200 400 800 m
Scale: Approximate

Datum: MGA94 Zone 56 - AHD

Rev	Description	Drn.	Date
A4			
0	Original Issue - Letter	SE	20-03-2012

Legend:
- Approximate Site Boundary

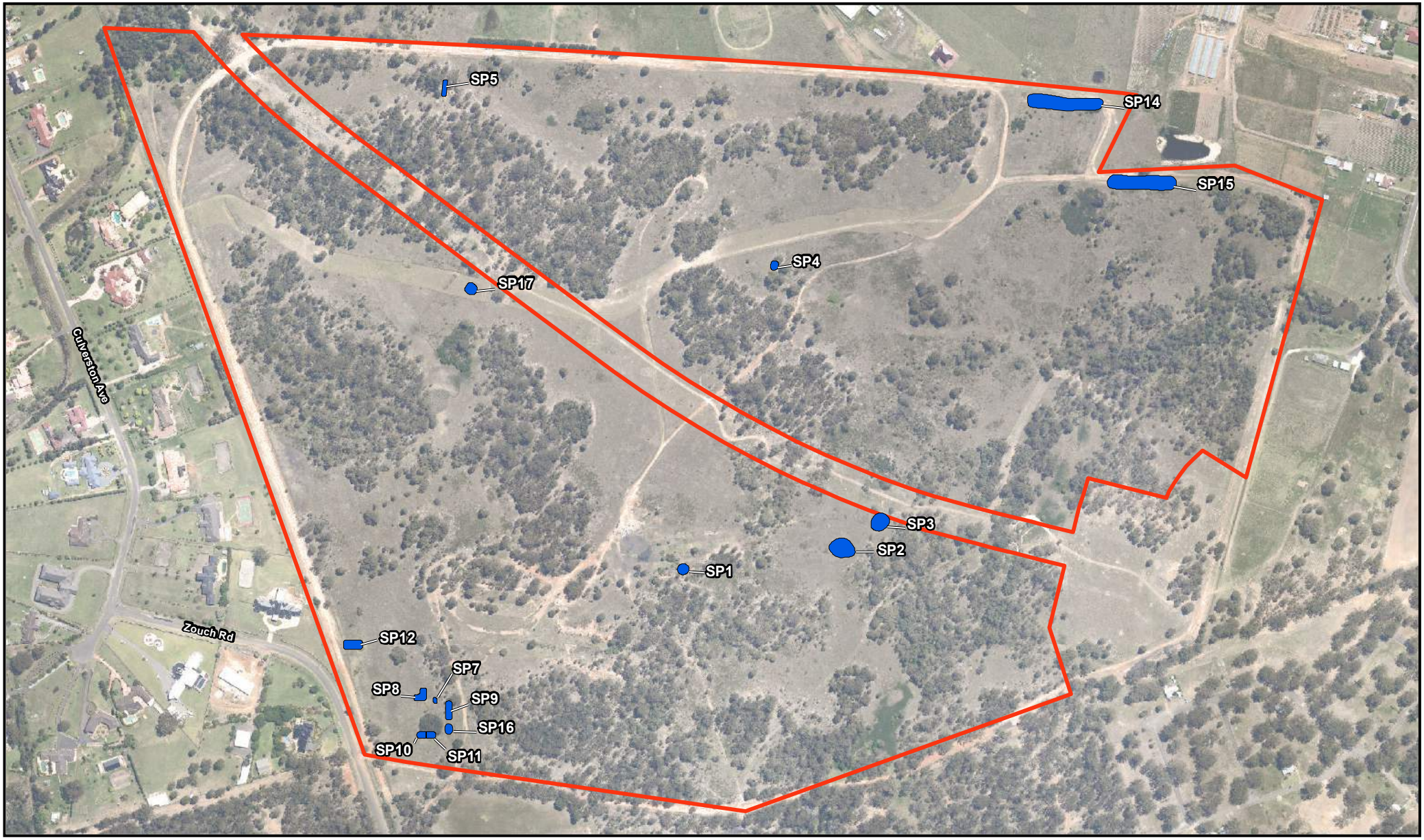
JBS ENVIRONMENTAL

Figure 1: Site Location

Client: Landcom

Project: Landcom, 12619 Zouch Rd, Edmondson Park, NSW

Job No: 41945 File Name: 41945_01



Source: Base Image: Hypertiles - Nearmap 23-10-2011

© 2011 JBS Environmental Pty Ltd

0 62.5 125 250 m

Scale: 1:6,000

Datum: MGA94 Zone 56 - AHD

Rev	Description	Drn.	Date:
A4			
0	Original Issue - L002	SE	19-03-2012

Legend:

- Approximate Site Boundary
- Clean Stockpile Location

JBS ENVIRONMENTAL

Figure 2: Clean Stockpile Locations

Client: Landcom

Project: Landcom, 12619 Zouch Rd, Edmondson Park, NSW

Job No: 41945 File Name: 41945_02

Attachment 3 –Golder (2005a) Test Pit and Laboratory Summary Tables

Sample number	Fill Type	Metals								BTEX				TPH					PAHs		Organochlorine Pesticides						Asbestos
		Arsenic	Cadmium	Chromium (Total)	Copper	Lead	Mercury	Nickel	Zinc	Benzene	Toluene	Ethyl-benzene	Xylenes	C6 - C9	C10 - C14	C15-C28	C29-C36	TPH (C10-C36)	Benzo (a) pyrene	Total PAHs	Aldrin + Dieldrin	Chlordane	Heptachlor	DDT + DDD + DDE	Total OPPs	Total PCBs	
LOR	-	4	0.5	1	1	1	0.1	1	1	0.5	0.5	1	2	20	20	50	50	120	0.05	1.55	0.2	0.2	0.1	0.3	Unknown	0.9	0.1 mg/kg
Landuse criteria (mg/kg)																											
Residential (HIL - D) (1)	-	400	80	8% (CrIII	4,000	1,200	60	2,400	28,000	0.5	1.4	3	14	65				1000	4	80	40	200	40	800	-	40	NIL
Golder 2005 Data																											
RZNRA																											
TPSP4-1	0.0-0.2	5	<0.5	13	22	16	<0.05	7	37	<0.5	<0.5	<0.5	<1.5	<20	<20	<50	<50	<120	<0.05	<1.55						<0.9	
TPSP4-3	0.8-1.0	4	<0.5	11	16	19	<0.05	7	29																		
TPSP5-1	0.0-0.2	4	<0.5	10	12	14	<0.05	6	21	<0.5	<0.5	<0.5	<1.5	<20	<20	<50	<50	<120	<0.05	<1.55							
TPSP5-4	1.1-1.3	7	<0.5	12	19	19	<0.05	4	23																		
TPSP6-1	0.0-0.2	<3	<0.5	9	12	13	<0.05	5	20	<0.5	<0.5	<0.5	<1.5	<20	<20	<50	<50	<120	<0.05	<1.55							
TPSP6-3	0.6-0.8	<3	<0.5	8	19	13	<0.05	5	30																		
TPSP6-4	1.2-1.3	7	<0.5	17	22	17	<0.05	10	50																		
DUP198	*TPSP4-1*	*4*	*<0.5*	*11*	*20*	*13*	*<0.05*	*5*	*27*	<0.5	<0.5	<0.5	<1.5	<20	<20	<50	<50		<0.05	<1.55							
DUP202	*TPSP6-1*	*9*	*<0.1*	*16*	*18*	*29*	*0.05*	*9*	*32*																		
RZSWC																											
TPSP7-1	0.0-0.2	6	<0.5	12	29	71	<0.05	8	50												<0.2	<0.1	<0.1	<0.6		<0.9	
TPSP7-3	0.3-0.5	7	<0.5	10	20	13	<0.05	6	33																		
TPSP8-1	0.0-0.1	10	<0.5	11	34	72	<0.05	8	50																		ND
TPSP8-3	0.5-0.7	3	<0.5	12	20	13	<0.05	10	42																		
TPSP11-1	0.3-0.5	6	<0.5	11	52	52	<0.05	7	42																		
TPSP11-3	0.5-0.7	6	<0.5	9	12	28	<0.05	6	28																		
TPSP12-1	0.0-0.1	4	<0.5	9	8	12	<0.05	5	29	<0.5	<0.5	<0.5	<1.5	<20	<20	<50	<50		<0.05	<1.55	<0.2	<0.1	<0.1	<0.6	LOR	<0.9	
TPSP12-3	1.0-1.2	3	<0.5	8	8	10	<0.05	5	24																		
TPSP12-4	1.5-1.8	5	<0.5	16	20	12	<0.05	7	35																		
DUP 200	TPSP12-1	4	<0.5	8	9	11	<0.05	5	25																		
DUP 200	TPSP12-1	6	<0.1	9	27	19	0.05	14	60	<0.2	<0.5	<0.5	<1.5	<10	<50	<100	<100	<250	<0.5	<8							
CZSRA																											
TPSP1-1	0.0-0.2	5	<0.5	11	30	15	<0.05	9	55	<0.5	<0.5	<0.5	<1.5	<20	<20	<50	<50		<0.05	<1.55							
TPSP1-3	1.0-1.2	5	<0.5	11	32	16	<0.05	9	58																		
TPSP1-4	1.8-2.0	5	<0.5	13	25	17	<0.05	9	41																		
TPSP2-1	0.0-0.2																				<0.2	<0.1	<0.1	<0.6		<0.9	
TPSP2-2	0.5-0.7	3	<0.5	7	24	15	<0.05	14	57	<0.5	<0.5	<0.5	<1.5	<20	<20	<50	<50		<0.05	<1.55							
TPSP2-4	1.4-1.6	3	<0.5	10	14	11	<0.05	3	18																		
TPSP3-1	0.0-0.2	5	<0.5	12	16	17	<0.05	9	33	<0.5	<0.5	<0.5	<1.5	<20	<20	<50	<50		<0.05	<1.55							
TPSP3-3	0.6-0.8	8	<0.5	13	19	18	<0.05	9	36																		
TPSP9-1	0.0-0.2	6	<0.5	10	36	150	<0.05	7	40	<0.5	<0.5	<0.5	<1.5	<20	<20	<50	<50		<0.05	<1.55	<0.2	<0.1	<0.1	<0.6		<0.9	
TPSP9-4	1.0-1.2	<3	<0.5	13	13	14	<0.05	5	28																		
TPSP10-1	0.0-0.1	4	<0.5	10	27	72	<0.05	7	40	<0.5	<0.5	<0.5	<1.5	<20	<20	<50	<50		<0.05	<1.55	<0.2	<0.1	<0.1	<0.6		<0.9	
TPSP10-4	1.0-1.2	4	<0.5	15	19	13	<0.05	7	38	<0.5	<0.5	<0.5	<1.5	<20	<20	<50	<50		<0.05	<1.55							
TPSP13-1	0.0-0.1	4	<0.5	11	14	22	<0.05	8	29	<0.5	<0.5	<0.5	<1.5	<20	<20	<50	<50		<0.05	<1.55	<0.2	<0.1	<0.1	<0.6		<0.9	
TPSP13-2	0.4-0.6	5	<0.5	12	16	20	<0.05	10	32																		
TPSP13-3	1.7-1.9	3	<0.5	12	30	33	<0.05	22	59																		

Attachment 4 –Stockpile Sampling Field Forms

Field Equipment Calibration and Decontamination

JBS ENVIRONMENTAL

PROJECT NAME:	Edmundson Park Remediation	**PROJECT NO:**	41945
FIELD DATES:	14 + 15/3/12	**FIELD STAFF:**	AB

CALIBRATION SUMMARY	N/A
EQUIPMENT:	
CALIBRATION STANDARD:	

DATE	TIME	READING (ppm$_v$)	COMMENTS

DECONTAMINATION SUMMARY

EQUIPMENT: - Shovel
- Gloves changed for each sample location

1. Was the equipment decontaminated appropriately prior to sampling at each location?	(Y)	N	NA
2. Was excess soil removed by scraping, brushing or wiping with disposable towels?	(Y)	N	NA
3. Was the equipment contaminated with grease, tar or similar material? If so, was the equipment steam cleaned or rinsed with pesticide-grade acetone:hexane?	Y Y	N N	(NA)
4. Was phosphate-free detergent used to wash the equipment?	(Y)	N	NA
5. Was the equipment rinsed with clean water?	(Y)	N	NA
6. Was the equipment then rinsed with deionised water?	(Y)	N	NA
7. Were all sample containers cleaned and acid or solvent washed prior to sample collection?	(Y)	N	NA

WERE ANY ADDITIONAL DECONTAMINATION MEASURES REQUIRED? PROVIDE DETAILS.

Field QC Log

JBS ENVIRONMENTAL

Job Name: Edmondson Park, GME

Job No: 41945 **Soil** **Water**

Project Manager: J. Reever **Sampler:** AB

QC requirements: 1 - 20

Field QC Sample ID	Sampling Date	Description
QC/QA 01	10-2-12	Water Sample (GME) BH608
QC/QA 02	14/3/12	Soil - SP14-1 (Bag + Jar)
~~QC/QA 03~~	~~15/3/12~~	~~Soil - Grab SP - (Bag)~~
QC/QA 03	19/3/12	Soil WDW2-1 (0.3m)
QC/QA 04	19/3/12	Soil PAH-1 (0.1m) - Jar only

JBS ENVIRONMENTAL

Borehole / Well / Test Pit No: SP1-1

Project No: 41945
Client: Lendcon
Project Name: E. Park
Site Address: Zouch Rd, E. Park

Date: 14/3/12
Contractor: —
Drill Rig/Excavation Plant: —
Method: HA
Total Hole Depth: 0.3m

Eastings (MGA):
Northings (MGA):
Reference Level:
Elevation - Surface/TOC:
Bore Diameter/Pit Dimension:

Water Level Initial:
Water Level Static:
Casing Type/Surface Finish:
Screen Diameter/Length:
Casing Diameter/Length:

SUBSURFACE PROFILE				SAMPLE				
Depth (m)	Graphic Log	Lithologic Classification	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments	Well Construction
		Fill	observation of AC on surface (see photos)					
			Silty Clay, orange, dry, stiff, fine gravel of sandstone + ironstone gravels	0.3m		BTJ		
0.3m			E.O.H at 0.3m required depth					

Method	Sample Type	Reference Level	Casing Type / Surface Finish	Log Details
HA – Hand Auger SFA – Solid Flight Auger HFA – Hollow Flight Auger PT – Push Tubing AH – Air Hammer TP – Test Pit	U – Undisturbed Tube Sample D – Disturbed Sample CS – Core Sample	AHD – Australian Height Datum BGS – Below Ground Surface TOC – Top of Casing	PVC18 – Class 18 PVC MT – Monument RB – Roadbox SP – Stick up/Standpipe	Logged By: Project Manager:

Description						Coarse Grained Soils			Fine Grained Soils		Inclusions
CLASS	Texture	Grading/Sorting	Colour	Structure	Moisture	Density	Grain Size	Angularity	Consistency	Plasticity	Secondary
FILL CLAY SILT SAND GRAVEL TOPSOIL PEAT	clayey silty sandy gravelly organic	well sorted-poorly graded poorly sorted-well graded	red yellow white black brown grey	homogeneous heterogeneous stratified laminated lens root holes occasional inter-bedded mottled	dry damp moist wet saturated	very loose loose medium dense very dense	boulders cobbles coarse gravel fine gravel coarse sand medium sand fine sand	very angular angular sub-angular sub-rounded rounded well rounded	very soft soft firm stiff very stiff hard	non-plastic low plasticity medium plasticity high plasticity	and (35-50%) some (20-35%) little (10-20%) trace (0-10%) Contamination odour staining solid waste

JBS ENVIRONMENTAL

Borehole / Well / Test Pit No: SP2 - 1

Project No: E19465
Client: Landcorp
Project Name: E. Perth
Site Address: Zenith Rd, E. Perth

Date: 14/3/12
Contractor: —
Drill Rig/Excavation Plant: —
Method: HA
Total Hole Depth: 0.3m

Eastings (MGA):
Northings (MGA):
Reference Level:
Elevation - Surface/TOC:
Bore Diameter/Pit Dimension:

Water Level Initial:
Water Level Static:
Casing Type/Surface Finish:
Screen Diameter/Length:
Casing Diameter/Length:

SUBSURFACE PROFILE				SAMPLE				
Depth (m)	Graphic Log	Lithologic Classification	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments	Well Construction
0.0		FILL	Silty clay, orange w/ brown mottles, fine L.P, dry/damp hetro w/ ironstone gravels	0.3m	0	BFJ		
0.3m			E.O.H at 0.3m reqd depth					

Method	Sample Type	Reference Level	Casing Type / Surface Finish	Log Details
HA – Hand Auger SFA – Solid Flight Auger HFA – Hollow Flight Auger PT – Push Tubing AH – Air Hammer TP – Test Pit	U – Undisturbed Tube Sample D – Disturbed Sample CS – Core Sample	AHD – Australian Height Datum BGS – Below Ground Surface TOC – Top of Casing	PVC18 – Class 18 PVC MT – Monument RB – Roadbox SP – Stick up/Standpipe	Logged By: NB Project Manager: JR

Description						Coarse Grained Soils			Fine Grained Soils		Inclusions
CLASS	Texture	Grading/Sorting	Colour	Structure	Moisture	Density	Grain Size	Angularity	Consistency	Plasticity	Secondary
FILL CLAY SILT SAND GRAVEL TOPSOIL PEAT	clayey silty sandy gravelly organic	well sorted-poorly graded poorly sorted-well graded	red yellow white black brown grey	homogeneous heterogeneous stratified laminated lens root holes occasional inter-bedded mottled	dry damp moist wet saturated	very loose loose medium dense very dense	boulders cobbles coarse gravel fine gravel coarse sand medium sand fine sand	very angular angular sub-angular sub-rounded rounded well rounded	very soft soft firm stiff very stiff hard	non-plastic low plasticity medium plasticity high plasticity	and (35-50%) some (20-35%) little (10-20%) trace (0-10%) Contamination odour staining solid waste

JBS ENVIRONMENTAL

Borehole / Well / Test Pit No: SP3-1

Project No: 4945
Client: Landcom
Project Name: E Park
Site Address: Zouch rd, E Park

Date: 4/3/12
Contractor: —
Drill Rig/Excavation Plant: —
Method: HA
Total Hole Depth: 0.3m

Eastings (MGA):
Northings (MGA):
Reference Level:
Elevation - Surface/TOC:
Bore Diameter/Pit Dimension:

Water Level Initial:
Water Level Static:
Casing Type/Surface Finish:
Screen Diameter/Length:
Casing Diameter/Length:

SUBSURFACE PROFILE				SAMPLE				
Depth (m)	Graphic Log	Lithologic Classification	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments	Well Construction
		FILL	Silty clay, brown, dark, M.P, soft, moist with trace gravels + grass roots	0.3m		BAG		
0.3m			E.O.H at 0.3m, Reqired depth					

Method	Sample Type	Reference Level	Casing Type / Surface Finish	Log Details
HA – Hand Auger SFA – Solid Flight Auger HFA – Hollow Flight Auger PT – Push Tubing AH – Air Hammer TP – Test Pit	U – Undisturbed Tube Sample D – Disturbed Sample CS – Core Sample	AHD – Australian Height Datum BGS – Below Ground Surface TOC – Top of Casing	PVC18 – Class 18 PVC MT – Monument RB – Roadbox SP – Stick up/Standpipe	Logged By: JB Project Manager: JR

Description						Coarse Grained Soils			Fine Grained Soils		Inclusions
CLASS	Texture	Grading/Sorting	Colour	Structure	Moisture	Density	Grain Size	Angularity	Consistency	Plasticity	Secondary
FILL CLAY SILT SAND GRAVEL TOPSOIL PEAT	clayey silty sandy gravelly organic	well sorted-poorly graded poorly sorted-well graded	red yellow white black brown grey	homogeneous heterogeneous stratified laminated lens root holes occasional inter-bedded mottled	dry damp moist wet saturated	very loose loose medium dense very dense	boulders cobbles coarse gravel fine gravel coarse sand medium sand fine sand	very angular angular sub-angular sub-rounded rounded well rounded	very soft soft firm stiff very stiff hard	non-plastic low plasticity medium plasticity high plasticity	and (35-50%) some (20-35%) little (10-20%) trace (0-10%) Contamination odour staining solid waste

JBS ENVIRONMENTAL

Borehole / Well / Test Pit No: SP4 - 1

Project No:
Client:
Project Name:
Site Address:

Date: 14/5/12
Contractor:
Drill Rig/Excavation Plant:
Method:
Total Hole Depth: 0.4m

Eastings (MGA):
Northings (MGA):
Reference Level:
Elevation - Surface/TOC:
Bore Diameter/Pit Dimension:

Water Level Initial:
Water Level Static:
Casing Type/Surface Finish:
Screen Diameter/Length:
Casing Diameter/Length:

SUBSURFACE PROFILE				SAMPLE				
Depth (m)	Graphic Log	Lithologic Classification	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments	Well Construction
			FILL: Silty clay, Grange/grey w/ brown/dry, L.P, hetero, fm, w/ ironstone gravels	SP4-1 0.4m		BAT		
0.4m			E.O.H at 0.4m reqrd depth					

Method	Sample Type	Reference Level	Casing Type / Surface Finish	Log Details
HA – Hand Auger SFA – Solid Flight Auger HFA – Hollow Flight Auger PT – Push Tubing AH – Air Hammer TP – Test Pit	U – Undisturbed Tube Sample D – Disturbed Sample CS – Core Sample	AHD – Australian Height Datum BGS – Below Ground Surface TOC – Top of Casing	PVC18 – Class 18 PVC MT – Monument RB – Roadbox SP – Stick up/Standpipe	Logged By: AR Project Manager:

Description						Coarse Grained Soils			Fine Grained Soils		Inclusions
CLASS	Texture	Grading/Sorting	Colour	Structure	Moisture	Density	Grain Size	Angularity	Consistency	Plasticity	Secondary
FILL CLAY SILT SAND GRAVEL TOPSOIL PEAT	clayey silty sandy gravelly organic	well sorted-poorly graded poorly sorted-well graded	red yellow white black brown grey	homogeneous heterogeneous stratified laminated fens root holes occasional inter-bedded mottled	dry damp moist wet saturated	very loose loose medium dense very dense	boulders cobbles coarse gravel fine gravel coarse sand medium sand fine sand	very angular angular sub-angular sub-rounded rounded well rounded	very soft soft firm stiff very stiff hard	non-plastic low plasticity medium plasticity high plasticity	and (35-50%) some (20-35%) little (10-20%) trace (0-10%) Contamination odour staining solid waste

JBS ENVIRONMENTAL

Borehole / Well / Test Pit No: SP5-1		Project No: 41945
		Client:
		Project Name:
		Site Address:
Date: 14/3/12	Eastings (MGA):	Water Level Initial:
Contractor:	Northings (MGA):	Water Level Static:
Drill Rig/Excavation Plant:	Reference Level:	Casing Type/Surface Finish:
Method:	Elevation - Surface/TOC:	Screen Diameter/Length:
Total Hole Depth: 0.4m	Bore Diameter/Pit Dimension:	Casing Diameter/Length:

SUBSURFACE PROFILE				SAMPLE				
Depth (m)	Graphic Log	Lithologic Classification	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments	Well Construction
		Fill	Silty clay, orange, dry, L.D, stiff, with ironstone gravels (trace)	0.3m	—	G/T		
0.4m			E.O.H at 0.4m, required depth					

Method	Sample Type	Reference Level	Casing Type / Surface Finish	Log Details
HA – Hand Auger SFA – Solid Flight Auger HFA – Hollow Flight Auger PT – Push Tubing AH – Air Hammer TP – Test Pit	U – Undisturbed Tube Sample D – Disturbed Sample CS – Core Sample	AHD – Australian Height Datum BGS – Below Ground Surface TOC – Top of Casing	PVC18 – Class 18 PVC MT – Monument RB – Roadbox SP – Stick up/Standpipe	Logged By: Project Manager:

Description						Coarse Grained Soils			Fine Grained Soils		Inclusions
CLASS	Texture	Grading/Sorting	Colour	Structure	Moisture	Density	Grain Size	Angularity	Consistency	Plasticity	Secondary
FILL CLAY SILT SAND GRAVEL TOPSOIL PEAT	clayey silty sandy gravelly organic	well sorted-poorly graded poorly sorted-well graded	red yellow white black brown grey	homogeneous heterogeneous stratified laminated lens root holes occasional inter-bedded mottled	dry damp moist wet saturated	very loose loose medium dense very dense	boulders cobbles coarse gravel fine gravel coarse sand medium sand fine sand	very angular angular sub-angular sub-rounded rounded well rounded	very soft soft firm stiff very stiff hard	non-plastic low plasticity medium plasticity high plasticity	and (35-50%) some (20-35%) little (10-20%) trace (0-10%) Contamination odour staining solid waste

JBS ENVIRONMENTAL

Borehole / Well / Test Pit No: SP7-1

Project No: 44445
Client: Landcorp
Project Name: E. Ardle
Site Address: Zouch Rd, E. Ardle

Date: 14/3/12
Contractor: —
Drill Rig/Excavation Plant: —
Method: HA
Total Hole Depth: 0.4m

Eastings (MGA):
Northings (MGA):
Reference Level:
Elevation - Surface/TOC:
Bore Diameter/Pit Dimension:

Water Level Initial:
Water Level Static:
Casing Type/Surface Finish:
Screen Diameter/Length:
Casing Diameter/Length:

SUBSURFACE PROFILE				SAMPLE				
Depth (m)	Graphic Log	Lithologic Classification	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments	Well Construction
		Fill	Silty clay, orange, clay, stiff, M.D, Nitro / w/ moisture gravels	0.4m		BAG		
0.4m			E.O.H at 0.4m Required depth					

Method	Sample Type	Reference Level	Casing Type / Surface Finish	Log Details
HA – Hand Auger SFA – Solid Flight Auger HFA – Hollow Flight Auger PT – Push Tubing AH – Air Hammer TP – Test Pit	U – Undisturbed Tube Sample D – Disturbed Sample CS – Core Sample	AHD – Australian Height Datum BGS – Below Ground Surface TOC – Top of Casing	PVC18 – Class 18 PVC MT – Monument RB – Roadbox SP – Stick up/Standpipe	Logged By: Project Manager:

Description						Coarse Grained Soils			Fine Grained Soils		Inclusions
CLASS	Texture	Grading/Sorting	Colour	Structure	Moisture	Density	Grain Size	Angularity	Consistency	Plasticity	Secondary
FILL CLAY SILT SAND GRAVEL TOPSOIL PEAT	clayey silty sandy gravelly organic	well sorted-poorly graded poorly sorted-well graded	red yellow white black brown grey	homogeneous heterogeneous stratified laminated lens root holes occasional inter-bedded mottled	dry damp moist wet saturated	very loose loose medium dense very dense	boulders cobbles coarse gravel fine gravel coarse sand medium sand fine sand	very angular angular sub-angular sub-rounded rounded well rounded	very soft soft firm stiff very stiff hard	non-plastic low plasticity medium plasticity high plasticity	and (35-50%) some (20-35%) little (10-20%) trace (0-10%) Contamination odour staining solid waste

JBS ENVIRONMENTAL

Borehole / Well / Test Pit No: SP8-1

Project No: 41946
Client: Landcorp
Project Name: E. Park
Site Address: South Rd, E. Park

Date: 14/3/12
Contractor: -
Drill Rig/Excavation Plant: -
Method: HA
Total Hole Depth: 0.4m

Eastings (MGA):
Northings (MGA):
Reference Level:
Elevation - Surface/TOC:
Bore Diameter/Pit Dimension:

Water Level Initial:
Water Level Static:
Casing Type/Surface Finish:
Screen Diameter/Length:
Casing Diameter/Length:

SUBSURFACE PROFILE				SAMPLE				
Depth (m)	Graphic Log	Lithologic Classification	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments	Well Construction
			Fill: Silty clay, orange, dry L.P, fine/silt, hetro w/ scrap metal + ironstone gravels	0.4m		BFT		
0.4m			E.O.H at 0.4m Required depth					

Method	Sample Type	Reference Level	Casing Type / Surface Finish	Log Details
HA – Hand Auger SFA – Solid Flight Auger HFA – Hollow Flight Auger PT – Push Tubing AH – Air Hammer TP – Test Pit	U – Undisturbed Tube Sample D – Disturbed Sample CS – Core Sample	AHD – Australian Height Datum BGS – Below Ground Surface TOC – Top of Casing	PVC18 – Class 18 PVC MT – Monument RB – Roadbox SP – Stick up/Standpipe	Logged By: KTB Project Manager:

Description						Coarse Grained Soils			Fine Grained Soils		Inclusions
CLASS	Texture	Grading/Sorting	Colour	Structure	Moisture	Density	Grain Size	Angularity	Consistency	Plasticity	Secondary
FILL CLAY SILT SAND GRAVEL TOPSOIL PEAT	clayey silty sandy gravelly organic	well sorted-poorly graded poorly sorted-well graded	red yellow white black brown grey	homogeneous heterogeneous stratified laminated lens root holes occasional inter-bedded mottled	dry damp moist wet saturated	very loose loose medium dense very dense	boulders cobbles coarse gravel fine gravel coarse sand medium sand fine sand	very angular angular sub-angular sub-rounded rounded well rounded	very soft soft firm stiff very stiff hard	non-plastic low plasticity medium plasticity high plasticity	and (35-50%) some (20-35%) little (10-20%) trace (0-10%) Contamination odour staining solid waste

JBS ENVIRONMENTAL

Borehole / Well / Test Pit No: SP9-1

Project No: 41945
Client: Landcom
Project Name: E. Pointe
Site Address: Zenith Rd, E. Pte

Date: 14/5/12
Contractor:
Drill Rig/Excavation Plant:
Method: HA
Total Hole Depth: 0.4m

Eastings (MGA):
Northings (MGA):
Reference Level:
Elevation - Surface/TOC:
Bore Diameter/Pit Dimension:

Water Level Initial:
Water Level Static:
Casing Type/Surface Finish:
Screen Diameter/Length:
Casing Diameter/Length:

SUBSURFACE PROFILE				SAMPLE				
Depth (m)	Graphic Log	Lithologic Classification	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments	Well Construction
		FILL	Silty clay, orange/grey w/ brown mottles, dry, L.P, stiff, hetro w/ ironstone gravels	0.4m		D+S		
0.4m			EOH at 0.4m Required depth					

Method	Sample Type	Reference Level	Casing Type / Surface Finish	Log Details
HA – Hand Auger SFA – Solid Flight Auger HFA – Hollow Flight Auger PT – Push Tubing AH – Air Hammer TP – Test Pit	U – Undisturbed Tube Sample D – Disturbed Sample CS – Core Sample	AHD – Australian Height Datum BGS – Below Ground Surface TOC – Top of Casing	PVC18 – Class 18 PVC MT – Monument RB – Roadbox SP – Stick up/Standpipe	Logged By: Project Manager:

Description						Coarse Grained Soils			Fine Grained Soils		Inclusions
CLASS	Texture	Grading/Sorting	Colour	Structure	Moisture	Density	Grain Size	Angularity	Consistency	Plasticity	Secondary
FILL CLAY SILT SAND GRAVEL TOPSOIL PEAT	clayey silty sandy gravelly organic	well sorted-poorly graded poorly sorted-well graded	red yellow white black brown grey	homogeneous heterogeneous stratified laminated lens root holes occasional inter-bedded mottled	dry damp moist wet saturated	very loose loose medium dense very dense	boulders cobbles coarse gravel fine gravel coarse sand medium sand fine sand	very angular angular sub-angular sub-rounded rounded well rounded	very soft soft firm stiff very stiff hard	non-plastic low plasticity medium plasticity high plasticity	and (35-50%) some (20-35%) ittle (10-20%) trace (0-10%) Contamination odour staining solid waste

JBS ENVIRONMENTAL

Borehole / Well / Test Pit No: SP10-1

Project No: 41945
Client: Landcorp
Project Name: E. Park
Site Address: Zouch Rd, E. Park

Date: 14/3/12
Contractor: —
Drill Rig/Excavation Plant: —
Method: HA
Total Hole Depth: 0.3m

Eastings (MGA):
Northings (MGA):
Reference Level:
Elevation - Surface/TOC:
Bore Diameter/Pit Dimension:

Water Level Initial:
Water Level Static:
Casing Type/Surface Finish:
Screen Diameter/Length:
Casing Diameter/Length:

SUBSURFACE PROFILE				SAMPLE				
Depth (m)	Graphic Log	Lithologic Classification	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments	Well Construction
			Fill: Silty clay, orange + brown, fine, dry, L.P, hetro w/ roadstone gravels	0.3m				
0.3			B.O.H at 0.3m Required depth reached					

Method	Sample Type	Reference Level	Casing Type / Surface Finish	Log Details
HA – Hand Auger SFA – Solid Flight Auger HFA – Hollow Flight Auger PT – Push Tubing AH – Air Hammer TP – Test Pit	U – Undisturbed Tube Sample D – Disturbed Sample CS – Core Sample	AHD – Australian Height Datum BGS – Below Ground Surface TOC – Top of Casing	PVC18 – Class 18 PVC MT – Monument RB – Roadbox SP – Stick up/Standpipe	Logged By: AR Project Manager: GR

Description						Coarse Grained Soils			Fine Grained Soils		Inclusions
CLASS	Texture	Grading/Sorting	Colour	Structure	Moisture	Density	Grain Size	Angularity	Consistency	Plasticity	Secondary
FILL CLAY SILT SAND GRAVEL TOPSOIL PEAT	clayey silty sandy gravelly organic	well sorted-poorly graded poorly sorted-well graded	red yellow white black brown grey	homogeneous heterogeneous stratified laminated lens root holes occasional inter-bedded mottled	dry damp moist wet saturated	very loose loose medium dense very dense	boulders cobbles coarse gravel fine gravel coarse sand medium sand fine sand	very angular angular sub-angular sub-rounded rounded well rounded	very soft soft firm stiff very stiff hard	non-plastic low plasticity medium plasticity high plasticity	and (35-50%) some (20-35%) little (10-20%) trace (0-10%) Contamination odour staining solid waste

JBS ENVIRONMENTAL

Borehole / Well / Test Pit No: SP11-1

Project No: 41445
Client:
Project Name:
Site Address:

Date: 14/3/12
Contractor:
Drill Rig/Excavation Plant:
Method: HA
Total Hole Depth: 0.4m

Eastings (MGA):
Northings (MGA):
Reference Level:
Elevation - Surface/TOC:
Bore Diameter/Pit Dimension:

Water Level Initial:
Water Level Static:
Casing Type/Surface Finish:
Screen Diameter/Length:
Casing Diameter/Length:

SUBSURFACE PROFILE				SAMPLE				
Depth (m)	Graphic Log	Lithologic Classification	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments	Well Construction
			Fill: silty clay, orange + brown, dry, L.D, fine to med grained moisture gravels	0.4m		BH		
0.4m			EOH at 0.4m Required depth					

Method	Sample Type	Reference Level	Casing Type / Surface Finish	Log Details
HA – Hand Auger SFA – Solid Flight Auger HFA – Hollow Flight Auger PT – Push Tubing AH – Air Hammer TP – Test Pit	U – Undisturbed Tube Sample D – Disturbed Sample CS – Core Sample	AHD – Australian Height Datum BGS – Below Ground Surface TOC – Top of Casing	PVC18 – Class 18 PVC MT – Monument RB – Roadbox SP – Stick up/Standpipe	Logged By: Project Manager:

Description						Coarse Grained Soils			Fine Grained Soils		Inclusions
CLASS	Texture	Grading/Sorting	Colour	Structure	Moisture	Density	Grain Size	Angularity	Consistency	Plasticity	Secondary
FILL CLAY SILT SAND GRAVEL TOPSOIL PEAT	clayey silty sandy gravelly organic	well sorted-poorly graded poorly sorted-well graded	red yellow white black brown grey	homogeneous heterogeneous stratified laminated lens root holes occasional inter-bedded mottled	dry damp moist wet saturated	very loose loose medium dense very dense	boulders cobbles coarse gravel fine gravel coarse sand medium sand fine sand	very angular angular sub-angular sub-rounded rounded well rounded	very soft soft firm stiff very stiff hard	non-plastic low plasticity medium plasticity high plasticity	and (35-50%) some (20-35%) little (10-20%) trace (0-10%) Contamination odour staining solid waste

JBS ENVIRONMENTAL

Borehole / Well / Test Pit No: SP12-1

Project No: 71945
Client: Landcom
Project Name: E. Park
Site Address: Zouch Rd, E. Park

Date: 14/3/12
Contractor:
Drill Rig/Excavation Plant:
Method: HA
Total Hole Depth: 0.4m

Eastings (MGA):
Northings (MGA):
Reference Level:
Elevation - Surface/TOC:
Bore Diameter/Pit Dimension:

Water Level Initial:
Water Level Static:
Casing Type/Surface Finish:
Screen Diameter/Length:
Casing Diameter/Length:

SUBSURFACE PROFILE				SAMPLE				
Depth (m)	Graphic Log	Lithologic Classification	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments	Well Construction
			Fill: silty clay, dark brown clayey M.P., soft, dry w ironstone gravels & grass roots	0.4m		GJ		
0.4m			E.O.H at 0.4m reqred depth					

Method	Sample Type	Reference Level	Casing Type / Surface Finish	Log Details
HA – Hand Auger SFA – Solid Flight Auger HFA – Hollow Flight Auger PT – Push Tubing AH – Air Hammer TP – Test Pit	U – Undisturbed Tube Sample D – Disturbed Sample CS – Core Sample	AHD – Australian Height Datum BGS – Below Ground Surface TOC – Top of Casing	PVC18 – Class 18 PVC MT – Monument RB – Roadbox SP – Stick up/Standpipe	Logged By: AB Project Manager: JR

Description						Coarse Grained Soils			Fine Grained Soils		Inclusions
CLASS	Texture	Grading/Sorting	Colour	Structure	Moisture	Density	Grain Size	Angularity	Consistency	Plasticity	Secondary
FILL CLAY SILT SAND GRAVEL TOPSOIL PEAT	clayey silty sandy gravelly organic	well sorted-poorly graded poorly sorted-well graded	red yellow white black brown grey	homogeneous heterogeneous stratified laminated lens root holes occasional inter-bedded mottled	dry damp moist wet saturated	very loose loose medium dense very dense	boulders cobbles coarse gravel fine gravel coarse sand medium sand fine sand	very angular angular sub-angular sub-rounded rounded well rounded	very soft soft firm stiff very stiff hard	non-plastic low plasticity medium plasticity high plasticity	and (35-50%) some (20-35%) little (10-20%) trace (0-10%) Contamination odour staining solid waste

JBS ENVIRONMENTAL

Borehole / Well / Test Pit No: SPLT-1

Project No: 41945
Client:
Project Name:
Site Address:

Date: 14/3/12
Contractor: —
Drill Rig/Excavation Plant: —
Method: HA
Total Hole Depth: 0.4m

Eastings (MGA):
Northings (MGA):
Reference Level:
Elevation - Surface/TOC:
Bore Diameter/Pit Dimension:

Water Level Initial:
Water Level Static:
Casing Type/Surface Finish:
Screen Diameter/Length:
Casing Diameter/Length:

SUBSURFACE PROFILE				SAMPLE				
Depth (m)	Graphic Log	Lithologic Classification	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments	Well Construction
			Fill: Silty clay, orange w/ brown mottles, fm/hard, L-P, dry, lots w/ glass roots	SPLT-1 0.4m		BAG		
0.4m			End of hole, required depth @ 0.4m					

Method	Sample Type	Reference Level	Casing Type / Surface Finish	Log Details
HA – Hand Auger SFA – Solid Flight Auger HFA – Hollow Flight Auger PT – Push Tubing AH – Air Hammer TP – Test Pit	U – Undisturbed Tube Sample D – Disturbed Sample CS – Core Sample	AHD – Australian Height Datum BGS – Below Ground Surface TOC – Top of Casing	PVC18 – Class 18 PVC MT – Monument RB – Roadbox SP – Stick up/Standpipe	Logged By: AG Project Manager:

Description						Coarse Grained Soils			Fine Grained Soils		Inclusions
CLASS	Texture	Grading/Sorting	Colour	Structure	Moisture	Density	Grain Size	Angularity	Consistency	Plasticity	Secondary
FILL CLAY SILT SAND GRAVEL TOPSOIL PEAT	clayey silty sandy gravelly organic	well sorted-poorly graded poorly sorted-well graded	red yellow white black brown grey	homogeneous heterogeneous stratified laminated lens root holes occasional inter-bedded mottled	dry damp moist wet saturated	very loose loose medium dense very dense	boulders cobbles coarse gravel fine gravel coarse sand medium sand fine sand	very angular angular sub-angular sub-rounded rounded well rounded	very soft soft firm stiff very stiff hard	non-plastic low plasticity medium plasticity high plasticity	and (35-50%) some (20-35%) little (10-20%) trace (0-10%) **Contamination** odour staining solid waste

JBS ENVIRONMENTAL

Borehole / Well / Test Pit No: SP15-1

Project No: 41945
Client:
Project Name:
Site Address:

Date: 4/3/12
Contractor:
Drill Rig/Excavation Plant:
Method: HA
Total Hole Depth: 0.4m

Eastings (MGA):
Northings (MGA):
Reference Level:
Elevation - Surface/TOC:
Bore Diameter/Pit Dimension:

Water Level Initial:
Water Level Static:
Casing Type/Surface Finish:
Screen Diameter/Length:
Casing Diameter/Length:

SUBSURFACE PROFILE				SAMPLE				
Depth (m)	Graphic Log	Lithologic Classification	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments	Well Construction
0.4m			Fill: Silty clay, brown, dry M.P. 5mm/Soft, Reted w/ igneous gravel	B+T (0.3m)		B+T		
			E.O.H: Reqmd depth at 0.4m					

Method	Sample Type	Reference Level	Casing Type / Surface Finish	Log Details
HA – Hand Auger SFA – Solid Flight Auger HFA – Hollow Flight Auger PT – Push Tubing AH – Air Hammer TP – Test Pit	U – Undisturbed Tube Sample D – Disturbed Sample CS – Core Sample	AHD – Australian Height Datum BGS – Below Ground Surface TOC – Top of Casing	PVC18 – Class 18 PVC MT – Monument RB – Roadbox SP – Stick up/Standpipe	Logged By: Project Manager:

Description						Coarse Grained Soils			Fine Grained Soils		Inclusions
CLASS	Texture	Grading/Sorting	Colour	Structure	Moisture	Density	Grain Size	Angularity	Consistency	Plasticity	Secondary
FILL CLAY SILT SAND GRAVEL TOPSOIL PEAT	clayey silty sandy gravelly organic	well sorted-poorly graded poorly sorted-well graded	red yellow white black brown grey	homogeneous heterogeneous stratified laminated lens root holes occasional inter-bedded mottled	dry damp moist wet saturated	very loose loose medium dense very dense	boulders cobbles coarse gravel fine gravel coarse sand medium sand fine sand	very angular angular sub-angular sub-rounded rounded well rounded	very soft soft firm stiff very stiff hard	non-plastic low plasticity medium plasticity high plasticity	and (35-50%) some (20-35%) little (10-20%) trace (0-10%) Contamination odour staining solid waste

JBS ENVIRONMENTAL

Borehole / Well / Test Pit No: SP16-1

Project No: 41945
Client:
Project Name:
Site Address:

Date: 14/8/12
Contractor:
Drill Rig/Excavation Plant:
Method:
Total Hole Depth: 0.4m

Eastings (MGA):
Northings (MGA):
Reference Level:
Elevation - Surface/TOC:
Bore Diameter/Pit Dimension:

Water Level Initial:
Water Level Static:
Casing Type/Surface Finish:
Screen Diameter/Length:
Casing Diameter/Length:

SUBSURFACE PROFILE				SAMPLE				
Depth (m)	Graphic Log	Lithologic Classification	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments	Well Construction
		Fill	Silty clay, orange + brown dry, M.D, fine to med ironstone gravels + grass roots	0-3m				
0.4m			EOH at 0.4m required depth					

Method	Sample Type	Reference Level	Casing Type / Surface Finish	Log Details
HA – Hand Auger SFA – Solid Flight Auger HFA – Hollow Flight Auger PT – Push Tubing AH – Air Hammer TP – Test Pit	U – Undisturbed Tube Sample D – Disturbed Sample CS – Core Sample	AHD – Australian Height Datum BGS – Below Ground Surface TOC – Top of Casing	PVC18 – Class 18 PVC MT – Monument RB – Roadbox SP – Stick up/Standpipe	Logged By: Project Manager:

Description						Coarse Grained Soils			Fine Grained Soils		Inclusions
CLASS	Texture	Grading/Sorting	Colour	Structure	Moisture	Density	Grain Size	Angularity	Consistency	Plasticity	Secondary
FILL CLAY SILT SAND GRAVEL TOPSOIL PEAT	clayey silty sandy gravelly organic	well sorted-poorly graded poorly sorted-well graded	red yellow white black brown grey	homogeneous heterogeneous stratified laminated lens root holes occasional inter-bedded mottled	dry damp moist wet saturated	very loose loose medium dense very dense	boulders cobbles coarse gravel fine gravel coarse sand medium sand fine sand	very angular angular sub-angular sub-rounded rounded well rounded	very soft soft firm stiff very stiff hard	non-plastic low plasticity medium plasticity high plasticity	and (35-50%) some (20-35%) little (10-20%) trace (0-10%) Contamination odour staining solid waste

JBS ENVIRONMENTAL

Borehole / Well / Test Pit No: SP17-1

Project No: 4645
Client:
Project Name:
Site Address:

Date: 14/3/12
Contractor:
Drill Rig/Excavation Plant:
Method: HA
Total Hole Depth: 0.3m

Eastings (MGA):
Northings (MGA):
Reference Level:
Elevation - Surface/TOC:
Bore Diameter/Pit Dimension:

Water Level Initial:
Water Level Static:
Casing Type/Surface Finish:
Screen Diameter/Length:
Casing Diameter/Length:

SUBSURFACE PROFILE				SAMPLE				
Depth (m)	Graphic Log	Lithologic Classification	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments	Well Construction
		FILL	~~Silty clay~~ Silty sandy clay, brown, dry, LPL, soft, hetro, w/ grass roots, well sorted sands	0.3m				
0.3m			E.O.H at 0.3m Required depth					

Method	Sample Type	Reference Level	Casing Type / Surface Finish	Log Details
HA – Hand Auger SFA – Solid Flight Auger HFA – Hollow Flight Auger PT – Push Tubing AH – Air Hammer TP – Test Pit	U – Undisturbed Tube Sample D – Disturbed Sample CS – Core Sample	AHD – Australian Height Datum BGS – Below Ground Surface TOC – Top of Casing	PVC18 – Class 18 PVC MT – Monument RB – Roadbox SP – Stick up/Standpipe	Logged By: NB Project Manager:

Description						Coarse Grained Soils			Fine Grained Soils		Inclusions
CLASS	Texture	Grading/Sorting	Colour	Structure	Moisture	Density	Grain Size	Angularity	Consistency	Plasticity	Secondary
FILL CLAY SILT SAND GRAVEL TOPSOIL PEAT	clayey silty sandy gravelly organic	well sorted-poorly graded poorly sorted-well graded	red yellow white black brown grey	homogeneous heterogeneous stratified laminated lens root holes occasional inter-bedded mottled	dry damp moist wet saturated	very loose loose medium dense very dense	boulders cobbles coarse gravel fine gravel coarse sand medium sand fine sand	very angular angular sub-angular sub-rounded rounded well rounded	very soft soft firm stiff very stiff hard	non-plastic low plasticity medium plasticity high plasticity	and (35-50%) some (20-35%) little (10-20%) trace (0-10%) Contamination odour staining solid waste

Attachment 5 – QA / QC Checker Summary

ESDAT QA Checker
Project:41945 - Clean SP
Filter: ALL

Overview Summary
- Count of Samples
- Summary By Compound
- Count of Results

Holding Times
- Holding Time Errors (0)

Blanks
- Field Blanks
- Detects in Lab Blanks (0)
- SDG's without Method Blanks (0)

Duplicates
- Field and Interlab Dupes
- Lab Duplicates with high RPDs (0)
- Duplicate Samples with incorrect or missing Parent Samples (0)
- Samples at the same Location/Depth/Time not specified as duplicates (0)

Surrogates
- Surrogate Variation > 30% or outside lab LCL or UCL or outside lab LCL or UCL (0)

Lab Control Samples
- SDG's without a Laboratory Control Sample (0)
- Laboratory Control Samples, Error > 30% (0)

Certified and Standard Reference Materials
- Certified Reference Materials - Error > 30% (0)

Matrix Spikes
- SDG's without a Matrix Spike (0)
- Trip Spikes with invalid Control Sample (0)
- Less than 1 matrix spike in 20 samples, or less than 1 matrix duplicate in 20 samples (1)
- Matrix Spike Recoveries less than 70% or greater than 130% or outside lab LCL or UCL (0)
- Trip Spike Recoveries (70% - 130% is acceptable) (0)

Inorganic

Other
- Unit Conversion Problems (2)
- OriginalChemNames Requiring Validation (3)
- Samples with no Results (0)
- Samples associated with Wells which are not specified in the Well Table (0)
- Aborted Analysis (0)

		EQL	Num Results	Holding Times (days)			Lab Control Samples			Method and Storage Blanks			Laboratory Duplicates			Surrogates			Matrix,Trip and Compound Spikes			Field,Rinsate and Trip Blanks			Field Duplicates		
Chem_Group	ChemName	Range	Non QA (Normal + Composite)	Volatility Group	Sample to Extraction	Sample to Analysis	Acceptable	Recovery %	Num Reported	Acceptable	Range	Num Reported	Acceptable	Max RPD > EQL x 4	Num Reported	Acceptable	Recovery %	Num Reported	Acceptable	Recovery %	Num Reported	Acceptable	Range	Num Reported	Acceptable	Max RPD > EQL x 4	Num Reported	Acceptable
Asbestos	Asbestos fibres		15	Other	6	6	Y		0			0			0	**N**		0			0			0			1	Y
BTEX	Benzene	0.2 mg/kg	15	VOC	2	3	Y	110 to 110	1	Y	ND	1	Y		2	Y		0		96 to 96	1	Y		0			0	**N**
	Ethylbenzene	1 mg/kg	15	VOC	2	3	Y	110 to 110	1	Y	ND	1	Y		2	Y		0		95 to 95	1	Y		0			0	**N**
	Toluene	0.5 mg/kg	15	VOC	2	3	Y	110 to 110	1	Y	ND	1	Y		2	Y		0		96 to 96	1	Y		0			0	**N**
	Trifluorotoluene		0	SVOC			Y	95 to 113	2	Y		0			0	**N**	79 to 117	26	Y		0			0			0	**N**
	Xylene (m & p)	2 mg/kg	15	VOC	2	3	Y	120 to 120	1	Y	ND	1	Y		2	Y		0		98 to 98	1	Y		0			0	**N**
	Xylene (o)	1 mg/kg	15	VOC	2	3	Y	120 to 120	1	Y	ND	1	Y		2	Y		0		98 to 98	1	Y		0			0	**N**
Halogenated Benzenes	Hexachlorobenzene	0.1 mg/kg	15	SVOC	2	3 to 4	Y		0		ND	1	Y		2	Y		0			0			0			0	**N**
Inorganics	% Moisture		0	SVOC	6	7	Y		0			0			0	**N**		0			0			0			0	**N**
	Moisture	0.1 %	15	Other		5	Y		0			0			0	**N**		0			0			0		0	1	Y
Lead	Lead	1 mg/kg	15	Other	8	5 to 8	Y	100 to 110	3	Y	ND	2	Y	14	2	Y		0		99 to 99	1	Y		0		25	1	Y
Metals	Arsenic	4 mg/kg	15	Other	8	5 to 8	Y	100 to 110	3	Y	ND	2	Y		2	Y		0		97 to 97	1	Y		0			1	Y
	Cadmium	0.5 mg/kg	15	Other	8	5 to 8	Y	100 to 110	3	Y	ND	2	Y		2	Y		0		97 to 97	1	Y		0			1	Y
	Chromium (III+VI)	1 mg/kg	15	Other	8	5 to 8	Y	100 to 110	3	Y	ND	2	Y	0	2	Y		0		97 to 97	1	Y		0		18	1	Y
	Copper	1 mg/kg	15	Other	8	5 to 8	Y	100 to 110	3	Y	ND	2	Y	9	2	Y		0		110 to 110	1	Y		0		4	1	Y
	Mercury	0.1 mg/kg	15	Specific		5	Y	104 to 110	3	Y	ND	2	Y		2	Y		0		110 to 110	1	Y		0			1	Y
	Nickel	1 mg/kg	15	Other	8	5 to 8	Y	105 to 110	3	Y	ND	2	Y	22	2	Y		0		94 to 94	1	Y		0		18	1	Y
	Zinc	1 mg/kg	15	Other	8	5 to 8	Y	100 to 110	3	Y	ND	2	Y	21	2	Y		0		100 to 100	1	Y		0		11	1	Y
Organochlorine Pesticides	4,4-DDE	0.1 mg/kg	15	SVOC	2	3 to 4	Y	96 to 96	1	Y	ND	1	Y		2	Y		0		100 to 100	1	Y		0			0	**N**
	a-BHC	0.1 mg/kg	15	SVOC	2	3 to 4	Y	100 to 100	1	Y	ND	1	Y		2	Y		0		100 to 100	1	Y		0			0	**N**
	Aldrin	0.1 mg/kg	15	SVOC	2	3 to 4	Y	90 to 90	1	Y	ND	1	Y		2	Y		0		93 to 93	1	Y		0			0	**N**
	b-BHC	0.1 mg/kg	15	SVOC	2	3 to 4	Y	100 to 100	1	Y	ND	1	Y		2	Y		0		110 to 110	1	Y		0			0	**N**
	Chlordane (cis)	0.1 mg/kg	15	SVOC	2	3 to 4	Y		0		ND	1	Y		2	Y		0			0			0			0	**N**
	Chlordane (trans)	0.1 mg/kg	15	SVOC	2	3 to 4	Y		0		ND	1	Y		2	Y		0			0			0			0	**N**
	d-BHC	0.1 mg/kg	15	SVOC	2	3 to 4	Y		0		ND	1	Y		2	Y		0			0			0			0	**N**
	DDD	0.1 mg/kg	15	SVOC	2	3 to 4	Y	100 to 100	1	Y	ND	1	Y		2	Y		0		100 to 100	1	Y		0			0	**N**
	DDT	0.1 mg/kg	15	SVOC	2	3 to 4	Y		0		ND	1	Y		2	Y		0			0			0			0	**N**
	Dieldrin	0.1 mg/kg	15	SVOC	2	3 to 4	Y	110 to 110	1	Y	ND	1	Y		2	Y		0		110 to 110	1	Y		0			0	**N**
	Endosulfan I	0.1 mg/kg	15	SVOC	2	3 to 4	Y		0		ND	1	Y		2	Y		0			0			0			0	**N**
	Endosulfan II	0.1 mg/kg	15	SVOC	2	3 to 4	Y		0		ND	1	Y		2	Y		0			0			0			0	**N**
	Endosulfan sulphate	0.1 mg/kg	15	SVOC	2	3 to 4	Y	91 to 91	1	Y	ND	1	Y		2	Y		0		100 to 100	1	Y		0			0	**N**
	Endrin	0.1 mg/kg	15	SVOC	2	3 to 4	Y	97 to 97	1	Y	ND	1	Y		2	Y		0		100 to 100	1	Y		0			0	**N**
	Endrin aldehyde	0.1 mg/kg	15	SVOC	2	3 to 4	Y		0		ND	1	Y		2	Y		0			0			0			0	**N**
	g-BHC (Lindane)	0.1 mg/kg	15	SVOC	2	3 to 4	Y		0		ND	1	Y		2	Y		0			0			0			0	**N**
	Heptachlor	0.1 mg/kg	15	SVOC	2	3 to 4	Y	91 to 91	1	Y	ND	1	Y		2	Y		0		95 to 95	1	Y		0			0	**N**
	Heptachlor epoxide	0.1 mg/kg	15	SVOC	2	3 to 4	Y	99 to 99	1	Y	ND	1	Y		2	Y		0		100 to 100	1	Y		0			0	**N**
	Methoxychlor	0.1 mg/kg	15	SVOC	2	3 to 4	Y		0		ND	1	Y		2	Y		0			0			0			0	**N**
	Tetrachlorometaxylene		0	SVOC			Y	98 to 98	1	Y		0			0	**N**	97 to 110	20	Y		0			0			0	**N**
PAH/Phenols	1-Methylnaphthalene		0	SVOC	6	7	Y		0		ND	1	Y		0	**N**		0			0			0			0	**N**
	2-Fluorobiphenyl		0	SVOC			Y	100 to 100	1	Y		0			0	**N**	86 to 103	6	Y		0			0			0	**N**
	2-methylnaphthalene		0	SVOC	6	7	Y		0		ND	1	Y		0	**N**		0			0			0			0	**N**
	Acenaphthene	0.1 mg/kg	15	SVOC	2 to 6	4 to 7	Y	95 to 95	1	Y	ND	2	Y		2	Y		0			0			0			1	Y
	Acenaphthylene	0.1 mg/kg	15	SVOC	2 to 6	4 to 7	Y	96 to 96	1	Y	ND	2	Y		2	Y		0			0			0			1	Y
	Anthracene	0.1 mg/kg	15	SVOC	2 to 6	4 to 7	Y	95 to 95	1	Y	ND	2	Y		2	Y		0			0			0			1	Y
	Benz(a)anthracene	0.1 mg/kg	15	SVOC	2 to 6	4 to 7	Y		0		ND	2	Y		2	Y		0			0			0			1	Y
	Benzo(a) pyrene	0.05 mg/kg	15	SVOC	2 to 6	4 to 7	Y	95 to 120	2	Y	ND	2	Y		2	Y		0		110 to 110	1	Y		0			1	Y
	Benzo(b)&(k)fluoranthene	0.2 mg/kg	15	SVOC	2	4	Y		0		ND	2	Y		2	Y		0			0			0			1	Y
	Benzo(b)fluoranthene		0	SVOC	6	7	Y		0		ND	1	Y		0	**N**		0			0			0			0	**N**
	Benzo(g,h,i)perylene	0.1 mg/kg	15	SVOC	2 to 6	4 to 7	Y		0		ND	2	Y		2	Y		0			0			0			1	Y
	Benzo(k)fluoranthene		0	SVOC	6	7	Y		0		ND	1	Y		0	**N**		0			0			0			0	**N**
	Chrysene	0.1 mg/kg	15	SVOC	2 to 6	4 to 7	Y	110 to 110	1	Y	ND	2	Y		2	Y		0		110 to 110	1	Y		0			1	Y
	Dibenz(a,h)anthracene	0.1 mg/kg	15	SVOC	2 to 6	4 to 7	Y		0		ND	2	Y		2	Y		0			0			0			1	Y
	Fluoranthene	0.1 mg/kg	15	SVOC	2 to 6	4 to 7	Y	97 to 100	2	Y	ND	2	Y		2	Y		0		100 to 100	1	Y		0			1	Y
	Fluorene	0.1 mg/kg	15	SVOC	2 to 6	4 to 7	Y	110 to 110	1	Y	ND	2	Y		2	Y		0		110 to 110	1	Y		0			1	Y
	Indeno(1,2,3-c,d)pyrene	0.1 mg/kg	15	SVOC	2 to 6	4 to 7	Y		0		ND	2	Y		2	Y		0			0			0			1	Y
	Naphthalene	0.1 mg/kg	15	SVOC	2 to 6	4 to 7	Y	94 to 120	2	Y	ND	2	Y		2	Y		0		120 to 120	1	Y		0			1	Y
	PAHs (Sum of total)		0	SVOC	6	7	Y		0		ND	1	Y		0	**N**		0			0			0			0	**N**
	Phenanthrene	0.1 mg/kg	15	SVOC	2 to 6	4 to 7	Y	93 to 99	2	Y	ND	2	Y		2	Y		0		97 to 97	1	Y		0			1	Y
	p-Terphenyl		0	SVOC			Y	101 to 120	2	Y		0			0	**N**	92 to 124	27	Y		0			0			0	**N**
	Pyrene	0.1 mg/kg	15	SVOC	2 to 6	4 to 7	Y	96 to 100	2	Y	ND	2	Y		2	Y		0		100 to 100	1	Y		0			1	Y
Surrogate	NB-d5		0	SVOC			Y	98 to 98	1	Y		0			0	**N**	84 to 99	6	Y		0			0			0	**N**
TPH	C10 - C14	50 mg/kg	15	SVOC	2 to 6	3 to 7	Y	86 to 103	2	Y	ND	2	Y		2	Y		0		87 to 87	1	Y		0			1	Y
	C15 - C28	100 mg/kg	15	SVOC	2 to 6	3 to 7	Y	100 to 110	2	Y	ND	2	Y		2	Y		0		110 to 110	1	Y		0			1	Y
	C29-C36	100 mg/kg	15	SVOC	2 to 6	3 to 7	Y	98 to 98	2	Y	ND	2	Y		2	Y		0		99 to 99	1	Y		0			1	Y
	C6 - C9	25 mg/kg	15	VOC	2	3	Y	110 to 122	2	Y	ND	2	Y		2	Y		0		97 to 97	1	Y		0			1	Y
	o-Terphenyl		0	SVOC			Y	96 to 96	1	Y		0			0	**N**	95 to 105	21	Y		0			0			0	**N**

Contents

Count of Samples

Matrix Type	soil
First Sample Date	14/03/2012
Last Sample Date	14/03/2012
Sampling Period (days)	1
Number of Samples Submitted	17
Number of Non QA Samples Submitted	15
Number of Field Blanks	0
Number of Trip Blanks	0
Number of Rinsates	0
Number of Field Duplicates	1
Number of Interlab Duplicates	1
Number of Trip Spikes	0
Number of Lab Duplicates	2
Number of LCSs	8
Number of CRMs	0
Number of Method Blanks	6
Number of Storage Blanks	0
Number of Matrix Spikes	1
Number of Matrix Spike Dupes	0

Contents

Count of Results

Matrix_Type	Sample_Type	Reg	Leached	Spike_Compounds	Surrogate
soil	Normal	870	0	0	60
soil	LAB_D	104	0	0	8
SOIL	NCP	85	0	0	12
soil	MB	84	0	0	8
soil	LCS	62	0	0	8
soil	MS	34	0	0	4
SOIL	Interlab_D	31	0	0	3
soil	Field_D	30	0	0	3

Field Duplicates (soil)
Filter: ALL

SDG	70384	70384		70384	Interlab_D	
Field_ID	SP14-1	QC02	RPD	SP14-1	QA02	RPD
Sampled_Date-Time	14/03/2012	14/03/2012		14/03/2012	14/03/2012	

Chem_Group	ChemName	Units	EQL						
Inorganics	Moisture	%	0.1	18.0	18.0	0	18.0		
Lead	Lead	mg/kg	1	14.0	18.0	25	14.0	16.0	13
Metals	Arsenic	mg/kg	4 (Primary): 3 (Interlab)	7.0	10.0	35	7.0	7.0	0
	Cadmium	mg/kg	0.5 (Primary): 0.3 (Interl	<0.5	<0.5	0	<0.5	<0.3	0
	Chromium (III+VI)	mg/kg	1 (Primary): 0.3 (Interlab	15.0	18.0	18	15.0	14.0	7
	Copper	mg/kg	1 (Primary): 0.5 (Interlab	22.0	23.0	4	22.0	19.0	15
	Mercury	mg/kg	0.1	<0.1	<0.1	0	<0.1		
	Nickel	mg/kg	1 (Primary): 0.5 (Interlab	5.0	6.0	18	5.0	5.1	2
	Zinc	mg/kg	1 (Primary): 0.5 (Interlab	26.0	29.0	11	26.0	35.0	30
PAH/Phenols	Acenaphthene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Acenaphthylene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Anthracene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Benz(a)anthracene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Benzo(a) pyrene	mg/kg	0.05 (Primary): 0.1 (Inter	<0.05	<0.05	0	<0.05	<0.1	0
	Benzo(b)&(k)fluoranthene	mg/kg	0.2	<0.2	<0.2	0	<0.2		
	Benzo(g,h,i)perylene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Chrysene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Dibenz(a,h)anthracene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Fluoranthene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Fluorene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Naphthalene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Phenanthrene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Pyrene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
TPH	C6 - C9	mg/kg	25	<25.0	<25.0	0	<25.0		
	C10 - C14	mg/kg	50 (Primary): 20 (Interlal	<50.0	<50.0	0	<50.0	<20.0	0
	C15 - C28	mg/kg	100 (Primary): 50 (Interla	<100.0	<100.0	0	<100.0	<50.0	0
	C29-C36	mg/kg	100 (Primary): 50 (Interla	<100.0	<100.0	0	<100.0	<50.0	0

*RPDs have only been considered where a concentration is greater than 4 times the EQL.
**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 50 (4-10 x EQL); 50 (10-30 x EQL); 50 (> 30 x EQL))
***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those u

Contents

Less than 1 matrix spike in 20 samples, or less than 1 matrix duplicate in 20 samples

Matrix_Type	Number_of_Samples	Number_of_Matrix_Spike_Samples	Number_of_Matrix_Spike_Dupe_Samples
soil	51	1	0

Attachment 6 – Laboratory Analysis Reports and Chain of Custody Information

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

CERTIFICATE OF ANALYSIS 70384

Client:
JBS Environmental Pty Ltd
P.O. Box 940
MASCOT
NSW 1460

Attention: Jo Rosner, A Boardman

Sample log in details:

Your Reference:	**41945, Edmondson Park - Clean SP**		
No. of samples:	16 soils		
Date samples received / completed instructions received	15/03/12	/	15/03/12

Analysis Details:
Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	22/03/12	/	22/03/12
Date of Preliminary Report:	Not issued		

NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Nancy Zhang
Chemist

Rhian Morgan
Reporting Supervisor

Paul Ching
Approved Signatory

ACCREDITED FOR TECHNICAL COMPETENCE

vTRH & BTEX in Soil						
Our Reference:	UNITS	70384-1	70384-2	70384-3	70384-4	70384-5
Your Reference	----------	SP14-1	QC02	SP15-1	SP4-1	SP5-1
Depth	----------	0.4	-	0.3	0.4	0.3
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	17/03/2012	17/03/2012	17/03/2012	17/03/2012	17/03/2012
vTRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	[NA]	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	[NA]	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	[NA]	<1	<1	<1
m+p-xylene	mg/kg	<2	[NA]	<2	<2	<2
o-Xylene	mg/kg	<1	[NA]	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	107	101	110	111	110

vTRH & BTEX in Soil						
Our Reference:	UNITS	70384-6	70384-7	70384-8	70384-9	70384-10
Your Reference	----------	SP17-1	SP16-1	SP11-1	SP10-1	SP9-1
Depth	----------	0.3	0.3	0.4	0.3	0.4
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	17/03/2012	17/03/2012	17/03/2012	17/03/2012	17/03/2012
vTRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	112	101	105	104	109

vTRH & BTEX in Soil						
Our Reference:	UNITS	70384-11	70384-12	70384-13	70384-14	70384-15
Your Reference	----------	SP7-1	SP8-1	SP1-1	SP2-1	SP3-1
Depth	----------	0.4	0.4	0.3	0.3	0.3
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	17/03/2012	17/03/2012	17/03/2012	17/03/2012	17/03/2012
vTRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	107	102	117	105	101

vTRH & BTEX in Soil		
Our Reference:	UNITS	70384-16
Your Reference	----------	SP12-1
Depth	----------	0.4
Date Sampled		14/03/2012
Type of sample		Soil
Date extracted	-	16/03/2012
Date analysed	-	17/03/2012
vTRH C_6 - C_9	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	102

sTRH in Soil (C10-C36)						
Our Reference:	UNITS	70384-1	70384-2	70384-3	70384-4	70384-5
Your Reference	----------	SP14-1	QC02	SP15-1	SP4-1	SP5-1
Depth	----------	0.4	-	0.3	0.4	0.3
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	17/03/2012	17/03/2012	17/03/2012	17/03/2012	17/03/2012
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	102	104	101	102	102

sTRH in Soil (C10-C36)						
Our Reference:	UNITS	70384-6	70384-7	70384-8	70384-9	70384-10
Your Reference	----------	SP17-1	SP16-1	SP11-1	SP10-1	SP9-1
Depth	----------	0.3	0.3	0.4	0.3	0.4
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	17/03/2012	17/03/2012	17/03/2012	17/03/2012	17/03/2012
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	101	101	101	101	101

sTRH in Soil (C10-C36)						
Our Reference:	UNITS	70384-11	70384-12	70384-13	70384-14	70384-15
Your Reference	----------	SP7-1	SP8-1	SP1-1	SP2-1	SP3-1
Depth	----------	0.4	0.4	0.3	0.3	0.3
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	17/03/2012	17/03/2012	17/03/2012	17/03/2012	17/03/2012
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	99	104	105	97	101

sTRH in Soil (C10-C36)		
Our Reference:	UNITS	70384-16
Your Reference	----------	SP12-1
Depth	----------	0.4
Date Sampled		14/03/2012
Type of sample		Soil
Date extracted	-	16/03/2012
Date analysed	-	17/03/2012
TRHC$_{10}$ - C$_{14}$	mg/kg	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100
Surrogate o-Terphenyl	%	101

PAHs in Soil						
Our Reference:	UNITS	70384-1	70384-2	70384-3	70384-4	70384-5
Your Reference	----------	SP14-1	QC02	SP15-1	SP4-1	SP5-1
Depth	----------	0.4	-	0.3	0.4	0.3
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	18/03/2012	18/03/2012	18/03/2012	18/03/2012	18/03/2012
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d_{14}	%	108	94	101	100	101

PAHs in Soil						
Our Reference:	UNITS	70384-6	70384-7	70384-8	70384-9	70384-10
Your Reference	----------	SP17-1	SP16-1	SP11-1	SP10-1	SP9-1
Depth	----------	0.3	0.3	0.4	0.3	0.4
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	18/03/2012	18/03/2012	18/03/2012	18/03/2012	18/03/2012
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d_{14}	%	102	102	99	103	101

PAHs in Soil						
Our Reference:	UNITS	70384-11	70384-12	70384-13	70384-14	70384-15
Your Reference	----------	SP7-1	SP8-1	SP1-1	SP2-1	SP3-1
Depth	----------	0.4	0.4	0.3	0.3	0.3
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	18/03/2012	18/03/2012	18/03/2012	18/03/2012	18/03/2012
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d$_{14}$	%	103	104	101	103	99

PAHs in Soil		
Our Reference:	UNITS	70384-16
Your Reference	----------	SP12-1
Depth	----------	0.4
Date Sampled		14/03/2012
Type of sample		Soil
Date extracted	-	16/03/2012
Date analysed	-	18/03/2012
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Surrogate p-Terphenyl-d$_{14}$	%	99

Organochlorine Pesticides in soil						
Our Reference:	UNITS	70384-1	70384-3	70384-4	70384-5	70384-6
Your Reference	----------	SP14-1	SP15-1	SP4-1	SP5-1	SP17-1
Depth	----------	0.4	0.3	0.4	0.3	0.3
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	17/03/2012	17/03/2012	17/03/2012	18/03/2012	18/03/2012
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	97	105	104	110	101

Organochlorine Pesticides in soil						
Our Reference:	UNITS	70384-7	70384-8	70384-9	70384-10	70384-11
Your Reference	----------	SP16-1	SP11-1	SP10-1	SP9-1	SP7-1
Depth	----------	0.3	0.4	0.3	0.4	0.4
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	18/03/2012	18/03/2012	18/03/2012	18/03/2012	18/03/2012
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	102	100	110	101	106

Organochlorine Pesticides in soil						
Our Reference:	UNITS	70384-12	70384-13	70384-14	70384-15	70384-16
Your Reference	----------	SP8-1	SP1-1	SP2-1	SP3-1	SP12-1
Depth	----------	0.4	0.3	0.3	0.3	0.4
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	18/03/2012	18/03/2012	18/03/2012	18/03/2012	18/03/2012
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	98	101	102	101	97

Acid Extractable metals in soil						
Our Reference:	UNITS	70384-1	70384-2	70384-3	70384-4	70384-5
Your Reference	----------	SP14-1	QC02	SP15-1	SP4-1	SP5-1
Depth	----------	0.4	-	0.3	0.4	0.3
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	19/03/2012	19/03/2012	19/03/2012	19/03/2012	19/03/2012
Arsenic	mg/kg	7	10	8	6	6
Cadmium	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	mg/kg	15	18	18	13	17
Copper	mg/kg	22	23	16	27	16
Lead	mg/kg	14	18	23	20	20
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	5	6	8	9	7
Zinc	mg/kg	26	29	32	49	33

Acid Extractable metals in soil						
Our Reference:	UNITS	70384-6	70384-7	70384-8	70384-9	70384-10
Your Reference	----------	SP17-1	SP16-1	SP11-1	SP10-1	SP9-1
Depth	----------	0.3	0.3	0.4	0.3	0.4
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	19/03/2012	19/03/2012	19/03/2012	19/03/2012	19/03/2012
Arsenic	mg/kg	<4	7	7	5	6
Cadmium	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	mg/kg	6	14	14	12	13
Copper	mg/kg	5	21	27	30	42
Lead	mg/kg	11	44	40	27	80
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	3	8	8	9	9
Zinc	mg/kg	13	52	43	48	51

Acid Extractable metals in soil						
Our Reference:	UNITS	70384-11	70384-12	70384-13	70384-14	70384-15
Your Reference	----------	SP7-1	SP8-1	SP1-1	SP2-1	SP3-1
Depth	----------	0.4	0.4	0.3	0.3	0.3
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	19/03/2012	19/03/2012	19/03/2012	19/03/2012	19/03/2012
Arsenic	mg/kg	7	<4	7	6	8
Cadmium	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	mg/kg	14	11	9	18	20
Copper	mg/kg	33	28	38	23	22
Lead	mg/kg	60	42	26	22	32
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	10	8	15	8	14
Zinc	mg/kg	52	47	57	34	51

Acid Extractable metals in soil		
Our Reference:	UNITS	70384-16
Your Reference	----------	SP12-1
Depth	----------	0.4
Date Sampled		14/03/2012
Type of sample		Soil
Date digested	-	16/03/2012
Date analysed	-	19/03/2012
Arsenic	mg/kg	6
Cadmium	mg/kg	<0.5
Chromium	mg/kg	14
Copper	mg/kg	12
Lead	mg/kg	18
Mercury	mg/kg	<0.1
Nickel	mg/kg	8
Zinc	mg/kg	36

Moisture						
Our Reference:	UNITS	70384-1	70384-2	70384-3	70384-4	70384-5
Your Reference	----------	SP14-1	QC02	SP15-1	SP4-1	SP5-1
Depth	----------	0.4	-	0.3	0.4	0.3
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	19/03/2012	19/03/2012	19/03/2012	19/03/2012	19/03/2012
Moisture	%	18	18	21	20	12

Moisture						
Our Reference:	UNITS	70384-6	70384-7	70384-8	70384-9	70384-10
Your Reference	----------	SP17-1	SP16-1	SP11-1	SP10-1	SP9-1
Depth	----------	0.3	0.3	0.4	0.3	0.4
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	19/03/2012	19/03/2012	19/03/2012	19/03/2012	19/03/2012
Moisture	%	17	25	18	14	12

Moisture						
Our Reference:	UNITS	70384-11	70384-12	70384-13	70384-14	70384-15
Your Reference	----------	SP7-1	SP8-1	SP1-1	SP2-1	SP3-1
Depth	----------	0.4	0.4	0.3	0.3	0.3
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	19/03/2012	19/03/2012	19/03/2012	19/03/2012	19/03/2012
Moisture	%	19	18	13	21	26

Moisture		
Our Reference:	UNITS	70384-16
Your Reference	----------	SP12-1
Depth	----------	0.4
Date Sampled		14/03/2012
Type of sample		Soil
Date prepared	-	16/03/2012
Date analysed	-	19/03/2012
Moisture	%	20

Asbestos ID - soils						
Our Reference:	UNITS	70384-1	70384-2	70384-3	70384-4	70384-5
Your Reference	----------	SP14-1	QC02	SP15-1	SP4-1	SP5-1
Depth	----------	0.4	-	0.3	0.4	0.3
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	20/03/2012	20/03/2012	20/03/2012	20/03/2012	20/03/2012
Sample mass tested	g	Approx 40g	Approx 40g	Approx 40g	Approx 40g	Approx 40g
Sample Description	-	Red-brown clayey soil	Red-brown clayey soil	Brown fine-grained soil	Red-brown clayey soil	Red-brown clayey soil
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected

Asbestos ID - soils						
Our Reference:	UNITS	70384-6	70384-7	70384-8	70384-9	70384-10
Your Reference	----------	SP17-1	SP16-1	SP11-1	SP10-1	SP9-1
Depth	----------	0.3	0.3	0.4	0.3	0.4
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	20/03/2012	20/03/2012	20/03/2012	20/03/2012	20/03/2012
Sample mass tested	g	Approx 40g	Approx 40g	Approx 40g	Approx 40g	Approx 40g
Sample Description	-	Brown fine-grained soil	Brown fine-grained soil	Red-brown clayey soil	Red-brown clayey soil	Red-brown clayey soil
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected

Asbestos ID - soils						
Our Reference:	UNITS	70384-11	70384-12	70384-13	70384-14	70384-15
Your Reference	----------	SP7-1	SP8-1	SP1-1	SP2-1	SP3-1
Depth	----------	0.4	0.4	0.3	0.3	0.3
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	20/03/2012	20/03/2012	20/03/2012	20/03/2012	20/03/2012
Sample mass tested	g	Approx 40g	Approx 40g	Approx 40g	Approx 40g	Approx 40g
Sample Description	-	Red-brown clayey soil	Red-brown clayey soil	Red-brown clayey soil	Red-brown clayey soil	Brown fine-grained soil
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected

Asbestos ID - soils		
Our Reference:	UNITS	70384-16
Your Reference	----------	SP12-1
Depth	----------	0.4
Date Sampled		14/03/2012
Type of sample		Soil
Date analysed	-	20/03/2012
Sample mass tested	g	Approx 40g
Sample Description	-	Brown fine-grained soil
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No respirable fibres detected

Method ID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Inorg-008	Moisture content determined by heating at 105 deg C for a minimum of 4 hours.
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.

QUALITY CONTROL vTRH & BTEX in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			16/03/2012	70384-1	16/03/2012 || 16/03/2012	LCS-7	16/03/2012
Date analysed	-			17/03/2012	70384-1	17/03/2012 || 17/03/2012	LCS-7	17/03/2012
vTRH C_6 - C_9	mg/kg	25	Org-016	<25	70384-1	<25 || <25	LCS-7	114%
Benzene	mg/kg	0.2	Org-016	<0.2	70384-1	<0.2 || <0.2	LCS-7	114%
Toluene	mg/kg	0.5	Org-016	<0.5	70384-1	<0.5 || <0.5	LCS-7	114%
Ethylbenzene	mg/kg	1	Org-016	<1	70384-1	<1 || <1	LCS-7	112%
m+p-xylene	mg/kg	2	Org-016	<2	70384-1	<2 || <2	LCS-7	116%
o-Xylene	mg/kg	1	Org-016	<1	70384-1	<1 || <1	LCS-7	116%
Surrogate aaa-Trifluorotoluene	%		Org-016	116	70384-1	107 || 108 || RPD: 1	LCS-7	113%

QUALITY CONTROL sTRH in Soil (C10-C36)	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			16/03/2012	70384-1	16/03/2012 || 16/03/2012	LCS-7	16/03/2012
Date analysed	-			17/03/2012	70384-1	17/03/2012 || 17/03/2012	LCS-7	17/03/2012
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	70384-1	<50 || <50	LCS-7	86%
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	70384-1	<100 || <100	LCS-7	106%
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	70384-1	<100 || <100	LCS-7	98%
Surrogate o-Terphenyl	%		Org-003	100	70384-1	102 || 104 || RPD: 2	LCS-7	96%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			16/03/2012	70384-1	16/03/2012 || 16/03/2012	LCS-7	16/03/2012
Date analysed	-			18/03/2012	70384-1	18/03/2012 || 18/03/2012	LCS-7	18/03/2012
Naphthalene	mg/kg	0.1	Org-012 subset	<0.1	70384-1	<0.1 || <0.1	LCS-7	121%
Acenaphthylene	mg/kg	0.1	Org-012 subset	<0.1	70384-1	<0.1 || <0.1	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012 subset	<0.1	70384-1	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012 subset	<0.1	70384-1	<0.1 || <0.1	LCS-7	110%
Phenanthrene	mg/kg	0.1	Org-012 subset	<0.1	70384-1	<0.1 || <0.1	LCS-7	99%
Anthracene	mg/kg	0.1	Org-012 subset	<0.1	70384-1	<0.1 || <0.1	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012 subset	<0.1	70384-1	<0.1 || <0.1	LCS-7	101%
Pyrene	mg/kg	0.1	Org-012 subset	<0.1	70384-1	<0.1 || <0.1	LCS-7	105%
Benzo(a)anthracene	mg/kg	0.1	Org-012 subset	<0.1	70384-1	<0.1 || <0.1	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012 subset	<0.1	70384-1	<0.1 || <0.1	LCS-7	114%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Benzo(b+k)fluoranthene	mg/kg	0.2	Org-012 subset	<0.2	70384-1	<0.2 || <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	Org-012 subset	<0.05	70384-1	<0.05 || <0.05	LCS-7	120%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012 subset	<0.1	70384-1	<0.1 || <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012 subset	<0.1	70384-1	<0.1 || <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012 subset	<0.1	70384-1	<0.1 || <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d_{14}	%		Org-012 subset	104	70384-1	108 || 106 || RPD: 2	LCS-7	101%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			16/03/2012	70384-1	16/03/2012 || 16/03/2012	LCS-7	16/03/2012
Date analysed	-			17/03/2012	70384-1	17/03/2012 || 17/03/2012	LCS-7	17/03/2012
HCB	mg/kg	0.1	Org-005	<0.1	70384-1	<0.1 || <0.1	[NR]	[NR]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	70384-1	<0.1 || <0.1	LCS-7	102%
gamma-BHC	mg/kg	0.1	Org-005	<0.1	70384-1	<0.1 || <0.1	[NR]	[NR]
beta-BHC	mg/kg	0.1	Org-005	<0.1	70384-1	<0.1 || <0.1	LCS-7	102%
Heptachlor	mg/kg	0.1	Org-005	<0.1	70384-1	<0.1 || <0.1	LCS-7	91%
delta-BHC	mg/kg	0.1	Org-005	<0.1	70384-1	<0.1 || <0.1	[NR]	[NR]
Aldrin	mg/kg	0.1	Org-005	<0.1	70384-1	<0.1 || <0.1	LCS-7	90%
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	70384-1	<0.1 || <0.1	LCS-7	99%
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	70384-1	<0.1 || <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	70384-1	<0.1 || <0.1	[NR]	[NR]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	70384-1	<0.1 || <0.1	[NR]	[NR]
pp-DDE	mg/kg	0.1	Org-005	<0.1	70384-1	<0.1 || <0.1	LCS-7	96%
Dieldrin	mg/kg	0.1	Org-005	<0.1	70384-1	<0.1 || <0.1	LCS-7	106%
Endrin	mg/kg	0.1	Org-005	<0.1	70384-1	<0.1 || <0.1	LCS-7	97%
pp-DDD	mg/kg	0.1	Org-005	<0.1	70384-1	<0.1 || <0.1	LCS-7	100%
Endosulfan II	mg/kg	0.1	Org-005	<0.1	70384-1	<0.1 || <0.1	[NR]	[NR]
pp-DDT	mg/kg	0.1	Org-005	<0.1	70384-1	<0.1 || <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	70384-1	<0.1 || <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	70384-1	<0.1 || <0.1	LCS-7	91%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	70384-1	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%		Org-005	99	70384-1	97 || 107 || RPD: 10	LCS-7	98%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date digested	-			16/03/2012	70384-1	16/03/2012 || 16/03/2012	LCS-1	16/003/2012
Date analysed	-			19/03/2012	70384-1	19/03/2012 || 19/03/2012	LCS-1	19/03/2012
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	70384-1	7 || 6 || RPD: 15	LCS-1	103%
Cadmium	mg/kg	0.5	Metals-020 ICP-AES	<0.5	70384-1	<0.5 || <0.5	LCS-1	104%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	70384-1	15 || 15 || RPD: 0	LCS-1	104%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	70384-1	22 || 21 || RPD: 5	LCS-1	104%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	70384-1	14 || 14 || RPD: 0	LCS-1	104%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	70384-1	<0.1 || <0.1	LCS-1	110%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	70384-1	5 || 4 || RPD: 22	LCS-1	106%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	70384-1	26 || 21 || RPD: 21	LCS-1	105%

QUALITY CONTROL Moisture	UNITS	PQL	METHOD	Blank
Date prepared	-			[NT]
Date analysed	-			[NT]
Moisture	%	0.1	Inorg-008	[NT]

QUALITY CONTROL Asbestos ID - soils	UNITS	PQL	METHOD	Blank
Date analysed	-			[NT]

QUALITY CONTROL vTRH & BTEX in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	70384-11	16/03/2012 || 16/03/2012	70384-3	16/03/2012
Date analysed	-	70384-11	17/03/2012 || 17/03/2012	70384-3	17/03/2012
vTRH C_6 - C_9	mg/kg	70384-11	<25 || <25	70384-3	97%
Benzene	mg/kg	70384-11	<0.2 || <0.2	70384-3	96%
Toluene	mg/kg	70384-11	<0.5 || <0.5	70384-3	96%
Ethylbenzene	mg/kg	70384-11	<1 || <1	70384-3	95%
m+p-xylene	mg/kg	70384-11	<2 || <2	70384-3	98%
o-Xylene	mg/kg	70384-11	<1 || <1	70384-3	98%
Surrogate aaa-Trifluorotoluene	%	70384-11	107 || 103 || RPD: 4	70384-3	103%

QUALITY CONTROL sTRH in Soil (C10-C36)	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	70384-11	16/03/2012 || 16/03/2012	70384-3	16/03/2012
Date analysed	-	70384-11	17/03/2012 || 17/03/2012	70384-3	17/03/2012
$TRHC_{10}$ - C_{14}	mg/kg	70384-11	<50 || <50	70384-3	87%
$TRHC_{15}$ - C_{28}	mg/kg	70384-11	<100 || <100	70384-3	107%
$TRHC_{29}$ - C_{36}	mg/kg	70384-11	<100 || <100	70384-3	99%
Surrogate o-Terphenyl	%	70384-11	99 || 104 || RPD: 5	70384-3	95%
QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	70384-11	16/03/2012 || 16/03/2012	70384-3	16/03/2012
Date analysed	-	70384-11	18/03/2012 || 18/03/2012	70384-3	18/03/2012
Naphthalene	mg/kg	70384-11	<0.1 || <0.1	70384-3	118%
Acenaphthylene	mg/kg	70384-11	<0.1 || <0.1	[NR]	[NR]
Acenaphthene	mg/kg	70384-11	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	70384-11	<0.1 || <0.1	70384-3	108%
Phenanthrene	mg/kg	70384-11	<0.1 || <0.1	70384-3	97%
Anthracene	mg/kg	70384-11	<0.1 || <0.1	[NR]	[NR]
Fluoranthene	mg/kg	70384-11	<0.1 || <0.1	70384-3	100%
Pyrene	mg/kg	70384-11	<0.1 || <0.1	70384-3	104%
Benzo(a)anthracene	mg/kg	70384-11	<0.1 || <0.1	[NR]	[NR]
Chrysene	mg/kg	70384-11	<0.1 || <0.1	70384-3	111%
Benzo(b+k)fluoranthene	mg/kg	70384-11	<0.2 || <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	70384-11	<0.05 || <0.05	70384-3	114%
Indeno(1,2,3-c,d)pyrene	mg/kg	70384-11	<0.1 || <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	70384-11	<0.1 || <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	70384-11	<0.1 || <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d_{14}	%	70384-11	103 || 100 || RPD: 3	70384-3	103%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	70384-11	16/03/2012 || 16/03/2012	70384-3	16/03/2012
Date analysed	-	70384-11	18/03/2012 || 18/03/2012	70384-3	17/03/2012
HCB	mg/kg	70384-11	<0.1 || <0.1	[NR]	[NR]
alpha-BHC	mg/kg	70384-11	<0.1 || <0.1	70384-3	105%
gamma-BHC	mg/kg	70384-11	<0.1 || <0.1	[NR]	[NR]
beta-BHC	mg/kg	70384-11	<0.1 || <0.1	70384-3	106%
Heptachlor	mg/kg	70384-11	<0.1 || <0.1	70384-3	95%
delta-BHC	mg/kg	70384-11	<0.1 || <0.1	[NR]	[NR]
Aldrin	mg/kg	70384-11	<0.1 || <0.1	70384-3	93%
Heptachlor Epoxide	mg/kg	70384-11	<0.1 || <0.1	70384-3	104%
gamma-Chlordane	mg/kg	70384-11	<0.1 || <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	70384-11	<0.1 || <0.1	[NR]	[NR]
Endosulfan I	mg/kg	70384-11	<0.1 || <0.1	[NR]	[NR]
pp-DDE	mg/kg	70384-11	<0.1 || <0.1	70384-3	101%
Dieldrin	mg/kg	70384-11	<0.1 || <0.1	70384-3	111%
Endrin	mg/kg	70384-11	<0.1 || <0.1	70384-3	101%
pp-DDD	mg/kg	70384-11	<0.1 || <0.1	70384-3	104%
Endosulfan II	mg/kg	70384-11	<0.1 || <0.1	[NR]	[NR]
pp-DDT	mg/kg	70384-11	<0.1 || <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	70384-11	<0.1 || <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	70384-11	<0.1 || <0.1	70384-3	100%
Methoxychlor	mg/kg	70384-11	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%	70384-11	106 || 102 || RPD: 4	70384-3	103%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	70384-11	16/03/2012 || 16/03/2012	LCS-2	16/03/2012
Date analysed	-	70384-11	19/03/2012 || 19/03/2012	LCS-2	19/03/2012
Arsenic	mg/kg	70384-11	7 || 7 || RPD: 0	LCS-2	109%
Cadmium	mg/kg	70384-11	<0.5 || <0.5	LCS-2	110%
Chromium	mg/kg	70384-11	14 || 14 || RPD: 0	LCS-2	111%
Copper	mg/kg	70384-11	33 || 36 || RPD: 9	LCS-2	110%
Lead	mg/kg	70384-11	60 || 69 || RPD: 14	LCS-2	110%
Mercury	mg/kg	70384-11	<0.1 || <0.1	LCS-2	112%
Nickel	mg/kg	70384-11	10 || 9 || RPD: 11	LCS-2	112%
Zinc	mg/kg	70384-11	52 || 51 || RPD: 2	LCS-2	111%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	[NT]	[NT]	70384-3	16/03/2012
Date analysed	-	[NT]	[NT]	70384-3	19/03/2012
Arsenic	mg/kg	[NT]	[NT]	70384-3	97%
Cadmium	mg/kg	[NT]	[NT]	70384-3	97%
Chromium	mg/kg	[NT]	[NT]	70384-3	97%
Copper	mg/kg	[NT]	[NT]	70384-3	106%
Lead	mg/kg	[NT]	[NT]	70384-3	99%
Mercury	mg/kg	[NT]	[NT]	70384-3	113%
Nickel	mg/kg	[NT]	[NT]	70384-3	94%
Zinc	mg/kg	[NT]	[NT]	70384-3	100%

Report Comments:

This report supersedes the previous report due to an amendment to sample ID #14.

Asbestos ID was analysed by Approved Identifier: Paul Ching
Asbestos ID was authorised by Approved Signatory: Paul Ching

INS: Insufficient sample for this test
NA: Test not required
<: Less than
PQL: Practical Quantitation Limit
RPD: Relative Percent Difference
>: Greater than
NT: Not tested
NA: Test not required
LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batched of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

CHAIN OF CUSTODY

JBS ENVIRONMENTAL

PROJECT NO.: 47945
PROJECT NAME: Edmondson Park Rezoning SP
SEND REPORT TO: J. Posner SEND INVOICE TO: A. Trayner
DATE NEEDED BY: Standard Turn Around

LABORATORY BATCH NO.
SAMPLERS AB
PHONE: 02 8338 1011
QC LEVEL: NEPM 1999 (✓)

J.posner@jbsgroup.com.au
EMAIL: abooldman@jbsgroup.com.au

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

	SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	Asbestos	TPH	BTEX	PAHs	Metals (6)	OCPs	NOTES
1	SP14-1 0.4m	Soil	14/3/12		B+J		X	X	X	X	X	X	
2	QC02						X	X		X	X		
	QA02												Send Bag + Pickford + Rhydr, Send Jar to SGS
3	SP15-1 0.3m						X	X	X	X	X	X	
4	SP4-1 0.4m						X	X	X	X	X	X	
5	SP5-1 0.3m						X	X	X	X	X	X	
6	SP17-1 0.3m						X	X	X	X	X	X	
7	SP16-1 0.3m						X	X	X	X	X	X	
8	SP11-1 0.4m						X	X	X	X	X	X	
9	SP10-1 0.3m						X	X	X	X	X	X	
10	SP9-1 0.4m						X	X	X	X	X	X	
11	SP7-1 0.4m						X	X	X	X	X	X	
12	SP8-1 0.4m						X	X	X	X	X	X	
13	SP1-1 0.3m						X	X	X	X	X	X	
14	SP2-1 0.3m						X	X	X	X	X	X	
15	SP3-1 0.3m						X	X	X	X	X	X	
16	SP12-1 0.4m						X	X	X	X	X	X	

Environmental Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 70384
Date Received: 15/03
Time Received: 14:30
Received by: SG
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: AB DATE: 15/3/12	CONSIGNMENT NOTE NO.	NAME: Soumi DATE: 15/03	COOLER SEAL - Yes..... No..... Intact..... Broken.....
OF: JBS Environmental	TRANSPORT CO.	OF: ES	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL - Yes..... No..... Intact..... Broken.....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

SAMPLE RECEIPT ADVICE

Client:

JBS Environmental Pty Ltd
P.O. Box 940
MASCOT NSW 1460

ph: 8338 1013
Fax: 8338 1700

Attention: Jo Rosner, A Boardman

Sample log in details:

Your reference:	**41945, Edmondson Park - Clean SP**
Envirolab Reference:	**70384**
Date received:	15/03/12
Date results expected to be reported:	**22/03/12**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	16 soils
Turnaround time requested:	Standard
Temperature on receipt	Cool
Cooling Method:	Ice

Comments:

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

Contact details:

Please direct any queries to Aileen Hie or Jacinta Hurst
ph: 02 9910 6200 fax: 02 9910 6201
email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

CERTIFICATE OF ANALYSIS 70383

Client:
JBS Environmental Pty Ltd
P.O. Box 940
MASCOT
NSW 1460

Attention: Jo Rosner, A Boardman

Sample log in details:

Your Reference:	**41945, Edmondson Park - Waste SP**
No. of samples:	9 soils, 3 waters
Date samples received / completed instructions received	15/03/12 / 15/03/12

Analysis Details:
Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	22/03/12 / 21/03/12
Date of Preliminary Report:	Not issued

NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Nancy Zhang
Chemist

Rhian Morgan
Reporting Supervisor

Kim Femia
Approved Signatory

NATA
ACCREDITED FOR TECHNICAL COMPETENCE

vTRH & BTEX in Soil						
Our Reference:	UNITS	70383-1	70383-2	70383-3	70383-4	70383-5
Your Reference	----------	WDW1-1	WDW1-1	WDW1-2	WDW1-2	WDW1-3
Depth	----------	0.2	0.6	0.2	0.9	0.2
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	17/03/2012	17/03/2012	17/03/2012	17/03/2012	17/03/2012
vTRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	102	103	104	107	109

vTRH & BTEX in Soil					
Our Reference:	UNITS	70383-6	70383-7	70383-8	70383-9
Your Reference	----------	WDW1-3	WDW1-3	WDW1-4	WDW1-4
Depth	----------	0.5	1.0	0.4	0.7
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	17/03/2012	17/03/2012	17/03/2012	17/03/2012
vTRH C_6 - C_9	mg/kg	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	95	104	102	109

sTRH in Soil (C10-C36)						
Our Reference:	UNITS	70383-1	70383-2	70383-3	70383-4	70383-5
Your Reference	----------	WDW1-1	WDW1-1	WDW1-2	WDW1-2	WDW1-3
Depth	----------	0.2	0.6	0.2	0.9	0.2
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	102	100	105	104	103

sTRH in Soil (C10-C36)					
Our Reference:	UNITS	70383-6	70383-7	70383-8	70383-9
Your Reference	----------	WDW1-3	WDW1-3	WDW1-4	WDW1-4
Depth	----------	0.5	1.0	0.4	0.7
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	16/03/2012	17/03/2012	17/03/2012	17/03/2012
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100	<100
Surrogate o-Terphenyl	%	94	100	101	93

PAHs in Soil						
Our Reference:	UNITS	70383-1	70383-2	70383-3	70383-4	70383-5
Your Reference	----------	WDW1-1	WDW1-1	WDW1-2	WDW1-2	WDW1-3
Depth	----------	0.2	0.6	0.2	0.9	0.2
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	17/03/2012	17/03/2012	17/03/2012	17/03/2012	17/03/2012
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d_{14}	%	111	107	113	111	113

PAHs in Soil					
Our Reference:	UNITS	70383-6	70383-7	70383-8	70383-9
Your Reference	----------	WDW1-3	WDW1-3	WDW1-4	WDW1-4
Depth	----------	0.5	1.0	0.4	0.7
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	17/03/2012	17/03/2012	17/03/2012	17/03/2012
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d_{14}	%	113	112	109	107

Organochlorine Pesticides in soil						
Our Reference:	UNITS	70383-1	70383-2	70383-3	70383-4	70383-5
Your Reference	----------	WDW1-1	WDW1-1	WDW1-2	WDW1-2	WDW1-3
Depth	----------	0.2	0.6	0.2	0.9	0.2
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	17/03/2012	17/03/2012	17/03/2012	17/03/2012	17/03/2012
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	97	102	105	112	104

Organochlorine Pesticides in soil					
Our Reference:	UNITS	70383-6	70383-7	70383-8	70383-9
Your Reference	----------	WDW1-3	WDW1-3	WDW1-4	WDW1-4
Depth	----------	0.5	1.0	0.4	0.7
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	17/03/2012	17/03/2012	17/03/2012	17/03/2012
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	101	97	99	99

Acid Extractable metals in soil						
Our Reference:	UNITS	70383-1	70383-2	70383-3	70383-4	70383-5
Your Reference	----------	WDW1-1	WDW1-1	WDW1-2	WDW1-2	WDW1-3
Depth	----------	0.2	0.6	0.2	0.9	0.2
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	19/03/2012	19/03/2012	19/03/2012	19/03/2012	19/03/2012
Arsenic	mg/kg	11	9	7	10	8
Cadmium	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	mg/kg	20	14	17	15	16
Copper	mg/kg	22	15	14	15	13
Lead	mg/kg	15	27	17	23	18
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	15	11	8	11	10
Zinc	mg/kg	48	38	26	32	30

Acid Extractable metals in soil					
Our Reference:	UNITS	70383-6	70383-7	70383-8	70383-9
Your Reference	----------	WDW1-3	WDW1-3	WDW1-4	WDW1-4
Depth	----------	0.5	1.0	0.4	0.7
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil
Date digested	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	19/03/2012	19/03/2012	19/03/2012	19/03/2012
Arsenic	mg/kg	8	6	6	8
Cadmium	mg/kg	<0.5	<0.5	<0.5	<0.5
Chromium	mg/kg	15	14	14	15
Copper	mg/kg	14	16	12	15
Lead	mg/kg	16	20	11	16
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	10	16	6	8
Zinc	mg/kg	29	19	19	28

Moisture						
Our Reference:	UNITS	70383-1	70383-2	70383-3	70383-4	70383-5
Your Reference	----------	WDW1-1	WDW1-1	WDW1-2	WDW1-2	WDW1-3
Depth	----------	0.2	0.6	0.2	0.9	0.2
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	19/03/2012	19/03/2012	19/03/2012	19/03/2012	19/03/2012
Moisture	%	17	20	16	21	16

Moisture					
Our Reference:	UNITS	70383-6	70383-7	70383-8	70383-9
Your Reference	----------	WDW1-3	WDW1-3	WDW1-4	WDW1-4
Depth	----------	0.5	1.0	0.4	0.7
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	19/03/2012	19/03/2012	19/03/2012	19/03/2012
Moisture	%	16	18	20	18

Asbestos ID - soils						
Our Reference:	UNITS	70383-1	70383-2	70383-3	70383-4	70383-5
Your Reference	----------	WDW1-1	WDW1-1	WDW1-2	WDW1-2	WDW1-3
Depth	----------	0.2	0.6	0.2	0.9	0.2
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	20/03/2012	20/03/2012	20/03/2012	20/03/2012	20/03/2012
Sample mass tested	g	Approx 50g	Approx 50g	Approx 50g	Approx 50g	Approx 50g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected

Asbestos ID - soils					
Our Reference:	UNITS	70383-6	70383-7	70383-8	70383-9
Your Reference	----------	WDW1-3	WDW1-3	WDW1-4	WDW1-4
Depth	----------	0.5	1.0	0.4	0.7
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil
Date analysed	-	20/03/2012	20/03/2012	20/03/2012	20/03/2012
Sample mass tested	g	Approx 50g	Approx 50g	Approx 50g	Approx 50g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected

Metals in TCLP USEPA1311						
Our Reference:	UNITS	70383-1	70383-2	70383-3	70383-4	70383-5
Your Reference	----------	WDW1-1	WDW1-1	WDW1-2	WDW1-2	WDW1-3
Depth	----------	0.2	0.6	0.2	0.9	0.2
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
pH of soil for fluid# determ.	pH units	9.2	8.5	8.4	8.4	7.5
pH of soil for fluid # determ. (acid)	pH units	1.7	1.6	1.6	1.5	1.6
Extraction fluid used	-	1	1	1	1	1
pH of final Leachate	pH units	5.0	5.0	5.0	5.0	5.0

Metals in TCLP USEPA1311					
Our Reference:	UNITS	70383-6	70383-7	70383-8	70383-9
Your Reference	----------	WDW1-3	WDW1-3	WDW1-4	WDW1-4
Depth	----------	0.5	1.0	0.4	0.7
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012
pH of soil for fluid# determ.	pH units	8.0	8.1	7.9	7.7
pH of soil for fluid # determ. (acid)	pH units	1.6	1.7	1.6	1.6
Extraction fluid used	-	1	1	1	1
pH of final Leachate	pH units	5.0	5.0	5.0	5.0

vTRH & BTEX in Water				
Our Reference:	UNITS	70383-10	70383-11	70383-12
Your Reference	----------	TRIPSPIKE	TRIP BLANK	RINSATE
Depth	----------	-	-	-
Date Sampled		14/03/2012	14/03/2012	14/03/2012
Type of sample		Water	Water	Water
Date extracted	-	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	16/03/2012	16/03/2012	16/03/2012
TRHC$_6$ - C$_9$	µg/L	[NA]	[NA]	<10
Benzene	µg/L	105%	<1	[NA]
Toluene	µg/L	103%	<1	[NA]
Ethylbenzene	µg/L	100%	<1	[NA]
m+p-xylene	µg/L	99%	<2	[NA]
o-xylene	µg/L	99%	<1	[NA]
Surrogate Dibromofluoromethane	%	98	98	99
Surrogate toluene-d8	%	99	98	99
Surrogate 4-BFB	%	96	95	96

sTRH in Water (C10-C36)		
Our Reference:	UNITS	70383-12
Your Reference	----------	RINSATE
Depth	----------	-
Date Sampled		14/03/2012
Type of sample		Water
Date extracted	-	20/03/2012
Date analysed	-	20/03/2012
TRHC$_{10}$ - C$_{14}$	µg/L	<50
TRHC$_{15}$ - C$_{28}$	µg/L	<100
TRHC$_{29}$ - C$_{36}$	µg/L	<100
Surrogate o-Terphenyl	%	88

PAHs in Water		
Our Reference:	UNITS	70383-12
Your Reference	----------	RINSATE
Depth	----------	-
Date Sampled		14/03/2012
Type of sample		Water
Date extracted	-	20/03/2012
Date analysed	-	20/03/2012
Naphthalene	µg/L	<1
Acenaphthylene	µg/L	<1
Acenaphthene	µg/L	<1
Fluorene	µg/L	<1
Phenanthrene	µg/L	<1
Anthracene	µg/L	<1
Fluoranthene	µg/L	<1
Pyrene	µg/L	<1
Benzo(a)anthracene	µg/L	<1
Chrysene	µg/L	<1
Benzo(b+k)fluoranthene	µg/L	<2
Benzo(a)pyrene	µg/L	<1
Indeno(1,2,3-c,d)pyrene	µg/L	<1
Dibenzo(a,h)anthracene	µg/L	<1
Benzo(g,h,i)perylene	µg/L	<1
Surrogate p-Terphenyl-d_{14}	%	89

Metals in Water - Dissolved		
Our Reference:	UNITS	70383-12
Your Reference	----------	RINSATE
Depth	----------	-
Date Sampled		14/03/2012
Type of sample		Water
Date digested	-	16/03/2012
Date analysed	-	16/03/2012
Arsenic - Dissolved	mg/L	<0.05
Cadmium - Dissolved	mg/L	<0.01
Chromium - Dissolved	mg/L	<0.01
Copper - Dissolved	mg/L	<0.01
Lead - Dissolved	mg/L	<0.03
Mercury - Dissolved	mg/L	<0.0001
Nickel - Dissolved	mg/L	<0.02
Zinc - Dissolved	mg/L	<0.02

Method ID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Inorg-008	Moisture content determined by heating at 105 deg C for a minimum of 4 hours.
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using AS 4439 and USEPA 1311.
EXTRACT.7	Toxicity Characteristic Leaching Procedure (TCLP).
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA 21st ED, 4500-H+.

QUALITY CONTROL vTRH & BTEX in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			16/03/2012	70383-1	16/03/2012 || 16/03/2012	LCS-5	16/03/2012
Date analysed	-			17/03/2012	70383-1	17/03/2012 || 17/03/2012	LCS-5	17/03/2012
vTRH C_6 - C_9	mg/kg	25	Org-016	<25	70383-1	<25 || <25	LCS-5	100%
Benzene	mg/kg	0.2	Org-016	<0.2	70383-1	<0.2 || <0.2	LCS-5	97%
Toluene	mg/kg	0.5	Org-016	<0.5	70383-1	<0.5 || <0.5	LCS-5	102%
Ethylbenzene	mg/kg	1	Org-016	<1	70383-1	<1 || <1	LCS-5	97%
m+p-xylene	mg/kg	2	Org-016	<2	70383-1	<2 || <2	LCS-5	103%
o-Xylene	mg/kg	1	Org-016	<1	70383-1	<1 || <1	LCS-5	102%
Surrogate aaa-Trifluorotoluene	%		Org-016	108	70383-1	102 || 114 || RPD: 11	LCS-5	114%

QUALITY CONTROL sTRH in Soil (C10-C36)	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			16/03/2012	70383-1	16/03/2012 || 16/03/2012	LCS-5	16/03/2012
Date analysed	-			16/03/2012	70383-1	16/03/2012 || 16/03/2012	LCS-5	16/03/2012
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	70383-1	<50 || <50	LCS-5	94%
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	70383-1	<100 || <100	LCS-5	98%
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	70383-1	<100 || <100	LCS-5	94%
Surrogate o-Terphenyl	%		Org-003	101	70383-1	102 || 97 || RPD: 5	LCS-5	108%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			16/03/2012	70383-1	16/03/2012 || 16/03/2012	LCS-3	16/03/2012
Date analysed	-			17/03/2012	70383-1	17/03/2012 || 17/03/2012	LCS-3	17/03/2012
Naphthalene	mg/kg	0.1	Org-012 subset	<0.1	70383-1	<0.1 || <0.1	LCS-3	120%
Acenaphthylene	mg/kg	0.1	Org-012 subset	<0.1	70383-1	<0.1 || <0.1	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012 subset	<0.1	70383-1	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012 subset	<0.1	70383-1	<0.1 || <0.1	LCS-3	107%
Phenanthrene	mg/kg	0.1	Org-012 subset	<0.1	70383-1	<0.1 || <0.1	LCS-3	99%
Anthracene	mg/kg	0.1	Org-012 subset	<0.1	70383-1	<0.1 || <0.1	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012 subset	<0.1	70383-1	<0.1 || <0.1	LCS-3	101%
Pyrene	mg/kg	0.1	Org-012 subset	<0.1	70383-1	<0.1 || <0.1	LCS-3	106%
Benzo(a)anthracene	mg/kg	0.1	Org-012 subset	<0.1	70383-1	<0.1 || <0.1	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012 subset	<0.1	70383-1	<0.1 || <0.1	LCS-3	115%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Benzo(b+k)fluoranthene	mg/kg	0.2	Org-012 subset	<0.2	70383-1	<0.2 || <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	Org-012 subset	<0.05	70383-1	<0.05 || <0.05	LCS-3	123%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012 subset	<0.1	70383-1	<0.1 || <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012 subset	<0.1	70383-1	<0.1 || <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012 subset	<0.1	70383-1	<0.1 || <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d_{14}	%		Org-012 subset	111	70383-1	111 || 109 || RPD: 2	LCS-3	99%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			16/03/2012	70383-1	16/03/2012 || 16/03/2012	LCS-3	16/03/2012
Date analysed	-			17/03/2012	70383-1	17/03/2012 || 17/03/2012	LCS-3	17/03/2012
HCB	mg/kg	0.1	Org-005	<0.1	70383-1	<0.1 || <0.1	[NR]	[NR]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	70383-1	<0.1 || <0.1	LCS-3	101%
gamma-BHC	mg/kg	0.1	Org-005	<0.1	70383-1	<0.1 || <0.1	[NR]	[NR]
beta-BHC	mg/kg	0.1	Org-005	<0.1	70383-1	<0.1 || <0.1	LCS-3	101%
Heptachlor	mg/kg	0.1	Org-005	<0.1	70383-1	<0.1 || <0.1	LCS-3	93%
delta-BHC	mg/kg	0.1	Org-005	<0.1	70383-1	<0.1 || <0.1	[NR]	[NR]
Aldrin	mg/kg	0.1	Org-005	<0.1	70383-1	<0.1 || <0.1	LCS-3	93%
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	70383-1	<0.1 || <0.1	LCS-3	101%
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	70383-1	<0.1 || <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	70383-1	<0.1 || <0.1	[NR]	[NR]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	70383-1	<0.1 || <0.1	[NR]	[NR]
pp-DDE	mg/kg	0.1	Org-005	<0.1	70383-1	<0.1 || <0.1	LCS-3	95%
Dieldrin	mg/kg	0.1	Org-005	<0.1	70383-1	<0.1 || <0.1	LCS-3	101%
Endrin	mg/kg	0.1	Org-005	<0.1	70383-1	<0.1 || <0.1	LCS-3	97%
pp-DDD	mg/kg	0.1	Org-005	<0.1	70383-1	<0.1 || <0.1	LCS-3	101%
Endosulfan II	mg/kg	0.1	Org-005	<0.1	70383-1	<0.1 || <0.1	[NR]	[NR]
pp-DDT	mg/kg	0.1	Org-005	<0.1	70383-1	<0.1 || <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	70383-1	<0.1 || <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	70383-1	<0.1 || <0.1	LCS-3	97%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	70383-1	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%		Org-005	100	70383-1	97 || 98 || RPD: 1	LCS-3	97%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date digested	-			16/03/2012	70383-1	16/03/2012 || 16/03/2012	LCS-1	16/03/2012
Date analysed	-			19/03/2012	70383-1	19/03/2012 || 19/03/2012	LCS-1	19/03/2012
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	70383-1	11 || 11 || RPD: 0	LCS-1	101%
Cadmium	mg/kg	0.5	Metals-020 ICP-AES	<0.5	70383-1	<0.5 || <0.5	LCS-1	107%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	70383-1	20 || 18 || RPD: 11	LCS-1	103%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	70383-1	22 || 22 || RPD: 0	LCS-1	103%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	70383-1	15 || 12 || RPD: 22	LCS-1	100%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	70383-1	<0.1 || <0.1	LCS-1	107%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	70383-1	15 || 15 || RPD: 0	LCS-1	104%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	70383-1	48 || 45 || RPD: 6	LCS-1	103%

QUALITY CONTROL Moisture	UNITS	PQL	METHOD	Blank
Date prepared	-			[NT]
Date analysed	-			[NT]
Moisture	%	0.1	Inorg-008	[NT]

QUALITY CONTROL Asbestos ID - soils	UNITS	PQL	METHOD	Blank
Date analysed	-			[NT]

QUALITY CONTROL Metals in TCLP USEPA1311	UNITS	PQL	METHOD	Blank
Date extracted	-			[NT]
Date analysed	-			[NT]

QUALITY CONTROL vTRH & BTEX in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			16/03/2012	[NT]	[NT]	LCS-W1	16/03/2012
Date analysed	-			16/03/2012	[NT]	[NT]	LCS-W1	16/03/2012
TRH C_6 - C_9	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-W1	112%
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	112%
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	113%
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	111%
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	LCS-W1	111%
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	111%
Surrogate Dibromofluoromethane	%		Org-016	97	[NT]	[NT]	LCS-W1	99%

QUALITY CONTROL vTRH & BTEX in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Surrogate toluene-d8	%		Org-016	98	[NT]	[NT]	LCS-W1	99%
Surrogate 4-BFB	%		Org-016	93	[NT]	[NT]	LCS-W1	97%
QUALITY CONTROL sTRH in Water (C10-C36)	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			20/03/2012	[NT]	[NT]	LCS-W1	20/03/2012
Date analysed	-			20/03/2012	[NT]	[NT]	LCS-W1	20/03/2012
TRHC$_{10}$ - C$_{14}$	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W1	80%
TRHC$_{15}$ - C$_{28}$	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	94%
TRHC$_{29}$ - C$_{36}$	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	92%
Surrogate o-Terphenyl	%		Org-003	96	[NT]	[NT]	LCS-W1	72%
QUALITY CONTROL PAHs in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			20/03/2012	[NT]	[NT]	LCS-W1	20/03/2012
Date analysed	-			20/03/2012	[NT]	[NT]	LCS-W1	20/03/2012
Naphthalene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	93%
Acenaphthylene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Fluorene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	108%
Phenanthrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	94%
Anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	95%
Pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	97%
Benzo(a)anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Chrysene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	107%
Benzo(b+k)fluoranthene	µg/L	2	Org-012 subset	<2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	97%
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]

QUALITY CONTROL PAHs in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Surrogate p-Terphenyl-d_{14}	%		Org-012 subset	109	[NT]	[NT]	LCS-W1	102%

QUALITY CONTROL Metals in Water - Dissolved	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date digested	-			16/03/2012	[NT]	[NT]	LCS-W1	16/03/2012
Date analysed	-			16/03/2012	[NT]	[NT]	LCS-W1	16/03/2012
Arsenic - Dissolved	mg/L	0.05	Metals-020 ICP-AES	<0.05	[NT]	[NT]	LCS-W1	101%
Cadmium - Dissolved	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	LCS-W1	100%
Chromium - Dissolved	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	LCS-W1	101%
Copper - Dissolved	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	LCS-W1	101%
Lead - Dissolved	mg/L	0.03	Metals-020 ICP-AES	<0.03	[NT]	[NT]	LCS-W1	100%
Mercury - Dissolved	mg/L	0.0001	Metals-021 CV-AAS	<0.0001	[NT]	[NT]	LCS-W1	100%
Nickel - Dissolved	mg/L	0.02	Metals-020 ICP-AES	<0.02	[NT]	[NT]	LCS-W1	104%
Zinc - Dissolved	mg/L	0.02	Metals-020 ICP-AES	<0.02	[NT]	[NT]	LCS-W1	104%

QUALITY CONTROL vTRH & BTEX in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	70383-2	16/03/2012
Date analysed	-	[NT]	[NT]	70383-2	16/03/2012
vTRH C_6 - C_9	mg/kg	[NT]	[NT]	70383-2	80%
Benzene	mg/kg	[NT]	[NT]	70383-2	76%
Toluene	mg/kg	[NT]	[NT]	70383-2	81%
Ethylbenzene	mg/kg	[NT]	[NT]	70383-2	78%
m+p-xylene	mg/kg	[NT]	[NT]	70383-2	83%
o-Xylene	mg/kg	[NT]	[NT]	70383-2	83%
Surrogate aaa-Trifluorotoluene	%	[NT]	[NT]	70383-2	96%

QUALITY CONTROL sTRH in Soil (C10-C36)	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	70383-2	16/03/2012
Date analysed	-	[NT]	[NT]	70383-2	16/03/2012
TRHC$_{10}$ - C$_{14}$	mg/kg	[NT]	[NT]	70383-2	96%
TRHC$_{15}$ - C$_{28}$	mg/kg	[NT]	[NT]	70383-2	97%
TRHC$_{29}$ - C$_{36}$	mg/kg	[NT]	[NT]	70383-2	95%
Surrogate o-Terphenyl	%	[NT]	[NT]	70383-2	105%
QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	70383-2	16/03/2012
Date analysed	-	[NT]	[NT]	70383-2	17/03/2012
Naphthalene	mg/kg	[NT]	[NT]	70383-2	122%
Acenaphthylene	mg/kg	[NT]	[NT]	[NR]	[NR]
Acenaphthene	mg/kg	[NT]	[NT]	[NR]	[NR]
Fluorene	mg/kg	[NT]	[NT]	70383-2	111%
Phenanthrene	mg/kg	[NT]	[NT]	70383-2	100%
Anthracene	mg/kg	[NT]	[NT]	[NR]	[NR]
Fluoranthene	mg/kg	[NT]	[NT]	70383-2	104%
Pyrene	mg/kg	[NT]	[NT]	70383-2	108%
Benzo(a)anthracene	mg/kg	[NT]	[NT]	[NR]	[NR]
Chrysene	mg/kg	[NT]	[NT]	70383-2	116%
Benzo(b+k)fluoranthene	mg/kg	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	mg/kg	[NT]	[NT]	70383-2	111%
Indeno(1,2,3-c,d)pyrene	mg/kg	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d$_{14}$	%	[NT]	[NT]	70383-2	103%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	[NT]	[NT]	70383-2	16/03/2012
Date analysed	-	[NT]	[NT]	70383-2	19/03/2012
Arsenic	mg/kg	[NT]	[NT]	70383-2	89%
Cadmium	mg/kg	[NT]	[NT]	70383-2	93%
Chromium	mg/kg	[NT]	[NT]	70383-2	96%
Copper	mg/kg	[NT]	[NT]	70383-2	106%
Lead	mg/kg	[NT]	[NT]	70383-2	89%
Mercury	mg/kg	[NT]	[NT]	70383-2	101%
Nickel	mg/kg	[NT]	[NT]	70383-2	86%
Zinc	mg/kg	[NT]	[NT]	70383-2	86%

Report Comments:

Asbestos ID was analysed by Approved Identifier: Alex Tam
Asbestos ID was authorised by Approved Signatory: Kim Femia

INS: Insufficient sample for this test
NA: Test not required
<: Less than

PQL: Practical Quantitation Limit
RPD: Relative Percent Difference
>: Greater than

NT: Not tested
NA: Test not required
LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batched of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

SAMPLE RECEIPT ADVICE

Client:

JBS Environmental Pty Ltd
P.O. Box 940
MASCOT NSW 1460

ph: 8338 1013
Fax: 8338 1700

Attention: Jo Rosner, A Boardman

Sample log in details:

Your reference:	**41945, Edmondson Park - Waste SP**
Envirolab Reference:	**70383**
Date received:	15/03/12
Date results expected to be reported:	**22/03/12**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	9 soils, 3 waters
Turnaround time requested:	Standard
Temperature on receipt	Cool
Cooling Method:	Ice

Comments:

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

Contact details:

Please direct any queries to Aileen Hie or Jacinta Hurst
ph: 02 9910 6200 fax: 02 9910 6201
email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au

Please Report Seperate to other COC

CHAIN OF CUSTODY

JBS ENVIRONMENTAL

PROJECT NO.: 41945
PROJECT NAME: Edmondson Park Remediation - Waste SP
SEND REPORT TO: KB + JR
SEND INVOICE TO: Accounts
DATE NEEDED BY: Standard Turn Around
COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

LABORATORY BATCH NO.
SAMPLERS KB
PHONE: 02 8338 1011
QC LEVEL: NEPM 1999 (✓)
EMAIL: aboodman@jbsgroup.com.au
jrosner@jbsgroup.com.au

	SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	Asbestos	Metals (8)	TPH	BTEX	PAHs	OCPs	TCLP Metals	TCLP PAHs	TCLP Pest	NOTES
1-	WDW1-1 0.2m	Soil	14/3/12		B+J		X	X	X	X	X	X			X	
2-	WDW1-1 0.6m						X	X	X	X	X	X			X	
3-	WDW1-2 0.2m						X	X	X	X	X	X			X	
4-	WDW1-2 0.9m						X	X	X	X	X	X			X	
5-	WDW1-3 0.2m						X	X	X	X	X	X			X	
6-	WDW1-3 0.5m						X	X	X	X	X	X			X	
7-	WDW1-3 1.0m						X	X	X	X	X	X			X	
8-	WDW1-4 0.4m						X	X	X	X	X	X			X	
9-	WDW1-4 0.7m						X	X	X	X	X	X			X	
10-	Trip Spike		-		2x vials					X						
11-	Trip Blank				2x vials					X						
12-	Rinsate							X	X		X					

Pete 11/18

Environmental Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 70383
Date Received: 15/3
Time Received: 4:30
Received by: [illegible]
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: KB DATE: 15/3/12	CONSIGNMENT NOTE NO.	NAME: Sepuri DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS Environmental	TRANSPORT CO.	OF: EL8 15/3	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

SAMPLE RECEIPT ADVICE

SE106428

CLIENT DETAILS

Contact	Joanne Rosner
Client	JBS Environmental
Address	Suite 2, 595 Gardeners Road Sydney Mascot NSW 2020
Telephone	02 8338 1011
Facsimile	02 8338 1700
Email	jrosner@jbsgroup.com.au
Project	**41945 - Edmendson Park Remediation**
Order Number	(Not specified)
Samples	1

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
Samples Received	Fri 16/3/2012
Report Due	Fri 23/3/2012
SGS Reference	**SE106428**

SUBMISSION DETAILS

This is to confirm that 1 sample was received on Friday 16/3/2012. Results are expected to be ready by Friday 23/3/2012. Please quote SGS reference SE106428 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Sample counts by matrix	1 Soil	Type of documentation received	COC
Date documentation received	16/3/2012	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	2.8
Sample container provider	SGS	Turnaround time requested	Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	Ice Bricks	Samples clearly labelled	Yes
Complete documentation received	Yes		

Samples will be held for one month for water samples and two months for soil samples from date of report, unless otherwise instructed.

COMMENTS

To the extent not inconsistent with the other provisions of this document and unless specifically agreed otherwise in writing by SGS, all SGS services are rendered in accordance with the applicable SGS General Conditions of Service accessible at http://www.sgs.com/terms_and_conditions.htm as at the date of this document. Attention is drawn to the limitations of liability and to the clauses of indemnification.

SAMPLE RECEIPT ADVICE

SE106428

CLIENT DETAILS

Client	JBS Environmental	Project	41945 - Edmendson Park Remediation

SUMMARY OF ANALYSIS

No.	Sample ID	Mercury in Soil	Moisture Content	PAH (Polynuclear Aromatic Hydrocarbons) in	Total Recoverable Metals in Soil by ICPOES from	TRH (Total Recoverable Hydrocarbons) in Soil	Volatile Petroleum Hydrocarbons in Soil
001	QA02	1	1	22	7	4	6

The above table represents SGS Environmental Services' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details.
Testing as per this table shall commence immediately unless the client intervenes with a correction.

ANALYTICAL REPORT

CLIENT DETAILS		LABORATORY DETAILS	
Contact	Joanne Rosner	Manager	Huong Crawford
Client	JBS Environmental	Laboratory	SGS Alexandria Environmental
Address	Suite 2, 595 Gardeners Road Mascot Sydney NSW 2020	Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	02 8338 1011	Telephone	+61 2 8594 0400
Facsimile	02 8338 1700	Facsimile	+61 2 8594 0499
Email	jrosner@jbsgroup.com.au	Email	au.environmental.sydney@sgs.com
Project	**41945 - Edmendson Park Remediation**	SGS Reference	SE106428 R0
Order Number	(Not specified)	Report Number	0000022165
Samples	1	Date Reported	23 Mar 2012
		Date Received	16 Mar 2012

COMMENTS

The document is issued in accordance with NATA's accreditation requirements.
Accredited for compliance with ISO/IEC 17025. NATA accredited laboratory 2562(4354).

SIGNATORIES

Andy Sutton
Organics Chemist

Dong Liang
Inorganics Metals Team Leader

Parameter	Units	LOR	Sample Number SE106428.001 Sample Matrix Soil Sample Date 14 Mar 2012 Sample Name QA02
Volatile Petroleum Hydrocarbons in Soil Method: AN433/AN434			
TRH C6-C9	mg/kg	20	<20
Surrogates			
Trifluorotoluene (Surrogate)	%	-	**79**
Dibromofluoromethane (Surrogate)	%	-	-
d4-1,2-dichloroethane (Surrogate)	%	-	-
d8-toluene (Surrogate)	%	-	-
Bromofluorobenzene (Surrogate)	%	-	-
TRH (Total Recoverable Hydrocarbons) in Soil Method: AN403			
TRH C10-C14	mg/kg	20	<20
TRH C15-C28	mg/kg	50	<50
TRH C29-C36	mg/kg	50	<50
Surrogates			
TRH (Surrogate)	%	-	-
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420			
Naphthalene	mg/kg	0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1
Fluorene	mg/kg	0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1
Anthracene	mg/kg	0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1
Pyrene	mg/kg	0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	<0.1
Chrysene	mg/kg	0.1	<0.1
Benzo(b)fluoranthene	mg/kg	0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1
Total PAH	mg/kg	0.8	<0.8
Surrogates			
d5-nitrobenzene (Surrogate)	%	-	**95**
2-fluorobiphenyl (Surrogate)	%	-	**102**
d14-p-terphenyl (Surrogate)	%	-	**124**

Parameter	Units	LOR	Sample Number SE106428.001 Sample Matrix Soil Sample Date 14 Mar 2012 Sample Name QA02
Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest	**Method: AN040/AN320**		
Arsenic, As	mg/kg	3	**7**
Cadmium, Cd	mg/kg	0.3	<0.3
Chromium, Cr	mg/kg	0.3	**14**
Copper, Cu	mg/kg	0.5	**19**
Lead, Pb	mg/kg	1	**16**
Nickel, Ni	mg/kg	0.5	**5.1**
Zinc, Zn	mg/kg	0.5	**35**
Mercury in Soil	**Method: AN312**		
Mercury	mg/kg	0.05	<0.05
Moisture Content	**Method: AN234**		
% Moisture	%	0.5	**22**

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula: *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

Mercury in Soil **Method: ME-(AU)-[ENV]AN312**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Mercury	LB016587	mg/kg	0.05	<0.05	0%	104%	100%

Moisture Content **Method: ME-(AU)-[ENV]AN234**

Parameter	QC Reference	Units	LOR	DUP %RPD
% Moisture	LB016442	%	0.5	1 - 3%

PAH (Polynuclear Aromatic Hydrocarbons) in Soil **Method: ME-(AU)-[ENV]AN420**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Naphthalene	LB016371	mg/kg	0.1	<0.1	0%	94%	91%
2-methylnaphthalene	LB016371	mg/kg	0.1	<0.1	0%	NA	NA
1-methylnaphthalene	LB016371	mg/kg	0.1	<0.1	0%	NA	NA
Acenaphthylene	LB016371	mg/kg	0.1	<0.1	0%	96%	94%
Acenaphthene	LB016371	mg/kg	0.1	<0.1	0%	95%	92%
Fluorene	LB016371	mg/kg	0.1	<0.1	0%	NA	NA
Phenanthrene	LB016371	mg/kg	0.1	<0.1	0%	93%	90%
Anthracene	LB016371	mg/kg	0.1	<0.1	0%	95%	91%
Fluoranthene	LB016371	mg/kg	0.1	<0.1	0%	97%	94%
Pyrene	LB016371	mg/kg	0.1	<0.1	0%	96%	94%
Benzo(a)anthracene	LB016371	mg/kg	0.1	<0.1	0%	NA	NA
Chrysene	LB016371	mg/kg	0.1	<0.1	0%	NA	NA
Benzo(b)fluoranthene	LB016371	mg/kg	0.1	<0.1	0%	NA	NA
Benzo(k)fluoranthene	LB016371	mg/kg	0.1	<0.1	0%	NA	NA
Benzo(a)pyrene	LB016371	mg/kg	0.1	<0.1	0%	95%	94%
Indeno(1,2,3-cd)pyrene	LB016371	mg/kg	0.1	<0.1	0%	NA	NA
Dibenzo(a&h)anthracene	LB016371	mg/kg	0.1	<0.1	0%	NA	NA
Benzo(ghi)perylene	LB016371	mg/kg	0.1	<0.1	0%	NA	NA
Total PAH	LB016371	mg/kg	0.8	<0.8	0%	NA	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
d5-nitrobenzene (Surrogate)	LB016371	%	-	94%	2%	98%	99%
2-fluorobiphenyl (Surrogate)	LB016371	%	-	86%	2%	100%	103%
d14-p-terphenyl (Surrogate)	LB016371	%	-	92%	2%	120%	117%

Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest **Method: ME-(AU)-[ENV]AN040/AN320**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Arsenic, As	LB016584	mg/kg	3	<3	0 - 13%	103%	83%
Cadmium, Cd	LB016584	mg/kg	0.3	<0.3	0%	103%	79%
Chromium, Cr	LB016584	mg/kg	0.3	<0.3	1 - 5%	102%	76%
Copper, Cu	LB016584	mg/kg	0.5	<0.5	0 - 8%	103%	75%
Lead, Pb	LB016584	mg/kg	1	<1	0 - 10%	103%	77%
Nickel, Ni	LB016584	mg/kg	0.5	<0.5	1 - 12%	105%	74%
Zinc, Zn	LB016584	mg/kg	0.5	<0.5	2 - 9%	105%	-157%

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula: *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

TRH (Total Recoverable Hydrocarbons) in Soil **Method: ME-(AU)-[ENV]AN403**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
TRH C10-C14	LB016366	mg/kg	20	<20	0%	103%	115%
TRH C15-C28	LB016366	mg/kg	50	<50	0%	100%	120%
TRH C29-C36	LB016366	mg/kg	50	<50	0%	98%	80%

Volatile Petroleum Hydrocarbons in Soil **Method: ME-(AU)-[ENV]AN433/AN434**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
TRH C6-C9	LB016362	mg/kg	20	<20	0%	122%	134%

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Trifluorotoluene (Surrogate)	LB016362	%	-	92%	0 - 1%	95%	83%

METHOD SUMMARY

METHOD	METHODOLOGY SUMMARY
AN040	A portion of sample is digested with Nitric acid to decompose organic matter and Hydrochloric acid to complete the digestion of metals and then filtered for analsysis by ASS or ICP as per USEPA Method 200.8.
AN088	Orbital rolling for Organic pollutants are extracted from soil/sediment by transferring an appropriate mass of sample to a clear soil jar and extracting with 1:1 Dichloromethane/Acetone. Orbital Rolling method is intended for the extraction of semi-volatile organic compounds from soil/sediment samples, and is based somewhat on USEPA method 3570 (Micro Organic extraction and sample preparation). Method 3700.
AN234	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
AN312	Mercury by Cold Vapour AAS in Soils: After digestion with nitric acid, hydrogen peroxide and hydrochloric acid, mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36.
AN403	Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Petroleum Hydrocarbons (TPH) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with diffential polarity of the elluent solvents.
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependant on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.
AN420	(SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN433/AN434	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.

FOOTNOTES

IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
*	This analysis is not covered by the scope of accreditation.
^	Performed by outside laboratory.
LOR	Limit of Reporting
↑↓	Raised or Lowered Limit of Reporting
QFH	QC result is above the upper tolerance
QFL	QC result is below the lower tolerance
-	The sample was not analysed for this analyte
NVL	Not Validated

Samples analysed as received.
Solid samples expressed on a dry weight basis.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: http://www.au.sgs.com/sgs-mp-au-env-qu-022-qa-qc-plan-en-11.pdf

This document is issued, on the Client's behalf, by the Company under its General Conditions of Service available on request and accessible at http://www.au.sgs.com/terms_and_conditions_au. The Client's attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

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

This report must not be reproduced, except in full.

STATEMENT OF QA/QC PERFORMANCE

SE106428 R0

CLIENT DETAILS

Contact	Joanne Rosner
Client	JBS Environmental
Address	Suite 2, 595 Gardeners Road Mascot Sydney NSW 2020
Telephone	02 8338 1011
Facsimile	02 8338 1700
Email	jrosner@jbsgroup.com.au
Project	**41945 - Edmendson Park Remediation**
Order Number	(Not specified)
Samples	1

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	SE106428 R0
Report Number	0000022166
Date Reported	23 Mar 2012

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS Environmental Services' stated Data Quality Objectives (DQO). Comments arising from the comparison were made and are reported below.

The data relating to sampling was taken from the Chain of Custody document and was supplied by the Client.
This QA/QC Statement must be read in conjunction with the referenced Analytical Report.
The Statement and the Analytical Report must not be reproduced except in full.

All Data Quality Objectives were met with the exception of the following:

Matrix Spike	Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest	1 item

SAMPLE SUMMARY

Sample counts by matrix	1 Soil	Type of documentation received	COC
Date documentation received	16/3/2012	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	2.8
Sample container provider	SGS	Turnaround time requested	Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	Ice Bricks	Samples clearly labelled	Yes
Complete documentation received	Yes		

HOLDING TIME SUMMARY

SE106428 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QA02	SE106428.001	LB016587	14 Mar 2012	16 Mar 2012	11 Apr 2012	22 Mar 2012	11 Apr 2012	22 Mar 2012

Moisture Content

Method: ME-(AU)-[ENV]AN234

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QA02	SE106428.001	LB016442	14 Mar 2012	16 Mar 2012	28 Mar 2012	20 Mar 2012	25 Mar 2012	21 Mar 2012

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QA02	SE106428.001	LB016371	14 Mar 2012	16 Mar 2012	28 Mar 2012	20 Mar 2012	29 Apr 2012	21 Mar 2012

Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest

Method: ME-(AU)-[ENV]AN040/AN320

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QA02	SE106428.001	LB016584	14 Mar 2012	16 Mar 2012	10 Sep 2012	22 Mar 2012	10 Sep 2012	22 Mar 2012

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QA02	SE106428.001	LB016366	14 Mar 2012	16 Mar 2012	28 Mar 2012	20 Mar 2012	29 Apr 2012	21 Mar 2012

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433/AN434

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QA02	SE106428.001	LB016362	14 Mar 2012	16 Mar 2012	28 Mar 2012	20 Mar 2012	29 Apr 2012	21 Mar 2012

SURROGATES

SE106428 R0

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

PAH (Polynuclear Aromatic Hydrocarbons) in Soil — Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	QA02	SE106428.001	%	60 - 130%	102
d14-p-terphenyl (Surrogate)	QA02	SE106428.001	%	60 - 130%	124
d5-nitrobenzene (Surrogate)	QA02	SE106428.001	%	60 - 130%	95

Volatile Petroleum Hydrocarbons in Soil — Method: ME-(AU)-[ENV]AN433/AN434

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Trifluorotoluene (Surrogate)	QA02	SE106428.001	%	60 - 130%	79

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Number	Parameter	Units	LOR	Result
LB016587.001	Mercury	mg/kg	0.05	<0.05

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB016371.001		Naphthalene	mg/kg	0.1	<0.1
		2-methylnaphthalene	mg/kg	0.1	<0.1
		1-methylnaphthalene	mg/kg	0.1	<0.1
		Acenaphthylene	mg/kg	0.1	<0.1
		Acenaphthene	mg/kg	0.1	<0.1
		Fluorene	mg/kg	0.1	<0.1
		Phenanthrene	mg/kg	0.1	<0.1
		Anthracene	mg/kg	0.1	<0.1
		Fluoranthene	mg/kg	0.1	<0.1
		Pyrene	mg/kg	0.1	<0.1
		Benzo(a)anthracene	mg/kg	0.1	<0.1
		Chrysene	mg/kg	0.1	<0.1
		Benzo(a)pyrene	mg/kg	0.1	<0.1
		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
		Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1
		Benzo(ghi)perylene	mg/kg	0.1	<0.1
		Total PAH	mg/kg	0.8	<0.8
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	94
		2-fluorobiphenyl (Surrogate)	%	-	86
		d14-p-terphenyl (Surrogate)	%	-	92

Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number	Parameter	Units	LOR	Result
LB016584.001	Arsenic, As	mg/kg	3	<3
	Cadmium, Cd	mg/kg	0.3	<0.3
	Chromium, Cr	mg/kg	0.3	<0.3
	Copper, Cu	mg/kg	0.5	<0.5
	Lead, Pb	mg/kg	1	<1
	Nickel, Ni	mg/kg	0.5	<0.5
	Zinc, Zn	mg/kg	0.5	<0.5

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR	Result
LB016366.001	TRH C10-C14	mg/kg	20	<20
	TRH C15-C28	mg/kg	50	<50
	TRH C29-C36	mg/kg	50	<50

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433/AN434

Sample Number		Parameter	Units	LOR	Result
LB016362.001		TRH C6-C9	mg/kg	20	<20
	Surrogates	Trifluorotoluene (Surrogate)	%	-	92

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE106489.001	LB016587.014	Mercury	mg/kg	0.05	0.000663969	20.000678615	6 200	0
SE106489.004	LB016587.018	Mercury	mg/kg	0.05	0.019606396	00.021697416	9 200	0

Moisture Content

Method: ME-(AU)-[ENV]AN234

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE106466.009	LB016442.011	% Moisture	%	0.5	14	14	34	1
SE106466.010	LB016442.013	% Moisture	%	0.5	14	13	34	3

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE106413.001	LB016371.004		Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			2-methylnaphthalene	mg/kg	0.1	0	0	200	0
			1-methylnaphthalene	mg/kg	0.1	0	0	200	0
			Acenaphthylene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluorene	mg/kg	0.1	<0.1	<0.1	200	0
			Phenanthrene	mg/kg	0.1	<0.1	<0.1	200	0
			Anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Chrysene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(b)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	%	-	89.0	91.0	30	2
			2-fluorobiphenyl (Surrogate)	%	-	91.0	93.0	30	2
			d14-p-terphenyl (Surrogate)	%	-	109.0	111.0	30	2
SE106466.004	LB016371.013		Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthylene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluorene	mg/kg	0.1	<0.1	<0.1	200	0
			Phenanthrene	mg/kg	0.1	<0.1	<0.1	200	0
			Anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Chrysene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(b)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	200	0
			Total PAH	mg/kg	0.8	<0.8	<0.8	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	%	-	82.0	84.0	30	2
			2-fluorobiphenyl (Surrogate)	%	-	98.0	100.0	30	2
			d14-p-terphenyl (Surrogate)	%	-	120.0	123.0	30	2

Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest

Method: ME-(AU)-[ENV]AN040/AN320

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE106489.001	LB016584.014	Arsenic, As	mg/kg	3	0.756803924	20.652976629	9 200	0
		Cadmium, Cd	mg/kg	0.3	0.037867420	40.033248377	5 200	0
		Chromium, Cr	mg/kg	0.3	6.918909820	86.550147676	4 34	5

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest (continued)

Method: ME-(AU)-[ENV]AN040/AN320

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE106489.001	LB016584.014	Copper, Cu	mg/kg	0.5	3.21150160222	2.9730566646	46	8
		Lead, Pb	mg/kg	1	1.8554238906	1.6869819915	86	10
		Nickel, Ni	mg/kg	0.5	2.7068234000	2.4103050286	50	12
		Zinc, Zn	mg/kg	0.5	9.2467926514	8.4783092909	36	9
SE106489.004	LB016584.018	Arsenic, As	mg/kg	3	3.4228653136	2.9790116236	124	13
		Cadmium, Cd	mg/kg	0.3	0.2282547970	0.2166599815	165	0
		Chromium, Cr	mg/kg	0.3	34.811107011	35.189059040	31	1
		Copper, Cu	mg/kg	0.5	21.331173431	21.256398523	32	0
		Lead, Pb	mg/kg	1	10.780666051	10.761972324	39	0
		Nickel, Ni	mg/kg	0.5	24.041857933	24.179739852	32	1
		Zinc, Zn	mg/kg	0.5	24.781514760	25.348380073	32	2

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE106413.001	LB016366.004	TRH C10-C14	mg/kg	20	<20	<20	200	0
		TRH C15-C28	mg/kg	50	<50	<50	200	0
		TRH C29-C36	mg/kg	50	<50	<50	200	0
SE106466.004	LB016366.016	TRH C10-C14	mg/kg	20	<20	<20	200	0
		TRH C15-C28	mg/kg	50	<50	<50	200	0
		TRH C29-C36	mg/kg	50	<50	<50	200	0

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433/AN434

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE106466.007	LB016362.014		TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	Trifluorotoluene (Surrogate)	%	-	79	79	30	0
SE106466.010	LB016362.018		TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	Trifluorotoluene (Surrogate)	%	-	88	89	30	1

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB016587.002	Mercury	mg/kg	0.05	0.21	0.2	70 - 130	104

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB016371.002		Naphthalene	mg/kg	0.1	3.8	4	60 - 140	94
		Acenaphthylene	mg/kg	0.1	3.9	4	60 - 140	96
		Acenaphthene	mg/kg	0.1	3.8	4	60 - 140	95
		Phenanthrene	mg/kg	0.1	3.7	4	60 - 140	93
		Anthracene	mg/kg	0.1	3.8	4	60 - 140	95
		Fluoranthene	mg/kg	0.1	3.9	4	60 - 140	97
		Pyrene	mg/kg	0.1	3.9	4	60 - 140	96
		Benzo(a)pyrene	mg/kg	0.1	3.8	4	60 - 140	95
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	98.0	100	60 - 140	98
		2-fluorobiphenyl (Surrogate)	%	-	100.0	100	60 - 140	100
		d14-p-terphenyl (Surrogate)	%	-	120.0	100	60 - 140	120

Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest

Method: ME-(AU)-[ENV]AN040/AN320

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB016584.002	Arsenic, As	mg/kg	3	52	50	80 - 120	103
	Cadmium, Cd	mg/kg	0.3	51	50	80 - 120	103
	Chromium, Cr	mg/kg	0.3	51	50	80 - 120	102
	Copper, Cu	mg/kg	0.5	51	50	80 - 120	103
	Lead, Pb	mg/kg	1	51	50	80 - 120	103
	Nickel, Ni	mg/kg	0.5	52	50	80 - 120	105
	Zinc, Zn	mg/kg	0.5	52	50	80 - 120	105

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB016366.002	TRH C10-C14	mg/kg	20	41	40	60 - 140	103
	TRH C15-C28	mg/kg	50	<50	40	60 - 140	100
	TRH C29-C36	mg/kg	50	<50	40	60 - 140	98

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433/AN434

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB016362.002	TRH C6-C9	mg/kg	20	30	24.4	60 - 140	122

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub -sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE106420.023	LB016587.004	Mercury	mg/kg	0.05	0.21	<0.05	0.2	100

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE106419.001	LB016371.007		Naphthalene	mg/kg	0.1	3.6	<0.1	4	91
			2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	-
			1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	-
			Acenaphthylene	mg/kg	0.1	3.8	<0.1	4	94
			Acenaphthene	mg/kg	0.1	3.7	<0.1	4	92
			Fluorene	mg/kg	0.1	<0.1	<0.1	-	-
			Phenanthrene	mg/kg	0.1	3.6	<0.1	4	90
			Anthracene	mg/kg	0.1	3.6	<0.1	4	91
			Fluoranthene	mg/kg	0.1	3.8	<0.1	4	94
			Pyrene	mg/kg	0.1	3.8	<0.1	4	94
			Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	-	-
			Chrysene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(b)fluoranthene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(a)pyrene	mg/kg	0.1	3.8	<0.1	4	94
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	-	-
			Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	-	-
			Total PAH	mg/kg	0.8	30	<0.8	-	-
		Surrogates	d5-nitrobenzene (Surrogate)	%	-	99.0	97.0	100	99
			2-fluorobiphenyl (Surrogate)	%	-	103.0	102.0	100	103
			d14-p-terphenyl (Surrogate)	%	-	117.0	120.0	100	117

Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest

Method: ME-(AU)-[ENV]AN040/AN320

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE106420.024	LB016584.004	Arsenic, As	mg/kg	3	45	3	50	83
		Cadmium, Cd	mg/kg	0.3	40	0.4	50	79
		Chromium, Cr	mg/kg	0.3	60	22	50	76
		Copper, Cu	mg/kg	0.5	67	29	50	75
		Lead, Pb	mg/kg	1	57	18	50	77
		Nickel, Ni	mg/kg	0.5	58	21	50	74
		Zinc, Zn	mg/kg	0.5	140	220	50	-157 ⓑ

TRH (Total Recoverable Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN403

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE106413.002	LB016366.006	TRH C10-C14	mg/kg	20	46	<20	40	115
		TRH C15-C28	mg/kg	50	64	<50	40	120
		TRH C29-C36	mg/kg	50	52	<50	40	80

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433/AN434

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE106413.001	LB016362.005		TRH C6-C9	mg/kg	20	33	<20	24.4	134
		Surrogates	Trifluorotoluene (Surrogate)	%	-	83	94.0	-	83

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The original result is the analyte concentration of the matrix spike. The Duplicate result is the analyte concentration of the matrix spike duplicate.

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

QC criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found here:
http://www.au.sgs.com/sgs-mp-au-env-qu-022-qa-qc-plan-en-11.pdf

*	Non-accredited analysis.
-	Sample not analysed for this analyte.
^	Analysis performed by external laboratory.

IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
LOR	Limit of reporting.
QFH	QC result is above the upper tolerance.
QFL	QC result is below the lower tolerance.

①	At least 2 of 3 surrogates are within acceptance criteria.
②	RPD failed acceptance criteria due to sample heterogeneity.
③	Results less than 5 times LOR preclude acceptance criteria for RPD.
④	Recovery failed acceptance criteria due to matrix interference.
⑤	Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
⑥	LOR was raised due to sample matrix interference.
⑦	LOR was raised due to dilution of significantly high concentration of analyte in sample.
⑧	Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
⑨	Recovery failed acceptance criteria due to sample heterogeneity.
†	Refer to Analytical Report comments for further information.

This document is issued, on the Client's behalf, by the Company under its General Conditions of Service, available on request and accessible at http://www.sgs.com/terms_and_conditions.htm. The Client's attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

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

This test report shall not be reproduced, except in full.

PICKFORD & RHYDER CONSULTING PTY LTD
ABN 17 105 546 076
Occupational Hygiene Measurements and Solutions.

PO Box 1422 Lane Cove 1595
Rear - 244 Burns Bay Road
Lane Cove NSW Australia
Phone: (02) 9418 9151
Fax: (02) 9418 9150

16 March 2012

Ms J. Rosner & A. Boardman
JBS Environmental
PO Box 940
MASCOT NSW 1460

Email: jrosner@jbsgroup.com.au

CERTIFICATE OF ANALYSIS -- ASBESTOS IDENTIFICATION

YOUR REFERENCE/JOB No.: 41945
TYPE OF SAMPLES: Bulk sample as received from Envirolab Services
SITE LOCATION: Edmondson Park Remediation
DATE SAMPLED: 14 March 2012 **DATE RECEIVED:** 16 March 2012
OUR REFERENCE: 69871-ID

TEST METHOD: Soil samples examined by Stereomicroscopy and Polarized Light Microscopy (with Dispersion Staining) in accordance with AS 4964-2004: - 'Method for the qualitative identification of asbestos in bulk samples' as outlined in Laboratory Method ID/1. The Reporting Limit for the result in this Certificate is numerically equal to the lowest detection limit of 0.1 g/kg. Trace asbestos analysis has been conducted on the samples, which is generally designed to detect 'respirable' asbestos fibres (i.e. less than 3 micrometres in width) distributed throughout the sample.

All sampling and site work have been undertaken by the client - the analytical procedures and results reported on this Certificate have been conducted by Pickford & Rhyder Consulting.

Sample No	*Lab No*	*Sample Information*	*Analysis Result*	*Description*
QA02	69871	Soil sample as received	no asbestos detected	The sample was an orange soil, of approximate weight 77 g, in which organic fibres were detected. No asbestos fibres were found at the Reporting Limit of 0.1 g/kg.

Analysed and reported by:

L. Apthorpe,
Approved Identifier and Signatory.

NATA
ACCREDITED FOR TECHNICAL COMPETENCE

This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. This document shall not be reproduced except in full.

Accreditation number 2515

For Pickford + Rhydda

6/5/12

CHAIN OF CUSTODY

JBS ENVIRONMENTAL

ES: 40384

PROJECT NO.: 41945
PROJECT NAME: Edmondson Park Remediation - Chemsp
SEND REPORT TO: TR + AB SEND INVOICE TO: Accounts
DATE NEEDED BY: Standard Turn Around

LABORATORY BATCH NO.
SAMPLERS AB
PHONE: 02 8338 1011 EMAIL: abcrockmore@jbsgroup.com.au
QC LEVEL: NEPM 1999 (✓) jessica@jbsgroup.com.au

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

SAMPLE ID	MATRIX	D A T E	TIME	TYPE & PRESERVATIVE	pH	Asbestos	NOTES
QA02	Soil	14/3/12		Bag		X	Dicd by ES

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: AB DATE: 15/3/12	CONSIGNMENT NOTE NO.	NAME: Stephen DATE:	COOLER SEAL - Yes..... No ..... Intact ..... Broken .....
OF: JBS Environmental	TRANSPORT CO.	OF: ES 15/3/12	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: KIM ORGNSHAW DATE: 16/3/12	COOLER SEAL - Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF: PICKFORD 1015	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar, B = Glass Bottle, N = Nitric Acid Prsvd , C = Sodium Hydroxide Prsvd, VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial, S = Sulfuric Acid Prsvd, Z = Zinc Prsvd; E = EDTA Prsvd, ST = Sterile Bottle, O = Other

JBS Environmental Pty Ltd ABN 67 071 842 638
Phone: (02) 8338 1011
Fax: (02) 8338-1700
128 O'Riordan St, MASCOT NSW 2020
PO Box 940 MASCOT NSW 1460
www.jbsgroup.com.au

Attachment 7 – Summary tables – Stockpile Sample Analytical Results

LANDCOM
Job Number: 41945
Zouch Road, Edmondson Park
Pre-Remediation GME
Table A - Groundwater Analytical Results

						BTEX						Halogenated Benzenes	Inorganics	Lead	Metals						
						Benzene	Ethylbenzene	Toluene	Xylene (m & p)	Xylene (o)	Xylene Total	Hexachlorobenzene	Moisture	Lead	Arsenic	Cadmium	Chromium (III+VI)	Copper	Mercury	Nickel	Zinc
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL						0.2	1	0.5	2	1		0.1	0.1	1	4	0.5	1	1	0.1	1	1
Assessment Criteria - Health Based (residential)														300	100	20		1000	15	600	7000
Assessment Criteria - Health Based (parks, open space)														600	200	40	240000	2000	30	600	14000
Assessment Criteria - Phytotoxicity Based														600	20	3		100	1	60	200
Assessment Criteria - Service Station Guidelines (EPA 1994)						1	50	130			25			300							
Field_ID	**LocCode**	**Sample_Depth_Range**	**Sampled_Date-Time**	**SDG**	**SampleCode**	**Matrix**	**Description**														
SP10-1	SP10-1	0.3	14/03/2012	7038470384	-9			<0.2	<1	<0.5	<2	<1	<3	<0.1	14	27	5	<0.5	12	30	<0.1	9	48
SP1-1	SP1-1	0.3	14/03/2012	7038470384	-13			<0.2	<1	<0.5	<2	<1	<3	<0.1	13	26	7	<0.5	9	38	<0.1	15	57
SP11-1	SP11-1	0.4	14/03/2012	7038470384	-8			<0.2	<1	<0.5	<2	<1	<3	<0.1	18	40	7	<0.5	14	27	<0.1	8	43
SP12-1	SP12-1	0.4	14/03/2012	7038470384	-16			<0.2	<1	<0.5	<2	<1	<3	<0.1	20	18	6	<0.5	14	12	<0.1	8	36
SP14-1	SP14-1	0.4	14/03/2012	7038470384	-1			<0.2	<1	<0.5	<2	<1	<3	<0.1	18	14	7	<0.5	15	22	<0.1	5	26
SP15-1	SP15-1	0.3	14/03/2012	7038470384	-3			<0.2	<1	<0.5	<2	<1	<3	<0.1	21	23	8	<0.5	18	16	<0.1	8	32
SP16-1	SP16-1	0.3	14/03/2012	7038470384	-7			<0.2	<1	<0.5	<2	<1	<3	<0.1	25	44	7	<0.5	14	21	<0.1	8	52
SP17-1	SP17-1	0.3	14/03/2012	7038470384	-6			<0.2	<1	<0.5	<2	<1	<3	<0.1	17	11	<4	<0.5	6	5	<0.1	3	13
SP2-1	SP2-1	0.3	14/03/2012	7038470384	-14			<0.2	<1	<0.5	<2	<1	<3	<0.1	21	22	6	<0.5	18	23	<0.1	8	34
SP3-1	SP3-1	0.3	14/03/2012	7038470384	-15			<0.2	<1	<0.5	<2	<1	<3	<0.1	26	32	8	<0.5	20	22	<0.1	14	51
SP4-1	SP4-1	0.4	14/03/2012	7038470384	-4			<0.2	<1	<0.5	<2	<1	<3	<0.1	20	20	6	<0.5	13	27	<0.1	9	49
SP5-1	SP5-1	0.3	14/03/2012	7038470384	-5			<0.2	<1	<0.5	<2	<1	<3	<0.1	12	20	6	<0.5	17	16	<0.1	7	33
SP7-1	SP7-1	0.4	14/03/2012	7038470384	-11			<0.2	<1	<0.5	<2	<1	<3	<0.1	19	60	7	<0.5	14	33	<0.1	10	52
SP8-1	SP8-1	0.4	14/03/2012	7038470384	-12			<0.2	<1	<0.5	<2	<1	<3	<0.1	18	42	<4	<0.5	11	28	<0.1	8	47
SP9-1	SP9-1	0.4	14/03/2012	7038470384	-10			<0.2	<1	<0.5	<2	<1	<3	<0.1	12	80	6	<0.5	13	42	<0.1	9	51

LANDCOM
Job Number: 41945
Zouch Road, Edmondson Park
Pre-Remediation GME
Table A - Groundwater Analytical Results

						Organochlorine Pesticides																				
						4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane (cis)	Chlordane (trans)	d-BHC	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Methoxychlor	Acenaphthene
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL						0.1	0.1	0.1		0.1	0.1	0.1	0.1	0.1	0.1		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Assessment Criteria - Health Based (residential)									10							200							10			
Assessment Criteria - Health Based (parks, open space)									20							400							20			
Assessment Criteria - Phytotoxicity Based																										
Assessment Criteria - Service Station Guidelines (EPA 1994)																										
Field_ID	**LocCode**	**Sample_Depth_Range**	**Sampled_Date-Time**	**SDG**	**SampleCode**	**Matrix_Description**																				
SP10-1	SP10-1	0.3	14/03/2012	70384	70384-9		<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
SP1-1	SP1-1	0.3	14/03/2012	70384	70384-13		<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
SP11-1	SP11-1	0.4	14/03/2012	70384	70384-8		<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
SP12-1	SP12-1	0.4	14/03/2012	70384	70384-16		<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
SP14-1	SP14-1	0.4	14/03/2012	70384	70384-1		<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
SP15-1	SP15-1	0.3	14/03/2012	70384	70384-3		<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
SP16-1	SP16-1	0.3	14/03/2012	70384	70384-7		<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
SP17-1	SP17-1	0.3	14/03/2012	70384	70384-6		<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
SP2-1	SP2-1	0.3	14/03/2012	70384	70384-14		<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
SP3-1	SP3-1	0.3	14/03/2012	70384	70384-15		<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
SP4-1	SP4-1	0.4	14/03/2012	70384	70384-4		<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
SP5-1	SP5-1	0.3	14/03/2012	70384	70384-5		<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
SP7-1	SP7-1	0.4	14/03/2012	70384	70384-11		<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
SP8-1	SP8-1	0.4	14/03/2012	70384	70384-12		<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
SP9-1	SP9-1	0.4	14/03/2012	70384	70384-10		<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

LANDCOM
Job Number: 41945
Zouch Road, Edmondson Park
Pre-Remediation GME
Table A - Groundwater Analytical Results

						PAH/Phenols														TPH				
						Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(b)&(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of total)
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL						0.1	0.1	0.1	0.05	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	25	50	100	100	
Assessment Criteria - Health Based (residential)									1															
Assessment Criteria - Health Based (parks, open space)									2															
Assessment Criteria - Phytotoxicity Based																								
Assessment Criteria - Service Station Guidelines (EPA 1994)																				65				1000
Field_ID	**LocCode**	**Sample_Depth_Range**	**Sampled_Date-Time**	**SDG**	**SampleCode**	**Matrix_Description**																		
SP10-1	SP10-1	0.3	14/03/2012	7038470384-9		<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<250
SP1-1	SP1-1	0.3	14/03/2012	7038470384-13		<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<250
SP11-1	SP11-1	0.4	14/03/2012	7038470384-8		<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<250
SP12-1	SP12-1	0.4	14/03/2012	7038470384-16		<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<250
SP14-1	SP14-1	0.4	14/03/2012	7038470384-1		<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<250
SP15-1	SP15-1	0.3	14/03/2012	7038470384-3		<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<250
SP16-1	SP16-1	0.3	14/03/2012	7038470384-7		<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<250
SP17-1	SP17-1	0.3	14/03/2012	7038470384-6		<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<250
SP2-1	SP2-1	0.3	14/03/2012	7038470384-14		<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<250
SP3-1	SP3-1	0.3	14/03/2012	7038470384-15		<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<250
SP4-1	SP4-1	0.4	14/03/2012	7038470384-4		<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<250
SP5-1	SP5-1	0.3	14/03/2012	7038470384-5		<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<250
SP7-1	SP7-1	0.4	14/03/2012	7038470384-11		<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<250
SP8-1	SP8-1	0.4	14/03/2012	7038470384-12		<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<250
SP9-1	SP9-1	0.4	14/03/2012	7038470384-10		<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<250

Appendix D – EMS Weapons Pit Clearance and Backfill Documentation

© 2013 JBS Environmental Pty Ltd

Client Landcom
Project Landcom/ 12619 Zouch Rd Edmondson park NSW
Weapons Pit Clearance
RZNRA Northside

EMS EnviroManage Systems
EnviroManage Systems Pty Ltd abn 84 037 956 078
PO Box 199 Church Point NSW 2105
p 02 9979 2233 f 02 9979 1033 m 0408 316 691
jason@enviromanage.com.au www.enviromanage.com.au

Pit Number	Clearance	Materials				Grid Reference			Size and Dimenson of Pitt			Approximate Backfill (tonnes)	Backfill supplied from Stockpile location No	Tracking details and Destination	Photo
		Asbestos	Timber	Metal	General Waste	East	North	Elevation	Length	Width	Depth				
1	Yes for all	No	No	No	No	301407.537	6239536.468	69.550	2.00	1.00	0.50	1 1/5	SP14	Please refer to the table below	Refer to following photos pages
2	Yes for all	No	No	No	No	301417.188	6239538.291	69.577	1.00	1.00	0.50	1	SP14	Please refer to the table below	
3	Yes for all	No	No	No	No	301415.282	6239548.892	69.388	1.00	1.00	0.60	1	SP14	Please refer to the table below	
4	Yes for all	No	No	No	No	301406.363	6239551.002	69.012	3.00	2.00	1.00	2 1/2	SP14	Please refer to the table below	
5	Yes for all	No	No	No	No	301400.049	6239548.775	68.978	3.00	2.00	1.00	2 1/2	SP14	Please refer to the table below	
6	Yes for all	No	No	No	No	301360.723	6239606.963	65.997	4.00	1.00	0.50	2 1/2	SP14	Please refer to the table below	
7	Yes for all	No	No	No	No	301459.398	6239509.256	67.805	3.00	2.00	0.50	2	SP14	Please refer to the table below	
8	Yes for all	No	No	No	No	301505.745	6239555.201	65.656	3.00	1.50	0.50	1 3/4	SP14	Please refer to the table below	
9	Yes for all	No	No	No	No	301510.241	6239707.115	66.329	1.00	1.00	0.50	1	SP14	Please refer to the table below	
10	Yes for all	No	No	No	No	301490.118	6239726.965	64.997	1.00	1.00	0.50	1	SP14	Please refer to the table below	
11	Yes for all	No	No	No	No	301635.998	6239760.058	67.397	1.00	1.00	0.50	1	SP14	Please refer to the table below	
12	Yes for all	No	No	No	No	301484.307	6239746.059	64.087	1.00	1.00	0.50	1	SP14	Please refer to the table below	
13	Yes for all	No	No	No	No	301445.424	6239759.006	63.179	1.00	1.00	0.50	1	SP14	Please refer to the table below	
14	Yes for all	No	No	No	No	301435.872	6239767.217	62.64	1.00	1.00	0.50	1	SP14	Please refer to the table below	
15	Yes for all	No	No	No	No	301425.671	6239767.156	62.698	2.50	1.00	1.00	2	SP14	Please refer to the table below	
16	Yes for all	No	No	No	No	301627.288	6239748.011	67.789	2.00	1.00	0.50	1 1/5	SP14	Please refer to the table below	
17	Yes for all	No	No	No	No	301354.117	6239615.313	65.566	2.00	1.00	0.50	1 1/5	SP14	Please refer to the table below	
18	Yes for all	No	No	No	No	301386.561	6239530.129	68.915	2.00	1.00	0.50	1 1/5	SP14	Please refer to the table below	
19	Yes for all	No	No	No	No	301348.948	6239603.8	65.804	2.00	1.00	0.50	1 1/5	SP14	Please refer to the table below	
20	Yes for all	No	No	No	No	301307.538	6239655.657	64.059	2.00	1.00	0.20	1/2	SP14	Please refer to the table below	
21	Yes for all	No	No	No	No	301305.39	6239662.464	63.903	2.00	1.00	0.50	1 1/5	SP14	Please refer to the table below	
22	Yes for all	No	No	No	No	301258.013	6239682.482	62.871	1.00	1.00	0.50	1	SP14	Please refer to the table below	
23	Yes for all	No	No	No	No	301278.935	6239676.629	63.198	1.00	1.00	0.50	1	SP14	Please refer to the table below	

Client Landcom
Project Landcom/ 12619 Zouch Rd Edmondson park NSW
Weapons Pit Clearance
RZNRA Northside

EMS EnviroManage Systems
EnviroManage Systems Pty Ltd abn 84 037 956 078
PO Box 199 Church Point NSW 2105
p 02 9979 2233 f 02 9979 1033 m 0408 316 691
jason@enviromanage.com.au www.enviromanage.com.au

Pit Number	Clearance	Materials				Grid Reference			Size and Dimenson of Pitt			Approximate Backfill (tonnes)	Backfill supplied from Stockpile location No	Tracking details and Destination	Photo
		Asbestos	Timber	Metal	General Waste	East	North	Elevation	Length	Width	Depth				
24	Yes for all	No	No	No	No	301245.507	6239671.501	63.115	1.00	1.00	0.50	1	SP14	Please refer to the table below	
25	Yes for all	No	No	No	No	301526.471	6239699.103	66.586	1.00	1.00	0.50	1	SP14	Please refer to the table below	Refer to following photos pages
26	Yes for all	No	No	No	No	301543.326	6239695.771	67.151	4.00	1.00	0.20	2 1/5	SP14	Please refer to the table below	
27	Yes for all	No	No	No	No	301219.089	6239709.151	60.984	3.00	1.00	0.30	1 1/2	SP14	Please refer to the table below	
28	Yes for all	No	No	No	No	301476.302	6239726.092	65.026	1.50	1.50	0.50	1 1/5	SP14	Please refer to the table below	
29	Yes for all	No	No	No	No	301468.236	6239725.829	64.907	1.00	1.00	1.00	1 1/9	SP14	Please refer to the table below	
30	Yes for all	No	No	No	No	301497.019	6239738.408	64.417	2.50	1.50	0.50	2	SP14	Please refer to the table below	
31	Yes for all	No	No	No	No	301557.059	6239737.006	65.575	1.00	1.00	0.50	1	SP14	Please refer to the table below	
32	Yes for all	No	No	No	No	301562.946	6239746.758	65.529	1.00	1.00	0.50	1	SP14	Please refer to the table below	
33	Yes for all	No	No	No	No	301279.796	6239746.009	59.428	2.50	2.00	0.50	2 1/5	SP14	Please refer to the table below	
34	Yes for all	No	No	No	No	301267.587	623679.203	63.058	2.00	1.00	0.50	1 1/5	SP14	Please refer to the table below	
35	Yes for all	No	No	No	No	301230.195	6239727.199	60.154	2.00	1.50	0.20	1 1/2	SP14	Please refer to the table below	
36	Yes for all	No	No	No	No	301221.101	6239725.774	60.094	1.00	1.00	0.30	1	SP14	Please refer to the table below	
37	Yes for all	No	No	No	No	301179.451	6239682.855	60.437	1.50	1.00	0.30	1	SP14	Please refer to the table below	
38	Yes for all	No	No	No	No	301178.681	6239716907	59.162	1.50	1.00	0.50	1	SP14	Please refer to the table below	
39	Yes for all	No	No	No	No	301180.285	6239720.748	59.066	1.00	1.00	0.20	1	SP14	Please refer to the table below	
40	Yes for all	No	No	No	No	301179.488	6239680.011	60.431	1.00	1.00	0.50	1	SP14	Please refer to the table below	
41	Yes for all	No	No	No	No	301172.984	6239678.566	60.52	2.00	2.00	0.30	2	SP14	Please refer to the table below	
42	Yes for all	No	No	No	No	301159.776	6239700.838	58.697	1.50	1.00	0.30	1	SP14	Please refer to the table below	
43	Yes for all	No	No	No	No	301293.791	6239793.548	56.412	2.00	1.00	0.50	1 1/2	SP14	Please refer to the table below	
44	Yes for all	No	No	No	No	301380.783	6239771.28	61.403	1.00	1.00	0.50	1	SP14	Please refer to the table below	
45	Yes for all	No	No	No	No	301400.915	6239769.652	62.412	1.50	1.50	0.50	1 1/2	SP14	Please refer to the table below	
46	Yes for all	No	No	No	No	301393.485	6239754.655	62.514	1.00	1.00	0.50	1	SP14	Please refer to the table below	

Client Landcom
Project Landcom/ 12619 Zouch Rd Edmondson park NSW
Weapons Pit Clearance
RZNRA Northside

EMS EnviroManage Systems
EnviroManage Systems Pty Ltd abn 84 037 956 078
PO Box 199 Church Point NSW 2105
p 02 9979 2233 f 02 9979 1033 m 0408 316 691
jason@enviromanage.com.au www.enviromanage.com.au

Pit Number	Clearance	Materials				Grid Reference			Size and Dimenson of Pitt			Approximate Backfill (tonnes)	Backfill supplied from Stockpile location No	Tracking details and Destination	Photo
		Asbestos	Timber	Metal	General Waste	East	North	Elevation	Length	Width	Depth				
47	Yes for all	No	No	No	No	301410.966	6239758	62.831	1.50	1.00	0.50	1	SP14	Please refer to the table below	
48	Yes for all	No	No	No	No	301418.524	6239750.868	67.123	1.00	1.00	0.50	1	SP14	Please refer to the table below	Refer to following photos pages
49	Yes for all	No	No	No	No	301432.716	6239744.43	63.562	1.00	1.00	0.50	1	SP14	Please refer to the table below	
50	Yes for all	No	No	No	No	301554.966	6239673.35	68.967	1.00	1.00	0.50	1	SP14	Please refer to the table below	
51	Yes for all	No	No	No	No	301524.295	6239691.715	67.252	1.00	1.00	0.50	1	SP14	Please refer to the table below	
52	Yes for all	No	No	No	No	301520.765	6239678.281	67.801	2.00	2.00	0.30	1 3/4	SP14	Please refer to the table below	
53	Yes for all	No	No	No	No	301572.1	6239647.185	68.105	1.50	1.50	0.50	1 1/2	SP14	Please refer to the table below	
54	Yes for all	No	No	No	No	301577.692	6239602.691	66.037	1.50	1.00	0.50	1	SP14	Please refer to the table below	
55	Yes for all	No	No	No	No	301534.245	6239657.848	68.48	2.00	1.50	0.30	1 1/2	SP14	Please refer to the table below	
56	Yes for all	No	No	No	No	301546.46	6239636.279	68.17	1.50	1.50	0.30	1 1/5	SP14	Please refer to the table below	
57	Yes for all	No	No	No	No	301586.744	6239658.391	68.269	2.00	1.00	0.30	1 1/5	SP14	Please refer to the table below	
58	Yes for all	No	No	No	No	301604.743	6239666.167	68.203	1.00	1.00	0.30	1	SP14	Please refer to the table below	
59	Yes for all	No	No	No	No	301626.454	6239657.517	67.33	1.00	1.00	0.30	1	SP14	Please refer to the table below	
60	Yes for all	No	No	No	No	301643.665	6239665.178	67.024	1.00	1.00	0.30	1	SP14	Please refer to the table below	
61	Yes for all	No	No	No	No	301664.765	6239656.63	65.869	1.00	1.00	0.30	1	SP14	Please refer to the table below	
62	Yes for all	No	No	No	No	301679.89	6239662.822	65.332	1.50	1.50	0.30	1 1/5	SP14	Please refer to the table below	
63	Yes for all	No	No	No	No	301717.047	6239652.087	62.866	1.50	1.50	0.30	1 1/5	SP14	Please refer to the table below	
64	Yes for all	No	No	No	No	301636.37	6239679.949	67.612	1.00	1.00	0.30	1	SP14	Please refer to the table below	
65	Yes for all	No	No	No	No	301354.142	6239671.31	62.444	1.00	1.00	0.30	1	SP14	Please refer to the table below	
66	Yes for all	No	No	No	No	301610.547	6239690.707	69.025	1.50	1.00	0.30	1	SP14	Please refer to the table below	
67	Yes for all	No	No	No	No	301802.48	6239635.728	62.368	1.00	1.00	0.30	1	SP14	Please refer to the table below	
68	Yes for all	No	No	No	No	301663.387	6239618.741	64.441	2.00	1.50	0.30	1 1/2	SP14	Please refer to the table below	
69	Yes for all	No	No	No	No	301619.069	6239602.744	64.826	3.00	1.00	0.30	2	SP14	Please refer to the table below	

Client Landcom
Project Landcom/ 12619 Zouch Rd Edmondson park NSW
Weapons Pit Clearance
RZNRA Northside

EMS EnviroManage Systems
EnviroManage Systems Pty Ltd abn 84 037 956 078
PO Box 199 Church Point NSW 2105
p 02 9979 2233 f 02 9979 1033 m 0408 316 691
jason@enviromanage.com.au www.enviromanage.com.au

Pit Number	Clearance	Materials				Grid Reference			Size and Dimenson of Pitt			Approximate Backfill (tonnes)	Backfill supplied from Stockpile location No	Tracking details and Destination	Photo
		Asbestos	Timber	Metal	General Waste	East	North	Elevation	Length	Width	Depth				
70	Yes for all	No	No	No	No	301140.772	6239729.177	56.979	1.00	1.00	0.30	1	SP14	Please refer to the table below	
71	Yes for all	No	No	No	No	301150.148	6239731.593	57.503	1.00	1.00	0.30	1	SP14	Please refer to the table below	Refer to following photos pages
72	Yes for all	No	No	No	No	301147.066	6239702.938	57.99	2.00	2.00	0.30	2	SP14	Please refer to the table below	
73	Yes for all	No	No	No	No				1.00	1.00	0.30	1	SP14	Please refer to the table below	
74	Yes for all	No	No	No	No	301790.212	6239734.44	67.99	1.00	1.00	0.30	1	SP14	Please refer to the table below	
75	Yes for all	No	No	No	No	301367.922	6239614.866	65.85	1.50	1.00	0.30	1	SP14	Please refer to the table below	
76	Yes for all	No	No	No	No	301532.916	6239426.205	70.362	2.00	2.00	0.30	2	SP14	Please refer to the table below	
77	Yes for all	No	No	No	No	301160.86	6239682.845	59.192	1.50	1.00	0.30	1	SP14	Please refer to the table below	
78	Yes for all	No	No	No	No	301190.698	6239705.95	60.154	2.00	1.00	0.30	1 1/5	SP14	Please refer to the table below	
79	Yes for all	No	No	No	No	301197.42	6239707.723	60.46	2.00	1.00	0.30	1 1/5	SP14	Please refer to the table below	
80	Yes for all	No	No	No	No	301515.15	6239615.953	67.98	1.50	1.50	0.30	1 1/5	SP14	Please refer to the table below	
81	Yes for all	No	No	No	No	301570.859	6239701.923	67.504	1.50	1.00	0.30	1	SP14	Please refer to the table below	
82	Yes for all	No	No	No	No	301628.842	6239725.133	67.666	1.50	1.00	0.30	1	SP14	Please refer to the table below	
83	Yes for all	No	No	No	No	301616.886	6239714.008	68.117	1.50	1.00	0.30	1	SP14	Please refer to the table below	
84	Yes for all	No	No	No	No	301593.666	6239683.455	68.271	1.00	1.00	0.50	1	SP14	Please refer to the table below	
85	Yes for all	No	No	No	No	301679.117	6239600.354	62.895	1.50	1.00	0.30	1	SP14	Please refer to the table below	
86	Yes for all	No	No	No	No	301661.688	6239596.569	63.239	1.50	1.50	0.30	1 1/5	SP14	Please refer to the table below	
87	Yes for all	No	No	No	No	301736.657	6239452.767	59.159	1.20	1.50	0.40	1/2	SP14	Please refer to the table below	
88	Yes for all	No	No	No	No	301608.018	6239768.778	65.687	1.70	1.50	0.40	1/2	SP14	Please refer to the table below	
89	Yes for all	No	No	No	No	301950.638	6239541.331	54.657	3.50	1.20	0.40	1	SP14	Please refer to the table below	
90	Yes for all	No	No	No	No	301940.893	6239537.259	547.898	3.20	2.30	0.30	1	SP14	Please refer to the table below	
91	Yes for all	No	No	No	No	301946.97	6239525.703	54.31	0.70	1.50	0.50	1	SP14	Please refer to the table below	
92	Yes for all	No	No	No	No	301959.029	6239525.585	53.888	4.20	1.20	0.50	1/2	SP14	Please refer to the table below	

Client Landcom
Project Landcom/ 12619 Zouch Rd Edmondson park NSW
Weapons Pit Clearance
RZNRA Northside

EMS EnviroManage Systems
EnviroManage Systems Pty Ltd abn 84 037 956 078
PO Box 199 Church Point NSW 2105
p 02 9979 2233 f 02 9979 1033 m 0408 316 691
jason@enviromanage.com.au www.enviromanage.com.au

Pit Number	Clearance	Materials				Grid Reference			Size and Dimenson of Pitt			Approximate Backfill (tonnes)	Backfill supplied from Stockpile location No	Tracking details and Destination	Photo
		Asbestos	Timber	Metal	General Waste	East	North	Elevation	Length	Width	Depth				
93	Yes for all	No	No	No	No	301983.657	6239619.658	55.651	3.00	1.50	0.40	1/2	SP14	Please refer to the table below	
94	Yes for all	No	No	No	No	301950.237	6239616.176	56.725	2.40	1.20	0.50	1/2	SP14	Please refer to the table below	Refer to following photos pages
95	Yes for all	No	No	No	No	301966.445	6239620.686	56.042	1.70	1.20	0.50	1	SP14	Please refer to the table below	
96	Yes for all	No	No	No	No	301975.196	6239631.392	56.265	3.80	1.20	0.50	1	SP14	Please refer to the table below	
97	Yes for all	No	No	No	No	301957.077	6239630.565	57.349	1.80	1.20	0.30	1/2	SP14	Please refer to the table below	
98	Yes for all	No	No	No	No	302021.869	6239564.317	52.857	3.80	1.20	0.60	1/2	SP14	Please refer to the table below	
99	Yes for all	No	No	No	No	301566.099	6239673.969	68.185	1.80	1.20	0.30	No backfill required	SP14	Please refer to the table below	
100	Yes for all	No	No	No	No	301191.238	6239690.18	60.859	1.50	2.40	0.40	1/2	SP14	Please refer to the table below	
101	Yes for all	No	No	No	No	301285.575	6239661.925	64.189	1.00	1.20	0.40	1/2	SP14	Please refer to the table below	
102	Yes for all	No	No	No	No	301536.974	6239415.696	71.187	3.00	1.20	0.30	No backfill required	SP14	Please refer to the table below	
103	Yes for all	No	No	No	No	301150.523	6239687.557	58.39	2.40	2.40	0.40	1/2	SP14	Please refer to the table below	
104	Yes for all	No	No	No	No	301386.124	6239741.62	62.122	3.10	1.80	0.40	1/2	SP14	Please refer to the table below	

Materials generated from the excavation and clearance from weapons pits located in the North and South Remediation areas Zouch Rd Edmondson Park Formerly known as the Ingleburn Military Training Grounds.

General solid waste, went to-- Sita Environmental Landfill.

Construction and Demolition waste went to Brandown land fill , Recovery plant.

Scrape metals were recovered at CMI Industries.

Clean concrete went to BBR processing plant Botany.

Asbestos materials located in any weapons pits were relocated to the nominated stock pile in area AOC-7

Asbestos sheeting bonded has been sealed in plastic bags and placed into a lined skip bin awaiting transport to sita Environmental landfill.

Tyres will be disposed of at Brandown Landfill.

Pit 1

Pit 2

Pit 3

Pit 4

Pit 5

Pit 6

Pit 7

Pit 8

Pit 9

Pit 11

Pit 12

Pit 13

© 2012 JBS Environmental 2012

Source:
JBS 2012

Rev	Description	Drn.	Date
A	Original Issue -	GB	23/08/2012

JBS ENVIRONMENTAL

Appendix:

Client: Landcom

Project: Edmonson Park Remediation Consultant

Job No: 41945 File Name: 41945-FPL1

Pit 14

Pit 15

Pit 16

Pit 17

Pit 18

Pit 19

Pit 20

Pit 21

Pit 22

Pit 23

Pit 24

Pit 25

© 2012 JBS Environmental 2012

Source:
JBS 2012

Rev	Description	Drn.	Date
A	Original Issue -	GB	23/08/2012

JBS ENVIRONMENTAL

Appendix:

Client: Landcom

Project: Edmonson Park Remediation Consultants

Job No: 41945 File Name: 41945-FPL2

Pit 27

Pit 28

Pit 29

Pit 30

Pit 31

Pit 31a

Pit 32

Pit 33

Pit 34

Pit 34a

Pit 36

Pit 37

© 2012 JBS Environmental 2012

Source:
JBS 2012

Rev	Description	Drn.	Date
A	Original Issue -	GB	23/08/2012

JBS ENVIRONMENTAL

Appendix:

Client: Landcom

Project: Edmonson Park Remediation Consultants

Job No: 41945 File Name: 41945-FPL1

Pit 38

Pit 39

Pit 40

Pit 41

Pit 41a

Pit 42

Pit 43

Pit 44

Pit 45

Pit 46

Pit 47

Pit 48

© 2012 JBS Environmental 2012

Source: EMS 2012 Weapons Pit Clearance Documentation

Rev	Description	Drn.	Date
A	Original Issue - R02	GB	23/08/2012

JBS ENVIRONMENTAL

Appendix:

Client: Landcom

Project: Edmonson Park Remediation Consultants

Job No: 41945 File Name: 41945-FPL1

Pit 49

Pit 50

Pit 51

Pit 52

Pit 53

Pit 54

Pit 55

Pit 56

Pit 57

Pit 58

Pit 59

Pit 60

© 2012 JBS Environmental 2012

Source:	EMS 2012 Weapons Pit Clearance Documentation		
A	Original Issue - R02	GB	23/08/2012
Rev	Description	Drn.	Date

JBS ENVIRONMENTAL

Appendix:

Client: Landcom

Project: Edmonson Park Remediation Consultants

Job No: 41945 File Name: 41945-FPL1

Pit 61

Pit 62

Pit 63

Pit 64

Pit 66

Pit 67

Pit 68

Pit 69

Pit 70

Pit 71

Pit 72

Pit 73

© 2012 JBS Environmental 2012

Source: EMS 2012 Weapons Pit Clearance Documentation			
A	Original Issue - R02	GB	23/08/2012
Rev	Description	Drn.	Date

JBS ENVIRONMENTAL

Appendix:

Client: Landcom

Project: Edmonson Park Remediation Consultants

Job No: 41945 File Name: 41945-FPL1

Pit 74

Pit 75

Pit 76

Pit 78

Pit 79

Pit 80

Pit 81

Pit 82

Pit 83

Pit 83a

Pit 85

Pit 86

© 2012 JBS Environmental 2012

Source: EMS 2012 Weapons Pit Clearance Documentation

Rev	Description	Drn.	Date
A	Original Issue - R02	GB	23/08/2012

JBS ENVIRONMENTAL

Appendix:

Client: Landcom

Project: Edmonson Park Remediation Consultants

Job No: 41945 File Name: 41945-FPL1

Pit 87

Pit 88

Pit 89

Pit 90

Pit 91

Pit 92

Pit 93

Pit 94

Pit 95

Pit 96

Pit 97

Pit 98

© 2012 JBS Environmental 2012

Source: EMS 2012 Weapons Pit Clearance Documentation

Rev	Description	Drn.	Date
A	Original Issue - R02	GB	23/08/2012

JBS ENVIRONMENTAL

Appendix:

Client: Landcom

Project: Edmonson Park Remediation Consultants

Job No: 41945 File Name: 41945-FPL1

Pit 99

Pit 100

Pit 101

Pit 102

Pit 103

Pit 104

© 2012 JBS Environmental 2012

Source: EMS 2012 Weapons Pit Clearance Documentation

Rev	Description	Drn.	Date
A	Original Issue - R02	GB	23/08/2012

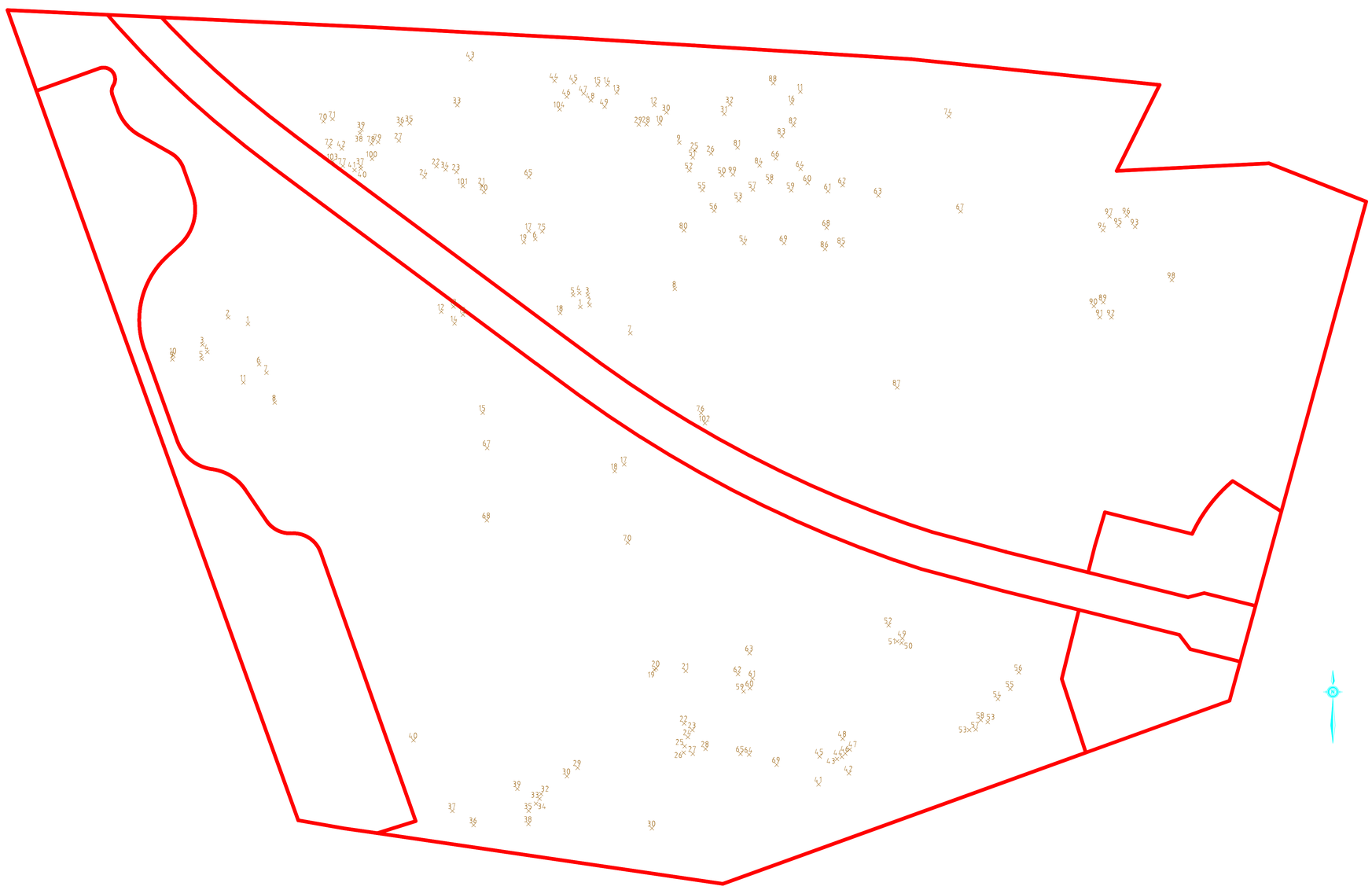
JBS ENVIRONMENTAL

Appendix:

Client: Landcom

Project: Edmonson Park Remediation Consultants

Job No: 41945 File Name: 41945-FPL1



Weapons Pit Locations North of Rail Corridor

Point No	Easting	Northing	Elevation	Point No	Easting	Northing	Elevation
1	301407.537	6239536.468	69.550	52	301520.765	6239678.281	67.801
2	301417.188	6239538.291	69.577	53	301572.100	6239647.185	68.105
3	301415.282	6239548.897	69.388	54	301577.692	6239602.691	66.037
4	301406.363	6239551.002	69.012	55	301534.245	6239657.848	68.480
5	301400.049	6239548.775	68.978	56	301546.460	6239636.279	68.170
6	301360.723	6239606.963	65.997	57	301586.744	6239658.391	68.269
7	301459.398	6239509.256	67.805	58	301604.743	6239666.167	68.203
8	301505.745	6239555.201	65.656	59	301626.454	6239657.517	67.330
9	301510.261	6239707.115	66.329	60	301643.665	6239665.178	67.026
10	301490.118	6239726.965	64.997	61	301664.765	6239656.630	65.869
11	301635.998	6239760.058	67.397	62	301679.890	6239662.822	65.332
12	301484.307	6239746.059	64.087	63	301717.047	6239652.087	62.866
13	301445.424	6239759.006	63.179	64	301636.370	6239679.949	67.612
14	301435.872	6239767.217	62.640	65	301354.142	6239671.310	62.444
15	301425.671	6239767.156	62.698	66	301610.547	6239690.707	69.025
16	301627.288	6239748.011	67.789	67	301802.480	6239635.728	62.368
17	301354.117	6239615.313	65.566	68	301663.387	6239618.741	64.441
18	301386.561	6239530.129	68.915	69	301619.069	6239602.744	64.826
19	301348.948	6239603.800	65.804	70	301140.772	6239729.177	56.979
20	301307.538	6239655.657	64.059	71	301150.148	6239731.593	57.503
21	301305.390	6239662.464	63.903	72	301147.066	6239702.938	57.990
22	301258.013	6239682.482	62.871	74	301790.212	6239734.440	67.990
23	301278.935	6239676.629	63.198	75	301367.922	6239614.866	65.850
24	301245.507	6239671.501	63.115	76	301532.916	6239476.205	70.362
25	301526.471	6239699.103	66.586	77	301160.860	6239682.845	59.192
26	301543.326	6239695.771	67.151	78	301190.698	6239705.950	60.154
27	301219.089	6239709.151	60.984	79	301197.420	6239707.723	60.460
28	301476.302	6239726.092	65.076	80	301515.150	6239615.953	67.980
29	301468.236	6239725.829	64.907	81	301570.859	6239701.923	67.504
30	301497.019	6239738.408	64.417	82	301628.842	6239725.133	67.666
31	301557.059	6239737.006	65.575	83	301616.886	6239714.008	68.117
32	301562.946	6239746.758	65.529	84	301593.666	6239683.455	68.271
33	301279.796	6239746.009	59.428	85	301679.117	6239600.354	62.895
34	301267.587	6239679.203	63.058	86	301661.688	6239596.569	63.239
35	301230.195	6239727.199	60.154	87	301736.657	6239452.767	59.159
36	301221.101	6239725.774	60.094	88	301608.018	6239768.778	65.687
37	301179.451	6239682.855	60.437	89	301950.638	6239541.331	54.657
38	301178.681	6239716.907	59.162	90	301940.893	6239537.259	54.898
39	301180.285	6239720.748	59.066	91	301946.970	6239525.703	54.310
40	301179.488	6239680.011	60.431	92	301959.029	6239525.585	53.888
41	301172.984	6239678.566	60.052	93	301983.657	6239619.658	55.651
42	301159.776	6239700.838	58.697	94	301950.237	6239616.176	56.725
43	301293.791	6239793.548	56.412	95	301966.445	6239620.686	56.042
44	301380.783	6239771.280	61.403	96	301975.196	6239631.392	56.265
45	301400.915	6239769.657	62.412	97	301957.077	6239630.565	57.349
46	301393.485	6239754.655	62.514	98	302021.867	6239564.317	52.857
47	301410.966	6239758.068	62.831	99	301566.099	6239673.969	68.185
48	301418.524	6239750.868	67.123	100	301191.238	6239690.180	60.859
49	301432.716	6239744.430	63.562	101	301285.575	6239661.925	64.189
50	301554.966	6239673.350	68.967	102	301536.974	6239415.696	71.187
51	301524.295	6239691.715	67.252	103	301150.523	6239687.557	58.390
				104	301386.124	6239741.620	62.122

Weapons Pit Locations South of Rail Corridor

Point No	Easting	Northing	Elevation	Point No	Easting	Northing	Elevation
1	301062.406	6239518.900	60.276	36	301296.731	6238998.441	0.000
2	301041.841	6239525.569	60.071	37	301274.716	6239013.189	75.614
3	301015.186	6239497.243	62.734	38	301353.607	6238999.607	0.000
4	301020.137	6239489.784	62.760	39	301342.139	6239036.150	0.000
5	301016.262	6239482.639	63.355	40	301234.256	6239086.490	0.000
6	301073.977	6239476.956	62.722	41	301654.990	6239040.778	61.137
7	301081.527	6239468.090	63.061	42	301686.424	6239052.129	0.000
8	301090.132	6239437.151	0.000	43	301674.027	6239067.086	0.000
9	300983.817	6239481.975	63.487	44	301679.152	6239069.265	0.000
10	300984.934	6239485.966	63.042	45	301656.034	6239069.666	61.502
11	301057.619	6239458.056	0.000	46	301682.745	6239072.795	0.000
12	301263.170	6239531.522	63.899	47	301687.275	6239076.886	0.000
13	301275.868	6239536.886	64.134	48	301679.993	6239088.162	0.000
14	301276.932	6239519.343	65.196	49	301742.038	6239192.314	0.000
15	301306.087	6239426.592	0.000	50	301741.130	6239187.686	0.000
16	301285.548	6239528.327	65.073	51	301736.461	6239189.291	0.000
17	301453.050	6239372.949	76.520	52	301727.747	6239705.838	59.307
18	301443.274	6239366.002	76.361	53	301830.621	6239105.398	58.396
19	301484.437	6239159.752	70.831	53	301811.376	6239097.120	58.601
20	301486.229	6239161.137	71.802	54	301841.268	6239129.484	57.799
21	301517.013	6239158.523	0.000	55	301854.040	6239139.828	57.802
22	301515.374	6239103.958	68.185	56	301867.942	6239157.045	57.361
23	301523.948	6239097.140	67.584	57	301818.101	6239097.710	58.866
24	301519.157	6239089.798	67.607	58	301823.490	6239107.526	58.401
25	301515.883	6239080.334	67.500	59	301577.108	6239137.288	64.696
26	301514.809	6239073.626	67.244	60	301583.645	6239140.596	0.000
27	301524.314	6239072.524	66.815	61	301586.408	6239151.027	0.000
28	301537.548	6239077.582	66.495	62	301571.182	6239155.222	0.000
29	301404.707	6239057.921	0.000	63	301583.338	6239176.976	0.000
30	301481.915	6238995.111	0.000	64	301582.820	6239071.669	64.359
30	301393.531	6239049.217	67.870	65	301573.843	6239072.500	64.965
32	301366.848	6239030.772	0.000	67	301310.820	6239390.051	0.000
33	301365.169	6239025.812	0.000	68	301310.446	6239314.933	0.000
34	301361.533	6239020.672	0.000	69	301611.405	6239061.155	63.242
35	301353.836	6239013.254	0.000	70	301456.818	6239291.745	74.542

LanUxo - Wx Weapons Pit Locations
TRN Group - Drawn - DP - Size A3

12d Model
Scale 1:2500
Tue May 15 15:58:07 2012

Appendix E – Unexpected Find / Additional Stockpiled Material Assessment Report

© 2013 JBS Environmental Pty Ltd

JBS41945-10342

29 May 2012

David Schofield
Landcom
Via email: (dschofield@landcom.nsw.gov.au)

(cc. David Riddell, Aver: driddell@aver.com.au
Graeme Nyland, Environ: gnyland@environ.com.au)
Rowena Salmon, Environ: rsalmon@environ.com.au)

Unexpected Find Stockpile Characterisation Advice

Landcom Project 12619 Zouch Road, Edmondson Park

Dear David,

1. Introduction and Background

JBS Environmental Pty Ltd was engaged by Landcom to act as remediation consultant during redevelopment of the land known as Landcom Project 12619 located at Zouch Road, Edmondson Park, NSW herein referred to as 'the Site'. The Site is formally identified as part lot 7 and lot 8 DP1127652, as shown in **Figure 1** (**Attachment 2**) and comprises a total area of approximately 86 hectares (ha). It is noted that the Site is bisected by the proposed rail corridor comprising part Lots 1 and 2 DP1127652, of approximately 8 ha which is excluded from the Site.

Previous assessment of Site contamination conditions completed previously by others identified the presence of soil contamination conditions requiring remediation prior to commencement of urban development works. The previous Site assessment and remediation plan documents include:

- *Detailed Contamination Site Investigation Report. Landcom Project No. 12619, Zouch Road, Edmondson Park, NSW*. Golder Associates Pty Ltd (Golder 2005a);
- *Remediation Action Plan, Landcom Project No: 12619, Zouch Road, Edmondson Park, NSW*. Golder Associates Pty Ltd (Golder 2005b); and
- *Landcom Project 12619 – Zouch Road, Edmondson Park, NSW, Remediation Action Plan*. Golder Associates Pty Ltd (Golder 2011).

In addition, the appointed independent contaminated Site Auditor has issued the following interim advice with respect to the suitability of the assessment works and remedial action plan (RAP):

- Interim *Advice #4 – Zouch Road, Edmondson Park, NSW, Remediation Action Plan*. Environ Australia Pty Ltd (Environ 2006)
- *Interim Advice #5 – Zouch Road, Edmondson Park, NSW, Revised Remediation Action Plan*. Environ Australia Pty Ltd, draft issue, 24 February 2011 (Environ 2011).

Following appointment as the remediation consultant, JBS has prepared a Validation Sampling Analysis and Quality Plan (JBS 2012a[1]) to guide the validation works during remediation activities.

Existing assessment of the site identified 16 stockpiles across the Site. Additional stockpiles not identified during previous site investigations have been observed. As required by the RAP (Golder 2011), additional assessment of the 'unexpected find' stockpiles is necessary to verify the absence of contaminated material prior to use as backfill on the site. This letter presents the results of the unexpected find stockpile characterisation assessment completed by JBS in April and May 2012.

[1] *Validation Sampling, Analysis and Quality Plan, Landcom Project 12619, Zouch Road, Edmondson Park, NSW*. JBS Environmental Pty Ltd, February 2012 (JBS 2012a)

128 O'Riordan St Mascot NSW I 50 Margaret St Sydney NSW
Tel: 02 8338 1011 I Fax: 02 8338 1700 www.jbsgroup.com.au

2. Objectives and Scope of Works

The objective of the sampling activities was to assess and further characterise previously unidentified stockpiles for possible re-use on the Site.

The scope of works comprised:

- Review of site information presented in the existing RAP (Golder, 2011);
- Identification, inspection and sampling of unexpected stockpiles within the Site (**Figure 2, Attachment 2**);
- Laboratory analysis of collected samples and QA/QC samples for a range of contaminants of potential concern (COPC); and
- Assessment and characterisation of stockpiles for potential re-use on the Site as backfill.

3. Review of Existing Stockpile Data

Previous site assessment activities (Golder 2005a) did not identify or provide any analytical soil data of the unexpected stockpiles presented in this letter.

4. Data Quality Objectives

Data Quality Objectives (DQOs) were established for the assessment works, as described in the following sections, in keeping with JBS (2012a) SAQP.

4.1. State the Problem

Stockpiles have been identified on the site that were not reported in previous site assessments. As required by the RAP (Golder 2011), additional assessment of the material is necessary to verify the absence of contaminated material prior to use as backfill on the Site.

4.2. Identify the Decision

For this stockpile characterisation sampling, the primary decisions required to be made are:

- Are stockpile soil conditions below the adopted site assessment criteria?
- Are stockpiles absent of any visually identifiable impacted material?

4.3. Identify Inputs to the Decision

Inputs to the decisions are:

- Stockpile soil data and observations collected during the current stockpile sampling event completed by JBS; and
- Adopted soil criteria as per the Golder (2011) RAP.

Specifically, sufficient data was required to be collected from the identified potentially impacted media (unexpected find stockpiles) in the identified areas of environmental concern for the associated COPC.

4.4. Define the Study Boundaries

The study boundary for the defined Site is shown schematically in **Figure 1** (**Attachment 2**) and in more detail with stockpile locations in **Figure 2** (**Attachment 2**). The Site is formally defined as part lot 7 and lot 8 DP111127652 comprising approximately 86 ha. As shown in **Figures 1** and **2** (**Attachment 2**), the extent of the Site comprises:

- North – the existing fence line marking the northern extent of Lot 8 (that portion north of the Rail Corridor) across the majority of the Site, with the northern extent of Lot 7 (north of the RC) comprising the east most portion of the Site's extent;
- West – the existing fence line marking the northern extent of Lot 8, the southern portion of which faces Zouch Road;
- South – the existing fence line marking the extent of Lot 8 in the western portion of the Site and of Lot 7 across the majority of the Site;
- East – the existing fence line marking the extent of Lot 7; and
- Internally – the extent of Lots 7 and 8 in relation to Lots 1 and 2 comprising the proposed rail corridor and future ancillary parking facilities soon to be remediated under a separate agreement between TWA and Landcom.

The maximum vertical extent of the investigation works comprised approximately 0.3 m below the ground surface beneath the stockpile. With consideration to the identified COPC, seasonality and other temporal

128 O'Riordan St Mascot NSW I 50 Margaret St Sydney NSW
Tel: 02 8338 1011 I Fax: 02 8338 1700 www.jbsgroup.com.au

variables were not assessed as part of the investigation works. The temporal boundaries were limited to the period of assessment from April to May 2012,

4.5. Develop a Decision Rule

Stockpile soil analytical data were assessed against site assessment criteria presented in **Section 6** as documented in the SAQP (JBS 2012a) derived from NSW EPA endorsed guidance. Decision rules used to expand on the decisions in **Section 3.2** are outlined in **Table 3.1**.

Table 3.1 Summary of Decision Rules

Decision Required to be Made	Decision Rule
Are stockpile soil conditions below the adopted site assessment criteria?	Stockpile soil laboratory results were compared against adopted site assessment criteria derived from the EPA endorsed criteria. Where contaminant concentrations in stockpiles were greater than the adopted assessment criteria, the answer was no. Where contaminant concentrations in stockpile were less than the adopted assessment criteria, the answer was yes.
Are stockpiles absent of any visually identifiable impacted material?	Each stockpile was visually assessed to identify any potential impacted material. Where visually identifiable impacted material was present on the stockpiles, the answer was yes. Where visually identifiable impacted material was absent from stockpiles, the answer was no.

4.6. Specify Limits on Decision Errors

To assess the usability of the data prior to making decisions, the data were assessed against pre-determined Data Quality Indicators (DQIs) for precision, accuracy, representativeness, completeness, comparability and sensitivity (PARCCS parameters) as discussed in the validation SAQP (JBS 2012a). The acceptable limit on decision error is a minimum of 95% compliance with DQIs.

The pre-determined Data Quality Indicators (DQIs) established for the project are shown in **Table 3.1**.

Table 3.1 Summary of Quality Assurance / Quality Control Program

Data Quality Indicators	Frequency	Data Quality Criteria
Precision		
Split duplicates (intra laboratory)	1 / 20 samples	<50% RPD[1] where conc > 10 x LOR/ PQL
Blind duplicates (inter laboratory)	1 / 20 samples	<50% RPD where conc > 10 x LOR
Laboratory Duplicates	1 / 20 samples	<50% RPD where conc > 10 x LOR
Accuracy		
Surrogate spikes	All organic analytes	60-140%
Laboratory control samples	1 per lab batch	70-130% metals, 60-140 % organics
Matrix spikes	1 per lab batch	70-130% metals, 60-140 % organics
Representativeness		
Sampling appropriate for media and analytes	1 / stockpile	-
Samples extracted and analysed within holding times.	All samples	Soil: 14 days for organics, 6 months for metals, asbestos Water: sTPH/PAHs 7 days to extraction, VOCs/vTPH – 14 days, 6 months for metals
Trip spike (volatiles only)	1 per sampling event	70-130% recovery
Rinsate	1 / 20 samples for TPH, PAHs, 8 metals, or minimum of one/day where sampling for these analyst.	<LOR
Storage blank	1 / media	<LOR

128 O'Riordan St Mascot NSW I 50 Margaret St Sydney NSW
Tel: 02 8338 1011 I Fax: 02 8338 1700 www.jbsgroup.com.au

Data Quality Indicators	Frequency	Data Quality Criteria
Comparability		
Standard operating procedures for sample collection & handling	All Samples	All samples
Standard analytical methods used for all analyses	All Samples	All samples
Consistent field conditions, sampling staff and laboratory analysis	All Samples	All samples
Limits of reporting appropriate and consistent	All Samples	All samples
Completeness		
Soil description and COCs completed and appropriate	All Samples	- All samples
Appropriate documentation	All Samples	- All samples
Satisfactory frequency and result for QC samples	All QA/QC samples	-
Data from critical samples is considered valid	All Samples	Critical samples valid
Sensitivity		
Analytical methods and limits of recovery appropriate for media and adopted Site assessment criteria	All Samples	LOR<= Site assessment criteria

(1) If the RPD between duplicates is greater than the pre-determined data quality indicator, a judgement will be made as to whether the excess is critical in relation to the validation of the data set or unacceptable sampling error is occurring in the field.

4.7. Optimise the Design for Obtaining Data

Stockpiles have been identified on the site that were not reported in previous site assessments as suitable for re-use on Site. As required by the RAP (Golder 2011), additional assessment of these stockpiles is necessary to verify the absence of contaminated material prior to re-use as backfill on the Site.

Stockpile sampling involved installation of one or more test pits throughout each stockpile and collection of a minimum of one sample per 50 m³ of material, to further assess the use of the stockpile as backfill on the Site, as per the JBS (2012a) SAQP.

5. Investigation Methodology

5.1. Stockpile Sampling Methodology

Test pits were installed into the stockpiles (UFSP01 to UFSP10) using an excavator. Samples were collected at a rate of one sample every 50 m³ of material from each stockpile at depths greater than 0.3 m below the stockpile surface. Samples at depth were collected directly from the centre of the excavator bucket shallow samples were collected using a hand trowel.

All soil samples were placed into laboratory supplied jars/bags. Each of the sample jars/bags were labelled with the project ID, date, sampler's initials and unique stockpile ID (or QC sample name), using permanent ink marker on labels affixed to the sides of the jars/bags by the laboratory. In addition, the sample ID (i.e., the stockpile ID) was also replicated on the lid of the jars in the event that the labels became detached from the jars during transport.

The jars/bags were placed directly into a pre-chilled ice chest, for transport to the testing laboratories under chain of custody conditions. COC documentation was completed for samples relinquished to the laboratory and included: sample ID; depth; number of jars/bags; media type (i.e., soil); project ID; name; date of sampling and relinquishment.

The completed activities were documented on borehole forms as included as **Attachment 3**. One rinsate sample was obtained for each day of sampling during the field decontamination procedures by rinsing the trowel with laboratory grade demineralised water following the decontamination procedure. The water sample was then appropriately preserved and stored with the site jar/bag samples prior to transport to the laboratory for chemical analysis.

128 O'Riordan St Mascot NSW I 50 Margaret St Sydney NSW
Tel: 02 8338 1011 I Fax: 02 8338 1700 www.jbsgroup.com.au

5.2. Laboratory Analysis Methodology

JBS Environmental engaged Envirolab Services Pty Ltd (Envirolab) at Chatswood, NSW as the primary laboratory for the required analyses. The secondary laboratories used for the works were SGS Environmental (SGS) at Alexandria, NSW and Pickford & Rhyder Consulting Pty Ltd (Pickford & Rhyder) at Lane Cove, NSW. All laboratories were NATA registered for the required analyses. In addition, the laboratories were required to meet JBS Environmental's internal QA/QC requirements.

Laboratory analysis methods for relevant soil contaminants are identified in **Table 6.1**.

6. Assessment Criteria

Assessment of stockpile soil conditions is required to verify the absence of contaminated material prior to re-use as backfill on the Site. The adopted criteria presented in **Table 6.1** were derived during the development of the validation SAQP (JBS 2012a) and include values adopted from the following documents:

- Department of Environment and Climate Change (DECC) (2006) *Contaminated Sites: Guidelines for the NSW Site Auditor Scheme 2nd edition:*
    - Health Investigation Levels (HILs) for residential with accessible soil are the most sensitive land use criteria presented in these guidelines.
    - HILs for parks, recreational open space and playing fields; and
    - Phytotoxicity-based ecological investigation levels.
- *Contaminated Sites: Guidelines for assessing Service Station Sites,* New South Wales Environment and Protection Authority, 1994 (EPA 1994)

Table 6.1 Adopted Soil Criteria (all units in mg/kg) for Residential Use with Accessible Soils

	Limit of Reporting	Laboratory Method	Health-Based Investigation Criteria (residential) (HIL – A)[1]	Health-Based Investigation Criteria (parks, open space) (HIL – E)[4]	Phytotoxicity-Based Ecological Investigation Levels (EIL)
METALS					
Arsenic	4	ICP-AES (USEPA 200.7)	100	200	20
Cadmium	0.5	ICP-AES (USEPA 200.7)	20	40	3
Chromium (total)	1	ICP-AES (USEPA 200.7)	12 %	24 %	400
Copper	1	ICP-AES (USEPA 200.7)	1000	2000	100
Lead	1	ICP-AES (USEPA 200.7)	300	600	600
Mercury (inorganic)	0.1	ICP-AES (USEPA 200.7)	15	30	1
Nickel	1	ICP-AES (USEPA 200.7)	600	600	60
Zinc	1	ICP-AES (USEPA 200.7)	7000	14 000	200
PETROLEUM HYDROCARBONS					
C6-C9 Fraction	25	Purge Trap-GCMS (USEPA8260)	65[2]	65[2]	-
C10 – C36 Fraction	250	Purge Trap-GCFID (USEPA8000)	1000[2]	1000[2]	-
PETROLEUM HYDROCARBONS					
Benzene	1.0	Purge Trap-GCMS (USEPA8260)	1.0[2]	1.0[2]	-
Toluene	1.0	Purge Trap-GCMS (USEPA8260)	1.4[2]	1.4[2]	-
Ethyl benzene	1.0	Purge Trap-GCMS (USEPA8260)	3.1[2]	3.1[2]	-
Total Xylenes	3.0	Purge Trap-GCMS (USEPA8260)	14[2]	14[2]	-
POLYCYCLIC AROMATIC HYDROCARBONS					
Benzo(a) pyrene	0.05	GCMS (USEPA8270)	1	2	-
Total PAHs	1.55	GCMS (USEPA8270)	20	40	-
ORGANOCHLORINE PESTICIDES					
Aldrin + Dieldrin	0.2	GCECD (USEPA8140,8080)	10	20	-
Chlordane	0.2	GCECD (USEPA8140,8080)	50	100	-
Heptachlor	0.1	GCECD (USEPA8140,8080)	10	20	-
DDT + DDD + DDE	0.3	GCECD (USEPA8140,8080)	200	400	-
POLYCHLORINATED BIPHENYLS					
Total PCBs	0.6	GCECD (USEPA8140,8080)	10	20	-
OTHER					
Asbestos	0.1 g/kg	PLM / Dispersion Staining	0.1[3] g/kg	0.1[3] g/kg	-

128 O'Riordan St Mascot NSW I 50 Margaret St Sydney NSW
Tel: 02 8338 1011 I Fax: 02 8338 1700 www.jbsgroup.com.au

Notes:
(1) DEC (2006) *Contaminated Sites: Guidelines for the NSW Site Auditor Scheme 2nd edition*. Residential with accessible soil is the most sensitive land use criteria presented in these guidelines.
(2) *Contaminated Sites: Guidelines for Assessing Service Station Sites,* NSW EPA, 1994 (EPA 1994)
(3) No endorsed criteria. The LOR is proposed as the screening level criteria in the absence of Site specific criteria.
(4) DEC (2006) *Contaminated Sites: Guidelines for the NSW Site Auditor Scheme 2nd edition*. Parks, recreational open space and playing fields.

The adopted soil criteria were applied at stockpile locations across the Site (UFSP01, UFSP02, UFSP03, UFSP04, UFSP05, UFSP06, UFSP07, UFSP08, UFSP09 and UFSP10) as shown in **Figure 2**.

Where both human health and ecosystem criteria have been nominated for a contaminant in **Table 6.1** above, the more sensitive criteria has been adopted (i.e. 20 mg/kg arsenic ecosystem level in preference to the 100 mg/kg health based criterion) as the site assessment criteria for stockpile validation purposes.

7. Quality Assurance / Quality Control

7.1. Results

The QA/QC results are summarised in **Table 7.1** and discussed in **Section 7.2** below. Detailed QA/QC results are included with laboratory reports in **Attachment 5** and QA/QC summary checker is provided in **Attachment 4.**

Table 7.1 Summary of Results of Quality Assurance / Quality Control Program

Data Quality Objective	Frequency/Criterion	Results	DQO met?
Precision			
Blind duplicate (intra-lab)	>1/20 samples RPDs<50% where conc > 10 x LOR	Duplicate samples were obtained and analysed at an appropriate density (1 duplicate, 12 primary samples). All results were within the adopted RPD% acceptance criteria.	Yes
Split duplicate (inter-lab)	>1/20 samples RPDs<50% where conc > 10 x LOR	Duplicate samples were obtained and analysed at an appropriate density (1 duplicate, 12 primary samples). All results were within the adopted RPD% acceptance criteria.	Yes
Laboratory Duplicate analysis	>1/20 samples RPDs<50% where conc > 5 x LOR	Laboratory duplicate samples were obtained and analysed at an appropriate density (1 duplicate, 12 primary samples), All results were within the adopted RPD% acceptance criteria.	Yes
Accuracy			
Surrogate spikes	All organic samples 60-140%	All samples analysed. Recoveries in range of 60 – 139 %, within the acceptance criteria.	Yes
Laboratory control samples	1 per lab batch 70-130% metals, 60-140 % organics	Lab control sample analysis results reported for 1 sample from batch. Results in range of 65 to 139 % for organics, within the acceptance criteria.	Yes
Matrix spikes	1 per lab batch 70-130% metals, 60-140 % organics	No matrix spike analyses were reported for the lab batches.	No
Representativeness			
Sampling appropriate for media and analytes	All media / analytes	All sampling conducted in accordance with JBS procedures	Yes
Trip spike (volatiles)	1 / media / per sampling event 70-130% recovery	A trip spike was carried for each of the sampling events and subsequently analysed for BTEX. Recoveries of 99 to 113 % were within the acceptable range.	Yes
Storage Blank	1 / media / per sampling event Results <LOR	One storage blank was carried for the sampling event and subsequently analysed for BTEX. Reported BTEX concentrations were all less than the LOR.	Yes
Rinsate	1 / 20 samples / PAHs, TPH and 8 metals Results <LOR	One rinsate sample was prepared during each day of the field works and submitted for analysis. The results for all analyses were less than the LOR.	Yes

128 O'Riordan St Mascot NSW I 50 Margaret St Sydney NSW
Tel: 02 8338 1011 I Fax: 02 8338 1700 www.jbsgroup.com.au

Data Quality Objective	Frequency / Criterion	Results	DQO met?
Samples extracted and analysed within holding times.	All samples	Samples for chemical analysis were submitted, extracted and analysed within holding times.	Yes
Comparability			
Standard operating procedures for sample collection & handling	All Samples	JBS field staff used the same standard operating procedures throughout works.	Yes
Standard analytical methods used for all analyses	All Samples	Standard analytical methods used as presented in the laboratory reports included as **Attachment 5**.	Yes
Consistent field conditions, sampling staff and laboratory analysis	All Samples	All sampling was completed by experienced JBS personnel. Field staff carried out the work in accordance with JBS operating procedures. One primary and two secondary laboratories completed the analysis for the sampling event.	Yes
Completeness			
Test pit logs, Notes and COCs completed and appropriate	All Samples	Test pit logs and COCs were completed appropriately.	Yes
Appropriate documentation	All Samples	Appropriate field documentation is included in **Attachment 3**.	Yes
Satisfactory frequency and result for QC samples	All QA/QC samples	QC samples were collected at an appropriate frequency	Yes
Data from critical samples is considered valid	All samples	The collected data presented in this report is considered valid.	Yes
Sensitivity			
Analytical methods and limits of recovery appropriate for media and adopted site assessment criteria	All samples	Appropriate laboratory analysis methods and detection limits were considered to have been achieved during the field and laboratory phases of this investigation.	Yes

7.2. Discussion of QA / QC Results

Precision

Intra and inter-laboratory duplicates for stockpile soil samples were collected at rates exceeding 1 per 20 samples (5%) analysed. The primary sample comprised SP18-3 with the intra-lab sample labelled as QC06 and the intra-lab duplicate as QA06 in the SGS report. The results for both intra- and inter-laboratory sample analyses were within the nominated range specified in the data quality indicators.

A laboratory duplicate sample was reported for one sample from the batch and analysed for heavy metals, TPH/BTEX, OCPs and PAHs. The laboratory duplicate sample results were within the nominate range specified in the data quality indicators.

Accuracy

Surrogate and spike and laboratory control sample analyses were completed at a suitable frequency and reported results within the acceptable range. No matrix spike analysis was reported for the lab batches. Given that the lab batches comprised supportive QA/QC samples, the absence of matrix analysis is considered not to be a considerable omission and the presence of LCS analyses provides sufficient data to demonstrate compliance with accuracy objectives in the absence of the matrix spike results.

Representativeness

The stockpile sampling methods were considered appropriate for the media and the analytes targeted. Stockpile soil samples were collected using an excavator. The stockpile sampling was completed by collecting soil directly from the centre of the excavator bucket or using a trowel for shallow samples and filling of new laboratory prepared jars/bags.

All primary and duplicate soil sample extractions and analyses were completed within the recommended holding times.

All levels of analytes in the storage blank and rinsate samples for each sampling event were below the laboratory limit or recovery for each analyte, and the recoveries for the trip spike were within the limits specified in the representative DQIs

128 O'Riordan St Mascot NSW I 50 Margaret St Sydney NSW
Tel: 02 8338 1011 I Fax: 02 8338 1700 www.jbsgroup.com.au

Water matrices were used for trip spike and storage blank samples as JBS has identified poor laboratory preparation of soil trip spikes samples in the past which have consequently resulted in inaccurate recoveries.

Comparability

The primary and secondary laboratories were NATA accredited for all methods undertaken during this assessment. The JBS field scientist completed the sampling for this assessment using the documented sampling methodology consistent JBS with sampling protocols. All required field forms and bore log sampling forms were appropriately completed by the sampling personnel. The assessment results indicate that significant bias of the data as a result of sampling or laboratory methods has not occurred.

Completeness

All documentation was completed to the required standard and are included in **Attachment 3**.

Sensitivity

Appropriate laboratory analysis methods and detection limits were considered to have been achieved during the field and laboratory phases of this investigation.

7.3. QA/QC Assessment

The results of the field and laboratory QA/QC program indicate that the data obtained from this investigation generally met the predetermined Data Quality Indicators (DQIs). As such the data are considered to be of adequate quality to be relied on for the purposes of assessing the environmental condition at the Site.

8. Results

Observations during field works have been recorded in field notes included in **Attachment 3**. Stockpile locations are shown on **Figure 2** in **Attachment 2**. Detailed laboratory reports and chain of custody documentation is presented in **Attachment 5**. An assessment of data quality has found that the data are of a suitable quality for the intended purposes (**Attachment 4**). A summary of stockpile suitability for re-use on site is presented in **Table 10.1**.

8.1. Site Observations

Observations of stockpile material have been included in **Attachment 3**. The following comments summarise stockpile inclusions where visually identifiable impacted material was observed:

- UFSP04: Inclusions of glass and tile fragments.
- UFSP05 and UFSP07: Inclusions of rubber bullets.
- UFSP06: Inclusions of rubber bullets, scrap metal and glass fragments.
- UFSP010: Inclusions of concrete and brick pieces.

Observations of the remaining stockpiles (UFSP01, UFSP02, UFSP03, UFSP08 and UFSP09 indicated that the material was absent of visually identifiable impacted material (anthropogenic inclusions, staining, odours, the presence of stressed vegetation, etc).

8.2. Stockpile Soil Results

The laboratory analysis results completed for this stockpile assessment are presented in **Table A** included as **Attachment 6**. Stockpiles UFSP01 and UFSP02 samples names were labelled as SP18-3 and SP19-1 respectively. The following comments summarise the results for the contaminants of concern:

- Sample UFSP06-1 reported 240 mg/kg of Zinc, which is above the EIL criteria of 200 mg/kg , however was well below the HIL-A criteria of 7000 mg/kg . All other heavy metals concentrations reported were all below the adopted site criteria.
- PAH concentrations reported were all below LOR and below the adopted site assessment criteria.
- OCP concentrations reported were all below LOR and below the adopted site assessment criteria.
- PCB concentrations reported were all below LOR and below the adopted site assessment criteria.
- vTPH (C_6-C_9) and BTEX concentration reported were all below LOR and the adopted site assessment criteria.
- sTPH (C_{10}-C_{36}) concentrations reported were all below LOR and below the adopted site assessment criteria.
- No asbestos was identified above the LOR and no respirable fibres were detected in the soil samples.

128 O'Riordan St Mascot NSW I 50 Margaret St Sydney NSW
Tel: 02 8338 1011 I Fax: 02 8338 1700 www.jbsgroup.com.au

9. Discussion of Results and Observations

Stockpile observations indicated that stockpiles UFSP04, UFSP05, UFSP06, UFSP07 and UFSP10 contain anthropogenic inclusions such as rubber bullets, glass fragments, tile fragments, bricks and concrete pieces. Stockpiles observations of UFSP01, UFSP02, UFSP03, UFSP08 and UFSP09 did not identify any visually identifiable impacted material.

Sample UFSP06-1 reported 240 mg/kg of Zinc, which is slightly above the EIL criteria of 200 mg/kg, however was well below the HIL-A criteria of 7000 mg/kg. All other analytical results for all stockpile samples revealed some concentrations below the relevant LOR and all concentrations below the adopted site criteria.

10. Conclusions and Recommendations

Table 10.1 Summary of Stockpile Suitability for Re-use on the Site

Stockpile	Location (centre of stockpile)		Approximate Volume (m^3)	Conclusion
Identification	Easting	Northing		Suitable for re-use on site?
UFSP01	301954.48	6239630.98	30	YES
UFSP02	301500.03	6239656.08	10	YES
UFSP03	301194.09	6239037.21	50	YES
UFSP04	302059.36	6239607.65	24	No
UFSP05	301729.67	6239320.07	12	No
UFSP06	301707.90	6239348.89	70	No
UFSP07	301622.25	6239414.60	10	No
UFSP08	301616.99	6239429.25	10	YES
UFSP09	301764.87	6239611.43	2	YES
UFSP10	301624.01	6239494.77	16	No

Based on the findings of this investigation and subsequent to the limitations in **Attachment 1**, the following conclusions have been reached:

- Laboratory results and visual observations indicated that the stockpiles UFSP01, UFSP02, UFSP03, UFSP08 and UFSP09 are suitable for re-use on site.
- Stockpiles UFSP04, UFSP05, UFSP06, UFSP07 and UFSP10 contain anthropogenic inclusions. These stockpiles would require screening of the material to remove the anthropogenic inclusions before reusing on site. Due to the relatively small volume of material it is recommended that these stockpiles be added to the lead particulate material, to be placed within the proposed cell encapsulation.

If you require any further assistance, please do not hesitate to contact me on (02) 8338 1011 or by email aboardman@jbsgroup.com.au

.Prepared by:

Alex Boardman
Environmental Scientist
JBS Environmental Pty Ltd

Reviewed/Approved by:

Matthew Bennett
Principal Contaminated Land
JBS Environmental Pty Ltd

Attachments: (1) Limitations
(2) Figures
(3) Stockpile sampling field forms
(4) QA/QC Checker Summary
(5) Laboratory Analysis Reports and Chain of Custody Information
(6) Summary Tables - Stockpile Sample Analytical Results

128 O'Riordan St Mascot NSW I 50 Margaret St Sydney NSW
Tel: 02 8338 1011 I Fax: 02 8338 1700 www.jbsgroup.com.au

Attachment 1 – Limitations

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only, and has been based in part on information obtained from the client and other parties.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

JBS Environmental Pty Ltd accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced without prior approval by the client, or amended in any way without prior approval by JBS Environmental Pty Ltd, and should not be relied upon by other parties, who should make their own enquires.

Sampling and chemical analysis of environmental media is based on appropriate guidance documents made and approved by the relevant regulatory authorities. Conclusions arising from the review and assessment of environmental data are based on the sampling and analysis considered appropriate based on the regulatory requirements.

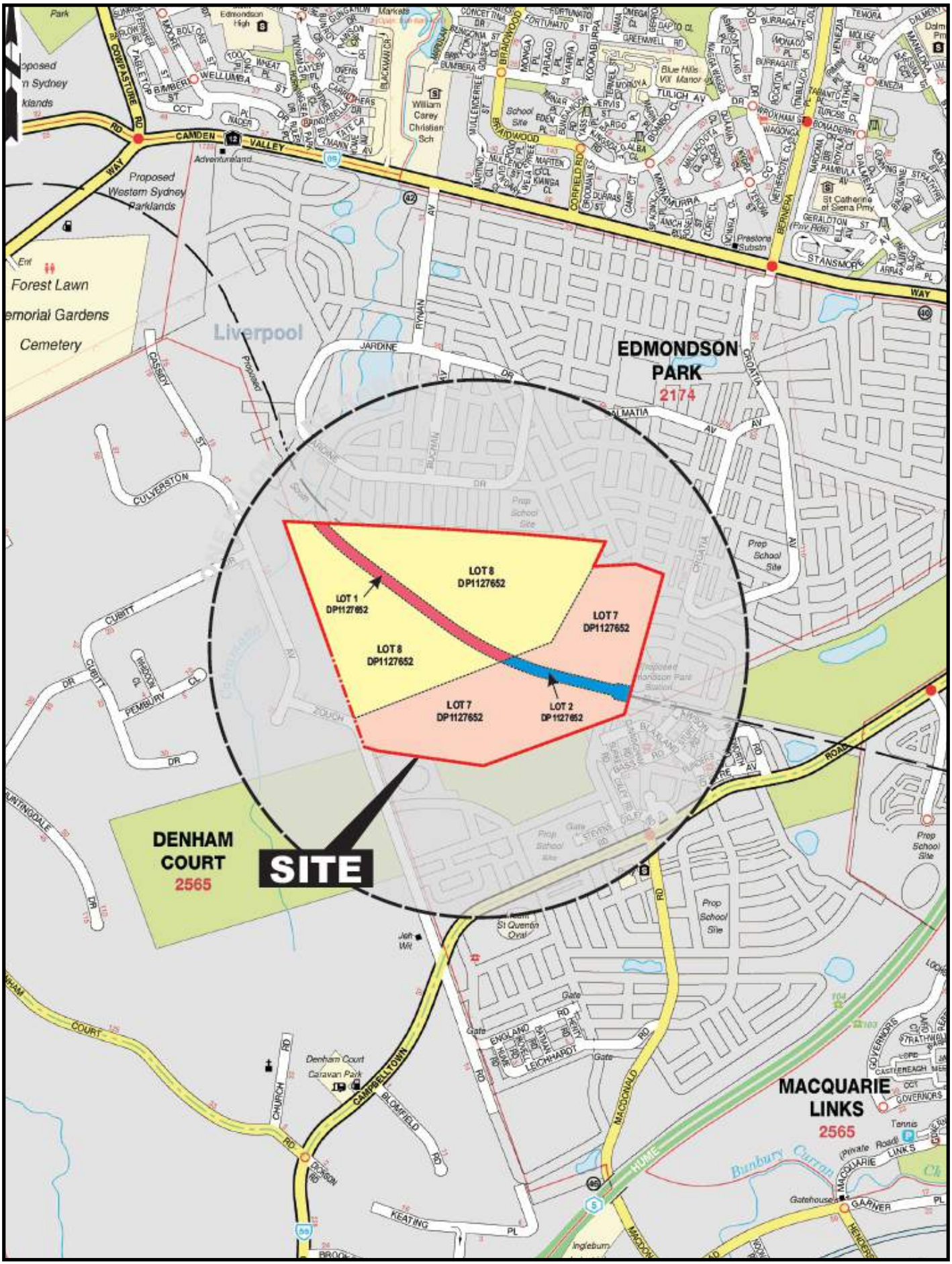
Limited sampling and laboratory analyses were undertaken as part of the investigations undertaken, as described herein. Ground conditions between sampling locations and media may vary, and this should be considered when extrapolating between sampling points. Chemical analytes are based on the information detailed in the site history. Further chemicals or categories of chemicals may exist at the site, which were not identified in the site history and which may not be expected at the site.

Changes to the subsurface conditions may occur subsequent to the investigations described herein, through natural processes or through the intentional or accidental addition of contaminants. The conclusions and recommendations reached in this report are based on the information obtained at the time of the investigations.

This report does not provide a complete assessment of the environmental status of the site, and it is limited to the scope defined herein. Should information become available regarding conditions at the site including previously unknown sources of contamination, JBS Environmental Pty Ltd reserves the right to review the report in the context of the additional information.

128 O'Riordan St Mascot NSW I 50 Margaret St Sydney NSW
Tel: 02 8338 1011 I Fax: 02 8338 1700 www.jbsgroup.com.au

Attachment 2 – Figures



Source: © Golder Associates Pty Ltd, Project No 107623047, Doc No 001, Figure No F0001, Rev No 0, 27-08-2010

© 2012 JBS Environmental Pty Ltd

0 200 400 800 m

Scale: Approximate

Datum: MGA94 Zone 56 - AHD

Rev	Description	Drn.	Date
A4			
A	Original Issue - R01	SE	27-01-2012

Legend:

Approximate Site Boundary

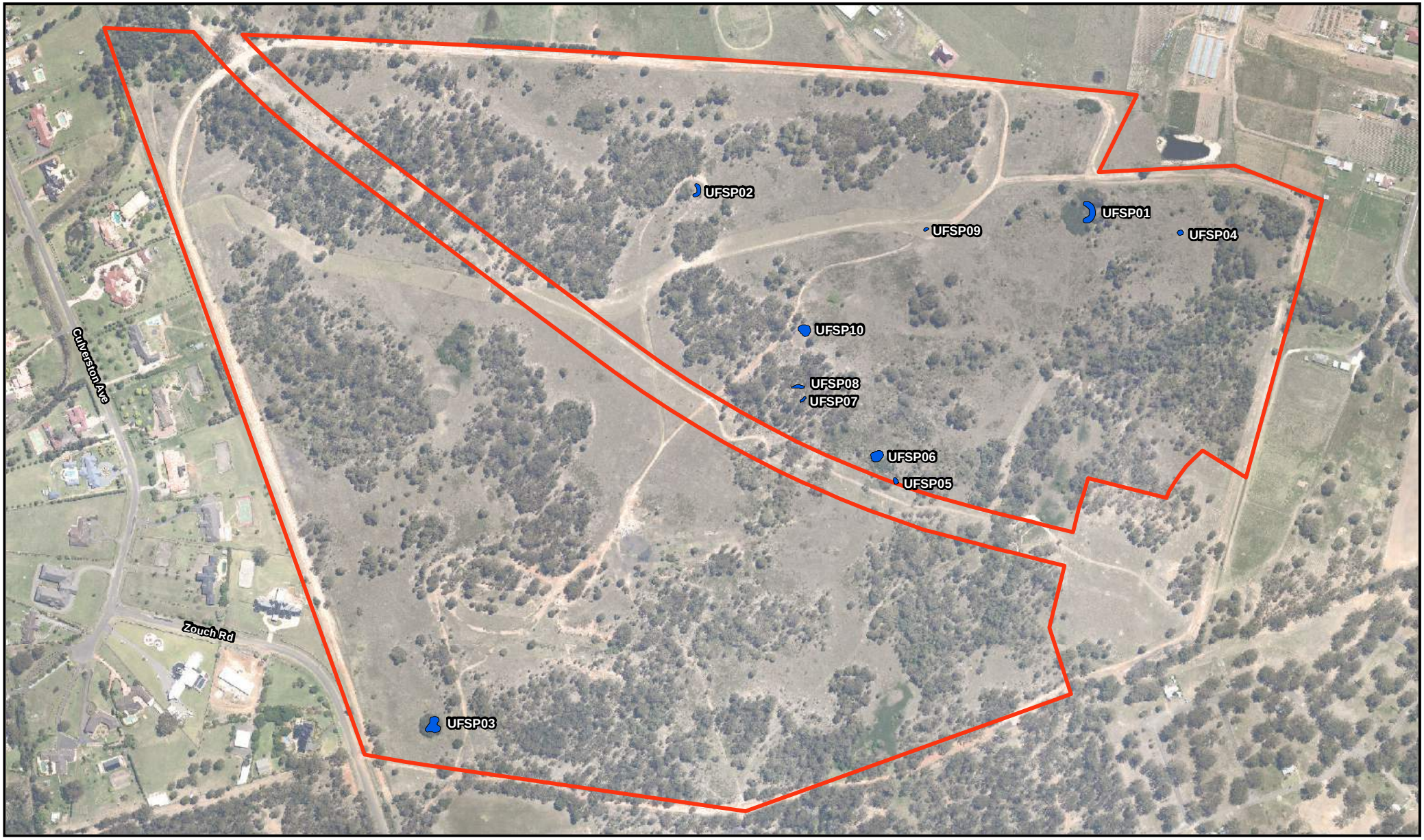
JBS ENVIRONMENTAL

Figure 1: Site Location and Current Cadastral Boundaries

Client: Landcom

Project: Edmondson Park Remedial Works

Job No: 41945 File Name: 41945_01



Source: Base Image: Hypertiles - Nearmap 23-10-2011

© 2011 JBS Environmental Pty Ltd

0 62.5 125 250 m

Scale: 1:6,000

Datum: MGA94 Zone 56 - AHD

Rev	Description	Drn.	Date:
A4			
0	Original Issue - L008	SE	28-05-2012

Legend:

- Approximate Site Boundary
- Stockpile Location

JBS ENVIRONMENTAL

Figure 2: Stockpile Locations

Client: Landcom

Project: Landcom, 12619 Zouch Rd, Edmondson Park, NSW

Job No: 41945 File Name: 41945_02

Attachment 3 –Stockpile Sampling Field Forms

Field Reporting Cover Sheet

JBS ENVIRONMENTAL

PROJECT NAME: Edwardson Park Rom.	**PROJECT NO:** 41945
FIELD DATES: 4/4/12 + 29/3/12	**JBS PM:** J.R
FIELD STAFF: A.B	
WEATHER: Fine	
PROPOSED WORKS: ~~UFSP~~ SP6 - validation + UFSPs	
SUMMARY OF FIELDWORK: validated SP6 footprint + inspected + sampled SP18 + 19 (UFSP01+02)	
IMPORTANT OUTCOMES TO NOTE:	
COC SENT? Yes	**DATE SAMPLES SENT:** 4/4/12
PRIMARY LAB: Envirolab	**SECONDARY LAB:** P+R + SGS

POST-FIELDWORK CHECKLIST

- ☐ COC checked with PM
- ☐ Site map updated and attached
- ☐ Field data sheets attached (bore logs, well monitoring sheets)
- ☐ Calibration and decontamination sheets attached
- ☐ Field notes attached
- ☐ Photos downloaded to file
- ☐ Electronic bore logs completed and checked

OUTSTANDING ACTIONS:

Daily Field Report

Page ___ of ___

Date: 29/3/12
Arrival Time 3:30pm
Depart Time 5:00pm
Site Address Zouch Rd, Edmondson Pk

Completed by AB
Weather Overcast
Subcontractor(s) N/A

Purpose of Visit Site Inspection / Status check

Notes (include sketch or attach site map/plan)

Arrived at 3:30pm
- Inspected SP1 & CSP; noted observation of ACM on CSP (photos taken) - Also large amount of ACM from SP1 (Photos) + associated debris adjacent to the SP1.
- Inspected Waste/burial Pits
- 50+ Dimensions = 2m x 1.5m
(Photo 1) - walls of excavation = silty clay orange w/ grey mottles, no anthropogenic inclusions
- no indication of contaminated substrate
- base of excavation obscured by water
- 30 - Dimensions = 3.5m x 2m x 1.3m deep
- base + walls of excavation = silty clay orange w/ grey mottles, no anthropogenic (Photo 2) material observed,
- base of excavation is visible + also free of anthropogenic material
- no potential indicators of contamination observed

SP6 - Appears to be missing - will need to clarify its location, by GPS + drivers site photos to identify where it is

left site 5:00pm

Associated Completed Forms (eg, bore logs, PID/XRF calibration forms)

N/A

Note
This document contains information that is privileged, confidential or otherwise protected from use, disclosure, reproduction or distribution. © 1999 - 2009 JBS Environmental
PO Box 940, Mascot NSW 1460 • Phone: 8338 1013 • Fax: 8338 1700 • E-mail: jbs@jbsgroup.com.au

Daily Field Report

Page 1 of 1

Date: 4/4/12
Arrival Time 6.40am
Depart Time 9.00am
Site Address Zouch Road, E Perth

Completed by AB
Weather Fine
Subcontractor(s) ~~N/A~~

Purpose of Visit SPG validation inspection of UE's

Notes

(include sketch or attach site map/plan)

- Arrived at 6.40am
- Inspected SPG footprint - no ACM or other potential contamination indicators were observed
- Breed (TDM) showed Area two bunkers not identified by previous site assessments
- A.B conducted UPs into material stockpiled and the adjacent depression to inspect the material
- No potential contamination indicators were observed,
- AB sampled SPs (18+19) for beneficial re-use onsite
- left site 9.00am

Associated Completed Forms

(eg, bore logs, PID/XRF calibration forms)

Borelogs
Field Sheets

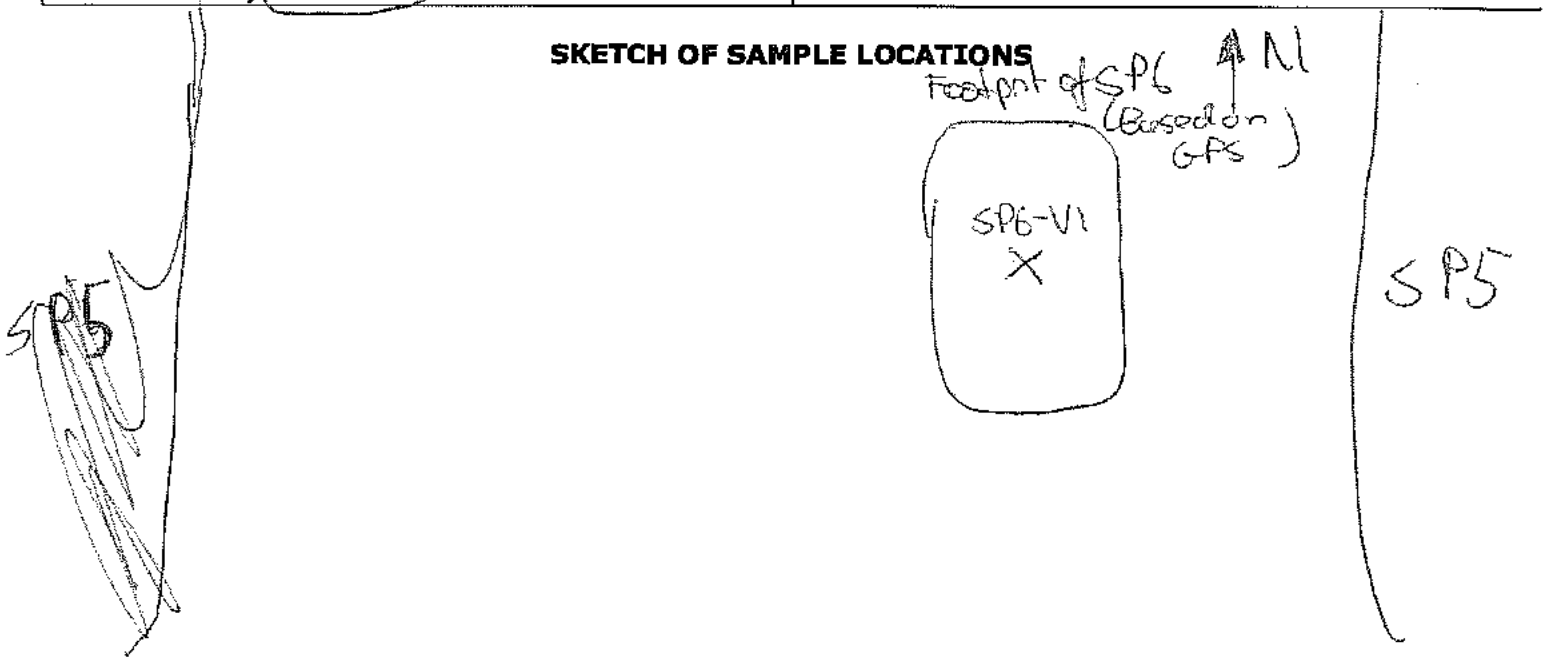
Note
This document contains information that is privileged, confidential or otherwise protected from use, disclosure, reproduction or distribution. © 1999 - 2009 JBS Environmental
PO Box 940, Mascot NSW 1460 • Phone: 8338 1013 • Fax: 8338 1700 • E-mail: jbs@jbsgroup.com.au

Field Screening of Soils

JBS ENVIRONMENTAL

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 4/4/12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation/Validation	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS



SAMPLE ID	DATE	DEPTH (m)	PID/XRF (ppm)	SOIL DESCRIPTION AND FATE
SP6-V1	4/4/12	0-0.1m	N/A	Silty clay, Orange, dry, hard, L.P, Inclusions of gravels
				- No odours, no staining, no anthropogenic material, no ACM observed across the stockpile footprint

ADDITIONAL NOTES:

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

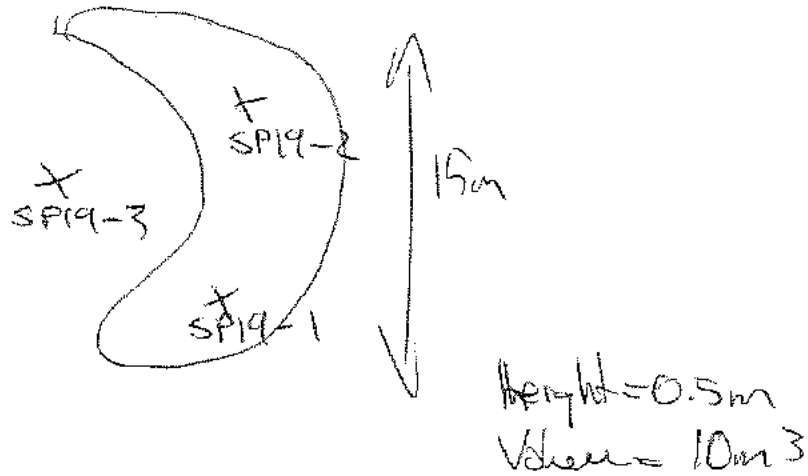
Field Screening of Soils

JBS ENVIRONMENTAL

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 4/4/12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation/Validation SP19 ~~#~~ Bunker 2	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS

UFSP02 [SP19] ↑ N



SAMPLE ID	DATE	DEPTH (m)	PID/XRF (ppm)	SOIL DESCRIPTION AND FATE
SP19-1				
SP19-2		See	logs	
SP19-3				

ADDITIONAL NOTES: No Potential contamination indicators identified

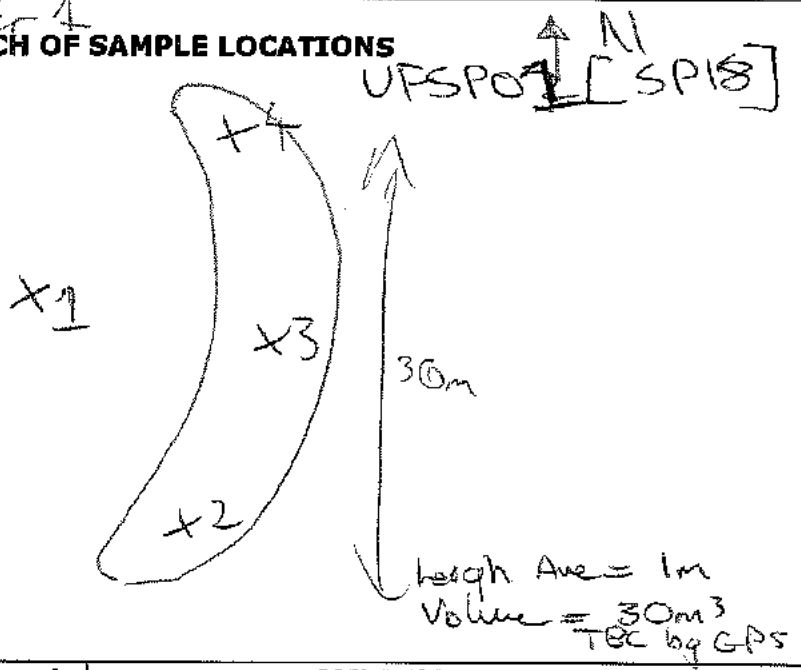
Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

Field Screening of Soils

JBS ENVIRONMENTAL

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 4/4/12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation/Validation SP18 under 1	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS



SAMPLE ID	DATE	DEPTH (m)	PID/XRF (ppm)	SOIL DESCRIPTION AND FATE
SP18-1	4/4/12			See log
SP18-2	"			See log
SP18-3	"			See log QC/QA06
SP18-4	"			See log

ADDITIONAL NOTES:

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

JBS ENVIRONMENTAL

Borehole / Well / Test Pit No: SP19-1

Project No: 41945
Client: Landcom
Project Name: Ed Parker
Site Address: South Rd

Date: 4/4/12
Contractor: TRM
Drill Rig/Excavation Plant: Tyrrell excavator
Method: TP
Total Hole Depth: 0.7m

Eastings (MGA):
Northings (MGA):
Reference Level:
Elevation - Surface/TOC:
Bore Diameter/Pit Dimension:

Water Level Initial:
Water Level Static:
Casing Type/Surface Finish:
Screen Diameter/Length:
Casing Diameter/Length:

SUBSURFACE PROFILE				SAMPLE				
Depth (m)	Graphic Log	Lithologic Classification	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments	Well Construction
0.3m			FILL: silty clay, light brown, dry, N.P, hetro w/ sandstone gravels	0.3m		G+J		
0.7m			NATIVE: silty clay, orange w/ yellow, Fm, N.P hetro					
			∠ 0.1 at 0.7m					

Method	Sample Type	Reference Level	Casing Type / Surface Finish	Log Details
HA – Hand Auger SFA – Solid Flight Auger HFA – Hollow Flight Auger PT – Push Tubing AH – Air Hammer TP – Test Pit	U – Undisturbed Tube Sample D – Disturbed Sample CS – Core Sample	AHD – Australian Height Datum BGS – Below Ground Surface TOC – Top of Casing	PVC18 – Class 18 PVC MT – Monument RB – Roadbox SP – Stick up/Standpipe	Logged By: AB Project Manager: JR

Description						Coarse Grained Soils			Fine Grained Soils		Inclusions
CLASS	Texture	Grading/Sorting	Colour	Structure	Moisture	Density	Grain Size	Angularity	Consistency	Plasticity	Secondary
FILL CLAY SILT SAND GRAVEL TOPSOIL PEAT	clayey silty sandy gravelly organic	well sorted-poorly graded poorly sorted-well graded	red yellow white black brown grey	homogeneous heterogeneous stratified laminated lens root holes occasional inter-bedded mottled	dry damp moist wet saturated	very loose loose medium dense very dense	boulders cobbles coarse gravel fine gravel coarse sand medium sand fine sand	very angular angular sub-angular sub-rounded rounded well rounded	very soft soft firm stiff very stiff hard	non-plastic low plasticity medium plasticity high plasticity	and (35-50%) some (20-35%) little (10-20%) trace (0-10%) Contamination odour staining solid waste

JBS ENVIRONMENTAL

Borehole / Well / Test Pit No: SP19-2

Project No: 41945
Client: Landcom
Project Name: Ed Park
Site Address: Leach Rd

Date: 4/4/12
Contractor:
Drill Rig/Excavation Plant: TRM
Method: Excavator
Total Hole Depth: 0.8m

Eastings (MGA):
Northings (MGA):
Reference Level:
Elevation - Surface/TOC:
Bore Diameter/Pit Dimension:

Water Level Initial:
Water Level Static:
Casing Type/Surface Finish:
Screen Diameter/Length:
Casing Diameter/Length:

SUBSURFACE PROFILE				SAMPLE				
Depth (m)	Graphic Log	Lithologic Classification	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments	Well Construction
			Silty clay, light brown, dry, with sandstone gravels	0.4m		BT		
0.3m			NAT: Silty clay, orange/yellow, dry, firm, L.P, lean					
			E.O.H at 0.8m					

Method	Sample Type	Reference Level	Casing Type / Surface Finish	Log Details
HA – Hand Auger SFA – Solid Flight Auger HFA – Hollow Flight Auger PT – Push Tubing AH – Air Hammer TP – Test Pit	U – Undisturbed Tube Sample D – Disturbed Sample CS – Core Sample	AHD – Australian Height Datum BGS – Below Ground Surface TOC – Top of Casing	PVC18 – Class 18 PVC MT – Monument RB – Roadbox SP – Stick up/Standpipe	Logged By: AG Project Manager: JR

Description						Coarse Grained Soils			Fine Grained Soils		Inclusions
CLASS	Texture	Grading/Sorting	Colour	Structure	Moisture	Density	Grain Size	Angularity	Consistency	Plasticity	Secondary
FILL CLAY SILT SAND GRAVEL TOPSOIL PEAT	clayey silty sandy gravelly organic	well sorted-poorly graded poorly sorted-well graded	red yellow white black brown grey	homogeneous heterogeneous stratified laminated lens root holes occasional inter-bedded mottled	dry damp moist wet saturated	very loose loose medium dense very dense	boulders cobbles coarse gravel fine gravel coarse sand medium sand fine sand	very angular angular sub-angular sub-rounded rounded well rounded	very soft soft firm stiff very stiff hard	non-plastic low plasticity medium plasticity high plasticity	and (35-50%) some (20-35%) little (10-20%) trace (0-10%) Contamination odour staining solid waste

JBS ENVIRONMENTAL

Borehole / Well / Test Pit No: SP19-3

Project No: 41945
Client: Landcom
Project Name: Ed. Park
Site Address: South Rd

Date: 4/4/19
Contractor: Fulton Excavations
Drill Rig/Excavation Plant: TRH
Method:
Total Hole Depth: 0.6m

Eastings (MGA):
Northings (MGA):
Reference Level:
Elevation - Surface/TOC:
Bore Diameter/Pit Dimension:

Water Level Initial:
Water Level Static:
Casing Type/Surface Finish:
Screen Diameter/Length:
Casing Diameter/Length:

SUBSURFACE PROFILE				SAMPLE				
Depth (m)	Graphic Log	Lithologic Classification	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments	Well Construction
			FILL: Silty Sandy clay, dark brown, damp, M/L, soft, hetro w/ shale + sandstone gravel	0.2m		ESA		
0.2m			NAT: Silty clay, orange w/ yellow mottles fm, N.P, dry hard					
			E.O.H at 0.6m					

Method	Sample Type	Reference Level	Casing Type / Surface Finish	Log Details
HA – Hand Auger SFA – Solid Flight Auger HFA – Hollow Flight Auger PT – Push Tubing AH – Air Hammer TP – Test Pit	U – Undisturbed Tube Sample D – Disturbed Sample CS – Core Sample	AHD – Australian Height Datum BGS – Below Ground Surface TOC – Top of Casing	PVC18 – Class 18 PVC MT – Monument RB – Roadbox SP – Stick up/Standpipe	Logged By: AB Project Manager: JR

Description						Coarse Grained Soils			Fine Grained Soils		Inclusions
CLASS	Texture	Grading/Sorting	Colour	Structure	Moisture	Density	Grain Size	Angularity	Consistency	Plasticity	Secondary
FILL CLAY SILT SAND GRAVEL TOPSOIL PEAT	clayey silty sandy gravelly organic	well sorted-poorly graded poorly sorted-well graded	red yellow white black brown grey	homogeneous heterogeneous stratified laminated lens root holes occasional inter-bedded mottled	dry damp moist wet saturated	very loose loose medium dense very dense	boulders cobbles coarse gravel fine gravel coarse sand medium sand fine sand	very angular angular sub-angular sub-rounded rounded well rounded	very soft soft firm stiff very stiff hard	non-plastic low plasticity medium plasticity high plasticity	and (35-50%) some (20-35%) little (10-20%) trace (0-10%) Contamination odour staining solid waste

JBS ENVIRONMENTAL

Borehole / Well / Test Pit No: SP18-4

Project No: 4445
Client: Longtom
Project Name: Ed. Park
Site Address: Zoch Rd

Date: 4/4/12
Contractor: TRN
Drill Rig/Excavation Plant:
Method: TP w/excavator
Total Hole Depth: 0.4m

Eastings (MGA):
Northings (MGA):
Reference Level:
Elevation - Surface/TOC:
Bore Diameter/Pit Dimension:

Water Level Initial:
Water Level Static:
Casing Type/Surface Finish:
Screen Diameter/Length:
Casing Diameter/Length:

SUBSURFACE PROFILE				SAMPLE				
Depth (m)	Graphic Log	Lithologic Classification	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments	Well Construction
			FILL: Silty clay, light brown dry, L.P. St/soft, hetro w/ trace sandstn gravels	0.3m		(BT)		
0.4m			NATURAL: Silty clay, orange w/ yellow mottles, firm, L.P., dry homo					
			E.O.H. at 0.2m bgs					

Method	Sample Type	Reference Level	Casing Type / Surface Finish	Log Details
HA – Hand Auger SFA – Solid Flight Auger HFA – Hollow Flight Auger PT – Push Tubing AH – Air Hammer TP – Test Pit	U – Undisturbed Tube Sample D – Disturbed Sample CS – Core Sample	AHD – Australian Height Datum BGS – Below Ground Surface TOC – Top of Casing	PVC18 – Class 18 PVC MT – Monument RB – Roadbox SP – Stick up/Standpipe	Logged By: AD Project Manager: TR

Description						Coarse Grained Soils			Fine Grained Soils		Inclusions
CLASS	Texture	Grading/Sorting	Colour	Structure	Moisture	Density	Grain Size	Angularity	Consistency	Plasticity	Secondary
FILL CLAY SILT SAND GRAVEL TOPSOIL PEAT	clayey silty sandy gravelly organic	well sorted-poorly graded poorly sorted-well graded	red yellow white black brown grey	homogeneous heterogeneous stratified laminated lens root holes occasional inter-bedded mottled	dry damp moist wet saturated	very loose loose medium dense very dense	boulders cobbles coarse gravel fine gravel coarse sand medium sand fine sand	very angular angular sub-angular sub-rounded rounded well rounded	very soft soft firm stiff very stiff hard	non-plastic low plasticity medium plasticity high plasticity	and (35-50%) some (20-35%) little (10-20%) trace (0-10%) Contamination odour staining solid waste

JBS ENVIRONMENTAL

Borehole / Well / Test Pit No: SP18-1

Project No: 41945
Client: Landcom
Project Name: Ed. Precinct
Site Address: South Rd

Date: 4/4/12
Contractor: TRW
Drill Rig/Excavation Plant: TP-excavator
Method:
Total Hole Depth: 0.6m

Eastings (MGA):
Northings (MGA):
Reference Level:
Elevation - Surface/TOC:
Bore Diameter/Pit Dimension:

Water Level Initial:
Water Level Static:
Casing Type/Surface Finish:
Screen Diameter/Length:
Casing Diameter/Length:

SUBSURFACE PROFILE				SAMPLE				
Depth (m)	Graphic Log	Lithologic Classification	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments	Well Construction
			Silty clay, dark brown, dap, M, Pl, soft, hetero w/ shale + sandstone gravels	0.2m		BTJ		
0.3m			NAT: Silty clay, orange w/ yellow mottles fm, LM, homo					
			E.O.H 0.6m NAT					

Method	Sample Type	Reference Level	Casing Type / Surface Finish	Log Details
HA – Hand Auger SFA – Solid Flight Auger HFA – Hollow Flight Auger PT – Push Tubing AH – Air Hammer TP – Test Pit	U – Undisturbed Tube Sample D – Disturbed Sample CS – Core Sample	AHD – Australian Height Datum BGS – Below Ground Surface TOC – Top of Casing	PVC18 – Class 18 PVC MT – Monument RB – Roadbox SP – Stick up/Standpipe	Logged By: BTJ Project Manager: JR

Description						Coarse Grained Soils			Fine Grained Soils		Inclusions
CLASS	Texture	Grading/Sorting	Colour	Structure	Moisture	Density	Grain Size	Angularity	Consistency	Plasticity	Secondary
FILL CLAY SILT SAND GRAVEL TOPSOIL PEAT	clayey silty sandy gravelly organic	well sorted-poorly graded poorly sorted-well graded	red yellow white black brown grey	homogeneous heterogeneous stratified laminated lens root holes occasional inter-bedded mottled	dry damp moist wet saturated	very loose loose medium dense very dense	boulders cobbles coarse gravel fine gravel coarse sand medium sand fine sand	very angular angular sub-angular sub-rounded rounded well rounded	very soft soft firm stiff very stiff hard	non-plastic low plasticity medium plasticity high plasticity	and (35-50%) some (20-35%) little (10-20%) trace (0-10%) Contamination odour staining solid waste

IMSO Forms 031 – **DRILLING_EXCAVATION LOG**

JBS ENVIRONMENTAL

Borehole / Well / Test Pit No: SP18-2

Project No: 41945
Client: Landcon
Project Name: Ed. Folk
Site Address: Search Rd

Date: 4/4/12
Contractor: TRN
Drill Rig/Excavation Plant:
Method: Excavator
Total Hole Depth: 0.7m

Eastings (MGA):
Northings (MGA):
Reference Level:
Elevation - Surface/TOC:
Bore Diameter/Pit Dimension:

Water Level Initial:
Water Level Static:
Casing Type/Surface Finish:
Screen Diameter/Length:
Casing Diameter/Length:

SUBSURFACE PROFILE				SAMPLE				
Depth (m)	Graphic Log	Lithologic Classification	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments	Well Construction
			FILL: Silty clay, light brown, dry, L.P., below with trace sandstone gravels	0.3m		B75		
0.4m			NAT: Silty clay orange w/ yellow, dry, brd, N.P.					
			E.O.H at 0.7m NAT					

Method	Sample Type	Reference Level	Casing Type / Surface Finish	Log Details
HA – Hand Auger SFA – Solid Flight Auger HFA – Hollow Flight Auger PT – Push Tubing AH – Air Hammer TP – Test Pit	U – Undisturbed Tube Sample D – Disturbed Sample CS – Core Sample	AHD – Australian Height Datum BGS – Below Ground Surface TOC – Top of Casing	PVC18 – Class 18 PVC MT – Monument RB – Roadbox SP – Stick up/Standpipe	Logged By: MB Project Manager: JR

Description						Coarse Grained Soils			Fine Grained Soils		Inclusions
CLASS	Texture	Grading/Sorting	Colour	Structure	Moisture	Density	Grain Size	Angularity	Consistency	Plasticity	Secondary
FILL CLAY SILT SAND GRAVEL TOPSOIL PEAT	clayey silty sandy gravelly organic	well sorted-poorly graded poorly sorted-well graded	red yellow white black brown grey	homogeneous heterogeneous stratified laminated lens root holes occasional inter-bedded mottled	dry damp moist wet saturated	very loose loose medium dense very dense	boulders cobbles coarse gravel fine gravel coarse sand medium sand fine sand	very angular angular sub-angular sub-rounded rounded well rounded	very soft soft firm stiff very stiff hard	non-plastic low plasticity medium plasticity high plasticity	and (35-50%) some (20-35%) little (10-20%) trace (0-10%) Contamination odour staining solid waste

JBS ENVIRONMENTAL

Borehole / Well / Test Pit No: SP18-3

Project No: 41945
Client: Landcom
Project Name: Ed. Park
Site Address: Zouch Rd

Date: 4/4/12
Contractor: TRN
Drill Rig/Excavation Plant: TP excavator
Method:
Total Hole Depth: 1.3m

Eastings (MGA):
Northings (MGA):
Reference Level:
Elevation - Surface/TOC:
Bore Diameter/Pit Dimension:

Water Level Initial:
Water Level Static:
Casing Type/Surface Finish:
Screen Diameter/Length:
Casing Diameter/Length:

SUBSURFACE PROFILE				SAMPLE				
Depth (m)	Graphic Log	Lithologic Classification	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments	Well Construction
			F.I: Silty clay, light brown, dry, N.P, firm/soft, hi50 w/ trace sandstone gravels	0.6m		B45	QC/QA06	
1.0m			NAT: Silty clay, orange w/ yellow, dry, hard, N.P, heavy					
			E.O.H at 1.3m					

Method	Sample Type	Reference Level	Casing Type / Surface Finish	Log Details
HA – Hand Auger SFA – Solid Flight Auger HFA – Hollow Right Auger PT – Push Tubing AH – Air Hammer TP – Test Pit	U – Undisturbed Tube Sample D – Disturbed Sample CS – Core Sample	AHD – Australian Height Datum BGS – Below Ground Surface TOC – Top of Casing	PVC18 – Class 18 PVC MT – Monument RB – Roadbox SP – Stick up/Standpipe	Logged By: Project Manager:

Description						Coarse Grained Soils			Fine Grained Soils		Inclusions
CLASS	Texture	Grading/Sorting	Colour	Structure	Moisture	Density	Grain Size	Angularity	Consistency	Plasticity	Secondary
FILL CLAY SILT SAND GRAVEL TOPSOIL PEAT	clayey silty sandy gravelly organic	well sorted-poorly graded poorly sorted-well graded	red yellow white black brown grey	homogeneous heterogeneous stratified laminated lens root holes occasional inter-bedded mottled	dry damp moist wet saturated	very loose loose medium dense very dense	boulders cobbles coarse gravel fine gravel coarse sand medium sand fine sand	very angular angular sub-angular sub-rounded rounded well rounded	very soft soft firm stiff very stiff hard	non-plastic low plasticity medium plasticity high plasticity	and (35-50%) some (20-35%) little (10-20%) trace (0-10%) Contamination odour staining solid waste

Field Reporting Cover Sheet

JBS ENVIRONMENTAL

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO:** 41945
FIELD DATES: 11-4-12	**JBS PM:** J. Rosner
FIELD STAFF: A.B	
WEATHER: Fine	
PROPOSED WORKS: UFSP testing	
SUMMARY OF FIELDWORK: inspected & sampled UFSP03-7 UFSP08	
IMPORTANT OUTCOMES TO NOTE: some anthropogenic material identified in SP's including bullets (rubber), metal, glass + tile.	
COC SENT? Yes	**DATE SAMPLES SENT:** 12/4/12
PRIMARY LAB: Envirolab	**SECONDARY LAB:** N/A

POST-FIELDWORK CHECKLIST

- ☐ COC checked with PM
- ☐ Site map updated and attached
- ☐ Field data sheets attached (bore logs, well monitoring sheets)
- ☐ Calibration and decontamination sheets attached
- ☐ Field notes attached
- ☐ Photos downloaded to file
- ☐ Electronic bore logs completed and checked

OUTSTANDING ACTIONS:

Daily Field Report

Date: 11/4/12
Arrival Time 6.40am
Depart Time 10.30am
Site Address Leach Rd

Completed by AB
Weather Fine
Subcontractor(s) TRN

Purpose of Visit Stockpile characterisation VESPS

Notes
(include sketch or attach site map/plan)

- Arrived at 6.40am
- VFSP03 (S^TH of rail - adjacent to SP10 + SP11)
- VFSP04 (N^th of rail adjacent to SP15)
- VFSP05 + 06 (@ rail line
- VFSP07 + 08 (Binder + depression near VFSP05 + 06
- 10am
- ~~TRN move~~ SP10 to
- TRN move SP11 - clean material
- assistant with Golders natural observations
- leave site 10.30am

Associated Completed Forms
(eg, bore logs, PID/XRF calibration forms)

borelogs

Note
This document contains information that is privileged, confidential or otherwise protected from use, disclosure, reproduction or distribution. © 1999 - 2009 JBS Environmental
PO Box 940, Mascot NSW 1460 • Phone: 8338 1013 • Fax: 8338 1700 • E-mail: jbs@jbsgroup.com.au

Field Screening of Soils

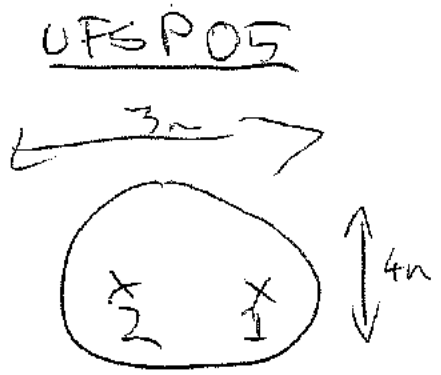
JBS ENVIRONMENTAL

PROJECT NAME:	**PROJECT NO:** 41945
FIELDWORK DATES: 11/4/12	**SAMPLERS:** AC
TYPE OF INVESTIGATION (GME/ESA etc):	**PROJECT MANAGER:**

12m3

SKETCH OF SAMPLE LOCATIONS

UFSP05



rail line

SAMPLE ID	DATE	DEPTH (m)	PID/XRF (ppm)	SOIL DESCRIPTION AND FATE
UFSP05-1				500 log
UFSP05-2				

ADDITIONAL NOTES:

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

Field Screening of Soils

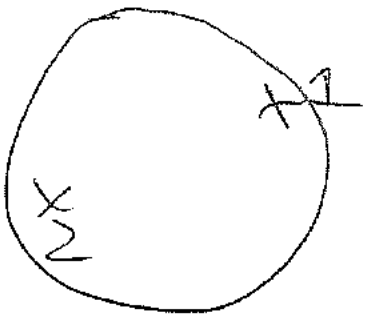
JBS ENVIRONMENTAL

PROJECT NAME: E Park Rem	**PROJECT NO:** 41945
FIELDWORK DATES: 11/4/17	**SAMPLERS:**
TYPE OF INVESTIGATION (GME/ESA etc):	**PROJECT MANAGER:**

Volume = 70m3

SKETCH OF SAMPLE LOCATIONS

UFSP06.



rail line

SAMPLE ID	DATE	DEPTH (m)	PID/XRF (ppm)	SOIL DESCRIPTION AND FATE
UFSP06-1	11/4/17	1.0m	see logs	
UFSP06-2	11/4/17	1.0m		

ADDITIONAL NOTES:

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

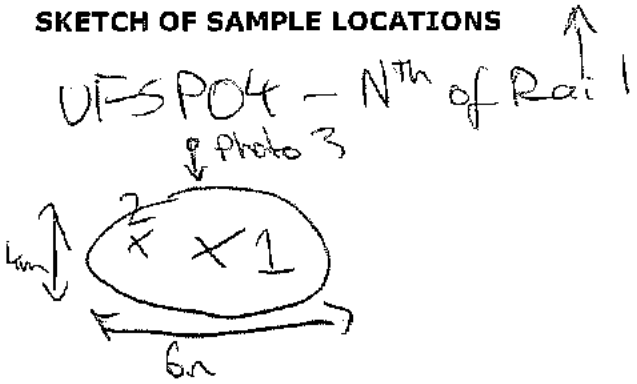
Field Screening of Soils

JBS ENVIRONMENTAL

PROJECT NAME: Ed Park Rem	**PROJECT NO:** 41945
FIELDWORK DATES: 11/4/12	**SAMPLERS:** AB
TYPE OF INVESTIGATION (GME/ESA etc):	**PROJECT MANAGER:** JR

SKETCH OF SAMPLE LOCATIONS

Volume = 24m3



SAMPLE ID	DATE	DEPTH (m)	PID/XRF (ppm)	SOIL DESCRIPTION AND FATE
UFSP04-1	11/4/12	0.5m	See book	

ADDITIONAL NOTES:

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

Field Screening of Soils

JBS ENVIRONMENTAL

PROJECT NAME: Ed Park Rem.	**PROJECT NO:** 41945
FIELDWORK DATES: 11/4/12	**SAMPLERS:** AB
TYPE OF INVESTIGATION (GME/ESA etc):	**PROJECT MANAGER:** JR

Approx Volume = 50m³

SKETCH OF SAMPLE LOCATIONS

UFSP03 – South of Rail

↓ Photo 2

N

Photo 1 →

SAMPLE ID	DATE	DEPTH (m)	PID/XRF (ppm)	SOIL DESCRIPTION AND FATE
UFSP03-1	11/4/12			
UFSP03-2	11/4/12		see logs	

ADDITIONAL NOTES:

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

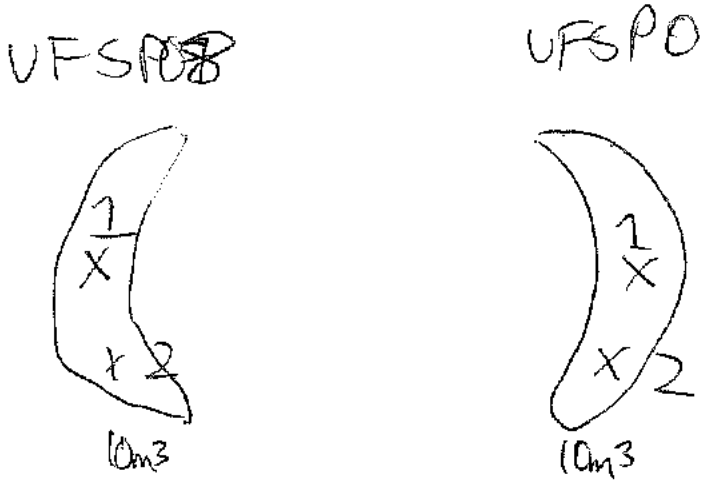
Field Screening of Soils

JBS ENVIRONMENTAL

PROJECT NAME: Ed. Park	**PROJECT NO:** 41945
FIELDWORK DATES: 11/4/12	**SAMPLERS:** AB
TYPE OF INVESTIGATION (GME/ESA etc):	**PROJECT MANAGER:**

SKETCH OF SAMPLE LOCATIONS

N



SAMPLE ID	DATE	DEPTH (m)	PID/XRF (ppm)	SOIL DESCRIPTION AND FATE
UFSP07-1	11/4/12		See logs	
UFSP08-1	11/4/12			

ADDITIONAL NOTES:

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

JBS ENVIRONMENTAL

Borehole / Well / Test Pit No: UFSP03-1

Project No: 41945
Client: Landcom
Project Name:
Site Address:

Date: 11/4/12
Contractor: TP w/excavator
Drill Rig/Excavation Plant:
Method:
Total Hole Depth:

Eastings (MGA):
Northings (MGA):
Reference Level:
Elevation - Surface/TOC:
Bore Diameter/Pit Dimension:

Water Level Initial:
Water Level Static:
Casing Type/Surface Finish:
Screen Diameter/Length:
Casing Diameter/Length:

SUBSURFACE PROFILE				SAMPLE				
Depth (m)	Graphic Log	Lithologic Classification	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments	Well Construction
			FILL: Silty clay, orange+brown, dry, L.P, hetro, frm, w/ sandstone + ironstone gravels throughout, tree roots	1.0m				
1.2m			1.2m E.O.H - end of SP, NAT: Silty clay orange w/ grey mottles, frm, L.P, dry					
			hard					
1.5m			E.O.H at 1.5m					

Method	Sample Type	Reference Level	Casing Type / Surface Finish	Log Details
HA – Hand Auger SFA – Solid Flight Auger HFA – Hollow Flight Auger PT – Push Tubing AH – Air Hammer TP – Test Pit	U – Undisturbed Tube Sample D – Disturbed Sample CS – Core Sample	AHD – Australian Height Datum BGS – Below Ground Surface TOC – Top of Casing	PVC18 – Class 18 PVC MT – Monument RB – Roadbox SP – Stick up/Standpipe	Logged By: AB Project Manager: JR

Description						Coarse Grained Soils			Fine Grained Soils		Inclusions
CLASS	Texture	Grading/Sorting	Colour	Structure	Moisture	Density	Grain Size	Angularity	Consistency	Plasticity	Secondary
FILL CLAY SILT SAND GRAVEL TOPSOIL PEAT	clayey silty sandy gravelly organic	well sorted-poorly graded poorly sorted-well graded	red yellow white black brown grey	homogeneous heterogeneous stratified laminated lens root holes occasional inter-bedded mottled	dry damp moist wet saturated	very loose loose medium dense very dense	boulders cobbles coarse gravel fine gravel coarse sand medium sand fine sand	very angular angular sub-angular sub-rounded rounded well rounded	very soft soft firm stiff very stiff hard	non-plastic low plasticity medium plasticity high plasticity	and (35-50%) some (20-35%) little (10-20%) trace (0-10%) Contamination odour staining solid waste

JBS ENVIRONMENTAL

Borehole / Well / Test Pit No: VFS P03-2

Project No: 41945
Client:
Project Name:
Site Address:

Date: 11/4/12
Contractor:
Drill Rig/Excavation Plant: TP w/excavator
Method:
Total Hole Depth:

Eastings (MGA):
Northings (MGA):
Reference Level:
Elevation - Surface/TOC:
Bore Diameter/Pit Dimension:

Water Level Initial:
Water Level Static:
Casing Type/Surface Finish:
Screen Diameter/Length:
Casing Diameter/Length:

SUBSURFACE PROFILE				SAMPLE				
Depth (m)	Graphic Log	Lithologic Classification	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments	Well Construction
			fill: Silty clay, orange + brown, dry, L.P, heterog, firm, w/ sandstone gravels + tree roots	0.5m				
1.2m			NAT: Silty clay, orange + grey, dry to L.D, stiff, hard					
			E.O.H at 1.5m NAT					

Method	Sample Type	Reference Level	Casing Type / Surface Finish	Log Details
HA – Hand Auger SFA – Solid Flight Auger HFA – Hollow Flight Auger PT – Push Tubing AH – Air Hammer TP – Test Pit	U – Undisturbed Tube Sample D – Disturbed Sample CS – Core Sample	AHD – Australian Height Datum BGS – Below Ground Surface TOC – Top of Casing	PVC18 – Class 18 PVC MT – Monument RB – Roadbox SP – Stick up/Standpipe	Logged By: AB Project Manager: JR

Description						Coarse Grained Soils			Fine Grained Soils		Inclusions
CLASS	Texture	Grading/Sorting	Colour	Structure	Moisture	Density	Grain Size	Angularity	Consistency	Plasticity	Secondary
FILL CLAY SILT SAND GRAVEL TOPSOIL PEAT	clayey silty sandy gravelly organic	well sorted-poorly graded poorly sorted-well graded	red yellow white black brown grey	homogeneous heterogeneous stratified laminated lens root holes occasional inter-bedded mottled	dry damp moist wet saturated	very loose loose medium dense very dense	boulders cobbles coarse gravel fine gravel coarse sand medium sand fine sand	very angular angular sub-angular sub-rounded rounded well rounded	very soft soft firm stiff very stiff hard	non-plastic low plasticity medium plasticity high plasticity	and (35-50%) some (20-35%) little (10-20%) trace (0-10%) **Contamination** odour staining solid waste

JBS ENVIRONMENTAL

Borehole / Well / Test Pit No: VFSP04 – 1

Project No: 41945
Client: Landcom
Project Name:
Site Address:

Date: 11/4/12
Contractor:
Drill Rig/Excavation Plant: tp whitecontractor
Method:
Total Hole Depth:

Eastings (MGA):
Northings (MGA):
Reference Level:
Elevation - Surface/TOC:
Bore Diameter/Pit Dimension:

Water Level Initial:
Water Level Static:
Casing Type/Surface Finish:
Screen Diameter/Length:
Casing Diameter/Length:

SUBSURFACE PROFILE				SAMPLE				
Depth (m)	Graphic Log	Lithologic Classification	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments	Well Construction
			FILL: Silty sandy clay, dark brown, soft, damp, M.P, hetero grass roots, ~~trace pres~~	VFSP04-1 0.5m				
1.0m			NAT: Silty clay, orange, dry, firm, L.P, homo					
1.3m			E.O.H at 1.3m					

Method	Sample Type	Reference Level	Casing Type / Surface Finish	Log Details
HA – Hand Auger SFA – Solid Flight Auger HFA – Hollow Flight Auger PT – Push Tubing AH – Air Hammer TP – Test Pit	U – Undisturbed Tube Sample D – Disturbed Sample CS – Core Sample	AHD – Australian Height Datum BGS – Below Ground Surface TOC – Top of Casing	PVC18 – Class 18 PVC MT – Monument RB – Roadbox SP – Stick up/Standpipe	Logged By: AB Project Manager: JR

Description						Coarse Grained Soils			Fine Grained Soils		Inclusions
CLASS	Texture	Grading/Sorting	Colour	Structure	Moisture	Density	Grain Size	Angularity	Consistency	Plasticity	Secondary
FILL CLAY SILT SAND GRAVEL TOPSOIL PEAT	clayey silty sandy gravelly organic	well sorted-poorly graded poorly sorted-well graded	red yellow white black brown grey	homogeneous heterogeneous stratified laminated lens root holes occasional inter-bedded mottled	dry damp moist wet saturated	very loose loose medium dense very dense	boulders cobbles coarse gravel fine gravel coarse sand medium sand fine sand	very angular angular sub-angular sub-rounded rounded well rounded	very soft soft firm stiff very stiff hard	non-plastic low plasticity medium plasticity high plasticity	and (35-50%) some (20-35%) little (10-20%) trace (0-10%) Contamination odour staining solid waste

IMSO Forms 031 – **DRILLING_EXCAVATION LOG**

JBS ENVIRONMENTAL

Borehole / Well / Test Pit No: UFSP04-2

Project No: 419c
Client: Lendlease
Project Name:
Site Address:

Date: 11/4/12
Contractor:
Drill Rig/Excavation Plant: TP excavator
Method:
Total Hole Depth:

Eastings (MGA):
Northings (MGA):
Reference Level:
Elevation - Surface/TOC:
Bore Diameter/Pit Dimension:

Water Level Initial:
Water Level Static:
Casing Type/Surface Finish:
Screen Diameter/Length:
Casing Diameter/Length:

SUBSURFACE PROFILE				SAMPLE				
Depth (m)	Graphic Log	Lithologic Classification	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments	Well Construction
			FILL: Silty sandy clay, dark brown, damp, M.P, soft, hetro glass rocks, trace ironstn gravels, trace pieces of glass + tile	No Sample				
1.0m			NAT: silty clay, orange, dry fm, L.P, hen					
1.3m			E.O.H at 1.3m					

Method	Sample Type	Reference Level	Casing Type / Surface Finish	Log Details
HA – Hand Auger SFA – Solid Flight Auger HFA – Hollow Flight Auger PT – Push Tubing AH – Air Hammer TP – Test Pit	U – Undisturbed Tube Sample D – Disturbed Sample CS – Core Sample	AHD – Australian Height Datum BGS – Below Ground Surface TOC – Top of Casing	PVC18 – Class 18 PVC MT – Monument RB – Roadbox SP – Stick up/Standpipe	Logged By: AB Project Manager: JR

Description						Coarse Grained Soils			Fine Grained Soils		Inclusions
CLASS	Texture	Grading/Sorting	Colour	Structure	Moisture	Density	Grain Size	Angularity	Consistency	Plasticity	Secondary
FILL CLAY SILT SAND GRAVEL TOPSOIL PEAT	clayey silty sandy gravelly organic	well sorted-poorly graded poorly sorted-well graded	red yellow white black brown grey	homogeneous heterogeneous stratified laminated lens root holes occasional inter-bedded mottled	dry damp moist wet saturated	very loose loose medium dense very dense	boulders cobbles coarse gravel fine gravel coarse sand medium sand fine sand	very angular angular sub-angular sub-rounded rounded well rounded	very soft soft firm stiff very stiff hard	non-plastic low plasticity medium plasticity high plasticity	and (35-50%) some (20-35%) tittle (10-20%) trace (0-10%) Contamination odour staining solid waste

IMSO Forms 031 – **DRILLING_EXCAVATION LOG**

JBS ENVIRONMENTAL

Borehole / Well / Test Pit No: UFSP05 – 1

Project No: 41945
Client: Landcorp
Project Name:
Site Address:

Date: 11/4/12
Contractor:
Drill Rig/Excavation Plant: Tp Excavator
Method:
Total Hole Depth:

Eastings (MGA):
Northings (MGA):
Reference Level:
Elevation - Surface/TOC:
Bore Diameter/Pit Dimension:

Water Level Initial:
Water Level Static:
Casing Type/Surface Finish:
Screen Diameter/Length:
Casing Diameter/Length:

SUBSURFACE PROFILE				SAMPLE				
Depth (m)	Graphic Log	Lithologic Classification	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments	Well Construction
			FILL: silty clay, brown/dk grey, M.Pl, fm, fine to m/l sandstone fragms gravels, bullet(probe)	1.0m				
1.5m			NAT: Silty clay, ~~brown~~ orange/grey/dk grey, L.Pl, fm, homo					
			E.O.H at 1.8m					

Method	Sample Type	Reference Level	Casing Type / Surface Finish	Log Details
HA – Hand Auger SFA – Solid Flight Auger HFA – Hollow Flight Auger PT – Push Tubing AH – Air Hammer TP – Test Pit	U – Undisturbed Tube Sample D – Disturbed Sample CS – Core Sample	AHD – Australian Height Datum BGS – Below Ground Surface TOC – Top of Casing	PVC18 – Class 18 PVC MT – Monument RB – Roadbox SP – Stick up/Standpipe	Logged By: NTB Project Manager: JR

Description						Coarse Grained Soils			Fine Grained Soils		Inclusions
CLASS	Texture	Grading/Sorting	Colour	Structure	Moisture	Density	Grain Size	Angularity	Consistency	Plasticity	Secondary
FILL CLAY SILT SAND GRAVEL TOPSOIL PEAT	clayey silty sandy gravelly organic	well sorted-poorly graded poorly sorted-well graded	red yellow white black brown grey	homogeneous heterogeneous stratified laminated lens root holes occasional inter-bedded mottled	dry damp moist wet saturated	very loose loose medium dense very dense	boulders cobbles coarse gravel fine gravel coarse sand medium sand fine sand	very angular angular sub-angular sub-rounded rounded well rounded	very soft soft firm stiff very stiff hard	non-plastic low plasticity medium plasticity high plasticity	and (35-50%) some (20-35%) little (10-20%) trace (0-10%) Contamination odour staining solid waste

JBS ENVIRONMENTAL

Borehole / Well / Test Pit No: UFSP05-2

Project No: 41945
Client: Landcom
Project Name:
Site Address:

Date: 11/4/12
Contractor:
Drill Rig/Excavation Plant: EP excavator
Method:
Total Hole Depth:

Eastings (MGA):
Northings (MGA):
Reference Level:
Elevation - Surface/TOC:
Bore Diameter/Pit Dimension:

Water Level Initial:
Water Level Static:
Casing Type/Surface Finish:
Screen Diameter/Length:
Casing Diameter/Length:

SUBSURFACE PROFILE				SAMPLE				
Depth (m)	Graphic Log	Lithologic Classification	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments	Well Construction
			Fill: Silty clay, [illegible] brown/beige, dry, N.P, fm, hetro w/ sandstone gravels, billet (photo)					
1.4m			1.4m					
1.7			1.7m NAT Silty clay, orange & grey dry, L.P, fm, hom E.O.H at 1.7m					

Method	Sample Type	Reference Level	Casing Type / Surface Finish	Log Details
HA – Hand Auger SFA – Solid Flight Auger HFA – Hollow Flight Auger PT – Push Tubing AH – Air Hammer TP – Test Pit	U – Undisturbed Tube Sample D – Disturbed Sample CS – Core Sample	AHD – Australian Height Datum BGS – Below Ground Surface TOC – Top of Casing	PVC18 – Class 18 PVC MT – Monument RB – Roadbox SP – Stick up/Standpipe	Logged By: AC Project Manager: JR

Description						Coarse Grained Soils			Fine Grained Soils		Inclusions
CLASS	Texture	Grading/Sorting	Colour	Structure	Moisture	Density	Grain Size	Angularity	Consistency	Plasticity	Secondary
FILL CLAY SILT SAND GRAVEL TOPSOIL PEAT	clayey silty sandy gravelly organic	well sorted-poorly graded poorly sorted-well graded	red yellow white black brown grey	homogeneous heterogeneous stratified laminated lens root holes occasional inter-bedded mottled	dry damp moist wet saturated	very loose loose medium dense very dense	boulders cobbles coarse gravel fine gravel coarse sand medium sand fine sand	very angular angular sub-angular sub-rounded rounded well rounded	very soft soft firm stiff very stiff hard	non-plastic low plasticity medium plasticity high plasticity	and (35-50%) some (20-35%) little (10-20%) trace (0-10%) Contamination odour staining solid waste

JBS ENVIRONMENTAL

Borehole / Well / Test Pit No: UFSP06-1

Project No: 41545
Client: Landcom
Project Name:
Site Address:

Date: 11/4/12
Contractor: TP Excavations
Drill Rig/Excavation Plant:
Method:
Total Hole Depth:

Eastings (MGA):
Northings (MGA):
Reference Level:
Elevation - Surface/TOC:
Bore Diameter/Pit Dimension:

Water Level Initial:
Water Level Static:
Casing Type/Surface Finish:
Screen Diameter/Length:
Casing Diameter/Length:

SUBSURFACE PROFILE				SAMPLE				
Depth (m)	Graphic Log	Lithologic Classification	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments	Well Construction
			Fill: Silty clay, light brown/orange, dry, N.P, fm, hetro w/ sandstone gravels, bullets, scrap metal + glass pieces (photo)	1.0m				
1.0m			NAT: Silty clay, orange/grey, dry, L.P, hard					
			E.O.H at 2.2m					

Method	Sample Type	Reference Level	Casing Type / Surface Finish	Log Details
HA – Hand Auger SFA – Solid Flight Auger HFA – Hollow Flight Auger PT – Push Tubing AH – Air Hammer TP – Test Pit	U – Undisturbed Tube Sample D – Disturbed Sample CS – Core Sample	AHD – Australian Height Datum BGS – Below Ground Surface TOC – Top of Casing	PVC18 – Class 18 PVC MT – Monument RB – Roadbox SP – Stick up/Standpipe	Logged By: AB Project Manager: JR

Description						Coarse Grained Soils			Fine Grained Soils		Inclusions
CLASS	Texture	Grading/Sorting	Colour	Structure	Moisture	Density	Grain Size	Angularity	Consistency	Plasticity	Secondary
FILL CLAY SILT SAND GRAVEL TOPSOIL PEAT	clayey silty sandy gravelly organic	well sorted-poorly graded poorly sorted-well graded	red yellow white black brown grey	homogeneous heterogeneous stratified laminated lens root holes occasional inter-bedded mottled	dry damp moist wet saturated	very loose loose medium dense very dense	boulders cobbles coarse gravel fine gravel coarse sand medium sand fine sand	very angular angular sub-angular sub-rounded rounded well rounded	very soft soft firm stiff very stiff hard	non-plastic low plasticity medium plasticity high plasticity	and (35-50%) some (20-35%) little (10-20%) trace (0-10%) Contamination odour staining solid waste

JBS ENVIRONMENTAL

Borehole / Well / Test Pit No: UFSP06-2

Project No: 4964
Client: Landcom
Project Name:
Site Address:

Date: 11/4/12
Contractor:
Drill Rig/Excavation Plant: TP excavator
Method:
Total Hole Depth:

Eastings (MGA):
Northings (MGA):
Reference Level:
Elevation - Surface/TOC:
Bore Diameter/Pit Dimension:

Water Level Initial:
Water Level Static:
Casing Type/Surface Finish:
Screen Diameter/Length:
Casing Diameter/Length:

SUBSURFACE PROFILE				SAMPLE				
Depth (m)	Graphic Log	Lithologic Classification	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments	Well Construction
			FILL: Silty clay, light brown, dry, hard, fm, N.P, w/ sandstone gravels	1.0m				
1.3m			NAT: Silty clay orange & grey, dry, L.P, fm, roots					
			E.O.H at 1.8m					

Method	Sample Type	Reference Level	Casing Type / Surface Finish	Log Details
HA – Hand Auger SFA – Solid Flight Auger HFA – Hollow Flight Auger PT – Push Tubing AH – Air Hammer TP – Test Pit	U – Undisturbed Tube Sample D – Disturbed Sample CS – Core Sample	AHD – Australian Height Datum BGS – Below Ground Surface TOC – Top of Casing	PVC18 – Class 18 PVC MT – Monument RB – Roadbox SP – Stick up/Standpipe	Logged By: AG Project Manager: TR

Description						Coarse Grained Soils			Fine Grained Soils		Inclusions
CLASS	Texture	Grading/Sorting	Colour	Structure	Moisture	Density	Grain Size	Angularity	Consistency	Plasticity	Secondary
FILL CLAY SILT SAND GRAVEL TOPSOIL PEAT	clayey silty sandy gravelly organic	well sorted-poorly graded poorly sorted-well graded	red yellow white black brown grey	homogeneous heterogeneous stratified laminated lens root holes occasional inter-bedded mottled	dry damp moist wet saturated	very loose loose medium dense very dense	boulders cobbles coarse gravel fine gravel coarse sand medium sand fine sand	very angular angular sub-angular sub-rounded rounded well rounded	very soft soft firm stiff very stiff hard	non-plastic low plasticity medium plasticity high plasticity	and (35-50%) some (20-35%) little (10-20%) trace (0-10%) Contamination odour staining solid waste

JBS ENVIRONMENTAL

Borehole / Well / Test Pit No: UFSP07-1

Project No: 41445
Client: Landcom
Project Name:
Site Address:

Date: 11/4/12
Contractor:
Drill Rig/Excavation Plant: TP excavator
Method:
Total Hole Depth:

Eastings (MGA):
Northings (MGA):
Reference Level:
Elevation - Surface/TOC:
Bore Diameter/Pit Dimension:

Water Level Initial:
Water Level Static:
Casing Type/Surface Finish:
Screen Diameter/Length:
Casing Diameter/Length:

SUBSURFACE PROFILE				SAMPLE				
Depth (m)	Graphic Log	Lithologic Classification	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments	Well Construction
			Silty clay, orange/brown, dry, N.P, fm, hard up trace ironstone gravels, bottel (photo)	0.4m				
0.5m								
			NAT: Silty clay, orange, dry, N.P, fm hard,					
0.8m								
			E.O.H @ 0.8m					

Method	Sample Type	Reference Level	Casing Type / Surface Finish	Log Details
HA – Hand Auger SFA – Solid Flight Auger HFA – Hollow Flight Auger PT – Push Tubing AH – Air Hammer TP – Test Pit	U – Undisturbed Tube Sample D – Disturbed Sample CS – Core Sample	AHD – Australian Height Datum BGS – Below Ground Surface TOC – Top of Casing	PVC18 – Class 18 PVC MT – Monument RB – Roadbox SP – Stick up/Standpipe	Logged By: AB Project Manager: TR

Description						Coarse Grained Soils			Fine Grained Soils		Inclusions
CLASS	Texture	Grading/Sorting	Colour	Structure	Moisture	Density	Grain Size	Angularity	Consistency	Plasticity	Secondary
FILL CLAY SILT SAND GRAVEL TOPSOIL PEAT	clayey silty sandy gravelly organic	well sorted-poorly graded poorly sorted-well graded	red yellow white black brown grey	homogeneous heterogeneous stratified laminated lens root holes occasional inter-bedded mottled	dry damp moist wet saturated	very loose loose medium dense very dense	boulders cobbles coarse gravel fine gravel coarse sand medium sand fine sand	very angular angular sub-angular sub-rounded rounded well rounded	very soft soft firm stiff very stiff hard	non-plastic low plasticity medium plasticity high plasticity	and (35-50%) some (20-35%) little (10-20%) trace (0-10%) Contamination odour staining solid waste

JBS ENVIRONMENTAL

Borehole / Well / Test Pit No: UFSP07-2

Project No: 41965
Client: Lendlease
Project Name:
Site Address:

Date: 11/4/12
Contractor: Hydroexcavator
Drill Rig/Excavation Plant:
Method:
Total Hole Depth:

Eastings (MGA):
Northings (MGA):
Reference Level:
Elevation - Surface/TOC:
Bore Diameter/Pit Dimension:

Water Level Initial:
Water Level Static:
Casing Type/Surface Finish:
Screen Diameter/Length:
Casing Diameter/Length:

SUBSURFACE PROFILE				SAMPLE				
Depth (m)	Graphic Log	Lithologic Classification	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments	Well Construction
			Fill: Silty clay, orange/brn, dry, LP, fm, lo-MD, m/trace inorganic gravels	—				
0.5m			NAT: Silty clay, orang+grey, dry, LP, v fm, hom					
0.8m			E.O.H at 0.8					

Method	Sample Type	Reference Level	Casing Type / Surface Finish	Log Details
HA – Hand Auger SFA – Solid Flight Auger HFA – Hollow Flight Auger PT – Push Tubing AH – Air Hammer TP – Test Pit	U – Undisturbed Tube Sample D – Disturbed Sample CS – Core Sample	AHD – Australian Height Datum BGS – Below Ground Surface TOC – Top of Casing	PVC18 – Class 18 PVC MT – Monument RB – Roadbox SP – Stick up/Standpipe	Logged By: RB Project Manager: TR

Description						Coarse Grained Soils			Fine Grained Soils		Inclusions
CLASS	Texture	Grading/Sorting	Colour	Structure	Moisture	Density	Grain Size	Angularity	Consistency	Plasticity	Secondary
FILL CLAY SILT SAND GRAVEL TOPSOIL PEAT	clayey silty sandy gravelly organic	well sorted-poorly graded poorly sorted-well graded	red yellow white black brown grey	homogeneous heterogeneous stratified laminated lens root holes occasional inter-bedded mottled	dry damp moist wet saturated	very loose loose medium dense very dense	boulders cobbles coarse gravel fine gravel coarse sand medium sand fine sand	very angular angular sub-angular sub-rounded rounded well rounded	very soft soft firm stiff very stiff hard	non-plastic low plasticity medium plasticity high plasticity	and (35-50%) some (20-35%) little (10-20%) trace (0-10%) Contamination odour staining solid waste

JBS ENVIRONMENTAL

Borehole / Well / Test Pit No: UFSP08-1

Project No: 41945
Client: Landcom
Project Name:
Site Address:

Date: 11/4/12
Contractor: TP. Interexcavations
Drill Rig/Excavation Plant:
Method:
Total Hole Depth:

Eastings (MGA):
Northings (MGA):
Reference Level:
Elevation - Surface/TOC:
Bore Diameter/Pit Dimension:

Water Level Initial:
Water Level Static:
Casing Type/Surface Finish:
Screen Diameter/Length:
Casing Diameter/Length:

SUBSURFACE PROFILE				SAMPLE				
Depth (m)	Graphic Log	Lithologic Classification	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments	Well Construction
			Fill: Silty clay, light brown/orange, dry, N.P., frm, hetro ultrafine ironstone gravels + siltstone	0.4m				
0.7m			NAF: Silty clay, orange, dry L.P., frm, homo					
1.0m			E.O.H at 1.0m					

Method	Sample Type	Reference Level	Casing Type / Surface Finish	Log Details
HA – Hand Auger SFA – Solid Flight Auger HFA – Hollow Flight Auger PT – Push Tubing AH – Air Hammer TP – Test Pit	U – Undisturbed Tube Sample D – Disturbed Sample CS – Core Sample	AHD – Australian Height Datum BGS – Below Ground Surface TOC – Top of Casing	PVC18 – Class 18 PVC MT – Monument RB – Roadbox SP – Stick up/Standpipe	Logged By: AB Project Manager: JR

Description						Coarse Grained Soils			Fine Grained Soils		Inclusions
CLASS	Texture	Grading/Sorting	Colour	Structure	Moisture	Density	Grain Size	Angularity	Consistency	Plasticity	Secondary
FILL CLAY SILT SAND GRAVEL TOPSOIL PEAT	clayey silty sandy gravelly organic	well sorted-poorly graded poorly sorted-well graded	red yellow white black brown grey	homogeneous heterogeneous stratified laminated lens root holes occasional inter-bedded mottled	dry damp moist wet saturated	very loose loose medium dense very dense	boulders cobbles coarse gravel fine gravel coarse sand medium sand fine sand	very angular angular sub-angular sub-rounded rounded well rounded	very soft soft firm stiff very stiff hard	non-plastic low plasticity medium plasticity high plasticity	and (35-50%) some (20-35%) little (10-20%) trace (0-10%) Contamination odour staining solid waste

JBS ENVIRONMENTAL

Borehole / Well / Test Pit No: UFSP08-2

Project No: 41965
Client:
Project Name:
Site Address:

Date: 11/4/12
Contractor:
Drill Rig/Excavation Plant:
Method:
Total Hole Depth:

Eastings (MGA):
Northings (MGA):
Reference Level:
Elevation - Surface/TOC:
Bore Diameter/Pit Dimension:

Water Level Initial:
Water Level Static:
Casing Type/Surface Finish:
Screen Diameter/Length:
Casing Diameter/Length:

SUBSURFACE PROFILE				SAMPLE				
Depth (m)	Graphic Log	Lithologic Classification	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments	Well Construction
			Fill: silty clay, orange/brown, dry, A.P, fm, ferro w/ trace fine/coarse gravels					
0.5m			NATIVE: silty clay, orange, fm, L.P, ferro					
			E.O.H 0.8m					

Method	Sample Type	Reference Level	Casing Type / Surface Finish	Log Details
HA – Hand Auger SFA – Solid Flight Auger HFA – Hollow Flight Auger PT – Push Tubing AH – Air Hammer TP – Test Pit	U – Undisturbed Tube Sample D – Disturbed Sample CS – Core Sample	AHD – Australian Height Datum BGS – Below Ground Surface TOC – Top of Casing	PVC18 – Class 18 PVC MT – Monument RB – Roadbox SP – Stick up/Standpipe	Logged By: Project Manager:

Description						Coarse Grained Soils			Fine Grained Soils		Inclusions
CLASS	Texture	Grading/Sorting	Colour	Structure	Moisture	Density	Grain Size	Angularity	Consistency	Plasticity	Secondary
FILL CLAY SILT SAND GRAVEL TOPSOIL PEAT	clayey silty sandy gravelly organic	well sorted-poorly graded poorly sorted-well graded	red yellow white black brown grey	homogeneous heterogeneous stratified laminated lens root holes occasional inter-bedded mottled	dry damp moist wet saturated	very loose loose medium dense very dense	boulders cobbles coarse gravel fine gravel coarse sand medium sand fine sand	very angular angular sub-angular sub-rounded rounded well rounded	very soft soft firm stiff very stiff hard	non-plastic low plasticity medium plasticity high plasticity	and (35-50%) some (20-35%) little (10-20%) trace (0-10%) Contamination odour staining solid waste

Field Reporting Cover Sheet

JBS ENVIRONMENTAL

PROJECT NAME: Edmondson Park Rem	**PROJECT NO:** 41945
FIELD DATES: 1/5/12	**JBS PM:** J. Rosner
FIELD STAFF: A.B	
WEATHER: Fine	
PROPOSED WORKS: Site visit, Progress check	
SUMMARY OF FIELDWORK: - inspection of treatment of items removed by TRN - SP sampling - inspection of open waste pits	
IMPORTANT OUTCOMES TO NOTE:	
COC SENT? Yes	**DATE SAMPLES SENT:** 2/5/12
PRIMARY LAB: Envirolab	**SECONDARY LAB:** N/a

POST-FIELDWORK CHECKLIST

- ☐ COC checked with PM
- ☐ Site map updated and attached
- ☐ Field data sheets attached (bore logs, well monitoring sheets)
- ☐ Calibration and decontamination sheets attached
- ☐ Field notes attached
- ☐ Photos downloaded to file
- ☐ Electronic bore logs completed and checked

OUTSTANDING ACTIONS:

Daily Field Report

Date: 1/5/12
Arrival Time 8am
Depart Time 3.20pm
Site Address Zouch Road

Completed by A.B
Weather Fine
Subcontractor(s) N/A

Purpose of Visit Site visit, checking progress on site works

Notes (include sketch or attach site map/plan)

- Site drive-over with Brad (foreman) and located items removed from the MRZ/NRA including: M5, R3, M7, R1, M4

notes:

- R1 - rubbish still existed inside, ACM pipes removed successfully
- M7 - Fill/SP beneath structure containing building demo (bricks, metal + concrete)
- Organised a time with DCD contractors to walk a 10% check with them (Friday AM)
- Open waste Pit - walls and surface covered excavation still contain ACM, western end of excavation - appears backfilled with ACM impacted fill material + rubbish (bricks, metal etc) may need to excavate backfilled area + add to JSP1/encapsulation area - Brad said when waste pit was scraped out material was moved to western end of excavation
- WDW + PATH area - expect to sample Thursday
- Lead impact) area - can stat friday/next monday

Associated Completed Forms (eg, bore logs, PID/XRF calibration forms)

Note
This document contains information that is privileged, confidential or otherwise protected from use, disclosure, reproduction or distribution. © 1999 - 2009 JBS Environmental
PO Box 940, Mascot NSW 1460 • Phone: 8338 1013 • Fax: 8338 1700 • E-mail: jbs@jbsgroup.com.au

Daily Field Report

Date: 1/5/12
Arrival Time 8am
Depart Time
Site Address Zetland

Completed by A. B
Weather Fine
Subcontractor(s) N/A

Purpose of Visit

Notes

(include sketch or attach site map/plan)

- Fill/SP - M7 opened up + sampled labelled as UFSP10
= UFSP07 - also opened up, inspected + sampled
~ Former footings adjacent to M7 were inspected after floor removal
- Photos of NW boundary taken showing amount of fill placed there - height = - Left side 3.20m

Associated Completed Forms

(eg, bore logs, PID/XRF calibration forms)

Note
This document contains information that is privileged, confidential or otherwise protected from use, disclosure, reproduction or distribution. © 1999 - 2009 JBS Environmental
PO Box 940, Mascot NSW 1460 • Phone: 8338 1013 • Fax: 8338 1700 • E-mail: jbs@jbsgroup.com.au

JBS ENVIRONMENTAL

Borehole / Well / Test Pit No: UFSP10-1

Project No: 46945
Client: Landcom
Project Name: Ed. Park
Site Address:

Date: 1/5/12
Contractor: EMS
Drill Rig/Excavation Plant: TP Excavator
Method:
Total Hole Depth: 1.6m

Eastings (MGA):
Northings (MGA):
Reference Level:
Elevation - Surface/TOC:
Bore Diameter/Pit Dimension:

Water Level Initial:
Water Level Static:
Casing Type/Surface Finish:
Screen Diameter/Length:
Casing Diameter/Length:

SUBSURFACE PROFILE				SAMPLE				
Depth (m)	Graphic Log	Lithologic Classification	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments	Well Construction
			FILL: Silty clay, brown + orange dry, M.P, hetro w/ trace concrete + brick pieces	UFSP10-1 (B+T) 0.5m				
1.2m			NAT - Silty clay, orange w/ grey mottles, hm, L.P, dry, homo					
1.6m			E.O.H at 1.6m					

Method	Sample Type	Reference Level	Casing Type / Surface Finish	Log Details
HA – Hand Auger SFA – Solid Flight Auger HFA – Hollow Flight Auger PT – Push Tubing AH – Air Hammer TP – Test Pit	U – Undisturbed Tube Sample D – Disturbed Sample CS – Core Sample	AHD – Australian Height Datum BGS – Below Ground Surface TOC – Top of Casing	PVC18 – Class 18 PVC MT – Monument RB – Roadbox SP – Stick up/Standpipe	Logged By: Project Manager:

Description						Coarse Grained Soils			Fine Grained Soils		Inclusions
CLASS	Texture	Grading/Sorting	Colour	Structure	Moisture	Density	Grain Size	Angularity	Consistency	Plasticity	Secondary
FILL CLAY SILT SAND GRAVEL TOPSOIL PEAT	clayey silty sandy gravelly organic	well sorted-poorly graded poorly sorted-well graded	red yellow white black brown grey	homogeneous heterogeneous stratified laminated lens root holes occasional inter-bedded mottled	dry damp moist wet saturated	very loose loose medium dense very dense	boulders cobbles coarse gravel fine gravel coarse sand medium sand fine sand	very angular angular sub-angular sub-rounded rounded well rounded	very soft soft firm stiff very stiff hard	non-plastic low plasticity medium plasticity high plasticity	and (35-50%) some (20-35%) little (10-20%) trace (0-10%) Contamination odour staining solid waste

JBS ENVIRONMENTAL

Borehole / Well / Test Pit No: UFSP10-2

Project No: 41945
Client: Landcom
Project Name: Ed Park
Site Address:

Date: 15/5/12
Contractor: EMS
Drill Rig/Excavation Plant: TP w excavator
Method: TP
Total Hole Depth: 1.3m

Eastings (MGA):
Northings (MGA):
Reference Level:
Elevation - Surface/TOC:
Bore Diameter/Pit Dimension:

Water Level Initial:
Water Level Static:
Casing Type/Surface Finish:
Screen Diameter/Length:
Casing Diameter/Length:

SUBSURFACE PROFILE				SAMPLE				
Depth (m)	Graphic Log	Lithologic Classification	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments	Well Construction
			Fill: Silty clay, orange brown, dry, M.D, hetro w/ trace concrete + brick pieces					
1.0m			NAT: silty clay orange w/ grey mottles fm, L.P, dry					
1.3m			E.O.H NAT					

Method	Sample Type	Reference Level	Casing Type / Surface Finish	Log Details
HA – Hand Auger SFA – Solid Flight Auger HFA – Hollow Flight Auger PT – Push Tubing AH – Air Hammer TP – Test Pit	U – Undisturbed Tube Sample D – Disturbed Sample CS – Core Sample	AHD – Australian Height Datum BGS – Below Ground Surface TOC – Top of Casing	PVC18 – Class 18 PVC MT – Monument RB – Roadbox SP – Stick up/Standpipe	Logged By: Project Manager:

Description						Coarse Grained Soils			Fine Grained Soils		Inclusions
CLASS	Texture	Grading/Sorting	Colour	Structure	Moisture	Density	Grain Size	Angularity	Consistency	Plasticity	Secondary
FILL CLAY SILT SAND GRAVEL TOPSOIL PEAT	clayey silty sandy gravelly organic	well sorted-poorly graded poorly sorted-well graded	red yellow white black brown grey	homogeneous heterogeneous stratified laminated lens root holes occasional inter-bedded mottled	dry damp moist wet saturated	very loose loose medium dense very dense	boulders cobbles coarse gravel fine gravel coarse sand medium sand fine sand	very angular angular sub-angular sub-rounded rounded well rounded	very soft soft firm stiff very stiff hard	non-plastic low plasticity medium plasticity high plasticity	and (35-50%) some (20-35%) little (10-20%) trace (0-10%) Contamination odour staining solid waste

JBS ENVIRONMENTAL

Borehole / Well / Test Pit No: UPSP09-1

Project No: 4145
Client: Landcom
Project Name: Ed. Park
Site Address:

Date: 11/5/12
Contractor: EMS
Drill Rig/Excavation Plant: Tp w/ excavator
Method:
Total Hole Depth: 0.8m

Eastings (MGA):
Northings (MGA):
Reference Level:
Elevation - Surface/TOC:
Bore Diameter/Pit Dimension:

Water Level Initial:
Water Level Static:
Casing Type/Surface Finish:
Screen Diameter/Length:
Casing Diameter/Length:

SUBSURFACE PROFILE				SAMPLE				
Depth (m)	Graphic Log	Lithologic Classification	Lithologic Description	Sample ID	PID (ppm)	Sample Type	Comments	Well Construction
			FILL: Topsoil: silty clay, brown, dmp, M.P, khb w/ sandstone + igneous gravels	0.3m (BFT)				
			0.3m NAT: silty clay orange w/ grey mottles, fcm, L.P, brown					
			0.8m ∑ 0.1l at 0.5m					

Method	Sample Type	Reference Level	Casing Type / Surface Finish	Log Details
HA – Hand Auger SFA – Solid Flight Auger HFA – Hollow Flight Auger PT – Push Tubing AH – Air Hammer TP – Test Pit	U – Undisturbed Tube Sample D – Disturbed Sample CS – Core Sample	AHD – Australian Height Datum BGS – Below Ground Surface TOC – Top of Casing	PVC18 – Class 18 PVC MT – Monument RB – Roadbox SP – Stick up/Standpipe	Logged By: Project Manager:

Description						Coarse Grained Soils			Fine Grained Soils		Inclusions
CLASS	Texture	Grading/Sorting	Colour	Structure	Moisture	Density	Grain Size	Angularity	Consistency	Plasticity	Secondary
FILL CLAY SILT SAND GRAVEL TOPSOIL PEAT	clayey silty sandy gravelly organic	well sorted-poorly graded poorly sorted-well graded	red yellow white black brown grey	homogeneous heterogeneous stratified laminated lens root holes occasional inter-bedded mottled	dry damp moist wet saturated	very loose loose medium dense very dense	boulders cobbles coarse gravel fine gravel coarse sand medium sand fine sand	very angular angular sub-angular sub-rounded rounded well rounded	very soft soft firm stiff very stiff hard	non-plastic low plasticity medium plasticity high plasticity	and (35-50%) some (20-35%) little (10-20%) trace (0-10%) Contamination odour staining solid waste

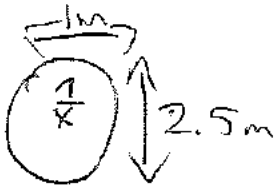
Field Screening of Soils

JBS ENVIRONMENTAL

PROJECT NAME: Edmondson Park Rem	**PROJECT NO:** 41945
FIELDWORK DATES: 1/5/12	**SAMPLERS:** BB
TYPE OF INVESTIGATION (GME/ESA etc):	**PROJECT MANAGER:** JR

SKETCH OF SAMPLE LOCATIONS

UFSP9



N E: 301764.658
N: 6239610.606

h=0.5m

Volume ≈ 2m3

SAMPLE ID	DATE	DEPTH (m)	PID/XRF (ppm)	SOIL DESCRIPTION AND FATE
UFSP9-1	5	See	log notes	

ADDITIONAL NOTES:

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

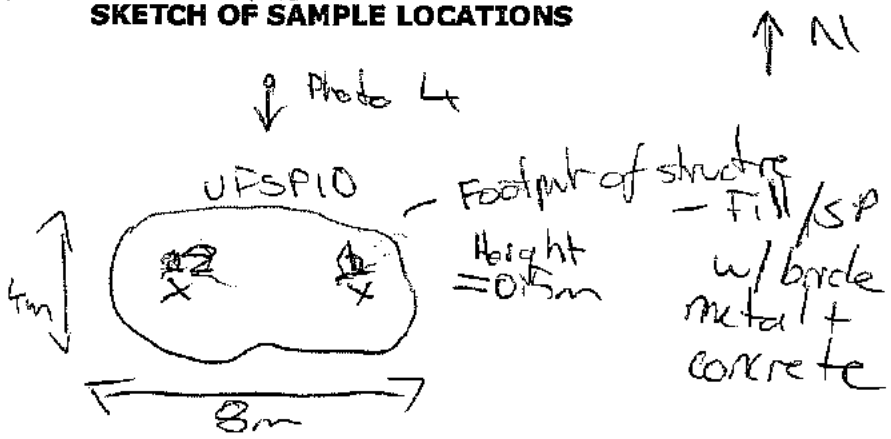
Field Screening of Soils

JBS ENVIRONMENTAL

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 1/5/12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation/Validation MJ	**PROJECT MANAGER: J. Rosner**

Raised Platform / four stretcher

SKETCH OF SAMPLE LOCATIONS



SAMPLE ID	DATE	DEPTH (m)	PID/XRF (ppm)	SOIL DESCRIPTION AND FATE
VFSP10-1		(Surface)	log no test)	

ADDITIONAL NOTES:

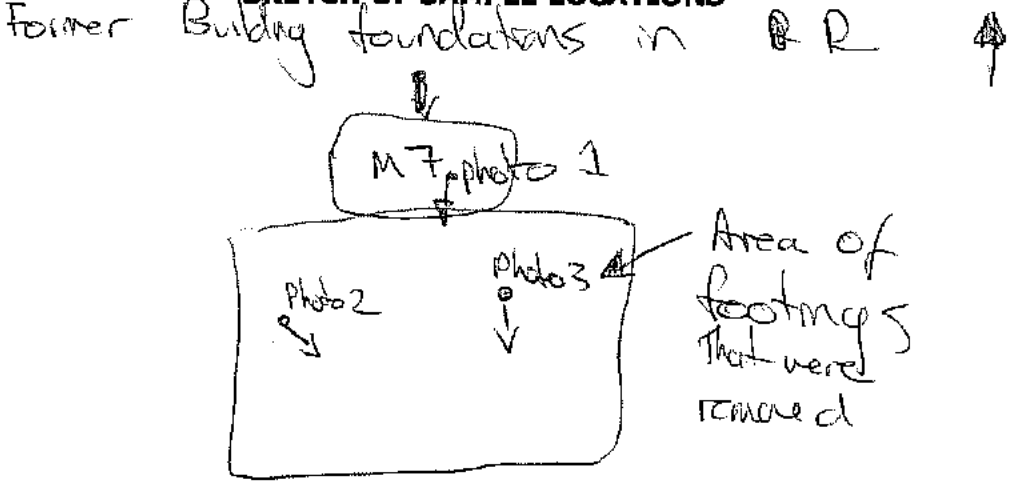
Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogeneous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

Field Screening of Soils

JBS ENVIRONMENTAL

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 1/5/12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation/Validation	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS



SAMPLE ID	DATE	DEPTH (m)	PID/XRF (ppm)	SOIL DESCRIPTION AND FATE

ADDITIONAL NOTES:

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

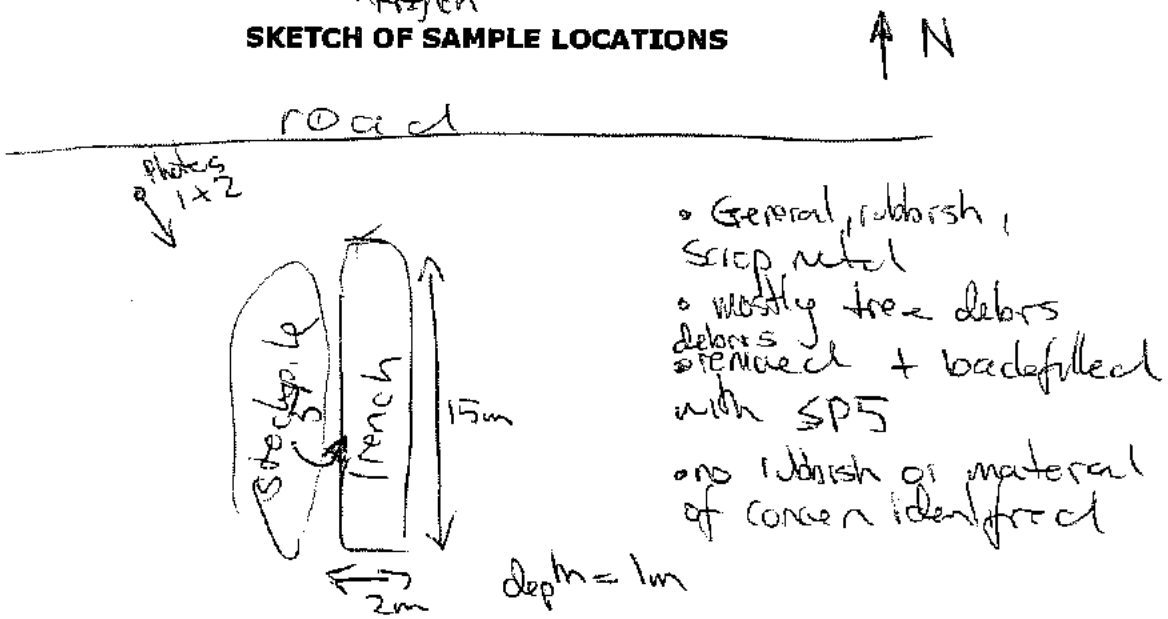
Location
N: 6239481
E: 301620

Field Screening of Soils

JBS ENVIRONMENTAL

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 1/5/12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation/Validation Inspection of N-S Infinity trench	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS



SAMPLE ID	DATE	DEPTH (m)	PID/XRF (ppm)	SOIL DESCRIPTION AND FATE

ADDITIONAL NOTES:

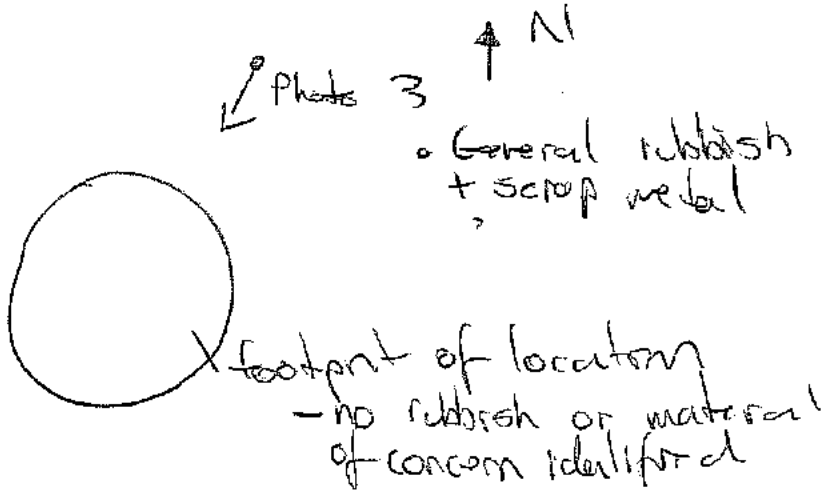
Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

Field Screening of Soils

JBS ENVIRONMENTAL

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 15/12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: R3 General Rubbish **Remediation/Validation**	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS



SAMPLE ID	DATE	DEPTH (m)	PID/XRF (ppm)	SOIL DESCRIPTION AND FATE

ADDITIONAL NOTES:

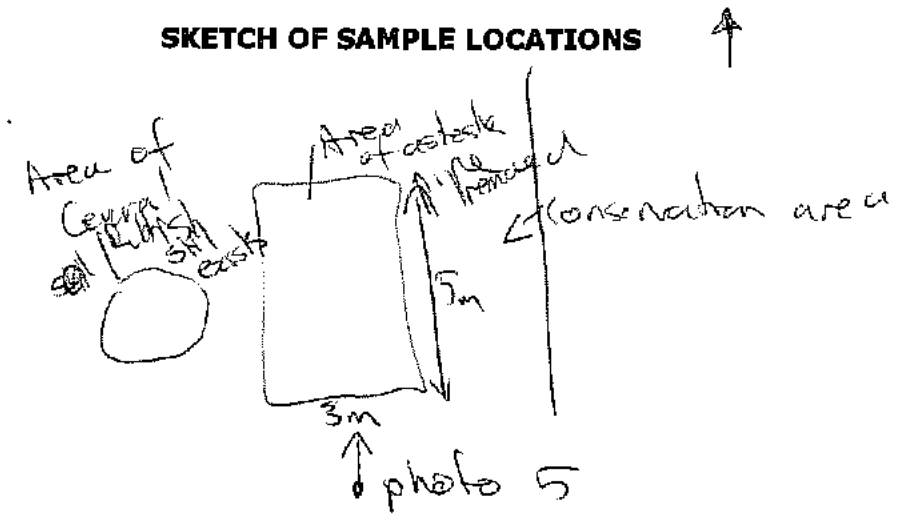
Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

Field Screening of Soils

JBS ENVIRONMENTAL

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 1/5/12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation/Validation R2	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS



SAMPLE ID	DATE	DEPTH (m)	PID/XRF (ppm)	SOIL DESCRIPTION AND FATE

ADDITIONAL NOTES:

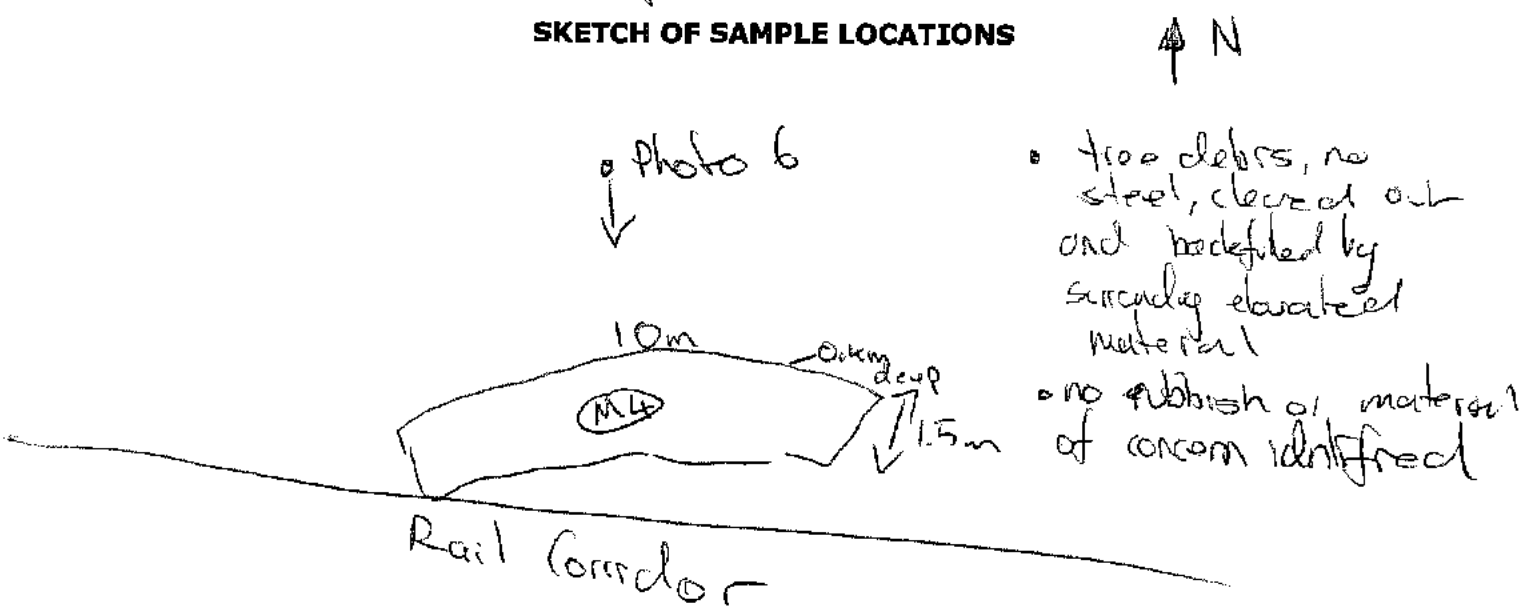
Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

Field Screening of Soils

JBS ENVIRONMENTAL

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 1/5/12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Inspection of Remediation/Validation ML4: trench	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS



SAMPLE ID	DATE	DEPTH (m)	PID/XRF (ppm)	SOIL DESCRIPTION AND FATE

ADDITIONAL NOTES:

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

CHAIN OF CUSTODY

JBS ENVIRONMENTAL

PROJECT NO.: 41545
PROJECT NAME: Edmondson Park Residential
SEND REPORT TO: ABATR SEND INVOICE TO: A. Traynor
DATE NEEDED BY: Standard Turn Around
COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

LABORATORY BATCH NO.
SAMPLERS AES
PHONE: 02 8338 1011 EMAIL: [illegible]@jbsgroup.com.au
QC LEVEL: NEPM 1999 (✓) [illegible]

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	TRH/BTEX	PAH/Phenols	Metals	Asbestos	VOC's	NOTES
BH5P10-1 (0.5)	Soil	1/5/12		B+T		X	X	X	X	X	
BH5P10-1 (0.8)	Soil	1/5/12		B+T		X	X	X	X	X	
Trip Blank	Water	1/5/12		2 x vial		X					
Trip Blank	Water	1/5/12		2 x vial		X					
Rinsate	Water	1/5/12		2 x vial, 1 x amb, 1 x plastic			X	X	X		Quote 41545

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: [illegible] DATE: 2/5/12	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS Environmental	TRANSPORT CO.	OF:	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Solf Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

JBS Environmental Pty Ltd ABN 67 071 842 638
Phone: (02) 8338-1011
Fax: (02) 8338-1700
128 O'Riordan St, MASCOT NSW 2020
PO Box 940 MASCOT NSW 1460
www.jbsgroup.com.au

Attachment 4 –QA / QC Checker Summary

ESDAT QA Checker
Project:41945 - UFSPs
Filter: ALL

Overview Summary
- Count of Samples
- Count of Results

Holding Times
- Holding Time Errors (0)

Blanks
- Field Blanks
- Detects in Lab Blanks (0)
- SDG's without Method Blanks (0)

Duplicates
- Field and Interlab Dupes
- Lab Duplicates with high RPDs (0)
- Duplicate Samples with incorrect or missing Parent Samples (0)

Surrogates
- Surrogate Variation > 30% or outside lab LCL or UCL or outside lab LCL or UCL (4)

Lab Control Samples
- SDG's without a Laboratory Control Sample (0)
- Laboratory Control Samples, Error > 30% (4)

Certified and Standard Reference Materials
- Certified Reference Materials - Error > 30% (0)

Matrix Spikes
- SDG's without a Matrix Spike (0)
- Trip Spikes with invalid Control Sample (0)
- Less than 1 matrix spike in 20 samples, or less than 1 matrix duplicate in 20 samples (2)
- Matrix Spike Recoveries less than 70% or greater than 130% or outside lab LCL or UCL (0)
- Trip Spike Recoveries (70% - 130% is acceptable) (15)

Inorganic

Other
- OriginalChemNames Requiring Validation (3)
- Samples with no Results (0)
- Aborted Analysis (0)

Contents

Count of Samples

Matrix Type	soil	water
First Sample Date	4/04/2012	4/04/2012
Last Sample Date	1/05/2012	1/05/2012
Sampling Period (days)	28	28
Number of Samples Submitted	14	3
Number of Non QA Samples Submitted	12	0
Number of Field Blanks	0	0
Number of Trip Blanks	0	0
Number of Rinsates	0	3
Number of Field Duplicates	1	0
Number of Interlab Duplicates	1	0
Number of Trip Spikes	0	3
Number of Lab Duplicates	3	2
Number of LCSs	11	6
Number of CRMs	0	0
Number of Method Blanks	8	3
Number of Storage Blanks	0	3
Number of Matrix Spikes	0	0
Number of Matrix Spike Dupes	0	0

Field Blanks (water)
Filter: ALL

SDG	71443	71679
Field_ID	RINSATE	Rinsate
Sampled_Date-Time	4/04/2012	11/04/2012
Sample_Type	Rinsate	Rinsate

Chem_Group	ChemName	Units	EQL		
BTEX	Benzene	µg/L	1		<1
	Ethylbenzene	µg/L	1		<1
	Toluene	µg/L	1		<1
	Xylene (m & p)	µg/L	2		<2
	Xylene (o)	µg/L	1		<1
Lead	Lead (Filtered)	mg/l	0.03	<0.03	<0.03
Metals	Arsenic	mg/l	0.05		
	Arsenic (Filtered)	mg/l	0.05	<0.05	<0.05
	Cadmium	mg/l	0.01		
	Cadmium (Filtered)	mg/l	0.01	<0.01	<0.01
	Chromium (III+VI)	mg/l	0.01		
	Chromium (III+VI) (Filtered)	mg/l	0.01	<0.01	<0.01
	Copper	mg/l	0.01		
	Copper (Filtered)	mg/l	0.01	<0.01	<0.01
	Mercury	mg/l	0.0005		
	Mercury (Filtered)	mg/l	0.0001	<0.0001	<0.0001
	Nickel	mg/l	0.02		
	Nickel (Filtered)	mg/l	0.02	<0.02	<0.02
	Zinc	mg/l	0.02		
	Zinc (Filtered)	mg/l	0.02	<0.02	<0.02
PAH/Phenols	Acenaphthene	µg/L	1	<1	<1
	Acenaphthylene	µg/L	1	<1	<1
	Anthracene	µg/L	1	<1	<1
	Benz(a)anthracene	µg/L	1	<1	<1
	Benzo(a) pyrene	µg/L	1	<1	<1
	Benzo(b)&(k)fluoranthene	µg/L	2	<2	<2
	Benzo(g,h,i)perylene	µg/L	1	<1	<1
	Chrysene	µg/L	1	<1	<1
	Dibenz(a,h)anthracene	µg/L	1	<1	<1
	Fluoranthene	µg/L	1	<1	<1
	Fluorene	µg/L	1	<1	<1
	Indeno(1,2,3-c,d)pyrene	µg/L	1	<1	<1
	Naphthalene	µg/L	1	<1	<1
	Phenanthrene	µg/L	1	<1	<1
	Pyrene	µg/L	1	<1	<1
TPH	C6 - C9	µg/L	10	<10	<10
	C10 - C14	µg/L	50	<50	<50
	C15 - C28	µg/L	100	<100	<100
	C29-C36	µg/L	100	<100	<100

Field Blanks (water)
Filter: ALL

SDG	72549
Field_ID	RINSATE
Sampled_Date-Time	1/05/2012
Sample_Type	Rinsate

Chem_Group	ChemName	Units	EQL	
BTEX	Benzene	µg/L	1	
	Ethylbenzene	µg/L	1	
	Toluene	µg/L	1	
	Xylene (m & p)	µg/L	2	
	Xylene (o)	µg/L	1	
Lead	Lead (Filtered)	mg/l	0.03	<0.03
Metals	Arsenic	mg/l	0.05	<0.05
	Arsenic (Filtered)	mg/l	0.05	
	Cadmium	mg/l	0.01	<0.01
	Cadmium (Filtered)	mg/l	0.01	
	Chromium (III+VI)	mg/l	0.01	<0.01
	Chromium (III+VI) (Filtered)	mg/l	0.01	
	Copper	mg/l	0.01	<0.01
	Copper (Filtered)	mg/l	0.01	
	Mercury	mg/l	0.0005	<0.0005
	Mercury (Filtered)	mg/l	0.0001	
	Nickel	mg/l	0.02	<0.02
	Nickel (Filtered)	mg/l	0.02	
	Zinc	mg/l	0.02	<0.02
	Zinc (Filtered)	mg/l	0.02	
PAH/Phenols	Acenaphthene	µg/L	1	<1
	Acenaphthylene	µg/L	1	<1
	Anthracene	µg/L	1	<1
	Benz(a)anthracene	µg/L	1	<1
	Benzo(a) pyrene	µg/L	1	<1
	Benzo(b)&(k)fluoranthene	µg/L	2	<2
	Benzo(g,h,i)perylene	µg/L	1	<1
	Chrysene	µg/L	1	<1
	Dibenz(a,h)anthracene	µg/L	1	<1
	Fluoranthene	µg/L	1	<1
	Fluorene	µg/L	1	<1
	Indeno(1,2,3-c,d)pyrene	µg/L	1	<1
	Naphthalene	µg/L	1	<1
	Phenanthrene	µg/L	1	<1
	Pyrene	µg/L	1	<1
TPH	C6 - C9	µg/L	10	<10
	C10 - C14	µg/L	50	<50
	C15 - C28	µg/L	100	<100
	C29-C36	µg/L	100	<100

Field Duplicates (soil)
Filter: ALL

SDG	71443	71443		71443	Interlab_D	
Field_ID	SP18-3	QC06	RPD	SP18-3	QA06	RPD
Sampled_Date-Time	4/04/2012	4/04/2012		4/04/2012	4/04/2012	

Chem_Group	ChemName	Units	EQL						
Inorganics	Moisture	%	0.1	15.0	16.0	6	15.0		
Lead	Lead	mg/kg	1	22.0	22.0	0	22.0	18.0	20
Metals	Arsenic	mg/kg	4 (Primary): 3 (Interlab)	9.0	9.0	0	9.0	8.0	12
	Cadmium	mg/kg	0.5 (Primary): 0.3 (Interla	<0.5	<0.5	0	<0.5	0.4	0
	Chromium (III+VI)	mg/kg	1 (Primary): 0.3 (Interlab	16.0	16.0	0	16.0	16.0	0
	Copper	mg/kg	1 (Primary): 0.5 (Interlab	15.0	13.0	14	15.0	13.0	14
	Mercury	mg/kg	0.1 (Primary): 0.05 (Inter	<0.1	<0.1	0	<0.1	<0.05	0
	Nickel	mg/kg	1 (Primary): 0.5 (Interlab	8.0	8.0	0	8.0	6.8	16
	Zinc	mg/kg	1 (Primary): 0.5 (Interlab	27.0	25.0	8	27.0	31.0	14
PAH/Phenols	Acenaphthene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Acenaphthylene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Anthracene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Benz(a)anthracene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Benzo(a) pyrene	mg/kg	0.05 (Primary): 0.1 (Inter	<0.05	<0.05	0	<0.05	<0.1	0
	Benzo(b)&(k)fluoranthene	mg/kg	0.2	<0.2	<0.2	0	<0.2		
	Benzo(g,h,i)perylene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Chrysene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Dibenz(a,h)anthracene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Fluoranthene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Fluorene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Naphthalene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Phenanthrene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Pyrene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
TPH	C6 - C9	mg/kg	25 (Primary): 20 (Interlab	<25.0	<25.0	0	<25.0	<20.0	0
	C10 - C14	mg/kg	50 (Primary): 20 (Interlab	<50.0	<50.0	0	<50.0	<20.0	0
	C15 - C28	mg/kg	100 (Primary): 50 (Interla	<100.0	<100.0	0	<100.0	<50.0	0
	C29-C36	mg/kg	100 (Primary): 50 (Interla	<100.0	<100.0	0	<100.0	<50.0	0

Field Duplicates (soil)
Filter: ALL

SDG	71443	71443		71443	Interlab_D	
Field_ID	SP18-3	QC06	**RPD**	SP18-3	QA06	**RPD**
Sampled_Date-Time	4/04/2012	4/04/2012		4/04/2012	4/04/2012	

*RPDs have only been considered where a concentration is greater than 4 times the EQL.
**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 50 (4-10 x EQL); 50 (10-30 x EQL); 50 (> 30 x EQL))
***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to th

Contents

Surrogate Variation > 30% or outside lab LCL or UCL or outside lab LCL or UCL

SDG	Sample_Type	Matrix_Type	SampleCode	Field_ID	Depth
71443	LCS	water	71443LCS-W3		
71679	Normal	soil	71679-1	UFSP03-1	1
71679	Normal	soil	71679-7	UFSP07-1	0.4
72549	LCS	water	72549LCS-W3		

Sampled_Date-Time	Compound	Recovery %	Unit
4/04/2012	Surrogate o-Terphenyl	139	%
11/04/2012	Surrogate aaa-Trifluorotoluene	66	%
11/04/2012	Surrogate p-Terphenyl-d14	60	%
1/05/2012	Surrogate o-Terphenyl	139	%

Comments

Contents

Laboratory Control Samples, Error > 30%

SDG	Matrix_Type	SampleCode	Method_Name
71443	water	71443LCS-W3	Org-003 - Semi-volatile TRH in waters and soil
71443	water	71443LCS-W3	Org-003 - Semi-volatile TRH in waters and soil
71679	soil	71679LCS-3	Org-016 - BTEX and C6-C9 alkanes in soil & water
72549	water	72549LCS-W3	Org-003 - Semi-volatile TRH in waters and soil

OriginalChemName	Recovery %	Unit	Result_Type	Comments
TRH C10 - C14	66	%	REG	
Surrogate o-Terphenyl	139	%	SUR	
Benzene	65	%	REG	
Surrogate o-Terphenyl	139	%	SUR	

Contents

Less than 1 matrix spike in 20 samples, or less than 1 matrix duplicate in 20 samples

Matrix_Type	Number_of_Samples	Number_of_Matrix_Spike_Samples
soil	42	0
water	20	0

Number_of_Matrix_Spike_Dupe_Samples

0

0

Contents

Trip Spike Recoveries (70% - 130% is acceptable)

SDG	Matrix_Type	SampleCode	Field_ID
71443	water	71443-4	TRIP SPIKE
71443	water	71443-4	TRIP SPIKE
71443	water	71443-4	TRIP SPIKE
71443	water	71443-4	TRIP SPIKE
71443	water	71443-4	TRIP SPIKE
71679	water	71679-9	Trip Spike
71679	water	71679-9	Trip Spike
71679	water	71679-9	Trip Spike
71679	water	71679-9	Trip Spike
71679	water	71679-9	Trip Spike
72549	water	72549-3	TRIP SPIKE
72549	water	72549-3	TRIP SPIKE
72549	water	72549-3	TRIP SPIKE
72549	water	72549-3	TRIP SPIKE
72549	water	72549-3	TRIP SPIKE

Method_Name	Compound	Trip_Spike_Result
Org-016 - BTEX and C6-C9 alkanes in soil & water	Benzene	NA
Org-016 - BTEX and C6-C9 alkanes in soil & water	Ethylbenzene	NA
Org-016 - BTEX and C6-C9 alkanes in soil & water	m+p-xylene	NA
Org-016 - BTEX and C6-C9 alkanes in soil & water	o-xylene	NA
Org-016 - BTEX and C6-C9 alkanes in soil & water	Toluene	NA
Org-016 - BTEX and C6-C9 alkanes in soil & water	Benzene	NA
Org-016 - BTEX and C6-C9 alkanes in soil & water	Ethylbenzene	NA
Org-016 - BTEX and C6-C9 alkanes in soil & water	m+p-xylene	NA
Org-016 - BTEX and C6-C9 alkanes in soil & water	o-xylene	NA
Org-016 - BTEX and C6-C9 alkanes in soil & water	Toluene	NA
Org-016 - BTEX and C6-C9 alkanes in soil & water	Benzene	NA
Org-016 - BTEX and C6-C9 alkanes in soil & water	Ethylbenzene	NA
Org-016 - BTEX and C6-C9 alkanes in soil & water	m+p-xylene	NA
Org-016 - BTEX and C6-C9 alkanes in soil & water	o-xylene	NA
Org-016 - BTEX and C6-C9 alkanes in soil & water	Toluene	NA

Trip_Spike_Control	Result_Units	Spike_Recovery_%	Acceptable
NA	NA	100	Y
NA	NA	102	Y
NA	NA	99	Y
NA	NA	99	Y
NA	NA	100	Y
NA	NA	107	Y
NA	NA	106	Y
NA	NA	106	Y
NA	NA	101	Y
NA	NA	106	Y
NA	NA	113	Y
NA	NA	112	Y
NA	NA	112	Y
NA	NA	112	Y
NA	NA	113	Y

Result_Type	Comments
REG	
REG	
REG	
REG	
REG	
REG	
REG	
REG	
REG	
REG	
REG	
REG	
REG	
REG	
REG	

Attachment 5 – Laboratory Analysis Reports and Chain of Custody Information

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

CERTIFICATE OF ANALYSIS 71443

Client:
JBS Environmental Pty Ltd
P.O. Box 940
MASCOT
NSW 1460

Attention: Jo Rosner, A Boardman

Sample log in details:

Your Reference:	**41945, Edmondson Park**
No. of samples:	3 Soils, 3 waters
Date samples received / completed instructions received	05/04/12 / 05/04/12

Analysis Details:
Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	16/04/12 / 28/05/12
Date of Preliminary Report:	Not issued

NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Nancy Zhang
Chemist

Rhian Morgan
Reporting Supervisor

Giovanni Agosti
Technical Manager

Lulu Guo
Approved Signatory

NATA
ACCREDITED FOR TECHNICAL COMPETENCE

vTRH & BTEX in Soil				
Our Reference:	UNITS	71443-1	71443-2	71443-3
Your Reference	----------	SP19-1	SP18-3	QC06
Date Sampled	----------	04/04/2012	04/04/2012	04/04/2012
Type of sample		Soil	Soil	Soil
Date extracted	-	10/04/2012	10/04/2012	10/04/2012
Date analysed	-	11/04/2012	11/04/2012	11/04/2012
vTRH C_6 - C_9	mg/kg	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	[NA]
Toluene	mg/kg	<0.5	<0.5	[NA]
Ethylbenzene	mg/kg	<1	<1	[NA]
m+p-xylene	mg/kg	<2	<2	[NA]
o-Xylene	mg/kg	<1	<1	[NA]
Surrogate aaa-Trifluorotoluene	%	115	107	105

sTRH in Soil (C10-C36)				
Our Reference:	UNITS	71443-1	71443-2	71443-3
Your Reference	----------	SP19-1	SP18-3	QC06
Date Sampled	----------	04/04/2012	04/04/2012	04/04/2012
Type of sample		Soil	Soil	Soil
Date extracted	-	10/04/2012	10/04/2012	10/04/2012
Date analysed	-	11/04/2012	11/04/2012	11/04/2012
$TRHC_{10}$ - C_{14}	mg/kg	<50	<50	<50
$TRHC_{15}$ - C_{28}	mg/kg	<100	<100	<100
$TRHC_{29}$ - C_{36}	mg/kg	<100	<100	<100
Surrogate o-Terphenyl	%	93	100	92

PAHs in Soil Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ----------	71443-1 SP19-1 04/04/2012 Soil	71443-2 SP18-3 04/04/2012 Soil	71443-3 QC06 04/04/2012 Soil
Date extracted	-	10/04/2012	10/04/2012	10/04/2012
Date analysed	-	11/04/2012	11/04/2012	11/04/2012
Naphthalene	mg/kg	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d_{14}	%	111	103	114

Organochlorine Pesticides in soil			
Our Reference:	UNITS	71443-1	71443-2
Your Reference	----------	SP19-1	SP18-3
Date Sampled	----------	04/04/2012	04/04/2012
Type of sample		Soil	Soil
Date extracted	-	10/04/2012	10/04/2012
Date analysed	-	11/04/2012	11/04/2012
HCB	mg/kg	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1
Surrogate TCLMX	%	99	101

PCBs in Soil			
Our Reference:	UNITS	71443-1	71443-2
Your Reference	----------	SP19-1	SP18-3
Date Sampled	----------	04/04/2012	04/04/2012
Type of sample		Soil	Soil
Date extracted	-	10/04/2012	10/04/2012
Date analysed	-	10/04/2012	10/04/2012
Arochlor 1016	mg/kg	<0.1	<0.1
Arochlor 1221	mg/kg	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1
Surrogate TCLMX	%	95	100

Acid Extractable metals in soil				
Our Reference:	UNITS	71443-1	71443-2	71443-3
Your Reference	----------	SP19-1	SP18-3	QC06
Date Sampled	----------	04/04/2012	04/04/2012	04/04/2012
Type of sample		Soil	Soil	Soil
Date digested	-	10/04/2012	10/04/2012	10/04/2012
Date analysed	-	11/04/2012	11/04/2012	11/04/2012
Arsenic	mg/kg	<4	9	9
Cadmium	mg/kg	<0.5	<0.5	<0.5
Chromium	mg/kg	7	16	16
Copper	mg/kg	5	15	13
Lead	mg/kg	12	22	22
Mercury	mg/kg	<0.1	<0.1	<0.1
Nickel	mg/kg	4	8	8
Zinc	mg/kg	17	27	25

Asbestos ID - soils				
Our Reference:	UNITS	71443-1	71443-2	71443-3
Your Reference	----------	SP19-1	SP18-3	QC06
Date Sampled	----------	04/04/2012	04/04/2012	04/04/2012
Type of sample		Soil	Soil	Soil
Date analysed	-	12/04/2012	12/04/2012	12/04/2012
Sample mass tested	g	Approx 60g	Approx 60g	Approx 60g
Sample Description	-	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected

Moisture				
Our Reference:	UNITS	71443-1	71443-2	71443-3
Your Reference	----------	SP19-1	SP18-3	QC06
Date Sampled	----------	04/04/2012	04/04/2012	04/04/2012
Type of sample		Soil	Soil	Soil
Date prepared	-	10/04/12	10/04/12	10/04/12
Date analysed	-	11/04/12	11/04/12	11/04/12
Moisture	%	5.2	15	16

vTRH & BTEX in Water				
Our Reference:	UNITS	71443-4	71443-5	71443-6
Your Reference	----------	TRIP SPIKE	TRIP BLANK	RINSATE
Date Sampled	----------	04/04/2012	04/04/2012	04/04/2012
Type of sample		Water	Water	Water
Date extracted	-	05/04/2012	05/04/2012	05/04/2012
Date analysed	-	06/04/2012	06/04/2012	06/04/2012
TRHC$_6$ - C$_9$	µg/L	[NA]	[NA]	<10
Benzene	µg/L	99%	<1	[NA]
Toluene	µg/L	100%	<1	[NA]
Ethylbenzene	µg/L	102%	<1	[NA]
m+p-xylene	µg/L	99%	<2	[NA]
o-xylene	µg/L	99%	<1	[NA]
Surrogate Dibromofluoromethane	%	99	106	107
Surrogate toluene-d8	%	99	98	98
Surrogate 4-BFB	%	97	98	98

sTRH in Water (C10-C36)		
Our Reference:	UNITS	71443-6
Your Reference	----------	RINSATE
Date Sampled	----------	04/04/2012
Type of sample		Water
Date extracted	-	10/04/2012
Date analysed	-	10/04/2012
$TRHC_{10}$ - C_{14}	µg/L	<50
$TRHC_{15}$ - C_{28}	µg/L	<100
$TRHC_{29}$ - C_{36}	µg/L	<100
Surrogate o-Terphenyl	%	92

PAHs in Water		
Our Reference:	UNITS	71443-6
Your Reference	----------	RINSATE
Date Sampled	----------	04/04/2012
Type of sample		Water
Date extracted	-	10/04/2012
Date analysed	-	11/04/2012
Naphthalene	µg/L	<1
Acenaphthylene	µg/L	<1
Acenaphthene	µg/L	<1
Fluorene	µg/L	<1
Phenanthrene	µg/L	<1
Anthracene	µg/L	<1
Fluoranthene	µg/L	<1
Pyrene	µg/L	<1
Benzo(a)anthracene	µg/L	<1
Chrysene	µg/L	<1
Benzo(b+k)fluoranthene	µg/L	<2
Benzo(a)pyrene	µg/L	<1
Indeno(1,2,3-c,d)pyrene	µg/L	<1
Dibenzo(a,h)anthracene	µg/L	<1
Benzo(g,h,i)perylene	µg/L	<1
Surrogate p-Terphenyl-d_{14}	%	106

Metals in Water - Dissolved		
Our Reference:	UNITS	71443-6
Your Reference	----------	RINSATE
Date Sampled	----------	04/04/2012
Type of sample		Water
Date digested	-	11/04/2012
Date analysed	-	11/04/2012
Arsenic - Dissolved	mg/L	<0.05
Cadmium - Dissolved	mg/L	<0.01
Chromium - Dissolved	mg/L	<0.01
Copper - Dissolved	mg/L	<0.01
Lead - Dissolved	mg/L	<0.03
Mercury - Dissolved	mg/L	<0.0005
Nickel - Dissolved	mg/L	<0.02
Zinc - Dissolved	mg/L	<0.02

Method ID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
Inorg-008	Moisture content determined by heating at 105 deg C for a minimum of 4 hours.

QUALITY CONTROL vTRH & BTEX in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			10/04/2012	[NT]	[NT]	LCS-4	10/04/2012
Date analysed	-			11/04/2012	[NT]	[NT]	LCS-4	11/04/2012
vTRH C_6 - C_9	mg/kg	25	Org-016	<25	[NT]	[NT]	LCS-4	92%
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	LCS-4	85%
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	LCS-4	90%
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS-4	92%
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	LCS-4	96%
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS-4	97%
Surrogate aaa-Trifluorotoluene	%		Org-016	115	[NT]	[NT]	LCS-4	102%
QUALITY CONTROL sTRH in Soil (C10-C36)	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			10/04/2012	[NT]	[NT]	LCS-4	10/04/2012
Date analysed	-			11/04/2012	[NT]	[NT]	LCS-4	11/04/2012
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	[NT]	[NT]	LCS-4	83%
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-4	103%
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-4	100%
Surrogate o-Terphenyl	%		Org-003	94	[NT]	[NT]	LCS-4	73%
QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			10/04/2012	[NT]	[NT]	LCS-4	10/04/2012
Date analysed	-			11/04/2012	[NT]	[NT]	LCS-4	11/04/2012
Naphthalene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-4	100%
Acenaphthylene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-4	109%
Phenanthrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-4	99%
Anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-4	102%
Pyrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-4	106%
Benzo(a)anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-4	114%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Benzo(b+k)fluoranthene	mg/kg	0.2	Org-012 subset	<0.2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	Org-012 subset	<0.05	[NT]	[NT]	LCS-4	99%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d_{14}	%		Org-012 subset	113	[NT]	[NT]	LCS-4	100%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			10/04/2012	[NT]	[NT]	LCS-4	10/04/2012
Date analysed	-			10/04/2012	[NT]	[NT]	LCS-4	10/04/2012
HCB	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-4	110%
gamma-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
beta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-4	92%
Heptachlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-4	102%
delta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Aldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-4	110%
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-4	112%
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
pp-DDE	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-4	108%
Dieldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-4	114%
Endrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-4	108%
pp-DDD	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-4	109%
Endosulfan II	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
pp-DDT	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-4	112%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate TCLMX	%		Org-005	94	[NT]	[NT]	LCS-4	96%

QUALITY CONTROL PCBs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			10/04/2012	[NT]	[NT]	LCS-4	10/04/2012
Date analysed	-			10/04/2012	[NT]	[NT]	LCS-4	10/04/2012
Arochlor 1016	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Arochlor 1221	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Arochlor 1232	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Arochlor 1242	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Arochlor 1248	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Arochlor 1254	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	LCS-4	102%
Arochlor 1260	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate TCLMX	%		Org-006	94	[NT]	[NT]	LCS-4	91%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date digested	-			[NT]	[NT]	[NT]	LCS-2	10/04/2012
Date analysed	-			[NT]	[NT]	[NT]	LCS-2	11/04/2012
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	[NT]	[NT]	LCS-2	101%
Cadmium	mg/kg	0.5	Metals-020 ICP-AES	<0.5	[NT]	[NT]	LCS-2	104%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-2	104%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-2	104%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-2	101%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	[NT]	[NT]	LCS-2	118%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-2	104%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-2	105%

QUALITY CONTROL Asbestos ID - soils	UNITS	PQL	METHOD	Blank
Date analysed	-			[NT]

QUALITY CONTROL Moisture	UNITS	PQL	METHOD	Blank
Date prepared	-			[NT]
Date analysed	-			[NT]
Moisture	%	0.1	Inorg-008	<0.1

QUALITY CONTROL vTRH & BTEX in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			05/04/2012	[NT]	[NT]	LCS-W1	05/04/2012
Date analysed	-			06/04/2012	[NT]	[NT]	LCS-W1	06/04/2012
TRHC$_6$ - C$_9$	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-W1	112%
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	112%
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	112%
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	111%
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	LCS-W1	112%
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	111%
Surrogate Dibromofluoromethane	%		Org-016	96	[NT]	[NT]	LCS-W1	98%
Surrogate toluene-d8	%		Org-016	100	[NT]	[NT]	LCS-W1	99%
Surrogate 4-BFB	%		Org-016	99	[NT]	[NT]	LCS-W1	99%

QUALITY CONTROL sTRH in Water (C10-C36)	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			10/04/2012	[NT]	[NT]	LCS-W3	10/04/2012
Date analysed	-			10/04/2012	[NT]	[NT]	LCS-W3	10/04/2012
TRHC$_{10}$ - C$_{14}$	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W3	66%
TRHC$_{15}$ - C$_{28}$	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W3	97%
TRHC$_{29}$ - C$_{36}$	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W3	101%
Surrogate o-Terphenyl	%		Org-003	106	[NT]	[NT]	LCS-W3	139%

QUALITY CONTROL PAHs in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			10/04/2012	[NT]	[NT]	LCS-W1	10/04/2012
Date analysed	-			11/04/2012	[NT]	[NT]	LCS-W1	11/04/2012
Naphthalene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	100%
Acenaphthylene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Fluorene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	111%

QUALITY CONTROL PAHs in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Phenanthrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	98%
Anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	102%
Pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	105%
Benzo(a)anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Chrysene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	109%
Benzo(b+k)fluoranthene	µg/L	2	Org-012 subset	<2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	106%
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d_{14}	%		Org-012 subset	104	[NT]	[NT]	LCS-W1	97%

QUALITY CONTROL Metals in Water - Dissolved	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date digested	-			10/04/2012	71443-6	11/04/2012 || 11/04/2012	LCS-W2	10/04/2012
Date analysed	-			11/04/2012	71443-6	11/04/2012 || 11/04/2012	LCS-W2	11/04/2012
Arsenic - Dissolved	mg/L	0.05	Metals-020 ICP-AES	<0.05	71443-6	<0.05 || <0.05	LCS-W2	101%
Cadmium - Dissolved	mg/L	0.01	Metals-020 ICP-AES	<0.01	71443-6	<0.01 || <0.01	LCS-W2	107%
Chromium - Dissolved	mg/L	0.01	Metals-020 ICP-AES	<0.01	71443-6	<0.01 || <0.01	LCS-W2	103%
Copper - Dissolved	mg/L	0.01	Metals-020 ICP-AES	<0.01	71443-6	<0.01 || <0.01	LCS-W2	104%
Lead - Dissolved	mg/L	0.03	Metals-020 ICP-AES	<0.03	71443-6	<0.03 || <0.03	LCS-W2	101%
Mercury - Dissolved	mg/L	0.0005	Metals-021 CV-AAS	<0.0005	71443-6	<0.0005 || [N/T]	LCS-W2	118%
Nickel - Dissolved	mg/L	0.02	Metals-020 ICP-AES	<0.02	71443-6	<0.02 || <0.02	LCS-W2	104%
Zinc - Dissolved	mg/L	0.02	Metals-020 ICP-AES	<0.02	71443-6	<0.02 || <0.02	LCS-W2	103%

QUALITY CONTROL sTRH in Soil (C10-C36)	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date extracted	-	[NT]	[NT]
Date analysed	-	[NT]	[NT]
$TRHC_{10}$ - C_{14}	mg/kg	[NT]	[NT]
$TRHC_{15}$ - C_{28}	mg/kg	[NT]	[NT]
$TRHC_{29}$ - C_{36}	mg/kg	[NT]	[NT]
Surrogate o-Terphenyl	%	[NT]	[NT]
QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date extracted	-	[NT]	[NT]
Date analysed	-	[NT]	[NT]
Naphthalene	mg/kg	[NT]	[NT]
Acenaphthylene	mg/kg	[NT]	[NT]
Acenaphthene	mg/kg	[NT]	[NT]
Fluorene	mg/kg	[NT]	[NT]
Phenanthrene	mg/kg	[NT]	[NT]
Anthracene	mg/kg	[NT]	[NT]
Fluoranthene	mg/kg	[NT]	[NT]
Pyrene	mg/kg	[NT]	[NT]
Benzo(a)anthracene	mg/kg	[NT]	[NT]
Chrysene	mg/kg	[NT]	[NT]
Benzo(b+k)fluoranthene	mg/kg	[NT]	[NT]
Benzo(a)pyrene	mg/kg	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	[NT]	[NT]
Surrogate p-Terphenyl-d_{14}	%	[NT]	[NT]

Report Comments:

Asbestos ID was analysed by Approved Identifier: Alex Tam
Asbestos ID was authorised by Approved Signatory: Lulu Guo

INS: Insufficient sample for this test
NA: Test not required
<: Less than

PQL: Practical Quantitation Limit
RPD: Relative Percent Difference
>: Greater than

NT: Not tested
NA: Test not required
LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batched of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

CHAIN OF CUSTODY

JBS ENVIRONMENTAL

PROJECT NO.: 41945
PROJECT NAME: Edmondson Park
SEND REPORT TO: RB + TR SEND INVOICE TO: A Traynor
DATE NEEDED BY: Standard Turn Around

LABORATORY BATCH NO.
SAMPLERS RB
PHONE: 02 8338 1011 EMAIL: a.boccardmero@bsgroupcorp.com.au
QC LEVEL: NEPM 1999 ✓ Usosror@bsgroupcorp.com.au

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

	SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	TPH	BTEX	PAHs	Metals (8)	OCPs	Asbestos	NOTES
1)	SP19 – 1	Soil	4/4/12		B+T		X	X	X	X	X	X	
2)	SP18 – 3						X	X	X	X	X	X	
3)	QC06						X		X	X		X	
	QA06						Send		bag	&	Ashford + Ryder	Jar	to SGS
4)	Trip Spike	Water			2 x vials			X					
5)	Trip Blank				"			X					
6)	Rinsate				4 bottles		X		X	X			

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 71443
Date Received: 5/4/12
Time Received: 11:46
Received by: PT
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: RB DATE: 5/4/12	CONSIGNMENT NOTE NO.	NAME: Patistha DATE: 5/4/12 11:46	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS Environmental	TRANSPORT CO.	OF: EL6	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

CERTIFICATE OF ANALYSIS 71679

Client:
JBS Environmental Pty Ltd
P.O. Box 940
MASCOT
NSW 1460

Attention: Jo Rosner, A Boardman

Sample log in details:

Your Reference:	**41945, Edmondson Park**
No. of samples:	8 Soils, 3 waters
Date samples received / completed instructions received	12/04/12 / 12/04/12

Analysis Details:
Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	19/04/12 / 28/05/12
Date of Preliminary Report:	Not issued

NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Nancy Zhang
Chemist

Rhian Morgan
Reporting Supervisor

Giovanni Agosti
Technical Manager

Kim Femia
Approved Signatory

NATA
ACCREDITED FOR TECHNICAL COMPETENCE

vTRH & BTEX in Soil						
Our Reference:	UNITS	71679-1	71679-2	71679-3	71679-4	71679-5
Your Reference	----------	UFSP03-1	UFSP03-2	UFSP04-1	UFSP05-1	UFSP06-1
Depth	----------	1.0	0.5	0.5	1.0	1.0
Date Sampled		11/04/2012	11/04/2012	11/04/2012	11/04/2012	11/04/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/04/2012	13/04/2012	13/04/2012	13/04/2012	13/04/2012
Date analysed	-	13/04/2012	13/04/2012	13/04/2012	13/04/2012	13/04/2012
vTRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	66	81	80	94	89

vTRH & BTEX in Soil				
Our Reference:	UNITS	71679-6	71679-7	71679-8
Your Reference	----------	UFSP06-2	UFSP07-1	UFSP08-1
Depth	----------	1.0	0.4	0.4
Date Sampled		11/04/2012	11/04/2012	11/04/2012
Type of sample		Soil	Soil	Soil
Date extracted	-	13/04/2012	13/04/2012	13/04/2012
Date analysed	-	13/04/2012	13/04/2012	13/04/2012
vTRH C_6 - C_9	mg/kg	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	76	74	108

sTRH in Soil (C10-C36)						
Our Reference:	UNITS	71679-1	71679-2	71679-3	71679-4	71679-5
Your Reference	----------	UFSP03-1	UFSP03-2	UFSP04-1	UFSP05-1	UFSP06-1
Depth	----------	1.0	0.5	0.5	1.0	1.0
Date Sampled		11/04/2012	11/04/2012	11/04/2012	11/04/2012	11/04/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/04/2012	13/04/2012	13/04/2012	13/04/2012	13/04/2012
Date analysed	-	14/04/2012	14/04/2012	14/04/2012	14/04/2012	14/04/2012
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	97	95	94	95	95

sTRH in Soil (C10-C36)				
Our Reference:	UNITS	71679-6	71679-7	71679-8
Your Reference	----------	UFSP06-2	UFSP07-1	UFSP08-1
Depth	----------	1.0	0.4	0.4
Date Sampled		11/04/2012	11/04/2012	11/04/2012
Type of sample		Soil	Soil	Soil
Date extracted	-	13/04/2012	13/04/2012	13/04/2012
Date analysed	-	14/04/2012	14/04/2012	14/04/2012
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100
Surrogate o-Terphenyl	%	96	107	94

PAHs in Soil						
Our Reference:	UNITS	71679-1	71679-2	71679-3	71679-4	71679-5
Your Reference	----------	UFSP03-1	UFSP03-2	UFSP04-1	UFSP05-1	UFSP06-1
Depth	----------	1.0	0.5	0.5	1.0	1.0
Date Sampled		11/04/2012	11/04/2012	11/04/2012	11/04/2012	11/04/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/04/2012	13/04/2012	13/04/2012	13/04/2012	13/04/2012
Date analysed	-	13/04/2012	13/04/2012	13/04/2012	13/04/2012	13/04/2012
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	0.06	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d_{14}	%	126	108	117	123	102

PAHs in Soil				
Our Reference:	UNITS	71679-6	71679-7	71679-8
Your Reference	----------	UFSP06-2	UFSP07-1	UFSP08-1
Depth	----------	1.0	0.4	0.4
Date Sampled		11/04/2012	11/04/2012	11/04/2012
Type of sample		Soil	Soil	Soil
Date extracted	-	13/04/2012	13/04/2012	13/04/2012
Date analysed	-	13/04/2012	13/04/2012	13/04/2012
Naphthalene	mg/kg	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d_{14}	%	97	60	71

Organochlorine Pesticides in soil						
Our Reference:	UNITS	71679-1	71679-2	71679-3	71679-4	71679-5
Your Reference	----------	UFSP03-1	UFSP03-2	UFSP04-1	UFSP05-1	UFSP06-1
Depth	----------	1.0	0.5	0.5	1.0	1.0
Date Sampled		11/04/2012	11/04/2012	11/04/2012	11/04/2012	11/04/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/04/2012	13/04/2012	13/04/2012	13/04/2012	13/04/2012
Date analysed	-	14/04/2012	14/04/2012	14/04/2012	14/04/2012	14/04/2012
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	97	89	90	87	88

Organochlorine Pesticides in soil				
Our Reference:	UNITS	71679-6	71679-7	71679-8
Your Reference	----------	UFSP06-2	UFSP07-1	UFSP08-1
Depth	----------	1.0	0.4	0.4
Date Sampled		11/04/2012	11/04/2012	11/04/2012
Type of sample		Soil	Soil	Soil
Date extracted	-	13/04/2012	13/04/2012	13/04/2012
Date analysed	-	14/04/2012	14/04/2012	14/04/2012
HCB	mg/kg	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1
Surrogate TCLMX	%	91	91	89

PCBs in Soil						
Our Reference:	UNITS	71679-1	71679-2	71679-3	71679-4	71679-5
Your Reference	----------	UFSP03-1	UFSP03-2	UFSP04-1	UFSP05-1	UFSP06-1
Depth	----------	1.0	0.5	0.5	1.0	1.0
Date Sampled		11/04/2012	11/04/2012	11/04/2012	11/04/2012	11/04/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/04/2012	13/04/2012	13/04/2012	13/04/2012	13/04/2012
Date analysed	-	14/04/2012	14/04/2012	14/04/2012	14/04/2012	14/04/2012
Arochlor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	89	83	84	81	82

PCBs in Soil				
Our Reference:	UNITS	71679-6	71679-7	71679-8
Your Reference	----------	UFSP06-2	UFSP07-1	UFSP08-1
Depth	----------	1.0	0.4	0.4
Date Sampled		11/04/2012	11/04/2012	11/04/2012
Type of sample		Soil	Soil	Soil
Date extracted	-	13/04/2012	13/04/2012	13/04/2012
Date analysed	-	14/04/2012	14/04/2012	14/04/2012
Arochlor 1016	mg/kg	<0.1	<0.1	<0.1
Arochlor 1221	mg/kg	<0.1	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1	<0.1
Surrogate TCLMX	%	84	84	82

Acid Extractable metals in soil						
Our Reference:	UNITS	71679-1	71679-2	71679-3	71679-4	71679-5
Your Reference	----------	UFSP03-1	UFSP03-2	UFSP04-1	UFSP05-1	UFSP06-1
Depth	----------	1.0	0.5	0.5	1.0	1.0
Date Sampled		11/04/2012	11/04/2012	11/04/2012	11/04/2012	11/04/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	13/04/2012	13/04/2012	13/04/2012	13/04/2012	13/04/2012
Date analysed	-	13/04/2012	13/04/2012	13/04/2012	13/04/2012	13/04/2012
Arsenic	mg/kg	4	6	<4	6	6
Cadmium	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	mg/kg	11	17	6	17	20
Copper	mg/kg	32	34	23	17	15
Lead	mg/kg	98	79	50	26	29
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	6	9	4	7	7
Zinc	mg/kg	34	47	44	160	240

Acid Extractable metals in soil				
Our Reference:	UNITS	71679-6	71679-7	71679-8
Your Reference	----------	UFSP06-2	UFSP07-1	UFSP08-1
Depth	----------	1.0	0.4	0.4
Date Sampled		11/04/2012	11/04/2012	11/04/2012
Type of sample		Soil	Soil	Soil
Date digested	-	13/04/2012	13/04/2012	13/04/2012
Date analysed	-	13/04/2012	13/04/2012	13/04/2012
Arsenic	mg/kg	6	<4	<4
Cadmium	mg/kg	<0.5	<0.5	<0.5
Chromium	mg/kg	20	15	16
Copper	mg/kg	15	16	17
Lead	mg/kg	29	20	20
Mercury	mg/kg	<0.1	<0.1	<0.1
Nickel	mg/kg	7	8	8
Zinc	mg/kg	180	33	34

Moisture						
Our Reference:	UNITS	71679-1	71679-2	71679-3	71679-4	71679-5
Your Reference	----------	UFSP03-1	UFSP03-2	UFSP04-1	UFSP05-1	UFSP06-1
Depth	----------	1.0	0.5	0.5	1.0	1.0
Date Sampled		11/04/2012	11/04/2012	11/04/2012	11/04/2012	11/04/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	13/04/2012	13/04/2012	13/04/2012	13/04/2012	13/04/2012
Date analysed	-	16/04/2012	16/04/2012	16/04/2012	16/04/2012	16/04/2012
Moisture	%	14	14	14	9.3	11

Moisture				
Our Reference:	UNITS	71679-6	71679-7	71679-8
Your Reference	----------	UFSP06-2	UFSP07-1	UFSP08-1
Depth	----------	1.0	0.4	0.4
Date Sampled		11/04/2012	11/04/2012	11/04/2012
Type of sample		Soil	Soil	Soil
Date prepared	-	13/04/2012	13/04/2012	13/04/2012
Date analysed	-	16/04/2012	16/04/2012	16/04/2012
Moisture	%	8.5	10	13

Asbestos ID - soils						
Our Reference:	UNITS	71679-1	71679-2	71679-3	71679-4	71679-5
Your Reference	----------	UFSP03-1	UFSP03-2	UFSP04-1	UFSP05-1	UFSP06-1
Depth	----------	1.0	0.5	0.5	1.0	1.0
Date Sampled		11/04/2012	11/04/2012	11/04/2012	11/04/2012	11/04/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	13/04/2012	13/04/2012	13/04/2012	13/04/2012	13/04/2012
Sample mass tested	g	Approx 40g	Approx 40g	Approx 40g	Approx 40g	Approx 40g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown fine-grained soil	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected

Asbestos ID - soils				
Our Reference:	UNITS	71679-6	71679-7	71679-8
Your Reference	----------	UFSP06-2	UFSP07-1	UFSP08-1
Depth	----------	1.0	0.4	0.4
Date Sampled		11/04/2012	11/04/2012	11/04/2012
Type of sample		Soil	Soil	Soil
Date analysed	-	13/04/2012	13/04/2012	13/04/2012
Sample mass tested	g	Approx 40g	Approx 40g	Approx 40g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected

vTRH & BTEX in Water				
Our Reference:	UNITS	71679-9	71679-10	71679-11
Your Reference	----------	Trip Spike	Trip Blank	Rinsate
Depth	----------	-	-	-
Date Sampled		11/04/2012	11/04/2012	11/04/2012
Type of sample		Water	Water	Water
Date extracted	-	13/04/2012	13/04/2012	13/04/2012
Date analysed	-	13/04/2012	13/04/2012	13/04/2012
TRHC$_6$ - C$_9$	µg/L	[NA]	<10	<10
Benzene	µg/L	107%	<1	<1
Toluene	µg/L	106%	<1	<1
Ethylbenzene	µg/L	106%	<1	<1
m+p-xylene	µg/L	106%	<2	<2
o-xylene	µg/L	101%	<1	<1
Surrogate Dibromofluoromethane	%	95	101	108
Surrogate toluene-d8	%	99	100	100
Surrogate 4-BFB	%	101	91	90

sTRH in Water (C10-C36)		
Our Reference:	UNITS	71679-11
Your Reference	----------	Rinsate
Depth	----------	-
Date Sampled		11/04/2012
Type of sample		Water
Date extracted	-	13/04/2012
Date analysed	-	13/04/2012
$TRHC_{10}$ - C_{14}	µg/L	<50
$TRHC_{15}$ - C_{28}	µg/L	<100
$TRHC_{29}$ - C_{36}	µg/L	<100
Surrogate o-Terphenyl	%	110

PAHs in Water		
Our Reference:	UNITS	71679-11
Your Reference	----------	Rinsate
Depth	----------	-
Date Sampled		11/04/2012
Type of sample		Water
Date extracted	-	13/04/2012
Date analysed	-	15/04/2012
Naphthalene	µg/L	<1
Acenaphthylene	µg/L	<1
Acenaphthene	µg/L	<1
Fluorene	µg/L	<1
Phenanthrene	µg/L	<1
Anthracene	µg/L	<1
Fluoranthene	µg/L	<1
Pyrene	µg/L	<1
Benzo(a)anthracene	µg/L	<1
Chrysene	µg/L	<1
Benzo(b+k)fluoranthene	µg/L	<2
Benzo(a)pyrene	µg/L	<1
Indeno(1,2,3-c,d)pyrene	µg/L	<1
Dibenzo(a,h)anthracene	µg/L	<1
Benzo(g,h,i)perylene	µg/L	<1
Surrogate p-Terphenyl-d_{14}	%	113

Metals in Water - Dissolved		
Our Reference:	UNITS	71679-11
Your Reference	----------	Rinsate
Depth	----------	-
Date Sampled		11/04/2012
Type of sample		Water
Date digested	-	13/04/2012
Date analysed	-	13/04/2012
Arsenic - Dissolved	mg/L	<0.05
Cadmium - Dissolved	mg/L	<0.01
Chromium - Dissolved	mg/L	<0.01
Copper - Dissolved	mg/L	<0.01
Lead - Dissolved	mg/L	<0.03
Mercury - Dissolved	mg/L	<0.0005
Nickel - Dissolved	mg/L	<0.02
Zinc - Dissolved	mg/L	<0.02

Method ID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Inorg-008	Moisture content determined by heating at 105 deg C for a minimum of 4 hours.
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.

QUALITY CONTROL vTRH & BTEX in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			13/04/2012	71679-1	13/04/2012 || 13/04/2012	LCS-3	13/04/2012
Date analysed	-			13/04/2012	71679-1	13/04/2012 || 13/04/2012	LCS-3	13/04/2012
vTRH C_6 - C_9	mg/kg	25	Org-016	<25	71679-1	<25 || <25	LCS-3	72%
Benzene	mg/kg	0.2	Org-016	<0.2	71679-1	<0.2 || <0.2	LCS-3	65%
Toluene	mg/kg	0.5	Org-016	<0.5	71679-1	<0.5 || <0.5	LCS-3	73%
Ethylbenzene	mg/kg	1	Org-016	<1	71679-1	<1 || <1	LCS-3	71%
m+p-xylene	mg/kg	2	Org-016	<2	71679-1	<2 || <2	LCS-3	76%
o-Xylene	mg/kg	1	Org-016	<1	71679-1	<1 || <1	LCS-3	76%
Surrogate aaa-Trifluorotoluene	%		Org-016	81	71679-1	66 || 100 || RPD: 41	LCS-3	82%

QUALITY CONTROL sTRH in Soil (C10-C36)	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			13/04/2012	71679-1	13/04/2012 || 13/04/2012	LCS-3	13/04/2012
Date analysed	-			14/04/2012	71679-1	14/04/2012 || 14/04/2012	LCS-3	14/04/2012
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	71679-1	<50 || <50	LCS-3	106%
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	71679-1	<100 || <100	LCS-3	114%
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	71679-1	<100 || <100	LCS-3	106%
Surrogate o-Terphenyl	%		Org-003	105	71679-1	97 || 97 || RPD: 0	LCS-3	106%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			13/04/2012	71679-1	13/04/2012 || 13/04/2012	LCS-3	13/04/2012
Date analysed	-			13/04/2012	71679-1	13/04/2012 || 13/04/2012	LCS-3	13/04/2012
Naphthalene	mg/kg	0.1	Org-012 subset	<0.1	71679-1	<0.1 || <0.1	LCS-3	109%
Acenaphthylene	mg/kg	0.1	Org-012 subset	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012 subset	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012 subset	<0.1	71679-1	<0.1 || <0.1	LCS-3	121%
Phenanthrene	mg/kg	0.1	Org-012 subset	<0.1	71679-1	<0.1 || <0.1	LCS-3	123%
Anthracene	mg/kg	0.1	Org-012 subset	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012 subset	<0.1	71679-1	<0.1 || <0.1	LCS-3	112%
Pyrene	mg/kg	0.1	Org-012 subset	<0.1	71679-1	<0.1 || <0.1	LCS-3	107%
Benzo(a)anthracene	mg/kg	0.1	Org-012 subset	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012 subset	<0.1	71679-1	<0.1 || <0.1	LCS-3	133%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Benzo(b+k)fluoranthene	mg/kg	0.2	Org-012 subset	<0.2	71679-1	<0.2 || <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	Org-012 subset	<0.05	71679-1	<0.05 || <0.05	LCS-3	75%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012 subset	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012 subset	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012 subset	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d_{14}	%		Org-012 subset	79	71679-1	126 || 103 || RPD: 20	LCS-3	94%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			13/04/2012	71679-1	13/04/2012 || 13/04/2012	LCS-2	13/04/2012
Date analysed	-			14/04/2012	71679-1	14/04/2012 || 14/04/2012	LCS-2	14/04/2012
HCB	mg/kg	0.1	Org-005	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	71679-1	<0.1 || <0.1	LCS-2	94%
gamma-BHC	mg/kg	0.1	Org-005	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
beta-BHC	mg/kg	0.1	Org-005	<0.1	71679-1	<0.1 || <0.1	LCS-2	76%
Heptachlor	mg/kg	0.1	Org-005	<0.1	71679-1	<0.1 || <0.1	LCS-2	82%
delta-BHC	mg/kg	0.1	Org-005	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
Aldrin	mg/kg	0.1	Org-005	<0.1	71679-1	<0.1 || <0.1	LCS-2	81%
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	71679-1	<0.1 || <0.1	LCS-2	79%
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
pp-DDE	mg/kg	0.1	Org-005	<0.1	71679-1	<0.1 || <0.1	LCS-2	94%
Dieldrin	mg/kg	0.1	Org-005	<0.1	71679-1	<0.1 || <0.1	LCS-2	108%
Endrin	mg/kg	0.1	Org-005	<0.1	71679-1	<0.1 || <0.1	LCS-2	97%
pp-DDD	mg/kg	0.1	Org-005	<0.1	71679-1	<0.1 || <0.1	LCS-2	111%
Endosulfan II	mg/kg	0.1	Org-005	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
pp-DDT	mg/kg	0.1	Org-005	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	71679-1	<0.1 || <0.1	LCS-2	96%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%		Org-005	95	71679-1	97 || 85 || RPD: 13	LCS-2	87%

QUALITY CONTROL PCBs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			13/04/2012	71679-1	13/04/2012 || 13/04/2012	LCS-3	13/04/2012
Date analysed	-			14/04/2012	71679-1	14/04/2012 || 14/04/2012	LCS-3	14/04/2012
Arochlor 1016	mg/kg	0.1	Org-006	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1221	mg/kg	0.1	Org-006	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1232	mg/kg	0.1	Org-006	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1242	mg/kg	0.1	Org-006	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1248	mg/kg	0.1	Org-006	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1254	mg/kg	0.1	Org-006	<0.1	71679-1	<0.1 || <0.1	LCS-3	102%
Arochlor 1260	mg/kg	0.1	Org-006	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%		Org-006	83	71679-1	89 || 79 || RPD: 12	LCS-3	82%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date digested	-			13/04/2012	71679-1	13/04/2012 || 13/04/2012	LCS-3	13/04/2012
Date analysed	-			13/04/2012	71679-1	13/04/2012 || 13/04/2012	LCS-3	13/04/2012
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	71679-1	4 || 4 || RPD: 0	LCS-3	93%
Cadmium	mg/kg	0.5	Metals-020 ICP-AES	<0.5	71679-1	<0.5 || <0.5	LCS-3	95%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	71679-1	11 || 10 || RPD: 10	LCS-3	98%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	71679-1	32 || 39 || RPD: 20	LCS-3	99%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	71679-1	98 || 110 || RPD: 12	LCS-3	95%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	71679-1	<0.1 || <0.1	LCS-3	113%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	71679-1	6 || 7 || RPD: 15	LCS-3	97%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	71679-1	34 || 37 || RPD: 8	LCS-3	97%

QUALITY CONTROL Moisture	UNITS	PQL	METHOD	Blank
Date prepared	-			[NT]
Date analysed	-			[NT]
Moisture	%	0.1	Inorg-008	[NT]

QUALITY CONTROL Asbestos ID - soils	UNITS	PQL	METHOD	Blank
Date analysed	-			[NT]

QUALITY CONTROL vTRH & BTEX in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			13/04/2012	[NT]	[NT]	LCS-W1	13/04/2012
Date analysed	-			13/04/2012	[NT]	[NT]	LCS-W1	13/04/2012
TRHC$_6$ - C$_9$	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-W1	114%
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	119%
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	114%
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	110%
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	LCS-W1	113%
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	112%
Surrogate Dibromofluoromethane	%		Org-016	94	[NT]	[NT]	LCS-W1	98%
Surrogate toluene-d8	%		Org-016	99	[NT]	[NT]	LCS-W1	99%
Surrogate 4-BFB	%		Org-016	93	[NT]	[NT]	LCS-W1	100%

QUALITY CONTROL sTRH in Water (C10-C36)	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			13/04/2012	[NT]	[NT]	LCS-W1	13/04/2012
Date analysed	-			13/04/2012	[NT]	[NT]	LCS-W1	13/04/2012
TRHC$_{10}$ - C$_{14}$	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W1	82%
TRHC$_{15}$ - C$_{28}$	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	104%
TRHC$_{29}$ - C$_{36}$	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	103%
Surrogate o-Terphenyl	%		Org-003	107	[NT]	[NT]	LCS-W1	71%

QUALITY CONTROL PAHs in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			13/04/2012	[NT]	[NT]	LCS-W1	13/04/2012
Date analysed	-			15/04/2012	[NT]	[NT]	LCS-W1	15/04/2012
Naphthalene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	109%
Acenaphthylene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Fluorene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	111%

QUALITY CONTROL PAHs in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Phenanthrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	105%
Anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	106%
Pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	112%
Benzo(a)anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Chrysene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	122%
Benzo(b+k)fluoranthene	µg/L	2	Org-012 subset	<2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	124%
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d_{14}	%		Org-012 subset	118	[NT]	[NT]	LCS-W1	110%

QUALITY CONTROL Metals in Water - Dissolved	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date digested	-			13/04/2012	[NT]	[NT]	LCS-W1	13/04/2012
Date analysed	-			13/04/2012	[NT]	[NT]	LCS-W1	13/04/2012
Arsenic - Dissolved	mg/L	0.05	Metals-020 ICP-AES	<0.05	[NT]	[NT]	LCS-W1	98%
Cadmium - Dissolved	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	LCS-W1	107%
Chromium - Dissolved	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	LCS-W1	104%
Copper - Dissolved	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	LCS-W1	103%
Lead - Dissolved	mg/L	0.03	Metals-020 ICP-AES	<0.03	[NT]	[NT]	LCS-W1	101%
Mercury - Dissolved	mg/L	0.0005	Metals-021 CV-AAS	<0.0005	[NT]	[NT]	LCS-W1	92%
Nickel - Dissolved	mg/L	0.02	Metals-020 ICP-AES	<0.02	[NT]	[NT]	LCS-W1	105%
Zinc - Dissolved	mg/L	0.02	Metals-020 ICP-AES	<0.02	[NT]	[NT]	LCS-W1	103%

Report Comments:

Asbestos ID was analysed by Approved Identifier: Alex Tam
Asbestos ID was authorised by Approved Signatory: Kim Femia

INS: Insufficient sample for this test
NA: Test not required
<: Less than
PQL: Practical Quantitation Limit
RPD: Relative Percent Difference
>: Greater than
NT: Not tested
NA: Test not required
LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batched of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

CHAIN OF CUSTODY

JBS ENVIRONMENTAL

+1945
Edmondson Park Rem.
REPORT TO: AE + JR
SEND INVOICE TO: A. Taylor

LABORATORY BATCH NO.
SAMPLERS AE
PHONE: 02 8338 1011
QC LEVEL: NEPM 1999 (✓)
EMAIL: abcoordmn@bsgroup.com.au
jrose@bsgroup.com.au

TURNAROUND TIME NEEDED BY: Standard Turn Around

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

B = Bag
J = Jar

	SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	TPH	BTEX	PAHs	Metals (6)	OCPs	Asbestos	NOTES
1	UFSP03-1 (10m)	Soil	11/4/12		B+J		X	X	X	X	X	X	
2	UFSP03-2 (0.5m)	Soil	11/4/12		B+J		X	X	X	X	X	X	
3	UFSP04-1 (0.5m)	Soil	11/4/12		B+J		X	X	X	X	X	X	
~~4~~	~~UFSP04-2~~												
4	UFSP05-1 (1.0m)	Soil	11/4/12		B+J		X	X	X	X	X	X	
~~5~~	~~UFSP05-2~~												
5	UFSP06-1 (10m)	Soil	11/4/12		B+J		X	X	X	X	X	X	
6	UFSP06-2 (1.0m)	Soil	11/4/12		B+J		X	X	X	X	X	X	
7	UFSP07-1 (0.4m)	Soil	11/4/12		B+J		X	X	X	X	X	X	
~~8~~	~~UFSP07-2~~												
8	UFSP08-1 (0.4m)	Soil	11/4/12		B+J		X	X	X	X	X	X	
9	Trip Spike	Water	11/4/12		2x vials			X					
10	Trip Blank	Water	11/4/12		2x vials			X					
11	Rinsate	Water	11/4/12		2x vials, metals, Amber		X		X	X			

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 71679

Date Received: 12.4.12
Time Received: 16:50
Received by: Jia Liu
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

RELINQUISHED BY:
NAME: A. Boardman DATE: 12/4/12
OF: JBS Environmental
NAME: DATE:
OF:

METHOD OF SHIPMENT:
CONSIGNMENT NOTE NO.
TRANSPORT CO.
CONSIGNMENT NOTE NO.
TRANSPORT CO

RECEIVED BY:
NAME: Jia Liu DATE: 12.4.12
OF: ELS
NAME: DATE:
OF:

FOR RECEIVING LAB USE ONLY:
COOLER SEAL – Yes..... No ..... Intact ....., Broken .....
COOLER TEMP ..... deg C
COOLER SEAL – Yes..... No ..... Intact ....., Broken .....
COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

JBS Environmental Pty Ltd ABN 67 071 842 638
Phone: (02) 8338-1011
Fax: (02) 8338-1700

128 O'Riordan St, MASCOT NSW 2020
PO Box 940 MASCOT NSW 1460
www.jbsgroup.com.au

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

CERTIFICATE OF ANALYSIS 72549

Client:
JBS Environmental Pty Ltd
P.O. Box 940
MASCOT
NSW 1460

Attention: J Rosner, A Boardman

Sample log in details:

Your Reference:	**41945, Edmondson Park Remediation**
No. of samples:	2 Soils, 3 waters
Date samples received / completed instructions received	02/05/12 / 02/05/12

Analysis Details:
Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	9/05/12 / 28/05/12
Date of Preliminary Report:	Not issued

NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Jacinta Hurst
Laboratory Manager

Nancy Zhang
Chemist

Rhian Morgan
Reporting Supervisor

Hinoko Miyazaki
Chemist

Lulu Guo
Approved Signatory

Alex MacLean
Chemist

Jeremy Faircloth
Chemist

ACCREDITED FOR TECHNICAL COMPETENCE

vTRH & BTEX in Soil			
Our Reference:	UNITS	72549-1	72549-2
Your Reference	----------	UFSP10-1	UFSP09-1
Date Sampled	----------	01/05/2012	01/05/2012
Type of sample		Soil	Soil
Date extracted	-	3/5/2012	3/5/2012
Date analysed	-	4/5/2012	4/5/2012
vTRH C_6 - C_9	mg/kg	<25	<25
Benzene	mg/kg	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1
m+p-xylene	mg/kg	<2	<2
o-Xylene	mg/kg	<1	<1
Surrogate aaa-Trifluorotoluene	%	95	93

sTRH in Soil (C10-C36)			
Our Reference:	UNITS	72549-1	72549-2
Your Reference	----------	UFSP10-1	UFSP09-1
Date Sampled	----------	01/05/2012	01/05/2012
Type of sample		Soil	Soil
Date extracted	-	03/05/2012	03/05/2012
Date analysed	-	04/05/2012	04/05/2012
$TRHC_{10}$ - C_{14}	mg/kg	<50	<50
$TRHC_{15}$ - C_{28}	mg/kg	<100	<100
$TRHC_{29}$ - C_{36}	mg/kg	<100	<100
Surrogate o-Terphenyl	%	104	100

PAHs in Soil Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ----------	72549-1 UFSP10-1 01/05/2012 Soil	72549-2 UFSP09-1 01/05/2012 Soil
Date extracted	-	03/05/2012	03/05/2012
Date analysed	-	06/05/2012	06/05/2012
Naphthalene	mg/kg	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1
Surrogate p-Terphenyl-d_{14}	%	85	86

Organochlorine Pesticides in soil			
Our Reference:	UNITS	72549-1	72549-2
Your Reference	----------	UFSP10-1	UFSP09-1
Date Sampled	----------	01/05/2012	01/05/2012
Type of sample		Soil	Soil
Date extracted	-	03/05/2012	03/05/2012
Date analysed	-	04/05/2012	04/05/2012
HCB	mg/kg	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1
Surrogate TCLMX	%	100	102

PCBs in Soil			
Our Reference:	UNITS	72549-1	72549-2
Your Reference	----------	UFSP10-1	UFSP09-1
Date Sampled	----------	01/05/2012	01/05/2012
Type of sample		Soil	Soil
Date extracted	-	03/05/2012	03/05/2012
Date analysed	-	04/05/2012	04/05/2012
Arochlor 1016	mg/kg	<0.1	<0.1
Arochlor 1221	mg/kg	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1
Surrogate TCLMX	%	100	102

Acid Extractable metals in soil			
Our Reference:	UNITS	72549-1	72549-2
Your Reference	----------	UFSP10-1	UFSP09-1
Date Sampled	----------	01/05/2012	01/05/2012
Type of sample		Soil	Soil
Date digested	-	03/05/2012	03/05/2012
Date analysed	-	03/05/2012	03/05/2012
Arsenic	mg/kg	6	8
Cadmium	mg/kg	<0.5	<0.5
Chromium	mg/kg	17	15
Copper	mg/kg	18	20
Lead	mg/kg	23	74
Mercury	mg/kg	<0.1	<0.1
Nickel	mg/kg	9	12
Zinc	mg/kg	56	55

Moisture			
Our Reference:	UNITS	72549-1	72549-2
Your Reference	----------	UFSP10-1	UFSP09-1
Date Sampled	----------	01/05/2012	01/05/2012
Type of sample		Soil	Soil
Date prepared	-	3/05/2012	3/05/2012
Date analysed	-	4/05/2012	4/05/2012
Moisture	%	27	24

Asbestos ID - soils			
Our Reference:	UNITS	72549-1	72549-2
Your Reference	----------	UFSP10-1	UFSP09-1
Date Sampled	----------	01/05/2012	01/05/2012
Type of sample		Soil	Soil
Date analysed	-	7/05/2012	7/05/2012
Sample mass tested	g	Approx 50g	Approx 50g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No respirable fibres detected	No respirable fibres detected

vTRH & BTEX in Water				
Our Reference:	UNITS	72549-3	72549-4	72549-5
Your Reference	----------	TRIP SPIKE	TRIP BLANK	RINSATE
Date Sampled	----------	01/05/2012	01/05/2012	01/05/2012
Type of sample		Water	Water	Water
Date extracted	-	02/05/2012	02/05/2012	02/05/2012
Date analysed	-	03/05/2012	03/05/2012	03/05/2012
TRH C_6 - C_9	µg/L	[NA]	[NA]	<10
Benzene	µg/L	113%	<1	[NA]
Toluene	µg/L	113%	<1	[NA]
Ethylbenzene	µg/L	112%	<1	[NA]
m+p-xylene	µg/L	112%	<2	[NA]
o-xylene	µg/L	112%	<1	[NA]
Surrogate Dibromofluoromethane	%	101	112	115
Surrogate toluene-d8	%	101	99	101
Surrogate 4-BFB	%	95	84	80

sTRH in Water (C10-C36)		
Our Reference:	UNITS	72549-5
Your Reference	----------	RINSATE
Date Sampled	----------	01/05/2012
Type of sample		Water
Date extracted	-	07/05/2012
Date analysed	-	07/05/2012
$TRHC_{10}$ - C_{14}	µg/L	<50
$TRHC_{15}$ - C_{28}	µg/L	<100
$TRHC_{29}$ - C_{36}	µg/L	<100
Surrogate o-Terphenyl	%	99

PAHs in Water		
Our Reference:	UNITS	72549-5
Your Reference	----------	RINSATE
Date Sampled	----------	01/05/2012
Type of sample		Water
Date extracted	-	07/05/2012
Date analysed	-	08/05/2012
Naphthalene	µg/L	<1
Acenaphthylene	µg/L	<1
Acenaphthene	µg/L	<1
Fluorene	µg/L	<1
Phenanthrene	µg/L	<1
Anthracene	µg/L	<1
Fluoranthene	µg/L	<1
Pyrene	µg/L	<1
Benzo(a)anthracene	µg/L	<1
Chrysene	µg/L	<1
Benzo(b+k)fluoranthene	µg/L	<2
Benzo(a)pyrene	µg/L	<1
Indeno(1,2,3-c,d)pyrene	µg/L	<1
Dibenzo(a,h)anthracene	µg/L	<1
Benzo(g,h,i)perylene	µg/L	<1
Surrogate p-Terphenyl-d_{14}	%	86

Metals in Waters - Acid extractable		
Our Reference:	UNITS	72549-5
Your Reference	----------	RINSATE
Date Sampled	----------	01/05/2012
Type of sample		Water
Date prepared	-	03/05/2012
Date analysed	-	07/05/2012
Arsenic - Total	mg/L	<0.05
Cadmium - Total	mg/L	<0.01
Chromium - Total	mg/L	<0.01
Copper - Total	mg/L	<0.01
Lead - Total	mg/L	<0.03
Mercury - Total	mg/L	<0.0005
Nickel - Total	mg/L	<0.02
Zinc - Total	mg/L	<0.02

Method ID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Inorg-008	Moisture content determined by heating at 105 deg C for a minimum of 4 hours.
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.

QUALITY CONTROL vTRH & BTEX in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			3/5/2012	[NT]	[NT]	LCS-2	3/5/2012
Date analysed	-			4/5/2012	[NT]	[NT]	LCS-2	4/5/2012
vTRH C_6 - C_9	mg/kg	25	Org-016	<25	[NT]	[NT]	LCS-2	104%
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	LCS-2	102%
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	LCS-2	104%
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS-2	103%
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	LCS-2	105%
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS-2	107%
Surrogate aaa-Trifluorotoluene	%		Org-016	98	[NT]	[NT]	LCS-2	111%

QUALITY CONTROL sTRH in Soil (C10-C36)	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			03/05/2012	[NT]	[NT]	LCS-7	03/05/2012
Date analysed	-			04/05/2012	[NT]	[NT]	LCS-7	04/05/2012
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	[NT]	[NT]	LCS-7	112%
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-7	108%
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-7	99%
Surrogate o-Terphenyl	%		Org-003	71	[NT]	[NT]	LCS-7	87%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			03/05/2012	[NT]	[NT]	LCS-7	03/05/2012
Date analysed	-			06/05/2012	[NT]	[NT]	LCS-7	06/05/2012
Naphthalene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-7	93%
Acenaphthylene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-7	92%
Phenanthrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-7	100%
Anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-7	89%
Pyrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-7	94%
Benzo(a)anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-7	111%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Benzo(b+k)fluoranthene	mg/kg	0.2	Org-012 subset	<0.2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	Org-012 subset	<0.05	[NT]	[NT]	LCS-7	112%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d_{14}	%		Org-012 subset	75	[NT]	[NT]	LCS-7	97%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			03/05/2012	[NT]	[NT]	LCS-7	03/05/2012
Date analysed	-			04/05/2012	[NT]	[NT]	LCS-7	04/05/2012
HCB	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-7	90%
gamma-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
beta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-7	75%
Heptachlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-7	79%
delta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Aldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-7	92%
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-7	99%
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
pp-DDE	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-7	92%
Dieldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-7	107%
Endrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-7	97%
pp-DDD	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-7	99%
Endosulfan II	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
pp-DDT	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-7	97%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate TCLMX	%		Org-005	95	[NT]	[NT]	LCS-7	92%

QUALITY CONTROL PCBs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			03/05/2012	[NT]	[NT]	LCS-7	03/05/2012
Date analysed	-			04/05/2012	[NT]	[NT]	LCS-7	04/05/2012
Arochlor 1016	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Arochlor 1221	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Arochlor 1232	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Arochlor 1242	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Arochlor 1248	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Arochlor 1254	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	LCS-7	97%
Arochlor 1260	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate TCLMX	%		Org-006	95	[NT]	[NT]	LCS-7	88%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date digested	-			03/05/2012	[NT]	[NT]	LCS-2	03/05/2012
Date analysed	-			03/05/2012	[NT]	[NT]	LCS-2	03/05/2012
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	[NT]	[NT]	LCS-2	95%
Cadmium	mg/kg	0.5	Metals-020 ICP-AES	<0.5	[NT]	[NT]	LCS-2	100%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-2	100%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-2	103%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-2	97%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	[NT]	[NT]	LCS-2	106%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-2	100%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-2	99%

QUALITY CONTROL Moisture	UNITS	PQL	METHOD	Blank
Date prepared	-			[NT]
Date analysed	-			[NT]
Moisture	%	0.1	Inorg-008	[NT]

QUALITY CONTROL Asbestos ID - soils	UNITS	PQL	METHOD	Blank
Date analysed	-			[NT]

QUALITY CONTROL vTRH & BTEX in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			02/05/2012	[NT]	[NT]	LCS-W1	02/05/2012
Date analysed	-			03/05/2012	[NT]	[NT]	LCS-W1	03/05/2012
$TRHC_6$ - C_9	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-W1	123%
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	124%
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	124%
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	118%
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	LCS-W1	124%
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	124%
Surrogate Dibromofluoromethane	%		Org-016	93	[NT]	[NT]	LCS-W1	112%
Surrogate toluene-d8	%		Org-016	104	[NT]	[NT]	LCS-W1	99%
Surrogate 4-BFB	%		Org-016	91	[NT]	[NT]	LCS-W1	96%

QUALITY CONTROL sTRH in Water (C10-C36)	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			07/05/2012	[NT]	[NT]	LCS-W3	07/05/2012
Date analysed	-			07/05/2012	[NT]	[NT]	LCS-W3	07/05/2012
$TRHC_{10}$ - C_{14}	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W3	90%
$TRHC_{15}$ - C_{28}	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W3	96%
$TRHC_{29}$ - C_{36}	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W3	96%
Surrogate o-Terphenyl	%		Org-003	95	[NT]	[NT]	LCS-W3	139%

QUALITY CONTROL PAHs in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			07/05/2012	[NT]	[NT]	LCS-W1	07/05/2012
Date analysed	-			08/05/2012	[NT]	[NT]	LCS-W1	08/05/2012
Naphthalene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	102%
Acenaphthylene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Fluorene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	95%

QUALITY CONTROL PAHs in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Phenanthrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	94%
Anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	71%
Pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	75%
Benzo(a)anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Chrysene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	105%
Benzo(b+k)fluoranthene	µg/L	2	Org-012 subset	<2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	101%
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d_{14}	%		Org-012 subset	79	[NT]	[NT]	LCS-W1	81%

QUALITY CONTROL Metals in Waters - Acid extractable	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			03/05/2012	72549-5	03/05/2012 || 03/05/2012	LCS-W3	03/05/2012
Date analysed	-			03/05/2012	72549-5	07/05/2012 || 07/05/2012	LCS-W3	04/05/2012
Arsenic - Total	mg/L	0.05	Metals-020 ICP-AES	<0.05	72549-5	<0.05 || [N/T]	LCS-W3	88%
Cadmium - Total	mg/L	0.01	Metals-020 ICP-AES	<0.01	72549-5	<0.01 || [N/T]	LCS-W3	91%
Chromium - Total	mg/L	0.01	Metals-020 ICP-AES	<0.01	72549-5	<0.01 || [N/T]	LCS-W3	92%
Copper - Total	mg/L	0.01	Metals-020 ICP-AES	<0.01	72549-5	<0.01 || [N/T]	LCS-W3	94%
Lead - Total	mg/L	0.03	Metals-020 ICP-AES	<0.03	72549-5	<0.03 || [N/T]	LCS-W3	89%
Mercury - Total	mg/L	0.0005	Metals-021 CV-AAS	<0.0005	72549-5	<0.0005 || <0.0005	LCS-W3	116%
Nickel - Total	mg/L	0.02	Metals-020 ICP-AES	<0.02	72549-5	<0.02 || [N/T]	LCS-W3	92%
Zinc - Total	mg/L	0.02	Metals-020 ICP-AES	<0.02	72549-5	<0.02 || [N/T]	LCS-W3	92%

Report Comments:

Asbestos ID was analysed by Approved Identifier: Alex Tam
Asbestos ID was authorised by Approved Signatory: Lulu Guo

INS: Insufficient sample for this test
NA: Test not required
<: Less than

PQL: Practical Quantitation Limit
RPD: Relative Percent Difference
>: Greater than

NT: Not tested
NA: Test not required
LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batched of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

CHAIN OF CUSTODY

JBS ENVIRONMENTAL

PROJECT NO.: 41945
PROJECT NAME: Edmondson Park Remediation
SEND REPORT TO: AB + JR
SEND INVOICE TO: Accounts
DATE NEEDED BY: Standard Turn Around
COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

LABORATORY BATCH NO.
SAMPLERS AB
PHONE: 02 8338 1011
QC LEVEL: NEPM 1999 (✓)
EMAIL: JRosmarin@jbsgroup.com.au
aboard man@jbsgroup.com.au

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	TPH	BTEX	PAHs	Metals (8)	OCPs	ABNs	NOTES
UESP10-1 (0.5m)	Soil	1/5/12		B+J		X	X	X	X	X	X	
UESP09-1 (0.3m)	Soil	1/5/12		B+J		X	X	X	X	X	X	
Trip Sple	Water	1/5/12		2x vials			X					Quote 11188
Trip Blank	Water	1/5/12		2x vials			X					
Rinsate	Water	1/5/12		2x vials, 1x enbn 1x metals		X		X	X			

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 72549
Date Received: 2.5.12
Time Received: 14.30
Received by: Jia Liu
Temp: Cool/Ambient
Cooling: Ice/Gelpack
Security: Intact/Broken/None

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: AB DATE: 2/5/12	CONSIGNMENT NOTE NO.	NAME: Jia Liu DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS Environmental	TRANSPORT CO.	OF: Evs 2.5.12.	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

Alex Boardman

From: Jacinta Hurst <JHurst@envirolab.com.au>
Sent: Friday, 25 May 2012 5:24 PM
To: Alex Boardman
Subject: RE: Additional anaylsis

We will have to run for PCB's. I will do them in an A job

Regards,

Jacinta Hurst | **Laboratory Manager** | **Envirolab Services**

Great Chemistry.Great Service.

12 Ashley St Chatswood NSW 2067
T 02 9910 6200 **F** 02 9910 6201 **M** 0407 003 037
jhurst@envirolab.com.au | www.envirolab.com.au

From: Alex Boardman [mailto:ABoardman@jbsgroup.com.au]
Sent: Friday, 25 May 2012 16:27
To: Jacinta Hurst
Subject: Additional anaylsis

Hey

The following Labs were tested for OCPs, can I please get the reports and Esdat spread sheets with PCBs also?

- 71443
- 71679
- 72549

Thanks in advanced

Regards
Alex Boardman | Environmental Scientist| JBS Environmental Pty Ltd
128 O'Riordan St Mascot NSW | 50 Margaret St Sydney NSW | 77 St Georges Terrace Perth WA | PO Box 940 Mascot NSW 1460
T: 02 8338 1011 | F: 02 8338 1700 | M: 0466 575 661 | www.jbsgroup.com.au
Groundwater | Contaminated Land | Planning and Approvals | Auditing and Compliance | Hazardous Materials and Air Monitoring

If you would like to send me large electronic files (>10MB), please use JBS Environmental's secure internet-based file delivery system located at http://dropbox.yousendit.com/JBSENVIRONMENTAL
This message is intended solely for the individual(s) and entity(s) addressed. It is confidential and may contain legally privileged information.
Please note that JBS Environmental Pty Ltd does not make any commitments through emails not confirmed by fax, letter or report.

Attachment 6 – Summary tables – Stockpile Sample Analytical Results

Edmondson Park Remediation
Job Number: 41945
Landcom
UF Stockpile Characterisation Letter
Table A: Summary Table Laboratory Analysis

Notes:
(1) Individual PAH compounds assessed under total PAHs. Individual TPH fractions assesed under total TPH.
(2) Site Validation Criterion (See Text Table 6.1, lower of Ecological or Health Investigation Level (residential))

100 Concentration exceeds Site Validation Criteria

				Asbestos	BTEX				Metals							OCPs					PAHs		PCBs	TPH				
				Asbestos Fibres	Benzene	Ethylbenzene	Toluene	Xylene Total	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Nickel	Zinc	Aldrin + Dieldrin	Chlordane (cis)	Chlordane (trans)	DDT+DDE+DDD	Heptachlor	Benzo(a) pyrene	Total PAHs	Total PCBs	C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of total)
EQL				0.1	0.2	1	0.5	<3	4	0.5	1	1	1	1	1		0.1	0.1		0.1	0.05	1.55	0.6	25	50	100	100	<250
Site Validation Criterion (HIL/EIL) - *See note 2*					1	3.1	1.4	14	20	3	400	100	300	60	200	10	50		200	10	1	20	10	65	-	-	-	1000
Field_ID	**Sample De**	**Sampled_D**	**Matrix_Description**																									
SP18-3	0.6	4/04/2012	Fill: Silty Clay	<0.1	<0.2	<1	<0.5	<3	9	<0.5	16	15	22	8	27	<0.2	<0.1	<0.1	<0.3	<0.1	<0.05	<1.55	<0.6	<25	<50	<100	<100	<250
SP19-1	0.3	4/04/2012	Fill: Silty Clay	<0.1	<0.2	<1	<0.5	<3	<4	<0.5	7	5	12	4	17	<0.2	<0.1	<0.1	<0.3	<0.1	<0.05	<1.55	<0.6	<25	<50	<100	<100	<250
UFSP03-1	1	11/04/2012	Fill: Silty Clay	<0.1	<0.2	<1	<0.5	<3	4	<0.5	11	32	98	6	34	<0.2	<0.1	<0.1	<0.3	<0.1	<0.05	<1.55	<0.6	<25	<50	<100	<100	<250
UFSP03-2	0.5	11/04/2012	Fill: Silty Clay	<0.1	<0.2	<1	<0.5	<3	6	<0.5	17	34	79	9	47	<0.2	<0.1	<0.1	<0.3	<0.1	<0.05	<1.55	<0.6	<25	<50	<100	<100	<250
UFSP04-1	0.5	11/04/2012	Fill: Silty Clay	<0.1	<0.2	<1	<0.5	<3	<4	<0.5	6	23	50	4	44	<0.2	<0.1	<0.1	<0.3	<0.1	0.06	0.46	<0.6	<25	<50	<100	<100	<250
UFSP05-1	1	11/04/2012	Fill: Silty Clay	<0.1	<0.2	<1	<0.5	<3	6	<0.5	17	17	26	7	160	<0.2	<0.1	<0.1	<0.3	<0.1	<0.05	<1.55	<0.6	<25	<50	<100	<100	<250
UFSP06-1	1	11/04/2012	Fill: Silty Clay	<0.1	<0.2	<1	<0.5	<3	6	<0.5	20	15	29	7	240	<0.2	<0.1	<0.1	<0.3	<0.1	<0.05	<1.55	<0.6	<25	<50	<100	<100	<250
UFSP06-2	1	11/04/2012	Fill: Silty Clay	<0.1	<0.2	<1	<0.5	<3	6	<0.5	20	15	29	7	180	<0.2	<0.1	<0.1	<0.3	<0.1	<0.05	<1.55	<0.6	<25	<50	<100	<100	<250
UFSP07-1	0.4	11/04/2012	Fill: Silty Clay	<0.1	<0.2	<1	<0.5	<3	<4	<0.5	15	16	20	8	33	<0.2	<0.1	<0.1	<0.3	<0.1	<0.05	<1.55	<0.6	<25	<50	<100	<100	<250
UFSP08-1	0.4	11/04/2012	Fill: Silty Clay	<0.1	<0.2	<1	<0.5	<3	<4	<0.5	16	17	20	8	34	<0.2	<0.1	<0.1	<0.3	<0.1	<0.05	<1.55	<0.6	<25	<50	<100	<100	<250
UFSP09-1	1	1/05/2012	Fill: Silty Clay	<0.1	<0.2	<1	<0.5	<3	8	<0.5	15	20	74	12	55	<0.2	<0.1	<0.1	<0.3	<0.1	<0.05	<1.55	<0.6	<25	<50	<100	<100	<250
UFSP10-1	1	1/05/2012	Fill: Silty Clay	<0.1	<0.2	<1	<0.5	<3	6	<0.5	17	18	23	9	56	<0.2	<0.1	<0.1	<0.3	<0.1	<0.05	<1.55	<0.6	<25	<50	<100	<100	<250

Appendix F – Hygienist (PEA) Clearance Documents

© 2013 JBS Environmental Pty Ltd

Pacific Environmental

ENVIRONMENTAL & OCCUPATIONAL HEALTH MANAGEMENT PLAN

FOR

ASBESOS MANAGEMENT

AT

ZOUCH ROAD EDMONDSON PARK FORMER BARDIA BARACKS REDEVELOPMENT SITE

FOR

TRN GROUP

Prepared by:

Pacific Environmental Services Pty Ltd

PO Box 4045 Illawong NSW 2234

Phone: 029543 2825

Fax.: 029543 2823

Email: decontam@bigpond.net.au

Reference: ContamSites/AsbestosMP/BardiaZouchRd23Feb2012

Table of Contents

1.0 INTRODUCTION 3
2.0 POLICY 5
3.0 IDENTIFIED CONTAMINATION HAZARDS REQUIRING MANAGEMENT 5
4.0 REGULATORY REQUIREMENT 6
5.0 HEALTH RISKS OF AIRBORNE ASBESTOS FIBRES 7
6.0 MANAGEMENT PLAN 8
6.1 OBJECTIVES 8
6.2 ROLE OF CONTAMINATED LAND CONSULTANT ON SITE 8
6.3 REMOVEL OF ASBESTOS CONTAMINATED FRIABLE SOIL/FILL 9
6.4 REMOVAL OF BONDED ASBESTOS FRAGMENTS 10
6.5 REQUIREMENT DURING EXCAVATION/TRANSPORTATION WORKS 10
6.6 SITE HYGIENE 11
6.7 UNFORSEEN EVENT OR EMERGENCY INVOLVING CONTAMINATION 11
6.8 GENERAL ENVIRONMENT PROTECTION 11
7.0 CONCLUSION & RECOMMENDATIONS 12
8.0 LIMITATIONS 12
Appendix A: Asbestos Procedures 14
A1 ASBESTOS WORK REQUIRMENTS 14
A1.1 ENCLOSURE 14
A1.2 DECONTAMINATION 14
A1.3 RESPIRATORY PROTECTION 14
A1.4 WARNING NOTICES 15
A2 AIRBORNE ASBESTOS FIBRE MONITORING 15
A2.1 MONITORING FREQUENCY 16
A 2.2 CERTIFICATION 16
APPENDIX B: LIMITED ASBESTOS REMOVAL REGISTER OF REMOVAL 18
DEFINITIONS 20

STATEMENT:
This document has been prepared by Pacific Environmental and is subject to the conditions and limitations detailed at Section 8 of this document.

1.0 INTRODUCTION

Pacific Environmental (PE) has been commissioned by TRN, the principal contractors at the earthwork and remediation site at the former Bardia Barracks (Zouch Road, Edmondson Park, NSW) to prepare an Asbestos Management Plan for the areas identified as being impacted by asbestos contamination. The impacted areas or areas of environmental concern (AOC) have been identified by several pertinent environmental documents being:

1. Remediation Action Plan, Landcom Project No. 12619, Zouch Road Edmondson PARK ns – Golder Associates Pty Ltd (2005b);

2. Interim Advice #4 Zouch Road Edmondson Park RAP, Environ Australia Pty Ltd 2006;

3. Interim Advice #5 Zouch Road Edmondson Park revised RAP, Environ Australia Pty Ltd 24 February 2011;

4. VSAQP Landcom Project 12619 JBS February 2012 Revision 0.

The above documents define the asbestos impacted areas of the site known as Zouch Road Edmondson Park, NSW - formerly Bardia Barracks. The Site is identified as:

- Lots 7 and 8 DP 1127652.

Lots 1 and 2 DP 1127652 are dedicated to the rail corridor through the site and are not part of the Management Plan.

This document is to assist in the implementation an Environmental and Occupational Hygiene Management Plan (the Plan) to address the management of deleterious building materials containing bonded asbestos fragments (BAF)and fibrous asbestos impacted soils (FAIS) in the civil earthworks of the site re-development. There exist three (3) areas that are of Concern (AECs) (as defined by JBS in their VSAQP OF February 2012) being:

1. **AOC 5 –**
   - The vicinity of the rifle range extending to the identified disposal pit area - in the centre of the site. – estimated by Golders (2005b) to cover the surface soils of 25,000m^2 and occupy 2,500m^3;
   - ACM pipes in the vicinity of Golders (2005b) sample point TP 348 and at the eastern portion of the site;
   - Chrysotile asbestos in Golders (2005b) soil samples SP6/A, HA-AS3/2 and HAS5/2 - refer to Figure 3 of JBS VSAQP (Feb 2012 rev 0);
   - Chrysotile and amosite asbestos in sample conservation area – defined by samples HA AS 8/1 and TP723/4 - refer to Figure 3 & 4 of JBS VSAQP (Feb 2012 rev 0);

2. **A0C7-**
   - Disposal Pits - three (3) trenches in the centre of the site and at the east of the former rifle range.

- South of the above area in an open trench;

3. **AOC OTHERS** – there are a number of areas within the site that have been identified as containing construction and demolition waste and not specifically identified as containing asbestos. These areas are suspect and should be treated as containing asbestos until completion of excavation and visual observation can determine otherwise. These areas are:

    - Stockpiles in the north western corner of the site, labelled at JBS VSAQP Fig 3, called "Waste Disposal Area West";
    - Open Trench 1.5 to 2.0 Deep and a 30m3 stockpile all adjacent to the northern boundary;
    - A small trench and stockpile east of the above trench;
    - Three (3) burial trenches inn the centre of the site and in the vicinity of the coal stockpile.

The purpose of the Plan is to promote the management of identified and potential land contamination risks at the site in a manner that protects human health. The Plan specifically deals with the asbestos contaminant that has been identified in inspections and in road works undertaken to date.

In addition this plan is to be utilized as a management plan for unexpected finds (asbestos) that may be uncovered under the identified asbestos contamination areas, in suspect area (AOC OTHERS) or outside these areas.

The Plan is not a Scope of Works, this covered in the Golder RAP (2005b) and JBS VSAQP (Feb2012). It is a recommended format for dealing with asbestos fragments or fibrous asbestos contaminated soil that have been uncovered or may be further uncovered during site works/excavations associated with the Edmondson Park earthworks and remediation.

The identified asbestos contaminated soils are proposed to be remediated, utilizing a NSW Licensed Asbestos Removalist, by:

1. Surface "emu bob" clearing of surface impacted soils, bagging the collected material for disposal in the prepared area to be capped according to the JBS VSAQP and Golders RAP;
2. Keeping the all stockpiled soils wet until all asbestos fragments have been removed and no fibres are shown to be present in validation samples;
3. Removing the asbestos contaminated soils to the area to be capped on the site as outlined in an associated RAP and VSAQP;
4. Sampling under the removed soils to demonstrate that the underlying exposed soils are not contaminated with asbestos fragments or fibres – undertaken by the site Environmental Consultant – JGS;.
5. It should be noted that a 5m buffer is to be maintained to any stormwater drainage system or drainage line at the remediation site.
6. During all soils management works conduct asbestos fibre air monitoring;
7. Ensure that PPE is worn by all staff associated with the remediation;
8. Ensure that only authorized personnel enter the work areas.

The Plan has been developed in line with the NSW Occupational Health and Safety Regulations 2005 amendments and the Code of Practice for the Management and Control of Asbestos in Workplaces (NOHSC:2018(2005)). Where the identification and risk evaluation process identifies a likelihood of exposure in airborne asbestos fibres, all practicable steps should be taken to ensure that employees, staff, visitors and contractors are not exposed.

The Plan is applicable only for the management of asbestos during demolition/construction works and does not cover the obligations for ongoing risk management following the completion of construction works.

Pacific Environmental is providing environmental and occupational hygiene soil sampling for the identification or otherwise of residue asbestos fibres in soil post removal of any uncovered asbestos bonded fragments to confirm the removal in each case.

Bonded and fibrous(friable) asbestos fragments have been identified to in the site soils and are potentially present to 100mm below the base of the identified areas (A0C5, AOC 7 and potentially AOC OTHERS).

A contaminated land consultant or Work Cover Licensed Supervisor will supervise; sample and monitor any potentially contaminated areas with fragments in soil/fill at the site until total removal of the impacted area has been completed.

2.0 POLICY

It has been stated to PE that it is the policy of the site prime contractor TRN to insist that its contractors (in this case TRN and EMS) have site have a policy to protect the safety of employees; staff; contractors; visitors and the neighbouring community with regards to exposure of identified and/or potential airborne asbestos fibres from the site.

All identified asbestos contaminated related Environmental and Occupational Hygiene works are to be carried out in accordance with the requirements of current Local Government; State and National Acts, Regulations and Code of Practice.

All non-asbestos related Environmental and Occupational Hygiene Works are to be carried out in accordance with the requirements of current State and National Acts, Regulations and Code of Practice.

3.0 IDENTIFIED CONTAMINATION HAZARDS REQUIRING MANAGEMENT

There is visual and documented evidence indicating asbestos containing fragments existing in soils at the site - A0C5, AOC 7 and potentially AOC OTHERS).

Based on information provided; visual and analytical records, the land contamination hazards associated with the proposed works would include:

- Bonded asbestos fibres in flat fibrous cement sheeting (FFCS) at AOC5 and 7across the site;
- Fibrous (friable) asbestos fragments at the stockpile identified by Golders (2005b) sample pits SP 6 and 13.
- Others as they are uncovered and suspected to be at AOC OTHERS.

Pacific Environmental understands the primary activities on the site are:

- Surface works such as soil/fill levelling and compaction;
- Removal of the contaminated soils and asbestos fragments to burial pit and then covering with a minimum of 1.0m soil in accordance with the JBS VSAQP and in accordance with the site Golders RAP;

4.0 REGULATORY REQUIREMENT

The risk management and control of Hazards (bonded asbestos fibres in fragments) in New South Wales workplaces are enshrined in several pieces of legislation. Any works with the potential to impact on asbestos containing materials or relating to the removal, encapsulation, transport , disposal or otherwise disturbance of asbestos containing materials shall be carried out in accordance with all State and Commonwealth Acts, regulations and Codes of Practice, including but not limited to the following documents and legislation:-

- AS1319-1983, Rules for the Design and Use of Safety Signs for the Occupational Environment;
- AS/NNZ1715-1994, Selection, Use and Maintenance of Respiratory Protective Devices;
- AS/NA1716-1994, Respiratory Protective Devices;
- NSW Occupational Health and Safety Act 2005 and amendments;
- NSW Dangerous Goods Act 1985 and the Regulations emanating there from, including but not limited to Placarding of Workplaces, Storage and Handling, and Flammable Liquids.;
- NSW Occupational Health and Safety Regulation 2007 and amendments;
- NSW Asbestos Removal Consultative Association (NSWARCA) Standard;
- NSW Department of Environment, Climate Change and Water (DECCW) (formerly NSW EPA) Regulation Regarding the Disposal of Asbestos (2009);
- Code of Practice For The Management And Control Of Asbestos in the Workplaces (NOHSC 2018 (2005));
- Code of Practice for the Safe Removal of Asbestos (NOHSC2002 (2005));
- Guidance Note On The Membrane Filter Method For Estimating Airborne Asbestos Fibres (NOHSC3003 (2005));
- Code of Practice for the Storage and Handling of Dangerous Goods, Regulation 2000.

5.0 HEALTH RISKS OF AIRBORNE ASBESTOS FIBRES

Asbestos is a known carcinogen. The inhalation of asbestos fibres is known to cause Mesothelioma, lung cancer and asbestosis.

Malignant Mesothelioma is a cancer of the outer covering of the lung (the pleura) or the abdominal cavity (the peritoneum). It is usually fatal. Mesothelioma is caused by the inhalation of needle like asbestos fibres deep into the lungs where they can damage Mesothelial cells, potentially resulting in cancer. The latency period is generally between 35 and 40 years, but it may be longer, and the disease is very difficult to detect prior to the onset of illness. Mesothelioma was one rare, but its incidence is increasing throughout the industrial world as a result of past exposures to asbestos. Australia has the highest incidence rate in the world.

Lung cancer has been shown to be caused by all types of asbestos related fibres. The average latency period of the disease, fro the first exposure to asbestos, ranges from 20 to 30 years. Lung cancer symptoms are rarely felt until the disease has developed to an advanced stage.

Asbestosis is a form of lung disease (pneumoconiosis) directly caused by inhaling asbestos fibres, causing a scarring (fibrosis) of the lung tissue, which decreases the ability of the lungs to transfer oxygen to the blood. The latency period of asbestosis is generally between 15 to 25 years.

Asbestos poses a risk to health by inhalation whenever asbestos fibres become airborne and people are exposed to theses fibres.

Accordingly, exposure should be prevented. The National Exposure Standard of 0.1 fibres/ml should never be exceeded, and „control level" of 0.01 fibres/ml has been reached. The Code of Practice for the Safe Removal of Asbestos (NOHSC: 2002(2005)) provides additional information on controls.

Asbestos Containing Materials (ACM) can release asbestos fibres into the air whenever they are disturbed, and distributed, and especially during the following activities:

- Any direct action on ACM, such as drilling, boring, cutting, filing, brushing, grinding, sanding, breaking, smashing, or blowing with compressed air (State and Territory legislation prohibits most of these actions, and the relevant laws should be check before performing any activity on ACM);
- The inspection or removal of ACM from workplaces (including vehicles, plant and equipment);
- The maintenance and servicing of materials from vehicles, plant, equipment or workplaces;
- The renovation or demolition of building containing ACM

Non friable ACM that has been subjected to extensive weathering or deterioration also has a higher potential to release asbestos fibres into the air „

Source: Code of Practice for The Management And Control of Asbestos In Workplaces (NOHSC 2018 (2005)).

6.0 MANAGEMENT PLAN

6.1 OBJECTIVES

The purpose of The Plan is to promote the management of identified asbestos contamination risks at the site in a manner that protects human health. The Plan specifically deals with asbestos fragments and fibrous(friable) asbestos fragments at the site, as identified at AOC5 and AOC7 as well as any material uncovered during the excavation of the AOC OTHERS.

6.2 ROLE OF RESPONSIBLE OFFICER ON SITE

Role of Responsible Officer

TRN and EMS, as the principal‟s representatives, shall appoint the „Responsible Office‟ to supervise and act as the main liaison and contact point for any asbestos related issues.

The "Responsible Officer‟ shall ensure the effective implementation, functioning and maintenance of The Plan, and is responsible for the following:-

- Providing an advisory service to workers, staff, visitors and contractors;
- Ensuring all workers, staff, visitors and contractors are aware of and comply with The Plan;
- Maintain the Asbestos Register for identified ACN fragments;
- Record incidents or hazards;
- Review The Plan with documentation of changes to site conditions;
- Manage training and awareness programs;
- Manage the asbestos removal and/or encapsulation program;
- Determine asbestos containing material identified that may be identified on the site.

Role of Contactors' Staff

All contractors and their staff must ensure that they:

- Do no impact on any identified and/or potential asbestos containing material without complying with The Plan;
- Comply with all policies, procedures and instructions stipulated in The Plan;
- Advise the „Responsible Officer‟ when workers or contractors are on the site;
- Ensure that any inquires or concerns are referred to the „Responsible officer‟;
- Ensure that they are informed and are clear on the responsibilities of the "Responsible Officer‟ and the risk control measures that are in effect.

Role of Sub-Contractors

All sub-contractors must ensure that:

- They and their employees and/or sub contractors are aware to their responsibilities under The Plan;
- Report to the „Responsible Officer" prior to commencing work on site;
- Do not impact on identified or potential asbestos containing materials without complying with The Plan;
- Report all incidents or potential hazards to the „Responsible Officer" for assessment and/or action;
- Comply with all policies, procedures and instructions stipulated in The Plan or specified in contract documents;
- Protect themselves and others in the workplace.

6.3 REMOVEL OF ASBESTOS CONTAMINATED FRIABLE SOIL/FILL

Friable asbestos has been identified at the site, Pacific Environmental suggests the following procedures for the management of identified friable free fibres in soil/fill be adopted:

1. Compliance with the NSW OH&S Regulations 2005 and amendments, any friable asbestos removal works are to be undertaken by an appropriately licensed ADI-F asbestos removalist;
2. As per industry good practice it is recommended that all friable works be undertaken by an appropriately experienced licensed ADI-F asbestos removalist;
3. All designated works areas are to be appropriately isolated and signed;
4. Establish a 10 metre exclusion zone around the excavation areas, with personnel inside the exclusion zone to wear at a minimum P2 Respirators, Hand protection, Suits and Boot protection or appropriate boot, decontamination processes and other recommended PPE as identified with Job Safety Analysis & Safe Work Method Statement. EG: Hard Hats, Hi-Vis vests;
5. Establishment of dust suppression with the minimum use of water through misting techniques;
6. An appropriate decontamination process at ingress and egress is established for the duration of the remediation works;
7. Contaminated soil to be placed into appropriately tarp covered bins/trucks for disposal to the adjacent licensed landfill;
8. Asbestos fibre air monitoring to be conducted during removal works at four points of the compass a minimum;
9. Decontamination and clearance inspections to be carried out of all tools/equipment prior to their removal for the asbestos works area;
10. Visual clearance inspection to be carried out following the completion of removal works;
11. Soil testing be undertaken to verify the successful clearance will be undertaken by the site Contaminated Land Consultant JBS in accordance with their VSAQP.

6.4 REMOVAL OF BONDED ASBESTOS FRAGMENTS

Pacific Environmental suggests the following procedures for the removal of identified bonded asbestos in the site soils:

1. „Responsible Officer" to determine if material is Bonded asbestos containing;
2. „Responsible Officer" to determine quantity of material to be removed;
3. „Responsible Officer" to determine to inform all employees and contractors adjacent to the proposed area if the proposed remediation works;
4. Isolate and sign works area;
5. Establish a **5 metre exclusion zone** around works area. All personnel inside the exclusion zone to wear at a minimum P2 Respirators, Hand protection, Hard Hat, Hi-Vis vests. Establish and maintain for the duration of works facilities for the decontamination of tools, equipment and personnel;
6. Spray the asbestos containing material with a fine water mist to dampen the surface and keep damp;
7. Place asbestos containing bonded material into appropriately tarp covered bins/trucks for disposal to the adjacent NSW DECCW licensed landfill;
8. Adopt a respirator removal procedure: whilst wearing respirators remove the unit inside-out and place in an asbestos waste bag;
9. „Responsible Officer" to determine to update register to cover completed works;
10. Advise JBS to allow clearance of the affected site and possible soil sampling to confirm the lack of fibres before finalizing excavations at the site in the affected area.

6.5 REQUIREMENT DURING EXCAVATION/TRANSPORTATION WORKS

1. Conduct a visual inspection of the area below the affected areas for the presence of FFCS materials that have a potential to contain asbestos;
2. All inspection works to be conducted by a capable and competent hygienist or contaminated land consultant;
3. If additional suspected asbestos containing materials are identified during initial inspection or during works:
   - 3.1 Notify the "Responsible Officer"
   - 3.2 Establish an exclusion zone around suspect area
   - 3.3 „Responsible Officer" to arrange for a sample of suspect materials and soil to be taken; and sent to an approved NATA analyst for analysis,
     OR
   - 3.4 „Responsible Officer" may deem that the material to be asbestos containing.

3.5 Where samples are found or deemed to contain asbestos at a minimum implement recommendations detailed in sections 6.3 and 6.4;

4. If no suspected asbestos containing materials are identified notify the „Responsible Officer" and continue works.

6.6 SITE HYGIENE

Establish and maintain washing facilities in close proximity to crib shed and lunch facilities.

Establish wash down and decontamination procedures,
Incorporate hygiene and prevention of cross contamination procedures into the site induction.

6.7 UNFORSEEN EVENT OR EMERGENCY INVOLVING CONTAMINATION

If during any site works or excavation, offensive or noxious odours, water seepage or ingress and/or evidence of waste, gross contamination not previously detected or other unforseen event occurs hen the site works are to cease in that area and action to be taken to immediately reduce the risk to human health, including the following:

- A minimum 10 metre exclusion area shall be secured to prevent unauthorised access;
- The Principal Contractor shall immediately notify all relevant parties as to the nature of the event;
- Any remedial action is to be developed by an appropriately qualified and experienced Contaminated Land Assessment Consultant, in this case JBS.

6.8 GENERAL ENVIRONMENT PROTECTION

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

7.0 CONCLUSION & RECOMMENDATIONS

This Environmental and Occupational Hygiene Asbestos Management Plan (The Plan) addresses Asbestos contamination fragments and fibrous(friable) asbestos fragments in soil located on and in the site soil at the area of the Zouch Road Edmondson Park Road, NSW earthworks and remediation in the areas known as AOC5 and AOC7 (as well as any asbestos contamination identified in the areas known as AOC OTHERS). In consultation with TRN and EMS, the principal‟s project managers, activities will be able to continue on site whilst the site is monitored ensuring that nominated activities are undertaken in a safe manner with respect to human health and in consideration of land contamination risks.

Pacific Environmental concludes from the historical environmental documentation that there exists FFCS with bonded asbestos contamination and fibrous(friable) asbestos fragments present in and on the site soils. This Management Plan, associated control measures and risks should be included in the site induction for all employees, contractors and visitors, and this information is to be provided to all existing designated work groups.

An appointed Contaminated Land Consultant (JBS) and a Work Cover Licensed Asbestos Supervisor will monitor control measures put in place by the Principal Contractor. The results of the monitoring shall be displayed daily and used to verify the effectiveness of the control measures, or to improve the measures, as required.

Based on the known nature of contamination on the site and in accordance with NSW Occupational Health and Safety Regulations 2005 and amendments, Pacific Environmental suggests all fibro cement debris identified be deemed to contain asbestos; and control measures defined in this plan be implemented.

Any use of the provision for „Limited FFCS bonded asbestos remediation work without a licence‟ should be considered with caution on this site. All „limited‟ remediation is to be conducted by the Responsible Officer and checked by PE personnel and in accordance with all requirements under the regulations and codes of practice.

It is recommended that all FFCS asbestos related works including but not limited to removal, wrapping and placement in the designated excavated pit (to be covered in accordance with the Goldrs RAP and JBS VSAQP), be conducted by appropriately trained and equipped personnel.

8.0 LIMITATIONS

All works carried out in preparing this report have utilised and were based on Pacific Environmental‟s professional knowledge and understanding of current relevant National and State standards, codes of practice, regulations and acts. Changes in legislation and guidance may occur at any time in the future and cause conclusions contained in this report to become incorrect or inappropriate.

Pacific Environmental – does not accept responsibility for advising the fact or implications of any such changes.

The findings of this report represent the professional opinion of experience scientists and consultants; Pacific Environmental – does not provide legal opinion and independent legal advise may be required.

Where information or data from external sources/consultants has been included in this report; the report, data or information has been reported on an as received basis with no extrapolation or interpretation made of any results, conclusions or recommendations.

Pacific Environmental dose not provide any warranty, assurances or accepts any liability as to the accuracy or suitability of any reports, data or information produced by external sources/consultants.

This report should not be regarded as absolute; soil/fill excavations and earthworks on site may reveal instances of asbestos containing materials insitu, not identified to date.

This report should not be used as a contractual document; Pacific Environmental does not provide any warranty, assurances or accepts any liability as to the suitability of the report as a contractual document. The use of the report as a contractual document is the sole risk of that party.

This document should be read in its entirety and in conjunction with previous reports presented for this site.

Prepared by:

Stephen John Smith
Director Pacific Environmental
23rd February 2012

Appendix A: Asbestos Procedures

A1 ASBESTOS WORK REQUIRMENTS

A1.1 ENCLOSURE

Hazardous materials (Asbestos) works in nominated areas shall not commence until mandatory procedures as specified herein and required by the Code of Practice have been carried out and all associated safety procedures having been verified by the Principal Contractor.

The Principal Contractor is responsible for the safety of all site personnel and ensuring safe systems of work are undertaken at all times. The Principal Contractor shall be responsible for the supervision of their employees, contractors and other site personnel, inspecting safety at all times.

A Contaminated Land Consultant (JBS) shall carry out an inspection of control measure to ascertain that asbestos and hazardous materials related risks are being adequately controlled, including integrity of containment, decontamination facilities, respiratory protection usage, work practices and waste handling operations.

A Contaminated Land Consultant has the right to stop the project if work is not being carried out according to the procedures herein, the Code and other applicable guidelines or if elevated air monitoring results are obtained.

All asbestos remediation/encapsulation work is to be performed as far as is applicable to the guidelines in Code of Practice for the Safe Removal of Asbestos (NOHSC2002 (2005)) and NSW WorkCover Authority regulatory requirements.

A1.2 DECONTAMINATION

The Principal Contractor shall provide adequate decontamination facilities in accordance with the guidelines specified in the Code of Practice for the Safe Remediation/Encapsulation of Asbestos(NHOSC2002 (2005)) and the NSW Occupational Health and Safety Regulations 2005 and amendments.

A1.3 RESPIRATORY PROTECTION

The Principal Contractor shall ensure that all persons engaged in asbestos remediation/encapsulation work or access8ing a contaminated area wear an approved respirator conforming to the requirement s of Australia/New Zealand Standard 1715 and 1716.

A1.4 WARNING NOTICES

Suitable warning signs shall be placed around the area of the works. These signs shall comply with all relevant acts, regulations, standards and codes of practice:

- AS1319-1983, Dangerous Goods Act 1985
- Dangerous Goods (Storage and Handling) Regulations 2000
- Dangerous Goods (Placarding of Workplaces) Regulations 1985

Te signs are to be replaced if removed or damaged before the Certificate of Practical Completion has been issued.

A1.5 WASTE REMOVAL – FRIABLE ASBESTOS

The Principal Contractor shall ensure that all hazardous waste (asbestos) if determined friable is to be removed and disposed offsite in accordance with all relevant acts, regulations, standards and codes of practice; including but not limited to:

- Environment Protection Act 1970;
- Environment Protection (Prescribed Waste) Regulations 1998;
- Occupational health and Safety (Hazardous Substances) Regulations 1999;
- NSW Occupational Health and Safety Regulations 2005 and amendments;
- Any asbestos material is not to be re-used – as specified by NSW DECCW.

A2 AIRBORNE ASBESTOS FIBRE MONITORING

A Contaminated Land Consultant shall carry out appropriate air monitoring of the workplace and surrounding areas at a cost to the Principal Contractor, **SHOULD FRIABLE ASBETOS BE DISCOVERED AT THE SITE**. The results of air monitoring can be used to identify failures in containment, identify poor work practices, provide evidence of containment for occupiers and regularity authorities and to provide evidence of good work practices for both present and future needs.

Work areas will be inspected by the Consultant Hygienist at the request of the Principal Contractor or at the discretion of the Contaminated Land Consultant.

The principal Contractor shall maintain air monitoring results below the control limit in areas, which are being worked, and areas checked by the Contaminated Land Consultant.

The control limits are as follows:

Air Monitoring Action Limits Asbestos Fibre Action Limits		
Area	**Fibres/ml**	**Action**
Public areas,	**0.01 fibres/ml**	**Close area to public, clean and clearance test**
Contractors decontamination area and buffer zone	**0.01 – 0.02 fibres/ml**	**Check for leaks and source of air readings**
Contractors decontamination area and buffer zone	**0.03 – 0.05 fibres/ml**	**Check for source of contamination**
Contractors decontamination area and buffer zone	**>0.05 fibres/ml**	**Cease work immediately and check for source of contamination. Clean area and ensure air test clearance (0.01 fibres/ml or less) by Consultant Hygienist prior to re-starting works.**

A2.1 MONITORING FREQUENCY

Daily monitoring will be conducted prior to any friable asbestos removal works, during works and prior to clearance certification by the hygienist.

Post encapsulation workplace air monitoring will be conducted to monitor the effectiveness of the control measures.

Daily monitoring will be conducted prior to and during any asbestos removal works.

Air monitoring shall be conducted in accordance with the National Occupational Health & Safety Commission (NOHSC) members filter method over a period of between 4 and 8 weeks.

A 2.2 CERTIFICATION

The inspection of the work area shall be carried out when the Principal Contractor‟s representative on site considers the encapsulation work is satisfactorily completed. This can occur on a pre-determined stage by stage or area by area basis.

All inspections will be carried out by the Contaminated Land Consultant in accordance with the NSW Occupational Health and Safety Regulations 2005 and amendments.

Inspections are to be carried out by a Contaminated Land Consultant with the Principal Contractor‟s site representative in order to establish areas that may require further cleaning. Adequate lighting, cleaning equipment, tool and assistance is to be provided to the inspecting Contaminated Land Consultant to effect the clearance certification of remediated/removal asbestos materials and complete the inspection. The Contaminated Land Consultant shall inspect the work area before any containment or protective sheeting is removed.

In addition, all identified or potential asbestos material must be removed from the work area prior to clearance inspection.

A Contaminated Land Consultant is to be notified if any previously unidentified asbestos material in areas outside asbestos identified enclosures. This location should be isolated by a ten metre barrier no work should precede that could disturb this material.

APPENDIX B:

LIMITED ASBESTOS REMOVAL

REGISTER OF REMOVAL

LIMITED ASBESTOS REMOVAL – REGISTER OF REMOVAL

Date	Start Time	Finish Time	Material location	Material Description	Tip Docket Receipt	Licensed Landfill Location	Qty (m^3)

DEFINITIONS

Administrative control means a system of work or a work procedure that is designed to eliminate or reduce a risk, but does not include-

a) A physical control; or
b) The use of personal protective equipment (PPE)

Approval asbestos analyst means an analyst approved-

a) By NATA to perform asbestos fibre counting or to identify asbestos in samples , and to issue findings as endorsed reports under the authority of a NATA accredited laboratory: or
b) By some other scheme determined by the Authority under NOHSC regulation 1.1.6

Asbestos means the fibrous form of the mineral silicates belonging to the serpentine and amphibole groups of rock-forming minerals and includes actinolite, amosite (brown asbestos), tremolite, or any material containing one or more of the mineral silicates belonging to the serpentine and amphibole groups.

***Asbestos Containing Material (ACM)** means any material or object that contains asbestos

Asbestos Exposure Standard means 0.1 f/ml of air measured in a person‟s breathing zone and expressed as a time weighted average fibre concentration of asbestos calculated over an 8 hour working day and measured over a minimum period of 4 hours in accordance with-

a) The membrane Filter Method; or
b) A method determined by the Authority under regulation 1.1.6

Asbestos Occupational Air Monitoring means air sampling to estimate the airborne asbestos fibre concentration in the occupational environment. Taken at fixed locations, usually between 1 and 25 metre above floor level, in accordance with-

a) The membrane Filer Method; or
b) A method determined by the Authority under NOHSC regulation 1.1.6

Asbestos Register means the asbestos register kept under NSW WorkCover regulation 4.2 as revised in accordance with Part 4.2 (Asbestos)

Class ASI asbestos removal licence means a licence that permits the holder to remove asbestos of any kind as specified in the licence.

Class AS2 asbestos removal licence means a licence that allows the holder to remove-

a) Non-friable asbestos containing material; and
b) Asbestos contaminated dust, associated with or derived from, the removal of non friable asbestos containing material that is or was fixed in a building , structure or plant-

As specified in the licence.

Control Plan means a document that identifies the control measures, which a licence holder will use to ensure employees and other persons, are not at risk when removal work is being conducted.

***Dust & Debris** means visible particles, fragments or chunks of material, large and heavy enough to have settled in work area, that are likely to have originated from asbestos containing material.

Friable means when dry-

May be crumbled, pulverised or reduced to powder by hand pressure,
Or as a result of a work process becomes such that it may be crumbled, pulverised or reduced to powder by hand pressure.
May be determined a free (non related) fibres in soil./fill.

Bonded means;-

Encapsulated (bonded into or forms part of the matrix of material or substance.)

***Hazard** means by any matter, thing or practice that may cause death, injury, illness or disease.

Membrane Filter Method means the method of estimating airborne asbestos fibres in accordance with the "Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres" prepared by the national Health and Safety Commission and published in 2005.

NATA means the National Association of Testing Authorities (Australia)

Negative air enclosure means an enclosed asbestos removal area that is maintained under negative air pressure to approximately 12 Pascals.

Personal protective equipment (PPE) Includes respiratory protective equipment and personal protective clothing.

****Practicable** having regard to
The severity of the hazard or risk in question;
The state if knowledge about the hazard or risk;
The availability and suitability of ways to remove or mitigate that hazard or risk;
The cost of removing or mitigating the hazard or risk;

***Risk** means the likelihood of a hazard causing harm to a person.

Review procedure conducted at nominated frequency wherein a standard is conducted and reported on standard format for a particular (nominated) situation and/or location.

Treatment in the context of asbestos cement cladding; is any procedure which is intended to and has the effect of transforming a friable surface, with the potential to produce airborne respirable fibres, into a non hazardous surface by either encapsulating a fibre or by rest9ring the 8nterlocking crystal structure (consolidation). Treatment may be considered f0or either interim or long term control measures.

Sources

Occupational Health and Safety Regulation 2007

*Code of Practice for the Safe Removal of Asbestos 2nd Edition {NOHSC; 2002(2005)}

** NSW Work Cover Authority

PACIFIC ENVIRONMENTAL SERVICES PTY LTD
POSTAL ADDRESS: PO BOX 4045
ILLAWONG, NSW 2234, AUSTRALIA

TEL: (02) 9543 2825 FAX: (02) 9543 2823
TEL: INTEL +612
E-MAIL: decontam@bigpond.net.au

Nowra Office: PO Box 6132
SUSSEX INLET, NSW 2540
Phone: 02 44210541

ENVIROMANAGE SYSTEMS
By Email: Jason@enviromanage.com,au
Attention: Mr. Jason Kennett

28th August 2012

Dear Sir,

Reference: Bardia - North Side Bardia, ex Rubble Pile –ACM Clearance.

The soils in area designated as the North Side Bardia ex Rubble Pile, located at Latitude 33.965964 and Longitude 150.85147, has been inspected for ACM by conducting a 1m Grid Walk. This inspection was conducted post removal of reported ACM contaminated materials.

The above area is visually free of ACM at the surface following 1m grid walk inspection on the 24th August 2012.

If you have any questions please do not hesitate to contact Steve Smith on 0416270451,
Yours faithfully

Steve Smith
Bsc Eng., Meng. Sc., CPEng
Director Pacific Environmental

PACIFIC ENVIRONMENTAL SERVICES PTY LTD
POSTAL ADDRESS: PO BOX 4045
ILLAWONG, NSW 2234, AUSTRALIA

TEL: (02) 9543 2825 FAX: (02) 943 2823
TEL: INTEL +612
E-MAIL: decontam@bigpond.net.au

Nowra Office: PO Box 6132 SUSSEX INLET, NSW 2540
Phone: 02 44210541

PACIFIC ENVIRONMENTAL
ABN 26111899837

ENVIROMANAGE SYSTEMS
By Email: Jason@enviromanage.com,au
Attention: Mr. Jason Kennett

25th May 2012

Dear Sir,

Reference: Remediation of weapons pits - Zouch Road Bardia North

The soils in the one hundred and four (104) weapon pits located in the northern area of the Bardia site have been inspected, post remediation on the 16th March, 19th March, 20th March and 23rd March 2012. Each of the pits was visually assessed for the presence of foreign material, including asbestos fragments. This inspection involved a minimum of a 1m grid walk. The remediation involved excavation of the pits until all foreign material was removed and virgin soil was exposed to a depth of 100mm below the natural surface in the pit (at both the walls and floor).

All pits in the southern portion of the Bardia site are visually free of foreign material, with only virgin soil exposed. The list of pits inspected is attached to this letter.

If you have any questions please do not hesitate to contact Steve Smith on 0416270451,
Yours faithfully

Steve Smith
Bsc Eng., Meng. Sc., CPEng
Director Pacific Environmental
Attached: List Weapon Pits in the Northern Portion of Bardia Site.

PACIFIC ENVIRONMENTAL SERVICES PTY LTD
POSTAL ADDRESS: PO BOX 4045
ILLAWONG, NSW 2234, AUSTRALIA

TEL: (02) 9543 2825 FAX: (02) 943 2823
TEL: INTEL +612
E-MAIL: decontam@bigpond.net.au

Nowra Office: PO Box 6132 SUSSEX INLE, NSW 2540
Phone: 02 44210541

PACIFIC ENVIRONMENTAL
ABN 26111899837

ENVIROMANAGE SYSTEMS
By Email: Jason@enviromanage.com,au
Attention: Mr. Jason Kennett

24th May 2012

Dear Sir,

Reference: Remediation of SP5 & SP6 - Zouch Road Bardia

The soils in the area under the stockpiles labelled SP5 and SP6 (located adjacent to the dirt access road along northern boundary of the Bardia site) were inspected on the 15th May 2012 (post surface clearance of foreign material).

This inspection revealed that the areas were visually free of asbestos fragments and foreign material. This inspection involved a 1 m grid walk of each of the areas. All soils appeared to be free of chemical stains and odours.

If you have any questions please do not hesitate to contact Steve Smith on 0416270451,
Yours faithfully

Steve Smith
Bsc Eng., Meng. Sc., CPEng
Director Pacific Environmental

Pacific Environmental

Northern Area Completed & Site Plan Marked

Bardia Weapons Pits Clearance Status: 25th May 2012

Pit No	Pit Timber Clearance	Pit Steel Clearance	Pit Asbestos Fragment Clearance	Pit SAA Clearance	Excavated Soil Timber, steel, asbestos SAA Clearance	Miscl Comment	Marked on Plan
1	OK	OK	OK	OK	OK	-	OK
2	OK	OK	OK	OK	OK	-	OK
3	OK	OK	OK	OK	OK	-	OK
4	OK	OK	OK	OK	OK	-	OK
5	OK	OK	OK	OK	OK	-	OK
6	OK	OK	OK	OK	OK	-	OK
7	OK	OK	OK	OK	OK	-	OK
8	OK	OK	OK	OK	OK	-	OK
9	OK	OK	OK	OK	OK	-	OK
10	OK	OK	OK	OK	OK	-	OK
11	OK	OK	OK	OK	OK	-	OK
12	OK	OK	OK	OK	OK	-	OK
13	OK	OK	OK	OK	OK	-	OK
14	OK	OK	OK	OK	OK	-	OK
15	OK	OK	OK	OK	OK	-	OK
16	OK	OK	OK	OK	OK	-	OK
17	OK	OK	OK	OK	OK	-	OK
18	OK	OK	OK	OK	OK	-	OK
19	OK	OK	OK	OK	OK	-	OK
20	OK	OK	OK	OK	OK	-	OK
21	OK	OK	OK	OK	OK	-	OK
22	OK	OK	OK	OK	OK	-	OK
23	OK	OK	OK	OK	OK	-	OK
24	OK	OK	OK	OK	OK	-	OK
25	OK	OK	OK	OK	OK	-	OK
26	OK	OK	OK	OK	OK	-	OK
27	OK	OK	OK	OK	OK	-	OK
28	OK	OK	OK	OK	OK	-	OK
29	OK	OK	OK	OK	OK	-	OK
30	OK	OK	OK	OK	OK	-	OK
31	OK	OK	OK	OK	OK	-	OK
32	OK	OK	OK	OK	OK	-	OK
33	OK	OK	OK	OK	OK	-	OK
34	OK	OK	OK	OK	OK	-	OK
35	OK	OK	OK	OK	OK	-	OK

36	OK	OK	OK	OK	OK	-	OK
37	OK	OK	OK	OK	OK	-	OK
38	OK	OK	OK	OK	OK	-	OK
39	OK	OK	OK	OK	OK	2 pits together	OK
40	OK	OK	OK	OK	OK	-	OK
41	OK	OK	OK	OK	OK	-	OK
42	OK	OK	OK	OK	OK	-	OK
43	OK	OK	OK	OK	OK	-	OK
44	OK	OK	OK	OK	OK	-	OK
45	OK	OK	OK	OK	OK	-	OK
46	OK	OK	OK	OK	OK	-	OK
47	OK	OK	OK	OK	OK	-	OK
48	OK	OK	OK	OK	OK	-	OK
49	OK	OK	OK	OK	OK	-	OK
50	OK	OK	OK	OK	OK	-	OK
51	OK	OK	OK	OK	OK	-	OK
52	OK	OK	OK	OK	OK	-	OK
53	OK	OK	OK	OK	OK	-	OK
54	OK	OK	OK	OK	OK	-	OK
55	OK	OK	OK	OK	OK	-	OK
56	OK	OK	OK	OK	OK	-	OK
57	OK	OK	OK	OK	OK	-	OK
58	OK	OK	OK	OK	OK	-	OK
59	OK	OK	OK	OK	OK	-	OK
60	OK	OK	OK	OK	OK	-	OK
61	OK	OK	OK	OK	OK	-	OK
62	OK	OK	OK	OK	OK	-	OK
63	OK	OK	OK	OK	OK	-	OK
64	OK	OK	OK	OK	OK	-	OK
65	OK	OK	OK	OK	OK	-	OK
66	OK	OK	OK	OK	OK	-	OK
67	OK	OK	OK	OK	OK	-	OK
68	OK	OK	OK	OK	OK	-	OK
69	OK	OK	OK	OK	OK	-	OK
70	OK	OK	OK	OK	OK	-	OK
71	OK	OK	OK	OK	OK	-	OK
72	OK	OK	OK	OK	OK	-	OK
73	OK	OK	OK	OK	OK	-	OK
74	OK	OK	OK	OK	OK	-	OK
75	OK	OK	OK	OK	OK	-	OK
76	OK	OK	OK	OK	OK	-	OK
77	OK	OK	OK	OK	OK	-	OK
78	OK	OK	OK	OK	OK	-	OK
79	OK	OK	OK	OK	OK	-	OK
80	OK	OK	OK	OK	OK		-
81	OK	OK	OK	OK	OK	-	OK
82	OK	OK	OK	OK	OK	-	OK

83	OK	OK	OK	OK	OK	-	OK
84	OK	OK	OK	OK	OK	-	OK
85	OK	OK	OK	OK	OK	Near rail & sacred site	OK
86	OK	OK	OK	OK	OK	Near rail & sacred site	OK
87	OK	OK	OK	OK	OK	-	OK
88	OK	OK	OK	OK	OK	-	OK
89	OK	OK	OK	OK	OK	-	OK
90	OK	OK	OK	OK	OK	-	OK
91	OK	OK	OK	OK	OK	-	OK
92	OK	OK	OK	OK	OK	-	OK
93	OK	OK	OK	OK	OK	-	OK
95	OK	OK	OK	OK	OK	-	OK
96	OK	OK	OK	OK	OK	-	OK
97	OK	OK	OK	OK	OK	-	OK
98	OK	OK	OK	OK	OK	-	OK
99	OK	OK	OK	OK	OK	-	OK
100	OK	OK	OK	OK	OK	-	OK
101	OK	OK	OK	OK	OK	-	OK
102	OK	OK	OK	OK	OK	-	OK
103	OK	OK	OK	OK	OK	-	OK
104	OK	OK	OK	OK	OK	-	OK
							OK

Note OK = inspected and found to be clear of titled material

The above table has been prepared by:

Bsc Eng., Meng. Sc., CPEng

Director Pacific Environmental

25TH May 2011

PACIFIC ENVIRONMENTAL SERVICES PTY LTD
POSTAL ADDRESS: PO BOX 4045
ILLAWONG, NSW 2234, AUSTRALIA

TEL: (02) 9543 2825 FAX: (02) 9543 2823
TEL: INTEL +612
E-MAIL: decontam@bigpond.net.au

Nowra Office: PO Box 6132
SUSSEX INLET, NSW 2540
Phone: 02 44210541

PACIFIC ENVIRONMENTAL
ABN 26111899837
Contaminated Land Consultants, Water, Wastewater & Environmental Engineers

ENVIROMANAGE SYSTEMS
By Email: Jason@enviromanage.com,au
Attention: Mr. Jason Kennett

4th September 2013

Dear Sir,

Reference: Bardia - Northern Area UFO4– ACM Clearance

The surface soils in the designated area, being a part of the northern area of the Bardia remediation and assigned the nomenclature UFO4, has been inspected for ACM by conducting a 1m Grid Walk on the 30th August 2012. This area is located at GPS coordinates:

- 33^0 57'57"S and 150^0 51'12"E

The area, nominally $50m^2$ is visually free of ACM at the surface following the 1m grid walk inspection.

If you have any questions please do not hesitate to contact Steve Smith on 0416270451,
Yours faithfully

Steve Smith
Bsc Eng., Meng. Sc., CPEng
Director Pacific Environmental

PACIFIC ENVIRONMENTAL SERVICES PTY LTD
POSTAL ADDRESS: PO BOX 4045
ILLAWONG, NSW 2234, AUSTRALIA

TEL: (02) 9543 2825 FAX: (02) 9543 2823
TEL: INTEL +612
E-MAIL: decontam@bigpond.net.au

Nowra Office: PO Box 6132
SUSSEX INLET, NSW 2540
Phone: 02 44210541

ENVIROMANAGE SYSTEMS
By Email: Jason@enviromanage.com,au
Attention: Mr. Jason Kennett

4th September 2013

Dear Sir,

Reference: Bardia - Waste Disposal Area West Asbestos Pipe-Clearance

The asbestos pipe located in the Waste Disposal Area West was removed from the site and this removal noted during our inspection of the 24th May 2012. This pipe was located at GPS coordinates:

- 33^0 57'43"S and 150^0 50'40"E

If you have any questions please do not hesitate to contact Steve Smith on 0416270451,
Yours faithfully

Steve Smith
Bsc Eng., Meng. Sc., CPEng
Director Pacific Environmental

Appendix G – Landfill Disposal Dockets

© 2013 JBS Environmental Pty Ltd

brandown
Quarry, Waste, & Recycling Services Proprietary Limited
ABN 30 003 830 304

SOR-371849

Postal Address: PO Box 141 Kemps Creek NSW 2178 **Site Address:** Lot 9 Elizabeth Drive Kemps Creek
Telephone: 02 9826 1256 **Facsimile:** 02 9826 1622 **Email:** info@brandown.com.au

WEIGHBRIDGE DOCKET / TAX INVOICE

Docket No.	SOR-371849	Vehicle Registration	BH76FW	Trailer	
Date	16/03/12	Gross	19.11	Capacity	15.46
Customer Name	ENVIROMANAGE SYSTEM	Tare	10.72	% Load	60.00
Customer Code	EMS001	Net	8.39	This Load	9.27
Customer Address	PO BOX 199			Density	0.90
	CHURCH POINT NSW 210	Delivery Address	ENVIROMANAGE SYSTEMS		
			PO BOX 199		
Customer Reference No.	ZOUCH		CHURCH POINT NSW 2105		
Customer PO No.	2575				
Docket Entered by	P H				
Location	AREA B				

We hereby confirm that we accept the conditions overleaf
Signature Carrier _____
Signature Customer _____

Product	Quantity	Unit of Measure	Rate	Effective Rate	Amount
Mixed B&D to B **General Solid**	8.39				

TIME IN 3:23:53 PM TIME OUT 3:39:53 PM

CUSTOMER COPY

brandown
Quarry, Waste, & Recycling Services Proprietary Limited
ABN 30 003 830 304

SOR-371784

Postal Address: PO Box 141 Kemps Creek NSW 2178 **Site Address:** Lot 9 Elizabeth Drive Kemps Creek
Telephone: 02 9826 1256 **Facsimile:** 02 9826 1622 **Email:** info@brandown.com.au

WEIGHBRIDGE DOCKET / TAX INVOICE

Docket No.	SOR-371784	Vehicle Registration	BH76FW	Trailer	
Date	16/03/12	Gross	17.23	Capacity	15.46
Customer Name	ENVIROMANAGE SYSTEM	Tare	10.72	% Load	40.00
Customer Code	EMS001	Net	6.51	This Load	6.18
Customer Address	PO BOX 199			Density	1.05
	CHURCH POINT NSW 210	Delivery Address	ENVIROMANAGE SYSTEMS		
			PO BOX 199		
Customer Reference No.	ZOUCH RD		CHURCH POINT NSW 2105		
Customer PO No.	2574				
Docket Entered by	J				
Location	AREA B				

We hereby confirm that we accept the conditions overleaf
Signature Carrier _____
Signature Customer _____

Product	Quantity	Unit of Measure	Rate	Effective Rate	Amount
Mixed B&D to B **General Solid**	6.51				

TIME IN 12:36:41 PM TIME OUT 12:37:20 PM

CUSTOMER COPY

brandown
Quarry, Waste, & Recycling Services Proprietary Limited
ABN 30 003 830 304

SOR-393192

Postal Address: PO Box 141 Kemps Creek NSW 2178 **Site Address:** Lot 9 Elizabeth Drive Kemps Creek
Telephone: 02 9826 1256 **Facsimile:** 02 9826 1622 **Email:** info@brandown.com.au

WEIGHBRIDGE DOCKET / TAX INVOICE

Docket No.	SOR-393192	Vehicle Registration	BH76FW	Trailer	
Date	06/08/12	Gross	40.61	Capacity	31.69
Customer Name	ENVIROMANAGE SYSTEM	Tare	17.06	% Load	90.00
Customer Code	EMS001	Net	23.55	This Load	28.52
Customer Address	PO BOX 199			Density	0.83
	CHURCH POINT NSW 210	Delivery Address	ENVIROMANAGE SYSTEMS		
			PO BOX 199		
Customer Reference No.	ZOUCH RD		CHURCH POINT NSW 2105		
Customer PO No.	LNA UXO				
Docket Entered by	A O				
Location	AREA B				

We hereby confirm that we accept the conditions overleaf
Signature Carrier _____

Signature Customer _____

Product	Quantity	Unit of Measure	Rate	Effective Rate	Amount
Mixed B&D to area B	28.5246				
Tyres CAR	163				

TIME IN 3:02:42 PM TIME OUT 3:18:42 PM

CUSTOMER COPY

brandown
Quarry, Waste, & Recycling Services Proprietary Limited
ABN 30 003 830 304

SOR-396862

Postal Address: PO Box 141 Kemps Creek NSW 2178 **Site Address:** Lot 9 Elizabeth Drive Kemps Creek
Telephone: 02 9826 1256 **Facsimile:** 02 9826 1622 **Email:** info@brandown.com.au

WEIGHBRIDGE DOCKET / TAX INVOICE

Docket No.	SOR-396862	Vehicle Registration	BH76FW	Trailer	
Date	31/08/12	Gross	41.61	Capacity	31.69
Customer Name	ENVIROMANAGE SYSTEM	Tare	17.29	% Load	80.00
Customer Code	EMS001	Net	24.32	This Load	25.36
Customer Address	PO BOX 199			Density	0.96
	CHURCH POINT NSW 210	Delivery Address	ENVIROMANAGE SYSTEMS		
			PO BOX 199		
Customer Reference No.	ZOUCH RD		CHURCH POINT NSW 2105		
Customer PO No.	3800				
Docket Entered by	A O				
Location	AREA B				

We hereby confirm that we accept the conditions overleaf
Signature Carrier _____

Signature Customer _____

Product	Quantity	Unit of Measure	Rate	Effective Rate	Amount
Mixed B&D to area B	25.3552				

TIME IN 1:14:29 PM TIME OUT 1:30:29 PM

CUSTOMER COPY

brandown
Quarry, Waste, & Recycling Services Proprietary Limited
ABN 30 003 830 304

SOR-396833

Postal Address: PO Box 141 Kemps Creek NSW 2178 **Site Address:** Lot 9 Elizabeth Drive Kemps Creek
Telephone: 02 9826 1256 **Facsimile:** 02 9826 1622 **Email:** info@brandown.com.au

WEIGHBRIDGE DOCKET / TAX INVOICE

Docket No.	SOR-396833	Vehicle Registration	BH76FW	Trailer	
Date	31/08/12	Gross	36.22	Capacity	31.69
Customer Name	ENVIROMANAGE SYSTEM	Tare	17.29	% Load	80.00
Customer Code	EMS001	Net	18.93	This Load	25.36
Customer Address	PO BOX 199			Density	0.75
	CHURCH POINT NSW 210	Delivery Address	ENVIROMANAGE SYSTEMS		
			PO BOX 199		
Customer Reference No.	DENHAM CR		CHURCH POINT NSW 2105		
Customer PO No.	3799				
Docket Entered by	J				
Location	AREA B				

We hereby confirm that we accept the conditions overleaf

Signature Carrier _____

Signature Customer _____

Product	Quantity	Unit of Measure	Rate	Effective Rate	Amount
Mixed B&D to area B	25.3552				

TIME IN 11:29:21 AM TIME OUT 11:45:21 AM

CUSTOMER COPY

CMI
38 York Rd
Ingleburn NSW 2565
Phone:02 9531 8961 Fax:02 9531 8962
ABN : 31081814397

Reissued 11:11/07/06/2012
Transaction No. 6100
Date : 07/06/2012 Time : 11:11

Rego No. : BN07VS
Product : MIXED SCRAP STEEL
Supplier : BARIDIA VILLAGE

Gross : 15.28t
Tare : 12.08t
Net : 3.20t
Paid By : ACCOUNT

JASON KENNETT

CMI
38 York Rd
Ingleburn NSW 2565
Phone:02 9531 8961 Fax:02 9531 8962
ABN : 31081814397

Reissued 11:13/07/06/2012
Transaction No. 6101
Date : 07/06/2012 Time : 11:13

Rego No. : BN07VS
Product : MIXED SCRAP STEEL
Supplier : BARIDIA VILLAGE

Gross : 16.07t
Tare : 12.01t
Net : 4.06t
Paid By : ACCOUNT

JASON KENNETT

CMI
38 York Rd
Ingleburn NSW 2565
Phone:02 9531 8961 Fax:02 9531 8962
ABN : 31081814397

Reissued 11:08/07/06/2012
Transaction No. 6098
Date : 07/06/2012 Time : 11:08

Rego No. : BN07VS
Product : MIXED SCRAP STEEL
Supplier : BARIDIA VILLAGE

Gross : 14.32t
Tare : 12.02t
Net : 2.30t
Paid By : ACCOUNT

JASON KENNETT

CMI
38 York Rd
Ingleburn NSW 2565
Phone:02 9531 8961 Fax:02 9531 8962
ABN : 31081814397

Reissued 11:09/07/06/2012
Transaction No 6099
Date : 07/06/2012 Time : 11:09

Rego No. : BN07VS
Product : MIXED SCRAP STEEL
Supplier : BARIDIA VILLAGE

Gross : 14.60t
Tare : 12.10t
Net : 2.50t
Paid By : ACCOUNT

JASON KENNETT

Delivery Docket

SITA Australia Pty Ltd
Elizabeth Drive Landfill
1725 Elizabeth Drive
KEMPS CREEK NSW 2178
Phone: 02 4774 8866

ABN: 70 002 902 650

Ticket No: 30498774-ED

Time In: 21/03/2012 2:45:36 PM
Time Out: 21/03/2012 2:58:38 PM

Vehicle Rego: AM81ZK
Client: ENVIRO MANAGE SYSTEMS
Order Number: no paper work

Contract: C72

Weighed Waste:
CONT ASB SOIL
Unit Cost: $
Storage Location:

Each Items Qty Price

GROSS Weight: 46.48t
TARE Weight: 15.58t
NET Weight: 30.90t

Chargeable Weight: 30.90t
Each Item Weight: 0.00t

Fee: $
Each Items: $
EPA Levy: $
GST : $
Temporary Acc: $
Total Price: $

Amount Tendered: $

Change Given:

Operator: milton

.....

Delivery Docket

SITA Australia Pty Ltd
Elizabeth Drive Landfill
1725 Elizabeth Drive
KEMPS CREEK NSW 2178
Phone: 02 4774 8866

ABN: 70 002 902 650

Ticket No: 30498800-ED

Time In: 21/03/2012 4:27:59 PM
Time Out: 21/03/2012 4:39:20 PM

Vehicle Rego: AM81ZK
Client: ENVIRO MANAGE SYSTEMS
Order Number: no order

Contract: C72

Weighed Waste:
CONT ASB SOIL
Unit Cost: $
Storage Location:

Each Items Qty Price

GROSS Weight: 45.78t
TARE Weight: 15.54t
NET Weight: 30.24t

Chargeable Weight: 30.24t
Each Item Weight: 0.00t

Fee: $
Each Items: $
EPA Levy: $
GST : $
Temporary Acc: $
Total Price: $

Amount Tendered: $

Change Given:

Operator: milton

.....

Delivery Docket

SITA Australia Pty Ltd
Elizabeth Drive Landfill
1725 Elizabeth Drive
KEMPS CREEK NSW 2178
Phone: 02 4774 8866

ABN: 70 002 902 650

Ticket No: 30511560-ED

Time In: 30/05/2012 9:05:18 AM
Time Out: 30/05/2012 9:22:02 AM

Vehicle Rego: BH76FW
Client: ENVIRO MANAGE SYSTEMS
Order Number: 3156

Contract: C160

Weighed Waste:
CONT SOIL
Unit Cost: $
Storage Location: LANDFILL

Each Items	Qty	Price

GROSS Weight:	47.60t
TARE Weight:	17.40t
NET Weight:	30.20t
Chargeable Weight:	30.20t
Each Item Weight:	0.00t

Fee:	$
Each Items:	$
EPA Levy:	$
GST :	$
Temporary Acc:	$
Total Price:	$

Amount Tendered: $

Change Given:

Operator: Jerry

EMS
EnviroManage Systems

EnviroManage Systems Pty Ltd
PO Box 199 Church Point NSW 2105
m 0408 316 691 abn 84 052 958 076
www.enviromanage.com.au

105 C160

Transport / Tipping Docket No.

Job No. Lot UXO Date 30-5-12

Customer T.R.N

Address Zouch Rd PENRITH COURT

Site Zouch Rd Time 8.00am

MATERIAL	
☑ Asbestos Contaminated Soils	
☑ General Solid Waste	
☐ VENM	
☐ ENM	
☐ Concrete	
☐ Mixed Demo	
☐ Sandstone	
☐ O/S Sandstone	
☐ Other	

QUANTITY

Approximately m³ ☐

WEIGHT

Gross

Tare

Nett

☐ Bogie	☑ Truck Dog
☐ Semi Trailer	☐ Skip Bin

Destination SITA KEMPS CREEK Gate No.

Transport Co. EMS

Vehicle Rego. BH 76F W Driver Name

Site Foreman Signature

Print Name Jason

TRANSPORTERS / SUPPLIERS NOTE
White Copy
Yellow Copy

Delivery Docket

SITA Australia Pty Ltd
Elizabeth Drive Landfill
1725 Elizabeth Drive
KEMPS CREEK NSW 2178
Phone: 02 4774 8866

ABN: 70 002 902 650

Ticket No: 30511619-ED

Time In: 30/05/2012 10:58:52 AM
Time Out: 30/05/2012 11:10:23 AM

Vehicle Rego: BH76FW
Client: ENVIRO MANAGE SYSTEMS
Order Number: 3157

Contract: C160

Weighed Waste:
CONT SOIL
Unit Cost: $
Storage Location:

Each Items	Qty	Price
GROSS Weight:		48.12t
TARE Weight:		17.32t
NET Weight:		30.80t
Chargeable Weight:		30.80t
Each Item Weight:		0.00t
Fee:		$
Each Items:		$
EPA Levy:		$
GST :		$
Temporary Acc:		$
Total Price:		$

Amount Tendered: $

Change Given:

Operator: Jerry

.....

EMS
EnviroManage Systems

EnviroManage Systems Pty Ltd
PO Box 199 Crumb Point NSW 2106
0408 316 981 abn 84 037 956 078
www.enviromanage.com.au

C160

Transport / Tipping Docket No.

Job No. LAN VKD. Date 29-5-12
Customer T.R.N.
Address 20UCh Rd DENHAM COURT.
Site Time

MATERIAL	QUANTITY
☐ Asbestos Contaminated Soils	Approximately (m³)
☑ General Solid Waste	WEIGHT
☐ VENM	Gross
☐ ENM	Tare
☐ Concrete	Nett
☐ Mixed Demo	
☐ Sandstone	
☐ O/S Sandstone	☐ Bogie ☑ Truck Dog
☐ Other	☐ Semi Trailer ☐ Skip Bin

Destination SITA Kemps CREEK
Gate No.
Transport Co. Enviro S
Vehicle Rego BH76FW Driver Name

Site Foreman Signature Print Name

TRANSPORTERS / SUPPLIERS NOTE
White Copy
Yellow Copy

Delivery Docket

SITA Australia Pty Ltd
Elizabeth Drive Landfill
1725 Elizabeth Drive
KEMPS CREEK NSW 2178
Phone: 02 4774 8866

ABN: 70 002 902 650

Ticket No: 30511690-ED

Time In: 30/05/2012 1:02:38 PM
Time Out: 30/05/2012 1:02:38 PM

Vehicle Rego: BH76FW
Client: ENVIRO MANAGE SYSTEMS
Order Number: 3158

Contract: C160

Weighed Waste:
CONT SOIL
Unit Cost: $
Storage Location:

Each Items	Qty	Price
GROSS Weight:		48.80t
TARE Weight:		17.34t
NET Weight		31.46t
Chargeable Weight:		31.46t
Each Item Weight:		0.00t
Fee:		
Each Items:		$
EPA Levy:		$
GST :		$
Temporary Acc:		$
Total Price:		$

Amount Tendered: $

OVERLOAD

Change Given:

Operator: milton

.....

EMS
EnviroManage Systems

EnviroManage Systems Pty Ltd
PO Box 199 Church Point NSW 2105
m 0408 316 691 abn 84 037 956 078
www.enviromanage.com.au

C160
3

Transport / Tipping Docket No.

Job No.
Date 30-5-12.
Customer T.R.N
Address
Site ZOUCH RD DENHAM COURT

MATERIAL	QUANTITY
☐ Asbestos Contaminated Soils	Approximately
☑ General Solid Waste	WEIGHT
☐ VENM	Gross
☐ ENM	Tare
☐ Concrete	Nett
☐ Mixed Demo	
☐ Sandstone	
☐ O/S Sandstone	☐ Bogie ☑ Truck Dog
☐ Other	☐ Semi Trailer ☐ Skip Bin

Destination SITA Kemps Creek
Gate No.
Transport Co. EMS
Vehicle Rego. BH76FW Driver Name

Site Foreman Signature
Print Name

TRANSPORTERS / SUPPLIERS NOTE
White Copy
Yellow Copy
Blue Copy

Botany Building Recyclers

ABN 97 003 760 183

Ph. 02 9316 6333

Mon-Fri. 6am to 6pm Sat 6am to 4pm

Tax Invoice No. 145003

Date/Time 2007/12 11:35

Customer.

EMS

Rego BH78FW-T

Product

EMS LICON

UnitPrice $0.00

m^3

Gross 44710 kg

Tare 17410 kg

Nett 27300 kg

Tipping Fee $0.00 Inc GST

GST $0.00

CustomerType Account

Comments 55 PVC + FEE $5C

Recycled materials generated under Recovered Aggregates Fines Exemption 2010

Signature

Botany Building Recyclers

ABN 97 003 760 183

Ph. 02 9316 6333

Mon-Fri. 6am to 6pm Sat 6am to 4pm

Tax Invoice No. 145032

Date/Time 19/7/12 12:34

Customer

EMS

Rego BH78FW-T

Product

EMS LICON

UnitPrice $0.00

m^3

Gross 45750 kg

Tare 17410 kg

Nett 28340 kg

Tipping Fee $0.00 Inc GST

GST $0.00

CustomerType Account

Comments

Recycled materials generated under Recovered Aggregates Fines Exemption 2010

Signature

Botany Building Recyclers

ABN 97 003 760 183
Ph: 02 9316 6333
Mon-Fri 6am to 6pm Sat 6am to 4pm

Tax Invoice No. 144900

Date/Time 19/7/12 15:23
Customer
EMS
Rego BH76FW-T
Product
EMS L/CON
UnitPrice $0.00
m^3
Gross 40770 kg
Tare 17410 kg
Nett 23360 kg
Tipping Fee $0.00 Inc GST
GST $0.00
CustomerType Account
Comments 6.46 LG-Car
$5-car $35.53

Recycled materials generated under Recovered Aggreate/Fines Exemption 2010

Signature: L

Botany Building Recyclers

ABN 97 003 760 183
Ph: 02 9316 6333
Mon-Fri 6am to 6pm Sat 6am to 4pm

Tax Invoice No. 145085

Date/Time 20/7/12 14:32
Customer
EMS
Rego BH76FW-T
Product
EMS L/CON
UnitPrice $0.00
m^3
Gross 42400 kg
Tare 17410 kg
Nett 24990 kg
Tipping Fee $0.00 Inc GST
GST $0.00
CustomerType Account
Comments $5 Pulverize
12 TON

Recycled materials generated under Recovered Aggreate/Fines Exemption 2010

Signature:

Botany Building Recyclers

ABN 97 003 760 183

Ph: 02 9316 6333

Mon-Fri 6am to 4pm,Sat 6am to 4pm

Tax Invoice No. 144223

Date/Time 16/07/12 14:23

Customer:

EMS

Rego BH76FW-T

Product

EMS LICON

UnitPrice $0.00

m^3

Gross 43240 kg

Tare 17410 kg

Nett 25830 kg

Tipping Fee $0.00 Inc GST

GST $0.00

CustomerType Account

Comments

Recycled materials generated under Recovered Aggregate/Fines Exemption 2010

Signature:_____

Botany Building Recyclers

ABN 97 003 760 183

Ph: 02 9316 6333

Mon-Fri 6am to 4pm,Sat 6am to 4pm

Tax Invoice No. 144396

Date/Time 17/7/12 12:20

Customer:

EMS

Rego BH76FW-T

Product

EMS LICON

UnitPrice $0.00

m^3

Gross 43490 kg

Tare 17410 kg

Nett 26080 kg

Tipping Fee $0.00 Inc GST

GST $0.00

CustomerType Account

Comments

Recycled materials generated under Recovered Aggregate/Fines Exemption 2010

Signature:_____

Zooch Rd

Botany Building Recyclers
ABN 97 003 760 163
Ph: 02 9316 6333
Mon-Fri 6am to 4pm Sat 6am to 4pm

Tax Invoice No. 146991

Date/Time 3/8/12 11:18
Customer
EMS
Rego BH76FW-T
Product
EMS/CON
UnitPrice $0.00
m^3
Gross 47330 kg
Tare 17410 kg
Nett 29920 kg
Tipping Fee $0.00 Inc GST
GST $0.00
CustomerType Account
Comments
N/C

Recycled materials generated under Recovered Aggregate/Fines Exemption 2010

Signature:

Botany Building Recyclers
ABN 97 003 760 163
Ph: 02 9316 6333
Mon-Fri 6am to 4pm Sat 6am to 4pm

Tax Invoice No. 146416

Date/Time 1/8/12 9:31
Customer
EMS
Rego BH76FW-T
Product
BIN CONCRETE SMALL
UnitPrice $15.00
m^3
Gross 41060 kg
Tare 17410 kg
Nett 23650 kg
Tipping Fee $290.23 Inc GST
GST $26.48
CustomerType Account
Comments
NO CHARGE

Recycled materials generated under Recovered Aggregate/Fines Exemption 2010

Signature:

Zouch Rd

Botany Building Recyclers

ABN 97 003 760 183

Ph: 02 9316 6333

Mon-Fri 6am to 4pm Sat 6am to 4pm

Tax Invoice No. 150511

Date/Time 28/8/12 14:15

Customer:
EMS

Rego BH78FW-T

Product
EMS L/CON

UnitPrice $0.00

m^3

Gross 42310 kg

Tare 17410 kg

Nett 24900 kg

Tipping Fee $0.00 Inc GST

GST $0.00

CustomerType Account

Comments

Recycled materials generated under Recovered Aggregate/Fines Exemption 2010

Signature: _____

Botany Building Recyclers

ABN 97 003 760 183

Ph: 02 9316 6333

Mon-Fri 6am to 4pm Sat 6am to 4pm

Tax Invoice No. 147142

Date/Time 6/8/12 12:16

Customer:
EMS

Rego BH78FW-T

Product
EMS L/CON

UnitPrice $0.00

m^3

Gross 42050 kg

Tare 17410 kg

Nett 24640 kg

Tipping Fee $60 Inc GST

GST $0.00

CustomerType Account

Comments L/Con
12 Ton x $5
= $60

Recycled materials generated under Recovered Aggregate/Fines Exemption 2010

Signature: _____

Leach Rd

Botany Building Recyclers

ABN 97 003 760 183

Ph: 02 9316 6333

Mon-Fri 6am to 4pm Sat 6am to 4pm

Tax Invoice No. 150985

Date/Time 30/8/12 13:54

Customer:
EMS

Rego BH76FW-T

Product
EMS L/CON

UnitPrice $0.00

m^3

Gross 49820 kg

Tare 17410 kg

Nett 32410 kg

Tipping Fee $0.00 Inc GST
GST $0.00

CustomerType Account

Comments

Recycled materials generated under Recovered Aggreate/Fines Exemption 2010

Signature: _____

Botany Building Recyclers

ABN 97 003 760 183

Ph: 02 9316 6333

Mon-Fri 6am to 4pm Sat 6am to 4pm

Tax Invoice No. 150438

Date/Time 28/8/12 10:50

Customer:
EMS

Rego BH76FW-T

Product
EMS L/CON

UnitPrice $0.00

m^3

Gross 38140 kg

Tare 17410 kg

Nett 20730 kg

Tipping Fee $0.00 Inc GST
GST $0.00

CustomerType Account

Comments

Recycled materials generated under Recovered Aggreate/Fines Exemption 2010

Signature: _____

ZOUCH RD

Botany Building Recyclers
ABN 97 003 760 183
Ph: 02 9316 6333
Mon-Fri 6am to 6pm Sat 6am to 4pm

Tax Invoice No. 150730

Date/Time 29/8/12 13:01
Customer:
EMS
Rego BH76FW-T
Product
EMS UCON
UnitPrice $0.00
m^3
Gross 41630 kg
Tare 17410 kg
Nett 24470 kg
Tipping Fee $0.00 Inc GST
GST $0.00
CustomerType Account
Comments

Recycled materials generated under Recovered Aggregate/Fines Exemption 2010

Signature:_____

Botany Building Recyclers
ABN 97 003 760 183
Ph: 02 9316 6333
Mon-Fri 6am to 6pm Sat 6am to 4pm

Tax Invoice No. 150889

Date/Time 30/8/12 9:31
Customer:
EMS
Rego BH76FW-T
Product
EMS UCON
UnitPrice $0.00
m^3
Gross 44680 kg
Tare 17410 kg
Nett 27270 kg
Tipping Fee $0.00 Inc GST
GST $0.00
CustomerType Account
Comments

Recycled materials generated under Recovered Aggregate/Fines Exemption 2010

Signature:_____

Botany Building Recyclers

ABN 97 003 760 183

Ph: 02 9316 6333

Mon-Fri 6am to 6pm Sat 6am to 4pm

Tax Invoice No. 150141

Date/Time 26/6/12 10:27

Customer:
EMS

Rego AM81ZK-T

Product
CONCRETE

UnitPrice $0.00

m^3

Gross 49140 kg

Tare 15930 kg

Nett 33210 kg

Tipping Fee $0.00 Inc GST
GST $0.00

CustomerType Account

Comments

Recycled materials generated under Recovered Aggregate/Fines Exemption 2010

Signature: _____

Botany Building Recyclers

ABN 97 003 760 183

Ph: 02 9316 6333

Mon-Fri 6am to 6pm Sat 6am to 4pm

Tax Invoice No. 150000

Date/Time 24/6/12 10:16

Customer:
EMS

Rego AM81ZK-T

Product
CONCRETE

UnitPrice $0.00

m^3

Gross 49730 kg

Tare 15930 kg

Nett 33770 kg

Tipping Fee $0.00 Inc GST
GST $0.00

CustomerType Account

Comments

Recycled materials generated under Recovered Aggregate/Fines Exemption 2010

Signature: _____

Appendix H – G-tek Release Document

© 2013 JBS Environmental Pty Ltd

G-tek Australia Pty Limited
ABN 47 099 519 034

Unit 5K, 256 New Line Road
Dural NSW Australia 2158

Tel: +61 (2) 9651 6838
Fax: +61 (2) 9651 6834

BETTER BY DEFINITION

UXO WORKS AREA RELEASE

PROJECT: 11076TRNG – UXO Works Edmondson Park Landcom Project 12619

RELEASE No: 11076/003a

DATE: 02 September 2013

G-tek Australia Pty Limited (G-tek) has completed hazard reduction works for unexploded ordnance (UXO) explosive ordnance waste (EOW) and inert training ordnance in the area described below and included in the included plan.

RELEASE AREA

Residential Zone North of the Rail Alignment

G-tek Australia has conducted Shallow Search over 34.2Ha of the Zouch Road Edmondson Park, Landcom project 12619 (the Site) as shown in Yellow on the attached drawing.

Two man teams, using Minelab F3 detectors searched 1m wide lanes and recorded results in 50m by 50m sub-grid. All metallic finds were collected and removed from the site.

One live 36M grenade was located and destroyed by Defence, one practice 81mm Mortar, eleven Practice 36M grenades and 2100 live Small Arms Ammunition (SAA) and pyrotechnics were located within this Site. These items have been transferred to Defence for disposal. Significant quantities of SAA (EOW) were also located and removed.

Conservation Zones North Rail Alignment

G-tek Australia has conducted Visual Search over 4.6Ha of the Zouch Road Edmondson Park, Landcom project 12619 (the Site) as shown in Green on the attached drawing.

Personnel walking shoulder to shoulder (0.5m spacing) visually searched each 50m by 50m sub-grid and collected all located Explosives Ordnance (EO) finds.

No items of EO (live Small Arms Ammunition (SAA)) were identified within this Site. Small quantities of SAA EOW were also located and removed.

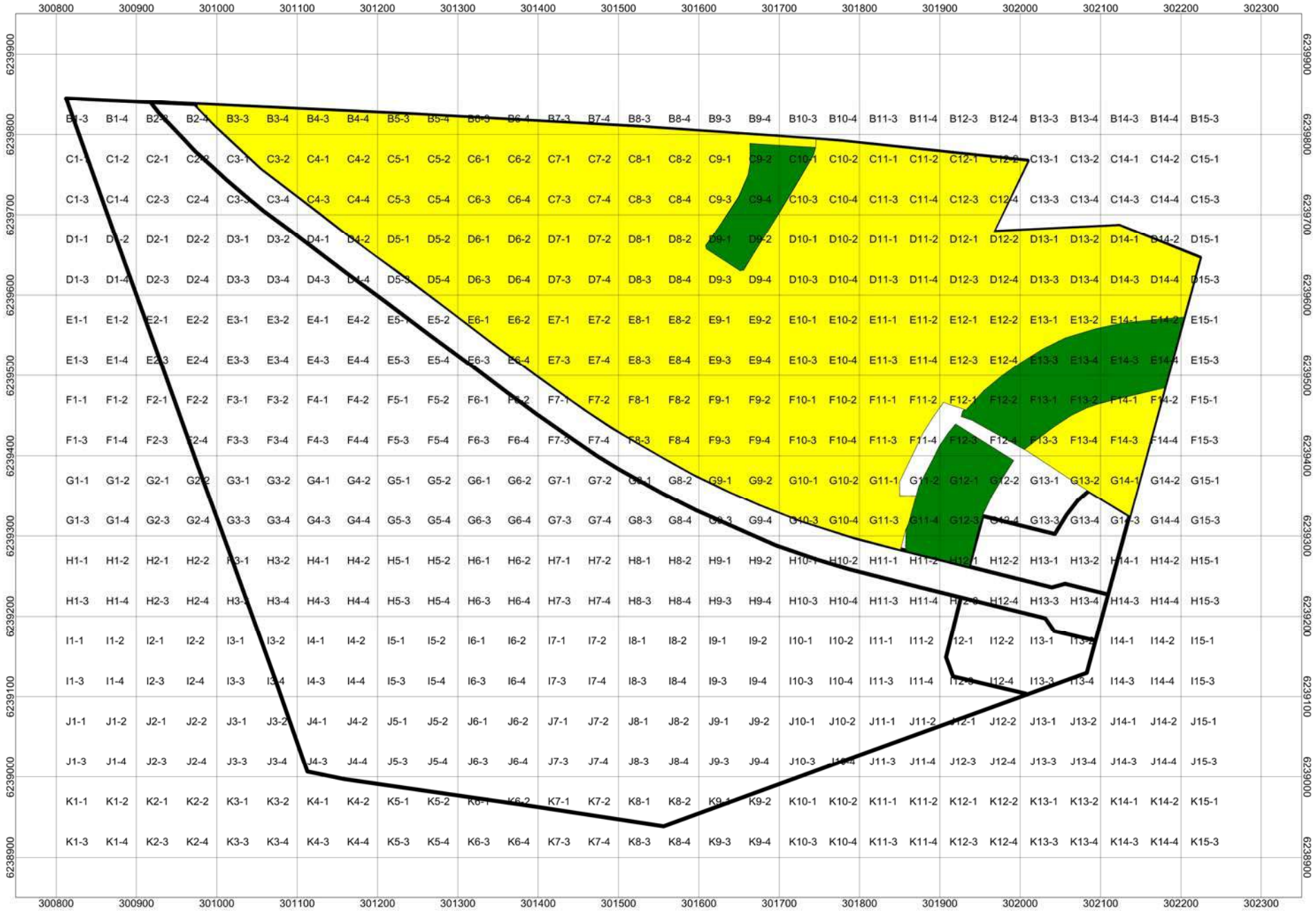
From an UXO perspective, it is considered that this Site is safe for the conduct of required use as a residential subdivision.

Reviewed:

Greg Guthrie
Project Director
gguthrie@g-tek.biz

Released

Paul O'Donnell
Senior Project Manager
podonnell@g-tek.biz



Residential

Conservation

Edmondson Park, Zouch Rd

Residential & Conservation Zone North Rail Alignment

G-tek Australia Pty Limited

100 0 100

(meters)

GDA94 / MGA zone 56

G-tek BETTER BY DEFINITION

Appendix I – Groundwater Monitoring Event Documentation

© 2013 JBS Environmental Pty Ltd

JBS41945-18462 (Rev B)

13 April 2012

David Schofield
Landcom
(dschofield@landcom.nsw.gov.au)
(cc. David Riddell, Aver: driddell@aver.com.au
Graeme Nyland, Environ: gnyland@environ.com.au)
Rowena Salmon, Environ: rsalmon@environ.com.au)

Pre-remediation Groundwater Monitoring Event Results

Landcom Project 12619 Zouch Road, Edmondson Park

Dear David,

1. Introduction and Background

JBS Environmental Pty Ltd was engaged by Landcom to act as remediation consultant during redevelopment of the land known as Landcom Project 12619 located at Zouch Road, Edmondson Park, NSW herein referred to as 'the Site'. The Site is formally identified as part lot 7 and lot 8 DP1127652, as shown in **Figure 1** and comprises a total area of approximately 86 hectares (ha). It is noted that the Site is bisected by the proposed rail corridor comprising part Lots 1 and 2 DP1127652, of approximately 8 ha which is excluded from the Site.

Previous assessment of Site contamination conditions completed previously by others identified the presence of soil contamination conditions requiring remediation prior to commencement of urban development works. The previous Site assessment and remediation plan documents include:

- *Detailed Contamination Site Investigation Report. Landcom Project No. 12619, Zouch Road, Edmondson Park, NSW*. Golder Associates Pty Ltd (Golder 2005a);
- *Remediation Action Plan, Landcom Project No: 12619, Zouch Road, Edmondson Park, NSW*. Golder Associates Pty Ltd (Golder 2005b); and
- *Landcom Project 12619 – Zouch Road, Edmondson Park, NSW, Remediation Action Plan*. Golder Associates Pty Ltd (Golder 2011).

In addition, the appointed independent contaminated Site Auditor has issued the following interim advice with respect to the suitability of the assessment works and remedial action plan (RAP):

- Interim *Advice #4 – Zouch Road, Edmondson Park, NSW, Remediation Action Plan*. Environ Australia Pty Ltd (Environ 2006)
- *Interim Advice #5 – Zouch Road, Edmondson Park, NSW, Revised Remediation Action Plan*. Environ Australia Pty Ltd, draft issue, 24 February 2011 (Environ 2011).

Following appointment as the remediation consultant, JBS has prepared a Validation Sampling Analysis and Quality Plan (JBS 2012a[1]) to guide the validation works during remediation activities.

As required by the RAP (Golder 2011), additional assessment of groundwater conditions is necessary to verify that there have been no impacts upon groundwater conditions by the remedial works at the Site. This letter presents the results of the groundwater assessment activities completed by JBS in February 2012, prior to the commencement of Site remediation activities. As a result of initial results in one monitoring well, BH2, additional sampling was completed in March 2012 in the north-western portion of the site with the results for both sampling events included in this report.

[1] *Validation Sampling, Analysis and Quality Plan, Landcom Project 12619, Zouch Road, Edmondson Park, NSW*. JBS Environmental Pty Ltd, February 2012 (JBS 2012a)

128 O'Riordan St Mascot NSW I 50 Margaret St Sydney NSW
Tel: 02 8338 1011 I Fax: 02 8338 1700 www.jbsgroup.com.au

2. Objectives and Scope of Works

The objective of the sampling activities was to assess and document current data on groundwater contaminant conditions prior to the commencement of remediation works.

The scope of works comprised:

- Review of groundwater data presented in existing site assessment reports;
- Identification, purging and sampling of existing monitoring wells located within the Site (**Figure 2**);
- Laboratory analysis of collected groundwater and QA/QC samples for a range of contaminants of potential concern (COPC);
- Collection and laboratory analysis of surface water identified in the vicinity of BH2 following a period of extended rainfall; and
- Assessment and documentation of current groundwater conditions prior to commencement of remediation works as per Golder (2011).

3. Review of Existing Groundwater Data

Previous site assessment activities (Golder 2005a) comprised installation of groundwater monitoring wells during February 2005 at 6 locations within the Site as shown in **Figure 2**. Well installation details as reported in Golder (2005a) are included in **Attachment 3** (with the exception of the BH558 log which was not included in the original report). At this time groundwater conditions were reported to vary considerably across the Site, being encountered at levels of between 2.5 m and 14.6 m bgl at locations BH2, BH291, BH521, BH558, BH608 and BH675. This corresponds to standing water elevations of 46.15 m AHD in the north-west of the Site and 58.5 m AHD in the southern portion of the Site.

The reported levels are considered to be indicative of perched groundwater occurring within alluvial deposits and at the residual soil-bedrock interface, particularly in low lying areas of the Site, including along drainage lines and in the vicinity of the dams. Interpretation of groundwater flow conditions presented in Golder (2005a) indicated groundwater generally flowed in a north to north-easterly direction apart from the conditions in the west most portion of the Site where groundwater tended to flow toward the surface water feature and Cabramatta Creek to the north-west of the site in a north-westerly direction.

Monitoring of field parameters during the sampling activities identified groundwater conditions at the site as moderately saline (9.21 to 14.27 mS/cm) with a relatively neutral pH (6.8 to 7.2) (Golders 2005a). Prior to sampling, each monitoring well was purged dry and allowed to recharge for a period of 24 hours.

To assess Site groundwater contamination conditions, samples were collected from each of the six monitoring wells during the Golder (2005a) assessment activities and subsequently analysed for a range of COPCs including heavy metals, polycyclic aromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPH), monocyclic aromatic hydrocarbon (BTEX) compounds, speciated phenolics, explosives, organochlorine pesticides (OCPs), organophosphate pesticides (OPPs), polychlorinated biphenyls (PCBs) and volatile chlorinated hydrocarbons (VCHs). Analysis results were compared to adopted assessment criteria as presented in **Table 6.1** of this correspondence.

The laboratory analysis results reported in Golder (2005a) are summarised in tables presented in **Attachment 3** in addition to the following comments:

- Various individual heavy metals were identified in some or all monitoring wells at concentrations above the adopted site assessment criteria. These include the following for each monitoring well:
  - BH2: arsenic (0.12 mg/L), chromium (0.008 mg/L) and lead (0.004 mg/L);
  - BH291: chromium (0.011 mg/L), copper (0.003 mg/L) and lead (0.01 mg/L);
  - BH521: chromium (0.007 mg/L), copper (0.002 mg/L) and lead (0.006 mg/L);
  - BH558: chromium (0.007 mg/L) and nickel (0.016 mg/L);
  - BH608: chromium (0.012 mg/L), copper (0.004 mg/L), lead (0.005 mg/L) and zinc (0.021 mg/L); and
  - BH675: chromium (0.008 mg/L), lead (0.012 mg/L) and nickel (0.022 mg/L).
- Concentrations of TPH and BTEX compounds at all groundwater sampling locations were less than the laboratory limit of recovery (LOR) and below the adopted site assessment criteria;
- Concentrations of individual PAH compounds at all groundwater sampling locations were less than the laboratory limit of recovery (LOR) and below the adopted site assessment criteria; and
- Concentrations of speciated phenolic compounds, OCPs, OPPs, PCBs, VCHs and explosives at all groundwater sampling locations were less than the laboratory limit of recovery (LOR).

128 O'Riordan St Mascot NSW I 50 Margaret St Sydney NSW
Tel: 02 8338 1011 I Fax: 02 8338 1700 www.jbsgroup.com.au

Given that the heavy metals exceedences were identified in both upgradient and down-gradient monitoring well locations at the Site, Golder (2005a) considered the concentrations were largely indicative of general water quality within the area and not evidence of anthropogenic impacts associated with Site activities. The results were considered to be within the range typically of Wianamatta group bedrock and residual soil conditions.

4. Data Quality Objectives

Data Quality Objectives (DQOs) were established for the assessment works, as described in the following sections.

4.1. State the Problem

Existing assessment of the Site did not identify groundwater impacts directly attributable to identified site contamination conditions requiring remediation for the land to be suitable for future urban use. However, as there is a low potential for impacts to groundwater associated with current conditions and the proposed remediation works, further groundwater monitoring is required by the RAP (Golder 2011) to verify the absence of impacts attributable to former site conditions or remediation works.

4.2. Identify the Decision

For this pre-remediation groundwater monitoring event, the primary decision required to be made comprises:

- Are groundwater conditions consistent with groundwater contaminant concentrations previously identified at the Site as previously documented in Golder (2005a) and the RAP (Golder 2011)?

In the event that the answer to the above is No, a second decision may be required to be addressed:

- Are amendments to the Golder (2011a) RAP requirements necessary to further assess and/or address the identified site contamination conditions in order for the Site to be able to be made suitable for the proposed landuse?

4.3. Identify Inputs to the Decision

Inputs to the decisions are:

- Historical groundwater monitoring event data including groundwater quality and contamination data collected during previous monitoring events; and
- Water data collected during the current groundwater monitoring event completed by JBS.

Specifically, sufficient data were required to be collected from the identified potentially impacted media (e.g. groundwater and surface water) in the identified areas of environmental concern for the associated potential contaminants of concern.

4.4. Define the Study Boundaries

The study boundary for the defined Site is shown schematically in **Figure 1** and as an overlay on an aerial photograph in **Figure 2**. The Site is formally defined as part lot 7 and lot 8 DP111127652 comprising approximately 86 ha. As shown in **Figures 1** and **2**, the extent of the Site comprises:

- North – the existing fence line marking the northern extent of Lot 8 (that portion north of the RC) across the majority of the Site, with the northern extent of Lot 7 (north of the RC) comprising the east most portion of the Site's extent;
- West – the existing fence line marking the northern extent of Lot 8, the southern portion of which faces Zouch Road;
- South – the existing fence line marking the extent of Lot 8 in the western portion of the Site and of Lot 7 across the majority of the Site;
- East – the existing fence line marking the extent of Lot 7; and
- Internally – the extent of Lots 7 and 8 in relation to Lots 1 and 2 comprising the proposed rail corridor and future ancillary parking facilities soon to be remediated under a separate agreement between TWA and Landcom.

The maximum vertical extent of the investigation comprised the maximum existing well depth of 15.8 m below ground level (bgl). Due to the nature of potential contaminants identified seasonality was not assessed as part of this investigation. The temporal boundaries of this investigation were limited to the period of the previous groundwater assessment activities February and March of 2005 and the JBS sampling works during February and March 2012.

128 O'Riordan St Mascot NSW I 50 Margaret St Sydney NSW
Tel: 02 8338 1011 I Fax: 02 8338 1700 www.jbsgroup.com.au

4.5. Develop a Decision Rule

Groundwater analytical data were assessed against site assessment criteria presented in **Section 6** as documented in the SAQP (JBS 2012a) derived from NSW EPA endorsed guidance including:

- *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. ANZECC/ARMCANZ (2000);
- *Australian Drinking Water Guidelines*. National Health and Medical Research Council/ National Resource Management Ministerial Council, (NHMRC/NRMMC 2004); and
- *Circular on Target Values and Intervention Values for Soil Remediation*. Netherlands Ministry of Housing, Spatial Planning and the Environment (VROM, 2000) – Adopted as TPH screening levels in the absence of NSW EPA endorsed guideline values.

Table 4.1 Summary of Decision Rules

Decision Required to be Made	Decision Rule
1. Are groundwater conditions consistent with groundwater contaminant conditions previously identified at the Site?	Groundwater data including physical and laboratory results were compared against adopted site assessment criteria derived from the EPA endorsed criteria and historical data. Both historical and additional data groundwater data were assessed against the adopted site assessment criteria. Where contaminant concentrations in groundwater differ significantly from those previously identified, the answer was No. In the event that the contaminant concentrations were consistent, the answer to the question was Yes.
2. Are amendments required to be made to the Golder (2011a) RAP to address identified site contamination conditions?	Review of the above decision was undertaken to establish whether the information collected during the additional assessment has materially changed the understanding of conditions at the Site. Where conditions are found to be substantially different to that documented in the RAP, the answer was Yes. Otherwise the answer to the question was No.

4.6. Specify Limits on Decision Errors

To assess the usability of the data prior to making decisions, the data were assessed against pre-determined Data Quality Indicators (DQIs) for precision, accuracy, representativeness, completeness, comparability and sensitivity (PARCCS parameters) as discussed in the validation SAQP (JBS 2012a). The acceptable limit on decision error is a minimum of 95% compliance with DQIs.

The pre-determined Data Quality Indicators (DQIs) established for the project are shown in **Table 4.2**.

Table 4.2 Summary of Quality Assurance / Quality Control Program

Data Quality Indicators	Frequency	Data Quality Criteria
Precision		
Split duplicates (intra laboratory)	1 / 20 samples	<50% RPD[1] where conc > 10 x LOR/ PQL
Blind duplicates (inter laboratory)	1 / 20 samples	<50% RPD where conc > 10 x LOR
Laboratory Duplicates	1 / 20 samples	<50% RPD where conc > 10 x LOR
Accuracy		
Surrogate spikes	All organic analytes	60-140%
Laboratory control samples	1 per lab batch	70-130% metals, 60-140 % organics
Matrix spikes	1 per lab batch	70-130% metals, 60-140 % organics
Representativeness		
Sampling appropriate for media and analytes		-
Samples extracted and analysed within holding times.	-	Groundwater: sTPH/ PAHs (7 days to ext'n) BTEX/vTPH (14 d) Metals (6 months)
Trip spike (volatiles only)	1 per sampling event	70-130% recovery
Rinsate	1 / 20 samples for TPH, PAHs, 8 metals, or minimum of one/day where sampling for these analyst.	<LOR
Storage blank	1 / media	<LOR

128 O'Riordan St Mascot NSW I 50 Margaret St Sydney NSW
Tel: 02 8338 1011 I Fax: 02 8338 1700 www.jbsgroup.com.au

Data Quality Indicators	Frequency	Data Quality Criteria
Comparability		
Standard operating procedures for sample collection & handling	All Samples	All samples
Standard analytical methods used for all analyses	All Samples	All samples
Consistent field conditions, sampling staff and laboratory analysis	All Samples	All samples
Limits of reporting appropriate and consistent	All Samples	All samples
Completeness		
Soil description and COCs completed and appropriate	All Samples	- All samples
Appropriate documentation	All Samples	- All samples
Satisfactory frequency and result for QC samples	All QA/QC samples	-
Data from critical samples is considered valid	-	Critical samples valid
Sensitivity		
Analytical methods and limits of recovery appropriate for media and adopted Site assessment criteria	-	LOR<= Site assessment criteria

(1) If the RPD between duplicates is greater than the pre-determined data quality indicator, a judgement will be made as to whether the excess is critical in relation to the validation of the data set or unacceptable sampling error is occurring in the field.

4.7. Optimise the Design for Obtaining Data

During previous Site assessment activities (Golder 2005a) groundwater monitoring wells were installed at a total of 6 locations within the Site (BH2, BH291, BH521, B558, BH608, and BH675) to depths of between 8 m and 15.6 m. Given the identified low risk of contaminant migration via groundwater migration, assessment/validation of groundwater conditions is required pre and post remediation works.

The groundwater monitoring works included purging and sampling of the existing monitoring wells prior to the commencement of remediation works associated with the lead particulate impacted material. As a result of conditions encountered in one monitoring well in the north-west of the site during the pre-remediation monitoring event, additional sampling was completed at this well location and of nearby surface water collected following a sustained rainfall event.

Following completion of the on-site containment cell, a final post-remediation groundwater monitoring event will be completed to compare groundwater conditions pre- and post-remediation.

5. Investigation Methodology

5.1. Groundwater Sampling Methodology

Given the depth of the monitoring wells, groundwater sampling was completed using a low flow Micropurge pump system with small diameter, single use tubing. Monitoring wells were purged at the highest possible flow-rate while ensuring that minimal fluctuations in depth to water occurred. A flow cell was employed to monitor water quality parameters of: Electrical conductivity (EC); Redox potential (Eh); pH; Dissolved oxygen (DO); and Temperature during purging and sampling.

Where insufficient inflow was observed at one or a number of well locations to facilitate steady state conditions, the identified monitoring wells was purged 'dry' prior to samples being collected following recharge. Samples were collected of the recharge using a new single use disposable bailer or the micropurge unit.

Following completion of the initial sampling event in February 2012, it was identified that BH2 contained considerable sediment, almost to the top of the screened section. Purging of the monitoring well was completed using a waterra foot valve pump on 20 March 2012 to stimulate and lift the sediment out of the well. The monitoring well was then allowed to stand for a period of 6 days prior to sampling. As a result of the purging, the apparent well depth was extended from a depth of 6.65 m bgl during the initial sampling event to 7.68 m bgl during the additional sampling event. The Golder (2005) indicated the well had a depth of 8 m bgl.

Samples destined for dissolved metal analysis were field filtered. All groundwater samples were placed into laboratory supplied bottles/vials with appropriate preservatives (where required). Each of the sample bottles was labelled with the project ID, date, sampler's initials and unique monitoring well ID (or QC sample name), using permanent ink marker on labels affixed to the sides of the bottles by the laboratory. In addition, the sample ID (i.e., the monitoring well ID) was also replicated on the lid of the bottles/vials in the event that the labels became detached from the bottles during transport.

The bottles were placed directly into a pre-chilled ice chest, for transport to the testing laboratories under chain of custody conditions. COC documentation was completed for samples relinquished to the laboratory and included: sample ID; number of bottles/vials; media type (i.e., water); project ID; name; date of sampling and relinquishment.

128 O'Riordan St Mascot NSW I 50 Margaret St Sydney NSW
Tel: 02 8338 1011 I Fax: 02 8338 1700 www.jbsgroup.com.au

The completed activities were documented on groundwater monitoring and calibration/decontamination record forms as included as **Attachment 4**. One rinsate sample was obtained during the field decontamination procedures by rinsing the interface probe and flow cell with laboratory grade demineralised water following the decontamination procedure. The water sample(s) was then appropriately preserved and stored with the site water samples prior to transport to the laboratory for chemical analysis.

5.2. Surface Water Grab Sample

During the March 2012 sampling event, a single grab sample was collected from an area of collected surface water nearby to the BH2 monitoring well location. As a result of the initial BH2 groundwater laboratory results, this water was identified as a potential contaminant source as a result of construction activities.

The surface water sample was collected using a tele-scoop sampler followed by direct filling of the laboratory supplied bottles/vials with appropriate preservatives (where required). Samples were marked as for the groundwater samples and placed in a pre-chilled ice chest for transport to the testing laboratories under chain of custody conditions. The COCs were documented as for the groundwater samples with field notes included in **Attachment 4**. The tele-scoop sampler was decontaminated prior to and following sample collection using the groundwater sampling equipment decontamination procedure outlined in **Section 6.2.3** of JBS (2012a).

5.3. Laboratory Analysis Methodology

JBS Environmental engaged Envirolab Services Pty Ltd (Envirolab) at Chatswood, NSW as the primary laboratory for the required analyses. The secondary laboratory used for the works was SGS Environmental (SGS) at Alexandria, NSW. All laboratories were NATA registered for the required analyses. In addition, the laboratories were required to meet JBS Environmental's internal QA/QC requirements.

Laboratory analysis methods for relevant groundwater contaminants are identified in **Table 6.1**.

6. Assessment Criteria

Assessment of groundwater conditions is required to verify that there have been no impacts upon groundwater conditions from the remedial works at the Site. The adopted criteria presented in **Table 6.1** were derived during development of the validation SAQP (JBS 2012a) and include values derived from the following documents:

- *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. ANZECC/ARMCANZ (2000);
- *Australian Drinking Water Guidelines* (NHMRC/NRMMC 2004); and
- *Circular on Target Values and Intervention Values for Soil Remediation.* Netherlands Ministry of Housing, Spatial Planning and the Environment (VROM, 2000) – Adopted as TPH screening levels in the absence of NSW EPA endorsed guideline values.

In addition, the adopted groundwater assessment criteria were also used as criteria for the assessment of surface water quality.

128 O'Riordan St Mascot NSW I 50 Margaret St Sydney NSW
Tel: 02 8338 1011 I Fax: 02 8338 1700 www.jbsgroup.com.au

Table 6.1 Adopted Groundwater Assessment Criteria

	Limit of Reporting	Laboratory Method	Adopted Health Based Criteria[1] (all units in μg/L unless stated)	Adopted Ecological Criteria[2] (all units in μg/L unless stated)
HEAVY METALS				
Arsenic	1.0	ICP-AES (USEPA 200.8, 6020A)	7	24
Cadmium	0.1	ICP-AES (USEPA 200.8, 6020A)	2	0.2
Chromium	1.0	ICP-AES (USEPA 200.8, 6020A)	5	3.3[5,6]
Copper	1.0	ICP-AES (USEPA 200.8, 6020A)	2000	1.4
Lead	1.0	ICP-AES (USEPA 200.8, 6020A)	10	3.4
Mercury	0.1	ICP-AES (USEPA 200.8, 6020A)	1	0.06
Nickel	1.0	ICP-AES (USEPA 200.8, 6020A)	20	11
Zinc	1.0	ICP-AES (USEPA 200.8, 6020A)	3000	8
PETROLEUM HYDROCARBONS				
TPH C_{10}-C_{36}	250	GC/FID (USEPA 8000)	-	600[8]
PAHs				
Naphthalene	0.1	GCMS (USEPA8270)	-	16[7]
Anthracene	0.1	GCMS (USEPA8270)	-	0.1 [4,5,6,9]
Phenanthrene	0.1	GCMS (USEPA8270)	-	0.6[5,6,9]
Flouranthene	0.1	GCMS (USEPA8270)	-	1[5,6,9]
Benzo(a)pyrene	0.1	GCMS (USEPA8270)	0.1[4]	0.1[5,6,9]
BTEX				
Benzene	1.0	P&T GC/MS (USEPA 8020A)	1	500
Toluene	1.0	P&T GC/MS (USEPA 8020A)	800	180[5]
Ethyl benzene	1.0	P&T GC/MS (USEPA 8020A)	300	5[5]
o-Xylene	1.0	P&T GC/MS (USEPA 8020A)		350
m-Xylene	1.0	P&T GC/MS (USEPA 8020A)	600[3]	75
p-Xylene	1.0	P&T GC/MS (USEPA 8020A)		200

Notes
(1) Australian Drinking Water Guidelines (NHMRC/NRMMC 2004)
(2) 95% Protection Trigger Values for Fresh Water (ANZECC/ARMCANZ 2000)
(3) Total Xylenes (sum of individual Xylene compounds)
(4) Laboratory limit of reporting is less than the adopted criterion, hence the laboratory LOR is adopted as the criterion for the purposes of this assessment.
(5) Low reliability Trigger Value for Freshwater Protection (ANZECC/ARMCANZ 2000)
(6) 99% Protection Level used, as recommended by ANZECC/ARMCANZ (2000)
(7) Moderate Reliability value in fresh water.
(8) Dutch intervention value adopted in absence of NSW EPA endorsed value.
(9) Indicative Interim Working Level (ANZECC/ARMCANZ 2000)

The adopted groundwater criteria were applied at monitoring well locations within the Site (BH2, BH291, BH521, BH558, BH608 and BH675) as shown in **Figure 2**. In addition the criteria were also applied at the surface water sampling location (PSW1), also shown in **Figure 2**.

Where both human health and ecosystem criteria have been nominated for a contaminant in **Table 6.1** above, the more sensitive criteria has been adopted (ie. 7 μg/L arsenic health level in preference to the 24 μg/Ll ecosystem based criterion) as the site assessment criteria for water assessment purposes.

7. Quality Assurance / Quality Control

7.1. Results

The QA/QC results are summarised in **Table 7.1** and discussed in **Section 7.2** below. Detailed QA/QC results are included with the laboratory reports in **Attachment 6.**

128 O'Riordan St Mascot NSW I 50 Margaret St Sydney NSW
Tel: 02 8338 1011 I Fax: 02 8338 1700 www.jbsgroup.com.au

Table 7.1 Summary of Results of Quality Assurance / Quality Control Program

Data Quality Objective	Frequency / Criterion	Results	DQO met?
Precision			
Blind duplicate (intra-lab)	>1/20 samples RPDs<50% where conc > 10 x LOR	Duplicate samples were obtained and analysed at an appropriate density with one duplicate for both monitoring events. All results were within the adopted RPD% acceptance criteria.	Yes
Split duplicate (inter-lab)	>1/20 samples RPDs<50% where conc > 10 x LOR	Duplicate samples were obtained and analysed at an appropriate density with one duplicate for both monitoring events. All results were within the adopted RPD% acceptance criteria.	Yes
Laboratory Duplicate analysis	>1/20 samples RPDs<50% where conc > 5 x LOR	Laboratory duplicate samples were obtained and analysed for heavy metals. RPD results were within the acceptance criteria.	Partial[1]
Accuracy			
Surrogate spikes	All organic samples 60-140%	All samples analysed. Recoveries in range of 75 – 140 %, within the acceptance criteria.	Yes
Laboratory control samples	1 per lab batch 70-130% metals, 60-140 % organics	Lab control sample analysis results reported for 3 samples from the 2 batches. Results in range of 80 to 140 %, within the acceptance criteria.	Yes
Matrix spikes	1 per lab batch 70-130% metals, 60-140 % organics	No matrix spike analyses were completed for samples within the batches which comprised a small number of samples when compared to the lab frequency (1 per 20 samples) of matrix sample analyses. With due consideration to the completion of 3 LCS's in conjunction with the primary samples, this is not considered to be a critical omission.	Partial[1]
Representativeness			
Sampling appropriate for media and analytes	All media / analytes	All sampling conducted in accordance with JBS procedures	Yes
Trip spike (volatiles)	1 / media / per sampling event 70-130% recovery	A trip spike was carried for both sampling events and subsequently analysed for BTEX. Recoveries of 88 to 106 % were within the acceptable range.	Yes
Storage Blank	1 / media / per sampling event Results <LOR	A storage blank was carried during both sampling events and subsequently analysed for BTEX. Reported BTEX concentrations were all less than the LOR.	Yes
Rinsate	1 / 20 samples / PAHs, TPH and 8 metals Results <LOR	Rinsate samples were prepared during the field works and submitted for analysis. The results for all analyses were less than the LOR.	Yes
Samples extracted and analysed within holding times.	All samples	Samples for chemical analysis were submitted, extracted and analysed within holding times.	Yes
Comparability			
Standard operating procedures for sample collection & handling	All Samples	JBS field staff used the same standard operating procedures throughout works.	Yes
Standard analytical methods used for all analyses	All Samples	Standard analytical methods used as presented in the laboratory reports included as **Attachment 6**.	Yes
Consistent field conditions, sampling staff and laboratory analysis	All Samples	All sampling was completed by experienced JBS personnel. Field staff carried out the work in accordance with JBS operating procedures. One primary and one secondary laboratory duplicate was completed for analysis for each of the sampling events.	Yes
Completeness			
Groundwater Sampling Notes and COCs completed and appropriate	All Samples	Sampling sheets and COCs were completed appropriately.	Yes
Appropriate documentation	All Samples	Appropriate field documentation is included in **Attachment 4**.	Yes

128 O'Riordan St Mascot NSW I 50 Margaret St Sydney NSW
Tel: 02 8338 1011 I Fax: 02 8338 1700 www.jbsgroup.com.au

Data Quality Objective	Frequency / Criterion	Results	DQO met?
Satisfactory frequency and result for QC samples	All QA/QC samples	QC samples were collected at an appropriate frequency. As summarised above, the QC sample results were considered acceptable when considered as a whole.	Yes
Data from critical samples is considered valid	All samples	The collected data presented in this report is considered valid.	Yes
Sensitivity			
Analytical methods and limits of recovery appropriate for media and adopted site assessment criteria	All samples	Appropriate laboratory analysis methods and detection limits were considered to have been achieved during the field and laboratory phases of this investigation.	Yes

Note: [1] Results associated with partial or non-compliance are discussed in the following sections

7.2. Discussion of QA / QC Results

Precision

Intra and inter-laboratory duplicates for groundwater were collected at rates exceeding 1 per 20 samples (5%) analysed. The results for both intra- and inter-laboratory sample analyses were within the nominated range specified in the data quality indicators.

Laboratory duplicate analysis was completed for heavy metals but not for TPH/BTEX or PAHs in the two batches. With consideration to small sample batch size and the frequency of duplicates completed by Envirolabs (one every 10 samples), the absence of laboratory duplicate data is within operational limitations. Given the frequency of JBS field duplicate organics analyses, the absence of lab duplicate data for the organics is considered to be a non-critical omission.

Accuracy

Surrogate spike and laboratory control sample analyses were completed at a suitable frequency and reported results within the acceptable range. As for laboratory duplicates, matrix spikes were not completed for the analysis batches. With consideration to the small sample batch size and the nominated frequency of matrix spikes by Envirolab being one in 20 samples, the absence is within operational limitations. Given that 3 laboratory control samples were analysed for contaminants and these reported acceptable recoveries in addition to all surrogate spike recoveries being within the acceptable range, the overall assessment results for accuracy were considered to satisfy project quality requirements.

Representativeness

The groundwater sampling methods were considered appropriate for the media and the analytes targeted. Groundwater samples were collected via a low flow micropurge pump unit. The surface water grab sample collection method was also considered appropriate. The sampling for both groundwater and surface water was completed by direct filling of new laboratory prepared and preserved (where required) bottles in order from most to least volatile.

All primary and duplicate water sample extractions and analyses were completed within the recommended holding times.

Laboratory blanks, rinsate samples and a storage blank were analysed with the sample batches. All levels of analytes in these samples were below the laboratory limit of recovery for each analyte.

Trip spikes were submitted with the batches for analysis. The recoveries were within the limits specified in the representativeness DQIs.

Comparability

The primary and secondary laboratories were NATA accredited for all methods undertaken during this assessment. The JBS field scientist completed the sampling for this assessment using the documented sampling methodology consistent JBS with sampling protocols. All required field forms and groundwater sampling forms were appropriately completed by the sampling personnel. The assessment results indicate that significant bias of the data as a result of sampling or laboratory methods has not occurred.

Completeness

All documentation was generally completed to the required standard and are included in **Attachment 4**.

Sensitivity

The primary laboratory limit of reporting (LOR) for anthracene and benzo(a)pyrene in groundwater slightly exceed the groundwater acceptance criteria. Therefore the laboratory LOR for these compounds has been adopted as the groundwater assessment criteria. As no individual concentrations were detected in

128 O'Riordan St Mascot NSW I 50 Margaret St Sydney NSW
Tel: 02 8338 1011 I Fax: 02 8338 1700 www.jbsgroup.com.au

groundwater for these compounds during this assessment, the use of LOR, rather than the published guideline value is considered not to have negatively impacted upon the sensitivity of the investigation, nor the conclusions drawn from the assessment.

7.3. QA/QC Assessment

The results of the field and laboratory QA/QC program indicate that the data obtained from this investigation generally met the predetermined Data Quality Indicators (DQIs) or, where the DQIs were exceeded, did not indicate systematic sampling or analytical errors. As such the data are considered to be of adequate quality to be relied on for the purposes of assessing the environmental condition at the Site.

8. Results

Observations during field works have been recorded in field notes included in **Attachment 4**. Sample locations are shown on **Figure 2** in **Attachment 2**. Detailed laboratory reports and chain of custody documentation is presented in **Attachment 6**. An assessment of data quality has found that the data are of a suitable quality for the intended purposes (**Attachment 5**).

8.1. Site Observations

Prior to commencement of the groundwater sampling event, standing groundwater levels were gauged at each well location on 9 February 2012 and the results are summarised in **Table 8.1**.

Table 8.1 Standing Groundwater Levels 9/2/2012

Monitoring Well ID	Depth (m bgl)	Elevation TOC[1] (m AHD)	Elevation (m AHD)
BH2	3.922	50.6	46.68
BH291	2.598	52.96	50.36
BH521	3.271	50.83	47.56
BH558	7.278	59.99	52.71
BH608	6.936	69	62.06
BH675	Nil (8.654m)	66.8	N/A

Notes: TOC – Top of Casing
N/A Not Applicable

Based on the standing water level (SWL) elevations, groundwater at the Site is generally moving in a northerly direction. Limited standing water was encountered at BH558 and BH675 was found to be 'dry' at the time of the gauging/sampling event. In addition, an assessment of the potential presence of light non-aqueous phase liquids (LNAPLs) was also completed during the gauging round. This confirmed the absence of detectable LNAPLs at each monitoring well location.

Measurement of physical parameters during purging and sampling of the monitoring wells was recorded on groundwater sampling forms included as **Attachment 4**. In general the results indicated aerobic, slightly oxidising conditions. The water was generally neutral to slightly acidic and moderately saline, typical of groundwater conditions within residual soils and weathered shale of the Wianamatta Group.

Following intensive purging of BH2, a standing water level of 3.35 m bgl corresponding to an elevation of 47.25 m AHD was documented for this well. The field parameters indicated similar conditions to those reported during the initial event.

Periods of heavy rainfall occurred during and following the February 2012 sampling event. During a site inspection in early March, pooled surface water was identified within the railway corridor approximately 10 to 20 m to the south of the BH2 monitoring well. This area was located at the toe of an extended north-west facing hillslope where ground disturbance has recently occurred as a result of preliminary site preparation/ construction activities associated with the railway. This ponded water was located external to the current site, however there was no boundary protection or sediment/stormwater control measures to prevent movement between this area and the subject site.

The surface water appeared to have ponded at this location as a result of ground disturbance associated with site activities by the railway construction contractors which resulted in a low point of compacted soil on the uphill side of the corridor crossing. As a result of the initial BH2 groundwater laboratory results, the ponded water was identified as a potential contaminant source. No indications of odour, discolouration, separate phase or staining were apparent in the vicinity or within the surface water pools at the time of the sampling, however minor algae was observed in several areas. The depth of water across the majority of the ponds was less than approximately 0.15 m deep with the total ponded area comprising approximately 40 m^2.

JBS also note that during a site inspection of 5 April 2012, works by construction contractors within the rail corridor has resulted in regrading of the ground surface in this area. This has resulted in removal of the low point adjoining the site access road and removed any remaining standing water issue.

128 O'Riordan St Mascot NSW I 50 Margaret St Sydney NSW
Tel: 02 8338 1011 I Fax: 02 8338 1700 www.jbsgroup.com.au

8.2. Groundwater Results

The laboratory analysis results completed for this additional assessment is presented in **Table A** included as **Attachment 7**. The following comments summarise the results for the contaminants of concern:

- Various individual heavy metals were identified in monitoring wells at concentrations above the adopted site assessment criteria. These include the following for each monitoring well:
    - BH2 (Feb): copper (0.014 mg/L), lead (0.011 mg/L) and zinc (0.14 mg/L);
    - BH2 (March): arsenic (0.017 mg/L), nickel (0.044 mg/L) and zinc (0.088 mg/l);
    - BH291: nickel (0.034 mg/L) and zinc (0.042 mg/L);
    - BH521: arsenic (0.012 mg/L), nickel (0.031 mg/L) and zinc (0.02 mg/L);
    - BH608: copper (0.01 mg/L), lead (0.01 mg/L), nickel (0.073 mg/L) and zinc (0.088 mg/L);
    - No analysis of samples from BH558 and BH675 were undertaken as a result of insufficient water volume for collecting samples; and
    - Surface water sample PSW1 (March): copper (0.006 mg/L), lead (0.004 mg/L) and zinc (0.027 mg/L).
- Four samples collected in February were analysed for sTPH (C_{10}-C_{36}). sTPH (C_{10}-C_{28}) concentrations were reported above the LOR in one sample, BH2 with a total TPH concentration of 436 µg/L, less than the adopted assessment criterion of 600 µg/L. The laboratory has supplied the chromatogram (included in **Attachment 7**). JBS note samples were not subjected to a silica gel clean up prior to extraction. During the February 2012 sampling event, a BH2 groundwater sample was analysed for sTPH (C_{10}-C_{36}) with the results reporting concentrations less than the LOR;
- Surface water sample PSW1 collected in March was analysed for sTPH (C_{10}-C_{36}) with a concentration of 1039 µg/L reported. It is noted that no silica gel clean up of the sample was undertaken. The surface water sample was also analysed for vTPH (C_6-C_9) and BTEX compounds, with all concentrations reported to be less than the LOR and below the adopted site assessment criteria;
- Five collected samples were analysed for vTPH (C_6-C_9) and BTEX compounds during the February sampling event. All concentrations were less than the LOR and below the adopted site assessment criteria. It is noted that the LORs for sample BH558 were raised as a result of matrix interference (silt content of sample). With the exception of the ecological criterion for ethylbenzene (5 µg/L), the raised LORs were all still significantly less than the adopted assessment criteria; and
- Samples collected from four monitoring wells were analysed for a range of PAHs. Concentrations were reported to be less than the LOR and below the adopted site assessment criteria.

9. Discussion of Results

The results are discussed below in relation to the established DQO decision rules (**Section 4.5**).

Groundwater Conditions

Review of the Golder (2005a) reported conditions indicates that standing water levels and flow direction noted during this pre-remediation groundwater sampling event were generally consistent with those previously documented.

Heavy metals concentrations reported during the current sampling event are considered to be typical of conditions in Wianamatta Group shales and generally consistent with those previously encountered at the Site. It is noted that chromium, previously identified in groundwater at the majority of sampling locations was not identified at concentrations about the laboratory LOR during this sampling event. Organic compounds including volatile TPH/BTEX and PAHs were also not encountered in groundwater, consistent with the previous assessment results.

Semi-volatile, medium to heavy fraction (C_{10}-C_{36}) TPH concentrations were reported in one groundwater sample collected in February from BH2 in the north-west portion of the Site. Whilst, the concentration of 436 µg/L was less than the adopted criterion of 600 µg/L, TPH had previously not been identified in groundwater at the Site (Golders 2005).

Review of the monitoring well condition field notes identified that the apparent well depth at this location was significantly less than that previously documented in Golder (2005). Whilst the sediment depth was not above the screened section, it was still considered that this may have influenced the apparent results. In addition to the well conditions, JBS noted that the well was located adjacent to the railway corridor. Preliminary ground disturbance activities had occurred within the rail corridor prior to the sampling activities. Given the significant rainfall, the location of the rail corridor up-gradient of the sampling location

128 O'Riordan St Mascot NSW I 50 Margaret St Sydney NSW
Tel: 02 8338 1011 I Fax: 02 8338 1700 www.jbsgroup.com.au

and the potential for contaminating activities to have occurred in the rail corridor (fuel, lubricant spill, etc) consideration was given to the potential for migration of a contaminant source onto the subject site.

To further assess the potential for groundwater TPH impact, the BH2 monitoring well was purged to remove sediment build up, then allowed to settle for a period prior to sampling during March 2012. In addition to sampling the groundwater at this location, a standing surface water grab sample was collected from within the railway corridor adjacent to BH2, at a location beyond the current site boundary. Laboratory analysis results for the additional BH2 groundwater sample did not identify elevated levels of TPH in groundwater with concentrations less than the LOR and less than the adopted site criterion. The results for the surface water sample (without silica gel clean up) identified concentrations of TPH (C_{10}-C_{36}) at 1039 µg/L, above the adopted site groundwater validation criterion of 600 µg/L. As noted above, subsequent to collection of this sample a site inspection identified that earth works within the rail corridor had resulted in removal of the existing ponded water area and regrading for construction of the railway which will also result in a significantly reduced potential for collection of surface water in the vicinity of the sampling location.

Application of RAP Requirements

The objective of the pre-remediation groundwater monitoring event was to provide an up to date baseline of groundwater conditions prior to the commencement of remediation works which potentially could result in migration of heavy metal impacts in groundwater. The RAP includes provision for completion of an additional groundwater monitoring event following completion of the remediation works.

Additional confirmation assessment completed following the initial sampling event that identified sTPH in groundwater at BH2 has identified the absence of elevated sTPH at this sampling location. Given that the result could not be repeated and with consideration to removal of sediment from the well and removal of a potential contamination source, being the collection of surface water immediately up-gradient of BH2, there is considered to be a low probability of further significant detections of TPH in groundwater at this location. As such, further assessment of the adequacy of the RAP in relation to characterisation and management of site conditions is not required in relation to future use of the Site.

10. Conclusions and Recommendations

Based on the findings of this investigation and subsequent to the limitations in **Attachment 1**, the following conclusions have been reached:

- Groundwater heavy metals conditions encountered during the monitoring event are generally consistent with conditions previously identified by Golder during initial assessment of the Site in 2005.
- Assessment of potential sTPH in groundwater impacts in the north-western portion of the site, particularly in the vicinity of BH2 monitoring well location has not identified the presence of an unacceptable risk to human and/or ecological receptors. Whilst laboratory results identified a potential occurrence of sTPH in groundwater during the initial sampling event, these results were unable to be verified following appropriate purging of the monitoring well.
- In addition, given the remediation works include management of lead impacts at the Site, it is proposed to collect and analyse, if sufficient water is present in the wells, samples from BH558 and BH675 to the north and south of the proposed containment cell location respectively prior to disturbance of the lead impacted soils to provide a full set of baseline results.
- In addition to sampling and analysis of groundwater samples from monitoring wells for heavy metals following completion of remediation works, JBS recommend that samples also be analysed for sTPH to confirm groundwater conditions and the suitability of the site for the proposed use.

---

128 O'Riordan St Mascot NSW I 50 Margaret St Sydney NSW
Tel: 02 8338 1011 I Fax: 02 8338 1700 www.jbsgroup.com.au

If you require any further assistance, please do not hesitate to contact me on (02) 8338 1011 or by email jrosner@jbsgroup.com.au .

Prepared by:

Joanne Rosner
Senior Environmental Scientist
JBS Environmental Pty Ltd

Reviewed/Approved by:

Matthew Bennett
Principal Contaminated Land
JBS Environmental Pty Ltd

Attachments:
(1) Limitations
(2) Figures
(3) Golder (2005a) Well Documentation and Laboratory Summary Tables
(4) Groundwater sampling field forms
(5) QA/QC Checker Summary
(6) Laboratory Analysis Reports and Chain of Custody Information
(7) Summary Tables - Groundwater Sample Analytical Results

128 O'Riordan St Mascot NSW I 50 Margaret St Sydney NSW
Tel: 02 8338 1011 I Fax: 02 8338 1700 www.jbsgroup.com.au

Attachment 1 – Limitations

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only, and has been based in part on information obtained from the client and other parties.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

JBS Environmental Pty Ltd accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced without prior approval by the client, or amended in any way without prior approval by JBS Environmental Pty Ltd, and should not be relied upon by other parties, who should make their own enquires.

Sampling and chemical analysis of environmental media is based on appropriate guidance documents made and approved by the relevant regulatory authorities. Conclusions arising from the review and assessment of environmental data are based on the sampling and analysis considered appropriate based on the regulatory requirements.

Limited sampling and laboratory analyses were undertaken as part of the investigations undertaken, as described herein. Ground conditions between sampling locations and media may vary, and this should be considered when extrapolating between sampling points. Chemical analytes are based on the information detailed in the site history. Further chemicals or categories of chemicals may exist at the site, which were not identified in the site history and which may not be expected at the site.

Changes to the subsurface conditions may occur subsequent to the investigations described herein, through natural processes or through the intentional or accidental addition of contaminants. The conclusions and recommendations reached in this report are based on the information obtained at the time of the investigations.

This report does not provide a complete assessment of the environmental status of the site, and it is limited to the scope defined herein. Should information become available regarding conditions at the site including previously unknown sources of contamination, JBS Environmental Pty Ltd reserves the right to review the report in the context of the additional information.

128 O'Riordan St Mascot NSW I 50 Margaret St Sydney NSW
Tel: 02 8338 1011 I Fax: 02 8338 1700 www.jbsgroup.com.au

Attachment 2 – Figures

Source: Base Image - Google Maps www.maps.google.com 20-03-2012

© 2012 JBS Environmental Pty Ltd

0 200 400 800 m
Scale: Approximate

Datum: MGA94 Zone 56 - AHD

Rev	Description	Drn.	Date
A4			
0	Original Issue - Letter	SE	20-03-2012

Legend:
- Approximate Site Boundary

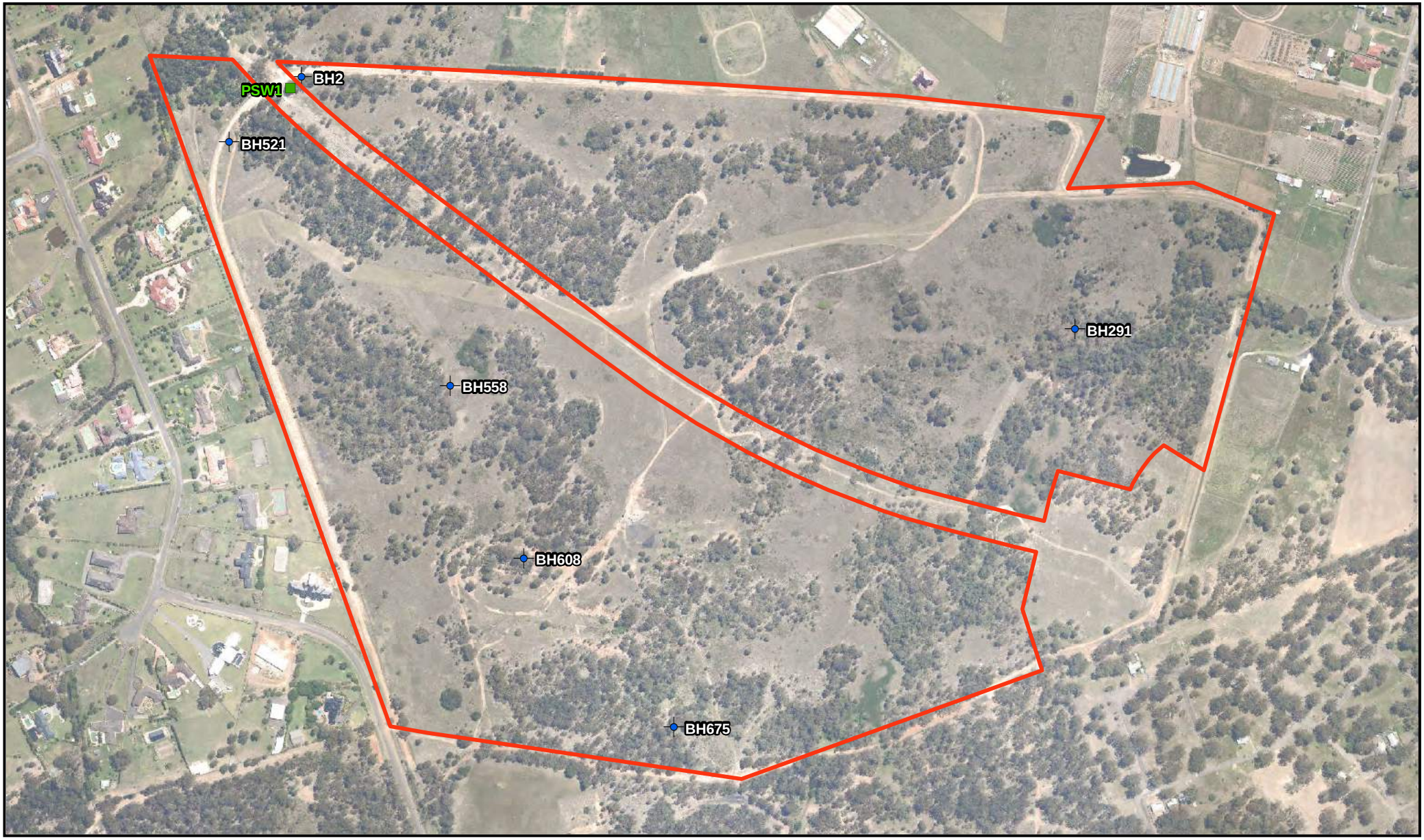
JBS ENVIRONMENTAL

Figure 1: Site Location

Client: Landcom

Project: Landcom, 12619 Zouch Rd, Edmondson Park, NSW

Job No: 41945 File Name: 41945_01



Source: Base Image - Near Map www.nearmap.com, 23-10-2011

© 2012 JBS Environmental Pty Ltd

0 62.5 125 250 m

Scale: 1:6,500

Datum: MGA94 Zone 56 - AHD

A4			
0	Original Issue - L001	SE	12-04-2012
Rev	Description	Drn.	Date:

Legend:

- Approximate Site Boundary
- Borehole Locations (Golder 2005)
- Surface Water Sampling Location

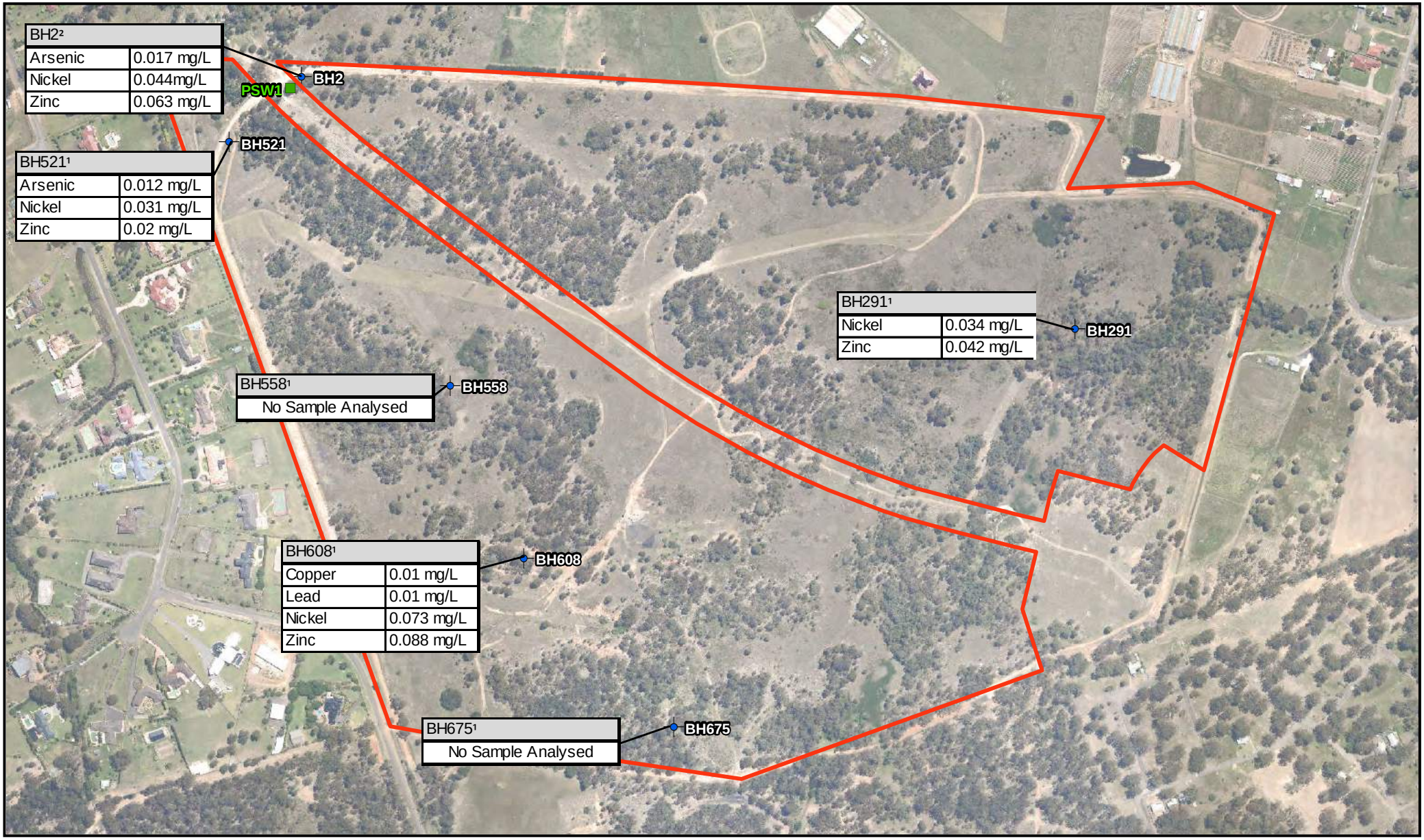
JBS ENVIRONMENTAL

Figure 2: Water Sampling Locations

Client: Landcom

Project: Landcom, 12619 Zouch Rd, Edmondson Park

Job No: 41945 File Name: 41945_02



Source: Base Image - Near Map www.nearmap.com, 23-10-2011

© 2012 JBS Environmental Pty Ltd

0 62.5 125 250 m

Scale: 1:6,500

Datum: MGA94 Zone 56 - AHD

Rev	Description	Drn.	Date:
A4			
0	Original Issue - L001	SE	12-04-2012

Legend:

- Approximate Site Boundary
- Monitoring Well Locations (Golder 2005)
- Surface Water Sampling Location

Note:
¹ February 2012 GME
² March 2012 GME

JBS ENVIRONMENTAL

Figure 3: Groundwater Exceedances

Client: Landcom

Project: Landcom, 12619 Zouch Rd, Edmondson Park

Job No: 41945 File Name: 41945_03

Attachment 3 –Golder (2005a) Well Documentation and Laboratory Summary Tables

REPORT OF BOREHOLE: BH2

SHEET: 1 OF 2

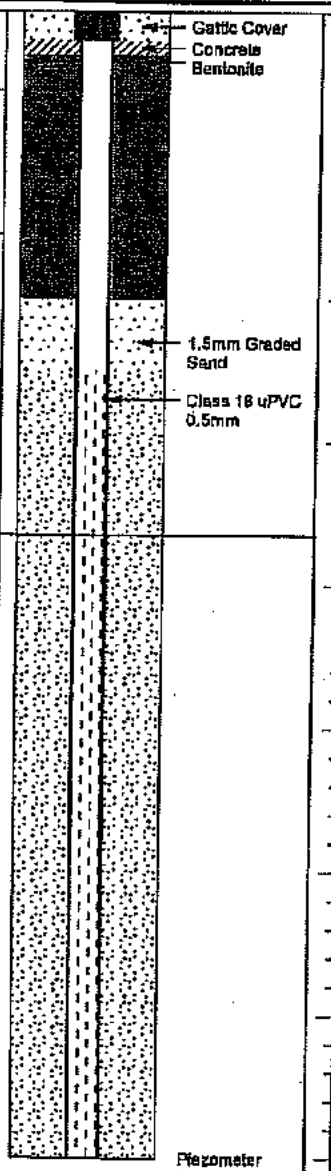
CLIENT: Landcom
PROJECT: Contamination Investigation
LOCATION: Zouch Road, Edmondson Park
JOB NO: 04623119

COORDS: 301003.46 m E 6239818.33 m N 56 MGA93 DRILL RIG: Gemco 210B
SURFACE RL: m DATUM: AHD DRILLER: Drilltest
INCLINATION: -90° LOGGED: RS DATE: 7/2/05
HOLE DIA: 100mm mm HOLE DEPTH: 8.00 m CHECKED: CPM DATE: 4/8/05

Drilling					Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USC Symbol	SOIL / ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY DENSITY
ADT	M-H	Water Level 29/2/05	0		BH2/1 DS 0.00-0.10 m R = 0A PID = 3.6 ppm			CI CH	FILL: Silty CLAY, medium to high plasticity, brown orange, trace fine angular gravel, trace roots	D	St-VSt
				0.55	BH2/2 SPT 0.10-0.55 m 7,7,8 N = 15 R = 0A PID = 2.1 ppm				Red brown mottle from 0.55m		VSt-H
			1		BH2/3 SPT 0.55-0.95 m 7,15,17/100mm, refusal R = 0A PID = 3.2 ppm				SHALE, extremely weathered, extremely low strength, with clay bands	D-M	
	H		2	2.10	BH2/4 SPT 1.10-1.55 m 8,14,21 N = 35 R = 0A PID = 3.8 ppm				Pale grey shale gravel cuttings from 2.1m		
			3	3.65					For Continuation Refer to Sheet 2		
			4								
			5								
			6								
			7								
			8								
			9								
			10								

CASING RL: 50.60 m AHD

PIEZOMETER DETAILS



This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01d RL2

GAP8_0-BETA.GLB FULL PAGE J:\04\PROJ\101-150\04623119_LANDCOM_EDMONDSON PARK\LOGS_BOREHOLES.GPJ GAP5_1.GDT 04/08/2005 22:41:41 PM

REPORT OF BOREHOLE: BH2

SHEET: 2 OF 2

CLIENT: Landcom
PROJECT: Contamination Investigation
LOCATION: Zouch Road, Edmondson Park
JOB NO: 04623119

COORDS: 301003.46 m E 6239818.33 m N 56 MGA DRILL RIG: Gemco 210B
SURFACE RL: m DATUM: AHD DRILLER: Drilltest
INCLINATION: -90° LOGGED: RS DATE: 7/2/05
HOLE DIA: 100mm mm HOLE DEPTH: 8.00 m CHECKED: CPM DATE: 4/8/05

Drilling						Field Material Description				Defect Information	
METHOD	WATER	TCR	RQD (SCR)	DEPTH (meters)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	INFERRED STRENGTH $I_{s(50)}$ MPa (0.03, 0.1, 0.3, 1, 3, 10)	DEFECT DESCRIPTION & Additional Observations	AVERAGE DEFECT SPACING (mm) (30, 100, 300, 1000, 3000)
				0							
				1							
				2							
				3							
					3.65		Continuation of Sheet 1				
					3.75		NO CORE 3.65 - 3.75m				
NMLC		92	0 (12)	4	4.25		SHALE, orange brown and grey, with pale grey clay seams/zones, fractured	DW		3.75-4.00m: Bx6, St, Sm, Sn (Fe) 3.80m: DS, silty clay, 25mm 3.88m: DS, silty clay, 4mm 3.90m: DS, silty clay, 20mm	
					4.37		Dark grey with occasional orange brown, friable 4.37-4.53m: highly fractured, with clay, possible sheared zone	EW-DW		4.10-4.20m: fractured around vertical joint 4.20m: J, 90°, Pl, Sm, Sn, Fe	
					4.70		4.70-4.85m: highly fractured, trace clay, possible sheared zone				
				5				DW		5.00-5.36m: Bx15, 0-5°, St, Sm, Cn & Sn (Fe)	
					5.35		SILTSTONE, dark grey, with occasional brown gravel sized inclusions	DW-SW		5.39m: Drilling break 5.60m: B, 5°, Un, Sm, Cn 5.61m: B, 0-10°, Un, Sm, Cn	
				6	6.30		Interbedded SILTSTONE / SANDSTONE, dark grey and grey, sandstone is fine grained			6.14m: J, 30°, St, Sm, Cn 6.27m: J, 20°, St, Sm, Sn, Fe 6.31m: B, 0°, St, Sm, Sn, Fe 6.34-6.36m: fractured along bedding, 5-10°, Sn (Fe)	
		90	43 (84)		6.73		6.73-7.05m: fractured	DW		6.42m: J, 45°, Un-St, Ro, Sn, Fe 6.51m: B, 0-10°, St, Ro, Sn, Fe 6.56m: B, 0-10°, St, Ro, Sn, Fe	
				7	7.05		SILTSTONE, dark grey	SW			
					7.70		NO CORE 7.70-8.00m			7.54m: J, 30-40°, St, Ro, Cn, fractured 7.70m: Possible J, 80°, Un-St, Sm, Cn	
				8	8.00		END OF BOREHOLE @ 8.00 m				
				9							
				10							

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP6_0-BETA.GLB CORED BOREHOLE J:\84\PROJ\101-1500\[EB0-1LOGS_BOREHOLES.GPJ GAP6_0-BETA.GDT 10/08/2005 8:59:58 AM

REPORT OF BOREHOLE: BH291

SHEET: 1 OF 2

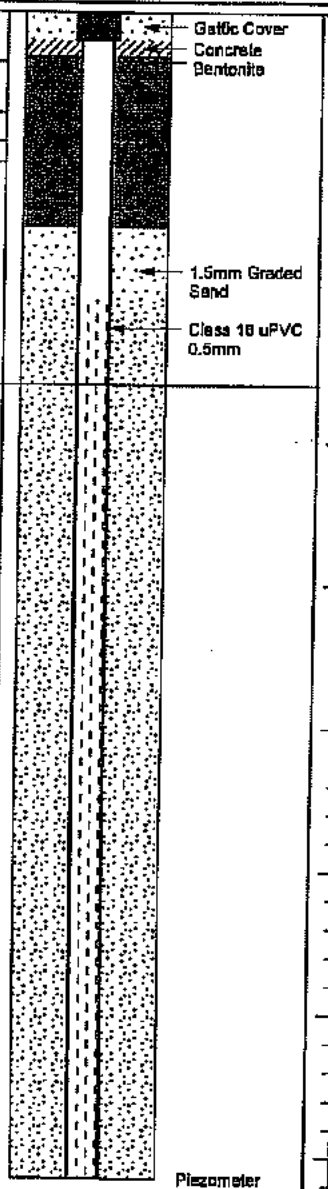
CLIENT: Landcom
PROJECT: Contamination Investigation
LOCATION: Zouch Road, Edmondson Park
JOB NO: 04623119

COORDS: 301974.25 m E 6239501.97 m N 56 MGA94 DRILL RIG: Gemco 210B
SURFACE RL: m DATUM: AHD DRILLER: Drilltest
INCLINATION: -90° LOGGED: RS DATE: 6/2/05
HOLE DIA: 100mm mm HOLE DEPTH: 8.15 m CHECKED: CPM DATE: 4/8/05

Drilling					Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (m/mm)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USC Symbol	SOIL / ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY DENSITY
ADT	M	Water Level 24/2/05	0	0.35	BH291/1 DS 0.00-0.10 m R = 0A PID = 3.1 ppm			ML	SILT, low plasticity, brown, with clay, trace fine angular and rounded gravel, trace roots TOPSOIL	M	L
				0.90	BH291/2 SPT 0.10-0.55 m 2,2,3 N = 5			CI CH	Silty CLAY, medium to high plasticity, red brown mottle, with roots, with fine subrounded gravel	M	F St
			1	1.05	PP = 100, 150, 110 kPa R = 0A PID = 3.4 ppm BH291/3 SPT 0.60-1.05 m 3,8,10 N = 18 PP = 420 kPa R = 0A PID = 3.6 ppm BH291/4 SPT 1.10-1.55 m 5,9,11 N = 20 PP = 350, 360 kPa R = 0A PID = 3.0 ppm			GP CH CI CH	Clayey GRAVEL / Gravelly CLAY, red, orange and grey, gravel is fine and medium, clay is high plasticity Silty CLAY with ironstone gravel layers, medium to high plasticity, grey and red brown, ironstone is fine to coarse, angular	M	St VSt
			2	2.60					For Continuation Refer to Sheet 2		
			3								
			4								
			5								
			6								
			7								
			8								
			9								
			10								

CASING RL: 52.96 m AHD

PIEZOMETER DETAILS



This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01d RL2

GAPS_04SETA.GLB FULL PAGE J:\04PROJ\101-150\04623119_LANDCOM_EDMONDSON PARK\LOGS_BOREHOLES.GPJ GAPS_1.GDT 04/8/2005 22:54 FN

REPORT OF BOREHOLE: BH291

Golder Associates

SHEET: 2 OF 2

CLIENT: Landcom
PROJECT: Contamination Investigation
LOCATION: Zouch Road, Edmondson Park
JOB NO: 04623119

COORDS: 301974.25 m E 6239501.97 m N 56 MGA93 DRILL RIG: Gemco 210B
SURFACE RL: m DATUM: AHD DRILLER: Drilltest
INCLINATION: -90° LOGGED: RS DATE: 8/2/05
HOLE DIA: 100mm mm HOLE DEPTH: 8.15 m CHECKED: CPM DATE: 4/8/05

Drilling						Field Material Description			Defect Information	
METHOD	WATER	TCR	RQD (SCR)	DEPTH (meters)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	INFERRED STRENGTH $I_{s(50)}$ MPa (0.03, 0.1, 0.3, 1, 3, 10; VL, L, M, H, VH)	DEFECT DESCRIPTION & Additional Observations	AVERAGE DEFECT SPACING (mm) (30, 100, 300, 1000, 3000)
				0							
				1							
				2	2.60		Continuation of Sheet 1				
NMLC		83	0 (5)	3	3.73		Silty CLAY, medium to high plasticity, pale grey, with ironstone gravel bands and iron stained sandstone layers, generally firm to stiff	EW		3.30m: PP=220kPa 3.60m: PP=110kPa	
				4	4.10		Sandy Silty CLAY, medium plasticity, grey, with occasional orange brown staining 3.77-3.86m: low strength iron stained sandstone layer				
		82	30 (60)		4.30		NO CORE 4.10 - 4.30m	DW		4.47m: B, 0-5°, Un, Ro, Sn, Fe	
					4.60		SANDSTONE, medium grained, brown with black inclusions 4.60-4.75m: fractured with clay, with ironstone gravel				
				5	4.84		SILTSTONE, dark grey, with occasional brown staining			4.81m: DS, 30mm 4.95-5.00m: fractured 5.05-5.10m: fractured, possibly drilling induced in lower strength rock	
					5.20		NO CORE 5.20 - 5.40m				
					5.40		SILTSTONE, dark gray, occasional orange brown, with fractured and weathered zones	DW		5.60m: J, 90°, St, Sm, Cn, fractured 5.61-5.65m: possible shear zone, highly fractured 5.69m: J, 45°, Pl, Sm, Ch 5.70m: DS, silty clay with VL strength friable black rock, 100mm 5.86m: DS, silty clay, 60mm	
		93	35 (50)	6	6.00		6.00-6.60m: fractured, friable, possible sheared zone	EW-DW			
								DW		6.89m: DS, silty clay, 10mm 6.92m: DS, silty clay, 10mm 6.86-6.91m: fractured, friable, very low strength	
				7				SW			
					7.50		SANDSTONE, fine grained, dark grey and orange brown	DW		7.22m: B, 5-10°, St, Sm, Cn 7.32m: DS, 60mm, friable 7.48m: J, 20°, Pl, Sm, Sn-Vr 7.64m: B, 0-10°, St, Sm, Sn, Fe	
STRATA PACK				8	8.00			SW		7.92m: DS, 3mm	
					8.15		(Hole strata packed 8.00 to 8.15m) END OF BOREHOLE @ 8.15 m				
				9							
				10							

GAP5_0-BETA.GLB CORED BOREHOLE_JAMFROM101-150M41E01~1\LOGS_BOREHOLES.GPJ GAP5_0-BETA.GDT 10/8/2005 8:58:17 AM

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

REPORT OF BOREHOLE: BH521

SHEET: 1 OF 2

CLIENT: Landcom
PROJECT: Contamination Investigation
LOCATION: Zouch Road, Edmondson Park
JOB NO: 04523119

COORDS: 300912.66 m E 6239736.05 m N 56 MGA94 DRILL RIG: Gemco 210B
SURFACE RL: m DATUM: AHD DRILLER: Drilltest
INCLINATION: -90° LOGGED: RS DATE: 11/2/05
HOLE DIA: 100mm mm HOLE DEPTH: 8.60 m CHECKED: CPM DATE: 4/8/05

Drilling					Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USC Symbol	SOIL / ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	CASING RL: 50.83 m AHD PIEZOMETER DETAILS
ADT	M	Water Level 24/2/05	0	0.45	BH521/1 DS 0.00-0.10 m R = 0A PID = 2.9 ppm			CI CH	Silty CLAY, medium plasticity, brown, with roots, zones of Clayey SILT, trace coarse sand and fine gravel, black, subangular POSSIBLE FILL / REWORKED TOPSOIL Silty CLAY, medium to high plasticity, orange brown mottle, with fine gravel, rounded to angular, trace roots, with firm zones RESIDUAL	M	F St F-St	Gatic Cover Concrete Bentonite
			1	1.30	BH521/2 SPT 0.15-0.60 m 3,7,7 N = 14 R = 0A PID = 4.2 ppm			CH	High plasticity, red brown, trace grey, tending sandy	M	F-St	
				1.60	BH521/3 SPT 0.65-1.10 m 4,6,8 N = 12 PP = 200 kPa R = 0A PID = 3.8 ppm			CI	Sandy Silty CLAY, medium plasticity, grey and orange brown, with ironstone gravel RESIDUAL	M	St-VSt	1.5mm Graded Sand Class 18 uPVC 0.5mm
			2	2.50	BH521/4 SPT 1.15-1.60 m 3,5,8 N = 13 PP = 160 kPa R = 0A PID = 4.1 ppm				For Continuation Refer to Sheet 2			
			3		BH521/5 SPT 1.60-2.05 m 6,9,11 N = 20 R = 0A PID = 3.6 ppm							
			4									
			5									
			6									
			7									
			8									
			9									
			10									

Piezometer Details to Scale

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP4_4-BETA.GLB FULL PAGE J:\SAMPROJ\01-05\04523119_LANDCOM_EDMONDSON PARK\LOGS_BOREHOLES.GPJ GAP4_1.GDT 8/4/2005 2:21:59 PM

REPORT OF BOREHOLE: BH521

SHEET: 2 OF 2

CLIENT: Landcom
PROJECT: Contamination Investigation
LOCATION: Zouch Road, Edmondson Park
JOB NO: 04623119

COORDS: 300912.66 m E 6239736.05 m N 56 MGA
SURFACE RL: m DATUM: AHD
INCLINATION: -90°
HOLE DIA: 100mm mm HOLE DEPTH: 8.60 m

DRILL RIG: Gemco 210B
DRILLER: Drilltest
LOGGED: RS DATE: 11/2/05
CHECKED: CPM DATE: 4/8/05

Drilling						Field Material Description				Defect Information	
METHOD	WATER	TCR	RQD (SCR)	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	INFERRED STRENGTH $I_{s(50)}$ MPa (EL VL L M H VH EH) 0.03 0.1 0.3 1 3 10	DEFECT DESCRIPTION & Additional Observations	AVERAGE DEFECT SPACING (mm) 10 30 100 300 1000 3000
STRATA PACK				0							
				1							
				2							
					2.50		Continuation of Sheet 1				
				3			Inferred SHALE, extremely weathered				
				4							
					4.60		Increased resistance from 4.6m				
				5							
				6							
				7							
				8							
					8.60		END OF BOREHOLE @ 8.60 m				
				9							
				10							

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F02a
RL2

GAP3_6 BETA.GLB CORED BOREHOLE J:\04PROJ\101-150\04119\E9~1\LOGS_BOREHOLES.GPJ GAP3_6-BETA.GDT 10/08/2005 8:51:20 AM

REPORT OF BOREHOLE: BH608

SHEET: 1 OF 3

CLIENT: Landcom
PROJECT: Contamination Investigation
LOCATION: Zouch Road, Edmondson Park
JOB NO: 04623119

COORDS: 301282.5 m E 6239214.9 m N 56 MGA94
SURFACE RL: m DATUM: AHD
INCLINATION: -90°
HOLE DIA: 100mm mm HOLE DEPTH: 15.70 m

DRILL RIG: Gemco 210B
DRILLER: Drilltest
LOGGED: RS DATE: 11/2/05
CHECKED: CPM DATE: 4/8/05

Drilling					Sampling		Field Material Description				
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USC Symbol	SOIL / ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	CASING RL: 69.00 m AHD PIEZOMETER DETAILS
ADT	M-H		0		BH608/1 DS 0.00-0.10 m R = 0A PID = 6.3 ppm			CI	Silty CLAY, medium plasticity, brown mottled orange, trace coarse black sand, friable RESIDUAL	D		Gatic Cover 0.0 - 0.1m Concrete 0.1 - 0.2m
				0.65	BH608/2 SPT 0.15-0.60 m 9,13,14 N = 27 R = 0A PID = 2.9 ppm				Red and grey, with ironstone gravel, with fine angular black gravel			
			1	1.45	BH608/3 SPT 0.65-1.10 m 8,12,15 N = 27 R = 0A PID = 3.4 ppm				Becoming extremely weathered shale, with medium strength from 1.50-1.60m	D-M	H	Bentonite 0.2 - 6.0m
			2	2.50	BH608/4 SPT 1.15-1.60 m 5,10,19 N = 29 R = 0A PID = 3.6 ppm				For Continuation Refer to Sheet 2			1.5mm Graded Sand 6.0 - 15.7m Class 18 uPVC 0.5mm 6.7 - 15.7m
			3									
			4									
			5									
			6									
			7									
			8									
			9									
			10									Piezometer Details Not To Scale

GAP8 U-BETA.GLB FULL PAGE J:\04\PROJA\101-150\04623119_LANDCOM_EDMONDSON PARK\LOGS_BOREHOLES.GPJ GAP8_1.GDT 04/08/2005 2:22:10 PM

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F01d RL2

REPORT OF BOREHOLE: BH608

SHEET: 2 OF 3

CLIENT: Landcom
PROJECT: Contamination Investigation
LOCATION: Zouch Road, Edmondson Park
JOB NO: 04623119

COORDS: 301282.5 m E 6239214.9 m N 56 MGA94 DRILL RIG: Gemco 210B
SURFACE RL: m DATUM: AHD DRILLER: Drilltest
INCLINATION: -90° LOGGED: RS DATE: 11/2/05
HOLE DIA: 100mm mm HOLE DEPTH: 15.70 m CHECKED: CPM DATE: 4/8/05

Drilling						Field Material Description			Defect Information	
METHOD	WATER	TCR	RQD (SCR)	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	INFERRED STRENGTH $I_{S(50)}$ MPa (0.03, 0.1, 0.3, 1, 3, 10)	DEFECT DESCRIPTION & Additional Observations	AVERAGE DEFECT SPACING (mm) (10, 30, 100, 300, 1000, 3000)
STRATA PACK				0							
				1							
				2							
					2.60		Continuation of Sheet 1				
				3			Inferred interbedded SHALE and SANDSTONE, grey, sandstone is fine grained				
				4							
				5							
					5.60		5.60-6.30m: Inferred high strength sandstone band				
				6							
				7							
				8							
				9							
				10							

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP8_0-BETA.GLB CORED BOREHOLE J:\MAP\NOV01\01-15\04\E019-7\LOGS_BOREHOLES.GPJ GAP8_0-BETA.GDT 10/05/2005 8:56:26 AM

REPORT OF BOREHOLE: BH608

SHEET: 3 OF 3

CLIENT: Landcom
PROJECT: Contamination Investigation
LOCATION: Zouch Road, Edmondson Park
JOB NO: 04623119

COORDS: 301282.5 m E 6239214.9 m N 56 MGA94
SURFACE RL: m DATUM: AHD
INCLINATION: -90°
HOLE DIA: 100mm mm HOLE DEPTH: 15.70 m

DRILL RIG: Gemco 210B
DRILLER: Drilltest
LOGGED: RS DATE: 11/2/05
CHECKED: CPM DATE: 4/8/05

Drilling						Field Material Description			Defect Information	
METHOD	WATER	TCR	RQD (SCR)	DEPTH (meters)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	INFERRED STRENGTH $I_{s(50)}$ MPa (0.03, 0.1, 0.3, 1, 3, 10) EL VL L M H VH EH	DEFECT DESCRIPTION & Additional Observations	AVERAGE DEFECT SPACING (mm) (10, 30, 100, 300, 1000, 3000)
STRATA PACK	Water Level 24/2/05			10			Inferred interbedded SHALE and SANDSTONE, grey, sandstone is fine grained				
				11							
				12							
				13							
				14							
				15	15.70						
				16			END OF BOREHOLE @ 15.70 m				
				17							
				18							
				19							
				20							

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP6_0-BETA-GLB CORED BOREHOLE JOB#ROJ101-150/041EN0~1\LOGS_BOREHOLES.GPJ GAP6_0-BETA.GDT 10/06/2005 8:50:27 AM

REPORT OF BOREHOLE: BH675

CLIENT: Landcom
PROJECT: Contamination Investigation
LOCATION: Zouch Road, Edmondson Park
JOB NO: 04623119

COORDS: 301470 m E 6239003 m N 56 MGA94
SURFACE RL: m DATUM: AHD
INCLINATION: -90°
HOLE DIA: 100mm mm HOLE DEPTH: 15.60 m

SHEET: 1 OF 3
DRILL RIG: Gemco 210B
DRILLER: Drillfast
LOGGED: RS DATE: 8/2/05
CHECKED: CPM DATE: 4/8/05

Drilling					Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	USC Symbol	SOIL / ROCK MATERIAL DESCRIPTION	MOISTURE	CONSISTENCY DENSITY	CASING RL: 66.80 m AHD PIEZOMETER DETAILS
ADT	M		0	0.10	BH675/1 DS 0.00-0.10 m R = 0A PID = 2.8 ppm			ML CI	SILT, brown, trace fine angular gravel TOPSOIL	D		Gatic Cover 0.0 - 0.1m Concrete 0.1 - 0.2m Bentonite 0.2 - 6.0m
				0.65	BH675/2			CH	Silty CLAY, medium to high plasticity, red brown grey mottle, with roots, with extremely weathered ironstone gravel RESIDUAL		St	
				0.80	SPT 0.15-0.60 m 4,5,6 N = 10 R = 0A PID = 3.4 ppm				From 0.95m: Less roots, with ironstone gravel, medium subrounded to angular From 0.8m: Increasing fine angular ironstone gravel with depth	M	VSt	
	H		1		BH675/3 SPT 0.65-1.10 m 5,7,11 N = 18 PP = 360 kPa R = 0A PID = 2.6 ppm							
			2		BH675/4 SPT 1.16-1.60 m 6,11,17 N = 28 PP = 480 kPa R = 0A PID = 1.9 ppm							
				2.55					For Continuation Refer to Sheet 2			1.5mm Graded Sand 6.0 - 15.6m Class 18 uPVC 0.5mm 6.6 - 15.6m Piezometer Details Not To Scale
			3									
			4									
			5									
			6									
			7									
			8									
			9									
			10									

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP5_0-BETA.GLB FULL PAGE J:\04\PROJ\001-150\04623119_LANDCOM_EDMONDSON PARK\LOGS_BOREHOLES.GPJ GAP5_1.GDT 04/08/2005 2:22:31 PM

REPORT OF BOREHOLE: BH675

SHEET: 2 OF 3

CLIENT: Landcom
PROJECT: Contamination Investigation
LOCATION: Zouch Road, Edmondson Park
JOB NO: 04623119

COORDS: 301470 m E 6239003 m N 56 MGA94
SURFACE RL: m DATUM: AHD
INCLINATION: -90°
HOLE DIA: 100mm mm HOLE DEPTH: 15.60 m

DRILL RIG: Gemco 210B
DRILLER: Drilltest
LOGGED: RS DATE: 8/2/05
CHECKED: CPM DATE: 4/8/05

Drilling						Field Material Description				Defect Information	
METHOD	WATER	TCR	RQD (SCR)	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	INFERRED STRENGTH $I_{S(50)}$ MPa (0.03, 0.1, 0.3, 1, 3, 10; VL, L, M, H, VH, EH)	DEFECT DESCRIPTION & Additional Observations	AVERAGE DEFECT SPACING (mm) (10, 30, 100, 300, 1000, 3000)
NMLC		88	30 (10)	0							
				1							
				2							
					2.55		Continuation of Sheet 1				
				3			SHALE, pale grey, friable, with red ironstone gravel layers, ironstone is low to high strength, fractured due to drilling and handling	EW			
		91	30 (10)	4						3.78m: Possible J, 15-25°, St, Sm, ironstone gravel fragments	
				5							
				6							
		100	30 (55)		6.35		Dark grey, trace iron stained zones, occasional medium ironstone gravel inclusion, generally fractured around ironstone inclusions due to drilling	DW		6.85m: J, 45°, Pl, Sm, Cn 6.93m: J, 30°, Un, Sm, Cn 7.04-7.10m: fractured, handling/drilling break	
				7						7.31m: J, 15°, Un, St, Cn 7.34m: J, 15°, Pl, St, Cn	
					7.45		Inferred interbedded SHALE and SANDSTONE, grey, sandstone is fine grained				
				8							
				9							
				10							

STRATA PACK

GAP8_0-BETA.GLB CORED BOREHOLE J:\04\PROJ\101-150\04\623119-1\LOGS_BOREHOLES.GPJ GAP8_0-BETA.GDT 10/08/2005 8:56:40 AM

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP gINT FN. F02a
RL2

REPORT OF BOREHOLE: BH675

CLIENT:	Landcom	COORDS: 301470 m E 6239003 m N 56 MGA94	SHEET: 3 OF 3
PROJECT:	Contamination Investigation	SURFACE RL: m DATUM: AHD	DRILL RIG: Gemco 210B
LOCATION:	Zouch Road, Edmondson Park	INCLINATION: -90°	DRILLER: Drillitest
JOB NO:	04623119	HOLE DIA: 100mm mm HOLE DEPTH: 15.60 m	LOGGED: RS DATE: 8/2/05
			CHECKED: CPM DATE: 4/8/05

Drilling						Field Material Description			Defect Information	
METHOD	WATER	TCR	RQD (SCR)	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	INFERRED STRENGTH $I_{S(50)}$ MPa (EL 0.03, VL 0.1, L 0.3, M 1, H 3, VH 10)	DEFECT DESCRIPTION & Additional Observations	AVERAGE DEFECT SPACING (mm) (10, 30, 100, 300, 1000, 3000)
STRATA PACK	Water Level 24/2/05			10			Inferred interbedded SHALE and SANDSTONE, grey, sandstone is fine grained				
				11							
				12							
				13							
				14							
				15	15.60						
							END OF BOREHOLE @ 15.60 m				
				16							
				17							
				18							
				19							
				20							

This report of borehole must be read in conjunction with accompanying notes and abbreviations. It has been prepared for environmental purposes only, without attempt to consider geotechnical properties or the geotechnical significance of the materials encountered. As such it should not be relied upon for geotechnical purposes.

GAP8_G-BETA.GLB CORED BOREHOLE J:\04\PROJA\61-150041E\8-1\LOGS_BOREHOLES.GPJ GAP8_G-BETA.GDT 19/8/2005 8:56:41 AM

APPENDIX F5

Summary of Laboratory Results

Groundwater

Sample Location	Matrix	Zone	Sample Date	Analytical Program									
BH2	Water	RZNRA	24/02/2005			Metals	PAH	TPH	BTEX	OCPs		PCBs	Explosives	Phenols	VHCs
			29/03/2005	pH	EC						OCP Low Level				
BH291	Water	RZNRA	24/02/2005			Metals	PAH	TPH	BTEX	OCPs		PCBs	Explosives	Phenols	VHCs
			29/03/2005	pH	EC						OCP Low Level				
BH521	Water	CZSRA	24/02/2005			Metals	PAH	TPH	BTEX	OCPs		PCBs	Explosives	Phenols	VHCs
			29/03/2005	pH	EC						OCP Low Level				
BH558	Water	CZSRA	24/02/2005			Metals	PAH	TPH	BTEX	OCPs		PCBs	Explosives	Phenols	VHCs
			29/03/2005	pH	EC						OCP Low Level				
BH608	Water	CZSRA	24/02/2005			Metals	PAH	TPH	BTEX	OCPs		PCBs	Explosives	Phenols	VHCs
			29/03/2005	pH	EC						OCP Low Level				
BH640	Water	CZSRA	24/02/2005			Metals	PAH	TPH	BTEX	OCPs		PCBs	Explosives	Phenols	VHCs
			29/03/2005	pH	EC						OCP Low Level				
BH675	Water	CZSRA	24/02/2005			Metals	PAH	TPH	BTEX	OCPs		PCBs	Explosives	Phenols	VHCs
			29/03/2005	pH	EC						OCP Low Level				
Trench1	Water	CZSRA	1/03/2005			Metals	PAH	TPH	BTEX	OCPs		PCBs	Explosives	Phenols	
Trench2	Water	CZSRA	1/03/2005			Metals	PAH	TPH	BTEX	OCPs		PCBs	Explosives	Phenols	
Trench3	Water	CZSRA	1/03/2005			Metals	PAH	TPH	BTEX	OCPs		PCBs	Explosives	Phenols	
QA/QC															
Dup W1	Duplicate of BH2		24/02/2005			Metals	PAH	TPH	BTEX	OCPs		PCBs	Explosives	Phenols	VHCs
Dup W2	Duplicate of BH3		24/02/2005												
Dup W3	Duplicate of BH4		29/03/2005	pH	EC						OCP Low Level				
Trips Spike	Trips Spike / Water		24/02/2005						BTEX						
Strip Blank	Trib Blank / Water		24/02/2005						BTEX						

Table 1 - Summary of Laboratory Results
Analytical Program
Landcom
DSI, Zouch Road
Edmondson Park

Sample No.	Collect Date/Time	Sample Matrix	Zone	pH	Ec	Arsenic	Cadmium	Chromium*	Copper	Lead	Mercury	Nickel	Zinc
				Units	uS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Threshold Concentrations for Groundwater				-	-	**0.024**	**0.0002**	**0.0033**	**0.0014**	**0.0034**	**0.0006**	**0.011**	**0.008**
BH2	24/02/2005	Water	RZNRA			**0.12**	<0.0002	**0.008**	<0.001	**0.004**	<0.0001	0.002	<0.001
BH2	29/03/2005	Water	RZNRA	7	10,000								
BH291	24/02/2005	Water	RZNRA			0.004	<0.0002	**0.011**	**0.003**	**0.01**	<0.0001	0.008	0.005
BH291	29/03/2005	Water	RZNRA	6.9	14,000								
BH521	24/02/2005	Water	CZSRA			0.021	<0.0002	**0.007**	**0.002**	**0.006**	<0.0001	0.005	0.005
BH521	29/03/2005	Water	CZSRA	6.9	15,000								
BH558	24/02/2005	Water	CZSRA			0.004	<0.0002	**0.007**	0.001	0.002	<0.0001	**0.016**	<0.001
BH558	29/03/2005	Water	CZSRA	7	12,000								
BH608	24/02/2005	Water	CZSRA			0.004	<0.0002	**0.012**	**0.004**	**0.005**	<0.0001	0.009	**0.021**
BH608	29/03/2005	Water	CZSRA	7.7	8,900								
BH640	24/02/2005	Water	CZSRA			0.004	<0.0002	**0.008**	<0.001	**0.005**	<0.0001	**0.019**	<0.001
BH640	29/03/2005	Water	CZSRA	7	11,000								
BH675	24/02/2005	Water	CZSRA			0.014	<0.0002	**0.008**	0.001	**0.012**	<0.0001	**0.022**	<0.001
BH675	29/03/2005	Water	CZSRA	7	10,000								
Trench1	1/03/2005	Water	CZSRA			0.001	<0.0002	0.002	<0.001	<0.001	<0.0001	0.004	0.002
Trench2	1/03/2005	Water	CZSRA			0.001	<0.0002	0.001	**0.002**	<0.001	<0.0001	0.007	**0.021**
Trench3	1/03/2005	Water	CZSRA			0.001	<0.0002	<0.001	**0.003**	0.002	<0.0001	0.01	**0.041**

Table 2 - Summary of Laboratory Results
Heavy Metals - Groundwater
Landcom
DSI, Zouch Road
Edmondson Park

Station Name	Sample Matrix	Collect Date/Time	Zone	TPH C_6-C_9	TPH C_{10}-C_{14}	TPH C_{15}-C_{28}	TPH C_{29}-C_{36}	TPH C_{10}-C_{36}	Benzene	Toluene	Ethyl Benzene	Xylene
				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Threshold Concentrations for Groundwater				-	-	-	-	**0.6**	**0.95**	**0.18**	**0.08**	**0.38**
BH2	WATER	24/02/2005	RZNRA	<0.040	<0.10	<0.20	<0.20	<0.54	<0.001	<0.001	<0.001	<0.003
BH291	WATER	24/02/2005	RZNRA	<0.040	<0.10	<0.20	<0.20	<0.54	<0.001	<0.001	<0.001	<0.003
BH521	WATER	24/02/2005	CZSRA	<0.040	<0.10	<0.20	<0.20	<0.54	<0.001	<0.001	<0.001	<0.003
BH558	WATER	24/02/2005	CZSRA	<0.040	<0.10	<0.20	<0.20	<0.54	<0.001	<0.001	<0.001	<0.003
BH608	WATER	24/02/2005	CZSRA	<0.040	<0.10	<0.20	<0.20	<0.54	<0.001	<0.001	<0.001	<0.003
BH640	WATER	24/02/2005	CZSRA	<0.040	<0.10	<0.20	<0.20	<0.54	<0.001	<0.001	<0.001	<0.003
BH675	WATER	24/02/2005	CZSRA	<0.040	<0.10	<0.20	<0.20	<0.54	<0.001	<0.001	<0.001	<0.003
DupW1	WATER	24/02/2005	CZSRA	<0.040	<0.10	<0.20	<0.20	<0.54	<0.001	<0.001	<0.001	<0.003
Trench1	WATER	1/03/2005	CZSRA	<0.040	<0.10	<0.20	<0.20	<0.54	<0.001	<0.001	<0.001	<0.003
Trench2	WATER	1/03/2005	CZSRA	<0.040	<0.10	<0.20	<0.20	<0.54	<0.001	<0.001	<0.001	<0.003
Trench3	WATER	1/03/2005	CZSRA	<0.040	<0.10	<0.20	<0.20	<0.54	<0.001	0.002	<0.001	<0.003

Table 3 - Summary of Laboratory Results
TPH/BTEX - Groundwater
Landcom
DSI, Zouch Road
Edmondson Park

Groundwater Lab Results.xls
Prepared By: DM Date: 12/08/05
Checked By: JN Date: 12/08/05

Station Name	Sample Matrix	Collect Date	Phenol	2-methylphenol (o-Cresol)	3/4-methylphenol (m/p-Cresol)	2-Chlorophenol	2,4 & 2,5-Dimethylphenol	2,6-Dichlorophenol	2,4-Dichlorophenol	2-Nitrophenol	2,4,6-Trichlorophenol	4-Nitrophenol	2,4,5-Trichlorophenol	2346-Tetrachlorophenol	Pentachlorophenol	2,4-Dinitrophenol
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
reshold Concentrations for Groundwat			**320**			**490**			**160**		**20**				**10**	
BH2	water	24/02/2005	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
BH291	water	24/02/2005	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
BH521	water	24/02/2005	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
BH558	water	24/02/2005	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
BH608	water	24/02/2005	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
BH640	water	24/02/2005	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
BH675	water	24/02/2005	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trench 1	WATER	1/03/2005	11	<10	17	<5	<10	<5	<5	10	<5	21	<5	<5	<5	<10
Trench 2	WATER	1/03/2005	11	<10	15	<5	<10	<5	<5	<5	<5	<5	<5	<5	<5	<10
Trench 3	WATER	1/03/2005	<10	<10	13	<5	<10	<5	<5	<5	<5	<5	<5	<5	<5	<10

Table 4 - Summary of Laboratory Results
Phenolics - Groundwater
Landcom
DSI, Zouch Road
Edmondson Park

Station Name	Sample Matrix	Collect Date	Dichlorodifluoromethane	Chloromethane	Vinyl Chloride	Bromomethane	Chloroethane	Trichlorofluoromethane	1,1-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethane	cis-1,2-Dichloroethene	Bromochloromethane	Chloroform	2,2-Dichloropropane	1,2-Dichloroethane	1,1,1-Trichloroethane	1,1-Dichloropropene	Carbon tetrachloride	Dibromomethane	1,2-Dichloropropane	Trichloroethene	Bromodichloromethane	trans-1,3-Dichloropropene
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Threshold Concentrations for Groundwater			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH2	water	24/02/2005	<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	<5.0	<5.0
BH291	water	24/02/2005	<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	<5.0	<5.0
BH521	water	24/02/2005	<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	<5.0	<5.0
BH558	water	24/02/2005	<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	<5.0	<5.0
BH608	water	24/02/2005	<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	<5.0	<5.0
BH640	water	24/02/2005	<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	<5.0	<5.0
BH675	water	24/02/2005	<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	<5.0	<5.0

Station Name	Sample Matrix	Collect Date	cis-1,3-Dichloropropene	1,1,2-Trichloroethane	1,3-Dichloropropane	Dibromochloromethane	1,2-Dibromoethane	Tetrachloroethene	1,1,1,2-Tetrachloroethane	Chlorobenzene	Bromoform	1,1,2,2-Tetrachloroethane	1,2,3-Trichloropropane	Bromobenzene	2-Chlorotoluene	4-Chlorotoluene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	1,2-Dichlorobenzene	1,2-Dibromo-3-chloropropane	1,2,4-Trichlorobenzene	Hexachlorobutadiene	1,2,3-Trichlorobenzene
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Threshold Concentrations for Groundwater			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH2	water	24/02/2005	<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	<5.0
BH291	water	24/02/2005	<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	<5.0
BH521	water	24/02/2005	<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	<5.0
BH558	water	24/02/2005	<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	<5.0
BH608	water	24/02/2005	<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	<5.0
BH640	water	24/02/2005	<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	<5.0
BH675	water	24/02/2005	<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	<5.0

Table 5 - Summary of Laboratory Results
VHCs - Groundwater
Landcom
DSI, Zouch Road
Edmondson Park

Station Name	Collect Date/Time	Sample Matrix	Zone	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo[a] anthracene	Chrysene	Benzo[b,k] fluoranthene	Benzo[a] pyrene	Indeno[123-cd] pyrene	Dibenzo[ah] anthracene	Benzo[ghi] perylene	Total PAH's
				ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Threshold Concentrations for Groundwater				**16**	-	-	-	**2**	**0.4**	**1.4**	-	-	-	-	**0.2**	-	-	-	-
BH2	24/02/2005	water	n/a	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	0
BH291	24/02/2005	water	n/a	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	0
BH521	24/02/2005	water	n/a	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	0
BH558	24/02/2005	water	n/a	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	0
BH608	24/02/2005	water	n/a	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	0
BH640	24/02/2005	water	n/a	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	0
BH675	24/02/2005	water	n/a	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	0
Dup W1	24/02/2005	water	n/a	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	0
Trench 1	1/03/2005	WATER	CZSRA	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	0
Trench 2	1/03/2005	WATER	CZSRA	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	0
Trench 3	1/03/2005	WATER	CZSRA	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	0

Table 6 - Summary of Laboratory Results
PAHs - Groundwater
Landcom
DSI, Zouch Road
Edmondson Park

Groundwater Lab Results.xls
Prepared By: DM Date: 12/08/05
Checked By: JN Date: 12/08/05

Station Name	Sample Matrix	Collect Date/Time	Zone	HCB	alpha BHC	gamma BHC(Lindane)	Heptachlor	Aldrin	beta-BHC	delta BHC	Heptachlor Epoxide	o,p'-DDE	alpha Endosulfan	beta-Endosulfan	trans-Chlordane	cis-Chlordane	alpha-Chlordane	gamma-Chlordane	trans-Nonachlor	p,p'-DDE	Dieldrin	Endrin	o,p'-DDD	o,p'-DDT	beta Endosulfan	p,p'-DDD	p,p'-DDT	Endosulfan Sulphate	Endrin Aldehyde	Methoxychlor	Endrin Ketone	Chlorpyrifos	Fenitrothion	Ethion	Bromophos Ethyl	Lindane
				ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Threshold Concentrations for Groundwater				-	-	-	0.09	0.001	-	-	-	-	-	-	-	-	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	0.01	-	-	-	-
BH2	24/02/2005	24/02/2005	RZNRA	<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	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.20	<0.20	-	-
BH291	24/02/2005	24/02/2005	RZNRA	<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	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.20	<0.20	-	-
BH521	24/02/2005	24/02/2005	CZSRA	<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	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.20	<0.20	-	-
BH558	24/02/2005	24/02/2005	CZSRA	<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	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.20	<0.20	-	-
BH608	24/02/2005	24/02/2005	CZSRA	<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	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.20	<0.20	-	-
BH640	24/02/2005	24/02/2005	CZSRA	<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	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.20	<0.20	-	-
BH675	24/02/2005	24/02/2005	CZSRA	<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	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.20	<0.20	-	-
Trench 1	1/03/2005	1/03/2005	CZSRA	<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	<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	<0.2	<0.2	-
Trench 2	1/03/2005	1/03/2005	CZSRA	<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	<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	<0.2	<0.2	-
Trench 3	1/03/2005	1/03/2005	CZSRA	<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	<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	<0.2	<0.2	-
BH2	29/03/2005	water	RZNRA	<0.01	-	-	<0.09	<0.02	-	-	-	-	<0.05	<0.05	-	-	<0.04	<0.04	-	<0.01	<0.02	<0.02	-	-	-	<0.01	<0.01	<0.05	-	<0.04	-	-	-	-	-	-	<0.2
BH291	29/03/2005	water	RZNRA	<0.01	-	-	<0.09	<0.02	-	-	-	-	<0.05	<0.05	-	-	<0.04	<0.04	-	<0.01	<0.02	<0.02	-	-	-	<0.01	<0.01	<0.05	-	<0.04	-	-	-	-	-	-	<0.2
BH521	29/03/2005	water	CZSRA	<0.01	-	-	<0.09	<0.02	-	-	-	-	<0.05	<0.05	-	-	<0.04	<0.04	-	<0.01	<0.02	<0.02	-	-	-	<0.01	<0.01	<0.05	-	<0.04	-	-	-	-	-	-	<0.2
BH558	29/03/2005	water	CZSRA	<0.01	-	-	<0.09	<0.02	-	-	-	-	<0.05	<0.05	-	-	<0.04	<0.04	-	<0.01	<0.02	<0.02	-	-	-	<0.01	<0.01	<0.05	-	<0.04	-	-	-	-	-	-	<0.2
BH608	29/03/2005	water	CZSRA	<0.01	-	-	<0.09	<0.02	-	-	-	-	<0.05	<0.05	-	-	<0.04	<0.04	-	<0.01	<0.02	<0.02	-	-	-	<0.01	<0.01	<0.05	-	<0.04	-	-	-	-	-	-	<0.2
BH640	29/03/2005	water	CZSRA	<0.01	-	-	<0.09	<0.02	-	-	-	-	<0.05	<0.05	-	-	<0.04	<0.04	-	<0.01	<0.02	<0.02	-	-	-	<0.01	<0.01	<0.05	-	<0.04	-	-	-	-	-	-	<0.2
BH675	29/03/2005	water	CZSRA	<0.01	-	-	<0.09	<0.02	-	-	-	-	<0.05	<0.05	-	-	<0.04	<0.04	-	<0.01	<0.02	<0.02	-	-	-	<0.01	<0.01	<0.05	-	<0.04	-	-	-	-	-	-	<0.2

Table 7 - Summary of Laboratory Results
OCPs - Groundwater
Landcom
DSI, Zouch Road
Edmondson Park

Station Name	Sample Matrix	Collect Date	Zone	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	Arochlor 1262	Arochlor 1268	Total Positive PCB
				ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Threshold Concentrations for Groundwater				-	-	-	-	-	-	-	-	-	-
BH2	water	24/02/2005	RZNRA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.90
BH291	water	24/02/2005	RZNRA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.90
BH521	water	24/02/2005	CZSRA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.90
BH558	water	24/02/2005	CZSRA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.90
BH608	water	24/02/2005	CZSRA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.90
BH640	water	24/02/2005	CZSRA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.90
BH675	water	24/02/2005	CZSRA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.90
Trench 1	water	1/03/2005	CZSRA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.90
Trench 2	water	1/03/2005	CZSRA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.90
Trench 3	water	1/03/2005	CZSRA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.90

Table 8 - Summary of Laboratory Results
PCBs - Groundwater
Landcom
DSI, Zouch Road
Edmondson Park

Groundwater Lab Results.xls
Prepared By: DM Date: 12/08/05
Checked By: JN Date: 12/08/05

Station Name	Sample Matrix	Collect Date/Time	Zone	1,3,5-TNB	1,3-DNB	2-MNT	3-MNT	4-MNT	NB	RDX	TNT	2,4-&2,6-DNT
				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Threshold Concentrations for Groundwater				-	-	-	-	-	-	-	-	-
BH2	water	24/02/2005	n/a	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
BH291	water	24/02/2005	n/a	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
BH521	water	24/02/2005	n/a	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
BH558	water	24/02/2005	n/a	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
BH608	water	24/02/2005	n/a	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
BH640	water	24/02/2005	n/a	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
BH675	water	24/02/2005	n/a	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
Trench 1	WATER	1/03/2005	CZSRA	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01
Trench 2	WATER	1/03/2005	CZSRA	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01
Trench 3	WATER	1/03/2005	CZSRA	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01

Table 9 - Summary of Laboratory Results
Explosives - Groundwater
Landcom
DSI, Zouch Road
Edmondson Park

Sample No.	Depth (m)	Collect Date/Time	Lab	Arsenic	Cadmium	Chromium*	Copper	Lead	Mercury	Nickel	Zinc
BH2	24/02/2005	Water	SGS	**0.12**	<0.0002	**0.008**	<0.001	**0.004**	<0.0001	0.002	<0.001
DupW1	N/A	38407	SGS	0.011	<0.0002	0.008	<0.001	0.008	<0.0001	0.003	<0.001
Relative Percent Difference (RPD)				*166.4*	*N/C*	*0.0*	*N/C*	*66.7*	*N/C*	*40.0*	*N/C*
BH291	N/A	24/02/2005	SGS	0.004	<0.0002	**0.011**	**0.003**	**0.01**	<0.0001	0.008	0.005
DupW2	N/A	24/02/2005	Labmark	<0.010*	<0.010*	0.1	0.005	0.01	0.0001	0.015	0.07
Relative Percent Difference (RPD)				*N/C*	*N/C*	*160.4*	*50.0*	*N/C*	*N/C*	*60.9*	*173.3*

Note

* EQL raised due to matrix interferance

Table 10 - Summary of Laboratory Results
QA/QC, Heavy Metals - Groundwater
Landcom
DSI, Zouch Road
Edmondson Park

Groundwater Lab Results.xls
Prepared By: DM Date: 12/08/05
Checked By: JN Date: 12/08/05

Attachment 4 –Groundwater Sampling Field Forms

Field Reporting Cover Sheet

JBS ENVIRONMENTAL

PROJECT NAME: Edmondson Park	**PROJECT NO:** 41945
FIELD DATES: 9 + 10/2/12	**JBS PM:** J Resnor
FIELD STAFF: A.B + Jura (Work Experience)	
WEATHER: Isolated heavy showers	
PROPOSED WORKS: Pre-remediation GME	

SUMMARY OF FIELDWORK: - All wells were located
- 5/6 wells had water when gauged
- 5/6 wells were sampled using micro-purge technique

IMPORTANT OUTCOMES TO NOTE: - BH675 was found to have no water
- All wells are difficult to find, GPS + metal detector essential

COC SENT? Yes	**DATE SAMPLES SENT:** 10-2-12
PRIMARY LAB: Envirolab	**SECONDARY LAB:** SGS

POST-FIELDWORK CHECKLIST

- [x] COC checked with PM
- [x] Site map updated and attached
- [x] Field data sheets attached (bore logs, well monitoring sheets)
- [x] Calibration and decontamination sheets attached
- [x] Field notes attached
- [x] Photos downloaded to file
- [ ] ~~Electronic bore logs completed and checked~~ N/A

OUTSTANDING ACTIONS:

Daily Field Report

Date: 9/2/12
Arrival Time 6.30am
Depart Time 4.30pm
Site Address South Rd, Edwardstown

Completed by AB
Weather Isolated showers
Subcontractor(s) N/A

Purpose of Visit pre-remediation groundwater monitoring event

Notes (include sketch or attach site map/plan)

- Arrived onto site at 6.30am
- AB + J. Mac (wolfe tagging)
- Called security company for access
- Security arrived at 6am
- AB + Jason drive around to all well locations + remove old water gauging round
- BH201, BH202 were purged + sampled
- BH2 was purged dry
- left site 4.30pm

Associated Completed Forms (eg, bore logs, PID/XRF calibration forms)

GSFs
Calibration/Decon
Well dev log
COCs
Map of wells sampled

Note
This document contains information that is privileged, confidential or otherwise protected from use, disclosure, reproduction or distribution. © 1999 - 2009 JBS Environmental
PO Box 940, Mascot NSW 1460 • Phone: 8338 1013 • Fax: 8338 1700 • E-mail: jbs@jbsgroup.com.au

Groundwater Sampling Form

JBS ENVIRONMENTAL

FIELD RECORD SHEETS

Project name:	Edmonson Park GME	**Location:**	site	**Well ID:**	BH291
Person sampling:	AB, JN	**Sample method:**	micro-purging	**Date:** / **Weather:**	9-2-12 rain
Pre-purging groundwater depth (m):	2.598	**Post-sampling groundwater depth (m):**	3.80	**Total well depth (m):**	7.739
Well diameter (mm): / **Well volume (L):**		**Pump on time:** 3:75pm / **Pump off time:** 4:19 pm		**Cycles per minute:**	4

Field Measurements

Time	Purge Rate (mL/min)	Volume purged (L)	DO (mg/L)	DO (% saturation)	EC (us/cm)	pH (units)	Redox (mV)	Temp (oC)	ppk TDS ppm
Field Stabilisation Criteria [1]:			**+/- 10%**		**+/- 3%**	**+/- 0.5**	**+/- 10 mV**		**+/- 3%**
3:45		2	2.14	21.1	14.47	6.59	30	19.4	10.72	
3:50		4	1.19	13	14.52	6.39	30	18.9	10.74	→ 3.4m
3:55		6	1.04	11.3	14.32	6.3	32	18.8	10.54	→ 3.7m
4:00		7	1.09	11.5	14.10	6.24	26	18.9	10.42	→ 3.8m
4:05		8	1.00	10.4	14.04	6.19	21	19.1	10.34	
4:10		9	0.99	10.5	14.03	6.17	19	19.2	10.34	
4:15		10	1.00	10.9	14.04	6.16	16	19.2	10.34	

Comments (Odour, colour, turbidity, sheen etc)

No odour, light brown, mid/high turb, No sheen

Were Metals Field Filtered? Yes

Were QA/QC Samples Collected? NO

[1] These parameters may be considered stable when three consecutive readings (obtained several minutes apart) are within these levels.

Source "Victorian Environmental Protection Authority, *Groundwater Sampling Guidelines*, Publication 669, April 2000".

Groundwater Sampling Form

JBS ENVIRONMENTAL

FIELD RECORD SHEETS

Project name: Edmonson Park GME	**Location:** site	**Well ID:** BH2	
Person sampling: AB JN	**Sample method:** micro-purge	**Date:** 9-2-12 **Weather:** rain	
Pre-purging groundwater depth (m): 3.922	**Post-sampling groundwater depth (m):** dry	**Total well depth (m):** 4.646	
Well diameter (mm): **Well volume (L):**	**Pump on time:** 2 05 **Pump off time:** 3 10	**Cycles per minute:** 4	

Field Measurements

Time	Purge Rate (mL/min)	Volume purged (L)	DO (mg/L)	DO (% saturation)	EC (us/cm)	pH (units)	Redox (mV)	Temp (oC)	TDS ppm
Field Stabilisation Criteria [1]:			**+/- 10%**		**+/- 3%**	**+/- 0.5**	**+/- 10 mV**		**+/- 3%**
2:40		1.5	3.09	31.3	711	5.74	-24	22.2	428
2:45		2	2.47	27.8	519	5.45	2	22.3	336
2:50		3	2.23	25.8	434	5.26	28	22.4	266
2:55		4	2.08	24.5	~~836~~ 436	5.12	54	22.6	229
3.00		5	1.98	24.5	326	5.02	71	22.7	202
3:05		6	2.09	24.3	646	5.27	40	22.3	390
DMO		~~7~~							
			Purged dry						
				10-2-12					
		Sampled							

Comments (Odour, colour, turbidity, sheen etc) no odour, foamy, high turbidity, no sheen ~~only~~

Were Metals Field Filtered? ~~Yes~~ Yes

Were QA/QC Samples Collected? NO

[1] These parameters may be considered stable when three consecutive readings (obtained several minutes apart) are within these levels.

Source "Victorian Environmental Protection Authority, *Groundwater Sampling Guidelines*, Publication 669, April 2000".

Groundwater Sampling Form 41945

JBS ENVIRONMENTAL

FIELD RECORD SHEETS

Project name: Edmonson Park GME		**Location:** site		**Well ID:** BH521	
Person sampling: AB. JN		**Sample method:** micro-purge		**Date:** 9-3-12 **Weather:** rain	
Pre-purging groundwater depth (m): 2.685		**Post-sampling groundwater depth (m):** 3.271		**Total well depth (m):** 9.113	
Well diameter (mm): **Well volume (L):**		**Pump on time:** 1:55 **Pump off time:**		**Cycles per minute:** 4	

Field Measurements

Time	Purge Rate (ml/min)	Volume purged (L)	DO (mg/L)	DO (% saturation)	EC (us/cm)	pH (units)	Redox (mV)	Temp (oC)	ppk TDS ppm
Field Stabilisation Criteria [1]:			**+/- 10%**		**+/- 3%**	**+/- 0.5**	**+/- 10 mV**		**+/- 3%**
1:10		2	2.06	22.2	2.98	6.16	-49	21.0	2.02
1:15		3	1.72	19.6	2.84	6.03	-80	20.9	1.96
1:20		5	1.50	16.5	2.70	5.93	-95	20.8	1.89 → 3.06 m
1:25		6	1.33	14.8	2.53	5.88	-101	20.5	1.73
1:30		7	1.24	13.9	2.41	5.86	-107	20.4	1.64 → 3.19m
1:35		9	1.19	13.1	2.43	5.88	-112	20.1	1.64
1:40		11	1.19	13.4	2.46	5.91	-114	19.9	1.68
1:45		12	1.19	13.1	2.53	5.96	-117	20.1	1.70

Comments (Odour, colour, turbidity, sheen etc) no odour, light brown, med-high turbidity, no sheen

Were Metals Field Filtered? Yes

Were QA/QC Samples Collected? NO

[1] These parameters may be considered stable when three consecutive readings (obtained several minutes apart) are within these levels.

Source "Victorian Environmental Protection Authority, *Groundwater Sampling Guidelines*, Publication 669, April 2000".

Daily Field Report

Date: 10-2-12
Arrival Time 6.50am
Depart Time 12pm
Site Address Zouch Rd, Edmondson PK

Completed by AR
Weather isolated heavy rain
Subcontractor(s) N-A

Purpose of Visit Pre-remediation groundwater monitoring event

Notes (include sketch or attach site map/plan)

- Arrived onto site at 6.50am (EIS + Jutra)
- Trees ~~car~~ bogged at site entrance - pulled out by RBS's UTE
- BH608 was purged & sampled
- BH538 purged dry - sampled @ after BH608 (only 2 vols collected)
- RBS ute stuck - 10am - required assistance by passing tractor
- leave site 12pm

Associated Completed Forms

(eg, bore logs, PID/XRF calibration forms)

Note
This document contains information that is privileged, confidential or otherwise protected from use, disclosure, reproduction or distribution. © 1999 - 2009 JBS Environmental
PO Box 940, Mascot NSW 1460 • Phone: 8338 1013 • Fax: 8338 1700 • E-mail: jbs@jbsgroup.com.au

Groundwater Sampling Form

FIELD RECORD SHEETS

Project name: Edmonson Park	**Location:** site	**Well ID:** BH608	
Person sampling: AB, JW	**Sample method:** micro-purge	**Date:** 10-2-12 **Weather:** rain	
Pre-purging groundwater depth (m): 6.936	**Post-sampling groundwater depth (m):** 6.915	**Total well depth (m):** 15.214	
Well diameter (mm): **Well volume (L):**	**Pump on time:** 9:25 **Pump off time:** 9:30	**Cycles per minute:** 4	

Field Measurements

Time	Purge Rate (mL/min)	Volume purged (L)	DO (mg/L)	DO (% saturation)	EC (us/cm)	pH (units)	Redox (mV)	Temp (oC)	ppk TDS -ppm-
Field Stabilisation Criteria [1]:			**+/- 10%**		**+/- 3%**	**+/- 0.5**	**+/- 10 mV**		**+/- 3%**
8:35		2	2.20	22.8	10.41	5.33	115	20.0	7.57
8:40		3	1.40	15.6	10.38	5.19	131	19.9	7.57
8:45		4	1.10	12.1	9.99	5.21	127	19.8	7.22
8:50		6	1.01	11.0	9.41	5.20	152	19.7	6.89
8:55		7	1.03	11.3	9.30	5.36	149	19.8	6.74 6.6
9:00		9	1.06	11.9	9.30	5.49	157	19.9	6.72
9:05		11	1.10	12.3	9.18	5.60	161	19.9	6.65
9:10		13	1.10	12.2	9.15	5.60	161	19.9	6.62 6.011
Comments (Odour, colour, turbidity, sheen etc)				light brown, no odour, med-turbidity no sheen					

Were Metals Field Filtered? Yes

Were QA/QC Samples Collected? Yes QC01 QA01

[1] These parameters may be considered stable when three consecutive readings (obtained several minutes apart) are within these levels.

Source "Victorian Environmental Protection Authority, *Groundwater Sampling Guidelines*, Publication 669, April 2000".

Groundwater Sampling Form

JBS ENVIRONMENTAL

FIELD RECORD SHEETS

Project name:	Edmonson Park GME	**Location:**	site	**Well ID:**	BH558
Person sampling:	AB, SN	**Sample method:**	micro-purging	**Date:** / **Weather:**	10-2-12 rain
Pre-purging groundwater depth (m):	7.278	**Post-sampling groundwater depth (m):**	dry	**Total well depth (m):**	8.549
Well diameter (mm): / **Well volume (L):**		**Pump on time:** / **Pump off time:**	7.40 / 7.46	**Cycles per minute:**	4

Field Measurements

Time	Purge Rate (mL/min)	Volume purged (L)	DO (mg/L)	DO (% saturation)	EC (us/cm)	pH (units)	Redox (mV)	Temp (oC)	ppt TDS -ppm-
Field Stabilisation Criteria [1]:			**+/- 10%**		**+/- 3%**	**+/- 0.5**	**+/- 10 mV**		**+/- 3%**
7:40		2	2.39	27.0	11.45	6.56	114	19.2	8.41
7:45									
7:50									
7:55									
8:00									
8:05									
				gone dry					
			sampled 10-2-12 (only 1 vials collected)						

Comments (Odour, colour, turbidity, sheen etc) no odour/brown, high turbidity, no sheen, only vials collected

Were Metals Field Filtered? N/A

Were QA/QC Samples Collected? No

[1] These parameters may be considered stable when three consecutive readings (obtained several minutes apart) are within these levels.

Source "Victorian Environmental Protection Authority, *Groundwater Sampling Guidelines*, Publication 669, April 2000".

CHAIN OF CUSTODY

JBS ENVIRONMENTAL

LABORATORY BATCH NO.

VOICE TO: A. Traynor

SAMPLERS AB

PHONE:

EMAIL: J.Rosre@jbsgroup.com.au aboardman@jbsgroup.com.au

QC LEVEL: NEPM 1999 (✓

TYPE & PRESERVATIVE	pH	Metals(6)	TPH(C10-C36)	PAHs(0.1mg/L)	BTEX	TPH(C6-C9)	NOTES
x vials only			⊗		X	X	
amber bag 2x vials, 1x plastic		X	X	X	X		
		X	X	X	X		
		X	X	X	X		
		X	X	X	X		
		X	X	X	X		
x vials, 1x amber 1x metals		X	X	X	X		
x vial					X		
x vial					X		
vials, 1x amber 1x metal		X	X	X	X		
		Send to SGS					

METHOD OF SHIPMENT:

E NO.

E NO.

RECEIVED BY:

NAME: DATE:

OF:

NAME: DATE:

OF:

FOR RECEIVING LAB USE ONLY:

COOLER SEAL – Yes..... No..... Intact..... Broken.....

COOLER TEMP..... deg C

COOLER SEAL – Yes..... No..... Intact..... Broken.....

COOLER TEMP..... deg C

vial: C = Sodium Hydroxide Presvd; VC = Hydrochloric Acid Presvd Vial; VS = Sulfuric Acid Presvd Vial; S = Sulfuric Acid Presvd; Z = Zinc Presvd; E = EDTA Presvd; ST = Sterile Bottle; O = Other

12 638

Suite 2, 595 Gardeners Road MASCOT NSW 2020
PO Box 940 MASCOT NSW 1460
www.jbsgroup.com.au

TRANSMISSION VERIFICATION REPORT

TIME : 10/02/2012 15:07
NAME :
FAX :
TEL :
SER.# : 000J0N579569

DATE,TIME 10/02 15:07
FAX NO./NAME 99106201
DURATION 00:00:29
PAGE(S) 01
RESULT OK
MODE STANDARD ECM

CHAIN OF CUSTODY

JBS ENVIRONMENTAL

PROJECT NO.: 41945
PROJECT NAME: Edmondson Park
SEND REPORT TO: JRosner — SEND INVOICE TO: A.traynor
DATE NEEDED BY: Standard
COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

LABORATORY BATCH NO.:
SAMPLERS: BB
PHONE: — EMAIL: J.Rosner@jbsgroup.com.au; aboardman@jbsgroup.com.au
QC LEVEL: — NEPM 1999 (✓

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	Metals(2)	TPH(C10-36)	PAHs(0.1 mg/L)	BTEX	TPH(C6-C9)	NOTES
BH558	Water	10-2-12		2x vials only					X	X	
BH608	Water	10-2-12		1x amber, 2x vials, 1x metals		X	X	X	X		
BH291		9-2-12				X	X	X	X		
BH521		9-2-12				X	X	X	X		
BH2		10-2-12				X	X	X	X		
Rinsate				2x vials, 1x amber 1x metals		X	X	X	X		
Trip Spike				1x vial					X		
Trip Blank				1x vial					X		
QC01				2x vials, 1x amber 1x metal		X	X	X	X		
QA01	↓	↓		↓		Send to SGS					

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: BB DATE: 10-2-12	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL - Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO.	OF:	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL - Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Add Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

JBS Environmental Pty Ltd ABN 67 071 842 638
Phone: (02) 8338-1011
Fax: (02) 8338-1700
Suite 2, 595 Gardeners Road MASCOT NSW 2020
PO Box 940 MASCOT NSW 1460
www.jbsgroup.com.au

Field QC Log

JBS ENVIRONMENTAL

Job Name: Edmondson Park, GME

Job No: 41945 **Soil** **Water**

Project Manager: J. Posner **Sampler:** AB

QC requirements: 1-20

Field QC Sample ID	Sampling Date	Description
QC/QA01	10-2-12	Water Sample (GME)

IMSO Forms006 - QC Log

Field Equipment Calibration and Decontamination

JBS ENVIRONMENTAL

PROJECT NAME:	Edmondson Park GME	**PROJECT NO:**	41945
FIELD DATES:	9/12/12 + 10/2/12	**FIELD STAFF:**	AB

CALIBRATION SUMMARY
EQUIPMENT: Water Quality Meter
CALIBRATION STANDARD:

DATE	TIME	READING (ppm_v)	COMMENTS
9/2/12		pH = 7.0	
		Slope = -97	
		Oxygen Air = 0 L 5 ppm 97.7	

DECONTAMINATION SUMMARY
EQUIPMENT: TP, Bladder container + wire

1. Was the equipment decontaminated appropriately prior to sampling at each location?	(Y)	N	NA
2. Was excess soil removed by scraping, brushing or wiping with disposable towels?	(Y)	N	NA
3. Was the equipment contaminated with grease, tar or similar material? If so, was the equipment steam cleaned or rinsed with pesticide-grade acetone:hexane?	Y Y	(N) N	(NA)
4. Was phosphate-free detergent used to wash the equipment?	(Y)	N	NA
5. Was the equipment rinsed with clean water?	(Y)	N	NA
6. Was the equipment then rinsed with deionised water?	(Y)	N	NA
7. Were all sample containers cleaned and acid or solvent washed prior to sample collection?	(Y)	N	NA

WERE ANY ADDITIONAL DECONTAMINATION MEASURES REQUIRED? PROVIDE DETAILS.

Groundwater Gauging Data

JBS ENVIRONMENTAL

PROJECT NAME: Edmonson Park GME	**PROJECT NO:** 41945
FIELDWORK DATES: 9-2-12 10-2-12	**SAMPLERS:** AB JN
TYPE OF INVESTIGATION (GME/ESA etc):	**PROJECT MANAGER:** Jo Rosner

WELL ID	DATE	TOTAL DEPTH (m)	DEPTH TO WATER (m)	DEPTH TO LNAPLS (m)	DEPTH TO DNAPLS (m)	CALCULATED WELL VOLUME	COMMENTS
BH291	9-2-12	7.739	2.598				
BH2	9-2-12	4.646	3.927				well covers detached.
BH521	9-2-12	9.113	2.685				hidden in grass
BH558	9-2-12	8.549	7.278				
BH608	9-2-12	15.214	6.936				
BH675	9-2-12	8.654	—				NO water

Source: Base Image: Nearmap - Nearmap 03-FEB-2011

Legend:

Job			
0	General Issue - Field	SW	08-02-2011
Rev	Description	Appr	Date

JBS Environmental Pty Ltd

Figure: GPS Drawings - Field

Client: GPS Name: 41945_Edmondson

Project:

Job No: File Name: 41945_Field

Field Reporting Cover Sheet

JBS ENVIRONMENTAL

PROJECT NAME: Edmondson Park Rone	**PROJECT NO:** ~~430~~ 41945
FIELD DATES: 26/3/12	**JBS PM:** J. Rosner
FIELD STAFF: A.R	
WEATHER: Fine	
PROPOSED WORKS: Groundwater - re testing	
SUMMARY OF FIELDWORK: Sampled well BH2, + collected surface water from adjacent area	
IMPORTANT OUTCOMES TO NOTE:	
COC SENT? Yes	**DATE SAMPLES SENT:** 26/3/12
PRIMARY LAB: Envirolab	**SECONDARY LAB:** SGS

POST-FIELDWORK CHECKLIST

- ☐ COC checked with PM
- ☐ Site map updated and attached
- ☐ Field data sheets attached (bore logs, well monitoring sheets)
- ☐ Calibration and decontamination sheets attached
- ☐ Field notes attached
- ☐ Photos downloaded to file
- ☐ Electronic bore logs completed and checked

OUTSTANDING ACTIONS:

Daily Field Report

Page ___ of ___

Date: 26/3/12
Arrival Time 7am
Depart Time 11am
Site Address Zouch Rd, Ethanson Park

Completed by AB
Weather Fine
Subcontractor(s) N/A

Purpose of Visit GME - re-sample

Notes
(include sketch or attach site map/plan)

- arrived at 7am to site
- drove back to office to pick up bladders for resampling
- began purging then sampling BH2
- Surface water of adjacent pond water in rail corridor were also sampled
- packed up gear + left site at 11am

Associated Completed Forms
(eg, bore logs, PID/XRF calibration forms)

Groundwater Sampling form

Note
This document contains information that is privileged, confidential or otherwise protected from use, disclosure, reproduction or distribution. © 1999 - 2009 JBS Environmental
PO Box 940, Mascot NSW 1460 • Phone: 8338 1013 • Fax: 8338 1700 • E-mail: jbs@jbsgroup.com.au

Groundwater Sampling Form

JBS ENVIRONMENTAL

FIELD RECORD SHEETS

Project name: Edwardson D.V. GATE	**Location:** Site	**Well ID:** BH2
Person sampling: A. Boardner	**Sample method:** Micro-purge	**Date:** 26/3/12 **Weather:** Fine
Pre-purging groundwater depth (m): 3.349	**Post-sampling groundwater depth (m):** 3.61m	**Total well depth (m):** 7.679
Well diameter (mm): **Well volume (L):**	**Pump on time:** 9.40am **Pump off time:**	**Cycles per minute:** 4

Field Measurements

+/- 290

Time	Purge Rate (mL/min)	Volume purged (L)	DO (mg/L)	DO (% saturation)	EC (us/cm)	pH (units)	Redox (mV)	Temp (oC)	N/A TDS ppm	Depth
Field Stabilisation Criteria [1]:			+/- 10%		+/- 3%	+/- 0.5	+/- 10 mV		+/- 3%	
9.50		1.5L	DISCARD	9.0	~~8847~~	6.67	-33.6	19.5°C	—	
10.00		3L	1.83	20.4	8894	6.51	-20.2	19.7	—	3.55
10:05		~~5L~~	3.16	35.5	9089	6.45	-15.8	19.5	—	
10.08		6L	3.36	37.7	9188	6.44	-16.0	19.4		3.58
10:11		7.5L	3.49	39.2	9331	6.44	-14.2	19.3		3.60
10:14		~~8.5L~~	3.54	39.7	9432	6.44	-22.4	19.3		3.62
10:19		10L	3.60	40.7	9576	6.44	-26	19.5		3.61
10:22		11L	3.62	40.9	9660	6.45	-30.5	19.5		3.61
10:25		12L	3.64	41.2	9711	6.46	-32.0	19.6		3.61

Comments (Odour, colour, turbidity, sheen etc) no odour. light brn low-mod turbidity, no sheen

Were Metals Field Filtered? Yes

Were QA/QC Samples Collected? Yes

[1] These parameters may be considered stable when three consecutive readings (obtained several minutes apart) are within these levels.

Source "Victorian Environmental Protection Authority, *Groundwater Sampling Guidelines*, Publication 669, April 2000".

Attachment 5 – QA / QC Checker Summary

ESDAT QA Checker
Project:41945
Filter: ALL

Overview Summary
- Count of Samples
- Summary By Compound
- Count of Results

Holding Times
- Holding Time Errors (0)

Blanks
- Field Blanks
- Detects in Lab Blanks (0)
- SDG's without Method Blanks (0)

Duplicates
- Field and Interlab Dupes
- Lab Duplicates with high RPDs (0)
- Duplicate Samples with incorrect or missing Parent Samples (0)
- Samples at the same Location/Depth/Time not specified as duplicates (0)

Surrogates
- Surrogate Variation > 30% or outside lab LCL or UCL or outside lab LCL or UCL (1)

Lab Control Samples
- SDG's without a Laboratory Control Sample (0)
- Laboratory Control Samples, Error > 30% (1)

Certified and Standard Reference Materials
- Certified Reference Materials - Error > 30% (0)

Matrix Spikes
- SDG's without a Matrix Spike (0)
- Trip Spikes with invalid Control Sample (0)
- Less than 1 matrix spike in 20 samples, or less than 1 matrix duplicate in 20 samples (1)
- Matrix Spike Recoveries less than 70% or greater than 130% or outside lab LCL or UCL (0)
- Trip Spike Recoveries (70% - 130% is acceptable) (10)

Inorganic

Other
- Unit Conversion Problems (0)
- OriginalChemNames Requiring Validation (0)
- Samples with no Results (0)
- Samples associated with Wells which are not specified in the Well Table (0)
- Aborted Analysis (0)

Contents

Count of Samples

Matrix Type	water
First Sample Date	9/02/2012
Last Sample Date	26/03/2012
Sampling Period (days)	47
Number of Samples Submitted	14
Number of Non QA Samples Submitted	7
Number of Field Blanks	0
Number of Trip Blanks	1
Number of Rinsates	2
Number of Field Duplicates	2
Number of Interlab Duplicates	2
Number of Trip Spikes	2
Number of Lab Duplicates	2
Number of LCSs	11
Number of CRMs	0
Number of Method Blanks	10
Number of Storage Blanks	1
Number of Matrix Spikes	0
Number of Matrix Spike Dupes	0

		EQL	Num Results	Holding Times (days)				Lab Control Samples			Method and Storage Blanks			Laboratory Duplicates			Surrogates			Matrix,Trip and Compound Spikes			Field,Rinsate and Trip Blanks			Field Duplicates		
Method_Type	ChemName	Range	Non QA (Normal + Composite)	Volatility Group	Sample to Extraction	Sample to Analysis	Acceptable	Recovery %	Num Reported	Acceptable	Range	Num Reported	Acceptable	Max RPD > EQL x 4	Num Reported	Acceptable	Recovery %	Num Reported	Acceptable	Recovery %	Num Reported	Acceptable	Range	Num Reported	Acceptable	Max RPD > EQL x 4	Num Reported	Acceptable
8 HM in water - dissolved	Arsenic	0.001 mg/L	6	Other		2 to 4	Y	100 to 110	2	Y	ND	2	Y	0	2	Y		0			0		ND	2	Y	0	2	Y
	Cadmium	0.1 µg/L	6	Other		2 to 4	Y	100 to 110	2	Y	ND	2	Y		2	Y		0			0		ND	2	Y		2	Y
	Chromium (III+VI)	0.001 mg/L	6	Other		2 to 4	Y	110 to 120	2	Y	ND	2	Y		2	Y		0			0		ND	2	Y		2	Y
	Copper	0.001 mg/L	6	Other		2 to 4	Y	110 to 120	2	Y	ND	2	Y	0	2	Y		0			0		ND	2	Y	50	2	Y
	Lead	0.001 mg/L	6	Other		2 to 4	Y	110 to 110	2	Y	ND	2	Y	0	2	Y		0			0		ND	2	Y	0	2	Y
	Mercury	0.05 µg/L	6	Specific		2 to 4	Y	100 to 120	2	Y	ND	2	Y		2	Y		0			0		ND	2	Y		2	Y
	Nickel	0.001 mg/L	6	Other		2 to 4	Y	110 to 110	2	Y	ND	2	Y	2	2	Y		0			0		ND	2	Y	2	2	Y
	Zinc	0.001 mg/L	6	Other		2 to 4	Y	100 to 110	2	Y	ND	2	Y	5	2	Y		0			0		ND to 3 mg/l	2	**N**	36	2	Y
EW_APHA3112B	Mercury		0	Specific	3 to 7	3 to 11	Y	105 to 117	2	Y	ND	2	Y		0	**N**		0			0			0			0	**N**
EW_EPA1664	C10 - C14		0	SVOC	2	8	Y	100 to 100	1	Y	ND	1	Y		0	**N**		0			0			0			0	**N**
	C15 - C28		0	SVOC	2	8	Y	104 to 104	1	Y	ND	1	Y		0	**N**		0			0			0			0	**N**
	C29-C36		0	SVOC	2	8	Y	94 to 94	1	Y	ND	1	Y		0	**N**		0			0			0			0	**N**
EW_EPA418	C10 - C14		0	SVOC	4	11	Y	87 to 87	1	Y	ND	1	Y		0	**N**		0			0			0			0	**N**
	C15 - C28		0	SVOC	4	11	Y	73 to 73	1	Y	ND	1	Y		0	**N**		0			0			0			0	**N**
	C29-C36		0	SVOC	4	11	Y	80 to 80	1	Y	ND	1	Y		0	**N**		0			0			0			0	**N**
EW_EPA6020A_DIS	Arsenic		0	Other	5 to 7	8 to 13	Y	95 to 96	2	Y	ND	2	Y		0	**N**		0			0			0			0	**N**
	Cadmium		0	Other	5 to 7	8 to 13	Y	99 to 99	2	Y	ND	2	Y		0	**N**		0			0			0			0	**N**
	Chromium (III+VI)		0	Other	5 to 7	8 to 13	Y	97 to 101	2	Y	ND	2	Y		0	**N**		0			0			0			0	**N**
	Copper		0	Other	5 to 7	8 to 13	Y	99 to 103	2	Y	ND	2	Y		0	**N**		0			0			0			0	**N**
	Lead		0	Other	5 to 7	8 to 13	Y	85 to 96	2	Y	ND	2	Y		0	**N**		0			0			0			0	**N**
	Nickel		0	Other	5 to 7	8 to 13	Y	97 to 102	2	Y	ND	2	Y		0	**N**		0			0			0			0	**N**
	Zinc		0	Other	5 to 7	8 to 13	Y	97 to 107	2	Y	ND	2	Y		0	**N**		0			0			0			0	**N**
EW_EPA8100	1-Methylnaphthalene		0	SVOC	4	6	Y		0		ND	1	Y		0	**N**		0			0			0			0	**N**
	2-Fluorobiphenyl		0	SVOC			Y		0			0			0	**N**	80 to 110	2	Y		0			0			0	**N**
	2-methylnaphthalene		0	SVOC	4	6	Y		0		ND	1	Y		0	**N**		0			0			0			0	**N**
	Acenaphthene		0	SVOC	4	6	Y		0		ND	1	Y		0	**N**		0			0			0			0	**N**
	Acenaphthylene		0	SVOC	4	6	Y		0		ND	1	Y		0	**N**		0			0			0			0	**N**
	Anthracene		0	SVOC	4	6	Y		0		ND	1	Y		0	**N**		0			0			0			0	**N**
	Benz(a)anthracene		0	SVOC	4	6	Y		0		ND	1	Y		0	**N**		0			0			0			0	**N**
	Benzo(a) pyrene		0	SVOC	4	6	Y		0		ND	1	Y		0	**N**		0			0			0			0	**N**
	Benzo(b)&(k)fluoranthene		0	SVOC			Y		0		ND	1	Y		0	**N**		0			0			0			0	**N**
	Benzo(b)fluoranthene		0	SVOC	4	6	Y		0		ND	1	Y		0	**N**		0			0			0			0	**N**
	Benzo(g,h,i)perylene		0	SVOC	4	6	Y		0		ND	1	Y		0	**N**		0			0			0			0	**N**
	Benzo(k)fluoranthene		0	SVOC	4	6	Y		0		ND	1	Y		0	**N**		0			0			0			0	**N**
	Chrysene		0	SVOC	4	6	Y		0		ND	1	Y		0	**N**		0			0			0			0	**N**
	Dibenz(a,h)anthracene		0	SVOC	4	6	Y		0		ND	1	Y		0	**N**		0			0			0			0	**N**
	Fluoranthene		0	SVOC	4	6	Y		0		ND	1	Y		0	**N**		0			0			0			0	**N**
	Fluorene		0	SVOC	4	6	Y		0		ND	1	Y		0	**N**		0			0			0			0	**N**
	Indeno(1,2,3-c,d)pyrene		0	SVOC	4	6	Y		0		ND	1	Y		0	**N**		0			0			0			0	**N**
	Naphthalene		0	SVOC	4	6	Y		0		ND	1	Y		0	**N**		0			0			0			0	**N**
	NB-d5		0	SVOC			Y		0			0			0	**N**	80 to 110	2	Y		0			0			0	**N**
	PAHs (Sum of total)		0	SVOC	4	6	Y		0		ND	1	Y		0	**N**		0			0			0			0	**N**
	Phenanthrene		0	SVOC	4	6	Y		0		ND	1	Y		0	**N**		0			0			0			0	**N**
	p-Terphenyl		0	SVOC			Y		0			0			0	**N**	107 to 120	2	Y		0			0			0	**N**
	Pyrene		0	SVOC	4	6	Y		0		ND	1	Y		0	**N**		0			0			0			0	**N**
EW_EPA8260	1,2-Dichloroethane-d4		0	VOC			Y	90 to 98	2	Y		0			0	**N**	90 to 107	8	Y		0			0			0	**N**
	4-Bromofluorobenzene		0	VOC			Y	95 to 103	2	Y		0			0	**N**	90 to 113	8	Y		0			0			0	**N**
	Benzene		0	VOC	6	7	Y	119 to 121	2	Y	ND	2	Y		0	**N**		0			0			0			0	**N**
	Dibromofluoromethane		0	SVOC			Y	94 to 98	2	Y		0			0	**N**	94 to 115	8	Y		0			0			0	**N**
	Ethylbenzene		0	VOC	6	7	Y	121 to 130	2	**N**	ND	2	Y		0	**N**		0			0			0			0	**N**
	MTBE		0	VOC	6	7	Y		0		ND	2	Y		0	**N**		0			0			0			0	**N**
	Toluene		0	VOC	6	7	Y	110 to 117	2	Y	ND	2	Y		0	**N**		0			0			0			0	**N**
	Toluene-D8		0	VOC			Y	89 to 100	2	Y		0			0	**N**	89 to 101	8	Y		0			0			0	**N**
	Total BTEX		0	SVOC	6	7	Y		0			0			0	**N**		0			0			0			0	**N**
	Xylene (m & p)		0	VOC	6	7	Y	116 to 124	2	Y	ND	2	Y		0	**N**		0			0			0			0	**N**
	Xylene (o)		0	VOC	6	7	Y	109 to 123	2	Y	ND	2	Y		0	**N**		0			0			0			0	**N**
	Xylene Total		0	VOC	6	7	Y		0			0			0	**N**		0			0			0			0	**N**
EW_EPA8260_B	C6 - C9		0	VOC	6	7	Y	104 to 111	2	Y	ND	2	Y		0	**N**		0			0			0			0	**N**
	Trifluorotoluene		0	SVOC			Y	87 to 91	2	Y		0			0	**N**	87 to 101	8	Y		0			0			0	**N**
PAHs in Water	4-Terphenyl-d14		0	SVOC			Y	87 to 87	1	Y		0			0	**N**	80 to 105	3	Y		0			0			0	**N**
	Acenaphthene		0	SVOC	1	1	Y		0		ND	1	Y		0	**N**		0			0		ND	1	Y		0	**N**
	Acenaphthylene		0	SVOC	1	1	Y		0		ND	1	Y		0	**N**		0			0		ND	1	Y		0	**N**
	Anthracene		0	SVOC	1	1	Y		0		ND	1	Y		0	**N**		0			0		ND	1	Y		0	**N**
	Benz(a)anthracene		0	SVOC	1	1	Y		0		ND	1	Y		0	**N**		0			0		ND	1	Y		0	**N**
	Benzo(a) pyrene		0	SVOC	1	1	Y	91 to 91	1	Y	ND	1	Y		0	**N**		0			0		ND	1	Y		0	**N**
	Benzo(b)&(k)fluoranthene		0	SVOC	1	1	Y		0		ND	1	Y		0	**N**		0			0		ND	1	Y		0	**N**
	Benzo(g,h,i)perylene		0	SVOC	1	1	Y		0		ND	1	Y		0	**N**		0			0		ND	1	Y		0	**N**
	Chrysene		0	SVOC	1	1	Y	96 to 96	1	Y	ND	1	Y		0	**N**		0			0		ND	1	Y		0	**N**
	Dibenz(a,h)anthracene		0	SVOC	1	1	Y		0		ND	1	Y		0	**N**		0			0		ND	1	Y		0	**N**
	Fluoranthene		0	SVOC	1	1	Y	110 to 110	1	Y	ND	1	Y		0	**N**		0			0		ND	1	Y		0	**N**
	Fluorene		0	SVOC	1	1	Y	100 to 100	1	Y	ND	1	Y		0	**N**		0			0		ND	1	Y		0	**N**
	Indeno(1,2,3-c,d)pyrene		0	SVOC	1	1	Y		0		ND	1	Y		0	**N**		0			0		ND	1	Y		0	**N**
	Naphthalene		0	SVOC	1	1	Y	85 to 85	1	Y	ND	1	Y		0	**N**		0			0		ND	1	Y		0	**N**
	Phenanthrene		0	SVOC	1	1	Y	110 to 110	1	Y	ND	1	Y		0	**N**		0			0		ND	1	Y		0	**N**
	Pyrene		0	SVOC	1	1	Y	120 to 120	1	Y	ND	1	Y		0	**N**		0			0		ND	1	Y		0	**N**
PAHs in Water - Low Level	4-Terphenyl-d14		0	SVOC			Y	108 to 108	1	Y		0			0	**N**	75 to 108	8	Y		0			0			0	**N**
	Acenaphthene	0.1 µg/L	4	SVOC	5 to 6	6 to 7	Y		0		ND	1	Y		0	**N**		0			0		ND	1	Y		1	Y
	Acenaphthylene	0.1 µg/L	4	SVOC	5 to 6	6 to 7	Y		0		ND	1	Y		0	**N**		0			0		ND	1	Y		1	Y
	Anthracene	0.1 µg/L	4	SVOC	5 to 6	6 to 7	Y		0		ND	1	Y		0	**N**		0			0		ND	1	Y		1	Y
	Benz(a)anthracene	0.1 µg/L	4	SVOC	5 to 6	6 to 7	Y		0		ND	1	Y		0	**N**		0			0		ND	1	Y		1	Y
	Benzo(a) pyrene	0.1 µg/L	4	SVOC	5 to 6	6 to 7	Y	99 to 99	1	Y	ND	1	Y		0	**N**		0			0		ND	1	Y		1	Y
	Benzo(b)&(k)fluoranthene	0.2 µg/L	4	SVOC	5 to 6	6 to 7	Y		0		ND	1	Y		0	**N**		0			0		ND	1	Y		1	Y
	Benzo(g,h,i)perylene	0.1 µg/L	4	SVOC	5 to 6	6 to 7	Y		0		ND	1	Y		0	**N**		0			0		ND	1	Y		1	Y
	Chrysene	0.1 µg/L	4	SVOC	5 to 6	6 to 7	Y	110 to 110	1	Y	ND	1	Y		0	**N**		0			0		ND	1	Y		1	Y
	Dibenz(a,h)anthracene	0.1 µg/L	4	SVOC	5 to 6	6 to 7	Y		0		ND	1	Y		0	**N**		0			0		ND	1	Y		1	Y
	Fluoranthene	0.1 µg/L	4	SVOC	5 to 6	6 to 7	Y	100 to 100	1	Y	ND	1	Y		0	**N**		0			0		ND	1	Y		1	Y
	Fluorene	0.1 µg/L	4	SVOC	5 to 6	6 to 7	Y	100 to 100	1	Y	ND	1	Y		0	**N**		0			0		ND	1	Y		1	Y
	Indeno(1,2,3-c,d)pyrene	0.1 µg/L	4	SVOC	5 to 6	6 to 7	Y		0		ND	1	Y		0	**N**		0			0		ND	1	Y		1	Y
	Naphthalene	0.1 µg/L	4	SVOC	5 to 6	6 to 7	Y	91 to 91	1	Y	ND	1	Y		0	**N**		0			0		ND	1	Y		1	Y
	Phenanthrene	0.1 µg/L	4	SVOC	5 to 6	6 to 7	Y	99 to 99	1	Y	ND	1	Y		0	**N**		0			0		ND	1	Y		1	Y
	Pyrene	0.1 µg/L	4	SVOC	5 to 6	6 to 7	Y	110 to 110	1	Y	ND	1	Y		0	**N**		0			0		ND	1	Y		1	Y
sTRH in Water (C10-C36)	C10 - C14	50 µg/L	6	SVOC	1 to 6	1 to 7	Y	100 to 110	2	Y	ND	2	Y		0	**N**		0			0		ND	2	Y		2	Y
	C15 - C28	100 µg/L	6	SVOC	1 to 6	1 to 7	Y	100 to 110	2	Y	ND	2	Y		0	**N**		0			0		ND	2	Y		2	Y
	C29-C36	100 µg/L	6	SVOC	1 to 6	1 to 7	Y	92 to 97	2	Y	ND	2	Y		0	**N**		0			0		ND	2	Y		2	Y
	o-Terphenyl		0	SVOC			Y	129 to 140	2	**N**		0			0	**N**	84 to 140	14	**N**		0			0			0	**N**
vTRH & BTEX in Water	4-Bromofluorobenzene		0	VOC			Y	101 to 102	2	Y		0			0	**N**	91 to 102	19	Y		0			0			0	**N**
	Benzene	1 µg/L	7	VOC	1 to 4	1 to 4	Y	110 to 120	2	Y	ND	3	Y		0	**N**		0		88 to 102	2	Y	ND	2	Y		2	Y
	C6 - C9	10 µg/L	7	VOC	1 to 4	1 to 4	Y	110 to 120	2	Y	ND	2	Y		0	**N**		0			0		ND	3	Y		2	Y
	Dibromofluoromethane		0	SVOC			Y	97 to 104	2	Y		0			0	**N**	97 to 108	19	Y		0			0			0	**N**
	Ethylbenzene	1 µg/L	7	VOC	1 to 4	1 to 4	Y	110 to 120	2	Y	ND	3	Y		0	**N**		0		93 to 106	2	Y	ND	2	Y		2	Y
	Toluene	1 µg/L	7	VOC	1 to 4	1 to 4	Y	110 to 110	2	Y	ND	3	Y		0	**N**		0		89 to 104	2	Y	ND	2	Y		2	Y
	Toluene-D8		0	VOC			Y	96 to 100	2	Y		0			0	**N**	96 to 101	19	Y		0			0			0	**N**
	Xylene (m & p)	2 µg/L	7	VOC	1 to 4	1 to 4	Y	110 to 120	2	Y	ND	3	Y		0	**N**		0		94 to 106	2	Y	ND	2	Y		2	Y
	Xylene (o)	1 µg/L	7	VOC	1 to 4	1 to 4	Y	120 to 120	2	Y	ND	3	Y		0	**N**		0		97 to 106	2	Y	ND	2	Y		2	Y

Contents

Count of Results

Matrix_Type	Sample_Type	Reg	Leached	Spike_Compounds	Surrogate
water	Normal	181	0	0	31
water	MB	120	0	0	23
water	LCS	82	0	0	20
WATER	Interlab_D	63	0	0	13
water	Rinsate	59	0	0	10
water	Field_D	53	0	0	9
WATER	NCP	22	0	0	10
water	Trip_S	10	0	0	6
water	LAB_D	16	0	0	0
water	Trip_B	6	0	0	3
water	SB	5	0	0	3

Field Blanks (water)
Filter: ALL

SDG	68855	70910	68855
Field_ID	RINSATE	Rinsate	TRIP BLANK
Sampled_Date-Time	10/02/2012	26/03/2012	10/02/2012
Sample_Type	Rinsate	Rinsate	Trip_B

Method_Type	**ChemName**	**Units**	**EQL**			
8 HM in water - dissolved	Arsenic (Filtered)	mg/l	0.001	<0.001	<0.001	
	Cadmium (Filtered)	µg/L	0.1	<0.1	<0.1	
	Chromium (III+VI) (Filtered)	mg/l	0.001	<0.001	<0.001	
	Copper (Filtered)	mg/l	0.001	<0.001	<0.001	
	Lead (Filtered)	mg/l	0.001	<0.001	<0.001	
	Mercury (Filtered)	µg/L	0.05	<0.05	<0.05	
	Nickel (Filtered)	mg/l	0.001	<0.001	<0.001	
	Zinc (Filtered)	mg/l	0.001	<0.001	**0.003**	
PAHs in Water	Acenaphthene	µg/L	1		<1	
	Acenaphthylene	µg/L	1		<1	
	Anthracene	µg/L	1		<1	
	Benz(a)anthracene	µg/L	1		<1	
	Benzo(a) pyrene	µg/L	1		<1	
	Benzo(b)&(k)fluoranthene	µg/L	2		<2	
	Benzo(g,h,i)perylene	µg/L	1		<1	
	Chrysene	µg/L	1		<1	
	Dibenz(a,h)anthracene	µg/L	1		<1	
	Fluoranthene	µg/L	1		<1	
	Fluorene	µg/L	1		<1	
	Indeno(1,2,3-c,d)pyrene	µg/L	1		<1	
	Naphthalene	µg/L	1		<1	
	Phenanthrene	µg/L	1		<1	
	Pyrene	µg/L	1		<1	
PAHs in Water - Low Level	Acenaphthene	µg/L	0.1	<0.1		
	Acenaphthylene	µg/L	0.1	<0.1		
	Anthracene	µg/L	0.1	<0.1		
	Benz(a)anthracene	µg/L	0.1	<0.1		
	Benzo(a) pyrene	µg/L	0.1	<0.1		
	Benzo(b)&(k)fluoranthene	µg/L	0.2	<0.2		
	Benzo(g,h,i)perylene	µg/L	0.1	<0.1		
	Chrysene	µg/L	0.1	<0.1		
	Dibenz(a,h)anthracene	µg/L	0.1	<0.1		
	Fluoranthene	µg/L	0.1	<0.1		
	Fluorene	µg/L	0.1	<0.1		
	Indeno(1,2,3-c,d)pyrene	µg/L	0.1	<0.1		
	Naphthalene	µg/L	0.1	<0.1		
	Phenanthrene	µg/L	0.1	<0.1		
	Pyrene	µg/L	0.1	<0.1		
sTRH in Water (C10-C36)	C10 - C14	µg/L	50	<50	<50	
	C15 - C28	µg/L	100	<100	<100	
	C29-C36	µg/L	100	<100	<100	
vTRH & BTEX in Water	Benzene	µg/L	1	<1		<1
	Ethylbenzene	µg/L	1	<1		<1
	Toluene	µg/L	1	<1		<1
	C6 - C9	µg/L	10	<10	<10	<10
	Xylene (m & p)	µg/L	2	<2		<2
	Xylene (o)	µg/L	1	<1		<1

Field Duplicates (water)
Filter: ALL

SDG			68855	68855		70910	70910		68855	Interlab_D		70910	Interlab_D		
Field_ID			BH608	QC01	**RPD**	BH2	QC05	**RPD**	BH608	QA01	**RPD**	BH2	QA05	**RPD**	
Sampled_Date-Time			10/02/2012	10/02/2012		26/03/2012	26/03/2012		10/02/2012	10/02/2012		26/03/2012	26/03/2012		
Method_Type	**ChemName**	**Units**	**EQL**												
8 HM in water - dissolved	Arsenic (Filtered)	mg/l	0.001	<0.001	<0.001	0	0.017	0.017	0	<0.001	<0.001	0	0.017	0.012	34
	Cadmium (Filtered)	µg/L	0.1 (Primary): 1 (Interlab	0.1	<0.1	0	<0.1	<0.1	0	0.1	<1.0	0	<0.1	<0.1	0
	Chromium (III+VI) (Filtered)	mg/l	0.001 (Primary): 0.002 (I	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.002	0	<0.001	<0.001	0
	Copper (Filtered)	mg/l	0.001	0.01	0.006	50	<0.001	<0.001	0	0.01	0.006	50	<0.001	<0.001	0
	Lead (Filtered)	mg/l	0.001	0.01	0.01	0	<0.001	<0.001	0	0.01	0.007	35	<0.001	<0.001	0
	Mercury (Filtered)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.1	0	<0.05	<0.1	0
	Nickel (Filtered)	mg/l	0.001	0.073	0.073	0	0.044	0.043	2	0.073	0.048	41	0.044	0.045	2
	Zinc (Filtered)	mg/l	0.001 (Primary): 0.002 (I	0.088	0.074	17	0.063	0.044	36	0.088	0.064	32	0.063	0.049	25
PAHs in Water - Low Level	Acenaphthene	µg/L	0.1	<0.1	<0.1	0				<0.1	<0.1	0			
	Acenaphthylene	µg/L	0.1	<0.1	<0.1	0				<0.1	<0.1	0			
	Anthracene	µg/L	0.1	<0.1	<0.1	0				<0.1	<0.1	0			
	Benz(a)anthracene	µg/L	0.1	<0.1	<0.1	0				<0.1	<0.1	0			
	Benzo(a) pyrene	µg/L	0.1	<0.1	<0.1	0				<0.1	<0.1	0			
	Benzo(b)&(k)fluoranthene	µg/L	0.2	<0.2	<0.2	0				<0.2					
	Benzo(g,h,i)perylene	µg/L	0.1	<0.1	<0.1	0				<0.1	<0.1	0			
	Chrysene	µg/L	0.1	<0.1	<0.1	0				<0.1	<0.1	0			
	Dibenz(a,h)anthracene	µg/L	0.1	<0.1	<0.1	0				<0.1	<0.1	0			
	Fluoranthene	µg/L	0.1	<0.1	<0.1	0				<0.1	<0.1	0			
	Fluorene	µg/L	0.1	<0.1	<0.1	0				<0.1	<0.1	0			
	Indeno(1,2,3-c,d)pyrene	µg/L	0.1	<0.1	<0.1	0				<0.1	<0.1	0			
	Naphthalene	µg/L	0.1	<0.1	<0.1	0				<0.1	<0.1	0			
	Phenanthrene	µg/L	0.1	<0.1	<0.1	0				<0.1	<0.1	0			
	Pyrene	µg/L	0.1	<0.1	<0.1	0				<0.1	<0.1	0			
sTRH in Water (C10-C36)	C10 - C14	µg/L	50 (Primary): 100 (Interla	<50.0	<50.0	0	<50.0	<50.0	0	<50.0	<100.0	0	<50.0	<100.0	0
	C15 - C28	µg/L	100 (Primary): 200 (Inter	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<200.0	0	<100.0	<200.0	0
	C29-C36	µg/L	100 (Primary): 200 (Inter	<100.0	<100.0	0	<100.0	<100.0	0	<100.0	<200.0	0	<100.0	<200.0	0
vTRH & BTEX in Water	Benzene	µg/L	1 (Primary): 0.5 (Interlab	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<0.5	0	<1.0	<0.5	0
	Ethylbenzene	µg/L	1 (Primary): 0.5 (Interlab	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<0.5	0	<1.0	<0.5	0
	Toluene	µg/L	1 (Primary): 0.5 (Interlab	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<0.5	0	<1.0	<0.5	0
	C6 - C9	µg/L	10 (Primary): 40 (Interlat	<10.0	<10.0	0	<10.0	<10.0	0	<10.0	<40.0	0	<10.0	<40.0	0
	Xylene (m & p)	µg/L	2 (Primary): 1 (Interlab)	<2.0	<2.0	0	<2.0	<2.0	0	<2.0	<1.0	0	<2.0	<1.0	0
	Xylene (o)	µg/L	1 (Primary): 0.5 (Interlab	<1.0	<1.0	0	<1.0	<1.0	0	<1.0	<0.5	0	<1.0	<0.5	0

*RPDs have only been considered where a concentration is greater than 4 times the EQL.

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 50 (4-10 x EQL); 50 (10-30 x EQL); 50 (> 30 x EQL))

***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

Contents

Surrogate Variation > 30% or outside lab LCL or UCL or outside lab LCL or UCL

SDG	Sample_Type	Matrix_Type	SampleCode	Field_ID	Depth	Sampled_Date-Time	Compound	Recovery %	Unit	Comments
68855	LCS	water	68855LCS-W2			10/02/2012	Surrogate o-Terphenyl	140	%	

Contents

Laboratory Control Samples, Error > 30%

SDG	Matrix_Type	SampleCode	Method_Name	OriginalChemName	Recovery %	Unit	Result_Type	Comments
68855	water	68855LCS-W2	Org-003 - Semi-volatile TRH in waters and soil	Surrogate o-Terphenyl	140	%	SUR	

Contents

Less than 1 matrix spike in 20 samples, or less than 1 matrix duplicate in 20 samples

Matrix_Type	Number_of_Samples	Number_of_Matrix_Spike_Samples	Number_of_Matrix_Spike_Dupe_Samples
water	48	0	0

Contents

Trip Spike Recoveries (70% - 130% is acceptable)

SDG	Matrix_Type	SampleCode	Field_ID	Method_Name	Compound	Trip_Spike_Result	Trip_Spike_Control	Result_Units	Spike_Recovery_%	Acceptable	Result_Type	Comments
68855	water	68855-7	TRIP SPIKE	Org-016 - BTEX and C6-C9 alkanes in soil & water	Benzene	NA	NA	NA	88	Y	REG	
68855	water	68855-7	TRIP SPIKE	Org-016 - BTEX and C6-C9 alkanes in soil & water	Ethylbenzene	NA	NA	NA	93	Y	REG	
68855	water	68855-7	TRIP SPIKE	Org-016 - BTEX and C6-C9 alkanes in soil & water	m+p-xylene	NA	NA	NA	94	Y	REG	
68855	water	68855-7	TRIP SPIKE	Org-016 - BTEX and C6-C9 alkanes in soil & water	o-xylene	NA	NA	NA	97	Y	REG	
68855	water	68855-7	TRIP SPIKE	Org-016 - BTEX and C6-C9 alkanes in soil & water	Toluene	NA	NA	NA	89	Y	REG	
70910	water	70910-3	Trip Spike	Org-016 - BTEX and C6-C9 alkanes in soil & water	Benzene	NA	NA	NA	102	Y	REG	
70910	water	70910-3	Trip Spike	Org-016 - BTEX and C6-C9 alkanes in soil & water	Ethylbenzene	NA	NA	NA	106	Y	REG	
70910	water	70910-3	Trip Spike	Org-016 - BTEX and C6-C9 alkanes in soil & water	m+p-xylene	NA	NA	NA	106	Y	REG	
70910	water	70910-3	Trip Spike	Org-016 - BTEX and C6-C9 alkanes in soil & water	o-xylene	NA	NA	NA	106	Y	REG	
70910	water	70910-3	Trip Spike	Org-016 - BTEX and C6-C9 alkanes in soil & water	Toluene	NA	NA	NA	104	Y	REG	

Attachment 6 – Laboratory Analysis Reports and Chain of Custody Information

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

CERTIFICATE OF ANALYSIS 68855

Client:
JBS Environmental Pty Ltd
P.O. Box 940
MASCOT
NSW 1460

Attention: Joanne Rosner

Sample log in details:

Your Reference:	**41945, Edmondson Park**
No. of samples:	9 Waters
Date samples received / completed instructions received	10/02/12 / 10/02/12

Analysis Details:
Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	17/02/12 / 16/02/12
Date of Preliminary Report:	Not issued

NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Nancy Zhang
Chemist

Giovanni Agosti
Technical Manager

Jeremy Faircloth
Chemist

NATA
ACCREDITED FOR TECHNICAL COMPETENCE

vTRH & BTEX in Water						
Our Reference:	UNITS	68855-1	68855-2	68855-3	68855-4	68855-5
Your Reference	----------	BH558	BH608	BH291	BH521	BH2
Date Sampled	----------	10/02/2012	10/02/2012	09/02/2012	09/02/2012	10/02/2012
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	13/02/2012	13/02/2012	13/02/2012	13/02/2012	13/02/2012
Date analysed	-	13/02/2012	13/02/2012	13/02/2012	13/02/2012	13/02/2012
TRHC$_6$ - C$_9$	µg/L	<100	<10	<10	<10	<10
Benzene	µg/L	<10	<1	<1	<1	<1
Toluene	µg/L	<10	<1	<1	<1	<1
Ethylbenzene	µg/L	<10	<1	<1	<1	<1
m+p-xylene	µg/L	<20	<2	<2	<2	<2
o-xylene	µg/L	<10	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	104	106	107	106	107
Surrogate toluene-d8	%	98	99	99	98	99
Surrogate 4-BFB	%	93	94	93	93	92

vTRH & BTEX in Water					
Our Reference:	UNITS	68855-6	68855-7	68855-8	68855-9
Your Reference	----------	RINSATE	TRIPSPIKE	TRIP BLANK	QC01
Date Sampled	----------	10/02/2012	10/02/2012	10/02/2012	10/02/2012
Type of sample		Water	Water	Water	Water
Date extracted	-	13/02/2012	13/02/2012	13/02/2012	13/02/2012
Date analysed	-	13/02/2012	13/02/2012	13/02/2012	13/02/2012
TRHC$_6$ - C$_9$	µg/L	<10	[NA]	<10	<10
Benzene	µg/L	<1	88%	<1	<1
Toluene	µg/L	<1	89%	<1	<1
Ethylbenzene	µg/L	<1	93%	<1	<1
m+p-xylene	µg/L	<2	94%	<2	<2
o-xylene	µg/L	<1	97%	<1	<1
Surrogate Dibromofluoromethane	%	108	104	107	108
Surrogate toluene-d8	%	99	100	98	98
Surrogate 4-BFB	%	91	101	93	93

sTRH in Water (C10-C36)						
Our Reference:	UNITS	68855-2	68855-3	68855-4	68855-5	68855-6
Your Reference	----------	BH608	BH291	BH521	BH2	RINSATE
Date Sampled	----------	10/02/2012	09/02/2012	09/02/2012	10/02/2012	10/02/2012
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	15/02/2012	15/02/2012	15/02/2012	15/02/2012	15/02/2012
Date analysed	-	16/02/2012	16/02/2012	16/02/2012	16/02/2012	16/02/2012
TRHC$_{10}$ - C$_{14}$	µg/L	<50	<50	<50	56	<50
TRHC$_{15}$ - C$_{28}$	µg/L	<100	<100	<100	330	<100
TRHC$_{29}$ - C$_{36}$	µg/L	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	102	96	84	91	98

sTRH in Water (C10-C36)		
Our Reference:	UNITS	68855-9
Your Reference	----------	QC01
Date Sampled	----------	10/02/2012
Type of sample		Water
Date extracted	-	15/02/2012
Date analysed	-	16/02/2012
TRHC$_{10}$ - C$_{14}$	µg/L	<50
TRHC$_{15}$ - C$_{28}$	µg/L	<100
TRHC$_{29}$ - C$_{36}$	µg/L	<100
Surrogate o-Terphenyl	%	93

PAHs in Water - Low Level Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ----------	68855-2 BH608 10/02/2012 Water	68855-3 BH291 09/02/2012 Water	68855-4 BH521 09/02/2012 Water	68855-5 BH2 10/02/2012 Water	68855-6 RINSATE 10/02/2012 Water
Date extracted	-	15/02/2012	15/02/2012	15/02/2012	15/02/2012	15/02/2012
Date analysed	-	16/02/2012	16/02/2012	16/02/2012	16/02/2012	16/02/2012
Naphthalene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b+k)fluoranthene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d_{14}	%	104	103	75	77	94

PAHs in Water - Low Level Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ----------	68855-9 QC01 10/02/2012 Water
Date extracted	-	15/02/2012
Date analysed	-	16/02/2012
Naphthalene	µg/L	<0.1
Acenaphthylene	µg/L	<0.1
Acenaphthene	µg/L	<0.1
Fluorene	µg/L	<0.1
Phenanthrene	µg/L	<0.1
Anthracene	µg/L	<0.1
Fluoranthene	µg/L	<0.1
Pyrene	µg/L	<0.1
Benzo(a)anthracene	µg/L	<0.1
Chrysene	µg/L	<0.1
Benzo(b+k)fluoranthene	µg/L	<0.2
Benzo(a)pyrene	µg/L	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1
Surrogate p-Terphenyl-d_{14}	%	106

HM in water - dissolved Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ----------	68855-2 BH608 10/02/2012 Water	68855-3 BH291 09/02/2012 Water	68855-4 BH521 09/02/2012 Water	68855-5 BH2 10/02/2012 Water	68855-6 RINSATE 10/02/2012 Water
Date prepared	-	13/2/2012	13/2/2012	13/2/2012	13/2/2012	13/2/2012
Date analysed	-	13/2/2012	13/2/2012	13/2/2012	13/2/2012	13/2/2012
Arsenic-Dissolved	µg/L	<1	<1	12	<1	<1
Cadmium-Dissolved	µg/L	0.1	<0.1	<0.1	<0.1	<0.1
Chromium-Dissolved	µg/L	<1	<1	<1	<1	<1
Copper-Dissolved	µg/L	10	1	<1	14	<1
Lead-Dissolved	µg/L	10	1	<1	11	<1
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel-Dissolved	µg/L	73	34	31	6	<1
Zinc-Dissolved	µg/L	88	42	20	140	<1

HM in water - dissolved Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ----------	68855-9 QC01 10/02/2012 Water
Date prepared	-	13/2/2012
Date analysed	-	13/2/2012
Arsenic-Dissolved	µg/L	<1
Cadmium-Dissolved	µg/L	<0.1
Chromium-Dissolved	µg/L	<1
Copper-Dissolved	µg/L	6
Lead-Dissolved	µg/L	10
Mercury-Dissolved	µg/L	<0.05
Nickel-Dissolved	µg/L	73
Zinc-Dissolved	µg/L	74

Method ID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
Metals-022 ICP-MS	Determination of various metals by ICP-MS.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.

QUALITY CONTROL vTRH & BTEX in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			13/02/2012	[NT]	[NT]	LCS-W1	13/02/2012
Date analysed	-			13/02/2012	[NT]	[NT]	LCS-W1	13/02/2012
TRHC$_6$ - C$_9$	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-W1	120%
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	116%
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	114%
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	120%
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	LCS-W1	125%
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	123%
Surrogate Dibromofluoromethane	%		Org-016	101	[NT]	[NT]	LCS-W1	97%
Surrogate toluene-d8	%		Org-016	100	[NT]	[NT]	LCS-W1	96%
Surrogate 4-BFB	%		Org-016	95	[NT]	[NT]	LCS-W1	101%

QUALITY CONTROL sTRH in Water (C10-C36)	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			15/02/2012	[NT]	[NT]	LCS-W2	15/02/2012
Date analysed	-			15/02/2012	[NT]	[NT]	LCS-W2	15/02/2012
TRHC$_{10}$ - C$_{14}$	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W2	107%
TRHC$_{15}$ - C$_{28}$	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W2	107%
TRHC$_{29}$ - C$_{36}$	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W2	97%
Surrogate o-Terphenyl	%		Org-003	93	[NT]	[NT]	LCS-W2	140%

QUALITY CONTROL PAHs in Water - Low Level	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			15/02/2012	[NT]	[NT]	LCS-W1	15/02/2012
Date analysed	-			16/02/2012	[NT]	[NT]	LCS-W1	16/02/2012
Naphthalene	µg/L	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-W1	91%
Acenaphthylene	µg/L	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	µg/L	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluorene	µg/L	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-W1	105%
Phenanthrene	µg/L	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-W1	99%
Anthracene	µg/L	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	µg/L	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-W1	103%
Pyrene	µg/L	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-W1	106%

QUALITY CONTROL PAHs in Water - Low Level	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Benzo(a)anthracene	µg/L	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Chrysene	µg/L	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-W1	113%
Benzo(b+k)fluoranthene	µg/L	0.2	Org-012 subset	<0.2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	µg/L	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-W1	99%
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	µg/L	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d_{14}	%		Org-012 subset	98	[NT]	[NT]	LCS-W1	108%
QUALITY CONTROL HM in water - dissolved	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			13/2/2012	68855-2	13/2/2012 || 13/2/2012	LCS-W1	13/2/2012
Date analysed	-			13/2/2012	68855-2	13/2/2012 || 13/2/2012	LCS-W1	13/2/2012
Arsenic-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	68855-2	<1 || <1	LCS-W1	106%
Cadmium-Dissolved	µg/L	0.1	Metals-022 ICP-MS	<0.1	68855-2	0.1 || <0.1	LCS-W1	110%
Chromium-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	68855-2	<1 || <1	LCS-W1	107%
Copper-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	68855-2	10 || 10 || RPD: 0	LCS-W1	108%
Lead-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	68855-2	10 || 10 || RPD: 0	LCS-W1	112%
Mercury-Dissolved	µg/L	0.05	Metals-021 CV-AAS	<0.05	68855-2	<0.05 || <0.05	LCS-W1	100%
Nickel-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	68855-2	73 || 73 || RPD: 0	LCS-W1	107%
Zinc-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	68855-2	88 || 86 || RPD: 2	LCS-W1	110%

Report Comments:

Total Recoverable Hydrocarbons/BTEX in water:PQL has been raised due to the sample matrix requiring dilution.

Asbestos ID was analysed by Approved Identifier:	Not applicable for this job
Asbestos ID was authorised by Approved Signatory:	Not applicable for this job

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NA: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

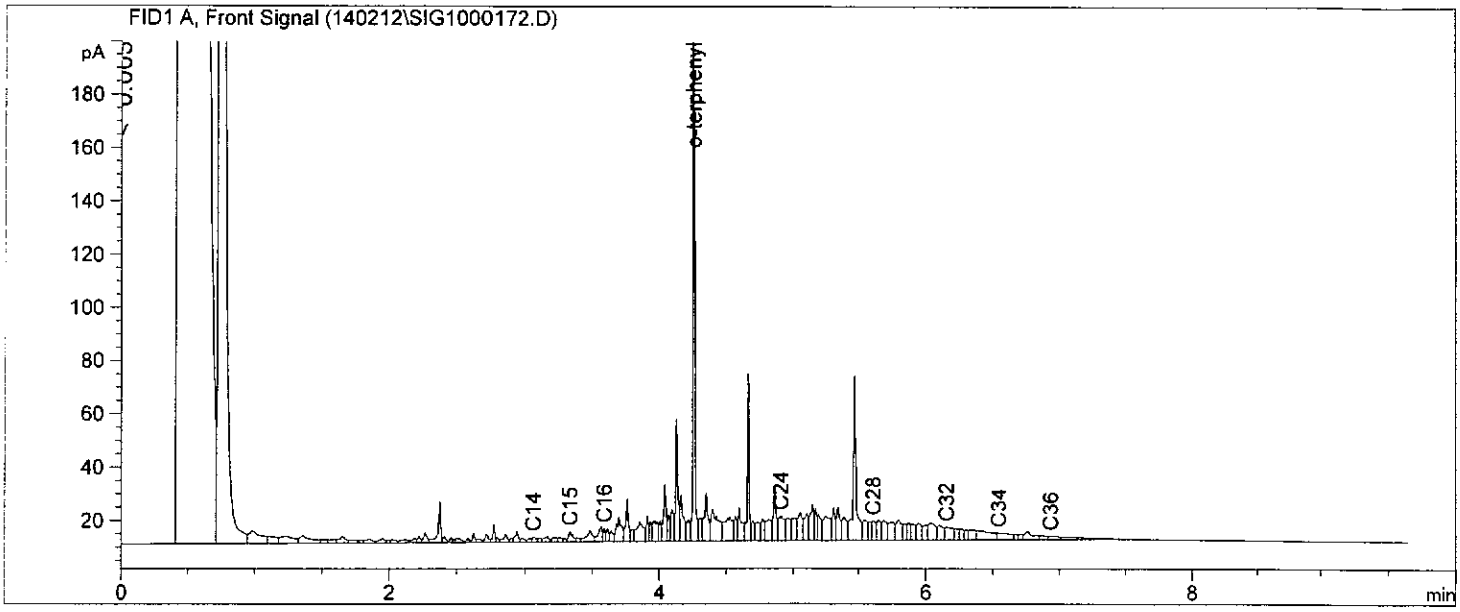
Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batched of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

Data File C:\DATA\02_12\140212\SIG1000172.D
Sample Name: 68855-5w

Acq. Operator	: AC	Seq. Line	: 102
Acq. Instrument	: GC#4	Location	: Vial 2
Injection Date	: 16/02/2012 1:42:50 AM	Inj	: 1
		Inj Volume	: 1 µl
Acq. Method	: C:\CHEM32\1\METHODS\NEPM TEST 06022012.M		
Last changed	: 14/02/2012 6:18:12 PM by AC		
Analysis Method	: C:\METHODS\02_12\140212F.M		
Last changed	: 16/02/2012 4:42:00 PM by AC		
	(modified after loading) (Current integration events modified)		
Method Info	: FAST TPH WITH 15M HP5 COLUMNS		



External Standard Report

Sorted By : Signal
Calib. Data Modified : 16/02/2012 4:41:20 PM
Multiplier: : 1.0000
Dilution: : 1.0000
Do not use Multiplier & Dilution Factor with ISTDs

Signal 1: FID1 A, Front Signal

RetTime [min]	Type	Area [pA*s]	Amt/Area	Amount [mg/L]	Grp	Name
0.920		-	-	-		C9
1.458		-	-	-	1	C10
3.061	VV	3.71991	1.22626e-1	4.56157e-1	1	C14
3.334	VV	8.46654	1.26139e-1	1.06796	2	C15
3.589	VV	5.39869	1.29834e-1	7.00935e-1		C16
4.260	VV	241.30333	1.15222e-1	27.80354		o-terphenyl
4.908	VV	29.70243	1.27226e-1	3.77893		C24
5.610	VV	15.79151	1.28827e-1	2.03437	2	C28
6.154	VV	19.20847	1.31728e-1	2.53030	3	C32
6.546	VV	16.56101	1.30880e-1	2.16750	3	C34
6.936	VB	6.52123	1.30504e-1	8.51047e-1	3	C36
8.250		-	-	-		C40
Totals :				41.39074		

CHAIN OF CUSTODY

JBS ENVIRONMENTAL

PROJECT NO.: 41945
PROJECT NAME: Edmondson Park
SEND REPORT TO: JRosser
SEND INVOICE TO: A.Traynor
DATE NEEDED BY: Standard
COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

LABORATORY BATCH NO.
SAMPLERS: RB
PHONE: EMAIL: J.Rosser@jbsgroup.com.au
QC LEVEL: NEPM 1999 (✓) abeardman@jbsgroup.com.au

	SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	Metals(6)	TPH(C6-C9)	PAHs(0.1mg/L)	X BTEX	X TPH(C6-C9)	NOTES
1	BH558	Water	10-2-12		2 x vials only					X	X	
2	BH608	Water	10-2-12		1 x amber, 2 x vials, 1 x jar		X	X	X	X		
3	BH291		9-2-12				X	X	X	X		
4	BH521		9-2-12				X	X	X	X		
5	BH2		10-2-12				X	X	X	X		
6	Rinsate				2 x vials, 1 x amber 1 x metals		X	X	X	X		
7	Trip Spike				1 x vial					X		
8	Trip Blank				1 x vial					X		
9	QC01				2 x vials, 1 x amber 1 x Metal		X	X	X	X		
	QA01	↓	↓		↓							

Send to SGS

ETV GROUP
Environmental Testing Services
13 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 68855
Date Received: 10.02.12
Time Received: 17.40
Received by: Jia Liu
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: RB DATE: 10-2-12	CONSIGNMENT NOTE NO.	NAME: Jia Liu DATE:	COOLER SEAL – Yes ... No ... Intact ... Broken ...
OF:	TRANSPORT CO.	OF: EIS 10.02.12	COOLER TEMP ... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes ... No ... Intact ... Broken ...
OF:	TRANSPORT CO	OF:	COOLER TEMP ... deg C

Containers & Preservative Codes: P = Plastic; J = Soil Jar; G = Glass Bottle; N = Nitric Acid Preval.; C = Sodium Hydroxide Preval; VC = Hydrochloric Acid Preval Vial; VS = Sulfuric Add Preval Vial; S = Sulfuric Acid Preval; Z = Zinc Preval; E = EDTA Preval; ST = Sterile Bottle; O = Other

JBS Environmental Pty Ltd ABN 67 071 842 638
Phone: (02) 8338-1011
Fax: (02) 8338-1700
Suite 2, 595 Gardeners Road MASCOT NSW 2020
PO Box 940 MASCOT NSW 1460
www.jbsgroup.com.au

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

SAMPLE RECEIPT ADVICE

Client:

JBS Environmental Pty Ltd
P.O. Box 940
MASCOT NSW 1460

ph: 8338 1013
Fax: 8338 1700

Attention: Joanne Rosner

Sample log in details:

Your reference:	**41945, Edmondson Park**
Envirolab Reference:	**68855**
Date received:	10/02/12
Date results expected to be reported:	**17/02/12**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	9 Waters
Turnaround time requested:	Standard
Temperature on receipt	Cool
Cooling Method:	Ice Pack

Comments:

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

Contact details:

Please direct any queries to Aileen Hie or Jacinta Hurst
ph: 02 9910 6200 fax: 02 9910 6201
email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

CERTIFICATE OF ANALYSIS 70910

Client:
JBS Environmental Pty Ltd
P.O. Box 940
MASCOT
NSW 1460

Attention: Joanne Rosner

Sample log in details:

Your Reference:	**41945, Edmondson Park**
No. of samples:	6 Waters
Date samples received / completed instructions received	26/03/2012 / 26/03/2012

Analysis Details:
Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	2/04/12 / 30/03/12
Date of Preliminary Report:	Not issued

NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Nancy Zhang
Chemist

Rhian Morgan
Reporting Supervisor

Hinoko Miyazaki
Chemist

vTRH & BTEX in Water						
Our Reference:	UNITS	70910-1	70910-2	70910-3	70910-4	70910-5
Your Reference	----------	BH2	QC05	Trip Spike	Trip Blank	Rinsate
Date Sampled	----------	26/03/2012	26/03/2012	26/03/2012	26/03/2012	26/03/2012
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	27/03/2012	27/03/2012	27/03/2012	27/03/2012	27/03/2012
Date analysed	-	27/03/2012	27/03/2012	27/03/2012	27/03/2012	27/03/2012
TRHC$_6$ - C$_9$	µg/L	<10	<10	[NA]	[NA]	<10
Benzene	µg/L	<1	<1	102%	<1	[NA]
Toluene	µg/L	<1	<1	104%	<1	[NA]
Ethylbenzene	µg/L	<1	<1	106%	<1	[NA]
m+p-xylene	µg/L	<2	<2	106%	<2	[NA]
o-xylene	µg/L	<1	<1	106%	<1	[NA]
Surrogate Dibromofluoromethane	%	104	105	101	104	105
Surrogate toluene-d8	%	100	101	99	100	100
Surrogate 4-BFB	%	95	95	100	95	94

vTRH & BTEX in Water		
Our Reference:	UNITS	70910-6
Your Reference	----------	PSW1
Date Sampled	----------	26/03/2012
Type of sample		Water
Date extracted	-	27/03/2012
Date analysed	-	27/03/2012
TRHC$_6$ - C$_9$	µg/L	<10
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Surrogate Dibromofluoromethane	%	107
Surrogate toluene-d8	%	100
Surrogate 4-BFB	%	94

sTRH in Water (C10-C36)					
Our Reference:	UNITS	70910-1	70910-2	70910-5	70910-6
Your Reference	----------	BH2	QC05	Rinsate	PSW1
Date Sampled	----------	26/03/2012	26/03/2012	26/03/2012	26/03/2012
Type of sample		Water	Water	Water	Water
Date extracted	-	27/03/2012	27/03/2012	27/03/2012	27/03/2012
Date analysed	-	27/03/2012	27/03/2012	27/03/2012	27/03/2012
TRHC$_{10}$ - C$_{14}$	µg/L	<50	<50	<50	59
TRHC$_{15}$ - C$_{28}$	µg/L	<100	<100	<100	420
TRHC$_{29}$ - C$_{36}$	µg/L	<100	<100	<100	560
Surrogate o-Terphenyl	%	93	91	92	97

PAHs in Water		
Our Reference:	UNITS	70910-5
Your Reference	----------	Rinsate
Date Sampled	----------	26/03/2012
Type of sample		Water
Date extracted	-	27/03/2012
Date analysed	-	27/03/2012
Naphthalene	µg/L	<1
Acenaphthylene	µg/L	<1
Acenaphthene	µg/L	<1
Fluorene	µg/L	<1
Phenanthrene	µg/L	<1
Anthracene	µg/L	<1
Fluoranthene	µg/L	<1
Pyrene	µg/L	<1
Benzo(a)anthracene	µg/L	<1
Chrysene	µg/L	<1
Benzo(b+k)fluoranthene	µg/L	<2
Benzo(a)pyrene	µg/L	<1
Indeno(1,2,3-c,d)pyrene	µg/L	<1
Dibenzo(a,h)anthracene	µg/L	<1
Benzo(g,h,i)perylene	µg/L	<1
Surrogate p-Terphenyl-d_{14}	%	80

HM in water - dissolved Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ----------	70910-1 BH2 26/03/2012 Water	70910-2 QC05 26/03/2012 Water	70910-5 Rinsate 26/03/2012 Water	70910-6 PSW1 26/03/2012 Water
Date prepared	-	28/03/2012	28/03/2012	28/03/2012	28/03/2012
Date analysed	-	28/03/2012	28/03/2012	28/03/2012	28/03/2012
Arsenic-Dissolved	µg/L	17	17	<1	3
Cadmium-Dissolved	µg/L	<0.1	<0.1	<0.1	0.1
Chromium-Dissolved	µg/L	<1	<1	<1	<1
Copper-Dissolved	µg/L	<1	<1	<1	6
Lead-Dissolved	µg/L	<1	<1	<1	4
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05	<0.05
Nickel-Dissolved	µg/L	44	43	<1	5
Zinc-Dissolved	µg/L	63	44	3	27

Method ID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
Metals-022 ICP-MS	Determination of various metals by ICP-MS.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.

QUALITY CONTROL vTRH & BTEX in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			27/03/2012	[NT]	[NT]	LCS-W1	27/03/2012
Date analysed	-			27/03/2012	[NT]	[NT]	LCS-W1	27/03/2012
TRHC$_6$ - C$_9$	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-W1	113%
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	111%
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	112%
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	112%
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	LCS-W1	115%
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	116%
Surrogate Dibromofluoromethane	%		Org-016	101	[NT]	[NT]	LCS-W1	104%
Surrogate toluene-d8	%		Org-016	100	[NT]	[NT]	LCS-W1	100%
Surrogate 4-BFB	%		Org-016	95	[NT]	[NT]	LCS-W1	102%

QUALITY CONTROL sTRH in Water (C10-C36)	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			27/03/2012	[NT]	[NT]	LCS-W1	27/03/2012
Date analysed	-			27/03/2012	[NT]	[NT]	LCS-W1	27/03/2012
TRHC$_{10}$ - C$_{14}$	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W1	103%
TRHC$_{15}$ - C$_{28}$	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	101%
TRHC$_{29}$ - C$_{36}$	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	92%
Surrogate o-Terphenyl	%		Org-003	97	[NT]	[NT]	LCS-W1	129%

QUALITY CONTROL PAHs in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			27/03/2012	[NT]	[NT]	LCS-W1	27/03/2012
Date analysed	-			27/03/2012	[NT]	[NT]	LCS-W1	27/03/2012
Naphthalene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	85%
Acenaphthylene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Fluorene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	105%
Phenanthrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	106%
Anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	113%
Pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	119%
Benzo(a)anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]

Client Reference: 41945, Edmondson Park

QUALITY CONTROL PAHs in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Chrysene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	96%
Benzo(b+k)fluoranthene	µg/L	2	Org-012 subset	<2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	91%
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d_{14}	%		Org-012 subset	105	[NT]	[NT]	LCS-W1	87%
QUALITY CONTROL HM in water - dissolved	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			27/03/2012	70910-2	28/03/2012 || 28/03/2012	LCS-W1	28/03/2012
Date analysed	-			27/03/2012	70910-2	28/03/2012 || 28/03/2012	LCS-W1	28/03/2012
Arsenic-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	70910-2	17 || 17 || RPD: 0	LCS-W1	101%
Cadmium-Dissolved	µg/L	0.1	Metals-022 ICP-MS	<0.1	70910-2	<0.1 || <0.1	LCS-W1	105%
Chromium-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	70910-2	<1 || <1	LCS-W1	116%
Copper-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	70910-2	<1 || <1	LCS-W1	116%
Lead-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	70910-2	<1 || <1	LCS-W1	107%
Mercury-Dissolved	µg/L	0.05	Metals-021 CV-AAS	<0.05	70910-2	<0.05 || <0.05	LCS-W1	116%
Nickel-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	70910-2	43 || 44 || RPD: 2	LCS-W1	110%
Zinc-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	70910-2	44 || 42 || RPD: 5	LCS-W1	103%

Report Comments:

No silica gel clean up needed as TRH's for samples negative.

Asbestos ID was analysed by Approved Identifier:	Not applicable for this job
Asbestos ID was authorised by Approved Signatory:	Not applicable for this job

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NA: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batched of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

SAMPLE RECEIPT ADVICE

Client:

JBS Environmental Pty Ltd
P.O. Box 940
MASCOT NSW 1460

ph: 8338 1013
Fax: 8338 1700

Attention: Joanne Rosner

Sample log in details:

Your reference:	**41945, Edmondson Park**
Envirolab Reference:	**70910**
Date received:	26/03/2012
Date results expected to be reported:	**2/04/12**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	6 Waters
Turnaround time requested:	Standard
Temperature on receipt	Cool
Cooling Method:	Ice Pack

Comments:

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

Contact details:

Please direct any queries to Aileen Hie or Jacinta Hurst
ph: 02 9910 6200 fax: 02 9910 6201
email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au

CHAIN OF CUSTODY

JBS ENVIRONMENTAL

PROJECT NO.: 41945
PROJECT NAME: Edmonson Park Remediation - CMP
SEND REPORT TO: AB + JD
SEND INVOICE TO: Accounts
DATE NEEDED BY: Standard Turn Around
LABORATORY BATCH NO.:
SAMPLERS: AB
PHONE: 02 8338 1011
EMAIL: aboardman@jbsgroup.com.au
QC LEVEL: NEPM 1999 (✓)
jbsmail@jbsgroup.com.au

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

	SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	TPH*	BTEX*	Metals	PAHs	NOTES
1	*BH2	Water	26-3-12		Amber, 2x vials, metals		X	X	X		*TPH/BTEX use direct extraction + silica Gel clean up for BH2, QC05
2	*QC05						X	X	X		
3	*QA05						Send to SGS				
4	Trip Spike				2x vials			X			
5	Trip Blank				2x vials			X			
6	Rinsate						X	X	X		
	PSW1						X	X	X		

ENVIROLAB
Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 70910
Date Received: 26/3/12
Time Received: 16:45
Received by: DCT
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: AB DATE: 26-3-12	CONSIGNMENT NOTE NO.	NAME: Dennis Tam DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS Environmental	TRANSPORT CO.	OF: JBS 26/3/12 16:45	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

ANALYTICAL REPORT

CLIENT DETAILS		LABORATORY DETAILS	
Contact	Joanne Rosner	Manager	Huong Crawford
Client	JBS Environmental	Laboratory	SGS Alexandria Environmental
Address	Suite 2, 595 Gardeners Road Mascot Sydney NSW 2020	Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	02 8338 1011	Telephone	+61 2 8594 0400
Facsimile	02 8338 1700	Facsimile	+61 2 8594 0499
Email	jrosner@jbsgroup.com.au	Email	au.environmental.sydney@sgs.com
Project	**41945 - Edmendson Park Remediation-GME**	SGS Reference	SE106705 R0
Order Number	(Not specified)	Report Number	0000023223
Samples	1	Date Reported	03 Apr 2012
		Date Received	27 Mar 2012

COMMENTS

The document is issued in accordance with NATA's accreditation requirements.
Accredited for compliance with ISO/IEC 17025. NATA accredited laboratory 2562(4354).

SIGNATORIES

Andy Sutton
Organics Chemist

Dong Liang
Inorganics Metals Team Leader

Snezana Kostoska
Inorganics Chemist

Parameter	Units	LOR	Sample Number SE106705.001 Sample Matrix Water Sample Date 26 Mar 2012 Sample Name QA05
VOCs in Water Method: AN433/AN434			
Monocyclic Aromatic Hydrocarbons			
Benzene	µg/L	0.5	<0.5
Toluene	µg/L	0.5	<0.5
Ethylbenzene	µg/L	0.5	<0.5
m/p-xylene	µg/L	1	<1
o-xylene	µg/L	0.5	<0.5
Oxygenated Compounds			
MtBE (Methyl-tert-butyl ether)	µg/L	0.5	<0.5
Surrogates			
Dibromofluoromethane (Surrogate)	%	-	**115**
d4-1,2-dichloroethane (Surrogate)	%	-	**106**
d8-toluene (Surrogate)	%	-	**99**
Bromofluorobenzene (Surrogate)	%	-	**90**
Totals			
Total Xylenes	µg/L	1.5	<1.5
Total BTEX	µg/L	3	<3
Volatile Petroleum Hydrocarbons in Water Method: AN433/AN434			
TRH C6-C9	µg/L	40	<40
Surrogates			
Trifluorotoluene (Surrogate)	%	-	**90**
Dibromofluoromethane (Surrogate)	%	-	-
d4-1,2-dichloroethane (Surrogate)	%	-	-
d8-toluene (Surrogate)	%	-	-
Bromofluorobenzene (Surrogate)	%	-	-
TPH (Total Petroleum Hydrocarbons) in Water Method: AN403			
TPH C10-C14 Silica Gel	µg/L	100	<100
TPH C15-C28 Silica Gel	µg/L	200	<200
TPH C29-C36 Silica Gel	µg/L	200	<200
Trace Metals (Dissolved) in Water by ICPMS Method: AN318			
Arsenic, As	µg/L	1	**12**
Cadmium, Cd	µg/L	0.1	<0.1
Chromium, Cr	µg/L	1	<1
Copper, Cu	µg/L	1	<1
Lead, Pb	µg/L	1	<1
Nickel, Ni	µg/L	1	**45**
Zinc, Zn	µg/L	1	**49**

Parameter	Units	LOR	Sample Number SE106705.001 Sample Matrix Water Sample Date 26 Mar 2012 Sample Name QA05
Mercury (dissolved) in Water Method: AN311/AN312			
Mercury	mg/L	0.0001	<0.0001

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula: *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

Mercury (dissolved) in Water **Method: ME-(AU)-[ENV]AN311/AN312**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Mercury	LB017174	mg/L	0.0001	<0.0001	0%	117%

TPH (Total Petroleum Hydrocarbons) in Water **Method: ME-(AU)-[ENV]AN403**

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
TPH C10-C14 Silica Gel	LB016995	µg/L	100	<100	100%
TPH C15-C28 Silica Gel	LB016995	µg/L	200	<200	104%
TPH C29-C36 Silica Gel	LB016995	µg/L	200	<200	94%

Trace Metals (Dissolved) in Water by ICPMS **Method: ME-(AU)-[ENV]AN318**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Arsenic, As	LB017420	µg/L	1	<1	2%	95%	
Cadmium, Cd	LB017420	µg/L	0.1	<0.1	0%	99%	
Chromium, Cr	LB017420	µg/L	1	<1	0%	101%	
Copper, Cu	LB017420	µg/L	1	<1	5%	103%	
Lead, Pb	LB017420	µg/L	1	<1	0%	85%	
Nickel, Ni	LB017420	µg/L	1	<1	0%	102%	
Zinc, Zn	LB017420	µg/L	1	<1	1%	107%	105%

VOCs in Water **Method: ME-(AU)-[ENV]AN433/AN434**

Monocyclic Aromatic Hydrocarbons

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Benzene	LB017378	µg/L	0.5	<0.5	119%
Toluene	LB017378	µg/L	0.5	<0.5	110%
Ethylbenzene	LB017378	µg/L	0.5	<0.5	121%
m/p-xylene	LB017378	µg/L	1	<1	116%
o-xylene	LB017378	µg/L	0.5	<0.5	109%

Oxygenated Compounds

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
MtBE (Methyl-tert-butyl ether)	LB017378	µg/L	0.5	<0.5	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Dibromofluoromethane (Surrogate)	LB017378	%	-	113%	94%
d4-1,2-dichloroethane (Surrogate)	LB017378	%	-	107%	90%
d8-toluene (Surrogate)	LB017378	%	-	96%	89%
Bromofluorobenzene (Surrogate)	LB017378	%	-	113%	95%

Volatile Petroleum Hydrocarbons in Water **Method: ME-(AU)-[ENV]AN433/AN434**

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
TRH C6-C9	LB017378	µg/L	40	<40	104%

Surrogates

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Trifluorotoluene (Surrogate)	LB017378	%	-	100%	91%

METHOD SUMMARY

METHOD	METHODOLOGY SUMMARY
AN020	Unpreserved water sample is filtered through a 0.45µm membrane filter and acidified with nitric acid similar to APHA3030B.
AN083	Separatory funnels are used for aqueous samples and extracted by transferring an appropriate volume (mass) of liquid into a separatory funnel and adding 3 serial aliquots of dichloromethane. Samples receive a single extraction at pH 7 to recover base / neutral analytes and two extractions at pH < 2 to recover acidic analytes. QC samples are prepared by spiking organic free water with target analytes and extracting as per samples.
AN311/AN312	Mercury by Cold Vapour AAS in Waters: Mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500.
AN318	Determination of elements at trace level in waters by ICP-MS technique, in accordance with USEPA 6020A.
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36.
AN403	Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Petroleum Hydrocarbons (TPH) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with diffential polarity of the elluent solvents.
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependant on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.
AN433/AN434	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.

FOOTNOTES

IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
*	This analysis is not covered by the scope of accreditation.
^	Performed by outside laboratory.
LOR	Limit of Reporting
↑↓	Raised or Lowered Limit of Reporting
QFH	QC result is above the upper tolerance
QFL	QC result is below the lower tolerance
-	The sample was not analysed for this analyte
NVL	Not Validated

Samples analysed as received.
Solid samples expressed on a dry weight basis.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here:
http://www.au.sgs.com/sgs-mp-au-env-qu-022-qa-qc-plan-en-11.pdf

This document is issued, on the Client's behalf, by the Company under its General Conditions of Service available on request and accessible at http://www.au.sgs.com/terms_and_conditions_au. The Client's attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

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

This report must not be reproduced, except in full.

STATEMENT OF QA/QC PERFORMANCE

SE106705 R0

CLIENT DETAILS

Contact	Joanne Rosner
Client	JBS Environmental
Address	Suite 2, 595 Gardeners Road Mascot Sydney NSW 2020
Telephone	02 8338 1011
Facsimile	02 8338 1700
Email	jrosner@jbsgroup.com.au
Project	**41945 - Edmendson Park Remediation-GME**
Order Number	(Not specified)
Samples	1

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	SE106705 R0
Report Number	0000023224
Date Reported	03 Apr 2012

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS Environmental Services' stated Data Quality Objectives (DQO). Comments arising from the comparison were made and are reported below.

The data relating to sampling was taken from the Chain of Custody document and was supplied by the Client.
This QA/QC Statement must be read in conjunction with the referenced Analytical Report.
The Statement and the Analytical Report must not be reproduced except in full.

All Data Quality Objectives were met.

SAMPLE SUMMARY

Sample counts by matrix	1 Water	Type of documentation received	COC
Date documentation received	27/3/2012	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	20.0°C
Sample container provider	Other Lab	Turnaround time requested	Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	None	Samples clearly labelled	Yes
Complete documentation received	Yes		

HOLDING TIME SUMMARY

SE106705 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311/AN312

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QA05	SE106705.001	LB017174	26 Mar 2012	27 Mar 2012	23 Apr 2012	29 Mar 2012	23 Apr 2012	29 Mar 2012

TPH (Total Petroleum Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QA05	SE106705.001	LB016995	26 Mar 2012	27 Mar 2012	02 Apr 2012	28 Mar 2012	07 May 2012	03 Apr 2012

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QA05	SE106705.001	LB017420	26 Mar 2012	27 Mar 2012	22 Sep 2012	02 Apr 2012	22 Sep 2012	03 Apr 2012

VOCs in Water

Method: ME-(AU)-[ENV]AN433/AN434

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QA05	SE106705.001	LB017378	26 Mar 2012	27 Mar 2012	02 Apr 2012	01 Apr 2012	11 May 2012	02 Apr 2012

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433/AN434

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QA05	SE106705.001	LB017378	26 Mar 2012	27 Mar 2012	02 Apr 2012	01 Apr 2012	11 May 2012	02 Apr 2012

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

VOCs in Water — Method: ME-(AU)-[ENV]AN433/AN434

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	QA05	SE106705.001	%	60 - 130%	90
d4-1,2-dichloroethane (Surrogate)	QA05	SE106705.001	%	40 - 130%	106
d8-toluene (Surrogate)	QA05	SE106705.001	%	60 - 130%	99
Dibromofluoromethane (Surrogate)	QA05	SE106705.001	%	60 - 130%	115

Volatile Petroleum Hydrocarbons in Water — Method: ME-(AU)-[ENV]AN433/AN434

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Trifluorotoluene (Surrogate)	QA05	SE106705.001	%	40 - 130%	90

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311/AN312

Sample Number	Parameter	Units	LOR	Result
LB017174.001	Mercury	mg/L	0.0001	<0.0001

TPH (Total Petroleum Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR	Result
LB016995.001	TPH C10-C14 Silica Gel	µg/L	100	<100
	TPH C15-C28 Silica Gel	µg/L	200	<200
	TPH C29-C36 Silica Gel	µg/L	200	<200

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR	Result
LB017420.001	Arsenic, As	µg/L	1	<1
	Cadmium, Cd	µg/L	0.1	<0.1
	Chromium, Cr	µg/L	1	<1
	Copper, Cu	µg/L	1	<1
	Lead, Pb	µg/L	1	<1
	Nickel, Ni	µg/L	1	<1
	Zinc, Zn	µg/L	1	<1

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433/AN434

Sample Number		Parameter	Units	LOR	Result
LB017378.001		TRH C6-C9	µg/L	40	<40
	Surrogates	Trifluorotoluene (Surrogate)	%	-	100

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311/AN312

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE106719.019	LB017174.012	Mercury	µg/L	0.0001	<0.0001	<0.0001	200	0

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE106848.001	LB017420.018	Arsenic, As	µg/L	1	1.608	1.64	77	2
		Cadmium, Cd	µg/L	0.1	0.004	0.004	200	0
		Chromium, Cr	µg/L	1	0.03	0.016	200	0
		Copper, Cu	µg/L	1	1.064	1.01	111	5
		Lead, Pb	µg/L	1	0.002	0.001	200	0
		Nickel, Ni	µg/L	1	0.372	0.341	200	0
		Zinc, Zn	µg/L	1	1.065	1.081	108	1

LABORATORY CONTROL SAMPLES

SE106705 R0

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311/AN312

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB017174.002	Mercury	mg/L	0.0001	0.0094	0.008	80 - 120	117

TPH (Total Petroleum Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB016995.002	TPH C10-C14 Silica Gel	µg/L	100	1200	1200	60 - 140	100
	TPH C15-C28 Silica Gel	µg/L	200	1200	1200	60 - 140	104
	TPH C29-C36 Silica Gel	µg/L	200	1100	1200	60 - 140	94

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB017420.002	Arsenic, As	µg/L	1	19	20	80 - 120	95
	Cadmium, Cd	µg/L	0.1	20	20	80 - 120	99
	Chromium, Cr	µg/L	1	20	20	80 - 120	101
	Copper, Cu	µg/L	1	21	20	80 - 120	103
	Lead, Pb	µg/L	1	17	20	80 - 120	85
	Nickel, Ni	µg/L	1	20	20	80 - 120	102
	Zinc, Zn	µg/L	1	21	20	80 - 120	107

VOCs in Water

Method: ME-(AU)-[ENV]AN433/AN434

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB017378.002	Monocyclic	Benzene	µg/L	0.5	54	45.45	60 - 140	119
	Aromatic	Toluene	µg/L	0.5	50	45.45	60 - 140	110
		Ethylbenzene	µg/L	0.5	55	45.45	60 - 140	121
		m/p-xylene	µg/L	1	110	90.9	60 - 140	116
		o-xylene	µg/L	0.5	50	45.45	60 - 140	109

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433/AN434

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB017378.002	TRH C6-C9	µg/L	40	860	827	60 - 140	104

MATRIX SPIKES

SE106705 R0

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub -sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Trace Metals (Dissolved) in Water by ICPMS — **Method: ME-(AU)-[ENV]AN318**

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE106681.001	LB017420.004	Zinc, Zn	µg/L	1	26	6	20	105

MATRIX SPIKE DUPLICATES

SE106705 R0

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The original result is the analyte concentration of the matrix spike. The Duplicate result is the analyte concentration of the matrix spike duplicate.

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

QC criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found here:
http://www.au.sgs.com/sgs-mp-au-env-qu-022-qa-qc-plan-en-11.pdf

*	Non-accredited analysis.
-	Sample not analysed for this analyte.
^	Analysis performed by external laboratory.

IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
LOR	Limit of reporting.
QFH	QC result is above the upper tolerance.
QFL	QC result is below the lower tolerance.

①	At least 2 of 3 surrogates are within acceptance criteria.
②	RPD failed acceptance criteria due to sample heterogeneity.
③	Results less than 5 times LOR preclude acceptance criteria for RPD.
④	Recovery failed acceptance criteria due to matrix interference.
⑤	Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
⑥	LOR was raised due to sample matrix interference.
⑦	LOR was raised due to dilution of significantly high concentration of analyte in sample.
⑧	Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
⑨	Recovery failed acceptance criteria due to sample heterogeneity.
†	Refer to Analytical Report comments for further information.

This document is issued, on the Client's behalf, by the Company under its General Conditions of Service, available on request and accessible at http://www.sgs.com/terms_and_conditions.htm. The Client's attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

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

This test report shall not be reproduced, except in full.

for SGS

CHAIN OF CUSTODY

JBS ENVIRONMENTAL

PROJECT NO.: 41945
PROJECT NAME: Edmondson Park Residential - GME
SEND REPORT TO: AB + JR
SEND INVOICE TO: Accounts
DATE NEEDED BY: Standard Turn Around ✓

LABORATORY BATCH NO.
SAMPLERS AB
PHONE: 02 8338 1011
EMAIL: abacdman@jbsgroup.com.au; jrosre@jbsgroup.com.au
QC LEVEL: NEPM 1999 (✓

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

SAMPLE ID	MATRIX	D A T E	TIME	TYPE & PRESERVATIVE	pH	TRH *	BTEX *	Metals (8)	NOTES
QA05	Note	26-3-12		1X amber, 2X vials		X	X	X	

* Use dual extraction + silica gel cleanup

SGS
Received 27/03/12
By SB @ 2.05 pm
Samples intact ... Y/N
Cooler Pack ... Y/N
Temperature on Receipt ... 26c
Ref ... WO43
SE106705

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: AB DATE: 26-3-12	CONSIGNMENT NOTE NO.	NAME: DATE: 27/03	COOLER SEAL – Yes..... No ✓ Intact ✓ Broken .....
OF: JBS Environmental	TRANSPORT CO.	OF:	COOLER TEMP ..... deg C
NAME: Sophie DATE: 27/03.	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: ELS	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

JBS Environmental Pty Ltd ABN 67 071 842 638
Phone: (02) 8338-1011
Fax: (02) 8338-1700
128 O'Riordan St, MASCOT NSW 2020
PO Box 940 MASCOT NSW 1460
www.jbsgroup.com.au

SGS

AUSTRALIA – ENVIRONMENTAL SERVICES SYDNEY – PROFORMA FORM
SAMPLE INFORMATION

Approved: D. Liang

JOB No. SE 106705

Sample No.	P 100ml UP	P 250ml UP	P 500ml UP	P 1L UP	G 100 Amber UP	G 200 Amber UP	G 500 Amber UP	G 1L Amber UP	G 40ml vial Up	G 40ml Vial HCl	P 100ml HCl	G 40ml Vial H2SO4	P 100ml H2SO4	P 250ml H2SO4	G 500ml Amber H2SO4	G 1L H2SO4	P 100/250ml HN03 Total	P 100ml HN03 Filtered	P 250ml NaOH	P 250ml Zn Acetate	Plastic Bag	G 250ml Soil Jar				Sample Matrix	Lab Bottles Supplied By	Comments
1								1		2								1								water	Envirolab	Full

SAMPLE RECEIPT ADVICE

SE106705

CLIENT DETAILS

Contact	Joanne Rosner
Client	JBS Environmental
Address	Suite 2, 595 Gardeners Road Mascot Sydney NSW 2020
Telephone	02 8338 1011
Facsimile	02 8338 1700
Email	jrosner@jbsgroup.com.au
Project	**41945 - Edmendson Park Remediation-GME**
Order Number	(Not specified)
Samples	1

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
Samples Received	Tue 27/3/2012
Report Due	Tue 3/4/2012
SGS Reference	**SE106705**

SUBMISSION DETAILS

This is to confirm that 1 sample was received on Tuesday 27/3/2012. Results are expected to be ready by Tuesday 3/4/2012. Please quote SGS reference SE106705 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Sample counts by matrix	1 Water	Type of documentation received	COC
Date documentation received	27/3/2012	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	20.0°C
Sample container provider	Other Lab	Turnaround time requested	Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	None	Samples clearly labelled	Yes
Complete documentation received	Yes		

Samples will be held for one month for water samples and two months for soil samples from date of report, unless otherwise instructed.

COMMENTS

To the extent not inconsistent with the other provisions of this document and unless specifically agreed otherwise in writing by SGS, all SGS services are rendered in accordance with the applicable SGS General Conditions of Service accessible at http://www.sgs.com/terms_and_conditions.htm as at the date of this document. Attention is drawn to the limitations of liability and to the clauses of indemnification.

SAMPLE RECEIPT ADVICE

SE106705

CLIENT DETAILS

Client	JBS Environmental	Project	41945 - Edmendson Park Remediation-GME

SUMMARY OF ANALYSIS

No.	Sample ID	Mercury (dissolved) in Water	TPH (Total Petroleum Hydrocarbons) in Water	Trace Metals (Dissolved) in Water by ICPMS	VOCs in Water	Volatile Petroleum Hydrocarbons in Water
001	QA05	1	3	7	12	6

The above table represents SGS Environmental Services' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details.
Testing as per this table shall commence immediately unless the client intervenes with a correction.

ANALYTICAL REPORT

CLIENT DETAILS		LABORATORY DETAILS	
Contact	Joanne Rosner	Manager	Huong Crawford
Client	JBS Environmental	Laboratory	SGS Alexandria Environmental
Address	Suite 2, 595 Gardeners Road Mascot Sydney NSW 2020	Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	02 8338 1011	Telephone	+61 2 8594 0400
Facsimile	02 8338 1700	Facsimile	+61 2 8594 0499
Email	jrosner@jbsgroup.com.au	Email	au.environmental.sydney@sgs.com
Project	**41945 - Edmondson Park**	SGS Reference	SE105375 R0
Order Number	(Not specified)	Report Number	0000019195
Samples	1	Date Reported	23 Feb 2012
		Date Received	13 Feb 2012

COMMENTS

The document is issued in accordance with NATA's accreditation requirements.
Accredited for compliance with ISO/IEC 17025. NATA accredited laboratory 2562(4354).

SIGNATORIES

Andy Sutton
Organics Chemist

Dong Liang
Inorganics Metals Team Leader

Huong Crawford
Laboratory Manager

Parameter	Units	LOR	Sample Number SE105375.001 Sample Matrix Water Sample Date 10 Feb 2012 Sample Name QA01
VOCs in Water Method: AN433/AN434			
Monocyclic Aromatic Hydrocarbons			
Benzene	µg/L	0.5	<0.5
Toluene	µg/L	0.5	<0.5
Ethylbenzene	µg/L	0.5	<0.5
m/p-xylene	µg/L	1	<1
o-xylene	µg/L	0.5	<0.5
Oxygenated Compounds			
MtBE (Methyl-tert-butyl ether)	µg/L	0.5	<0.5
Surrogates			
Dibromofluoromethane (Surrogate)	%	-	**108**
d4-1,2-dichloroethane (Surrogate)	%	-	**107**
d8-toluene (Surrogate)	%	-	**100**
Bromofluorobenzene (Surrogate)	%	-	**92**
Totals			
Total Xylenes	µg/L	1.5	<1.5
Total BTEX	µg/L	3	<3
Volatile Petroleum Hydrocarbons in Water Method: AN433/AN434			
TRH C6-C9	µg/L	40	<40
Surrogates			
Trifluorotoluene (Surrogate)	%	-	**100**
Dibromofluoromethane (Surrogate)	%	-	-
d4-1,2-dichloroethane (Surrogate)	%	-	-
d8-toluene (Surrogate)	%	-	-
Bromofluorobenzene (Surrogate)	%	-	-
TRH (Total Recoverable Hydrocarbons) in Water Method: AN403			
TRH C10-C14	µg/L	100	<100
TRH C15-C28	µg/L	200	<200
TRH C29-C36	µg/L	200	<200
Surrogates			
TRH (Surrogate)	%	-	-
PAH (Polynuclear Aromatic Hydrocarbons) in Water Method: AN420			
Naphthalene	µg/L	0.1	<0.1
2-methylnaphthalene	µg/L	0.1	<0.1
1-methylnaphthalene	µg/L	0.1	<0.1
Acenaphthylene	µg/L	0.1	<0.1
Acenaphthene	µg/L	0.1	<0.1
Fluorene	µg/L	0.1	<0.1
Phenanthrene	µg/L	0.1	<0.1
Anthracene	µg/L	0.1	<0.1
Fluoranthene	µg/L	0.1	<0.1
Pyrene	µg/L	0.1	<0.1
Benzo(a)anthracene	µg/L	0.1	<0.1
Chrysene	µg/L	0.1	<0.1
Benzo(b)fluoranthene	µg/L	0.1	<0.1
Benzo(k)fluoranthene	µg/L	0.1	<0.1
Benzo(a)pyrene	µg/L	0.1	<0.1
Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1
Dibenzo(a&h)anthracene	µg/L	0.1	<0.1

Parameter	Units	LOR	Sample Number SE105375.001 Sample Matrix Water Sample Date 10 Feb 2012 Sample Name QA01
PAH (Polynuclear Aromatic Hydrocarbons) in Water Method: AN420 (continued)			
Benzo(ghi)perylene	µg/L	0.1	<0.1
Total PAH (18)	µg/L	1	<1
Surrogates			
d5-nitrobenzene (Surrogate)	%	-	**110**
2-fluorobiphenyl (Surrogate)	%	-	**110**
d14-p-terphenyl (Surrogate)	%	-	**120**
Trace Metals (Dissolved) in Water by ICPMS Method: AN318			
Arsenic, As	µg/L	1	<1
Cadmium, Cd	µg/L	0.1	<1.0↑
Chromium, Cr	µg/L	1	<2↑
Copper, Cu	µg/L	1	**6**
Lead, Pb	µg/L	1	**7**
Nickel, Ni	µg/L	1	**48**
Zinc, Zn	µg/L	1	**64**
Mercury (dissolved) in Water Method: AN311/AN312			
Mercury	mg/L	0.0001	<0.0001

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula: *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

Mercury (dissolved) in Water Method: ME-(AU)-[ENV]AN311/AN312

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Mercury	LB014307	mg/L	0.0001	<0.0001	0%	105%

PAH (Polynuclear Aromatic Hydrocarbons) in Water Method: ME-(AU)-[ENV]AN420

Parameter	QC Reference	Units	LOR	MB
Naphthalene	LB014066	µg/L	0.1	<0.1
2-methylnaphthalene	LB014066	µg/L	0.1	<0.1
1-methylnaphthalene	LB014066	µg/L	0.1	<0.1
Acenaphthylene	LB014066	µg/L	0.1	<0.1
Acenaphthene	LB014066	µg/L	0.1	<0.1
Fluorene	LB014066	µg/L	0.1	<0.1
Phenanthrene	LB014066	µg/L	0.1	<0.1
Anthracene	LB014066	µg/L	0.1	<0.1
Fluoranthene	LB014066	µg/L	0.1	<0.1
Pyrene	LB014066	µg/L	0.1	<0.1
Benzo(a)anthracene	LB014066	µg/L	0.1	<0.1
Chrysene	LB014066	µg/L	0.1	<0.1
Benzo(b)fluoranthene	LB014066	µg/L	0.1	<0.1
Benzo(k)fluoranthene	LB014066	µg/L	0.1	<0.1
Benzo(a)pyrene	LB014066	µg/L	0.1	<0.1
Indeno(1,2,3-cd)pyrene	LB014066	µg/L	0.1	<0.1
Dibenzo(a&h)anthracene	LB014066	µg/L	0.1	<0.1
Benzo(ghi)perylene	LB014066	µg/L	0.1	<0.1
Total PAH (18)	LB014066	µg/L	1	<1

Surrogates

Parameter	QC Reference	Units	LOR	MB
d5-nitrobenzene (Surrogate)	LB014066	%	-	80%
2-fluorobiphenyl (Surrogate)	LB014066	%	-	80%
d14-p-terphenyl (Surrogate)	LB014066	%	-	107%

Trace Metals (Dissolved) in Water by ICPMS Method: ME-(AU)-[ENV]AN318

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Arsenic, As	LB014163	µg/L	1	<1	96%
Cadmium, Cd	LB014163	µg/L	0.1	<0.1	99%
Chromium, Cr	LB014163	µg/L	1	<1	97%
Copper, Cu	LB014163	µg/L	1	<1	99%
Lead, Pb	LB014163	µg/L	1	<1	96%
Nickel, Ni	LB014163	µg/L	1	<1	97%
Zinc, Zn	LB014163	µg/L	1	<2	97%

TRH (Total Recoverable Hydrocarbons) in Water Method: ME-(AU)-[ENV]AN403

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
TRH C10-C14	LB014066	µg/L	100	<100	87%
TRH C15-C28	LB014066	µg/L	200	<200	73%
TRH C29-C36	LB014066	µg/L	200	<200	80%

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula: *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

VOCs in Water **Method: ME-(AU)-[ENV]AN433/AN434**

Monocyclic Aromatic Hydrocarbons

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Benzene	LB014263	µg/L	0.5	<0.5	0%	121%	109%
Toluene	LB014263	µg/L	0.5	<0.5	0%	117%	110%
Ethylbenzene	LB014263	µg/L	0.5	<0.5	0%	130%	108%
m/p-xylene	LB014263	µg/L	1	<1	0%	124%	109%
o-xylene	LB014263	µg/L	0.5	<0.5	0%	123%	110%

Oxygenated Compounds

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery	MS %Recovery
MtBE (Methyl-tert-butyl ether)	LB014263	µg/L	0.5	<0.5	NA	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Dibromofluoromethane (Surrogate)	LB014263	%	-	102%	0%	98%	102%
d4-1,2-dichloroethane (Surrogate)	LB014263	%	-	104%	2%	98%	101%
d8-toluene (Surrogate)	LB014263	%	-	101%	2%	100%	100%
Bromofluorobenzene (Surrogate)	LB014263	%	-	94%	1%	103%	100%

Volatile Petroleum Hydrocarbons in Water **Method: ME-(AU)-[ENV]AN433/AN434**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
TRH C6-C9	LB014263	µg/L	40	<40	0%	111%	95%

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Trifluorotoluene (Surrogate)	LB014263	%	-	101%	2%	87%	100%

METHOD SUMMARY

METHOD	METHODOLOGY SUMMARY
AN020	Unpreserved water sample is filtered through a 0.45µm membrane filter and acidified with nitric acid similar to APHA3030B.
AN083	Separatory funnels are used for aqueous samples and extracted by transferring an appropriate volume (mass) of liquid into a separatory funnel and adding 3 serial aliquots of dichloromethane. Samples receive a single extraction at pH 7 to recover base / neutral analytes and two extractions at pH < 2 to recover acidic analytes. QC samples are prepared by spiking organic free water with target analytes and extracting as per samples.
AN311/AN312	Mercury by Cold Vapour AAS in Waters: Mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500.
AN318	Determination of elements at trace level in waters by ICP-MS technique, in accordance with USEPA 6020A.
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36.
AN403	Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Petroleum Hydrocarbons (TPH) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with diffential polarity of the elluent solvents.
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependant on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.
AN420	(SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN433/AN434	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.

FOOTNOTES

IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
*	This analysis is not covered by the scope of accreditation.
^	Performed by outside laboratory.
LOR	Limit of Reporting
↑↓	Raised or Lowered Limit of Reporting
QFH	QC result is above the upper tolerance
QFL	QC result is below the lower tolerance
-	The sample was not analysed for this analyte
NVL	Not Validated

Samples analysed as received.
Solid samples expressed on a dry weight basis.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here:
http://www.au.sgs.com/sgs-mp-au-env-qu-022-qa-qc-plan-en-11.pdf

This document is issued, on the Client's behalf, by the Company under its General Conditions of Service available on request and accessible at http://www.au.sgs.com/terms_and_conditions_au. The Client's attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

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

This report must not be reproduced, except in full.

STATEMENT OF QA/QC PERFORMANCE

SE105375 R0

CLIENT DETAILS

Contact	Joanne Rosner
Client	JBS Environmental
Address	Suite 2, 595 Gardeners Road Mascot Sydney NSW 2020
Telephone	02 8338 1011
Facsimile	02 8338 1700
Email	jrosner@jbsgroup.com.au
Project	**41945 - Edmondson Park**
Order Number	(Not specified)
Samples	1

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	SE105375 R0
Report Number	0000019196
Date Reported	23 Feb 2012

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS Environmental Services' stated Data Quality Objectives (DQO). Comments arising from the comparison were made and are reported below.

The data relating to sampling was taken from the Chain of Custody document and was supplied by the Client.
This QA/QC Statement must be read in conjunction with the referenced Analytical Report.
The Statement and the Analytical Report must not be reproduced except in full.

All Data Quality Objectives were met.

SAMPLE SUMMARY

Sample counts by matrix	1 Water	Type of documentation received	COC
Date documentation received	13/2/2012	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	2.7°C
Sample container provider	Other Lab	Turnaround time requested	Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	Ice Bricks	Samples clearly labelled	Yes
Complete documentation received	Yes		

HOLDING TIME SUMMARY

SE105375 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311/AN312

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QA01	SE105375.001	LB014307	10 Feb 2012	13 Feb 2012	09 Mar 2012	17 Feb 2012	09 Mar 2012	21 Feb 2012

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QA01	SE105375.001	LB014066	10 Feb 2012	13 Feb 2012	17 Feb 2012	14 Feb 2012	25 Mar 2012	16 Feb 2012

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QA01	SE105375.001	LB014163	10 Feb 2012	13 Feb 2012	08 Aug 2012	15 Feb 2012	08 Aug 2012	23 Feb 2012

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QA01	SE105375.001	LB014066	10 Feb 2012	13 Feb 2012	17 Feb 2012	14 Feb 2012	25 Mar 2012	21 Feb 2012

VOCs in Water

Method: ME-(AU)-[ENV]AN433/AN434

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QA01	SE105375.001	LB014263	10 Feb 2012	13 Feb 2012	17 Feb 2012	16 Feb 2012	27 Mar 2012	17 Feb 2012

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433/AN434

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QA01	SE105375.001	LB014263	10 Feb 2012	13 Feb 2012	17 Feb 2012	16 Feb 2012	27 Mar 2012	17 Feb 2012

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

PAH (Polynuclear Aromatic Hydrocarbons) in Water — Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	QA01	SE105375.001	%	40 - 130%	110
d14-p-terphenyl (Surrogate)	QA01	SE105375.001	%	40 - 130%	120
d5-nitrobenzene (Surrogate)	QA01	SE105375.001	%	40 - 130%	110

VOCs in Water — Method: ME-(AU)-[ENV]AN433/AN434

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	QA01	SE105375.001	%	60 - 130%	92
d4-1,2-dichloroethane (Surrogate)	QA01	SE105375.001	%	40 - 130%	107
d8-toluene (Surrogate)	QA01	SE105375.001	%	60 - 130%	100
Dibromofluoromethane (Surrogate)	QA01	SE105375.001	%	60 - 130%	108

Volatile Petroleum Hydrocarbons in Water — Method: ME-(AU)-[ENV]AN433/AN434

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Trifluorotoluene (Surrogate)	QA01	SE105375.001	%	40 - 130%	100

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311/AN312

Sample Number	Parameter	Units	LOR	Result
LB014307.001	Mercury	mg/L	0.0001	<0.0001

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB014066.001		Naphthalene	µg/L	0.1	<0.1
		2-methylnaphthalene	µg/L	0.1	<0.1
		1-methylnaphthalene	µg/L	0.1	<0.1
		Acenaphthylene	µg/L	0.1	<0.1
		Acenaphthene	µg/L	0.1	<0.1
		Fluorene	µg/L	0.1	<0.1
		Phenanthrene	µg/L	0.1	<0.1
		Anthracene	µg/L	0.1	<0.1
		Fluoranthene	µg/L	0.1	<0.1
		Pyrene	µg/L	0.1	<0.1
		Benzo(a)anthracene	µg/L	0.1	<0.1
		Chrysene	µg/L	0.1	<0.1
		Benzo(a)pyrene	µg/L	0.1	<0.1
		Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1
		Dibenzo(a&h)anthracene	µg/L	0.1	<0.1
		Benzo(ghi)perylene	µg/L	0.1	<0.1
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	80
		2-fluorobiphenyl (Surrogate)	%	-	80
		d14-p-terphenyl (Surrogate)	%	-	107

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR	Result
LB014163.001	Arsenic, As	µg/L	1	<1
	Cadmium, Cd	µg/L	0.1	<0.1
	Chromium, Cr	µg/L	1	<1
	Copper, Cu	µg/L	1	<1
	Lead, Pb	µg/L	1	<1
	Nickel, Ni	µg/L	1	<1
	Zinc, Zn	µg/L	1	<2

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR	Result
LB014066.001	TRH C10-C14	µg/L	100	<100
	TRH C15-C28	µg/L	200	<200
	TRH C29-C36	µg/L	200	<200

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433/AN434

Sample Number		Parameter	Units	LOR	Result
LB014263.001		TRH C6-C9	µg/L	40	<40
	Surrogates	Trifluorotoluene (Surrogate)	%	-	101

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311/AN312

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE105440.034	LB014307.014		Mercury	µg/L	0.0001	0	0	200	0

VOCs in Water

Method: ME-(AU)-[ENV]AN433/AN434

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE105448.003	LB014263.014	Monocyclic	Benzene	µg/L	0.5	0	0	200	0
		Aromatic	Toluene	µg/L	0.5	0	0	200	0
			Ethylbenzene	µg/L	0.5	0	0	200	0
			m/p-xylene	µg/L	1	0	0	200	0
			o-xylene	µg/L	0.5	0	0	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	103	103	30	0
			d4-1,2-dichloroethane (Surrogate)	µg/L	-	103	105	30	2
			d8-toluene (Surrogate)	µg/L	-	101	99	30	2
			Bromofluorobenzene (Surrogate)	µg/L	-	94	93	30	1

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433/AN434

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE105448.003	LB014263.014		TRH C6-C9	µg/L	40	0	0	200	0
		Surrogates	Trifluorotoluene (Surrogate)	%	-	101	99	30	2

LABORATORY CONTROL SAMPLES

SE105375 R0

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311/AN312

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB014307.002	Mercury	mg/L	0.0001	0.0084	0.008	80 - 120	105

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB014163.002	Arsenic, As	µg/L	1	19	20	80 - 120	96
	Cadmium, Cd	µg/L	0.1	20	20	80 - 120	99
	Chromium, Cr	µg/L	1	19	20	80 - 120	97
	Copper, Cu	µg/L	1	20	20	80 - 120	99
	Lead, Pb	µg/L	1	19	20	80 - 120	96
	Nickel, Ni	µg/L	1	19	20	80 - 120	97
	Zinc, Zn	µg/L	1	19	20	80 - 120	97

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB014066.002	TRH C10-C14	µg/L	100	1000	1200	60 - 140	87
	TRH C15-C28	µg/L	200	880	1200	60 - 140	73
	TRH C29-C36	µg/L	200	960	1200	60 - 140	80

VOCs in Water

Method: ME-(AU)-[ENV]AN433/AN434

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB014263.002	Monocyclic	Benzene	µg/L	0.5	55	45.45	60 - 140	121
	Aromatic	Toluene	µg/L	0.5	53	45.45	60 - 140	117
		Ethylbenzene	µg/L	0.5	59	45.45	60 - 140	130
		m/p-xylene	µg/L	1	110	90.9	60 - 140	124
		o-xylene	µg/L	0.5	56	45.45	60 - 140	123

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433/AN434

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB014263.002	TRH C6-C9	µg/L	40	920	827	60 - 140	111

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub -sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

VOCs in Water

Method: ME-(AU)-[ENV]AN433/AN434

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE105405.047	LB014263.007	Monocyclic	Benzene	µg/L	0.5	50	<0.5	45.45	109
		Aromatic	Toluene	µg/L	0.5	50	<0.5	45.45	110
			Ethylbenzene	µg/L	0.5	49	<0.5	45.45	108
			m/p-xylene	µg/L	1	99	<1	90.9	109
			o-xylene	µg/L	0.5	50	<0.5	45.45	110
		Oxygenated	MtBE (Methyl-tert-butyl ether)	µg/L	0.5	<0.5	<0.5	-	-
		Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	102.0	109.0	-	102
			d4-1,2-dichloroethane (Surrogate)	µg/L	-	101.0	107.0	-	101
			d8-toluene (Surrogate)	µg/L	-	100.0	99.0	-	100
			Bromofluorobenzene (Surrogate)	µg/L	-	100.0	91.0	-	100

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433/AN434

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE105405.047	LB014263.007		TRH C6-C9	µg/L	40	780	<40	827	95
		Surrogates	Trifluorotoluene (Surrogate)	%	-	100.0	99.0	-	100

MATRIX SPIKE DUPLICATES

SE105375 R0

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The original result is the analyte concentration of the matrix spike. The Duplicate result is the analyte concentration of the matrix spike duplicate.

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

QC criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found here:
http://www.au.sgs.com/sgs-mp-au-env-qu-022-qa-qc-plan-en-11.pdf

*	Non-accredited analysis.
-	Sample not analysed for this analyte.
^	Analysis performed by external laboratory.

IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
LOR	Limit of reporting.
QFH	QC result is above the upper tolerance.
QFL	QC result is below the lower tolerance.

①	At least 2 of 3 surrogates are within acceptance criteria.
②	RPD failed acceptance criteria due to sample heterogeneity.
③	Results less than 5 times LOR preclude acceptance criteria for RPD.
④	Recovery failed acceptance criteria due to matrix interference.
⑤	Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
⑥	LOR was raised due to sample matrix interference.
⑦	LOR was raised due to dilution of significantly high concentration of analyte in sample.
⑧	Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
⑨	Recovery failed acceptance criteria due to sample heterogeneity.
†	Refer to Analytical Report comments for further information.

This document is issued, on the Client's behalf, by the Company under its General Conditions of Service, available on request and accessible at http://www.sgs.com/terms_and_conditions.htm. The Client's attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

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

This test report shall not be reproduced, except in full.

coc received 13/12/12 @ 5:14 pm

For SGS

CHAIN OF CUSTODY

JBS ENVIRONMENTAL

PROJECT NO.: 41945	LABORATORY BATCH NO.
PROJECT NAME Edmondson Park	SAMPLERS RB
SEND REPORT TO: Jrosner SEND INVOICE TO: A.Trayer	PHONE: EMAIL: Jrosner@jbsgroup.com.au
DATE NEEDED BY: standard	QC LEVEL: NEPM 1999 (✓)
COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:	

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	Metals (8)	TPH (C6-36)	TRH (C6-10)	BTEX														NOTES
QA01	water	10-2-12		2xvials, 1xamber 1xmetal		X	X	X	X														

Received 13/12/12 $185.375

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: RB DATE: 10-2-12	CONSIGNMENT NOTE NO.	NAME: DATE: 13/12	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO.	OF:	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

JBS Environmental Pty Ltd ABN 67 071 842 638
Phone: (02) 8338-1011
Fax: (02) 8338-1700

Suite 2, 595 Gardeners Road MASCOT NSW 2020
PO Box 940 MASCOT NSW 1460
www.jbsgroup.com.au

SGS

AUSTRALIA – ENVIRONMENTAL SERVICES SYDNEY – PROFORMA FORM
SAMPLE INFORMATION

Approved: D. Liang

JOB No. SE105375

Sample No.	P 100ml UP	P 250ml UP	P 500ml UP	P 1L UP	G 100 Amber UP	G 200 Amber UP	G 500 Amber UP	G 1L Amber UP	G 40ml vial Up	G 40ml Vial HCl	P 100ml HCl	G 40ml Vial H2SO4	P 100ml H2SO4	P 250ml H2SO4	G 500ml Amber H2SO4	G 1L H2SO4	P 100/250ml HN03 Total	P ~~100~~ml HN03 Filtered	P 250ml NaOH	P 250ml Zn Acetate	Plastic Bag	G 250ml Soil Jar				Sample Matrix	Lab Bottles Supplied By	Comments
1								1		2								1								water	Envirolab	Fe(+)

SAMPLE RECEIPT ADVICE

SE105375

CLIENT DETAILS

Contact	Joanne Rosner
Client	JBS Environmental
Address	Suite 2, 595 Gardeners Road Sydney Mascot NSW 2020
Telephone	02 8338 1011
Facsimile	02 8338 1700
Email	jrosner@jbsgroup.com.au
Project	**41945 - Edmondson Park**
Order Number	(Not specified)
Samples	1

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
Samples Received	Mon 13/2/2012
Report Due	Tue 21/2/2012
SGS Reference	**SE105375**

SUBMISSION DETAILS

This is to confirm that 1 sample was received on Monday 13/2/2012. Results are expected to be ready by Tuesday 21/2/2012. Please quote SGS reference SE105375 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Sample counts by matrix	1 Water	Type of documentation received	COC
Date documentation received	13/2/2012	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	2.7°C
Sample container provider	Other Lab	Turnaround time requested	Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	Ice Bricks	Samples clearly labelled	Yes
Complete documentation received	Yes		

Samples will be held for one month for water samples and two months for soil samples from date of report, unless otherwise instructed.

COMMENTS

Instructions received 13/2/12@5:14pm. Samples were not registered until the next working day.

To the extent not inconsistent with the other provisions of this document and unless specifically agreed otherwise in writing by SGS, all SGS services are rendered in accordance with the applicable SGS General Conditions of Service accessible at http://www.sgs.com/terms_and_conditions.htm as at the date of this document. Attention is drawn to the limitations of liability and to the clauses of indemnification.

SAMPLE RECEIPT ADVICE

SE105375

CLIENT DETAILS

Client	JBS Environmental	Project	41945 - Edmondson Park

SUMMARY OF ANALYSIS

No.	Sample ID	Mercury (dissolved) in Water	PAH (Polynuclear Aromatic Hydrocarbons) in	Trace Metals (Dissolved) in Water by ICPMS	TRH (Total Recoverable Hydrocarbons) in Water	VOCs in Water	Volatile Petroleum Hydrocarbons in Water
001	QA01	1	22	7	4	12	6

The above table represents SGS Environmental Services' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details.
Testing as per this table shall commence immediately unless the client intervenes with a correction.

Attachment 7 – Summary tables – Groundwater Sample Analytical Results

Arise Developments
Job Number: 41945
Zouch Road, Edmondson Park
Pre-Remediation GME
Table A - Groundwater Analytical Results

Notes:
(1) Adopted Groundwater Assessment Criteria (refer to text Table 6.1) - the lower of the nominated health/ecological investigation criterion

Units as indicated in table.
bold Concentration Exceeds (1)

- Not Analysed - insufficient sample volume

			Metals								PAHs															TPH					BTEX					
			Arsenic (Filtered)	Cadmium (Filtered)	Chromium (III+VI) (Filtered)	Copper (Filtered)	Lead (Filtered)	Mercury (Filtered)	Nickel (Filtered)	Zinc (Filtered)	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(b)&(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of total)	Benzene	Ethylbenzene	Toluene	Xylene (m & p)	Xylene (o)	Xylene Total
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL			0.001	0.0001	0.001	0.001	0.001	0.00005	0.001	0.001	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	10	50	100	100		1	1	1	2	1	
Assessment Criteria - Health Based			0.007	0.002	0.005	2	0.01	0.001	0.02	3																				600	1	300	800			600
Assessment Criteria - Ecological			0.024	0.0002	0.0033	0.0014	0.0034	0.00006	0.011	0.008			0.1		0.1					1			16	0.6							500	5	180	275	350	
Field_ID	**Sampled_Date-Time**	**Matrix**																																		
February 2012 Sampling Event																																				
BH2	10/02/2012	Groundwater	<0.001	<0.0001	<0.001	**0.014**	**0.011**	<0.00005	0.006	**0.14**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<10	56	330	<100	436	<1	<1	<1	<2	<1	<3
BH291	9/02/2012	Groundwater	<0.001	<0.0001	<0.001	0.001	0.001	<0.00005	**0.034**	**0.042**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<10	<50	<100	<100	<250	<1	<1	<1	<2	<1	<3
BH521	9/02/2012	Groundwater	**0.012**	<0.0001	<0.001	<0.001	<0.001	<0.00005	**0.031**	**0.02**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<10	<50	<100	<100	<250	<1	<1	<1	<2	<1	<3
BH558	10/02/2012	Groundwater	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<100	-	-	-	-	<10	<10	<10	<20	<10	<30
BH608	10/02/2012	Groundwater	<0.001	0.0001	<0.001	**0.01**	**0.01**	<0.00005	**0.073**	**0.088**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<10	<50	<100	<100	<250	<1	<1	<1	<2	<1	<3
March 2012 Limited Sampling Event																																				
BH2	26/03/2012	Groundwater	**0.017**	<0.0001	<0.001	<0.001	<0.001	<0.00005	**0.044**	**0.063**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<10	<50	<100	<100	<250	<1	<1	<1	<2	<1	<3
PSW1	26/03/2012	Surface water	0.003	0.001	<0.001	**0.006**	**0.004**	<0.00005	0.005	**0.027**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<10	59	420	560	**1039**	<1	<1	<1	<2	<1	<3

JBS41945- 53464

25 February 2013

David Schofield
Landcom
(dschofield@landcom.nsw.gov.au)
(cc. David Riddell, Aver: driddell@aver.com.au
Graeme Nyland, Environ: gnyland@environ.com.au)
Rowena Salmon, Environ: rsalmon@environ.com.au)

Post-remediation Groundwater Monitoring Event Results

Landcom Project 12619 Zouch Road, Edmondson Park

Dear David,

1. Introduction and Background

JBS Environmental Pty Ltd was engaged by Landcom to act as remediation consultant during redevelopment of the land known as Landcom Project 12619 located at Zouch Road, Edmondson Park, NSW herein referred to as 'the Site'. The Site is formally identified as part Lot 7 and Lot 8 DP1127652, as shown in **Figure 1** and comprises a total area of approximately 86 hectares (ha). It is noted that the Site is bisected by the proposed rail corridor (RC) comprising part Lots 1 and 2 DP1127652, of approximately 8 ha which is excluded from the Site.

Previous assessment of Site contamination conditions completed by others as detailed in the remedial action plan (RAP) (Golder 2011[1]) identified the presence of soil contamination conditions requiring remediation prior to commencement of urban development works. It is noted that the appointed independent contaminated Site Auditor has issued an endorsement of this document (Environ 2011[2]). Following appointment as the remediation consultant, JBS has prepared a Validation Sampling Analysis and Quality Plan (JBS 2012a[3]) to guide the validation works during remediation activities. The site auditor also reviewed the SAQP (JBS 2012a).

2. Objectives and Scope of Works

The objective of the sampling activities was to assess and document current data on groundwater contaminant conditions following completion of site remediation works.

The scope of works comprised:

- Identification, purging and sampling of remaining monitoring wells located within the Site (**Figure 3**);
- Laboratory analysis of collected groundwater and QA/QC samples for a range of contaminants of potential concern (COPC); and
- Assessment and documentation of current groundwater conditions as per Golder (2011) and JBS (2012a).

[1] *Landcom Project 12619 – Zouch Road, Edmondson Park, NSW, Remediation Action Plan*
[2] *Interim Advice #5 – Zouch Road, Edmondson Park, NSW, Revised Remediation Action Plan*. Environ Australia Pty Ltd, draft issue, 24 February 2011 (Environ 2011).
[3] *Validation Sampling, Analysis and Quality Plan, Landcom Project 12619, Zouch Road, Edmondson Park, NSW*. JBS Environmental Pty Ltd, February 2012 (JBS 2012a)

Level 1, 50 Margaret St, Sydney NSW, 2000 | Level 2, 12 Thelma St, West Perth WA, 6005
Tel: 02 8245 0300 | Fax: 02 8245 0399 www.jbsgroup.com.au

3. Previous Assessment Data

3.1. Golder 2005 Assessment Data

Previous site assessment activities (Golder 2005a[4]) comprised installation of groundwater monitoring wells during February 2005 at six locations within the Site as shown in **Figure 2**. At this time groundwater conditions were reported to vary considerably across the Site, being encountered at levels of between 2.5 m and 14.6 m bgl at locations BH2, BH291, BH521, BH558, BH608 and BH675. This corresponds to standing water elevations of 46.15 m AHD in the north-west of the Site and 58.5 m AHD in the southern portion of the Site. The groundwater was considered resident within alluvial deposits or the residual soil-bedrock interface, particularly in low lying areas of the Site, including along drainage lines and in the vicinity of the dams. Groundwater flow generally occurred toward the north and north-east apart from the most westerly portion of the site where groundwater flowed in a north-westerly direction toward a surface water feature and Cabramatta Creek to the north-west of the site.

Monitoring of field parameters during the sampling activities identified groundwater conditions at the site as moderately saline (9.21 to 14.27 mS/cm) with a relatively neutral pH (6.8 to 7.2) (Golders 2005a). To assess Site groundwater contamination conditions, samples were collected from each of the six monitoring wells during the Golder (2005a) assessment activities and subsequently analysed for a range of COPCs including heavy metals, polycyclic aromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPH), monocyclic aromatic hydrocarbon (BTEX) compounds, speciated phenolics, explosives, organochlorine pesticides (OCPs), organophosphate pesticides (OPPs), polychlorinated biphenyls (PCBs) and volatile chlorinated hydrocarbons (VCHs). Analysis results were compared to adopted assessment criteria as presented in **Table 6.1** of this correspondence.

The laboratory analysis results reported in Golder (2005a) are summarised in tables presented in **Attachment 3**. These results indicated concentrations of TPH, PAH and BTEX compounds were all less than the laboratory limit of recovery (LOR) and below the adopted site assessment criteria. Concentrations of speciated phenolic compounds, OCPs, OPPs, PCBs, VCHs and explosives at all groundwater sampling locations were less than the laboratory limit of recovery (LOR).

Individual heavy metals including arsenic, chromium, lead, copper, nickel and zinc were identified at one or more sampling locations at concentrations above the adopted at site assessment criteria. As the heavy metals exceedences were identified in both upgradient and down-gradient monitoring well locations at the Site, Golder (2005a) considered the concentrations were largely indicative of general water quality within the area and not evidence of anthropogenic impacts associated with Site activities. The results were considered to be within the range typical of Wianamatta group bedrock and residual soil conditions.

3.2. JBS 2012b Assessment Data

Prior to the commencement of site remediation works, further groundwater assessment was completed from existing wells as documented in JBS (2012b[5]). Based on the standing water level (SWL) elevations, groundwater at the Site is generally moving in a northerly direction. Limited standing water was encountered at BH558 and BH675 was found to be 'dry' at the time of the gauging/sampling event.

Measurement of physical parameters during purging and sampling indicated aerobic, slightly oxidising conditions in groundwater across the site (including BH2 following intensive purging). The water was generally neutral to slightly acidic and moderately saline, typical of groundwater conditions within residual soils and weathered shale of the Wianamatta Group.

Laboratory analysis results for the collected samples from the four monitoring wells are summarised in tables included in **Attachment 3**. Heavy metals concentrations reported during the 2012 sampling event are considered to be typical of conditions in Wianamatta Group shales and generally consistent with those previously encountered at the Site. It is noted that chromium, previously identified in groundwater at the majority of sampling locations was not identified at concentrations about the laboratory LOR during this sampling event. Organic compounds including volatile TPH/BTEX and PAHs were also not encountered in groundwater, consistent with the previous assessment results.

Semi-volatile, medium to heavy fraction (C_{10}-C_{36}) TPH concentrations were reported in one groundwater sample collected in February 2012 from BH2 in the north-west portion of the Site. Whilst, the concentration of 436 µg/L was less than the adopted criterion of 600 µg/L, TPH had previously not been identified in groundwater at the Site (Golders 2005). Following removal of identified sediment build up in this well, a second round of sampling was completed in March 2012. Laboratory analysis results for the additional BH2 groundwater sample did not identify elevated levels of TPH in groundwater with concentrations less than the LOR and less than the adopted site criterion.

---

[4] *Detailed Contamination Site Investigation Report. Landcom Project No. 12619, Zouch Road, Edmondson Park, NSW*. Golder Associates Pty Ltd (Golder 2005a)

[5] *Pre-remediation Groundwater Monitoring Event Results. Landcom Project 12619 Zouch Road, Edmondson Park*. JBS Environmental Pty Ltd, 13 April 2012 (JBS 2012b)

Level 1, 50 Margaret St, Sydney NSW, 2000 | Level 2, 12 Thelma St, West Perth WA, 6005
Tel: 02 8245 0300 | Fax: 02 8245 0399 www.jbsgroup.com.au

4. Data Quality Objectives

Data Quality Objectives (DQOs) were established for the assessment works, as described in the following sections.

4.1. State the Problem

Existing assessment of the Site did not identify groundwater impacts directly attributable to identified site contamination conditions requiring remediation for the land to be suitable for future urban use. However, as there is a low potential for impacts to groundwater associated with current conditions and the proposed remediation works, further groundwater monitoring is required by the RAP (Golder 2011) to verify the absence of impacts attributable to former site conditions or remediation works.

4.2. Identify the Decision

For this post-remediation groundwater monitoring event, the primary decision required to be made comprises:

- Are groundwater conditions consistent with groundwater contaminant concentrations previously identified at the Site as previously documented in the RAP (Golder 2011) and pre-remediation groundwater monitoring event (JBS 2012)?

In the event that the answer to the above is No, a second decision may be required to be addressed:

- Are amendments to the Golder (2011a) RAP requirements necessary to further assess and/or address the identified site contamination conditions in order for the Site to be able to be made suitable for the proposed landuse?

4.3. Identify Inputs to the Decision

Inputs to the decisions are:

- Historical groundwater monitoring event data including groundwater quality and contamination data collected during previous monitoring events; and
- Water data collected during the current groundwater monitoring event completed by JBS.

Specifically, sufficient data were required to be collected from the identified potentially impacted media (e.g. groundwater and surface water) in the identified areas of environmental concern for the associated potential contaminants of concern.

4.4. Define the Study Boundaries

The study boundary for the defined Site is shown schematically in **Figure 1** and as an overlay on an aerial photograph in **Figure 2**. The Site is formally defined as part Lot 7 and Lot 8 DP111127652 comprising approximately 86 ha. As shown in **Figures 1** and **2**, the extent of the Site comprises:

- North – the existing fence line marking the northern extent of Lot 8 (that portion north of the RC) across the majority of the Site, with the northern extent of Lot 7 (north of the RC) comprising the east most portion of the Site's extent;
- West – the existing fence line marking the northern extent of Lot 8, the southern portion of which faces Zouch Road;
- South – the existing fence line marking the extent of Lot 8 in the western portion of the Site and of Lot 7 across the majority of the Site;
- East – the existing fence line marking the extent of Lot 7; and
- Internally – the extent of Lots 7 and 8 in relation to Lots 1 and 2 comprising the proposed RC and future ancillary parking facilities soon to be remediated under a separate agreement between TWA and Landcom.

The maximum vertical extent of the investigation comprised the maximum existing well depth of 15.8 m below ground level (bgl). Due to the nature of potential contaminants identified seasonality was not assessed as part of this investigation. The temporal boundaries of this investigation were limited to the period of the previous groundwater assessment activities in February and March of 2005 and the JBS sampling works during February, March and October 2012.

4.5. Develop a Decision Rule

Groundwater analytical data were assessed against site assessment criteria presented in **Section 6** as documented in the SAQP (JBS 2012a) derived from NSW EPA endorsed guidance including:

- *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. ANZECC/ARMCANZ (2000);

Level 1, 50 Margaret St, Sydney NSW, 2000 | Level 2, 12 Thelma St, West Perth WA, 6005
Tel: 02 8245 0300 | Fax: 02 8245 0399 www.jbsgroup.com.au

- *Australian Drinking Water Guidelines*. National Health and Medical Research Council/ National Resource Management Ministerial Council, (NHMRC/NRMMC 2004); and
- *Circular on Target Values and Intervention Values for Soil Remediation*. Netherlands Ministry of Housing, Spatial Planning and the Environment (VROM, 2000) – Adopted as TPH screening levels in the absence of NSW EPA endorsed guideline values.

Table 4.1 Summary of Decision Rules

Decision Required to be Made	Decision Rule
1. Are groundwater conditions consistent with groundwater contaminant conditions previously identified at the Site?	Groundwater data including physical and laboratory results were compared against adopted site assessment criteria derived from the EPA endorsed criteria and historical data. Both historical and additional data groundwater data were assessed against the adopted site assessment criteria. Where contaminant concentrations in groundwater differ significantly from those previously identified, the answer was No. In the event that the contaminant concentrations were consistent, the answer to the question was Yes.
2. Are amendments required to be made to the Golder (2011a) RAP to address identified site contamination conditions?	Review of the above decision was undertaken to establish whether the information collected during the additional assessment has materially changed the understanding of conditions at the Site. Where conditions are found to be substantially different to that documented in the RAP, the answer was Yes. Otherwise the answer to the question was No.

4.6. Specify Limits on Decision Errors

To assess the usability of the data prior to making decisions, the data were assessed against pre-determined Data Quality Indicators (DQIs) for precision, accuracy, representativeness, completeness, comparability and sensitivity (PARCCS parameters) as discussed in the validation SAQP (JBS 2012a). The acceptable limit on decision error is a minimum of 95% compliance with DQIs.

The pre-determined Data Quality Indicators (DQIs) established for the project are shown in **Table 4.2**.

Table 4.2 Summary of Quality Assurance / Quality Control Program

Data Quality Indicators	Frequency	Data Quality Criteria
Precision		
Split duplicates (intra laboratory)	1 / 20 samples	<50% RPD[1] where conc > 10 x LOR/ PQL
Blind duplicates (inter laboratory)	1 / 20 samples	<50% RPD where conc > 10 x LOR
Laboratory Duplicates	1 / 20 samples	<50% RPD where conc > 10 x LOR
Accuracy		
Surrogate spikes	All organic analytes	60-140%
Laboratory control samples	1 per lab batch	70-130% metals, 60-140 % organics
Matrix spikes	1 per lab batch	70-130% metals, 60-140 % organics
Representativeness		
Sampling appropriate for media and analytes		-
Samples extracted and analysed within holding times.	-	Groundwater: sTPH/ PAHs (7 days to ext'n) BTEX/vTPH (14 d) Metals (6 months)
Trip spike (volatiles only)	1 per sampling event	70-130% recovery
Rinsate	1 / 20 samples for TPH, PAHs, 8 metals, or minimum of one/day where sampling for these analyst.	<LOR
Storage blank	1 / media	<LOR
Comparability		
Standard operating procedures for sample collection & handling	All Samples	All samples
Standard analytical methods used for all analyses	All Samples	All samples
Consistent field conditions, sampling staff and laboratory analysis	All Samples	All samples
Limits of reporting appropriate and consistent	All Samples	All samples

Level 1, 50 Margaret St, Sydney NSW, 2000 | Level 2, 12 Thelma St, West Perth WA, 6005
Tel: 02 8245 0300 | Fax: 02 8245 0399 www.jbsgroup.com.au

Data Quality Indicators	Frequency	Data Quality Criteria
Completeness		
Soil description and COCs completed and appropriate	All Samples	- All samples
Appropriate documentation	All Samples	- All samples
Satisfactory frequency and result for QC samples	All QA/QC samples	-
Data from critical samples is considered valid	-	Critical samples valid
Sensitivity		
Analytical methods and limits of recovery appropriate for media and adopted Site assessment criteria	-	LOR<= Site assessment criteria

(1) If the RPD between duplicates is greater than the pre-determined data quality indicator, a judgement will be made as to whether the excess is critical in relation to the validation of the data set or unacceptable sampling error is occurring in the field.

4.7. Optimise the Design for Obtaining Data

During previous Site assessment activities (Golder 2005a) groundwater monitoring wells were installed at a total of six locations within the Site (BH2, BH291, BH521, B558, BH608, and BH675) to depths of between 8 m and 15.6 m. It is noted that during the JBS sampling activities in February and March 2012, monitoring wells BH558 and BH675 were dry or contained insufficient water to sample for all contaminants of concern.

Subsequent to completion of the remediation works, three remaining viable wells were identified at the site, comprising BH558, BH2 and BH291.

5. Investigation Methodology

5.1. Groundwater Sampling Methodology

Groundwater sampling was completed using a low flow Micropurge pump system with small diameter, single use tubing. Monitoring wells were purged at the highest possible flow-rate while ensuring that minimal fluctuations in depth to water occurred. A flow cell was employed to monitor water quality parameters of: Electrical conductivity (EC); Redox potential (Eh); pH; Dissolved oxygen (DO); and Temperature during purging and sampling.

Where insufficient inflow was observed to facilitate steady state conditions, the identified monitoring wells was purged 'dry' prior to samples being collected following recharge. Samples were collected of the recharge using a new single use disposable bailer or the micropurge unit.

Samples destined for dissolved metal analysis were field filtered. All groundwater samples were placed into laboratory supplied bottles/vials with appropriate preservatives (where required). Each of the sample bottles was labelled with the project ID, date, sampler's initials and unique monitoring well ID (or QC sample name), using permanent ink marker on labels affixed to the sides of the bottles by the laboratory. In addition, the sample ID (i.e., the monitoring well ID) was also replicated on the lid of the bottles/vials in the event that the labels became detached from the bottles during transport.

The bottles were placed directly into a pre-chilled ice chest, for transport to the testing laboratories under chain of custody conditions. COC documentation was completed for samples relinquished to the laboratory and included: sample ID; number of bottles/vials; media type (i.e., water); project ID; name; date of sampling and relinquishment.

The completed activities were documented on groundwater monitoring and calibration/decontamination record forms as included as **Attachment 4**. One rinsate sample was obtained during the field decontamination procedures by rinsing the interface probe and flow cell with laboratory grade demineralised water following the decontamination procedure. The water sample(s) was then appropriately preserved and stored with the site water samples prior to transport to the laboratory for chemical analysis.

5.2. Laboratory Analysis Methodology

JBS Environmental engaged Envirolab Services Pty Ltd (Envirolab) at Chatswood, NSW as the primary laboratory for the required analyses. The secondary laboratory used for the works was SGS Environmental (SGS) at Alexandria, NSW. All laboratories were NATA registered for the required analyses. In addition, the laboratories were required to meet JBS Environmental's internal QA/QC requirements.

Laboratory analysis methods for relevant groundwater contaminants are identified in **Table 6.1**.

6. Assessment Criteria

Assessment of groundwater conditions is required to verify that there have been no impacts upon groundwater conditions from the remedial works at the Site. The adopted criteria presented in **Table 6.1** were derived during development of the validation SAQP (JBS 2012a) and include values derived from the following documents:

Level 1, 50 Margaret St, Sydney NSW, 2000 | Level 2, 12 Thelma St, West Perth WA, 6005
Tel: 02 8245 0300 | Fax: 02 8245 0399 www.jbsgroup.com.au

- *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. ANZECC/ARMCANZ (2000);
- *Australian Drinking Water Guidelines* (NHMRC/NRMMC 2004); and
- *Circular on Target Values and Intervention Values for Soil Remediation.* Netherlands Ministry of Housing, Spatial Planning and the Environment (VROM, 2000) – Adopted as TPH screening levels in the absence of NSW EPA endorsed guideline values.

In addition, the adopted groundwater assessment criteria were also used as criteria for the assessment of surface water quality.

Table 6.1 Adopted Groundwater Assessment Criteria

	Limit of Reporting	Laboratory Method	Adopted Health Based Criteria[1] (all units in μg/L unless stated)	Adopted Ecological Criteria[2] (all units in μg/L unless stated)
HEAVY METALS				
Arsenic	1.0	ICP-AES (USEPA 200.8, 6020A)	7	24
Cadmium	0.1	ICP-AES (USEPA 200.8, 6020A)	2	0.2
Chromium	1.0	ICP-AES (USEPA 200.8, 6020A)	5	3.3[5,6]
Copper	1.0	ICP-AES (USEPA 200.8, 6020A)	2000	1.4
Lead	1.0	ICP-AES (USEPA 200.8, 6020A)	10	3.4
Mercury	0.1	ICP-AES (USEPA 200.8, 6020A)	1	0.06
Nickel	1.0	ICP-AES (USEPA 200.8, 6020A)	20	11
Zinc	1.0	ICP-AES (USEPA 200.8, 6020A)	3000	8
PETROLEUM HYDROCARBONS				
TPH C_{10}-C_{36}	250	GC/FID (USEPA 8000)	-	600[8]
PAHs				
Naphthalene	0.1	GCMS (USEPA8270)	-	16[7]
Anthracene	0.1	GCMS (USEPA8270)	-	0.1 [4,5,6,9]
Phenanthrene	0.1	GCMS (USEPA8270)	-	0.6[5,6,9]
Flouranthene	0.1	GCMS (USEPA8270)	-	1[5,6,9]
Benzo(a)pyrene	0.1	GCMS (USEPA8270)	0.1[4]	0.1[5,6,9]
BTEX				
Benzene	1.0	P&T GC/MS (USEPA 8020A)	1	500
Toluene	1.0	P&T GC/MS (USEPA 8020A)	800	180[5]
Ethyl benzene	1.0	P&T GC/MS (USEPA 8020A)	300	5[5]
o-Xylene	1.0	P&T GC/MS (USEPA 8020A)		350
m-Xylene	1.0	P&T GC/MS (USEPA 8020A)	600[3]	75
p-Xylene	1.0	P&T GC/MS (USEPA 8020A)		200

Notes
(1) Australian Drinking Water Guidelines (NHMRC/NRMMC 2004)
(2) 95% Protection Trigger Values for Fresh Water (ANZECC/ARMCANZ 2000)
(3) Total Xylenes (sum of individual Xylene compounds)
(4) Laboratory limit of reporting is less than the adopted criterion, hence the laboratory LOR is adopted as the criterion for the purposes of this assessment.
(5) Low reliability Trigger Value for Freshwater Protection (ANZECC/ARMCANZ 2000)
(6) 99% Protection Level used, as recommended by ANZECC/ARMCANZ (2000)
(7) Moderate Reliability value in fresh water.
(8) Dutch intervention value adopted in absence of NSW EPA endorsed value.
(9) Indicative Interim Working Level (ANZECC/ARMCANZ 2000)

Where both human health and ecosystem criteria have been nominated for a contaminant in **Table 6.1** above, the more sensitive criteria has been adopted (ie. 7 μg/L arsenic health level in preference to the 24 μg/Ll ecosystem based criterion) as the site assessment criteria for water assessment purposes.

7. Quality Assurance / Quality Control

7.1. Results

The QA/QC results are summarised in **Table 7.1** and discussed in **Section 7.2** below. Detailed QA/QC results are included with the laboratory reports in **Attachment 6.**

Level 1, 50 Margaret St, Sydney NSW, 2000 | Level 2, 12 Thelma St, West Perth WA, 6005
Tel: 02 8245 0300 | Fax: 02 8245 0399 www.jbsgroup.com.au

Table 7.1 Summary of Results of Quality Assurance / Quality Control Program

Data Quality Objective	Frequency / Criterion	Results	DQO met?
Precision			
Blind duplicate (intra-lab)	>1/20 samples RPDs<50% where conc > 10 x LOR	Duplicate samples were obtained and analysed at an appropriate density. All results were within the adopted RPD% acceptance criteria.	Yes
Split duplicate (inter-lab)	>1/20 samples RPDs<50% where conc > 10 x LOR	Duplicate samples were obtained and analysed at an appropriate density. All results were within the adopted RPD% acceptance criteria.	Yes
Laboratory Duplicate analysis	>1/20 samples RPDs<50% where conc > 5 x LOR	Laboratory duplicate samples were analysed for heavy metals. RPD results were within the acceptance criteria.	Partial[1]
Accuracy			
Surrogate spikes	All organic samples 60-140%	All samples analysed. Recoveries in range of 67 – 116 %.	Partial[1]
Laboratory control samples	1 per lab batch 70-130% metals, 60-140 % organics	Lab control sample analysis results reported at appropriate frequency. Results in range of 67 to 110 %, within the acceptance criteria.	Partial[1]
Matrix spikes	1 per lab batch 70-130% metals, 60-140 % organics	Analysis of matrix spikes was limited to 1 sample analysed for mercury with a reported recovery within the acceptable limits. The sample batch comprised a small number of samples when compared to the lab frequency (1 per 20 samples) of matrix sample analyses. With due consideration to the completion of LCS analyses in conjunction with the primary samples, this is not considered to be a critical omission.	Partial[1]
Representativeness			
Sampling appropriate for media and analytes	All media / analytes	All sampling conducted in accordance with JBS procedures	Yes
Trip spike (volatiles)	1 / media / per sampling event 70-130% recovery	A trip spike was carried during the sampling event and subsequently analysed for BTEX. Recoveries of 85 to 97 % were within the acceptable range.	Yes
Storage Blank	1 / media / per sampling event Results <LOR	A storage blank was carried during both sampling events and subsequently analysed for BTEX. Reported BTEX concentrations were all less than the LOR.	Yes
Rinsate	1 / 20 samples / PAHs, TPH and 8 metals Results <LOR	Rinsate samples were prepared during the field works and submitted for analysis. The results for all analyses were less than the LOR.	Yes
Samples extracted and analysed within holding times.	All samples	Samples for chemical analysis were submitted, extracted and analysed within holding times with a maximum period of 6 days.	Yes
Comparability			
Standard operating procedures for sample collection & handling	All Samples	JBS field staff used the same standard operating procedures throughout works.	Yes
Standard analytical methods used for all analyses	All Samples	Standard analytical methods used as presented in the laboratory reports included as **Attachment 6**.	Yes
Consistent field conditions, sampling staff and laboratory analysis	All Samples	All sampling was completed by experienced JBS personnel. Field staff carried out the work in accordance with JBS operating procedures. One primary and one secondary laboratory duplicate was completed during the field program.	Yes
Completeness			
Groundwater Sampling Notes and COCs completed and appropriate	All Samples	Sampling sheets and COCs were completed appropriately.	Yes
Appropriate documentation	All Samples	Appropriate field documentation is included in **Attachment 4**.	Yes

Level 1, 50 Margaret St, Sydney NSW, 2000 | Level 2, 12 Thelma St, West Perth WA, 6005
Tel: 02 8245 0300 | Fax: 02 8245 0399 www.jbsgroup.com.au

Data Quality Objective	Frequency / Criterion	Results	DQO met?
Satisfactory frequency and result for QC samples	All QA/QC samples	QC samples were collected at an appropriate frequency. As summarised above, the QC sample results were considered acceptable when considered as a whole.	Yes
Data from critical samples is considered valid	All samples	The collected data presented in this report is considered valid.	Yes
Sensitivity			
Analytical methods and limits of recovery appropriate for media and adopted site assessment criteria	All samples	Appropriate laboratory analysis methods considered to have been achieved during the field and laboratory phases of this investigation. It is noted that as a result of matrix interference in two of the three samples, LORs were raised for BTEX compounds and in one sample analysed for TPH C_6-C_9 the LORs were raised.	Partial

Note: [1] Results associated with partial or non-compliance are discussed in the following sections

7.2. Discussion of QA / QC Results

Precision

Intra and inter-laboratory duplicates for groundwater were collected at rates exceeding 1 per 20 samples (5%) analysed. The results for both intra- and inter-laboratory sample analyses were within the nominated range specified in the data quality indicators.

Laboratory duplicate analysis was completed for heavy metals but not for TPH/BTEX or PAHs by the laboratory. With consideration to small sample batch size and the frequency of duplicates completed by Envirolab (one every 10 samples), the absence of laboratory duplicate data is within operational limitations. Given the frequency of JBS field duplicate organics analyses, the absence of lab duplicate data for the organics is considered to be a non-critical omission.

Accuracy

Surrogate spike and laboratory control sample analyses were completed at a suitable frequency and reported results within the acceptable range. As for laboratory duplicates, matrix spikes were not completed for the analysis batch apart from mercury analysis. With consideration to the small sample batch size and the nominated frequency of matrix spikes by Envirolab being one in 20 samples, the absence is within operational limitations. Given the laboratory control samples were analysed for all contaminants and these reported acceptable recoveries in addition to all surrogate spike recoveries being within the acceptable range, the overall assessment results for accuracy were considered to satisfy project quality requirements.

Representativeness

The groundwater sampling methods were considered appropriate for the media and the analytes targeted. Groundwater samples were collected via a low flow micropurge pump unit. The sampling for both groundwater and surface water was completed by direct filling of new laboratory prepared and preserved (where required) bottles in order from most to least volatile.

All primary and duplicate water sample extractions and analyses were completed within the recommended holding times.

Laboratory blanks, rinsate samples and a storage blank were analysed with the sample batches. All levels of analytes in these samples were below the laboratory limit of recovery for each analyte.

Trip spikes were submitted with the batches for analysis. The recoveries were within the limits specified in the representativeness DQIs.

Comparability

The primary and secondary laboratories were NATA accredited for all methods undertaken during this assessment. The JBS field scientist completed the sampling for this assessment using the documented sampling methodology consistent JBS with sampling protocols. All required field forms and groundwater sampling forms were appropriately completed by the sampling personnel. The assessment results indicate that significant bias of the data as a result of sampling or laboratory methods has not occurred.

Completeness

All documentation was generally completed to the required standard and are included in **Attachment 4**.

Level 1, 50 Margaret St, Sydney NSW, 2000 | Level 2, 12 Thelma St, West Perth WA, 6005
Tel: 02 8245 0300 | Fax: 02 8245 0399 www.jbsgroup.com.au

Sensitivity

The primary laboratory limit of reporting (LOR) for anthracene and benzo(a)pyrene in groundwater slightly exceed the groundwater acceptance criteria. Therefore the laboratory LOR for these compounds has been adopted as the groundwater assessment criteria. As no individual concentrations were detected in groundwater for these compounds during this assessment, the use of LOR, rather than the published guideline value is considered not to have negatively impacted upon the sensitivity of the investigation, nor the conclusions drawn from the assessment.

In addition, as a result of reported matrix interferences requiring dilution of the samples, the LORs for samples BH291 and BH558 were raised by an order of magnitude for individual BTEX compounds in both samples and in C_6-C_9 TPH in the BH291 sample. This has resulted in LORs for benzene and ethylbenzene contaminants in these two samples exceeding the adopted site assessment criteria. Concentrations of both contaminants in both samples have been reported as less than the adopted LOR for this round of sampling. As historically there is no evidence of benzene and/or ethylbenzene impacts in groundwater at the site, the risk of contaminant impacts exceeding the adopted criteria but not reported above the LOR is low and as such, further consideration of BTEX concentrations is considered not to be necessary.

7.3. QA/QC Assessment

The results of the field and laboratory QA/QC program indicate that the data obtained from this investigation generally met the predetermined Data Quality Indicators (DQIs) or, where the DQIs were exceeded, did not indicate systematic sampling or analytical errors. As such the data are considered to be of adequate quality to be relied on for the purposes of assessing the environmental condition at the Site.

8. Results

Observations during field works have been recorded in field notes included in **Attachment 4**. Sample locations are shown on **Figure 2** in **Attachment 2**. Detailed laboratory reports and chain of custody documentation is presented in **Attachment 6**. An assessment of data quality has found that the data are of a suitable quality for the intended purposes (**Attachment 5**).

8.1. Site Observations

Standing groundwater levels were gauged at each well location prior to the commencement of sampling activities on 16 October 2012 and the results are summarised in **Table 8.1**.

Table 8.1 Standing Groundwater Levels 16/10/2012

Monitoring Well ID	Depth (m bgl)	Elevation TOC[1] (m AHD)	Elevation (m AHD)
BH2	3.854	50.6	46.75
BH291	1.685	52.96	51.28
BH558	7.118	59.99	52.87

Notes: TOC – Top of Casing

Based on the limited standing water level (SWL) elevation data, groundwater elevations are consistent with those recorded in February 2012, indicating groundwater at the Site continues to generally move in a northerly direction. An assessment of the potential presence of light non-aqueous phase liquids (LNAPLs) was also completed during the gauging round with no detectable LNAPLs identified at the monitoring well locations.

Measurement of physical parameters during purging and sampling of the monitoring wells was recorded on groundwater sampling forms included as **Attachment 4**. In general the results were generally neutral to slightly acidic and moderately saline, typical of groundwater conditions within residual soils and weathered shale of the Wianamatta Group. Minor anoxic conditions were reported for BH2 and BH291, whilst minor oxidising conditions were reported in BH558, possibly a result of limited groundwater volumes within the well.

8.2. Groundwater Results

The laboratory analysis results completed for this additional assessment is presented in **Table A** included as **Attachment 7**. The following comments summarise the results for the contaminants of concern:

- Various individual heavy metals were identified in monitoring wells at concentrations above the adopted site assessment criteria. These include the following for each monitoring well:
    - BH2: arsenic (0.012 mg/L) and zinc (0.042 mg/L);
    - BH291: nickel (0.035 mg/L) and zinc (0.07 mg/L); and
    - BH558: copper (0.002 mg/L) and zinc (0.009 mg/L).
- Samples from BH2 and BH291 were analysed for sTPH (C_{10}-C_{36}) and PAHs with concentrations reported to be less than the LOR and less than the adopted validation criteria.

Level 1, 50 Margaret St, Sydney NSW, 2000 | Level 2, 12 Thelma St, West Perth WA, 6005
Tel: 02 8245 0300 | Fax: 02 8245 0399 www.jbsgroup.com.au

- vTPH (C_6-C_9) concentrations and individual BTEX concentrations for all three primary samples were less than the adopted validation criterion.

9. Discussion of Results

The results are discussed below in relation to the established DQO decision rules (**Section 4.5**).

Review of the data collected from the remaining wells following the completion of remediation site works identified physical groundwater levels consistent with those reported prior to the commencement of remediation works at the Project site.

Heavy metals concentrations reported during the current sampling event are considered to be typical of conditions in Wianamatta Group shales and generally consistent with those previously encountered at the Site. Organics contaminants were reported to have concentrations less than the LOR and less than the adopted validation criterion.

As a result of remediation works completed at the site, monitoring wells BH521 located in the RRZW portion of the site and BH608 located in the vicinity of the containment cell in the CZSA had been removed. Site data indicates that groundwater is anticipated to flow generally in a northerly direction across the majority of the site, apart from in the west most section of the site where movement is in a more north-westerly direction. On this basis, the BH558 and BH2 sampling locations are considered down-gradient of the installed containment cell and areas of greatest disturbance during remediation works. Contaminant concentrations for individual heavy metals and mobile TPH contaminants were reported to be consistent between the pre- and post-remediation monitoring events for the monitoring wells when conditions in BH608 (pre-) and BH558 (post-) are considered.

Further, given there is no indication of significant groundwater contamination associated with historical use of the site; remediation works at the site have reduced the total contaminant mass and lateral extent at the site; and lead impacted soils have been placed beneath a low permeability cap, significantly above groundwater table levels, therefore reducing the potential rate of leachate production; the potential for contaminant migration has been significantly reduced by implementation of the remediation works. On the basis of this qualitative assessment of migration potential, it is considered that there is no requirement for reinstallation of the two former monitoring wells to demonstrate the objectives of the RAP have been met.

10. Conclusions

Based on the findings of this investigation and subsequent to the limitations in **Attachment 1**, the following conclusions have been reached:

- Groundwater heavy metals and organic contaminant conditions reported in available remaining wells during the post-remediation monitoring event are generally consistent with conditions previously identified by Golder (2005) and JBS during the pre-remediation sampling event.
- There are no unacceptable risks associated with migration of site contamination via groundwater as a result of site conditions prior to or following site remediation works.

If you require any further assistance, please do not hesitate to contact me on (02) 8338 1011 or by email jrosner@jbsgroup.com.au .

Prepared by:

Joanne Rosner
Senior Environmental Scientist
JBS Environmental Pty Ltd

Reviewed/Approved by:

Matthew Bennett
Principal Contaminated Land
JBS Environmental Pty Ltd

Attachments: (1) Limitations
(2) Figures
(3) Golder (2005a) and JBS (2012) Laboratory Analysis Result Summary Tables
(4) Groundwater sampling field forms – JBS October 2012
(5) QA/QC Checker Summary
(6) Laboratory Analysis Reports and Chain of Custody Information
(7) Summary Tables - Groundwater Sample Analytical Results

Level 1, 50 Margaret St, Sydney NSW, 2000 | Level 2, 12 Thelma St, West Perth WA, 6005
Tel: 02 8245 0300 | Fax: 02 8245 0399 www.jbsgroup.com.au

Attachment 1 – Limitations

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only, and has been based in part on information obtained from the client and other parties.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

JBS Environmental Pty Ltd accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced without prior approval by the client, or amended in any way without prior approval by JBS Environmental Pty Ltd, and should not be relied upon by other parties, who should make their own enquires.

Sampling and chemical analysis of environmental media is based on appropriate guidance documents made and approved by the relevant regulatory authorities. Conclusions arising from the review and assessment of environmental data are based on the sampling and analysis considered appropriate based on the regulatory requirements.

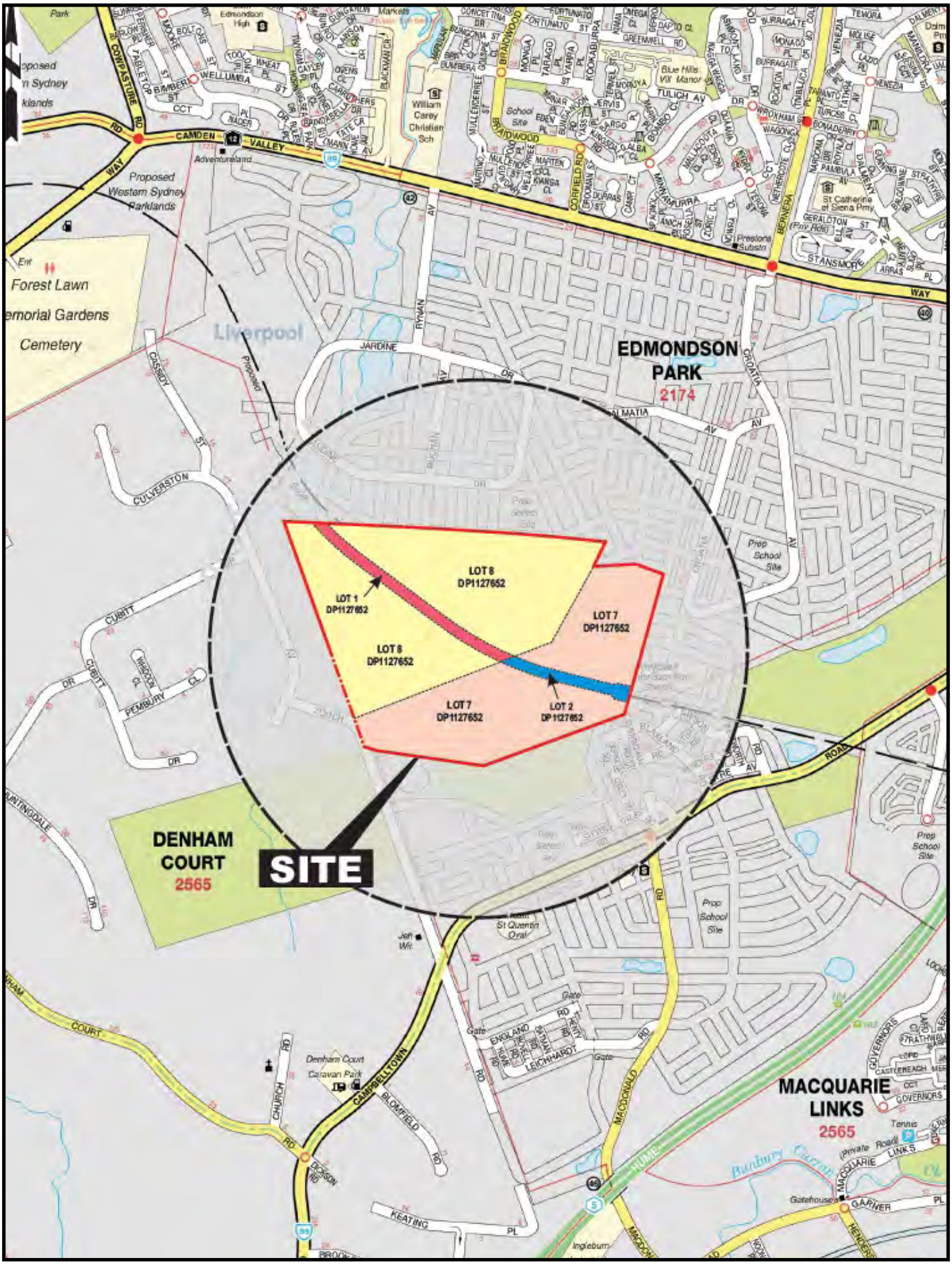
Limited sampling and laboratory analyses were undertaken as part of the investigations undertaken, as described herein. Ground conditions between sampling locations and media may vary, and this should be considered when extrapolating between sampling points. Chemical analytes are based on the information detailed in the site history. Further chemicals or categories of chemicals may exist at the site, which were not identified in the site history and which may not be expected at the site.

Changes to the subsurface conditions may occur subsequent to the investigations described herein, through natural processes or through the intentional or accidental addition of contaminants. The conclusions and recommendations reached in this report are based on the information obtained at the time of the investigations.

This report does not provide a complete assessment of the environmental status of the site, and it is limited to the scope defined herein. Should information become available regarding conditions at the site including previously unknown sources of contamination, JBS Environmental Pty Ltd reserves the right to review the report in the context of the additional information.

Level 1, 50 Margaret St, Sydney NSW, 2000 | Level 2, 12 Thelma St, West Perth WA, 6005
Tel: 02 8245 0300 | Fax: 02 8245 0399 www.jbsgroup.com.au

Attachment 2 – Figures



Source: © Golder Associates Pty Ltd, Project No 107623047, Doc No 001, Figure No F0001, Rev No 0, 27-08-2010

© 2013 JBS Environmental Pty Ltd

0 200 400 800 m

Scale: Approximate

Datum: MGA94 Zone 56 - AHD

Rev	Description	Drn.	Date
A4			
B	Original Issue - R03	SE	19-02-2013

Legend:

Approximate Site Boundary

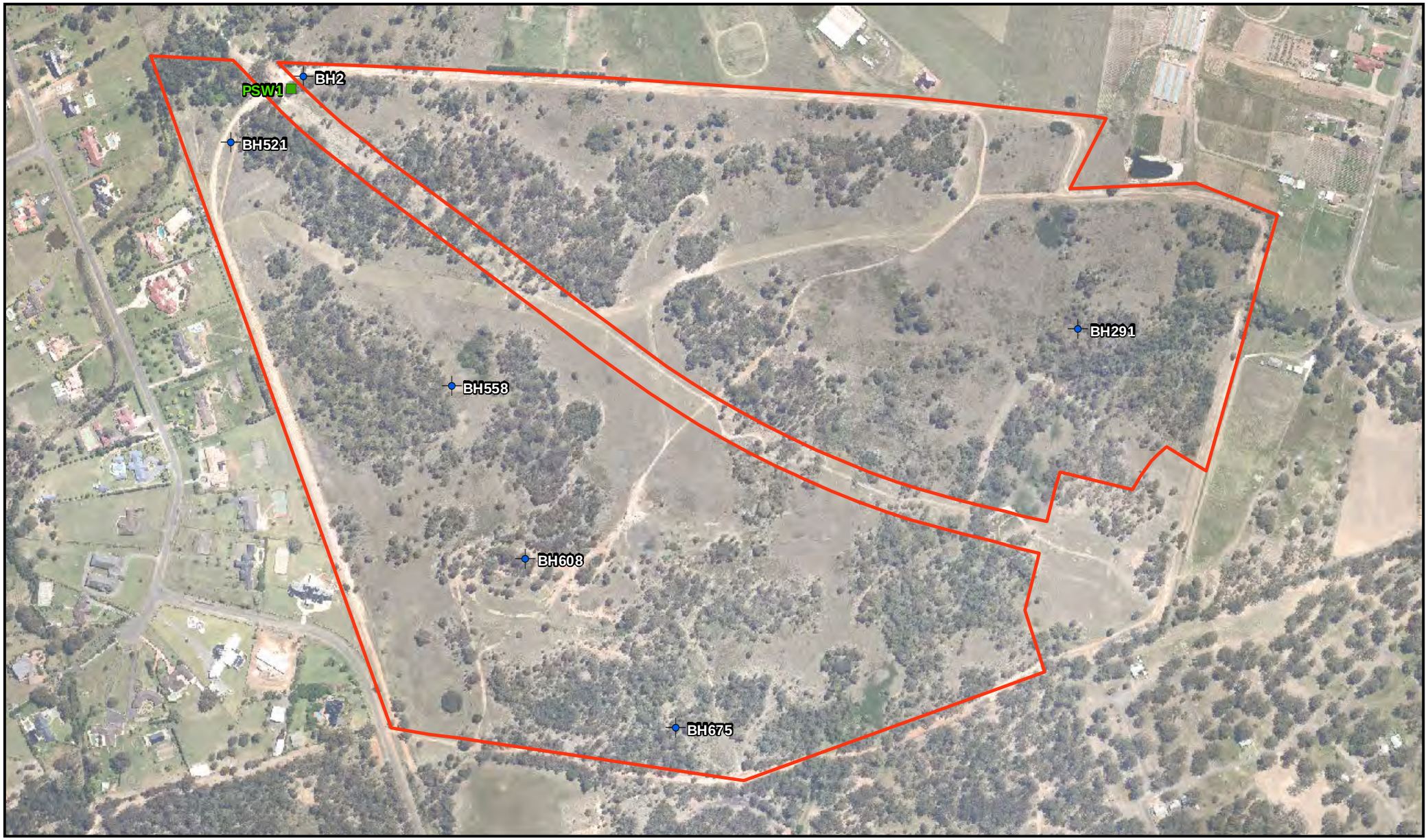
JBS ENVIRONMENTAL

Figure 1: Site Location and Current Cadastral Boundaries

Client: Landcom

Project: Zouch Rd, Edmondson Park Remediation

Job No: 41945 File Name: 41945_01



Source: Base Image - Near Map www.nearmap.com, 23-10-2011

© 2013 JBS Environmental Pty Ltd

0 62.5 125 250 m

Scale: 1:6,500

Datum: MGA94 Zone 56 - AHD

Rev	Description	Drn.	Date:
A4			
0	Original Issue - L026	SE	28-02-2013

Legend:

- Approximate Site Boundary
- Monitoring Well Locations (Golder 2005)
- Surface Water Sampling Location

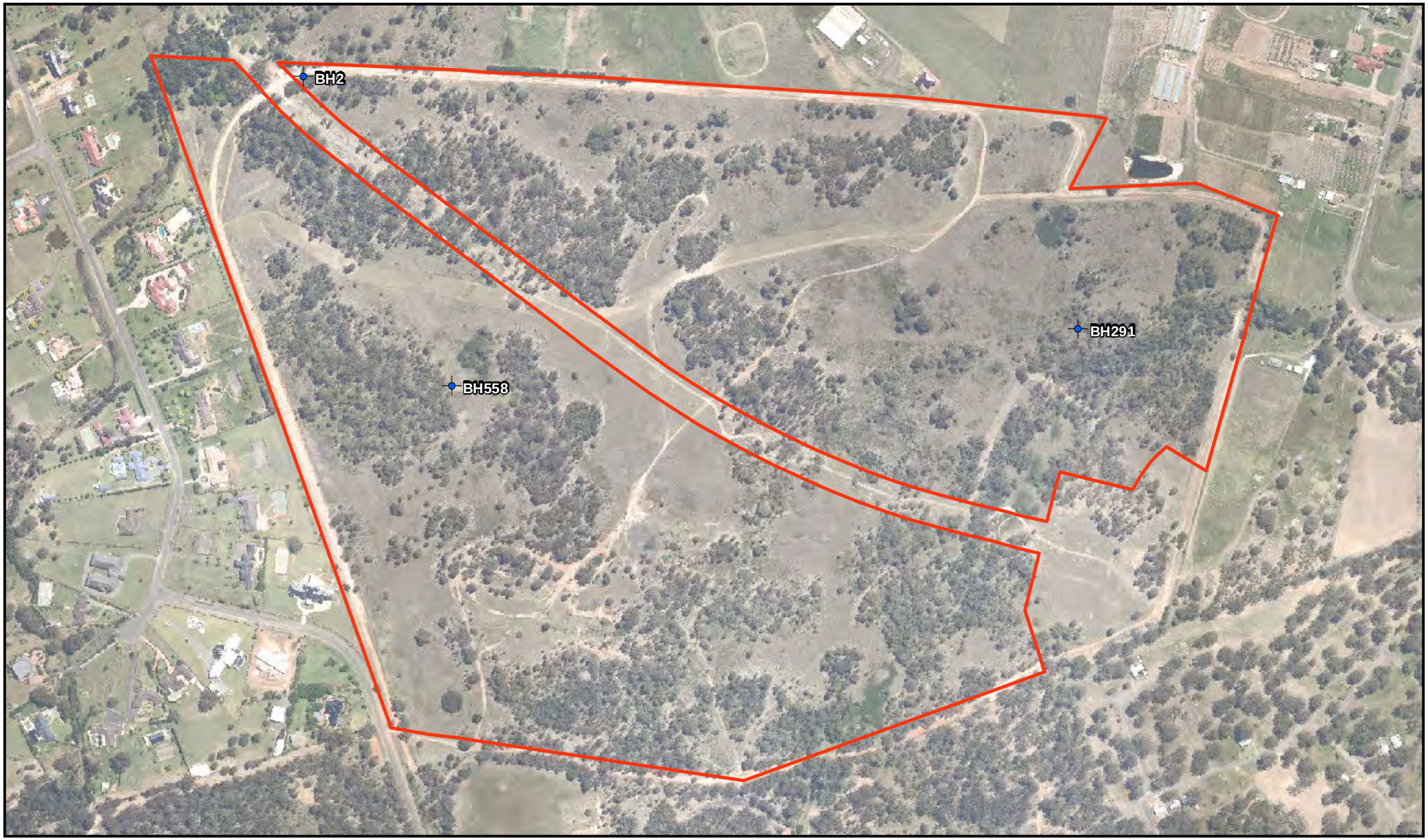
JBS ENVIRONMENTAL

Figure 2: Pre-Remediation Water Sampling Locations

Client: Landcom

Project: Landcom, 12619 Zouch Rd, Edmondson Park

Job No: 41945 File Name: 41945_02



Source: Base Image - Near Map www.nearmap.com, 23-10-2011

© 2013 JBS Environmental Pty Ltd

0 62.5 125 250 m

Scale: 1:6,500

Datum: MGA94 Zone 56 - AHD

Rev	Description	Drn.	Date:
A4			
0	Original Issue - L026	SE	28-02-2013

Legend:

- Approximate Site Boundary
- Monitoring Well Locations

JBS ENVIRONMENTAL

Figure 3: Post-Remediation Water Sampling Locations

Client: Landcom

Project: Landcom, 12619 Zouch Rd, Edmondson Park

Job No: 41945 File Name: 41945_03

Attachment 3 –Golder (2005a) Well Documentation and Laboratory Summary Tables

Arise Developments
Job Number: 41945
Zouch Road, Edmondson Park
Pre-Remediation GME
Table A - Groundwater Analytical Results

Notes:
(1) Adopted Groundwater Assessment Criteria (refer to text Table 6.1) - the lower of the nominated health/ecological investigation criterion

Units as indicated in table.
bold Concentration Exceeds (1)

- Not Analysed - insufficient sample volume

			Metals								PAHs															TPH					BTEX					
			Arsenic (Filtered)	Cadmium (Filtered)	Chromium (III+VI) (Filtered)	Copper (Filtered)	Lead (Filtered)	Mercury (Filtered)	Nickel (Filtered)	Zinc (Filtered)	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(b)&(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of total)	Benzene	Ethylbenzene	Toluene	Xylene (m & p)	Xylene (o)	Xylene Total
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL			0.001	0.0001	0.001	0.001	0.001	0.00005	0.001	0.001	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	10	50	100	100		1	1	1	2	1	
Assessment Criteria - Health Based			0.007	0.002	0.005	2	0.01	0.001	0.02	3																				600	1	300	800			600
Assessment Criteria - Ecological			0.024	0.0002	0.0033	0.0014	0.0034	0.00006	0.011	0.008			0.1		0.1					1			16	0.6							500	5	180	275	350	
Field_ID	**Sampled_Date-Time**	**Matrix**																																		
February 2012 Sampling Event																																				
BH2	10/02/2012	Groundwater	<0.001	<0.0001	<0.001	**0.014**	**0.011**	<0.00005	0.006	**0.14**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<10	56	330	<100	436	<1	<1	<1	<2	<1	<3
BH291	9/02/2012	Groundwater	<0.001	<0.0001	<0.001	0.001	0.001	<0.00005	**0.034**	**0.042**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<10	<50	<100	<100	<250	<1	<1	<1	<2	<1	<3
BH521	9/02/2012	Groundwater	**0.012**	<0.0001	<0.001	<0.001	<0.001	<0.00005	**0.031**	**0.02**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<10	<50	<100	<100	<250	<1	<1	<1	<2	<1	<3
BH558	10/02/2012	Groundwater	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<100	-	-	-	-	<10	<10	<10	<20	<10	<30
BH608	10/02/2012	Groundwater	<0.001	0.0001	<0.001	**0.01**	**0.01**	<0.00005	**0.073**	**0.088**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<10	<50	<100	<100	<250	<1	<1	<1	<2	<1	<3
March 2012 Limited Sampling Event																																				
BH2	26/03/2012	Groundwater	**0.017**	<0.0001	<0.001	<0.001	<0.001	<0.00005	**0.044**	**0.063**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<10	<50	<100	<100	<250	<1	<1	<1	<2	<1	<3
PSW1	26/03/2012	Surface water	0.003	0.001	<0.001	**0.006**	**0.004**	<0.00005	0.005	**0.027**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<10	59	420	560	**1039**	<1	<1	<1	<2	<1	<3

Sample Location	Matrix	Zone	Sample Date	Analytical Program									
BH2	Water	RZNRA	24/02/2005			Metals	PAH	TPH	BTEX	OCPs		PCBs	Explosives	Phenols	VHCs
			29/03/2005	pH	EC						OCP Low Level				
BH291	Water	RZNRA	24/02/2005			Metals	PAH	TPH	BTEX	OCPs		PCBs	Explosives	Phenols	VHCs
			29/03/2005	pH	EC						OCP Low Level				
BH521	Water	CZSRA	24/02/2005			Metals	PAH	TPH	BTEX	OCPs		PCBs	Explosives	Phenols	VHCs
			29/03/2005	pH	EC						OCP Low Level				
BH558	Water	CZSRA	24/02/2005			Metals	PAH	TPH	BTEX	OCPs		PCBs	Explosives	Phenols	VHCs
			29/03/2005	pH	EC						OCP Low Level				
BH608	Water	CZSRA	24/02/2005			Metals	PAH	TPH	BTEX	OCPs		PCBs	Explosives	Phenols	VHCs
			29/03/2005	pH	EC						OCP Low Level				
BH640	Water	CZSRA	24/02/2005			Metals	PAH	TPH	BTEX	OCPs		PCBs	Explosives	Phenols	VHCs
			29/03/2005	pH	EC						OCP Low Level				
BH675	Water	CZSRA	24/02/2005			Metals	PAH	TPH	BTEX	OCPs		PCBs	Explosives	Phenols	VHCs
			29/03/2005	pH	EC						OCP Low Level				
Trench1	Water	CZSRA	1/03/2005			Metals	PAH	TPH	BTEX	OCPs		PCBs	Explosives	Phenols	
Trench2	Water	CZSRA	1/03/2005			Metals	PAH	TPH	BTEX	OCPs		PCBs	Explosives	Phenols	
Trench3	Water	CZSRA	1/03/2005			Metals	PAH	TPH	BTEX	OCPs		PCBs	Explosives	Phenols	
QA/QC															
Dup W1	Duplicate of BH2		24/02/2005			Metals	PAH	TPH	BTEX	OCPs		PCBs	Explosives	Phenols	VHCs
Dup W2	Duplicate of BH3		24/02/2005												
Dup W3	Duplicate of BH4		29/03/2005	pH	EC						OCP Low Level				
Trips Spike	Trips Spike / Water		24/02/2005						BTEX						
Strip Blank	Trib Blank / Water		24/02/2005						BTEX						

Table 1 - Summary of Laboratory Results
Analytical Program
Landcom
DSI, Zouch Road
Edmondson Park

Sample No.	Collect Date/Time	Sample Matrix	Zone	pH	Ec	Arsenic	Cadmium	Chromium*	Copper	Lead	Mercury	Nickel	Zinc
				Units	uS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Threshold Concentrations for Groundwater				-	-	**0.024**	**0.0002**	**0.0033**	**0.0014**	**0.0034**	**0.0006**	**0.011**	**0.008**
BH2	24/02/2005	Water	RZNRA			**0.12**	<0.0002	**0.008**	<0.001	**0.004**	<0.0001	0.002	<0.001
BH2	29/03/2005	Water	RZNRA	7	10,000								
BH291	24/02/2005	Water	RZNRA			0.004	<0.0002	**0.011**	**0.003**	**0.01**	<0.0001	0.008	0.005
BH291	29/03/2005	Water	RZNRA	6.9	14,000								
BH521	24/02/2005	Water	CZSRA			0.021	<0.0002	**0.007**	**0.002**	**0.006**	<0.0001	0.005	0.005
BH521	29/03/2005	Water	CZSRA	6.9	15,000								
BH558	24/02/2005	Water	CZSRA			0.004	<0.0002	**0.007**	0.001	0.002	<0.0001	**0.016**	<0.001
BH558	29/03/2005	Water	CZSRA	7	12,000								
BH608	24/02/2005	Water	CZSRA			0.004	<0.0002	**0.012**	**0.004**	**0.005**	<0.0001	0.009	**0.021**
BH608	29/03/2005	Water	CZSRA	7.7	8,900								
BH640	24/02/2005	Water	CZSRA			0.004	<0.0002	**0.008**	<0.001	**0.005**	<0.0001	**0.019**	<0.001
BH640	29/03/2005	Water	CZSRA	7	11,000								
BH675	24/02/2005	Water	CZSRA			0.014	<0.0002	**0.008**	0.001	**0.012**	<0.0001	**0.022**	<0.001
BH675	29/03/2005	Water	CZSRA	7	10,000								
Trench1	1/03/2005	Water	CZSRA			0.001	<0.0002	0.002	<0.001	<0.001	<0.0001	0.004	0.002
Trench2	1/03/2005	Water	CZSRA			0.001	<0.0002	0.001	**0.002**	<0.001	<0.0001	0.007	**0.021**
Trench3	1/03/2005	Water	CZSRA			0.001	<0.0002	<0.001	**0.003**	0.002	<0.0001	0.01	**0.041**

Table 2 - Summary of Laboratory Results
Heavy Metals - Groundwater
Landcom
DSI, Zouch Road
Edmondson Park

Station Name	Sample Matrix	Collect Date/Time	Zone	TPH C_6-C_9	TPH C_{10}-C_{14}	TPH C_{15}-C_{28}	TPH C_{29}-C_{36}	TPH C_{10}-C_{36}	Benzene	Toluene	Ethyl Benzene	Xylene
				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Threshold Concentrations for Groundwater				-	-	-	-	**0.6**	**0.95**	**0.18**	**0.08**	**0.38**
BH2	WATER	24/02/2005	RZNRA	<0.040	<0.10	<0.20	<0.20	<0.54	<0.001	<0.001	<0.001	<0.003
BH291	WATER	24/02/2005	RZNRA	<0.040	<0.10	<0.20	<0.20	<0.54	<0.001	<0.001	<0.001	<0.003
BH521	WATER	24/02/2005	CZSRA	<0.040	<0.10	<0.20	<0.20	<0.54	<0.001	<0.001	<0.001	<0.003
BH558	WATER	24/02/2005	CZSRA	<0.040	<0.10	<0.20	<0.20	<0.54	<0.001	<0.001	<0.001	<0.003
BH608	WATER	24/02/2005	CZSRA	<0.040	<0.10	<0.20	<0.20	<0.54	<0.001	<0.001	<0.001	<0.003
BH640	WATER	24/02/2005	CZSRA	<0.040	<0.10	<0.20	<0.20	<0.54	<0.001	<0.001	<0.001	<0.003
BH675	WATER	24/02/2005	CZSRA	<0.040	<0.10	<0.20	<0.20	<0.54	<0.001	<0.001	<0.001	<0.003
DupW1	WATER	24/02/2005	CZSRA	<0.040	<0.10	<0.20	<0.20	<0.54	<0.001	<0.001	<0.001	<0.003
Trench1	WATER	1/03/2005	CZSRA	<0.040	<0.10	<0.20	<0.20	<0.54	<0.001	<0.001	<0.001	<0.003
Trench2	WATER	1/03/2005	CZSRA	<0.040	<0.10	<0.20	<0.20	<0.54	<0.001	<0.001	<0.001	<0.003
Trench3	WATER	1/03/2005	CZSRA	<0.040	<0.10	<0.20	<0.20	<0.54	<0.001	0.002	<0.001	<0.003

Table 3 - Summary of Laboratory Results
TPH/BTEX - Groundwater
Landcom
DSI, Zouch Road
Edmondson Park

Groundwater Lab Results.xls
Prepared By: DM Date: 12/08/05
Checked By: JN Date: 12/08/05

Station Name	Sample Matrix	Collect Date	Phenol	2-methylphenol (o-Cresol)	3/4-methylphenol (m/p-Cresol)	2-Chlorophenol	2,4 & 2,5-Dimethylphenol	2,6-Dichlorophenol	2,4-Dichlorophenol	2-Nitrophenol	2,4,6-Trichlorophenol	4-Nitrophenol	2,4,5-Trichlorophenol	2346-Tetrachlorophenol	Pentachlorophenol	2,4-Dinitrophenol
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
reshold Concentrations for Groundwat			**320**			**490**			**160**		**20**				**10**	
BH2	water	24/02/2005	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
BH291	water	24/02/2005	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
BH521	water	24/02/2005	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
BH558	water	24/02/2005	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
BH608	water	24/02/2005	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
BH640	water	24/02/2005	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
BH675	water	24/02/2005	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trench 1	WATER	1/03/2005	11	<10	17	<5	<10	<5	<5	10	<5	21	<5	<5	<5	<10
Trench 2	WATER	1/03/2005	11	<10	15	<5	<10	<5	<5	<5	<5	<5	<5	<5	<5	<10
Trench 3	WATER	1/03/2005	<10	<10	13	<5	<10	<5	<5	<5	<5	<5	<5	<5	<5	<10

Table 4 - Summary of Laboratory Results
Phenolics - Groundwater
Landcom
DSI, Zouch Road
Edmondson Park

Station Name	Sample Matrix	Collect Date	Dichlorodifluoromethane	Chloromethane	Vinyl Chloride	Bromomethane	Chloroethane	Trichlorofluoromethane	1,1-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethane	cis-1,2-Dichloroethene	Bromochloromethane	Chloroform	2,2-Dichloropropane	1,2-Dichloroethane	1,1,1-Trichloroethane	1,1-Dichloropropene	Carbon tetrachloride	Dibromomethane	1,2-Dichloropropane	Trichloroethene	Bromodichloromethane	trans-1,3-Dichloropropene
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Threshold Concentrations for Groundwater			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH2	water	24/02/2005	<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	<5.0	<5.0
BH291	water	24/02/2005	<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	<5.0	<5.0
BH521	water	24/02/2005	<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	<5.0	<5.0
BH558	water	24/02/2005	<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	<5.0	<5.0
BH608	water	24/02/2005	<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	<5.0	<5.0
BH640	water	24/02/2005	<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	<5.0	<5.0
BH675	water	24/02/2005	<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	<5.0	<5.0

Station Name	Sample Matrix	Collect Date	cis-1,3-Dichloropropene	1,1,2-Trichloroethane	1,3-Dichloropropane	Dibromochloromethane	1,2-Dibromoethane	Tetrachloroethene	1,1,1,2-Tetrachloroethane	Chlorobenzene	Bromoform	1,1,2,2-Tetrachloroethane	1,2,3-Trichloropropane	Bromobenzene	2-Chlorotoluene	4-Chlorotoluene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	1,2-Dichlorobenzene	1,2-Dibromo-3-chloropropane	1,2,4-Trichlorobenzene	Hexachlorobutadiene	1,2,3-Trichlorobenzene
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Threshold Concentrations for Groundwater			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH2	water	24/02/2005	<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	<5.0
BH291	water	24/02/2005	<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	<5.0
BH521	water	24/02/2005	<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	<5.0
BH558	water	24/02/2005	<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	<5.0
BH608	water	24/02/2005	<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	<5.0
BH640	water	24/02/2005	<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	<5.0
BH675	water	24/02/2005	<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	<5.0

Table 5 - Summary of Laboratory Results
VHCs - Groundwater
Landcom
DSI, Zouch Road
Edmondson Park

Station Name	Collect Date/Time	Sample Matrix	Zone	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo[a] anthracene	Chrysene	Benzo[b,k] fluoranthene	Benzo[a] pyrene	Indeno[123-cd] pyrene	Dibenzo[ah] anthracene	Benzo[ghi] perylene	Total PAH's
				ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Threshold Concentrations for Groundwater				**16**	-	-	-	**2**	**0.4**	**1.4**	-	-	-	-	**0.2**	-	-	-	-
BH2	24/02/2005	water	n/a	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	0
BH291	24/02/2005	water	n/a	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	0
BH521	24/02/2005	water	n/a	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	0
BH558	24/02/2005	water	n/a	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	0
BH608	24/02/2005	water	n/a	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	0
BH640	24/02/2005	water	n/a	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	0
BH675	24/02/2005	water	n/a	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	0
Dup W1	24/02/2005	water	n/a	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	0
Trench 1	1/03/2005	WATER	CZSRA	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	0
Trench 2	1/03/2005	WATER	CZSRA	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	0
Trench 3	1/03/2005	WATER	CZSRA	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	0

Table 6 - Summary of Laboratory Results
PAHs - Groundwater
Landcom
DSI, Zouch Road
Edmondson Park

Groundwater Lab Results.xls
Prepared By: DM Date: 12/08/05
Checked By: JN Date: 12/08/05

Station Name	Sample Matrix	Collect Date/Time	Zone	HCB	alpha BHC	gamma BHC(Lindane)	Heptachlor	Aldrin	beta-BHC	delta BHC	Heptachlor Epoxide	o,p'-DDE	alpha Endosulfan	beta-Endosulfan	trans-Chlordane	cis-Chlordane	alpha-Chlordane	gamma-Chlordane	trans-Nonachlor	p,p'-DDE	Dieldrin	Endrin	o,p'-DDD	o,p'-DDT	beta Endosulfan	p,p'-DDD	p,p'-DDT	Endosulfan Sulphate	Endrin Aldehyde	Methoxychlor	Endrin Ketone	Chlorpyrifos	Fenitrothion	Ethion	Bromophos Ethyl	Lindane
				ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Threshold Concentrations for Groundwater				-	-	-	0.09	0.001	-	-	-	-	-	-	-	-	-	-	-	-	0.01	-	-	-	-	-	-	-	-	-	-	0.01	-	-	-	-
BH2	24/02/2005	24/02/2005	RZNRA	<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	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.20	<0.20	-	-
BH291	24/02/2005	24/02/2005	RZNRA	<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	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.20	<0.20	-	-
BH521	24/02/2005	24/02/2005	CZSRA	<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	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.20	<0.20	-	-
BH558	24/02/2005	24/02/2005	CZSRA	<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	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.20	<0.20	-	-
BH608	24/02/2005	24/02/2005	CZSRA	<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	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.20	<0.20	-	-
BH640	24/02/2005	24/02/2005	CZSRA	<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	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.20	<0.20	-	-
BH675	24/02/2005	24/02/2005	CZSRA	<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	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.20	<0.20	-	-
Trench 1	1/03/2005	1/03/2005	CZSRA	<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	<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	<0.2	<0.2	-
Trench 2	1/03/2005	1/03/2005	CZSRA	<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	<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	<0.2	<0.2	-
Trench 3	1/03/2005	1/03/2005	CZSRA	<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	<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	<0.2	<0.2	-
BH2	29/03/2005	water	RZNRA	<0.01	-	-	<0.09	<0.02	-	-	-	-	<0.05	<0.05	-	-	<0.04	<0.04	-	<0.01	<0.02	<0.02	-	-	-	<0.01	<0.01	<0.05	-	<0.04	-	-	-	-	-	-	<0.2
BH291	29/03/2005	water	RZNRA	<0.01	-	-	<0.09	<0.02	-	-	-	-	<0.05	<0.05	-	-	<0.04	<0.04	-	<0.01	<0.02	<0.02	-	-	-	<0.01	<0.01	<0.05	-	<0.04	-	-	-	-	-	-	<0.2
BH521	29/03/2005	water	CZSRA	<0.01	-	-	<0.09	<0.02	-	-	-	-	<0.05	<0.05	-	-	<0.04	<0.04	-	<0.01	<0.02	<0.02	-	-	-	<0.01	<0.01	<0.05	-	<0.04	-	-	-	-	-	-	<0.2
BH558	29/03/2005	water	CZSRA	<0.01	-	-	<0.09	<0.02	-	-	-	-	<0.05	<0.05	-	-	<0.04	<0.04	-	<0.01	<0.02	<0.02	-	-	-	<0.01	<0.01	<0.05	-	<0.04	-	-	-	-	-	-	<0.2
BH608	29/03/2005	water	CZSRA	<0.01	-	-	<0.09	<0.02	-	-	-	-	<0.05	<0.05	-	-	<0.04	<0.04	-	<0.01	<0.02	<0.02	-	-	-	<0.01	<0.01	<0.05	-	<0.04	-	-	-	-	-	-	<0.2
BH640	29/03/2005	water	CZSRA	<0.01	-	-	<0.09	<0.02	-	-	-	-	<0.05	<0.05	-	-	<0.04	<0.04	-	<0.01	<0.02	<0.02	-	-	-	<0.01	<0.01	<0.05	-	<0.04	-	-	-	-	-	-	<0.2
BH675	29/03/2005	water	CZSRA	<0.01	-	-	<0.09	<0.02	-	-	-	-	<0.05	<0.05	-	-	<0.04	<0.04	-	<0.01	<0.02	<0.02	-	-	-	<0.01	<0.01	<0.05	-	<0.04	-	-	-	-	-	-	<0.2

Table 7 - Summary of Laboratory Results
OCPs - Groundwater
Landcom
DSI, Zouch Road
Edmondson Park

Station Name	Sample Matrix	Collect Date	Zone	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	Arochlor 1262	Arochlor 1268	Total Positive PCB
				ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Threshold Concentrations for Groundwater				-	-	-	-	-	-	-	-	-	-
BH2	water	24/02/2005	RZNRA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.90
BH291	water	24/02/2005	RZNRA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.90
BH521	water	24/02/2005	CZSRA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.90
BH558	water	24/02/2005	CZSRA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.90
BH608	water	24/02/2005	CZSRA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.90
BH640	water	24/02/2005	CZSRA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.90
BH675	water	24/02/2005	CZSRA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.90
Trench 1	water	1/03/2005	CZSRA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.90
Trench 2	water	1/03/2005	CZSRA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.90
Trench 3	water	1/03/2005	CZSRA	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.90

Table 8 - Summary of Laboratory Results
PCBs - Groundwater
Landcom
DSI, Zouch Road
Edmondson Park

Groundwater Lab Results.xls
Prepared By: DM Date: 12/08/05
Checked By: JN Date: 12/08/05

Station Name	Sample Matrix	Collect Date/Time	Zone	1,3,5-TNB	1,3-DNB	2-MNT	3-MNT	4-MNT	NB	RDX	TNT	2,4-&2,6-DNT
				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Threshold Concentrations for Groundwater				-	-	-	-	-	-	-	-	-
BH2	water	24/02/2005	n/a	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
BH291	water	24/02/2005	n/a	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
BH521	water	24/02/2005	n/a	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
BH558	water	24/02/2005	n/a	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
BH608	water	24/02/2005	n/a	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
BH640	water	24/02/2005	n/a	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
BH675	water	24/02/2005	n/a	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01
Trench 1	WATER	1/03/2005	CZSRA	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01
Trench 2	WATER	1/03/2005	CZSRA	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01
Trench 3	WATER	1/03/2005	CZSRA	<0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01

Table 9 - Summary of Laboratory Results
Explosives - Groundwater
Landcom
DSI, Zouch Road
Edmondson Park

Sample No.	Depth (m)	Collect Date/Time	Lab	Arsenic	Cadmium	Chromium*	Copper	Lead	Mercury	Nickel	Zinc
BH2	24/02/2005	Water	SGS	**0.12**	<0.0002	**0.008**	<0.001	**0.004**	<0.0001	0.002	<0.001
DupW1	N/A	38407	SGS	0.011	<0.0002	0.008	<0.001	0.008	<0.0001	0.003	<0.001
Relative Percent Difference (RPD)				*166.4*	*N/C*	*0.0*	*N/C*	*66.7*	*N/C*	*40.0*	*N/C*
BH291	N/A	24/02/2005	SGS	0.004	<0.0002	**0.011**	**0.003**	**0.01**	<0.0001	0.008	0.005
DupW2	N/A	24/02/2005	Labmark	<0.010*	<0.010*	0.1	0.005	0.01	0.0001	0.015	0.07
Relative Percent Difference (RPD)				*N/C*	*N/C*	*160.4*	*50.0*	*N/C*	*N/C*	*60.9*	*173.3*

Note

* EQL raised due to matrix interferance

Table 10 - Summary of Laboratory Results
QA/QC, Heavy Metals - Groundwater
Landcom
DSI, Zouch Road
Edmondson Park

Groundwater Lab Results.xls
Prepared By: DM Date: 12/08/05
Checked By: JN Date: 12/08/05

Attachment 4 –Groundwater Sampling Field Forms

Field Equipment Calibration and Decontamination

JBS ENVIRONMENTAL

PROJECT NAME:	Edmondson Park Remediation	**PROJECT NO:**	41945
FIELD DATES:	16-10-12	**FIELD STAFF:**	A.B

CALIBRATION SUMMARY
EQUIPMENT: Water quality Metre (see attached docs.)
CALIBRATION STANDARD:

DATE	TIME	READING (ppm_v)	COMMENTS

DECONTAMINATION SUMMARY			
EQUIPMENT: I.P,			
1. Was the equipment decontaminated appropriately prior to sampling at each location?	(Y)	N	NA
2. Was excess soil removed by scraping, brushing or wiping with disposable towels?	Y	N	(NA)
3. Was the equipment contaminated with grease, tar or similar material? If so, was the equipment steam cleaned or rinsed with pesticide-grade acetone:hexane?	Y Y	N N	(NA)
4. Was phosphate-free detergent used to wash the equipment?	(Y)	N	NA
5. Was the equipment rinsed with clean water?	(Y)	N	NA
6. Was the equipment then rinsed with deionised water?	(Y)	N	NA
7. Were all sample containers cleaned and acid or solvent washed prior to sample collection?	(Y)	N	NA
WERE ANY ADDITIONAL DECONTAMINATION MEASURES REQUIRED? PROVIDE DETAILS.			

Groundwater Gauging Data

JBS ENVIRONMENTAL

PROJECT NAME: Ed Park Rem	**PROJECT NO:** 41945
FIELDWORK DATES: 16-10-12	**SAMPLERS:** ACoordman
TYPE OF INVESTIGATION (GME/ESA etc):	**PROJECT MANAGER:** J. Rosner

WELL ID	DATE	TOTAL DEPTH (m)	DEPTH TO WATER (m)	DEPTH TO LNAPLS (m)	DEPTH TO DNAPLS (m)	CALCULATED WELL VOLUME	COMMENTS
BH5S	16-10-12	8.559	7.118	—	—		Purged dry
BH2	16-10-12	7.689	3.854	—	—		
BH291	16-10-12	7.714m	1.685m	—	—		Well cap + cover broken

Groundwater Sampling Form

FIELD RECORD SHEETS

Project name: Ed. Park Room	**Location:**	**Well ID:** BH291
Person sampling: AB	**Sample method:** Micro-Purge	**Date:** **Weather:**
Pre-purging groundwater depth (m): 1.685	**Post-sampling groundwater depth (m):** 3.52m	**Total well depth (m):** 7.714m
Well diameter (mm): **Well volume (L):**	**Pump on time:** 11:20am **Pump off time:**	**Cycles per minute:** 4

Field Measurements

Time	Purge Rate (mL/min)	Volume purged (L)	DO (mg/L) ×0.2	DO (% saturation)	EC (us/cm) ×0.3	pH (units)	Redox (mV) +16	Temp (oC)	TDS ppm ×0.19	
Field Stabilisation Criteria [1]:			+/- 10%		+/- 3%	+/- 0.5	+/- 10 mV		+/- 3%	
11:25am		2	1.87	9.2	12.24	6.54	−149	18.9	7.72	2.94m
11:30am		3	0.38	4.7	11.96	6.59	−158	18.8	7.55	3.27m
11:35am		5	0.20	2.0	10.98	6.57	−167	18.4	6.82	3.5m
11:40am		6	0.20	2.3	[illegible]	6.55	159	18.6	6.25	3.51m
11:45am		7	0.19	1.8	9.94	6.54	−147	18.9	6.20	3.52m
11:50am		8	0.19	1.5	10.00	6.54	−141	18.9	6.22	3.52m
11:55a		10	0.18	1.6	9.95	6.53	−139	18.9	6.20	3.52
				Sampled @ 11:58am						

Comments (Odour, colour, turbidity, sheen etc) light brown, mod/high turbidity, no odour or sheen, well cap + cover destroyed — very high turbidity for first 2-4L purging

Were Metals Field Filtered? Yes

Were QA/QC Samples Collected? No

[1] These parameters may be considered stable when three consecutive readings (obtained several minutes apart) are within these levels.

Source "Victorian Environmental Protection Authority, *Groundwater Sampling Guidelines*, Publication 669, April 2000".

Groundwater Sampling Form

JBS ENVIRONMENTAL

FIELD RECORD SHEETS

Project name: Ed. Parker Ren	**Location:** RZNRA	**Well ID:** BH.7
Person sampling: AB	**Sample method:** Micro-Purge	**Date:** 16/10/12 **Weather:** Fine
Pre-purging groundwater depth (m): 3.854	**Post-sampling groundwater depth (m):** 4.12m	**Total well depth (m):** 7.689m
Well diameter (mm): **Well volume (L):**	**Pump on time:** 9:45am **Pump off time:** 10:40am	**Cycles per minute:** 4

Field Measurements

Time	Purge Rate (mL/min)	Volume purged (L)	DO (mg/L)	DO (% saturation)	EC (us/cm)	pH (units)	Redox (mV)	Temp (oC)	TDS ppm	
			✓		±0.3		±2.2		±0.18	
Field Stabilisation Criteria [1]:			+/- 10%		+/- 3%	+/- 0.5	+/- 10 mV		+/- 3%	
9:50		3	0.41	3.8	6.58	6.96	-41	19.6	4.05	
9:55		4	0.18	2.3	7.38	6.91	-45	19.4	4.45	4.05m
10:00		5	0.15	1.6	7.90	6.87	-40	19.4	4.94	
10:05		6	0.11	1.2	8.72	6.84	-35	19.5	5.36	4.07m
10:10		8	0.10	1.1	9.38	6.81	-28	19.6	5.84	4.07m
10:15am		9	0.10	1.1	9.83	6.80	-22	19.6	6.10	4.07m
10:20am		10	0.10	1.1	10.09	6.78	-20	19.6	6.15	4.07m
10:25am		11	0.10	1.1	10.11	6.79	-20	19.6	6.17	
10:30		12	0.10	1.1	10.12	6.78	-20	19.6	6.15	
		Sampled @ 10:32am								

Comments (Odour, colour, turbidity, sheen etc) Very light grey, low turbid.ty no odours or sheen

Were Metals Field Filtered? Yes

Were QA/QC Samples Collected? Yes - QCW1 + QCW1/A

[1] These parameters may be considered stable when three consecutive readings (obtained several minutes apart) are within these levels.

Source "Victorian Environmental Protection Authority, *Groundwater Sampling Guidelines*, Publication 669, April 2000".

Groundwater Sampling Form

FIELD RECORD SHEETS

Project name: Ed Park Rem	**Location:** CZSIA	**Well ID:** BH558
Person sampling: A.B	**Sample method:** Micro Purge	**Date:** **Weather:**
Pre-purging groundwater depth (m): 7.115	**Post-sampling groundwater depth (m):**	**Total well depth (m):** 8.559
Well diameter (mm): **Well volume (L):**	**Pump on time:** 8:10am **Pump off time:**	**Cycles per minute:** 4

Field Measurements

Time	Purge Rate (mL/min)	Volume purged (L)	DO (mg/L)	DO (% saturation)	EC (us/cm)	pH (units)	Redox (mV)	Temp (oC)	TDS, ppm
Field Stabilisation Criteria [1]:			**+/- 10%**		**+/- 3%**	**+/- 0.5**	**+/- 10 mV**		**+/- 3%**
8:15am		2	4.57	31.6	11.50	6.92	110	18.5	7.21
8.20am		5	1.47	15.9	10.89	6.81	68	18.1	6.90
			Drop @ 8:22am						
			sampled w/ disposable						
			bailer @ 12:35pm						

Comments (Odour, colour, turbidity, sheen etc) light brown, moderate turbidity, no sheen or odour

Were Metals Field Filtered? Yes — no amber bottle collected

Were QA/QC Samples Collected? No

[1] These parameters may be considered stable when three consecutive readings (obtained several minutes apart) are within these levels.

Source "Victorian Environmental Protection Authority, *Groundwater Sampling Guidelines*, Publication 669, April 2000".

Attachment 5 – QA / QC Checker Summary

ESDAT QA Checker
Project:41945 GW
Filter: SDG in('80316')

Overview Summary
- Count of Samples
- Summary By Compound
- Count of Results

Holding Times
- Holding Time Errors (0)

Blanks
- Field Blanks
- Detects in Lab Blanks (0)
- SDG's without Method Blanks (0)

Duplicates
- Field and Interlab Dupes
- Lab Duplicates with high RPDs (0)
- Duplicate Samples with incorrect or missing Parent Samples (0)
- Samples at the same Location/Depth/Time not specified as duplicates (0)

Surrogates
- Surrogate Variation > 30% or outside lab LCL or UCL or outside lab LCL or UCL (3)

Lab Control Samples
- SDG's without a Laboratory Control Sample (0)
- Laboratory Control Samples, Error > 30% (1)

Certified and Standard Reference Materials
- Certified Reference Materials - Error > 30% (0)

Matrix Spikes
- SDG's without a Matrix Spike (0)
- Trip Spikes with invalid Control Sample (0)
- Less than 1 matrix spike in 20 samples, or less than 1 matrix duplicate in 20 samples (1)
- Matrix Spike Recoveries less than 70% or greater than 130% or outside lab LCL or UCL (0)
- Trip Spike Recoveries (70% - 130% is acceptable) (0)

Inorganic

Other
- Unit Conversion Problems (0)
- OriginalChemNames Requiring Validation (0)
- Samples with no Results (0)
- Samples associated with Wells which are not specified in the Well Table (0)
- Aborted Analysis (0)

Contents

Count of Samples

Matrix Type	water
First Sample Date	16/10/2012
Last Sample Date	16/10/2012
Sampling Period (days)	1
Number of Samples Submitted	6
Number of Non QA Samples Submitted	3
Number of Field Blanks	0
Number of Trip Blanks	0
Number of Rinsates	1
Number of Field Duplicates	1
Number of Interlab Duplicates	1
Number of Trip Spikes	1
Number of Lab Duplicates	2
Number of LCSs	2
Number of CRMs	0
Number of Method Blanks	1
Number of Storage Blanks	1
Number of Matrix Spikes	1
Number of Matrix Spike Dupes	0

			Num Results	Holding Times (days)			Lab Control Samples			Method and Storage Blanks			Laboratory Duplicates			Surrogates			Matrix,Trip and Compound Spikes			Field,Rinsate and Trip Blanks			Field Duplicates		
Chem_Group	ChemName	Range	Non QA (Normal + Composite)	Volatility Group	Sample to Extraction	Sample to Analysis	Acceptable	Recovery %	Num Reported	Acceptable	Range	Num Reported	Acceptable	Max RPD > EQL x 4	Num Reported	Acceptable	Recovery %	Num Reported	Acceptable	Recovery %	Num Reported	Acceptable	Range	Num Reported	Acceptable	Max RPD > EQL x 4	Num Reported	Acceptable
BTEX	Benzene	1 µg/L	3	VOC	0	1	Y	110 to 110	1	Y	ND	2	Y		0	**N**		0		0.85 to 0.85	1	**N**	ND	1	Y		1	Y
	Ethylbenzene	1 µg/L	3	VOC	0	1	Y	96 to 96	1	Y	ND	2	Y		0	**N**		0		0.9 to 0.9	1	**N**	ND	1	Y		1	Y
	Toluene	1 µg/L	3	VOC	0	1	Y	110 to 110	1	Y	ND	2	Y		0	**N**		0		0.97 to 0.97	1	**N**	ND	1	Y		1	Y
	Xylene (m & p)	2 µg/L	3	VOC	0	1	Y	97 to 97	1	Y	ND	2	Y		0	**N**		0		0.92 to 0.92	1	**N**	ND	1	Y		1	Y
	Xylene (o)	1 µg/L	3	VOC	0	1	Y	96 to 96	1	Y	ND	2	Y		0	**N**		0		0.93 to 0.93	1	**N**	ND	1	Y		1	Y
Halogenated Hydrocarbons	Dibromofluoromethane		0	SVOC			Y	105 to 105	1	Y		0			0	**N**	92 to 105	9	Y		0			0			0	**N**
Metals	Arsenic	0.001 mg/L	3	Other	1	1	Y	95 to 95	1	Y	ND	1	Y		1	Y		0			0		ND	1	Y	0	1	Y
	Cadmium	0.1 µg/L	3	Other	1	1	Y	94 to 94	1	Y	ND	1	Y		1	Y		0			0		ND	1	Y		1	Y
	Chromium (III+VI)	0.001 mg/L	3	Other	1	1	Y	95 to 95	1	Y	ND	1	Y		1	Y		0			0		ND	1	Y		1	Y
	Copper	0.001 mg/L	3	Other	1	1	Y	88 to 88	1	Y	ND	1	Y		1	Y		0			0		ND	1	Y		1	Y
	Lead	0.001 mg/L	3	Other	1	1	Y	96 to 96	1	Y	ND	1	Y		1	Y		0			0		ND	1	Y		1	Y
	Mercury	0.05 µg/L	3	Specific	1	1	Y	92 to 92	1	Y	ND	1	Y		1	Y		0		84 to 84	1	Y	ND	1	Y		1	Y
	Nickel	0.001 mg/L	3	Other	1	1	Y	89 to 89	1	Y	ND	1	Y	0	1	Y		0			0		ND	1	Y	0	1	Y
	Zinc	0.001 mg/L	3	Other	1	1	Y	89 to 89	1	Y	ND	1	Y	0	1	Y		0			0		ND	1	Y	5	1	Y
PAH/Phenols	4-Terphenyl-d14		0	SVOC			Y	95 to 95	1	Y		0			0	**N**	68 to 116	6	**N**		0			0			0	**N**
	Acenaphthene	0.1 µg/L	2	SVOC	2	6	Y		0		ND	1	Y		0	**N**		0			0		ND	1	Y		1	Y
	Acenaphthylene	0.1 µg/L	2	SVOC	2	6	Y		0		ND	1	Y		0	**N**		0			0		ND	1	Y		1	Y
	Anthracene	0.1 µg/L	2	SVOC	2	6	Y		0		ND	1	Y		0	**N**		0			0		ND	1	Y		1	Y
	Benz(a)anthracene	0.1 µg/L	2	SVOC	2	6	Y		0		ND	1	Y		0	**N**		0			0		ND	1	Y		1	Y
	Benzo(a) pyrene	0.1 µg/L	2	SVOC	2	6	Y	100 to 100	1	Y	ND	1	Y		0	**N**		0			0		ND	1	Y		1	Y
	Benzo(b)&(k)fluoranthene	0.2 µg/L	2	SVOC	2	6	Y		0		ND	1	Y		0	**N**		0			0		ND	1	Y		1	Y
	Benzo(g,h,i)perylene	0.1 µg/L	2	SVOC	2	6	Y		0		ND	1	Y		0	**N**		0			0		ND	1	Y		1	Y
	Chrysene	0.1 µg/L	2	SVOC	2	6	Y	110 to 110	1	Y	ND	1	Y		0	**N**		0			0		ND	1	Y		1	Y
	Dibenz(a,h)anthracene	0.1 µg/L	2	SVOC	2	6	Y		0		ND	1	Y		0	**N**		0			0		ND	1	Y		1	Y
	Fluoranthene	0.1 µg/L	2	SVOC	2	6	Y	110 to 110	1	Y	ND	1	Y		0	**N**		0			0		ND	1	Y		1	Y
	Fluorene	0.1 µg/L	2	SVOC	2	6	Y	100 to 100	1	Y	ND	1	Y		0	**N**		0			0		ND	1	Y		1	Y
	Indeno(1,2,3-c,d)pyrene	0.1 µg/L	2	SVOC	2	6	Y		0		ND	1	Y		0	**N**		0			0		ND	1	Y		1	Y
	Naphthalene	0.1 µg/L	2	SVOC	2	6	Y	99 to 99	1	Y	ND	1	Y		0	**N**		0			0		ND	1	Y		1	Y
	Phenanthrene	0.1 µg/L	2	SVOC	2	6	Y	100 to 100	1	Y	ND	1	Y		0	**N**		0			0		ND	1	Y		1	Y
	Pyrene	0.1 µg/L	2	SVOC	2	6	Y	110 to 110	1	Y	ND	1	Y		0	**N**		0			0		ND	1	Y		1	Y
TPH	4-Bromofluorobenzene		0	VOC			Y	103 to 103	1	Y		0			0	**N**	95 to 105	9	Y		0			0			0	**N**
	C15-C28	100 µg/L	2	SVOC	2	3	Y	96 to 96	1	Y	ND	1	Y		0	**N**		0			0		ND	1	Y		1	Y
	C29-C36	100 µg/L	2	SVOC	2	3	Y	93 to 93	1	Y	ND	1	Y		0	**N**		0			0		ND	1	Y		1	Y
	C6 - C9	10 µg/L	3	VOC	0	1	Y	100 to 100	1	Y	ND	1	Y		0	**N**		0			0		ND	1	Y		1	Y
	o-Terphenyl		0	SVOC			Y	67 to 67	1	**N**		0			0	**N**	67 to 96	6	**N**		0			0			0	**N**
	Toluene-D8		0	VOC			Y	102 to 102	1	Y		0			0	**N**	76 to 102	9	Y		0			0			0	**N**

Filter: SDG in('80316')

Contents

Count of Results

Matrix_Type	Sample_Type	Reg	Leached	Spike_Compounds	Surrogate
water	Normal	86	0	0	13
WATER	Interlab_D	42	0	0	11
water	Field_D	35	0	0	5
water	Rinsate	31	0	0	5
water	MB	31	0	0	5
water	LCS	23	0	0	5
water	Trip_S	5	0	0	3
water	SB	5	0	0	3
water	LAB_D	8	0	0	0
water	MS	1	0	0	0

Field Blanks (water)
Filter: SDG in('80316')

SDG	80316
Field_ID	Rinsate
Sampled_Date-Time	16/10/2012
Sample_Type	Rinsate

Chem_Group	ChemName	Units	EQL	
BTEX	Benzene	µg/L	1	<1
	Toluene	µg/L	1	<1
	Ethylbenzene	µg/L	1	<1
	Xylene (m & p)	µg/L	2	<2
	Xylene (o)	µg/L	1	<1
Metals	Arsenic (Filtered)	mg/l	0.001	<0.001
	Cadmium (Filtered)	µg/L	0.1	<0.1
	Chromium (III+VI) (Filtered)	mg/l	0.001	<0.001
	Copper (Filtered)	mg/l	0.001	<0.001
	Lead (Filtered)	mg/l	0.001	<0.001
	Mercury (Filtered)	µg/L	0.05	<0.05
	Nickel (Filtered)	mg/l	0.001	<0.001
	Zinc (Filtered)	mg/l	0.001	<0.001
PAH/Phenols	Acenaphthene	µg/L	0.1	<0.1
	Acenaphthylene	µg/L	0.1	<0.1
	Anthracene	µg/L	0.1	<0.1
	Benz(a)anthracene	µg/L	0.1	<0.1
	Benzo(a) pyrene	µg/L	0.1	<0.1
	Benzo(b)&(k)fluoranthene	µg/L	0.2	<0.2
	Benzo(g,h,i)perylene	µg/L	0.1	<0.1
	Chrysene	µg/L	0.1	<0.1
	Dibenz(a,h)anthracene	µg/L	0.1	<0.1
	Fluoranthene	µg/L	0.1	<0.1
	Fluorene	µg/L	0.1	<0.1
	Indeno(1,2,3-c,d)pyrene	µg/L	0.1	<0.1
	Naphthalene	µg/L	0.1	<0.1
	Phenanthrene	µg/L	0.1	<0.1
	Pyrene	µg/L	0.1	<0.1
TPH	C6 - C9	µg/L	10	<10
	C15-C28	µg/L	100	<100
	C29-C36	µg/L	100	<100

Field Duplicates (water)
Filter: SDG in('80316')

SDG	80316	80316		80316	Interlab_D	
Field_ID	BH 2	QCW1	RPD	BH 2	QCWVA	RPD
Sampled_Date-Time	16/10/2012	16/10/2012		16/10/2012	16/10/2012	

Chem_Group	ChemName	Units	EQL						
BTEX	Benzene	µg/L	1 (Primary): 0.5 (Interlab	<1.0	<1.0	0	<1.0	<0.5	0
	Toluene	µg/L	1 (Primary): 0.5 (Interlab	<1.0	<1.0	0	<1.0	<0.5	0
	Ethylbenzene	µg/L	1 (Primary): 0.5 (Interlab	<1.0	<1.0	0	<1.0	<0.5	0
	Xylene (m & p)	µg/L	2 (Primary): 1 (Interlab)	<2.0	<2.0	0	<2.0	<1.0	0
	Xylene (o)	µg/L	1 (Primary): 0.5 (Interlab	<1.0	<1.0	0	<1.0	<0.5	0
Metals	Arsenic (Filtered)	mg/l	0.001	0.012	0.012	0	0.012	0.012	0
	Cadmium (Filtered)	µg/L	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Chromium (III+VI) (Filtered)	mg/l	0.001	<0.001	<0.001	0	<0.001	<0.001	0
	Copper (Filtered)	mg/l	0.001	<0.001	<0.001	0	<0.001	<0.001	0
	Lead (Filtered)	mg/l	0.001	<0.001	<0.001	0	<0.001	<0.001	0
	Mercury (Filtered)	µg/L	0.05	<0.05	<0.05	0	<0.05		
	Nickel (Filtered)	mg/l	0.001	0.005	0.005	0	0.005	0.005	0
	Zinc (Filtered)	mg/l	0.001	0.042	0.04	5	0.042	0.049	15
PAH/Phenols	Acenaphthene	µg/L	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Acenaphthylene	µg/L	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Anthracene	µg/L	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Benz(a)anthracene	µg/L	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Benzo(a) pyrene	µg/L	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Benzo(b)&(k)fluoranthene	µg/L	0.2	<0.2	<0.2	0	<0.2		
	Benzo(g,h,i)perylene	µg/L	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Chrysene	µg/L	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Dibenz(a,h)anthracene	µg/L	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Fluoranthene	µg/L	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Fluorene	µg/L	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Indeno(1,2,3-c,d)pyrene	µg/L	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Naphthalene	µg/L	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Phenanthrene	µg/L	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Pyrene	µg/L	0.1	<0.1	<0.1	0	<0.1	<0.1	0
TPH	C6 - C9	µg/L	10 (Primary): 40 (Interlal	<10.0	<10.0	0	<10.0	<40.0	0
	C15-C28	µg/L	100 (Primary): 200 (Inter	<100.0	<100.0	0	<100.0	<200.0	0
	C29-C36	µg/L	100 (Primary): 200 (Inter	<100.0	<100.0	0	<100.0	<200.0	0

*RPDs have only been considered where a concentration is greater than 4 times the EQL.
**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 50 (4-10 x EQL); 50 (10-30 x EQL); 50 (> 30 x EQL))
***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those use

Contents

Surrogate Variation > 30% or outside lab LCL or UCL or outside lab LCL or UCL

SDG	Sample_Type	Matrix_Type	SampleCode	Field_ID	Depth	Sampled_Date-Time	Compound	Recovery %	Unit	Comments
80316	Rinsate	water	80316-6	Rinsate		16/10/2012	Surrogate o-Terphenyl	68	%	
80316	Rinsate	water	80316-6	Rinsate		16/10/2012	Surrogate p-Terphenyl-d14	68	%	
80316	LCS	water	80316LCS-W1			16/10/2012	Surrogate o-Terphenyl	67	%	

Contents

Laboratory Control Samples, Error > 30%

SDG	Matrix_Type	SampleCode	Method_Name	OriginalChemName	Recovery %	Unit	Result_Type	Comments
80316	water	80316LCS-W1	Org-003 - Semi-volatile TRH in waters and soil	Surrogate o-Terphenyl	67	%	SUR	

Contents

Less than 1 matrix spike in 20 samples, or less than 1 matrix duplicate in 20 samples

Matrix_Type	Number_of_Samples	Number_of_Matrix_Spike_Samples	Number_of_Matrix_Spike_Dupe_Samples
water	13	1	0

Attachment 6 – Laboratory Analysis Reports and Chain of Custody Information

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

CERTIFICATE OF ANALYSIS 80316

Client:
JBS Environmental Pty Ltd
P.O. Box 940
MASCOT
NSW 1460

Attention: Joanne Rosner

Sample log in details:

Your Reference:	**41945, Edmondson Park Remediation**
No. of samples:	7 Waters
Date samples received / completed instructions received	16/10/2012 / 16/10/2012

Analysis Details:
Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	23/10/12 / 22/10/12
Date of Preliminary Report:	Not issued

NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Rhian Morgan
Reporting Supervisor

Hinoko Miyazaki
Chemist

Jeremy Faircloth
Chemist

vTRH & BTEX in Water						
Our Reference:	UNITS	80316-1	80316-2	80316-3	80316-4	80316-5
Your Reference	----------	BH 558	BH 2	BH291	Trip Spike	Trip Blank
Date Sampled	----------	16/10/2012	16/10/2012	16/10/2012	16/10/2012	16/10/2012
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	16/10/2012	16/10/2012	16/10/2012	16/10/2012	16/10/2012
Date analysed	-	17/10/2012	17/10/2012	17/10/2012	17/10/2012	17/10/2012
TRHC$_6$ - C$_9$	µg/L	<100	<10	<100	[NA]	[NA]
Benzene	µg/L	<10	<1	<10	85%	<1
Toluene	µg/L	<10	<1	<10	97%	<1
Ethylbenzene	µg/L	<10	<1	<10	90%	<1
m+p-xylene	µg/L	<20	<2	<20	92%	<2
o-xylene	µg/L	<10	<1	<10	93%	<1
Surrogate Dibromofluoromethane	%	92	103	103	104	104
Surrogate toluene-d8	%	76	102	101	102	101
Surrogate 4-BFB	%	95	103	103	102	103

vTRH & BTEX in Water			
Our Reference:	UNITS	80316-6	80316-7
Your Reference	----------	Rinsate	QCW1
Date Sampled	----------	16/10/2012	16/10/2012
Type of sample		Water	Water
Date extracted	-	16/10/2012	16/10/2012
Date analysed	-	17/10/2012	17/10/2012
TRHC$_6$ - C$_9$	µg/L	<10	<10
Benzene	µg/L	<1	<1
Toluene	µg/L	<1	<1
Ethylbenzene	µg/L	<1	<1
m+p-xylene	µg/L	<2	<2
o-xylene	µg/L	<1	<1
Surrogate Dibromofluoromethane	%	104	105
Surrogate toluene-d8	%	101	101
Surrogate 4-BFB	%	103	105

sTRH in Water (C10-C36) Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ----------	80316-2 BH 2 16/10/2012 Water	80316-3 BH291 16/10/2012 Water	80316-6 Rinsate 16/10/2012 Water	80316-7 QCW1 16/10/2012 Water
Date extracted	-	18/10/2012	18/10/2012	18/10/2012	18/10/2012
Date analysed	-	19/10/2012	19/10/2012	19/10/2012	19/10/2012
TRHC$_{10}$ - C$_{14}$	µg/L	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	µg/L	<100	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	µg/L	<100	<100	<100	<100
Surrogate o-Terphenyl	%	92	77	68	90

PAHs in Water - Low Level Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ----------	80316-2 BH 2 16/10/2012 Water	80316-3 BH291 16/10/2012 Water	80316-6 Rinsate 16/10/2012 Water	80316-7 QCW1 16/10/2012 Water
Date extracted	-	18/10/2012	18/10/2012	18/10/2012	18/10/2012
Date analysed	-	22/10/2012	22/10/2012	22/10/2012	22/10/2012
Naphthalene	µg/L	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	µg/L	<0.1	<0.1	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1	<0.1	<0.1
Benzo(b+k)fluoranthene	µg/L	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d_{14}	%	97	73	68	92

HM in water - dissolved Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ----------	80316-1 BH 558 16/10/2012 Water	80316-2 BH 2 16/10/2012 Water	80316-3 BH291 16/10/2012 Water	80316-6 Rinsate 16/10/2012 Water	80316-7 QCW1 16/10/2012 Water
Date prepared	-	17/10/2012	17/10/2012	17/10/2012	17/10/2012	17/10/2012
Date analysed	-	17/10/2012	17/10/2012	17/10/2012	17/10/2012	17/10/2012
Arsenic-Dissolved	µg/L	<1	12	3	<1	12
Cadmium-Dissolved	µg/L	0.1	<0.1	<0.1	<0.1	<0.1
Chromium-Dissolved	µg/L	<1	<1	<1	<1	<1
Copper-Dissolved	µg/L	2	<1	<1	<1	<1
Lead-Dissolved	µg/L	<1	<1	<1	<1	<1
Mercury-Dissolved	µg/L	<0.050	<0.050	<0.050	<0.050	<0.050
Nickel-Dissolved	µg/L	8	5	35	<1	5
Zinc-Dissolved	µg/L	9	42	70	<1	40

Method ID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
Metals-022 ICP-MS	Determination of various metals by ICP-MS.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.

QUALITY CONTROL vTRH & BTEX in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			16/10/2012	[NT]	[NT]	LCS-W1	16/10/2012
Date analysed	-			17/10/2012	[NT]	[NT]	LCS-W1	17/10/2012
TRH C_6 - C_9	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-W1	101%
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	106%
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	108%
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	96%
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	LCS-W1	97%
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	96%
Surrogate Dibromofluoromethane	%		Org-016	99	[NT]	[NT]	LCS-W1	105%
Surrogate toluene-d8	%		Org-016	98	[NT]	[NT]	LCS-W1	102%
Surrogate 4-BFB	%		Org-016	98	[NT]	[NT]	LCS-W1	103%
QUALITY CONTROL sTRH in Water (C10-C36)	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			18/10/2012	[NT]	[NT]	LCS-W1	18/10/2012
Date analysed	-			19/10/2012	[NT]	[NT]	LCS-W1	19/10/2012
TRH C_{10} - C_{14}	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W1	94%
TRH C_{15} - C_{28}	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	96%
TRH C_{29} - C_{36}	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	93%
Surrogate o-Terphenyl	%		Org-003	96	[NT]	[NT]	LCS-W1	67%
QUALITY CONTROL PAHs in Water - Low Level	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			18/10/2012	[NT]	[NT]	LCS-W1	18/10/2012
Date analysed	-			22/10/2012	[NT]	[NT]	LCS-W1	22/10/2012
Naphthalene	µg/L	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-W1	99%
Acenaphthylene	µg/L	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	µg/L	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluorene	µg/L	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-W1	103%
Phenanthrene	µg/L	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-W1	103%
Anthracene	µg/L	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	µg/L	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-W1	106%
Pyrene	µg/L	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-W1	108%

QUALITY CONTROL PAHs in Water - Low Level	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Benzo(a)anthracene	µg/L	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Chrysene	µg/L	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-W1	109%
Benzo(b+k)fluoranthene	µg/L	0.2	Org-012 subset	<0.2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	µg/L	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-W1	105%
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	µg/L	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d_{14}	%		Org-012 subset	116	[NT]	[NT]	LCS-W1	95%
QUALITY CONTROL HM in water - dissolved	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			17/10/2012	80316-1	17/10/2012 || 17/10/2012	LCS-3	17/10/2012
Date analysed	-			17/10/2012	80316-1	17/10/2012 || 17/10/2012	LCS-3	17/10/2012
Arsenic-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	80316-1	<1 || <1	LCS-3	95%
Cadmium-Dissolved	µg/L	0.1	Metals-022 ICP-MS	<0.1	80316-1	0.1 || 0.1 || RPD: 0	LCS-3	94%
Chromium-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	80316-1	<1 || <1	LCS-3	95%
Copper-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	80316-1	2 || 2 || RPD: 0	LCS-3	88%
Lead-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	80316-1	<1 || <1	LCS-3	96%
Mercury-Dissolved	µg/L	0.05	Metals-021 CV-AAS	<0.050	80316-1	<0.050 || [N/T]	LCS-3	92%
Nickel-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	80316-1	8 || 8 || RPD: 0	LCS-3	89%
Zinc-Dissolved	µg/L	1	Metals-022 ICP-MS	<1	80316-1	9 || 9 || RPD: 0	LCS-3	89%

QUALITY CONTROL HM in water - dissolved	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	80316-3	17/10/2012 || 17/10/2012	80316-7	17/10/2012
Date analysed	-	80316-3	17/10/2012 || 17/10/2012	80316-7	17/10/2012
Mercury-Dissolved	µg/L	80316-3	<0.050 || <0.050	80316-7	84%

Report Comments:

Total Recoverable Hydrocarbons/BTEX in water:PQL has been raised due to the sample matrix requiring dilution.

Asbestos ID was analysed by Approved Identifier:	Not applicable for this job
Asbestos ID was authorised by Approved Signatory:	Not applicable for this job

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NA: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batched of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

SAMPLE RECEIPT ADVICE

Client:

JBS Environmental Pty Ltd
P.O. Box 940
MASCOT NSW 1460

ph: 8338 1013
Fax: 8338 1700

Attention: Joanne Rosner

Sample log in details:

Your reference:	**41945, Edmondson Park Remediation**
Envirolab Reference:	**80316**
Date received:	16/10/2012
Date results expected to be reported:	**23/10/12**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	7 Waters
Turnaround time requested:	Standard
Temperature on receipt	Cool
Cooling Method:	Ice
Sampling Date Provided:	

Comments:

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

Contact details:

Please direct any queries to Aileen Hie or Jacinta Hurst
ph: 02 9910 6200 fax: 02 9910 6201
email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au

JBS ENVIRONMENTAL

CHAIN OF CUSTODY

PROJECT NO.: 41945
PROJECT NAME: Edmondson Park Remediation
SEND REPORT TO: J.R + A.B
SEND INVOICE TO: A.Traynor
DATE NEEDED BY: Standard TAT
COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

LABORATORY BATCH NO:
SAMPLERS AB
PHONE: 02 8338 1011
EMAIL: aboardman@jbsgroup.com.au jrosnere@jbsgroup.com.au
QC LEVEL: NEPM 1999 (✓)

	SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	Metals (8)	PAHs (Low)	BTEX	TPH C6-C9	TPH C10-C36
1	BH558	Water	16-10-12		[redacted] 2 x vials, 1x metals		X	[redacted]	X	[redacted]	X
2	BH2	Water	16-10-12		1x amber, 2 x vials, 1x metals		X	X	X	X	X
3	BH291	Water	16-10-12		1 x amber, 2 x vials, 1x metals		X	X	X	X	X
4	Trip Spike	Water	16-10-12		vial				X		
5	Trip Blank	Water	16-10-12		vial				X		
6	Rinsate	Water	16-10-12		1x amber, 2 x vials, 1x metals		X	X	X	X	X
7	QCW1	Water	16-10-12		1x amber, 2 x vials, 1x metals		X	X	X	X	X
	QCW1/A	Water	16-10-12		1x amber, 2x vials, 1x metals		Send		to	SGS	

NOTES

Enviroslab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 80316
Date Received: 16/10/12
Time Received: 16:30
Received by: JH e
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

RELINQUISHED BY:
NAME: A. Boardman DATE: 16-10-12
OF: JBS Environmental
NAME: DATE:
OF:

METHOD OF SHIPMENT:
CONSIGNMENT NOTE NO.
TRANSPORT CO.
CONSIGNMENT NOTE NO.
TRANSPORT CO

RECEIVED BY:
NAME: DATE: 16/10/12
OF: ELS
NAME: DATE:
OF:

FOR RECEIVING LAB
COOLER SEAL - Yes..... No..... Intact..... Broken.....
COOLER TEMP..... deg C
COOLER SEAL - Yes..... No..... Intact..... Broken.....
COOLER TEMP..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

JBS Environmental Pty Ltd ABN 67 071 842 638
Phone: (02) 8338-1011
Fax: (02) 8338-1700

128 O'Riordan St, MASCOT NSW 2020
PO Box 940 MASCOT NSW 1460
www.jbsgroup.com.au

ANALYTICAL REPORT

WORLD RECOGNISED ACCREDITATION

CLIENT DETAILS

Contact	Joanne Rosner
Client	JBS Environmental
Address	(PO Box 940 Mascot NSW 1460) 128 O'Riordan Street MASCOT NSW 2020
Telephone	02 8338 1011
Facsimile	02 8338 1700
Email	jrosner@jbsgroup.com.au
Project	**41945-Edmondson Park Remediation**
Order Number	(Not specified)
Samples	1

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE112861 R0**
Report Number	0000043225
Date Reported	24 Oct 2012
Date Received	17 Oct 2012

COMMENTS

Accredited for compliance with ISO/IEC 17025. NATA accredited laboratory 2562(4354).

SIGNATORIES

Andy Sutton
Organics Chemist

Dong Liang
Inorganics Metals Team Leader

Ly Kim Ha
Organics Supervisor

Parameter	Units	LOR	Sample Number: SE112861.001 Sample Matrix: Water Sample Date: 16 Oct 2012 Sample Name: QCWVA
VOCs in Water Method: AN433/AN434			
Monocyclic Aromatic Hydrocarbons			
Benzene	µg/L	0.5	<0.5
Toluene	µg/L	0.5	<0.5
Ethylbenzene	µg/L	0.5	<0.5
m/p-xylene	µg/L	1	<1
o-xylene	µg/L	0.5	<0.5
Oxygenated Compounds			
MtBE (Methyl-tert-butyl ether)	µg/L	0.5	-
Surrogates			
Dibromofluoromethane (Surrogate)	%	-	**124**
d4-1,2-dichloroethane (Surrogate)	%	-	**126**
d8-toluene (Surrogate)	%	-	**103**
Bromofluorobenzene (Surrogate)	%	-	**83**
Totals			
Total Xylenes	µg/L	1.5	<1.5
Total BTEX	µg/L	3	<3
Volatile Petroleum Hydrocarbons in Water Method: AN433/AN434/AN410			
TRH C6-C9	µg/L	40	<40
Surrogates			
Trifluorotoluene (Surrogate)	%	-	-
Dibromofluoromethane (Surrogate)	%	-	**124**
d4-1,2-dichloroethane (Surrogate)	%	-	**126**
d8-toluene (Surrogate)	%	-	**103**
Bromofluorobenzene (Surrogate)	%	-	**83**
TRH (Total Recoverable Hydrocarbons) in Water Method: AN403			
TRH C10-C14	µg/L	100	<100
TRH C15-C28	µg/L	200	<200
TRH C29-C36	µg/L	200	<200

Parameter	Units	LOR	Sample Number: SE112861.001 Sample Matrix: Water Sample Date: 16 Oct 2012 Sample Name: QCWVA
TRH (Total Recoverable Hydrocarbons) in Water Method: AN403 (continued)			
Surrogates			
TRH (Surrogate)	%	-	-
PAH (Polynuclear Aromatic Hydrocarbons) in Water Method: AN420			
Naphthalene	µg/L	0.1	<0.1
2-methylnaphthalene	µg/L	0.1	<0.1
1-methylnaphthalene	µg/L	0.1	<0.1
Acenaphthylene	µg/L	0.1	<0.1
Acenaphthene	µg/L	0.1	<0.1
Fluorene	µg/L	0.1	<0.1
Phenanthrene	µg/L	0.1	<0.1
Anthracene	µg/L	0.1	<0.1
Fluoranthene	µg/L	0.1	<0.1
Pyrene	µg/L	0.1	<0.1
Benzo(a)anthracene	µg/L	0.1	<0.1
Chrysene	µg/L	0.1	<0.1
Benzo(b)fluoranthene	µg/L	0.1	<0.1
Benzo(k)fluoranthene	µg/L	0.1	<0.1
Benzo(a)pyrene	µg/L	0.1	<0.1
Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1
Dibenzo(a&h)anthracene	µg/L	0.1	<0.1
Benzo(ghi)perylene	µg/L	0.1	<0.1
Total PAH (18)	µg/L	1	<1
Surrogates			
d5-nitrobenzene (Surrogate)	%	-	**84**
2-fluorobiphenyl (Surrogate)	%	-	**77**
d14-p-terphenyl (Surrogate)	%	-	**112**
Trace Metals (Dissolved) in Water by ICPMS Method: AN318			
Arsenic, As	µg/L	1	**12**
Cadmium, Cd	µg/L	0.1	<0.1
Chromium, Cr	µg/L	1	<1
Copper, Cu	µg/L	1	<1
Lead, Pb	µg/L	1	<1
Nickel, Ni	µg/L	1	**5**
Zinc, Zn	µg/L	1	**49**

Parameter	Units	LOR	Sample Number SE112861.001 Sample Matrix Water Sample Date 16 Oct 2012 Sample Name QCWVA
Mercury (dissolved) in Water Method: AN311/AN312			
Mercury	mg/L	0.0001	<0.0001

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula: *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

Mercury (dissolved) in Water **Method: ME-(AU)-[ENV]AN311/AN312**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Mercury	LB028242	mg/L	0.0001	<0.0001	4 - 22%	98%	100%

PAH (Polynuclear Aromatic Hydrocarbons) in Water **Method: ME-(AU)-[ENV]AN420**

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Naphthalene	LB028246	µg/L	0.1	<0.1	94%
2-methylnaphthalene	LB028246	µg/L	0.1	<0.1	NA
1-methylnaphthalene	LB028246	µg/L	0.1	<0.1	NA
Acenaphthylene	LB028246	µg/L	0.1	<0.1	96%
Acenaphthene	LB028246	µg/L	0.1	<0.1	94%
Fluorene	LB028246	µg/L	0.1	<0.1	NA
Phenanthrene	LB028246	µg/L	0.1	<0.1	95%
Anthracene	LB028246	µg/L	0.1	<0.1	93%
Fluoranthene	LB028246	µg/L	0.1	<0.1	94%
Pyrene	LB028246	µg/L	0.1	<0.1	92%
Benzo(a)anthracene	LB028246	µg/L	0.1	<0.1	NA
Chrysene	LB028246	µg/L	0.1	<0.1	NA
Benzo(b)fluoranthene	LB028246	µg/L	0.1	<0.1	NA
Benzo(k)fluoranthene	LB028246	µg/L	0.1	<0.1	NA
Benzo(a)pyrene	LB028246	µg/L	0.1	<0.1	93%
Indeno(1,2,3-cd)pyrene	LB028246	µg/L	0.1	<0.1	NA
Dibenzo(a&h)anthracene	LB028246	µg/L	0.1	<0.1	NA
Benzo(ghi)perylene	LB028246	µg/L	0.1	<0.1	NA
Total PAH (18)	LB028246	µg/L	1	<1	

Surrogates

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
d5-nitrobenzene (Surrogate)	LB028246	%	-	109%	100%
2-fluorobiphenyl (Surrogate)	LB028246	%	-	111%	102%
d14-p-terphenyl (Surrogate)	LB028246	%	-	111%	108%

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula: *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

Trace Metals (Dissolved) in Water by ICPMS Method: ME-(AU)-[ENV]AN318

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Arsenic, As	LB028307	µg/L	1	<1	0%	87%	101%
Cadmium, Cd	LB028307	µg/L	0.1	<0.1	0%	94%	80%
Chromium, Cr	LB028307	µg/L	1	<1		90%	83%
Copper, Cu	LB028307	µg/L	1	<1	17%	89%	76%
Lead, Pb	LB028307	µg/L	1	<1	0%	95%	85%
Nickel, Ni	LB028307	µg/L	1	<1	20%	91%	84%
Zinc, Zn	LB028307	µg/L	1	<1	19%	92%	93%

TRH (Total Recoverable Hydrocarbons) in Water Method: ME-(AU)-[ENV]AN403

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
TRH C10-C14	LB028246	µg/L	100	<100	100%
TRH C15-C28	LB028246	µg/L	200	<200	103%
TRH C29-C36	LB028246	µg/L	200	<200	98%

VOCs in Water Method: ME-(AU)-[ENV]AN433/AN434

Monocyclic Aromatic Hydrocarbons

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Benzene	LB028353	µg/L	0.5	<0.5	0%	117%	106%
Toluene	LB028353	µg/L	0.5	<0.5	0%	130%	116%
Ethylbenzene	LB028353	µg/L	0.5	<0.5	0%	125%	121%
m/p-xylene	LB028353	µg/L	1	<1	0%	111%	125%
o-xylene	LB028353	µg/L	0.5	<0.5	0%	124%	119%

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Dibromofluoromethane (Surrogate)	LB028353	%	-	114%	2 - 3%	97%	98%
d4-1,2-dichloroethane (Surrogate)	LB028353	%	-	113%	2%	98%	103%
d8-toluene (Surrogate)	LB028353	%	-	104%	1 - 5%	105%	91%
Bromofluorobenzene (Surrogate)	LB028353	%	-	84%	1%	104%	115%

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula: *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

Volatile Petroleum Hydrocarbons in Water **Method: ME-(AU)-[ENV]AN433/AN434/AN410**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
TRH C6-C9	LB028353	µg/L	40	<40	0%	93%	83%

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Dibromofluoromethane (Surrogate)	LB028353	%	-	114%	2 - 3%	97%	98%
d4-1,2-dichloroethane (Surrogate)	LB028353	%	-	113%	2%	98%	103%
d8-toluene (Surrogate)	LB028353	%	-	104%	1 - 5%	105%	91%
Bromofluorobenzene (Surrogate)	LB028353	%	-	84%	1%	104%	115%

METHOD SUMMARY

METHOD	METHODOLOGY SUMMARY
AN020	Unpreserved water sample is filtered through a 0.45µm membrane filter and acidified with nitric acid similar to APHA3030B.
AN083	Separatory funnels are used for aqueous samples and extracted by transferring an appropriate volume (mass) of liquid into a separatory funnel and adding 3 serial aliquots of dichloromethane. Samples receive a single extraction at pH 7 to recover base / neutral analytes and two extractions at pH < 2 to recover acidic analytes. QC samples are prepared by spiking organic free water with target analytes and extracting as per samples.
AN311/AN312	Mercury by Cold Vapour AAS in Waters: Mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500.
AN318	Determination of elements at trace level in waters by ICP-MS technique, in accordance with USEPA 6020A.
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the Draft NEPM 2011, >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). F2 is not corrected for Naphthalene.
AN403	Additionally, the volatile C6-C9/C6-C10 fractions may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Petroleum Hydrocarbons (TPH) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents.
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependant on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.
AN420	(SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN433/AN434	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.
AN433/AN434/AN410	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.

FOOTNOTES

IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
*	This analysis is not covered by the scope of accreditation.
^	Performed by outside laboratory.
LOR	Limit of Reporting
↑↓	Raised or Lowered Limit of Reporting
QFH	QC result is above the upper tolerance
QFL	QC result is below the lower tolerance
-	The sample was not analysed for this analyte
NVL	Not Validated

Samples analysed as received.
Solid samples expressed on a dry weight basis.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here:
http://www.sgs.com.au.pv.sgsv3/~/media/Local/Australia/Documents/Technical%20Documents/MP-AU-ENV-QU-022%20QA%20QC%20Plan.pdf

This document is issued, on the Client's behalf, by the Company under its General Conditions of Service available on request and accessible at http://www.au.sgs.com/terms_and_conditions_au. The Client's attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

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

This report must not be reproduced, except in full.

STATEMENT OF QA/QC PERFORMANCE

SE112861 R0

CLIENT DETAILS

Contact	Joanne Rosner
Client	JBS Environmental
Address	(PO Box 940 Mascot NSW 1460) 128 O'Riordan Street MASCOT NSW 2020
Telephone	02 8338 1011
Facsimile	02 8338 1700
Email	jrosner@jbsgroup.com.au
Project	**41945-Edmondson Park Remediation**
Order Number	(Not specified)
Samples	1

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	SE112861 R0
Report Number	0000043226
Date Reported	24 Oct 2012

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS Environmental Services' stated Data Quality Objectives (DQO). Comments arising from the comparison were made and are reported below.

The data relating to sampling was taken from the Chain of Custody document and was supplied by the Client.
This QA/QC Statement must be read in conjunction with the referenced Analytical Report.
The Statement and the Analytical Report must not be reproduced except in full.

All Data Quality Objectives were met.

SAMPLE SUMMARY

Sample counts by matrix	1 Water	Type of documentation received	COC
Date documentation received	17/10/2012	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	2.9°C
Sample container provider	Other Lab	Turnaround time requested	Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	Ice Bricks	Samples clearly labelled	Yes
Complete documentation received	Yes		

HOLDING TIME SUMMARY

SE112861 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS "Field Sampling Guide for Containers and Holding Time" (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311/AN312

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QCWVA	SE112861.001	LB028242	16 Oct 2012	17 Oct 2012	13 Nov 2012	18 Oct 2012	13 Nov 2012	19 Oct 2012

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QCWVA	SE112861.001	LB028246	16 Oct 2012	17 Oct 2012	23 Oct 2012	18 Oct 2012	27 Nov 2012	24 Oct 2012

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QCWVA	SE112861.001	LB028307	16 Oct 2012	17 Oct 2012	14 Apr 2013	19 Oct 2012	14 Apr 2013	22 Oct 2012

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QCWVA	SE112861.001	LB028246	16 Oct 2012	17 Oct 2012	23 Oct 2012	18 Oct 2012	27 Nov 2012	23 Oct 2012

VOCs in Water

Method: ME-(AU)-[ENV]AN433/AN434

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QCWVA	SE112861.001	LB028353	16 Oct 2012	17 Oct 2012	23 Oct 2012	19 Oct 2012	28 Nov 2012	22 Oct 2012

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433/AN434/AN410

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
QCWVA	SE112861.001	LB028353	16 Oct 2012	17 Oct 2012	23 Oct 2012	19 Oct 2012	28 Nov 2012	22 Oct 2012

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

PAH (Polynuclear Aromatic Hydrocarbons) in Water — Method: ME-(AU)-[ENV]AN420

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	QCWVA	SE112861.001	%	40 - 130%	77
d14-p-terphenyl (Surrogate)	QCWVA	SE112861.001	%	40 - 130%	112
d5-nitrobenzene (Surrogate)	QCWVA	SE112861.001	%	40 - 130%	84

VOCs in Water — Method: ME-(AU)-[ENV]AN433/AN434

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	QCWVA	SE112861.001	%	60 - 130%	83
d4-1,2-dichloroethane (Surrogate)	QCWVA	SE112861.001	%	40 - 130%	126
d8-toluene (Surrogate)	QCWVA	SE112861.001	%	60 - 130%	103
Dibromofluoromethane (Surrogate)	QCWVA	SE112861.001	%	60 - 130%	124

Volatile Petroleum Hydrocarbons in Water — Method: ME-(AU)-[ENV]AN433/AN434/AN410

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	QCWVA	SE112861.001	%	60 - 130%	83
d4-1,2-dichloroethane (Surrogate)	QCWVA	SE112861.001	%	60 - 130%	126
d8-toluene (Surrogate)	QCWVA	SE112861.001	%	60 - 130%	103
Dibromofluoromethane (Surrogate)	QCWVA	SE112861.001	%	60 - 130%	124

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311/AN312

Sample Number	Parameter	Units	LOR	Result
LB028242.001	Mercury	mg/L	0.0001	<0.0001

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result
LB028246.001		Naphthalene	µg/L	0.1	<0.1
		2-methylnaphthalene	µg/L	0.1	<0.1
		1-methylnaphthalene	µg/L	0.1	<0.1
		Acenaphthylene	µg/L	0.1	<0.1
		Acenaphthene	µg/L	0.1	<0.1
		Fluorene	µg/L	0.1	<0.1
		Phenanthrene	µg/L	0.1	<0.1
		Anthracene	µg/L	0.1	<0.1
		Fluoranthene	µg/L	0.1	<0.1
		Pyrene	µg/L	0.1	<0.1
		Benzo(a)anthracene	µg/L	0.1	<0.1
		Chrysene	µg/L	0.1	<0.1
		Benzo(a)pyrene	µg/L	0.1	<0.1
		Indeno(1,2,3-cd)pyrene	µg/L	0.1	<0.1
		Dibenzo(a&h)anthracene	µg/L	0.1	<0.1
		Benzo(ghi)perylene	µg/L	0.1	<0.1
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	109
		2-fluorobiphenyl (Surrogate)	%	-	111
		d14-p-terphenyl (Surrogate)	%	-	111

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR	Result
LB028307.001	Arsenic, As	µg/L	1	<1
	Cadmium, Cd	µg/L	0.1	<0.1
	Chromium, Cr	µg/L	1	<1
	Copper, Cu	µg/L	1	<1
	Lead, Pb	µg/L	1	<1
	Nickel, Ni	µg/L	1	<1
	Zinc, Zn	µg/L	1	<1

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR	Result
LB028246.001	TRH C10-C14	µg/L	100	<100
	TRH C15-C28	µg/L	200	<200
	TRH C29-C36	µg/L	200	<200

VOCs in Water

Method: ME-(AU)-[ENV]AN433/AN434

Sample Number		Parameter	Units	LOR	Result
LB028353.001	Monocyclic Aromatic Hydrocarbons	Benzene	µg/L	0.5	<0.5
		Toluene	µg/L	0.5	<0.5
		Ethylbenzene	µg/L	0.5	<0.5
		m/p-xylene	µg/L	1	<1
		o-xylene	µg/L	0.5	<0.5
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	114
		d4-1,2-dichloroethane (Surrogate)	%	-	113
		d8-toluene (Surrogate)	%	-	104
		Bromofluorobenzene (Surrogate)	%	-	84

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433/AN434/AN410

Sample Number		Parameter	Units	LOR	Result
LB028353.001		TRH C6-C9	µg/L	40	<40
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	114
		d4-1,2-dichloroethane (Surrogate)	%	-	113
		d8-toluene (Surrogate)	%	-	104
		Bromofluorobenzene (Surrogate)	%	-	84

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311/AN312

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE112800.004	LB028242.014	Mercury	µg/L	0.0001	<0.00010	<0.00010	200	22
SE112858.022	LB028242.020	Mercury	µg/L	0.0001	0.0098	<0.00010	200	4

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE112887.003	LB028307.014	Cadmium, Cd	µg/L	0.1	-0.013	-0.012	200	0
		Copper, Cu	µg/L	1	1.025	1.221	104	17
		Lead, Pb	µg/L	1	0.193	0.191	200	0
		Nickel, Ni	µg/L	1	1.533	1.877	74	20
		Zinc, Zn	µg/L	1	2.739	3.307	48	19
SE112903.001	LB028307.020	Arsenic, As	µg/L	1	<1	<1	200	0

VOCs in Water

Method: ME-(AU)-[ENV]AN433/AN434

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE112841.001	LB028353.006	Monocyclic	Benzene	µg/L	0.5	<0.5	<0.5	200	0
		Aromatic	Toluene	µg/L	0.5	<0.5	<0.5	200	0
			Ethylbenzene	µg/L	0.5	<0.5	<0.5	200	0
			m/p-xylene	µg/L	1	<1	<1	200	0
			o-xylene	µg/L	0.5	<0.5	<0.5	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	119.0	122.0	30	2
			d4-1,2-dichloroethane (Surrogate)	µg/L	-	124.0	127.0	30	2
			d8-toluene (Surrogate)	µg/L	-	103.0	108.0	30	5
			Bromofluorobenzene (Surrogate)	µg/L	-	82.0	83.0	30	1
SE112858.022	LB028353.014	Monocyclic	Benzene	µg/L	0.5	<0.5	<0.5	200	0
		Aromatic	Toluene	µg/L	0.5	<0.5	<0.5	200	0
			Ethylbenzene	µg/L	0.5	<0.5	<0.5	200	0
			m/p-xylene	µg/L	1	<1	<1	200	0
			o-xylene	µg/L	0.5	<0.5	<0.5	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	119	123.0	30	3
			d4-1,2-dichloroethane (Surrogate)	µg/L	-	119	122.0	30	2
			d8-toluene (Surrogate)	µg/L	-	106	105.0	30	1
			Bromofluorobenzene (Surrogate)	µg/L	-	83	82.0	30	1

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433/AN434/AN410

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE112841.001	LB028353.006		TRH C6-C9	µg/L	40	<40	<40	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	119.0	122.0	30	2
			d4-1,2-dichloroethane (Surrogate)	µg/L	-	124.0	127.0	30	2
			d8-toluene (Surrogate)	µg/L	-	103.0	108.0	30	5
			Bromofluorobenzene (Surrogate)	µg/L	-	82.0	83.0	30	1
SE112858.022	LB028353.014		TRH C6-C9	µg/L	40	<40	<40	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	µg/L	-	119	123.0	30	3
			d4-1,2-dichloroethane (Surrogate)	µg/L	-	119	122.0	30	2
			d8-toluene (Surrogate)	µg/L	-	106	105.0	30	1
			Bromofluorobenzene (Surrogate)	µg/L	-	83	82.0	30	1

LABORATORY CONTROL SAMPLES

SE112861 R0

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311/AN312

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB028242.002	Mercury	mg/L	0.0001	0.0078	0.008	80 - 120	98

PAH (Polynuclear Aromatic Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN420

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB028246.002		Naphthalene	µg/L	0.1	38	40	60 - 140	94
		Acenaphthylene	µg/L	0.1	38	40	60 - 140	96
		Acenaphthene	µg/L	0.1	38	40	60 - 140	94
		Phenanthrene	µg/L	0.1	38	40	60 - 140	95
		Anthracene	µg/L	0.1	37	40	60 - 140	93
		Fluoranthene	µg/L	0.1	38	40	60 - 140	94
		Pyrene	µg/L	0.1	37	40	60 - 140	92
		Benzo(a)pyrene	µg/L	0.1	37	40	60 - 140	93
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	100.0	100	60 - 140	100
		2-fluorobiphenyl (Surrogate)	%	-	102.0	100	60 - 140	102
		d14-p-terphenyl (Surrogate)	%	-	108.0	100	60 - 140	108

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB028307.002	Arsenic, As	µg/L	1	17	20	80 - 120	87
	Cadmium, Cd	µg/L	0.1	19	20	80 - 120	94
	Chromium, Cr	µg/L	1	18	20	80 - 120	90
	Copper, Cu	µg/L	1	18	20	80 - 120	89
	Lead, Pb	µg/L	1	19	20	80 - 120	95
	Nickel, Ni	µg/L	1	18	20	80 - 120	91
	Zinc, Zn	µg/L	1	18	20	80 - 120	92

TRH (Total Recoverable Hydrocarbons) in Water

Method: ME-(AU)-[ENV]AN403

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB028246.002	TRH C10-C14	µg/L	100	1200	1200	60 - 140	100
	TRH C15-C28	µg/L	200	1200	1200	60 - 140	103
	TRH C29-C36	µg/L	200	1200	1200	60 - 140	98

VOCs in Water

Method: ME-(AU)-[ENV]AN433/AN434

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB028353.002	Monocyclic	Benzene	µg/L	0.5	53	45.45	60 - 140	117
	Aromatic	Toluene	µg/L	0.5	59	45.45	60 - 140	130
		Ethylbenzene	µg/L	0.5	57	45.45	60 - 140	125
		m/p-xylene	µg/L	1	100	90.9	60 - 140	111
		o-xylene	µg/L	0.5	56	45.45	60 - 140	124
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	97.0	100	60 - 140	97
		d4-1,2-dichloroethane (Surrogate)	%	-	98.0	100	60 - 140	98
		d8-toluene (Surrogate)	%	-	105.0	100	60 - 140	105
		Bromofluorobenzene (Surrogate)	%	-	104.0	100	60 - 140	104

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433/AN434/AN410

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB028353.002		TRH C6-C9	µg/L	40	770	827	60 - 140	93
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	97.0	100	60 - 140	97
		d4-1,2-dichloroethane (Surrogate)	%	-	98.0	100	60 - 140	98
		d8-toluene (Surrogate)	%	-	105.0	100	60 - 140	105
		Bromofluorobenzene (Surrogate)	%	-	104.0	100	60 - 140	104

MATRIX SPIKES

SE112861 R0

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub -sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Mercury (dissolved) in Water

Method: ME-(AU)-[ENV]AN311/AN312

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE112745.007	LB028242.004	Mercury	mg/L	0.0001	0.0080	<0.0001	0.008	100

Trace Metals (Dissolved) in Water by ICPMS

Method: ME-(AU)-[ENV]AN318

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE112859.026	LB028307.004	Arsenic, As	µg/L	1	28	8.051	20	101
		Cadmium, Cd	µg/L	0.1	16	0.551	20	80
		Chromium, Cr	µg/L	1	22	5.237	20	83
		Copper, Cu	µg/L	1	21	6.147	20	76
		Lead, Pb	µg/L	1	19	1.646	20	85
		Nickel, Ni	µg/L	1	21	3.911	20	84
		Zinc, Zn	µg/L	1	62	43.187	20	93

VOCs in Water

Method: ME-(AU)-[ENV]AN433/AN434

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE112910.029	LB028353.025	Monocyclic	Benzene	µg/L	0.5	48	<0.5	45.45	106
		Aromatic	Toluene	µg/L	0.5	53	<0.5	45.45	116
			Ethylbenzene	µg/L	0.5	55	<0.5	45.45	121
			m/p-xylene	µg/L	1	110	<1	90.9	125
			o-xylene	µg/L	0.5	54	<0.5	45.45	119
		Surrogates	Dibromofluoromethane (Surrogate)	%	-	98.0	115.0	100	98
			d4-1,2-dichloroethane (Surrogate)	%	-	103.0	118.0	100	103
			d8-toluene (Surrogate)	%	-	91.0	100.0	100	91
			Bromofluorobenzene (Surrogate)	%	-	115.0	87.0	100	115

Volatile Petroleum Hydrocarbons in Water

Method: ME-(AU)-[ENV]AN433/AN434/AN410

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE112910.029	LB028353.025		TRH C6-C9	µg/L	40	690	<40	827	83
		Surrogates	Dibromofluoromethane (Surrogate)	%	-	98.0	115.0	100	98
			d4-1,2-dichloroethane (Surrogate)	%	-	103.0	118.0	100	103
			d8-toluene (Surrogate)	%	-	91.0	100.0	100	91
			Bromofluorobenzene (Surrogate)	%	-	115.0	87.0	100	115

MATRIX SPIKE DUPLICATES

SE112861 R0

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The original result is the analyte concentration of the matrix spike. The Duplicate result is the analyte concentration of the matrix spike duplicate.

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

QC criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found here:
http://www.au.sgs.com/sgs-mp-au-env-qu-022-qa-qc-plan-en-11.pdf

*	Non-accredited analysis.
-	Sample not analysed for this analyte.
^	Analysis performed by external laboratory.

IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
LOR	Limit of reporting.
QFH	QC result is above the upper tolerance.
QFL	QC result is below the lower tolerance.

①	At least 2 of 3 surrogates are within acceptance criteria.
②	RPD failed acceptance criteria due to sample heterogeneity.
③	Results less than 5 times LOR preclude acceptance criteria for RPD.
④	Recovery failed acceptance criteria due to matrix interference.
⑤	Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
⑥	LOR was raised due to sample matrix interference.
⑦	LOR was raised due to dilution of significantly high concentration of analyte in sample.
⑧	Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
⑨	Recovery failed acceptance criteria due to sample heterogeneity.
†	Refer to Analytical Report comments for further information.

This document is issued, on the Client's behalf, by the Company under its General Conditions of Service, available on request and accessible at http://www.sgs.com/terms_and_conditions.htm. The Client's attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

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

This test report shall not be reproduced, except in full.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

SAMPLE RECEIPT ADVICE

Client:

JBS Environmental Pty Ltd
P.O. Box 940
MASCOT NSW 1460

ph: 8338 1013
Fax: 8338 1700

Attention: Joanne Rosner

Sample log in details:

Your reference:	**41945, Edmondson Park Remediation**
Envirolab Reference:	**80316**
Date received:	16/10/2012
Date results expected to be reported:	**23/10/12**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	7 Waters
Turnaround time requested:	Standard
Temperature on receipt	Cool
Cooling Method:	Ice
Sampling Date Provided:	

Comments:

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

Contact details:

Please direct any queries to Aileen Hie or Jacinta Hurst
ph: 02 9910 6200 fax: 02 9910 6201
email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au

For SGS

ELS#: 80316

CHAIN OF CUSTODY

JBS ENVIRONMENTAL

PROJECT NO.: 41945	LABORATORY BATCH NO.
PROJECT NAME: Edmondson Park Remediation	SAMPLERS AB aboardman@jbsgroup.com.au
SEND REPORT TO: JR + AB SEND INVOICE TO: A. Traynor	PHONE: 02 8338 1011 EMAIL: Jrosner@jbsgroup.com.au
DATE NEEDED BY: Standard TAT	QC LEVEL: NEPM 1999 (✓)
COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:	

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	X Metals (4)	X PAHs (Low)	X BTEX + TPH	NOTES
QCW V/A	Water	16-10-12		1x amber, 2x vials, 1x metals		X	X	X	

SGS
Received 17/10/12
By SJ
Time 3.09 am/pm
Samples intact yes/no
Ice/Cooler Pack yes/no
Temperature on Receipt 2.9 °C
Storage Location W154
SGS REF No SB112861

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: A. Boardman DATE: 16-10-12	CONSIGNMENT NOTE NO.	NAME: DATE: 16/10/12	COOLER SEAL – Yes ✓ No ..... Intact ✓ Broken .....
OF: JBS Environmental	TRANSPORT CO.	OF: ELS	COOLER TEMP ..... deg C
NAME: Sapna DATE: 17/10	CONSIGNMENT NOTE NO.	NAME: Connie DATE: 17/10/12	COOLER SEAL – Yes ✓ No ..... Intact ✓ Broken .....
OF: ELS	TRANSPORT CO	OF: SGS	COOLER TEMP 2.9 deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

JBS Environmental Pty Ltd ABN 67 071 842 638
Phone: (02) 8338-1011
Fax: (02) 8338-1700
IMSO FormsO13 – Chain of Custody

128 O'Riordan St, MASCOT NSW 2020
PO Box 940 MASCOT NSW 1460
www.jbsgroup.com.au

SGS

AUSTRALIA – ENVIRONMENTAL SERVICES SYDNEY – PROFORMA FORM

SAMPLE INFORMATION

Approved: D. Liang

JOB No. SB112861

Sample No.	P 100ml UP	P 250ml UP	P 500ml UP	P 1L UP	G 100 Amber UP	G 200 Amber UP	G 500 Amber UP	G 1L Amber UP	G 40ml Vial Up	G 40ml Vial HCl	P 100ml HCl	G 40ml Vial H2SO4	P 100ml H2SO4	P 250ml H2SO4	G 500ml Amber H2SO4	G 1L H2SO4	P 100/250ml HN03 Total	P 100ml HN03 Filtered	P 250ml NaOH	P 250ml Zn Acetate	Plastic Bag	G 250ml Soil Jar				Sample Matrix	Lab Bottles Supplied By	Comments
1								1		2								1								water	Envirolab	Fees

Uncontrolled template when printed

Ref: PF-(AU)-[ENV]-[ALX]105.doc/ver.2/31.10.2008/Page 1 of 1

Attachment 7 – Summary tables – Groundwater Sample Analytical Results

Landcom
Job Number: 41945
Zouch Road, Edmondson Park
Post-Remediation GME
Table A - Groundwater Analytical Results

Notes:
(1) Adopted Groundwater Assessment Criteria (refer to text Table 6.1) - the lower of the nominated health/ecological investigation criterion

Units as indicated in table.
bold Concentration Exceeds (1)

- Not Analysed - insufficient sample volume

		Metals								PAHs																TPH					BTEX					
		Arsenic (Filtered)	Cadmium (Filtered)	Chromium (III+VI) (Filtered)	Copper (Filtered)	Lead (Filtered)	Mercury (Filtered)	Nickel (Filtered)	Zinc (Filtered)	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(b)&(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of total)	Benzene	Ethylbenzene	Toluene	Xylene (m & p)	Xylene (o)	Xylene Total
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL		0.001	0.0001	0.001	0.001	0.001	0.00005	0.001	0.001	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	10	50	100	100		1	1	1	2	1	
Assessment Criteria - Health Based		0.007	0.002	0.005	2	0.01	0.001	0.02	3																				600	1	300	800			600
Assessment Criteria - Ecological		0.024	0.0002	0.0033	0.0014	0.0034	0.00006	0.011	0.008			0.1		0.1						1			16	0.6						500	5	180	275	350	
Field_ID	**Sampled_Date-Time**																																		
BH2	16/10/2012	**0.012**	<0.0001	<0.001	<0.001	<0.001	<0.00005	0.005	**0.042**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<10	<50	<100	<100	<250	<1	<1	<1	<2	<1	<3
BH291	16/10/2012	0.003	<0.0001	<0.001	<0.001	<0.001	<0.00005		**0.07**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<100	<50	<100	<100	<250	<10	<10	<10	<20	<10	<30
BH558	16/10/2012	<0.001	0.0001	<0.001	**0.002**	<0.001	<0.00005	0.008	**0.009**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	<10	<10	<10	<20	<10	<30

Appendix J – Field Documentation

© 2013 JBS Environmental Pty Ltd

Field Equipment Calibration and Decontamination

JBS ENVIRONMENTAL

PROJECT NAME:	Edmundson Park Remediation	**PROJECT NO:**	41945
FIELD DATES:	14 + 15/3/12	**FIELD STAFF:**	AB

CALIBRATION SUMMARY	N/A
EQUIPMENT:	
CALIBRATION STANDARD:	

DATE	TIME	READING (ppm$_v$)	COMMENTS

DECONTAMINATION SUMMARY

EQUIPMENT: - Shovel
- Gloves changed for each sample location

1. Was the equipment decontaminated appropriately prior to sampling at each location?	(Y)	N	NA
2. Was excess soil removed by scraping, brushing or wiping with disposable towels?	(Y)	N	NA
3. Was the equipment contaminated with grease, tar or similar material? If so, was the equipment steam cleaned or rinsed with pesticide-grade acetone:hexane?	Y Y	N N	(NA)
4. Was phosphate-free detergent used to wash the equipment?	(Y)	N	NA
5. Was the equipment rinsed with clean water?	(Y)	N	NA
6. Was the equipment then rinsed with deionised water?	(Y)	N	NA
7. Were all sample containers cleaned and acid or solvent washed prior to sample collection?	(Y)	N	NA

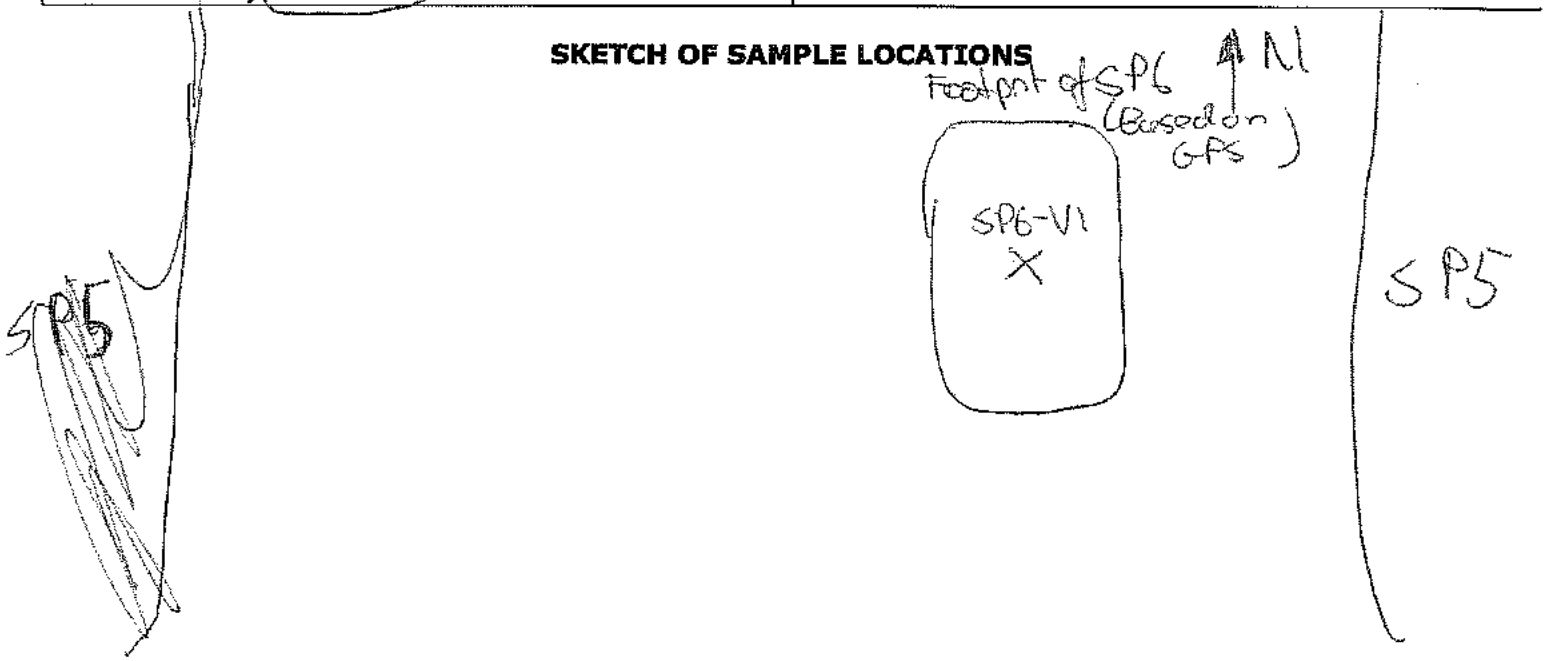
WERE ANY ADDITIONAL DECONTAMINATION MEASURES REQUIRED? PROVIDE DETAILS.

Field Screening of Soils

JBS ENVIRONMENTAL

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 4/4/12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation/Validation	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS



SAMPLE ID	DATE	DEPTH (m)	PID/XRF (ppm)	SOIL DESCRIPTION AND FATE
SP6-V1	4/4/12	0-0.1m	N/A	Silty clay, orange, dry, hard, L.P, Natural with sandstone gravels
				- No odours, no staining, no anthropogenic material, no ACM observed across the stockpile footprint

ADDITIONAL NOTES:

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

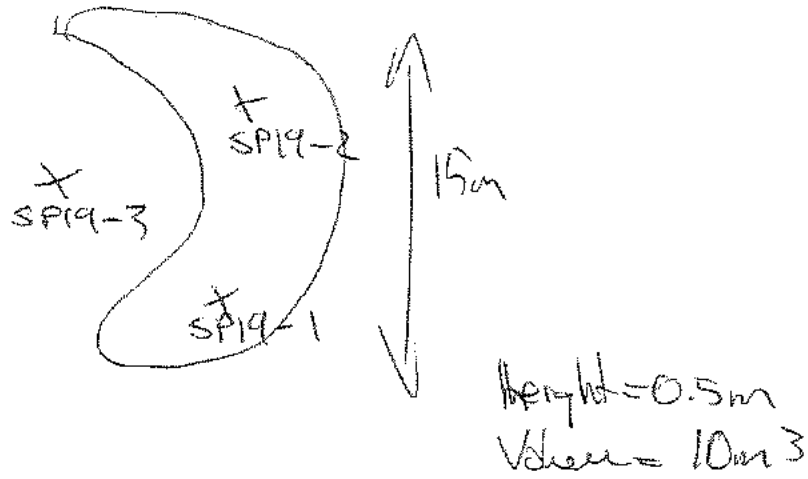
Field Screening of Soils

JBS ENVIRONMENTAL

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 4/4/12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation/Validation SP19 ~~#~~ Bunker 2	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS

UFSP02 [SP19] ↑ N



SAMPLE ID	DATE	DEPTH (m)	PID/XRF (ppm)	SOIL DESCRIPTION AND FATE
SP19-1				
SP19-2		See	logs	
SP19-3				

ADDITIONAL NOTES: No Potential contamination indicators identified

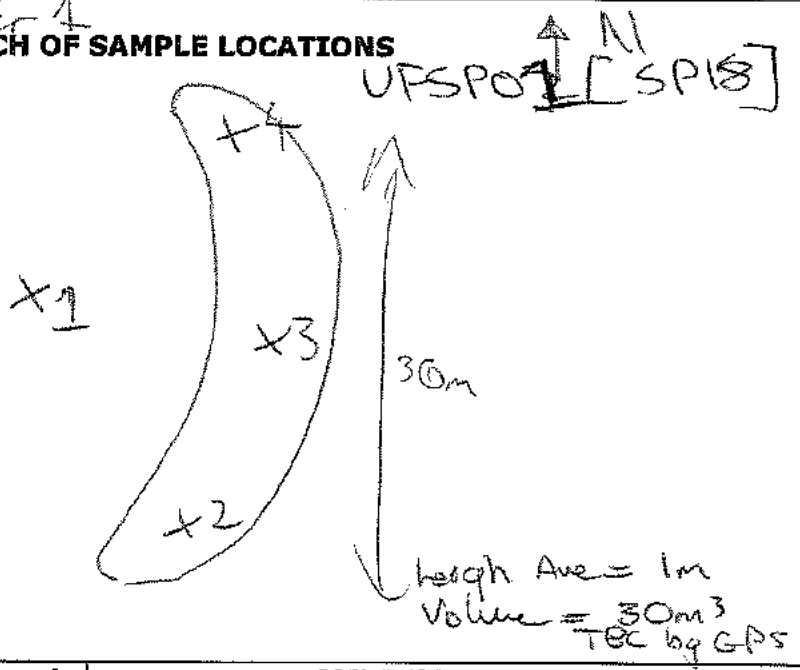
Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

Field Screening of Soils

JBS ENVIRONMENTAL

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 4/4/12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation/Validation SP18 under 1	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS



SAMPLE ID	DATE	DEPTH (m)	PID/XRF (ppm)	SOIL DESCRIPTION AND FATE
SP18-1	4/4/12			See log
SP18-2	"			See log
SP18-3	"			See log QC/QA06
SP18-4	"			See log

ADDITIONAL NOTES:

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

Field Screening of Soils

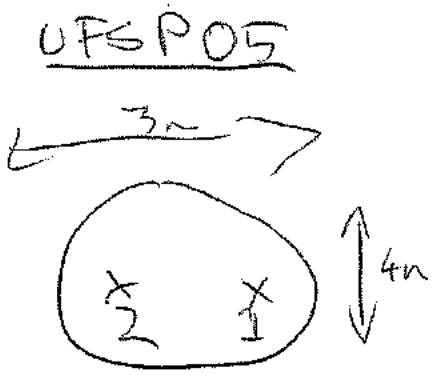
JBS ENVIRONMENTAL

PROJECT NAME:	**PROJECT NO:** 41945
FIELDWORK DATES: 11/4/12	**SAMPLERS:** AC
TYPE OF INVESTIGATION (GME/ESA etc):	**PROJECT MANAGER:**

12m3

SKETCH OF SAMPLE LOCATIONS

UFSP05



rail line

SAMPLE ID	DATE	DEPTH (m)	PID/XRF (ppm)	SOIL DESCRIPTION AND FATE
UFSP05-1				500 log
UFSP05-2				

ADDITIONAL NOTES:

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

Field Screening of Soils

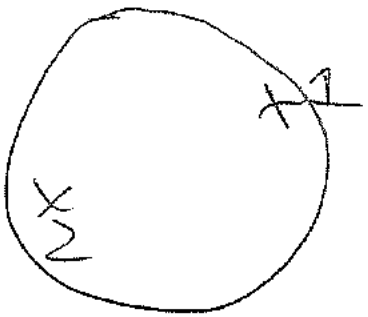
JBS ENVIRONMENTAL

PROJECT NAME: E Park Rem	**PROJECT NO:** 41945
FIELDWORK DATES: 11/4/17	**SAMPLERS:**
TYPE OF INVESTIGATION (GME/ESA etc):	**PROJECT MANAGER:**

Volume = 70m3

SKETCH OF SAMPLE LOCATIONS

UFSP06.



rail line

SAMPLE ID	DATE	DEPTH (m)	PID/XRF (ppm)	SOIL DESCRIPTION AND FATE
UFSP06-1	11/4/17	1.0m	see logs	
UFSP06-2	11/4/17	1.0m		

ADDITIONAL NOTES:

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

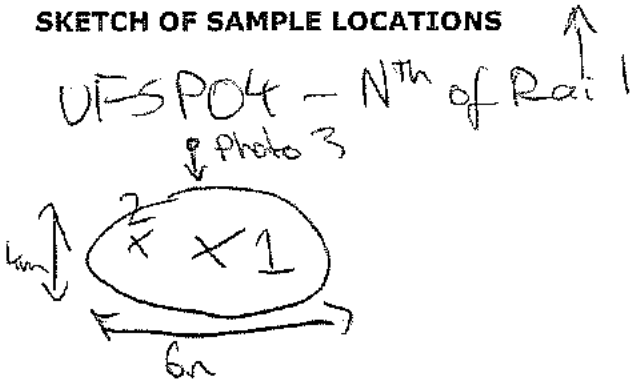
Field Screening of Soils

JBS ENVIRONMENTAL

PROJECT NAME: Ed Park Rem	**PROJECT NO:** 41945
FIELDWORK DATES: 11/4/12	**SAMPLERS:** AB
TYPE OF INVESTIGATION (GME/ESA etc):	**PROJECT MANAGER:** JR

SKETCH OF SAMPLE LOCATIONS

Volume = 24m3



SAMPLE ID	DATE	DEPTH (m)	PID/XRF (ppm)	SOIL DESCRIPTION AND FATE
UFSP04-1	11/4/12	0.5m	See book	

ADDITIONAL NOTES:

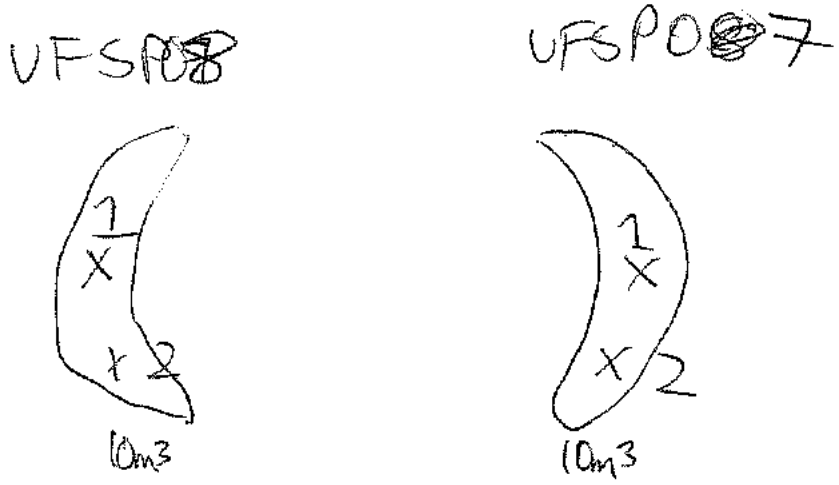
Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

Field Screening of Soils

JBS ENVIRONMENTAL

PROJECT NAME: Ed. Park	**PROJECT NO:** 41945
FIELDWORK DATES: 11/4/12	**SAMPLERS:** AB
TYPE OF INVESTIGATION (GME/ESA etc):	**PROJECT MANAGER:**

SKETCH OF SAMPLE LOCATIONS



SAMPLE ID	DATE	DEPTH (m)	PID/XRF (ppm)	SOIL DESCRIPTION AND FATE
UFSP07-1	11/4/12		See logs	
UFSP08-1	11/4/12			

ADDITIONAL NOTES:

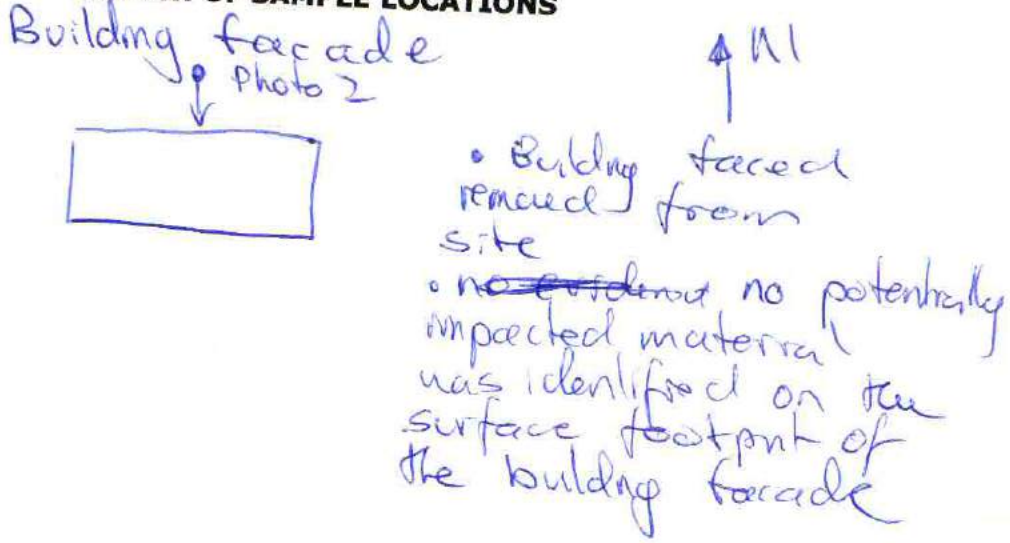
Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

Field Screening of Soils

JBS ENVIRONMENTAL

ROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
IELDWORK DATES: 4/5/12	**SAMPLERS: A. Boardman**
YPE OF INVESTIGATION: **emediation/Validation** M13	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS



PLE ID	DATE	DEPTH (m)	PID/XRF (ppm)	SOIL DESCRIPTION AND FATE

TIONAL NOTES:

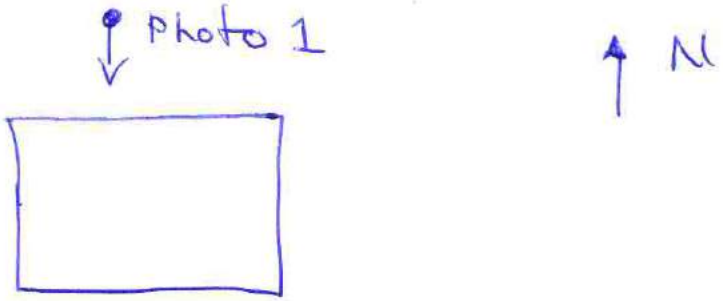
	Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
clayey silty sandy gravelly organic	red yellow black brown grey	homogenous heterogeneous stratified laminated lens	dry damp moist wet saturated	very soft soft firm stiff very stiff	non-plastic low plasticity mod plasticity high plasticity	very loose loose medium dense dense very dense	boulders cobbles coarse gravel fine gravel coarse sand	poorly sorted (well graded) well sorted (poorly graded)	and (35-50%) some (20-35%) little (10-20%) trace (0-10%)

Field Screening of Soils

JBS ENVIRONMENTAL

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO:** 41945
FIELDWORK DATES: 4/5/12	**SAMPLERS:** A. Boardman
TYPE OF INVESTIGATION: Remediation/Validation L1 - concrete slab	**PROJECT MANAGER:** J. Rosner

SKETCH OF SAMPLE LOCATIONS



- concrete slab removed from site, ~~not~~ ~~items~~ ~~potential~~ no identified impacted material on the surface footprint of the concrete slab observed

SAMPLE ID	DATE	DEPTH (m)	PID/XRF (ppm)	SOIL DESCRIPTION AND FATE

ADDITIONAL NOTES:

Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
clayey silty sandy gravelly organic	red yellow black brown grey	homogenous heterogeneous stratified laminated lens	dry damp moist wet saturated	very soft soft firm stiff very stiff	non-plastic low plasticity mod plasticity high plasticity	very loose loose medium dense dense very dense	boulders cobbles coarse gravel fine gravel coarse sand	poorly sorted (well graded) well sorted (poorly graded)	and (35-50%) some (20-35%) little (10-20%) trace (0-10%)

Field Screening of Soils

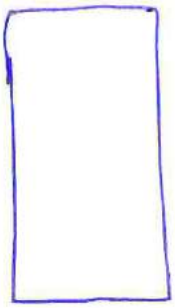
JBS ENVIRONMENTAL

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 4/5/12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation/Validation M14	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS

Waste Disposal trench

Photo 3



- waste removed from trench
- no potentially impacted material observed on surface of the trench
- trench still requires backfilling with validated material

SP from trench

SAMPLE ID	DATE	DEPTH (m)	PID/XRF (ppm)	SOIL DESCRIPTION AND FATE

ADDITIONAL NOTES:

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

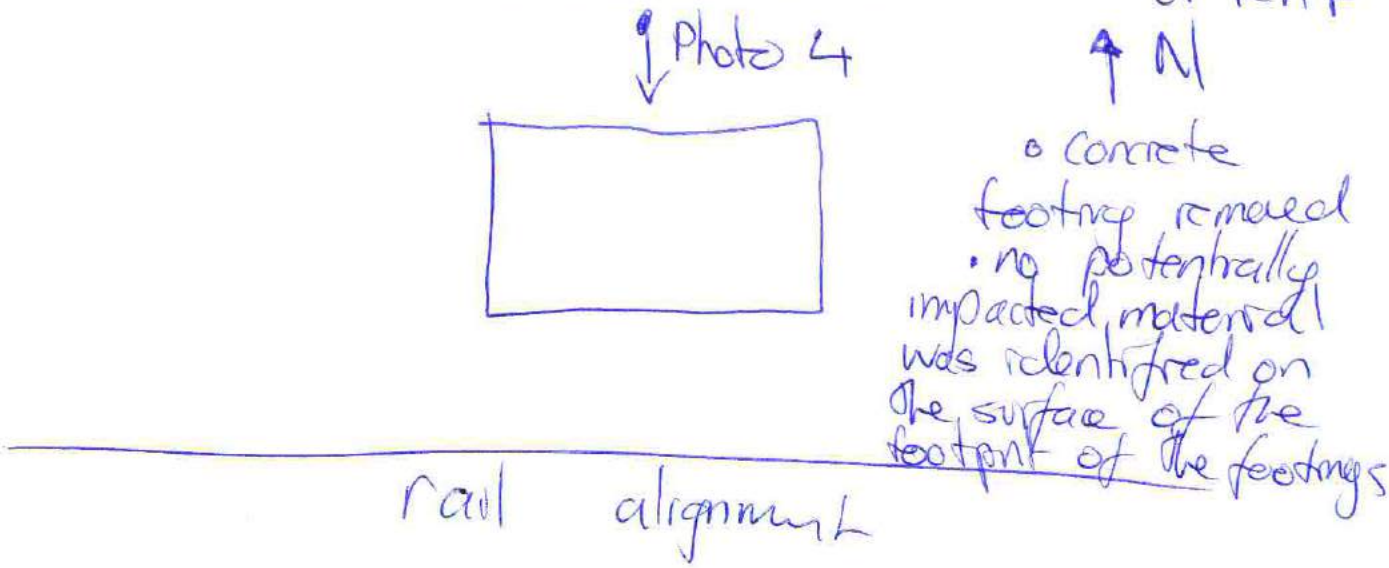
Field Screening of Soils

JBS ENVIRONMENTAL

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 4/5/12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation/Validation F2	**PROJECT MANAGER: J. Rosner**

Footings not identified in Golders DSI or RAP

SKETCH OF SAMPLE LOCATIONS



SAMPLE ID	DATE	DEPTH (m)	PID/XRF (ppm)	SOIL DESCRIPTION AND FATE

ADDITIONAL NOTES:

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

Field Screening of Soils

JBS ENVIRONMENTAL

Pg 1 & 4

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 10/5/12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation Lead Particulate area	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS

See P.3 for map

SAMPLE ID	DATE	DEPTH (m)	Pb (ppm)(XRF)	SOIL DESCRIPTION	Lead particulate observed?
VB007	10/5/12	0.2	19	Nat: Weathered siltstone	No
VB008	10/5/12	0.1	15	As above	No
VB009	10/5/12	0.2	13	Silty clay, orange tg grey	No
VO22	10/5/12	0.2	37	Silty clay, light brown, dry	No
VB010	10/5/12	0.2	26	As above silty clay, orange grey	No
DPN-VB011	10/5/12	0.2	22	As above	No
DPN-VB012	10/5/12	0.3	16	As above	No

ADDITIONAL NOTES:

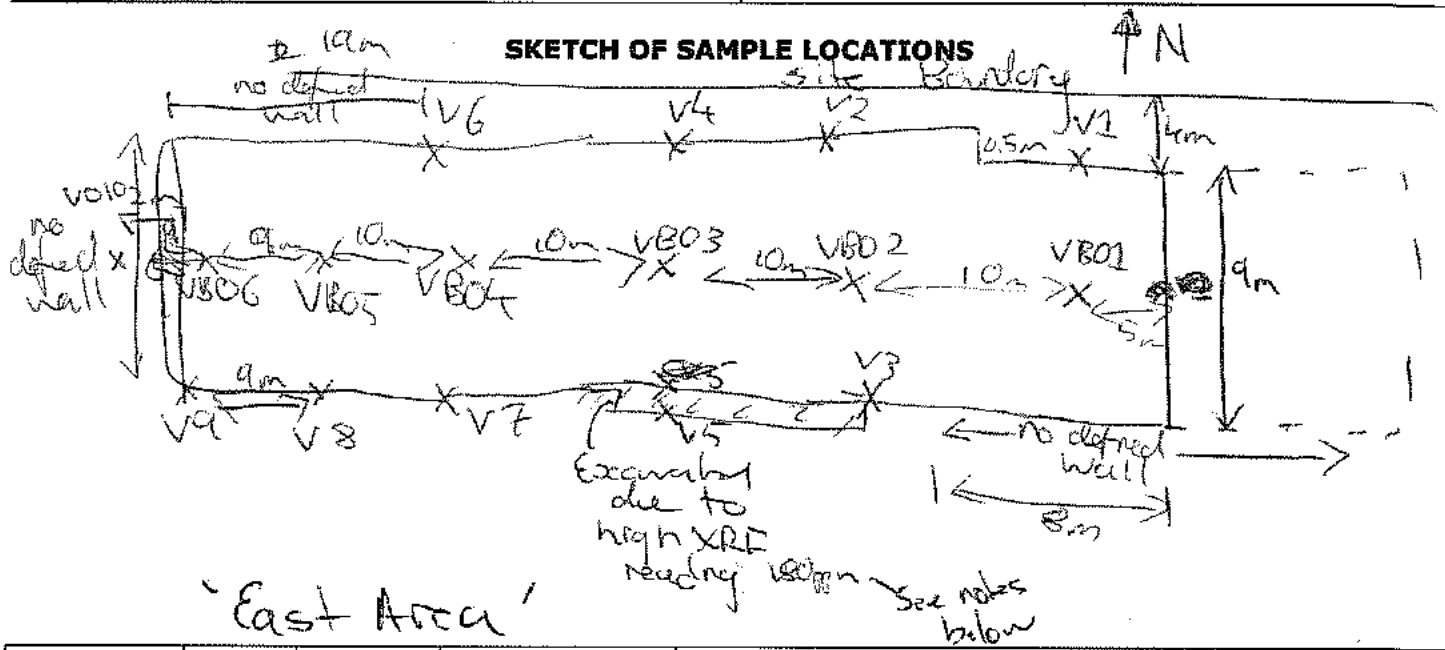
Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

Field Screening of Soils

JBS ENVIRONMENTAL

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 7/5/12 + 8/5/12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation Lead Particulate area	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS



'East Area'

SAMPLE ID	DATE	DEPTH (m)	Pb (ppm)(XRF)	SOIL DESCRIPTION	Lead particulate observed?
LPN-VB01	7/5/12	0.3m	64	Silty clay, orange, fm, L.P, dry, homo	No
LPN-VB08	7/5/12	0.1m	20	Silty clay (NAT), orange, fm, L.P, dry, homo	No
LPN-VB07	7/5/12	0.3m	16	Silty clay, brown, damp, M.P, hetro w/ ironstone gravels	No
LPN-VB03	7/5/12	0.1m	66	Silty clay, orange brown, dry, L.P, hetro w/ ironstone gravels	No
LPN-VB02	7/5/12	0.1m	38	Silty clay (NAT) orange, fm, L.P, dry homo	No
LPN-VB03	7/5/12	0.1m	20	Silty clay (NAT) orange, fm, L.P, dry homo	No
LPN-VB09	7/5/12	0.3m	180	Excavated further + re-sample 8/5/12	No
LPN-VB04	7/5/12	0.2m	21	Silty clay, brown, damp, M.P, hetero (Topsoil)	No
LPN-VB06	8/5/12	0.2	34	Silty clay, brown, dry, L.P, hetro w/ ironstone gravels	No
LPN-VB04	8/5/12	0.2m	18	Silty clay (NAT), silty clay, orange w/ grey	No
LPN-VB07	8/5/12	0.1		Silty clay, dark brown, dry, L.P, hetero	No

ADDITIONAL NOTES:

VB009 - 1st = 180ppm, 2nd = 300ppm

VB007 - 1st = 180ppm

~~VB005 - 1st = 180ppm~~

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	fens	saturated	very stiff		very dense	coarse sand	graded)	

Field Screening of Soils

JBS ENVIRONMENTAL

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 8/5/12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation Lead Particulate area	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS

See P1 for Map

'East Area'

SAMPLE ID	DATE	DEPTH (m)	Pb (ppm)(XRF)	SOIL DESCRIPTION	Lead particulate observed?
LPN-V008	8/5/12	0.2	30	Silty clay, brown + orange	No
LPN-V009	8/5/12	0.2	25	As above	No
LPN-VB005	8/5/12	0.1		Silty clay (NAT) orange, tan, hard	No
LPN-VB006	8/5/12	0.1	20	As above	No
LPN-V010	9/5/12	0.1	25	Silty clay, light brown	No

ADDITIONAL NOTES:

VB005 – 1st = 1801ppm

← PN – V010 – validation of the western extent of excavation

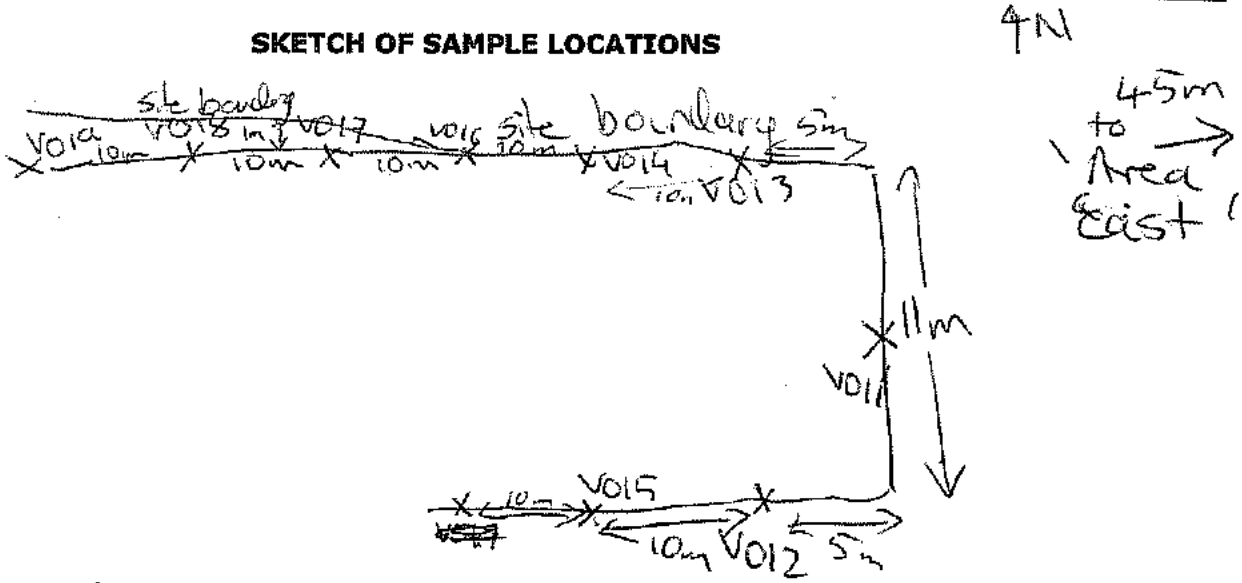
Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

Field Screening of Soils

JBS ENVIRONMENTAL

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 9/5/12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation Lead Particulate area	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS



SAMPLE ID	DATE	DEPTH (m)	Pb (ppm)(XRF)	SOIL DESCRIPTION	Lead particulate observed?
LPN-VO11					
LPN-VO12	9/5/12	0.2m	25	Nat; Silty clay orange, stiff dry hard	No
LPN-VO13	9/5/12	0.2m	22	Nat; Silty clay orange/brn, soft, L.P, hard	No
LPN-VO14	9/5/12	0.2m	28	Nat; Silty clay, orange/brn, soft, hard	No
LPN-VO15	9/5/12	0.2m	32	Silty clay, orange dry, L.P,	No
LPN-VO16	9/5/12	0.2	23	QC/QA08 - Nat orange clay	No
LPN-VO17	9/5/12	0.2	29	Silty clay (NAT) org/brn soft	No
LPN-VO18	9/5/12	0.2	26	As above	No
LPN-VO19	9/5/12	0.2	14	As above	No
LPN-VO20	9/5/12	0.2	20	Silty clay as above	No
LPN-VO21	9/5/12	0.2	23	as above	No

ADDITIONAL NOTES:
VO11 - Lead particle observed

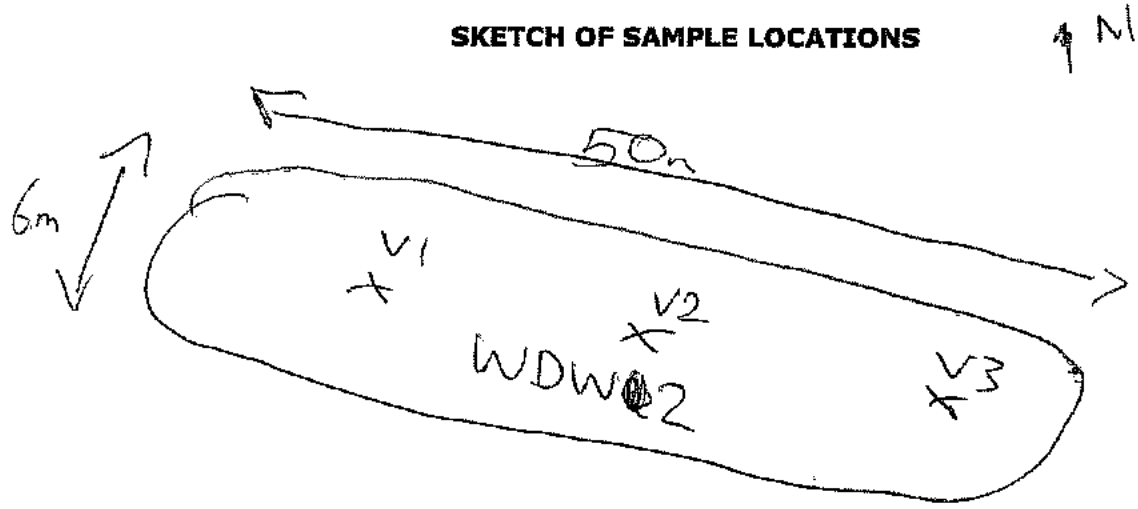
Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

Field Screening of Soils

JBS ENVIRONMENTAL

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO:** 41945
FIELDWORK DATES: 9/5/12	**SAMPLERS:** A. Boardman
TYPE OF INVESTIGATION: ~~Remediation Lead Particulate area~~ Validation WDW2	**PROJECT MANAGER:** J. Rosner

SKETCH OF SAMPLE LOCATIONS



SAMPLE ID	DATE	DEPTH (m)	~~Pb (ppm) (XRF)~~	SOIL DESCRIPTION	~~Lead particulate observed?~~
WDW2-V1	9/5/12	0.1m		Silty clay (FILL) orange/yellow, fm, L.P, homo	
WDW2-V2	9/5/12	0.1m		As above	
WDW2-V3	9/5/12	0.1m		As above	

ADDITIONAL NOTES:
No visually identifiable impacted material was observed along the former footprint of WDW2

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

Field Equipment Calibration and Decontamination

JBS ENVIRONMENTAL

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO:** 41945
FIELD DATES: 7, 8, 9/5/12	**FIELD STAFF:** A.R

CALIBRATION SUMMARY
EQUIPMENT: N/A
CALIBRATION STANDARD:

DATE	TIME	READING (ppm$_v$)	COMMENTS
		N/A	

DECONTAMINATION SUMMARY
EQUIPMENT: trowel, & disposable gloves

1. Was the equipment decontaminated appropriately prior to sampling at each location?	(Y)	N	NA
2. Was excess soil removed by scraping, brushing or wiping with disposable towels?	(Y)	N	NA
3. Was the equipment contaminated with grease, tar or similar material? If so, was the equipment steam cleaned or rinsed with pesticide-grade acetone:hexane?	Y Y	(N) N	NA
4. Was phosphate-free detergent used to wash the equipment?	(Y)	N	NA
5. Was the equipment rinsed with clean water?	(Y)	N	NA
6. Was the equipment then rinsed with deionised water?	(Y)	N	NA
7. Were all sample containers cleaned and acid or solvent washed prior to sample collection?	(Y)	N	(NA)

WERE ANY ADDITIONAL DECONTAMINATION MEASURES REQUIRED? PROVIDE DETAILS.

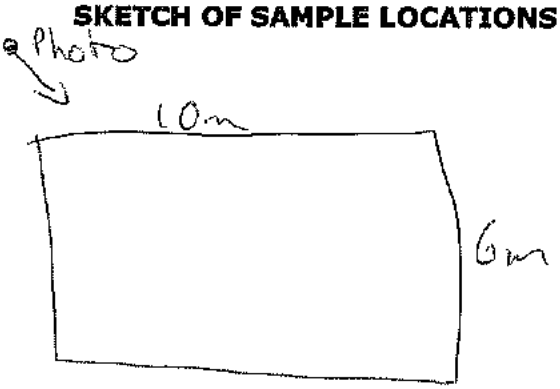
Field Screening of Soils

JBS ENVIRONMENTAL

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 15-5-12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation/Validation	**PROJECT MANAGER: J. Rosner**

Concrete Slab

SKETCH OF SAMPLE LOCATIONS



- 10m x 6m x 200mm concrete slab removed - topsoil underneath
- no potentially contaminated soils or items observed on footprint of the former concrete slab

Approx
- 20m west of weapons pit #47 north of rail alignment

SAMPLE ID	DATE	DEPTH (m)	PID/XRF (ppm)	SOIL DESCRIPTION AND FATE

ADDITIONAL NOTES:

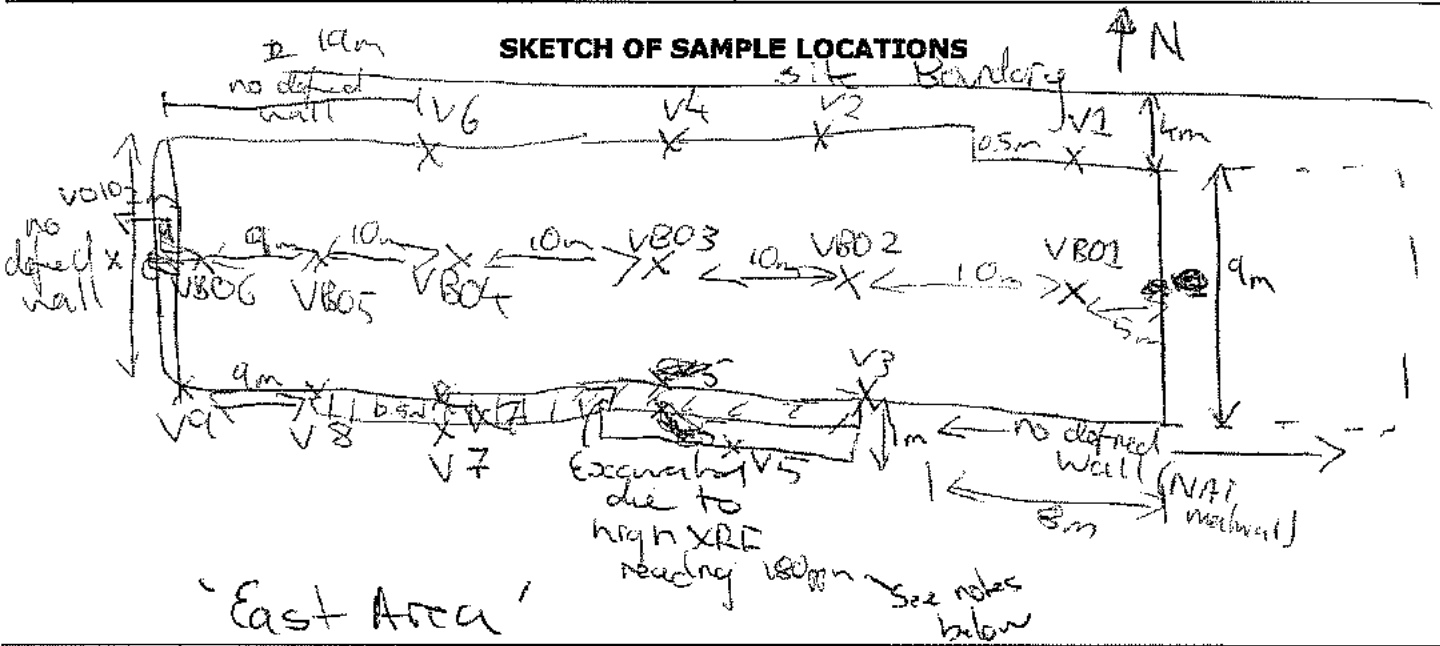
Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

Field Screening of Soils

JBS ENVIRONMENTAL

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 7/5/12 + 8/5/12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation Lead Particulate area	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS



'East Area'

SAMPLE ID	DATE	DEPTH (m)	Pb (ppm)(XRF)	SOIL DESCRIPTION	Lead particulate observed?
LPN-VB01	7/5/12	0.3m	64	Silty clay, brown, dry, L.P, hetero of gravels, gravels + sandstone. QA/QC collected	No
LPN-VB07	7/5/12	0.1m	20	Silty clay (NAT), orange, fm, L.P, dry, homo	No
LPN-VB02	7/5/12	0.3m	16	Silty clay, brown, damp, M.P, hetero of gravels	No
LPN-VB03	7/5/12	0.1m	66	Silty clay, orange brown, dry, L.P, hetero of gravel	No
LPN-VB02	7/5/12	0.1m	88	Silty clay (NAT) orange, fm, L.P, dry homo	No
LPN-VB03	7/5/12	0.1m	20	Silty clay (NAT) orange, fm, L.P, dry homo	No
LPN-VB05	7/5/12	0.3m	180ppm	Excavated to test + re-sampled	No
LPN-VB04	7/5/12	0.2m	21	Silty clay, brown, damp, M.P, hetero of gravels	No
LPN-VB06	8/5/12	0.2	34	Silty clay, brown, dry, L.P, hetero of gravels	No
LPN-VB04	8/5/12	0.2m	18	Silty clay (NAT), silty clay, orange n grey	No
LPN-VB07	8/5/12	0.1	18	Silty clay, orange brown, dry, L.P, hetero	No

ADDITIONAL NOTES:

VB005 – 1st = 180ppm, 2nd = 300ppm – Sieved (10/5/12) = 16ppm

VB007 – 1st = 180ppm, 2nd = 18ppm – after removed further 1m

~~VB005 – 1st = 180ppm~~

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

P2

Field Screening of Soils

JBS ENVIRONMENTAL

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 8/5/12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation Lead Particulate area	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS

See P1 for Map

'East Area'

SAMPLE ID	DATE	DEPTH (m)	Pb (ppm)(XRF)	SOIL DESCRIPTION	Lead particulate observed?
LPN-V008	8/5/12	0.2	30	Silty clay, brown + orange	No
LPN-V009	8/5/12	0.2	25	As above	No
LPN-VB005	8/5/12	0.1	10	Silty clay (NAT) orange, tan, hard	No
LPN-VB006	8/5/12	0.1	20	As above	No
LPN-V010	9/5/12	0.1	25	Silty clay, light brown	No

ADDITIONAL NOTES:

VB005 – 1st = 180ppm – Scraped down 100mm 2nd = 10

LPN-V010 – validation of the Western extent of excavation

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

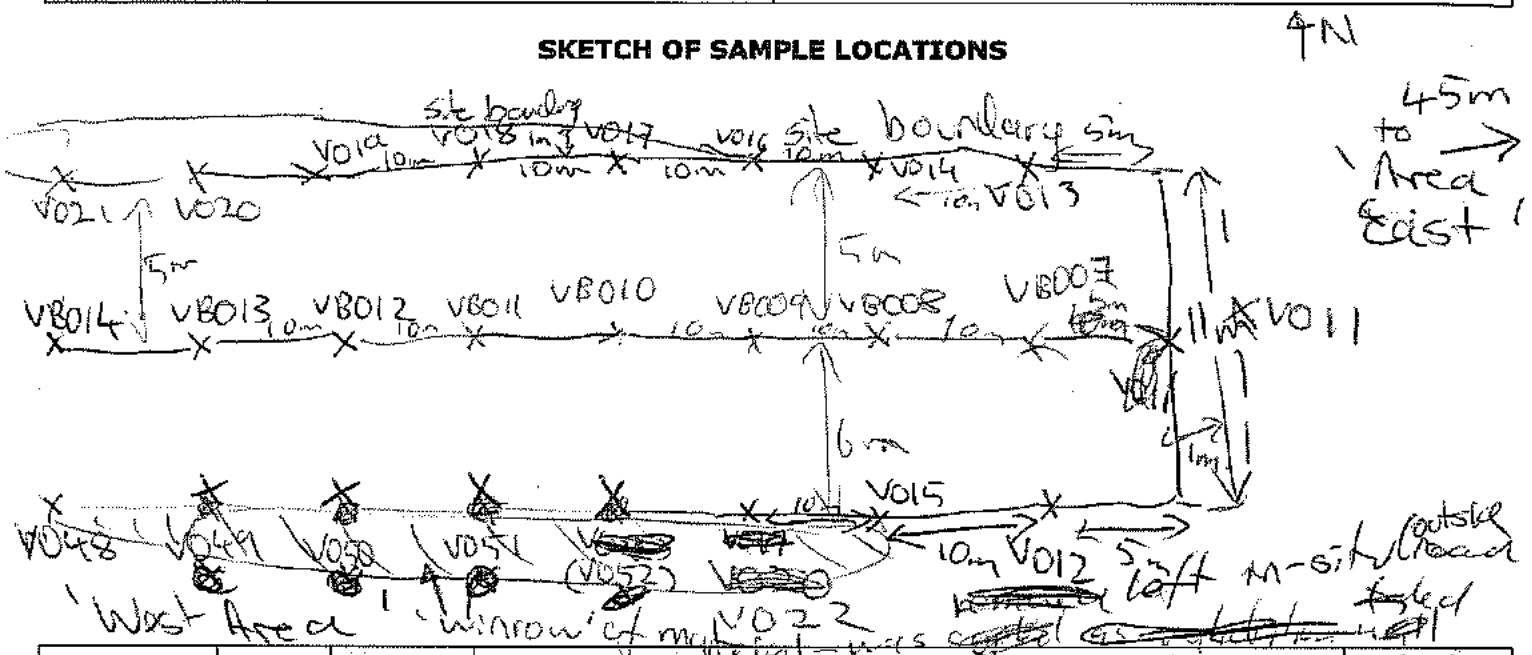
Field Screening of Soils

JBS ENVIRONMENTAL

Pg 3

PROJECT NAME: Edmondson Park Remediation	PROJECT NO: 41945
FIELDWORK DATES: 9/5/12	SAMPLERS: A. Boardman
TYPE OF INVESTIGATION: Remediation Lead Particulate area	PROJECT MANAGER: J. Rosner

SKETCH OF SAMPLE LOCATIONS



SAMPLE ID	DATE	DEPTH (m)	Pb (ppm)(XRF)	SOIL DESCRIPTION	Lead particulate observed?
LPN-VO11	9/5/12	0.1m	90	Fill: silty clay, with gravels, light brown	No
LPN-VO12	9/5/12	0.2m	25	Nat; Silty clay orange, firm dry brown	No
LPN-VO13	9/5/12	0.2m	22	Nat: Silty clay orange/brown, soft, L.P, brown	No
LPN-VO14	9/5/12	0.2m	28	Nat; silty clay, orange/brown, soft, brown	No
LPN-VO15	9/5/12	0.2m	32	Silty clay, orange clay, L.P.	No
LPN-VO16	9/5/12	0.2	23	QC/QA08 - Nat orange clay	No
LPN-VO17	9/5/12	0.2	29	Silty clay (NAT) orng/brown soft	No
LPN-VO18	9/5/12	0.2	26	As above	No
LPN-VO19	9/5/12	0.2	14	As above	No
LPN-VO20	9/5/12	0.2	20	Silty clay as above	No
LPN-VO21	9/5/12	0.2	23	as above	No

ADDITIONAL NOTES:
VO11 - lead particulate observed - removed back 1m - no lead particulate observed.

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

Field Screening of Soils

JBS ENVIRONMENTAL

Pg 4

PROJECT NAME: Edmondson Park Remediation	PROJECT NO: 41945
FIELDWORK DATES: 10/5/12 + 11/5/12	SAMPLERS: A. Boardman
TYPE OF INVESTIGATION: Remediation Lead Particulate area	PROJECT MANAGER: J. Rosner

SKETCH OF SAMPLE LOCATIONS

See P. 3 for map

SAMPLE ID	DATE	DEPTH (m)	Pb (ppm)(XRF)	SOIL DESCRIPTION	Lead particulate observed?
VB007	10/5/12	0.2	18	Natural Weathered siltstone	No
VB008	10/5/12	0.1	15	As above	No
VB009	10/5/12	0.2	13	Silty clay, orange tan grey	No
VD22	10/5/12	0.2	37	Silty clay, bright brown, dry	No
VB010	10/5/12	0.2	26	As above Silty clay orange tan grey	No
DUP-VB011	10/5/12	0.2	22	As above	No
DUP-VB012	10/5/12	0.3	16	As above	No
DUP-VB013	11/5/12	0.3	15	As above	No
DUP-VB014	11/5/12	0.3	20	As above	No

ADDITIONAL NOTES:

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

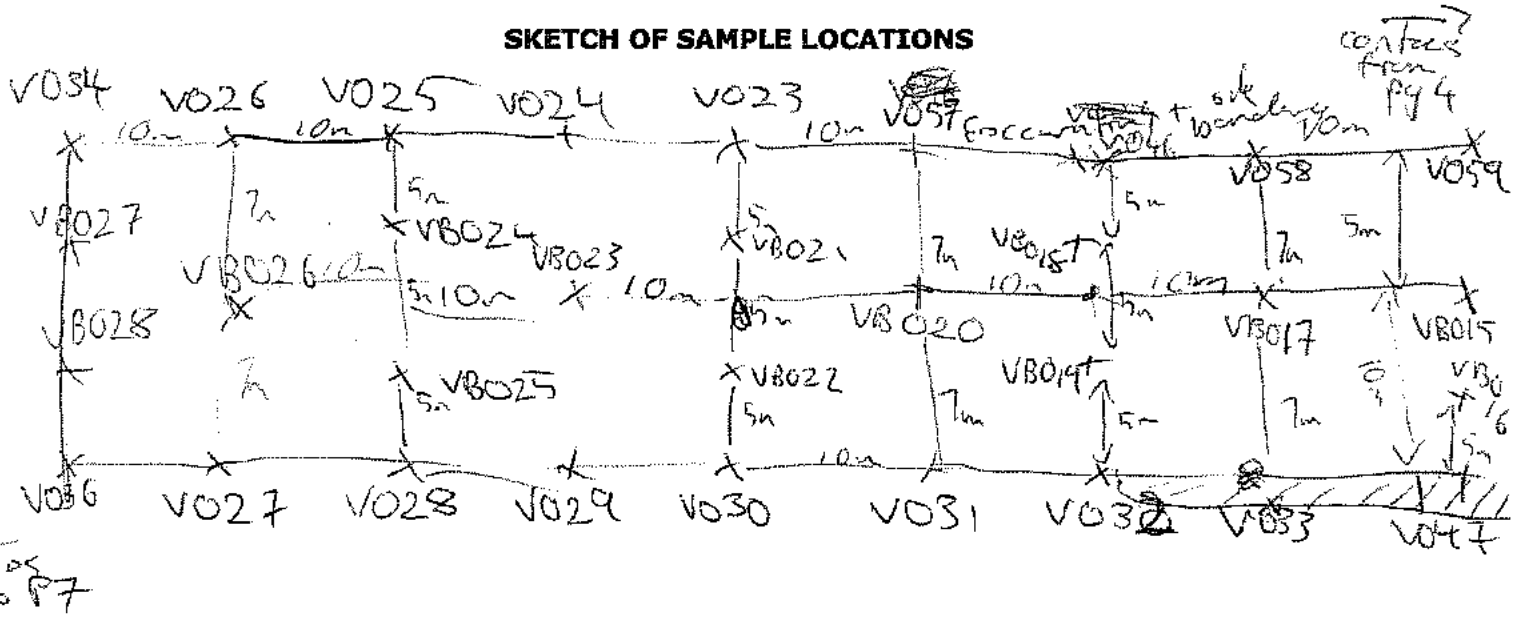
Field Screening of Soils

JBS ENVIRONMENTAL

Pg 5

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 11/5/12 + 12/5/12 + 14/5/12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation Lead Particulate area	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS



SAMPLE ID	DATE	DEPTH (m)	Pb (ppm)(XRF)	SOIL DESCRIPTION	Lead particulate observed?
LPN-VBO15	11/5/12	0.3	20	silty clay, orange + grey	No
LPN-VBO16	11/5/12	0.3	18	As above	No
LPN-VBO17	11/5/12	0.4	22	weathered s/stone grey + orange	No
LPN-VBO18	12/5/12	0.4	21	As above	No
LPN-VBO19	12/5/12	0.4	22	As above	No
LPN-VBO20	12/5/12	0.4	21	As above	No
LPN-VBO21	12/5/12	0.4	20	As above	No
LPN-VBO22	12/5/12	0.4	21	As above	No
LPN-VBO23	12/5/12	0.2	19	Silty clay, orange + yellow	No
LPN-VO23	14/5/12	0.2	25	Silty clay, brown, dry	No
LPN-VO24	14/5/12	0.2	17	As above	No

ADDITIONAL NOTES:

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

Field Screening of Soils

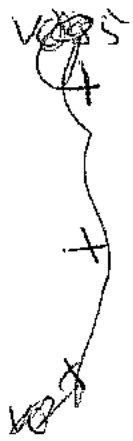
JBS ENVIRONMENTAL

Pg 6

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 14/5/12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation Lead Particulate area	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS

See Pg 5 for Map



SAMPLE ID	DATE	DEPTH (m)	Pb (ppm)(XRF)	SOIL DESCRIPTION	Lead particulate observed?
LPN-VO25	14/5/12	0.2	32	Silty clay, brown, hetero	No
LPN-VB024	14/5/12	0.3	21	Silty clay, orange, firm, homo	No
LPN-VB025	14/5/12	0.3	17	As above	No
LPN-VO26	14/5/12	0.3	40	Silty clay, black to grey, dry, hetro	No
LPN-VO27	14/5/12	0.3	12	Silty clay, orange, dry, homo	No
LPN-VO28	14/5/12	0.5	24	As above	No
LPN-VO29	14/5/12	0.4	21	As above	No
LPN-VO30	14/5/12	0.2	29	Silty clay, light brown, hetro	No
LPN-VO31	14/5/12	0.1	19	Silty clay, dark brown, hetro	No
LPN-VO32	14/5/12	0.1	21	Silty clay, light brown, dry, hetro	No
LPN-VO33	14/5/12	0.2	21	Silty clay brown	No

ADDITIONAL NOTES:
LPN-VO33 - Mixed = 110ppm, 2nd (after excavation) = 21

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

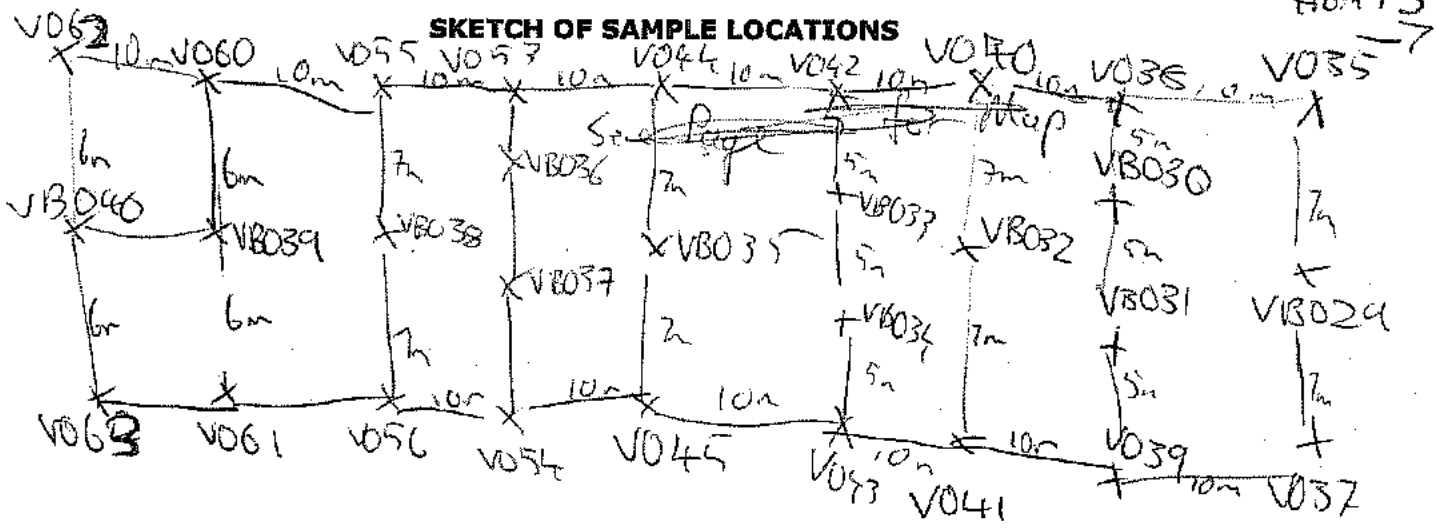
Field Screening of Soils

JBS ENVIRONMENTAL

Pg 7

PROJECT NAME: Edmondson Park Remediation	PROJECT NO: 41945
FIELDWORK DATES: 15/5/12	SAMPLERS: A. Boardman
TYPE OF INVESTIGATION: Remediation Lead Particulate area	PROJECT MANAGER: J. Rosner

SKETCH OF SAMPLE LOCATIONS



SAMPLE ID	DATE	DEPTH (m)	Pb (ppm)(XRF)	SOIL DESCRIPTION	Lead particulate observed?
LPN-VB026	15/5/12	0.3	17	silty clay, orange, hard	N/O
LPN-VO54	15/5/12	0.2	37	Silty clay, dark brown, damp	N/O
LPN-VO55	15/5/12	0.2	45	As above	N/O
LPN-VB027	15/5/12	0.3	16	Silty clay, orange, hard	No
LPN-VB028	15/5/12	0.3	24	Silty clay, orange, hard	No
LPN-VO36	15/5/12	0.2	14	Silty clay, brown, dry	No
LPN-VB029	15/5/12	0.3	21	Silty weathered silt stone, orange	No
LPN-VO37	15/5/12	0.2	13	Silty clay, brown, dry	No
LPN-VO38	15/5/12	0.2	16	As above	No
LPN-VO39	15/5/12	0.2	18	As above	No
LPN-VB030	15/5/12	0.3	37	Silty clay, orange firm,	N/O

ADDITIONAL NOTES:

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

Field Screening of Soils

JBS ENVIRONMENTAL

Pg 8

PROJECT NAME: Edmondson Park Remediation	PROJECT NO: 41945
FIELDWORK DATES: 15/5/12	SAMPLERS: A. Boardman
TYPE OF INVESTIGATION: Remediation Lead Particulate area	PROJECT MANAGER: J. Rosner

SKETCH OF SAMPLE LOCATIONS See Page 7 for Map

SAMPLE ID	DATE	DEPTH (m)	Pb (ppm)(XRF)	SOIL DESCRIPTION	Lead particulate observed?
LPN-VB031	15/5/12	0.2	18	Silty clay, orange + firm	No
LPN-VB040	15/5/12	0.2	23	Silty clay, brown, dry	No
LPN-VB041	15/5/12	0.2	25	As above	No
LPN-VB032	15/5/12	0.2	23	Siltstone	No
LPN-VB033	15/5/12	0.2	15	Siltstone	No
LPN-VB034	15/5/12	0.2	15	Siltstone	No
LPN-VB042	15/5/12	0.2	23	Silty clay, dark brown	No
LPN-VB043	15/5/12	0.3	7	Silty clay, orange w/ grey	No
LPN-VB044	15/5/12	0.2	20	silty clay, brown Qal/QAlO	No
LPN-VB045	15/5/12	0.2	24	As above	No
LPN-VB035	15/5/12	0.2	0	Siltstone	No

ADDITIONAL NOTES:

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

Field Screening of Soils

JBS ENVIRONMENTAL

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 16-5-12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation Lead Particulate area	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS

SAMPLE ID	DATE	DEPTH (m)	Pb (ppm)(XRF)	SOIL DESCRIPTION	Lead particulate observed?
LPN-V046	16-5-12	0.2	26	Silty clay, brown, dry (See P5 for Map)	No
LPN-V047	16-5-12	0.1	30	Silty clay, light brown (See P5 for Map)	
LPN-V048	16-5-12	0.1	24	Silty clay light brown (See P5 for Map	
LPN-V049	16-5-12	0.1	49	Silty clay, light brown dry (See P5 for Map	No
LPN-V050	16-5-12	0.1	33	Silty clay, light brown (See P5 for Map)	No
LPN-V051	16-5-12	0.1	105	As above (See P5 for Map)	No
LPN-V052	16-5-12	0.1	169	As above (See P5 for Map)	No
LPN-V053	16-5-12	0.1	24	Silty clay brown (See P7 for Map)	No
LPN-V054	16-5-12	0.1	16	As above (Map P7)	No
LPN-V0057	16-5-12	0.2	26	Silty clay, orange (Map P7)	No
LPN-V0056	16-5-12	0.2	15	As above (Map P7)	No

ADDITIONAL NOTES:
LPN-V047 = 115ppm; 2nd after excavation = 30
LPN-V048 = 180ppm; 2nd after excavation = 24

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

Field Screening of Soils

JBS ENVIRONMENTAL

PIO

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 16-5-12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation Lead Particulate area	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS

SAMPLE ID	DATE	DEPTH (m)	Pb (ppm)(XRF)	SOIL DESCRIPTION	Lead particulate observed?
LPN-V054	16-5-12	0.1	24	Silty clay, brown, damp	N/C
LPN-V056	16-5-12	0.2	30	Silty clay, orange	N/C
LPN-VB038	16-5-12	0.2	22	Silty clay light brown, dry	No
LPN-V057	16-5-12	0.1	73	Silty clay, light brown	No
LPN-V058	16-5-12	0.1	19	Silty clay, light brown	No
LPN-V059	16-5-12	0.1	20	Silty clay, light brown	No
LPN-V060	16-5-12	0.1	34	Silty clay, brown	No
LPN-V061	16-5-12	0.1	0	Silty clay, orange	No
LPN-VB039	16-5-12	0.2	15	Silty clay above	No
LPN-V062	16-5-12	0.1	29	silty clay brown QC/QA 11	No
LPN-V063	16-5-12	0.1	27	silty clay orange QC/QA 12	No

ADDITIONAL NOTES:

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

Field Screening of Soils

JBS ENVIRONMENTAL

P11

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 16-5-12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation Lead Particulate area	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS

SAMPLE ID	DATE	DEPTH (m)	Pb (ppm)(XRF)	SOIL DESCRIPTION	Lead particulate observed?
LAN-VBOH4	16-5-12	0.2	22	silty clay orange ~~[illegible]~~ (Pg 7 for Map)	No

ADDITIONAL NOTES:

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

Field Screening of Soils

JBS ENVIRONMENTAL

P13

PROJECT NAME: Edmondson Park Remediation	PROJECT NO: 41945
FIELDWORK DATES: 18-7 21-5-12	SAMPLERS: A. Boardman
TYPE OF INVESTIGATION: Remediation Lead Particulate area	PROJECT MANAGER: J. Rosner

SKETCH OF SAMPLE LOCATIONS

SAMPLE ID	DATE	DEPTH (m)	Pb (ppm)(XRF)	SOIL DESCRIPTION	Lead particulate observed?
LPN-V077	18-5-12	0.2	72	silty clay, orange + grey (PI Mcp)	No
LPN-V078	18-5-12	0.1	25	silty clay, orange + brown (PI Mcp)	NO
LPN-V079	21-5-12	0.1	30	As above (PII Mcp)	No
LPN-V080	21-5-12	0.1	24	silty clay, damp, brown (PII-Mcp)	No
LPN-V081	21-5-12	0.1	42	silty clay, brown (PII-Mcp)	No
LPN-V082	21-5-12	0.1	30	silty clay, brown QC/QA 14	No
LPN-V083	21-5-12	0.1	24	silty clay orange/brown PII-Mcp	No
LPN-V084	21-5-12	0.1	10	silty clay, brown PII-Mcp	No
LPN-V085	21-5-12	0.1	24	As above PII-Mcp	No
LPN-V086	21-5-12	0.1	18	As above PII-Mcp	No
LPN-V087	21-5-12	0.1	27	As above PII-Mcp	No

ADDITIONAL NOTES:
LPN-V079 - 1st: 280ppm - 2nd: 30 (after excavation)

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

Field Screening of Soils

JBS ENVIRONMENTAL

P12

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 17-5-12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation Lead Particulate area	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS

SAMPLE ID	DATE	DEPTH (m)	Pb (ppm)(XRF)	SOIL DESCRIPTION	Lead particulate observed?
LPN-V069	17-5-12	0.2	27	Silty clay, orange + brn (PH Mgt)	No
LPN-VB044	17-5-12	0.2	25	Silty clay, orange (PH Mgt)	No
LPN-VB047			~~25~~ 85	(PH Mgt)	No
LPN-V070	17-5-12	0.2	46	Silty clay, light brn	No
LPN-V071	17-5-12	0.2	32	Silty clay, orange	No
LPN-VB048					
LPN-V072	17-5-12	0.2	70	Silty clay, orange ~~FILL~~ 3	No
LPN-V073	17-5-12	0.1	30	As above QC/QA 13	No
LPN-V074					
LPN-V075	17-5-12	0.1	50	Silty clay orange	No
LPN-V076					

ADDITIONAL NOTES: LPN-VB047 = 1st: 363ppm (excavated later) 2nd:
LPN-VB048 = 1st: 280ppm (excavated further) 2nd:
LPN-V076 = 1st: 334ppm (excavated further) 2nd:
LPN-V074 = 1st: 200ppm (excavated further) 2nd:

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

Field Screening of Soils

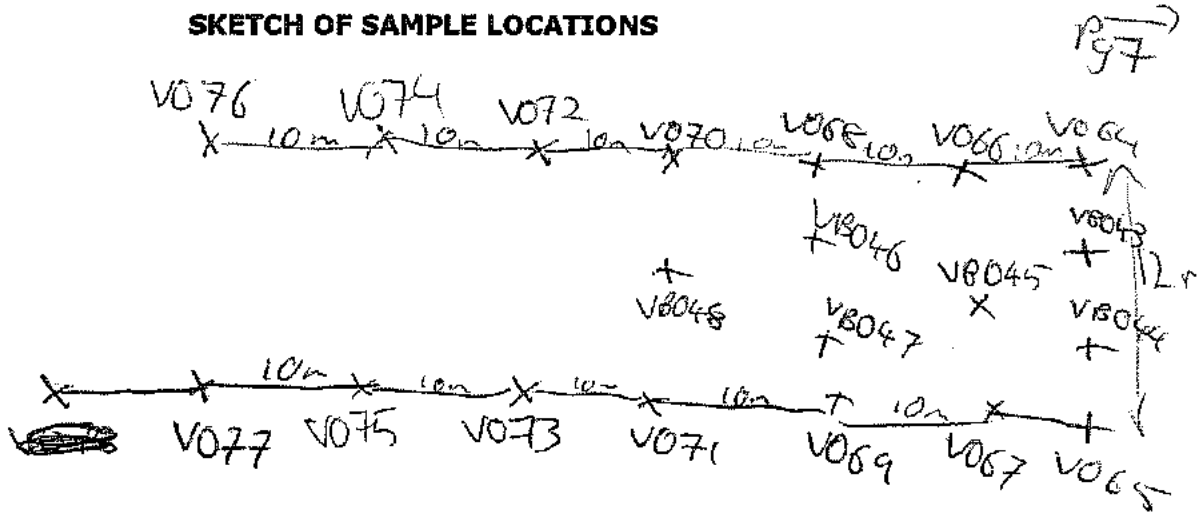
JBS ENVIRONMENTAL

P11

PROJECT NAME: Edmondson Park Remediation	PROJECT NO: 41945
FIELDWORK DATES: 16-5-12 17-5-12	SAMPLERS: A. Boardman
TYPE OF INVESTIGATION: Remediation Lead Particulate area	PROJECT MANAGER: J. Rosner

SKETCH OF SAMPLE LOCATIONS

P97



SAMPLE ID	DATE	DEPTH (m)	Pb (ppm)(XRF)	SOIL DESCRIPTION	Lead particulate observed?
LPN-VB044	16-5-12	0.2	22	Silty clay orange (P7 map)	No
LPN-VB041	17-5-12	0.2	0	Silty clay, orange + grey (P3 map)	No
LPN-VB042	17-5-12	0.2	0	As above (P7 map)	No
LPN-V064	17-5-12	0.2	33	Silty clay, brown	No
LPN-V065	17-5-12	0.3	26	Silty clay, orange, dry	No
LPN-VB043	17-5-12	0-2	24	As above	No
LPN-VB044	17-5-12	0.2	19	As above	No
LPN-V066	17-5-12	0.2	18	Silty clay, light brown	No
LPN-V067	17-5-12	0.2	32	Silty clay, As above	No
LPN-VB045	17-5-12	0.2	22	Silty clay, orange	No
LPN-V068	17-5-12	0.2	24	Silty clay, brown	No

ADDITIONAL NOTES:

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

Field Screening of Soils

JBS ENVIRONMENTAL

PID

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 16-5-12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation Lead Particulate area	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS

SAMPLE ID	DATE	DEPTH (m)	Pb (ppm)(XRF)	SOIL DESCRIPTION	Lead particulate observed?
LPN-V054	16-5-12	0.1	24	Silty clay, brown, damp	No
LPN-V056	16-5-12	0.2	30	Silty clay, orange	No
LPN-VB038	16-5-12	0.2	22	Silty clay light brown, dry	No
LPN-V057	16-5-12	0.1	73	Silty clay, light brown	No
LPN-V058	16-5-12	0.1	19	Silty clay, light brown	No
LPN-V059	16-5-12	0.1	20	Silty clay, light brown	No
LPN-V060	16-5-12	0.1	34	Silty clay, brown	No
LPN-V061	16-5-12	0.1	0	Silty clay, orange	No
LPN-VB039	16-5-12	0.2	15	Silty clay brown	No
LPN-V062	16-5-12	0.1	29	silty clay brown QC/QA 11	No
LPN-V063	16-5-12	0.1	27	silty clay orange QC/QA 12	No

ADDITIONAL NOTES:

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

Field Screening of Soils

JBS ENVIRONMENTAL

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 16-5-12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation Lead Particulate area	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS

SAMPLE ID	DATE	DEPTH (m)	Pb (ppm)(XRF)	SOIL DESCRIPTION	Lead particulate observed?
LPN-V046	16-5-12	0.2	26	silty clay, brown, damp (see P5 for Map)	No
LPN-V047	16-5-12	0.1	30	Silty clay, light brown (see P5 for map)	No
LPN-V048	16-5-12	0.1	24	Silty clay light brown (see P5 for Map	No
LPN-V049	16-5-12	0.1	49	Silty clay, light brn dry (see P5 for Map	No
LPN-V050	16-5-12	0.1	33	Silty clay, light brown (see P5 for Map)	No
LPN-V051	16-5-12	0.1	105	As above (see P5 for Map)	No
LPN-V052	16-5-12	0.1	109	As above (see P5 for Map)	No
LPN-V053	16-5-12	0.1	24	Silty clay brown (see P7 for Map)	No
LPN-V054	16-5-12	0.1	16	As abv (Map P7)	No
LPN-V0057	16-5-12	0.2	26	Silty clay, orange (Map P7)	No
LPN-V0036	16-5-12	0.2	15	As above (Map P7)	No

ADDITIONAL NOTES:
LPN-V047 = 115ppm; 2nd after excavation = 36
LPN-V048 = 180ppm; 2nd after excavation = 24

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

Field Screening of Soils

JBS ENVIRONMENTAL

Pg 8

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 15/5/12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation Lead Particulate area	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS See Page 7 for Map

SAMPLE ID	DATE	DEPTH (m)	Pb (ppm)(XRF)	SOIL DESCRIPTION	Lead particulate observed?
LPN-VB031	15/5/12	0.2	18	Silty clay, orange + tan	No
LPN-VB040	15/5/12	0.2	23	Silty clay, brown, dry	No
LPN-VB041	15/5/12	0.2	25	As above	No
LPN-VB032	15/5/12	0.2	23	Siltstone	No
LPN-VB033	15/5/12	0.2	15	Siltstone	No
LPN-VB034	15/5/12	0.2	15	Siltstone	No
LPN-VB042	15/5/12	0.2	23	Silty clay, dark brown	No
LPN-VB043	15/5/12	0.3	7	Silty clay, orange w/ grey	No
LPN-VB044	15/5/12	0.2	20	silty clay, brown Q2/Q4 10	No
LPN-VB045	15/5/12	0.2	24	As abv	No
LPN-VB035	15/5/12	0.2	0	Siltstone	No

ADDITIONAL NOTES:

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

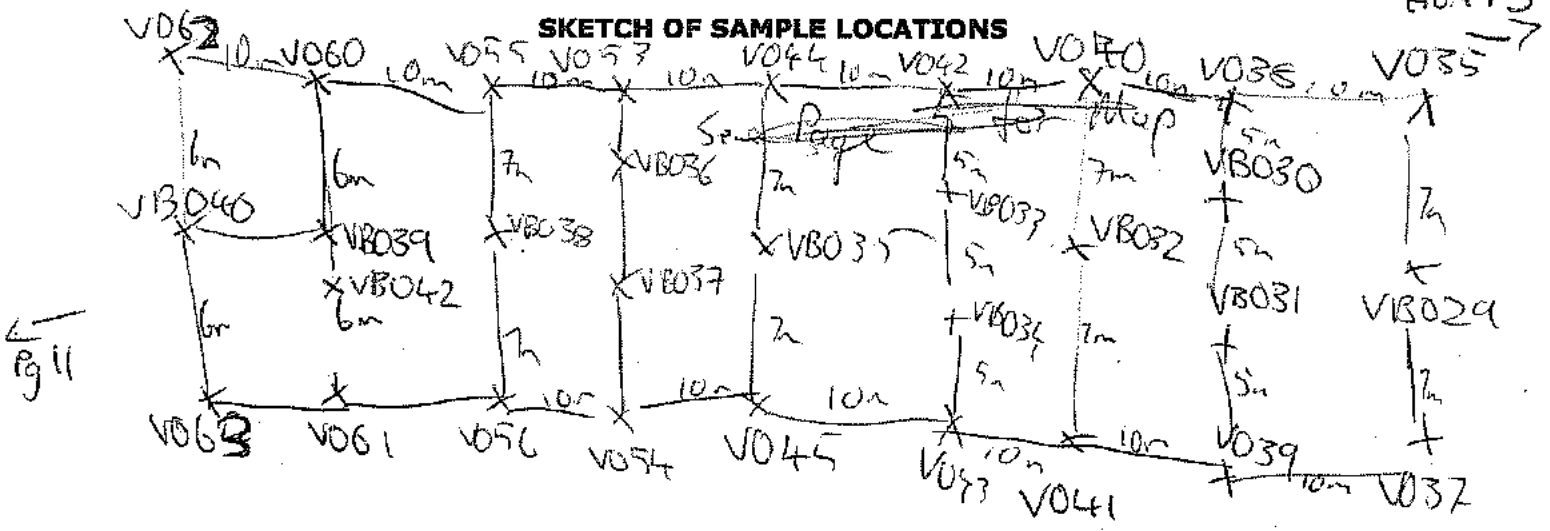
Field Screening of Soils

JBS ENVIRONMENTAL

Pg 7

PROJECT NAME: Edmondson Park Remediation	PROJECT NO: 41945
FIELDWORK DATES: 15/5/12	SAMPLERS: A. Boardman
TYPE OF INVESTIGATION: Remediation Lead Particulate area	PROJECT MANAGER: J. Rosner

SKETCH OF SAMPLE LOCATIONS



SAMPLE ID	DATE	DEPTH (m)	Pb (ppm)(XRF)	SOIL DESCRIPTION	Lead particulate observed?
LPN-VB026	15/5/12	0.3	17	Silty clay, orange, hard	N/O
LPN-VO54	15/5/12	0.2	37	Silty clay, dark brown, damp	No
LPN-VO55	15/5/12	0.2	45	As above	N/O
LPN-VB027	15/5/12	0.3	11	Silty clay, orange, hard	No
LPN-VB028	15/5/12	0.3	24	Silty clay, orange, hard	No
LPN-VO36	15/5/12	0.2	14	Silty clay, brown, dry	No
LPN-VB029	15/5/12	0.3	21	Weathered siltstone, orange	No
LPN-VO37	15/5/12	0.2	13	Silty clay, brown, dry	No
LPN-VO38	15/5/12	0.2	16	As above	No
LPN-VO39	15/5/12	0.2	18	As above	No
LPN-VB030	15/5/12	0.3	37	Silty clay, orange fine	No

ADDITIONAL NOTES:

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

Field Screening of Soils

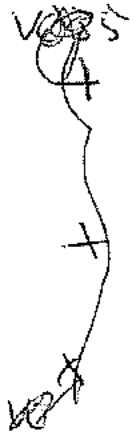
JBS ENVIRONMENTAL

Pg 6

PROJECT NAME: Edmondson Park Remediation	PROJECT NO: 41945
FIELDWORK DATES: 14/5/12	SAMPLERS: A. Boardman
TYPE OF INVESTIGATION: Remediation Lead Particulate area	PROJECT MANAGER: J. Rosner

SKETCH OF SAMPLE LOCATIONS

See Pg 5 for Map



SAMPLE ID	DATE	DEPTH (m)	Pb (ppm)(XRF)	SOIL DESCRIPTION	Lead particulate observed?
LPN-VB25	14/5/12	0.2	32	Silty clay, brown, hetero	No
LPN-VB24	14/5/12	0.3	21	Silty clay, Orange, frm, homo	No
LPN-VB025	14/5/12	0.3	17	As above	No
LPN-VB26	14/5/12	0.3	40	Silty clay, black brown, dry, hetro	No
LPN-VB27	14/5/12	0.3	12	Silty clay, orange, dry, homo	No
LPN-VB28	14/5/12	0.5	24	As above	No
LPN-VB29	14/5/12	0.4	21	As above	No
LPN-VB30	14/5/12	0.2	29	Silty clay, light brown, hetro	No
LPN-VB31	14/5/12	0.1	19	Silty clay, dark brown, hetro	No
LPN-VB32	14/5/12	0.1	21	Silty clay, light brown dry, hetro	No
LPN-VB33	14/5/12	0.2	21	Silty clay brown	No

ADDITIONAL NOTES:
LPN-VB33 - mineral = 110ppm, 2nd (after excavation) = 21

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

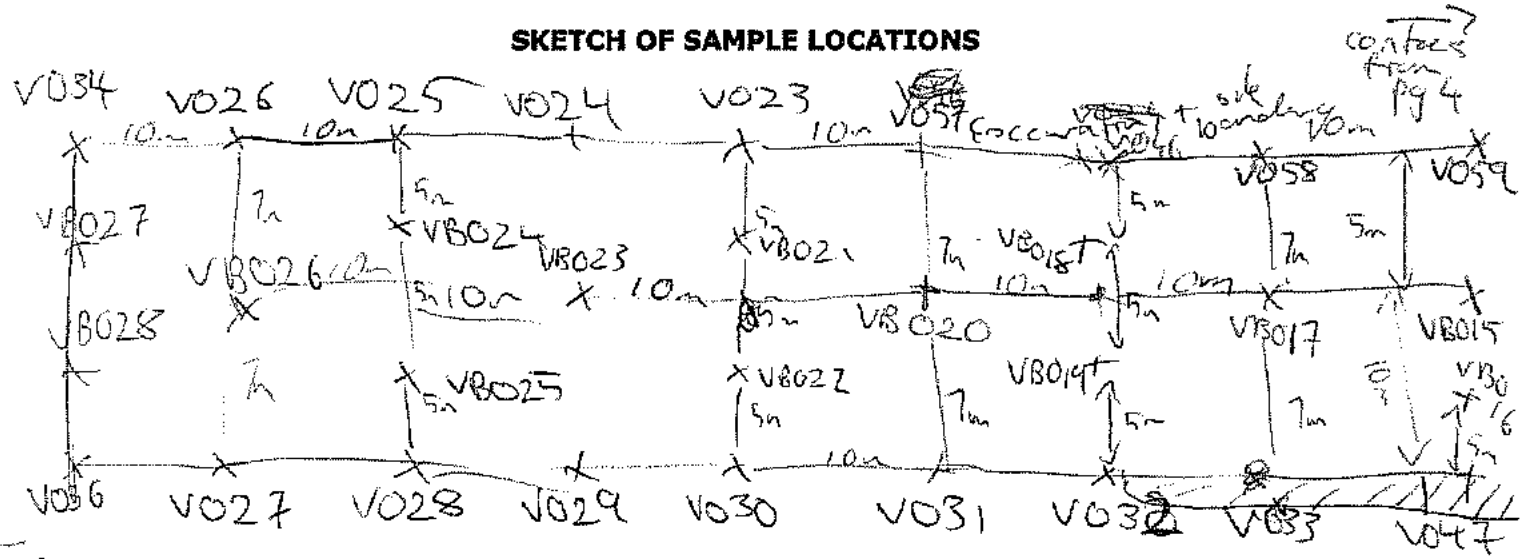
Field Screening of Soils

JBS ENVIRONMENTAL

Pg 5

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 11/5/12 + 12/5/12 + 14/5/12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation Lead Particulate area	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS



SAMPLE ID	DATE	DEPTH (m)	Pb (ppm)(XRF)	SOIL DESCRIPTION	Lead particulate observed?
LPN - VBO15	11/5/12	0.3	20	Silty clay, orange + grey	No
LPN - VBO16	11/5/12	0.3	18	As above	No
LPN - VBO17	11/5/12	0.4	22	weathered siltstone grey + orange	No
LPN - VBO18	12/5/12	0.4	21	As above	No
LPN - VBO19	12/5/12	0.4	22	As above	No
LPN - VBO20	12/5/12	0.4	21	As above	No
LPN - VBO21	12/5/12	0.4	28	As above	No
LPN - VBO22	12/5/12	0.4	21	As above	No
LPN - VBO23	12/5/12	0.3	19	Silty clay, orange + yellow	No
LPN - VO23	14/5/12	0.2	25	Silty clay, brown, dry	No
LPN - VO24	14/5/12	0.2	17	As above	No

ADDITIONAL NOTES:

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

Field Screening of Soils

JBS ENVIRONMENTAL

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 10/5/12 & 11/5/12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation Lead Particulate area	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS

See P.3 for map

SAMPLE ID	DATE	DEPTH (m)	Pb (ppm)(XRF)	SOIL DESCRIPTION	Lead particulate observed?
VB007	10/5/12	0.2	18	Mark: Weathered silt/clay	No
VB008	10/5/12	0.1	15	As above	No
VB009	10/5/12	0.2	13	Silty clay, orange tan grey	No
VB022	10/5/12	0.2	37	Silty clay, light brown, dry	No
VB010	10/5/12	0.2	26	As above silty clay, orange tan grey	No
UAN-VB011	10/5/12	0.2	22	As above	No
EPN-VB012	10/5/12	0.3	16	As above	No
ZAN-VB013	11/5/12	0.3	15	As above	No
EPN-VB014	11/5/12	0.3	20	As above	No

ADDITIONAL NOTES:

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

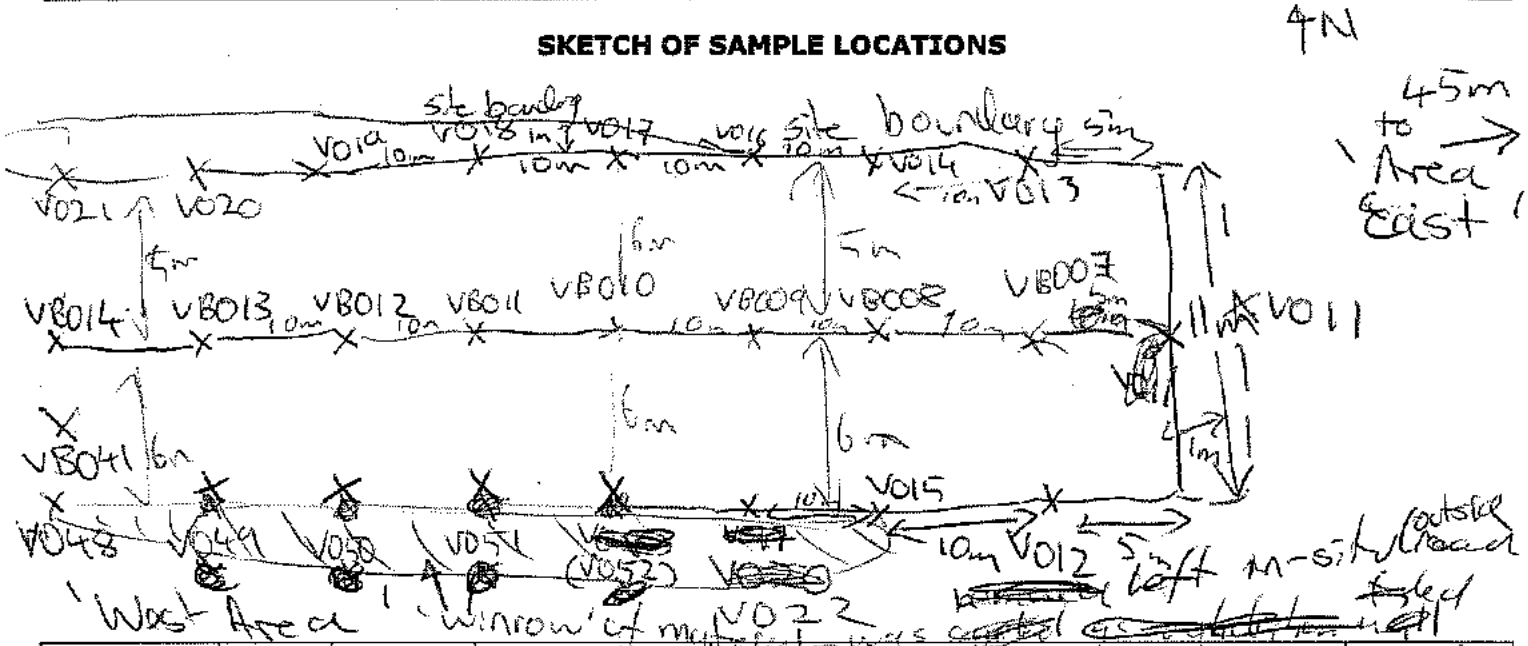
Field Screening of Soils

JBS ENVIRONMENTAL

P93

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 9/5/12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation Lead Particulate area	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS



SAMPLE ID	DATE	DEPTH (m)	Pb (ppm)(XRF)	SOIL DESCRIPTION	Lead particulate observed?
LPN-VO11	9/5/12	0.1m	90	Fill: Silty clay, with grass roots, light brown	No
LPN-VO12	9/5/12	0.2m	25	Nat; Silty clay orange/brown, stiff, dry, hard	No
LPN-VO13	9/5/12	0.2m	22	Nat: Silty clay, orange/brown, soft, L.P, hard	No
LPN-VO14	9/5/12	0.2m	28	Nat; Silty clay, orange/brown, soft, hard	No
LPN-VO15	9/5/12	0.2m	32	Silty clay, orange dry, L.P,	No
LPN-VO16	9/5/12	0.2	23	QC/QA08 - Nat orange clay	No
LPN-VO17	9/5/12	0.2	21	Silty clay (NAT) orng/brn soft	No
LPN-VO18	9/5/12	0.2	26	As above	No
LPN-VO19	9/5/12	0.2	14	As above	No
LPN-VO20	9/5/12	0.2	20	Silty clay as abv	No
LPN-VO21	9/5/12	0.2	23	as above	No

ADDITIONAL NOTES:
VO11 - lead particle observed - removed back 1m - no lead particulate observed.

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

P2

Field Screening of Soils

JBS ENVIRONMENTAL

P2

PROJECT NAME: Edmondson Park Remediation	PROJECT NO: 41945
FIELDWORK DATES: 8/5/12	SAMPLERS: A. Boardman
TYPE OF INVESTIGATION: Remediation Lead Particulate area	PROJECT MANAGER: J. Rosner

SKETCH OF SAMPLE LOCATIONS

See P1 for Map

'East Area'

SAMPLE ID	DATE	DEPTH (m)	Pb (ppm)(XRF)	SOIL DESCRIPTION	Lead particulate observed?
LPN-V005	8/5/12	0.2	30	Silty clay, brown + orange	No
LPN-V009	8/5/12	0.2	25	As above	No
LPN-VB005	8/5/12	0.1	10	Silty clay (NAT) compact, firm, hard	No
LPN-VB006	8/5/12	0.1	20	As above	No
LPN-V010	9/5/12	0.1	25	Silty clay, light brown	No

ADDITIONAL NOTES:

VB005 – 1st = 1804ppm
– Scraped down 100mm
2nd = 10

LPN-V010 – validation of the western extent of excavation

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

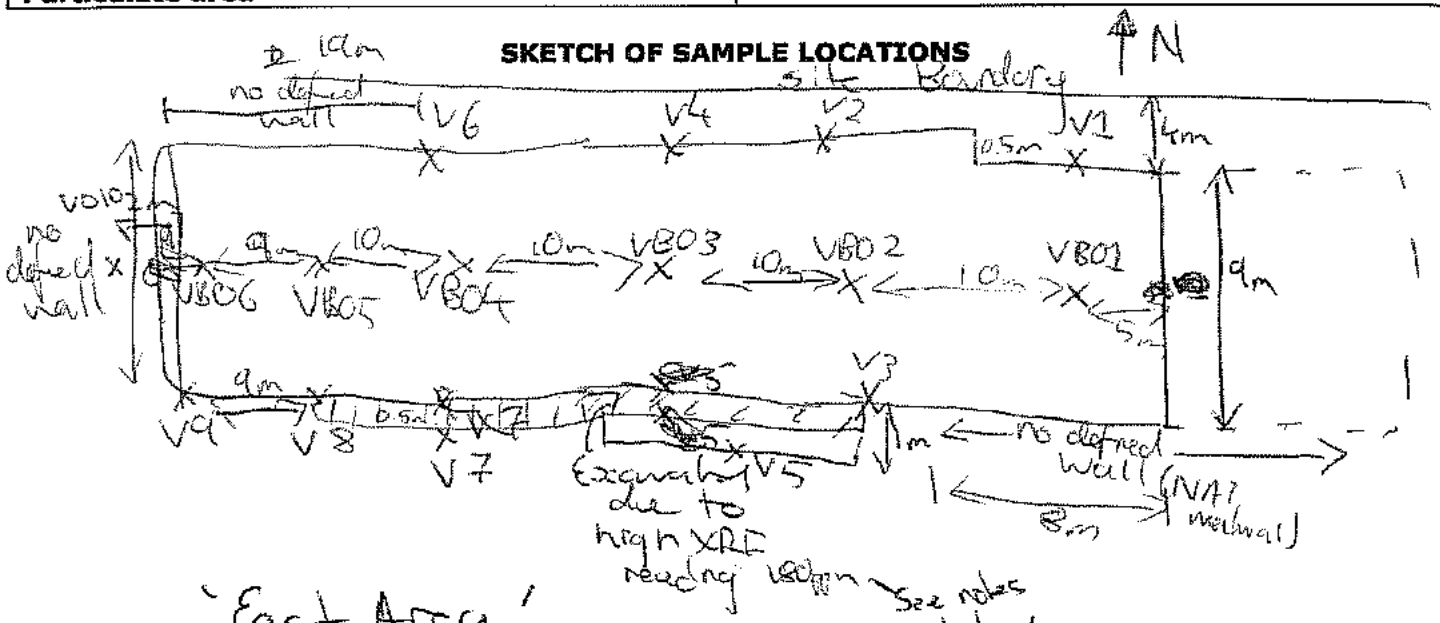
Field Screening of Soils

JBS ENVIRONMENTAL

P1

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 7/5/12 + 8/5/12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation Lead Particulate area	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS



SAMPLE ID	DATE	DEPTH (m)	Pb (ppm)(XRF)	SOIL DESCRIPTION	Lead particulate observed?
LPN-VB01	7/5/12	0.3m	64	Silty clay, brown, damp, M.P, hetero inclusions of igneous gravels + sandstone (Re-Collected)	No
LPN-VB02	7/5/12	0.1m	20	silty clay (NAT), orange, fm, L.P, dry, homo	No
LPN-VB02	7/5/12	0.3m	16	silty clay, brown, damp, M.P, hetero inclusions of igneous gravels	No
LPN-VB03	7/5/12	0.1m	66	Silty clay, orange brown, dry, L.P, hetero inclusions of igneous gravels	No
LPN-VB02	7/5/12	0.1m	38	Silty clay (NAT) orange, fm, L.P, dry homo	No
LPN-VB03	7/5/12	0.1m	20	Silty clay (NAT) orange, fm, L.P, dry homo	No
LPN-VB05	7/5/12	0.3m	160	~~Excavated further + re-sample~~ (2)	No
LPN-VB04	7/5/12	0.2m	21	Silty clay, brown, damp, M.P, hetero (Topsoil)	No
LPN-VB06	8/5/12	0.2	34	Silty clay, brown, dry, L.P, hetero all igneous gravels	No
LPN-VB04	8/5/12	0.2m	18	Silty clay (NAT), silty clay, orange w/ grey	No
LPN-VB07	8/5/12	0.1	18	silty clay, orange brown, dry, L.P, hetero	No

ADDITIONAL NOTES:

VB005 – 1st = 180ppm, 2nd = 300ppm — Sid (10/5/12) = 16ppm removed further

VB007 – 1st = 189ppm, 2nd = 18ppm — 4th 5m removed 1m

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

P2

Field Screening of Soils

JBS ENVIRONMENTAL

P2

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 8/5/12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation Lead Particulate area	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS

See P1 for Map

'East Area'

SAMPLE ID	DATE	DEPTH (m)	Pb (ppm)(XRF)	SOIL DESCRIPTION	Lead particulate observed?
LPN-V005	8/5/12	0.2	30	Silty clay, brown + orange	No
LPN-V009	8/5/12	0.2	25	As above	No
LPN-VB005	8/5/12	0.1	10	Silty clay (NAT) orange/tan, loose	No
LPN-VB006	8/5/12	0.1	20	As above	No
LPN-V010	9/5/12	0.1	25	Silty clay, light brown	No

ADDITIONAL NOTES:

VB005 – 1st = 180ppm
- Scraped down 100mm
2nd = 10

LPN-V010 – validation of the Western extent of excavation

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

IMSO Forms008 – Validation

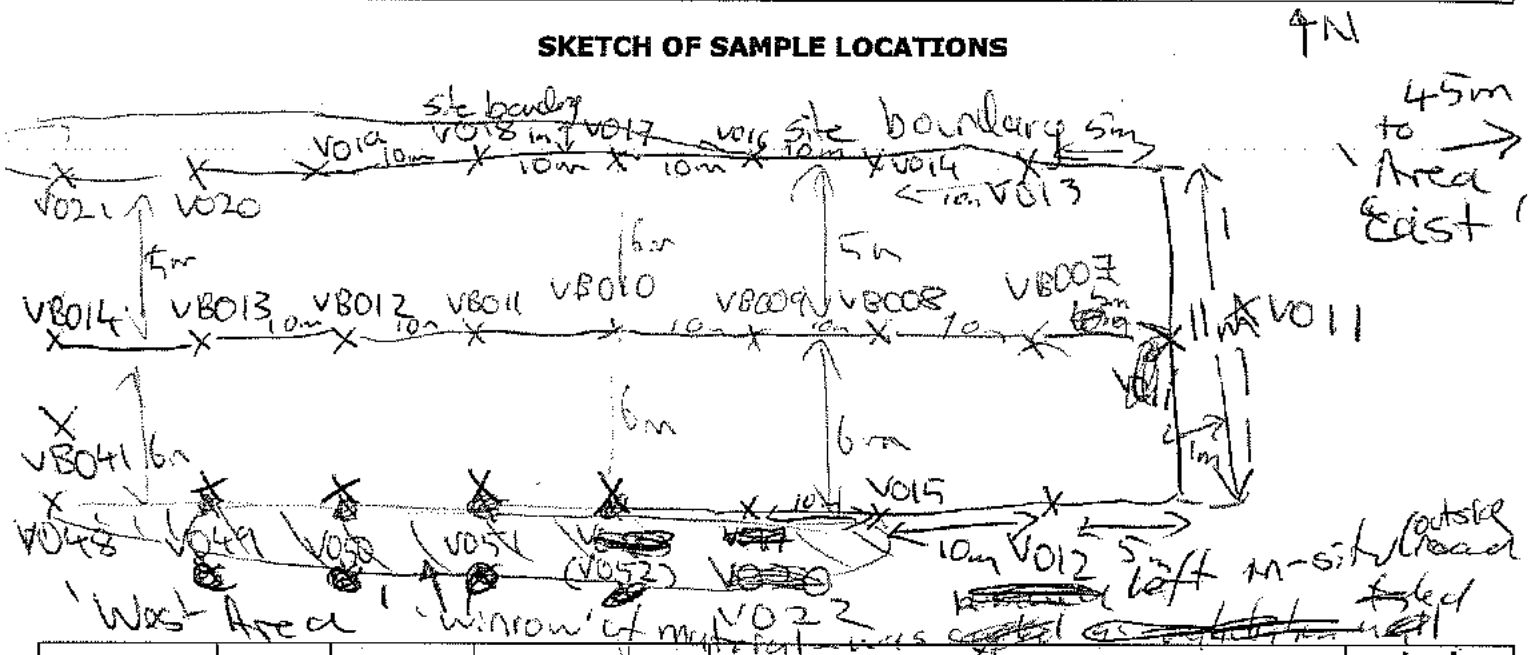
Field Screening of Soils

JBS ENVIRONMENTAL

P93

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 9/5/12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation Lead Particulate area	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS



SAMPLE ID	DATE	DEPTH (m)	Pb (ppm)(XRF)	SOIL DESCRIPTION	Lead particulate observed?
LPN-VO11	9/5/12	0.1m	90	Fill: silty clay, with approx 5% roots, light brown	No
LPN-VO12	9/5/12	0.2m	25	Nat; Silty clay, orange, stiff, dry, hard	No
LPN-VO13	9/5/12	0.2m	22	Nat; Silty clay, orange/brown, soft, L.P., hard	No
LPN-VO14	9/5/12	0.2m	28	Nat; Silty clay, orange/brown, soft, hard	No
LPN-VO15	9/5/12	0.2m	32	Silty clay, orange, dry, L.P.	No
LPN-VO16	9/5/12	0.2	23	QC/QA08 - Nat orange clay	No
LPN-VO17	9/5/12	0.2	29	Silty clay (NAT) orng/brn soft	No
LPN-VO18	9/5/12	0.2	26	As above	No
LPN-VO19	9/5/12	0.2	14	As above	No
LPN-VO20	9/5/12	0.2	20	Silty clay as above	No
LPN-VO21	9/5/12	0.2	23	as above	No

ADDITIONAL NOTES:
VO11 - Lead particle observed - removed bede 1m - no lead particulate observed.

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

Field Screening of Soils

JBS ENVIRONMENTAL

PROJECT NAME: Edmondson Park Remediation	PROJECT NO: 41945
FIELDWORK DATES: 10/5/12 + 11/5/12	SAMPLERS: A. Boardman
TYPE OF INVESTIGATION: Remediation Lead Particulate area	PROJECT MANAGER: J. Rosner

SKETCH OF SAMPLE LOCATIONS

See P.3 for map

SAMPLE ID	DATE	DEPTH (m)	Pb (ppm)(XRF)	SOIL DESCRIPTION	Lead particulate observed?
VB007	10/5/12	0.2	18	Nat: Weathered siltstone	No
VB008	10/5/12	0.1	15	As above	No
VB009	10/5/12	0.2	13	Silty clay, orange tg grey	No
VB22	10/5/12	0.2	37	Silty clay, light brown, dry	No
VB010	10/5/12	0.2	26	As above silty clay, orange + grey	No
DPN-VB011	10/5/12	0.2	22	As above	No
DPN-VB012	10/5/12	0.3	16	As above	No
DPN-VB013	11/5/12	0.3	15	As above	No
DPN-VB014	11/5/12	0.3	20	As above	No

ADDITIONAL NOTES:

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

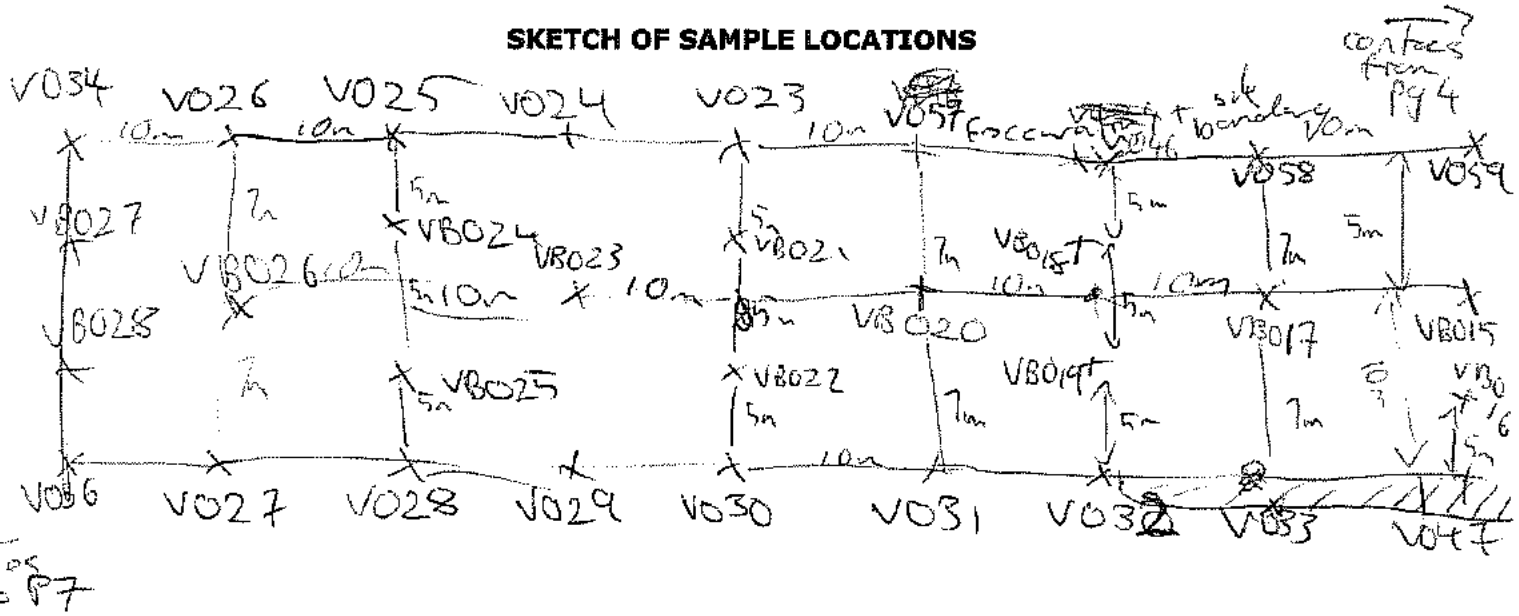
Field Screening of Soils

JBS ENVIRONMENTAL

Pg 5

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 11/5/12 + 12/5/12 + 14/5/12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation Lead Particulate area	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS



SAMPLE ID	DATE	DEPTH (m)	Pb (ppm)(XRF)	SOIL DESCRIPTION	Lead particulate observed?
LPN - VBO15	11/5/12	0.3	20	silty clay, orange + grey	No
LPN - VBO16	11/5/12	0.3	18	As above	No
LPN - VBO17	11/5/12	0.4	22	[illegible] medium to fine stone grey + orange	No
LPN - VBO18	12/5/12	0.4	21	As above	No
LPN - VBO19	12/5/12	0.4	22	As above	No
LPN - VBO20	12/5/12	0.4	21	As above	No
LPN - VBO21	12/5/12	0.4	28	As above	No
LPN - VBO22	12/5/12	0.4	21	As above	No
LPN - VBO24	12/5/12	0.3	19	Silty clay, orange + yellow	No
LPN - VO23	14/5/12	0.2	25	Silty clay, brown + grey	No
LPN - VO24	14/5/12	0.2	17	As above	No

ADDITIONAL NOTES:

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

Field Screening of Soils

JBS ENVIRONMENTAL

Pg 6

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 14/5/12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation Lead Particulate area	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS

See Pg 5 for Map

SAMPLE ID	DATE	DEPTH (m)	Pb (ppm)(XRF)	SOIL DESCRIPTION	Lead particulate observed?
LPN-V025	14/5/12	0.2	32	Silty clay, brown, hetro	No
LPN-V026	14/5/12	0.3	21	Silty clay, orange, frm, homo	NO
LPN-V025	14/5/12	0.3	17	As above	No
LPN-V026	14/5/12	0.3	40	Silty clay, dk brown, dry, hetro	No
LPN-V027	14/5/12	0.3	12	Silty clay, orange, dry, homo	NO
LPN-V028	14/5/12	0.5	24	As above	No
LPN-V029	14/5/12	0.4	21	As above	No
LPN-V030	14/5/12	0.2	29	Silty clay, light brown, hetro	No
LPN-V031	14/5/12	0.1	19	Silty clay, dk brown, hetro	No
LPN-V032	14/5/12	0.1	21	Silty clay, light brown, dry, hetro	No
LPN-V033	14/5/12	0.2	21	Silty clay brown	No

ADDITIONAL NOTES:
LPN-V033 - initial = 110ppm, 2nd (after excavation) = 21

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

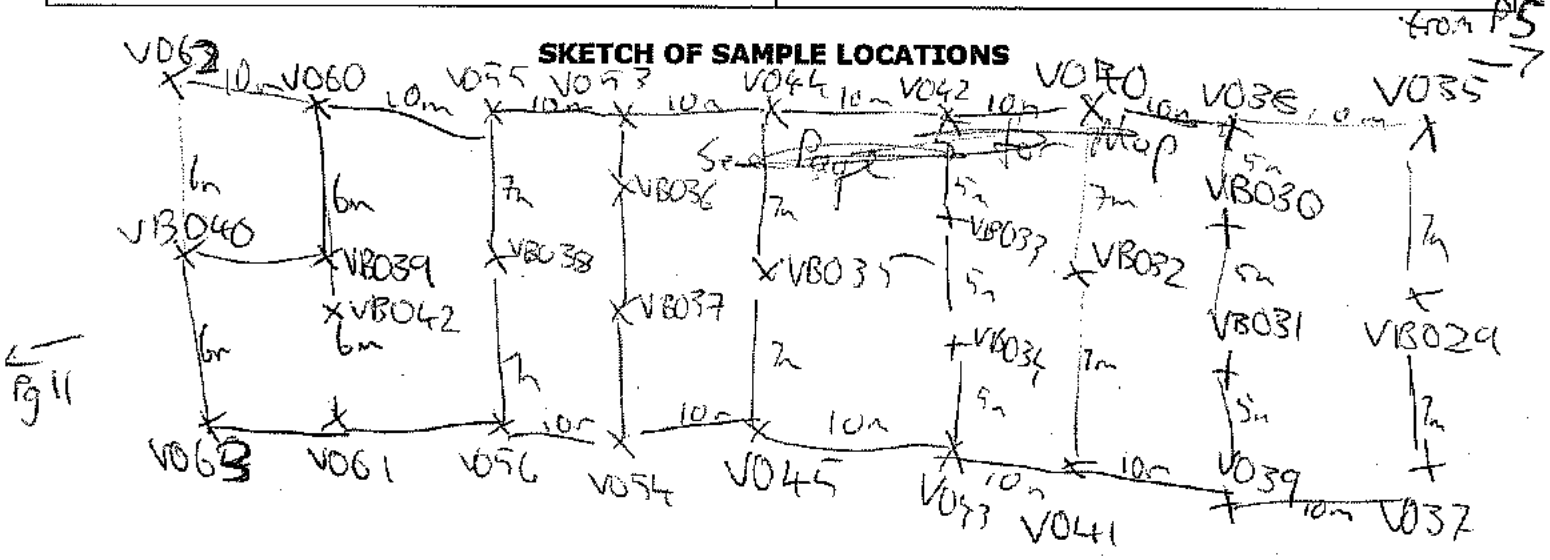
Field Screening of Soils

JBS ENVIRONMENTAL

Pg 7

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 15/5/12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation Lead Particulate area	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS



SAMPLE ID	DATE	DEPTH (m)	Pb (ppm)(XRF)	SOIL DESCRIPTION	Lead particulate observed?
LPN-VB026	15/5/12	0.3	17	silty clay, orange, hard	N/O
LPN-VO54	15/5/12	0.2	37	Silty clay, dark brown, damp	N/O
LPN-VO35	15/5/12	0.2	45	As above	N/O
LPN-VB027	15/5/12	0.3	11	Silty clay, orange, hard	No
LPN-VB028	15/5/12	0.3	24	Silty clay, orange, hard	No
LPN-VO36	15/5/12	0.2	14	Silty clay, brown, dam	No
LPN-VB029	15/5/12	0.3	21	Silty, weathered siltstone, orange	No
LPN-VO37	15/5/12	0.2	13	Silty clay, brown, dry	No
LPN-VO38	15/5/12	0.2	16	As above	No
LPN-VO39	15/5/12	0.2	18	As above	No
LPN-VB030	15/5/12	0.3	37	Silty clay, orange fine	No

ADDITIONAL NOTES:

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

Field Screening of Soils

JBS ENVIRONMENTAL

Pg 8

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 15/5/12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation Lead Particulate area	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS See Page 7 for map

SAMPLE ID	DATE	DEPTH (m)	Pb (ppm)(XRF)	SOIL DESCRIPTION	Lead particulate observed?
LPN-VB031	15/5/12	0.2	18	Silty clay, orange + fibrous	No
LPN-VB040	15/5/12	0.2	23	Silty clay, brown, dry	No
LPN-VB041	15/5/12	0.2	25	As above	No
LPN-VB032	15/5/12	0.2	23	Siltstone	No
LPN-VB033	15/5/12	0.2	15	Siltstone	No
LPN-VB034	15/5/12	0.2	15	Siltstone	No
LPN-VB042	15/5/12	0.2	23	silty clay, dark brown	No
LPN-VB043	15/5/12	0.3	7	Silty clay, orange w/ grey	No
LPN-VB044	15/5/12	0.2	20	silty clay, brown QL/QATO	No
LPN-VB045	15/5/12	0.2	24	As above	No
LPN-VB035	15/5/12	0.2	0	Siltstone	No

ADDITIONAL NOTES:

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL CLAY SILT SAND	clayey silty sandy gravelly organic	red yellow black brown grey	homogenous heterogeneous stratified laminated lens	dry damp moist wet saturated	very soft soft firm stiff very stiff	non-plastic low plasticity mod plasticity high plasticity	very loose loose medium dense dense very dense	boulders cobbles coarse gravel fine gravel coarse sand	poorly sorted (well graded) well sorted (poorly graded)	and (35-50%) some (20-35%) little (10-20%) trace (0-10%)

Field Screening of Soils

JBS ENVIRONMENTAL

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 16-5-12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation Lead Particulate area	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS

SAMPLE ID	DATE	DEPTH (m)	Pb (ppm)(XRF)	SOIL DESCRIPTION	Lead particulate observed?
LPN-V046	16-5-12	0.2	26	silty clay, brown, damp (see P5 for Map)	NO
LPN-V047	16-5-12	0.1	30	Silty clay, light brown (see P5 for Map)	No
LPN-V048	16-5-12	0.1	24	Silty clay light brown (see P5 for Map	No
LPN-V049	16-5-12	0.1	49	Silty clay, light brown dry (see P5 for Map	No
LPN-V050	16-5-12	0.1	33	Silty clay, light brown (see P5 for Map)	No
LPN-V051	16-5-12	0.1	105	As above (see P5 for Map)	No
LPN-V052	16-5-12	0.1	109	As above (see P5 for Map)	No
LPN-V053	16-5-12	0.1	24	Silty clay brown (see P7 for Map	No
LPN-V054	16-5-12	0.1	16	As abt (Map P7)	No
LPN-V055	16-5-12	0.2	26	Silty clay, orange (Map P7)	No
LPN-V056	16-5-12	0.2	15	As above (Map P7)	No

ADDITIONAL NOTES:
LPN-V047 = 115ppm, 2nd after excavation = 30
LPN-V048 = 180ppm, 2nd after excavation = 24

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

Field Screening of Soils

JBS ENVIRONMENTAL

PID

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 16-5-12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation Lead Particulate area	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS

SAMPLE ID	DATE	DEPTH (m)	Pb (ppm)(XRF)	SOIL DESCRIPTION	Lead particulate observed?
LPN-V054	16-5-12	0.1	24	Silty clay, brown, damp	N/C
LPN-V056	16-5-12	0.2	30	Silty clay, orange	N/C
LPN-V8038	16-5-12	0.2	22	Silty clay, light brown, dry	N/C
LPN-V057	16-5-12	0.1	73	Silty clay, light brown	N/C
LPN-V058	16-5-12	0.1	19	Silty clay, light brown	N/C
LPN-V059	16-5-12	0.1	20	Silty clay, light brown	N/C
LPN-V060	16-5-12	0.1	34	Silty clay, brown	N/C
LPN-V061	16-5-12	0.1	0	Silty clay, orange	N/C
LPN-V8039	16-5-12	0.2	15	Silty clay brown	N/C
LPN-V062	16-5-12	0.1	29	silty clay brown QC/QA 11	N/C
LPN-V063	16-5-12	0.1	27	silty clay orange QC/QA 12	N/C

ADDITIONAL NOTES:

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

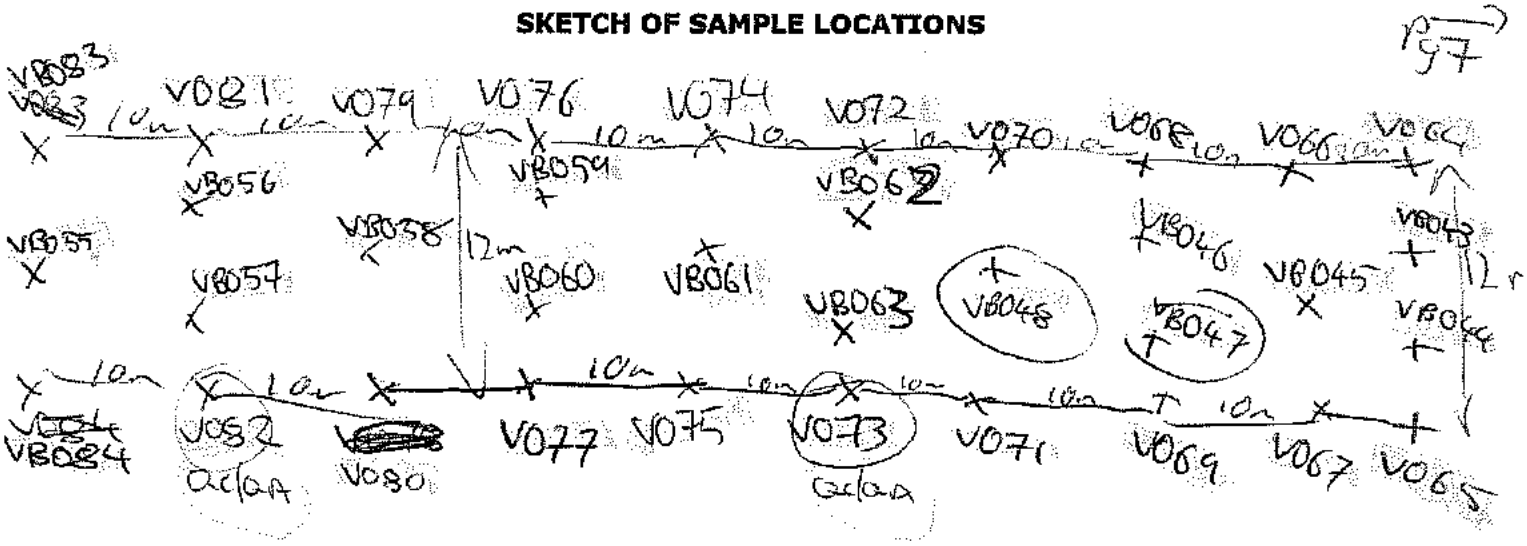
Field Screening of Soils

JBS ENVIRONMENTAL

P11

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 16-5-12 | 17-5-12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation Lead Particulate area	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS



SAMPLE ID	DATE	DEPTH (m)	Pb (ppm)(XRF)	SOIL DESCRIPTION	Lead particulate observed?
LPN-VB084 (VB040)	16-5-12	0.2	22	Silty clay orange (P7 map)	No
LPN-VB041	17-5-12	0.2	0	Silty clay, orange + grey (CP3 map)	No
LPN-VB042	17-5-12	0.2	0	As above (CP7 map)	No
LPN-VB064	17-5-12	0.2	33	Silty clay, brown	No
LPN-VB065	17-5-12	0.2	26	Silty clay, orange, dry	No
LPN-VB043	17-5-12	0.2	24	As above	No
LPN-VB044	17-5-12	0.2	19	As above	No
LPN-VB066	17-5-12	0.2	18	Silty clay, light brown	No
LPN-VB067	17-5-12	0.2	22	Silty clay, As above	No
LPN-VB045	17-5-12	0.2	22	Silty clay, orange	No
LPN-VB068	17-5-12	0.2	24	Silty clay, brown	No

ADDITIONAL NOTES:

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

Field Screening of Soils

JBS ENVIRONMENTAL

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 21-5-12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation Lead Particulate area	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS

SAMPLE ID	DATE	DEPTH (m)	Pb (ppm)(XRF)	SOIL DESCRIPTION	Lead particulate observed?
VB055	21-5-12	0.1	24	Silty clay orange (PII see Map)	No
VB056	21-5-12	0.1	15	As above (PII see Map)	No
VB057	21-5-12	0.1	22	As above (PII see Map)	No
VB058	21-5-12	0-1	6	As above (PII see Map)	No
VB059	21-5-12	0.1	17	As above (PII see Map)	No
VB060	21-5-12	0.1	18	As above (PII see Map)	No
VB061	21-5-12	0.1	15	Silty clay, orange (PII see Map)	No
VB062	21-5-12	0.1	55	As above (PII see Map)	No
VB063	21-5-12	0.1	15	As above (PII see Map)	No

ADDITIONAL NOTES:

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

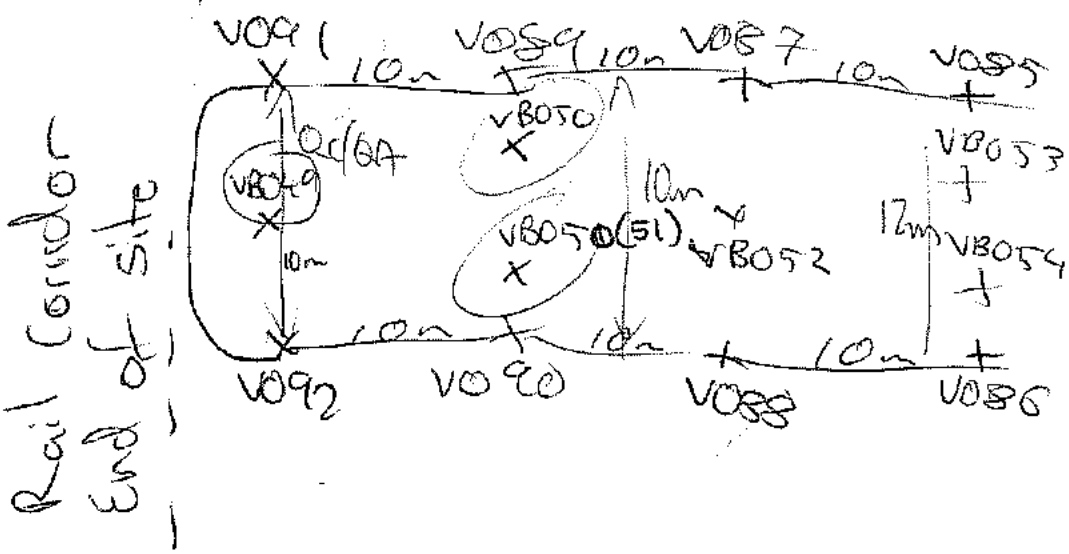
Field Screening of Soils

JBS ENVIRONMENTAL

P14

PROJECT NAME: Edmondson Park Remediation	PROJECT NO: 41945
FIELDWORK DATES: 21-5-12	SAMPLERS: A. Boardman
TYPE OF INVESTIGATION: Remediation Lead Particulate area	PROJECT MANAGER: J. Rosner

SKETCH OF SAMPLE LOCATIONS



SAMPLE ID	DATE	DEPTH (m)	Pb (ppm)(XRF)	SOIL DESCRIPTION	Lead particulate observed?
LPN-VO86	21-5-12	0.1	17	Silty clay, brown	No
LPN-VO87	21-5-12	0.1	17	Silty clay brown	No
LPN-VO88	21-5-12	0.1	9	As above	No
LPN-VO91	21-5-12	0.1	21	As above	No
LPN-VO92	21-5-12	0.1	20	Silty clay, brown	No
LPN-VB049	21-5-12	0.1	22	Silty clay orange QC/QA 15	No
LPN-VB052	21-5-12	0.1	444	Silty clay orange	No
LPN-VB053	21-5-12	0.1	20	As above	No
LPN-VB054	21-5-12	0.1	30	As above	No
LPN-VB050	22-5-12	0.1	12	Silty clay orange	No
LPN-VB050 (QC)	21-5-12	0.1	12	Silty clay orange	No

ADDITIONAL NOTES:

VO89 = 1st: 200ppm, 2nd (after excavation) = 17ppm
VO91 = 1st: 300ppm, 2nd (after excavation) = 21
VB050 = 1st 1000ppm, 2nd = 12 (after excavation)

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

Field Screening of Soils

JBS ENVIRONMENTAL

P13

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 18-7 21-5-12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation Lead Particulate area	**PROJECT MANAGER: J. Rosner**

SKETCH OF SAMPLE LOCATIONS

SAMPLE ID	DATE	DEPTH (m)	Pb (ppm)(XRF)	SOIL DESCRIPTION	Lead particulate observed?
LPN-V077	18-5-12	0.2	72	silty clay, orange + grey (PIIMcp)	No
LPN-V078	18-5-12	0.1	25	silty clay, orange + brown (PI Mcp)	No
LPN-V079	21-5-12	0.1	30	As above (PII Mcp)	No
LPN-V080	21-5-12	0.1	24	silty clay, damp, brown (PII-Mcp)	No
LPN-V081	21-5-12	0.1	42	silty clay, brown (PII-Mcp)	No
LPN-V082	21-5-12	0.1	30	silty clay, brown QC/QA 14	No
LPN-V083	21-5-12	0.1	24	silty clay orange/brown PII-Mcp	No
LPN-V084	21-5-12	0.1	10	silty clay, brown PII-Mcp	No
LPN-V085	21-5-12	0.1	24	As above PII-Mcp	No
LPN-V086	21-5-12	0.1	18	As above PII-Mcp	No
LPN-V087	21-5-12	0.1	27	As above PII-Mcp	No

ADDITIONAL NOTES:
LPN-V079 - 1st: 280ppm - 2nd: 30 (after excavation)

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

Field Screening of Soils

JBS ENVIRONMENTAL

P12

PROJECT NAME: Edmondson Park Remediation	PROJECT NO: 41945
FIELDWORK DATES: 17-5-12	SAMPLERS: A. Boardman
TYPE OF INVESTIGATION: Remediation Lead Particulate area	PROJECT MANAGER: J. Rosner

SKETCH OF SAMPLE LOCATIONS

SAMPLE ID	DATE	DEPTH (m)	Pb (ppm)(XRF)	SOIL DESCRIPTION	Lead particulate observed?
LPN-V069	17-5-12	0.2	27	Silty clay, orange + brn (PII Mgt)	No
LPN-VB046	17-5-12	0.2	25	Silty clay, orange (PII Mgt)	No
LPN-VB047	21-5-12	0.2	~~25~~ 22	Silty clay, orange (PII Mgt)	No
LPN-V070	17-5-12	0.2	46	Silty clay, light brn (PII Mgt)	No
LPN-V071	17-5-12	0.2	32	Silty clay, orange (PII Mgt)	No
LPN-VB048	21-5-12	0.2	27	Silty clay, orange (PII Mgt)	No
LPN-V072	17-5-12	0.2	70	Silty clay, orange ~~Fill~~ 3 (PII Mgt)	No
LPN-V073	17-5-12	0.1	30	As above @ C/QA 3 (PII Mgt)	No
LPN-V074	21-5-12	0-1	50	Silty clay orange + brown (PII Mgt)	No
LPN-V075	17-5-12	0.1	50	Silty clay orange (PII Mgt)	No
LPN-V076	21-5-12	0.1	35	Silty clay brown + orange (PII Mgt)	No

ADDITIONAL NOTES: LPN-VB047=1st: 363ppm (excavated further) 2nd: 22ppm
LPN-VB048=1st: 28ppm (excavated further) 2nd: 27ppm
LPN-V076=1st: 334ppm (excavated further) 2nd: 35ppm
LPN-V074=1st: 200ppm (excavated further) 2nd: 50ppm

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

Field Equipment Calibration and Decontamination

JBS ENVIRONMENTAL

PROJECT NAME:	Edmondson Park Remediation	**PROJECT NO:**	41945
FIELD DATES:	20, 21/8/12	**FIELD STAFF:**	A.B

CALIBRATION SUMMARY
EQUIPMENT:
CALIBRATION STANDARD:

DATE	TIME	READING (ppm$_v$)	COMMENTS

DECONTAMINATION SUMMARY

EQUIPMENT: _____

_____

_____

1. Was the equipment decontaminated appropriately prior to sampling at each location?	(Y)	N	NA
2. Was excess soil removed by scraping, brushing or wiping with disposable towels?	(Y)	N	NA
3. Was the equipment contaminated with grease, tar or similar material? If so, was the equipment steam cleaned or rinsed with pesticide-grade acetone:hexane?	Y Y	N N	(NA)
4. Was phosphate-free detergent used to wash the equipment?	(Y)	N	NA
5. Was the equipment rinsed with clean water?	(Y)	N	NA
6. Was the equipment then rinsed with deionised water?	(Y)	N	NA
7. Were all sample containers cleaned and acid or solvent washed prior to sample collection?	(Y)	N	NA

WERE ANY ADDITIONAL DECONTAMINATION MEASURES REQUIRED? PROVIDE DETAILS.

_____

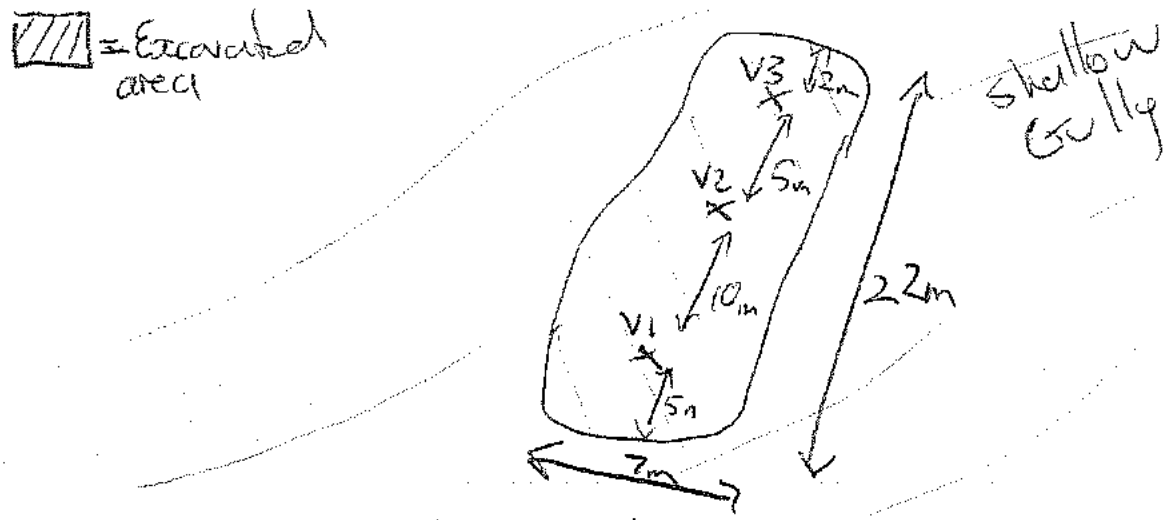
Field Screening of Soils

JBS ENVIRONMENTAL

PROJECT NAME: Edmondson Park Remediation	**PROJECT NO: 41945**
FIELDWORK DATES: 21/8/12	**SAMPLERS: A. Boardman**
TYPE OF INVESTIGATION: Remediation/Validation	**PROJECT MANAGER: J. Rosner**

UFO4

SKETCH OF SAMPLE LOCATIONS N



////= Excavated area

ACM observed

SAMPLE ID	DATE	DEPTH (m)	~~PID/XRF (ppm)~~	SOIL DESCRIPTION AND FATE
UFO4-V1	21/8/12	0.1	No	Silty clay, dark brown, damp, M.P
UFO4-V2	21/8/12	0.1	No	" " "
UFO4-V3	21/8/12	0.1	No	" " "

ADDITIONAL NOTES: Excavation had no defined walls, shallow excavation 100mm deep

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

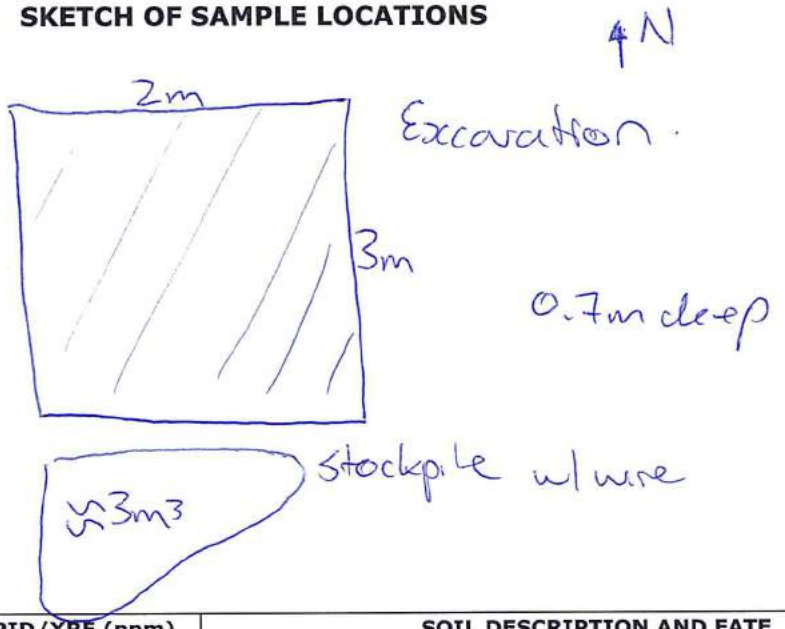
Field Screening of Soils

JBS ENVIRONMENTAL

PROJECT NAME: Ed Park Rem	**PROJECT NO:** 41945
FIELDWORK DATES: 27/11/12	**SAMPLERS:**
TYPE OF INVESTIGATION (GME/ESA etc):	**PROJECT MANAGER:**

SKETCH OF SAMPLE LOCATIONS

E: 0301121
N: 6239479



SAMPLE ID	DATE	DEPTH (m)	PID/XRF (ppm)	SOIL DESCRIPTION AND FATE

ADDITIONAL NOTES: stockpile: Silty clay, dark brown w/ orange mottles, hetero w/ timber, steel wire & star pickets, NO ACM

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

Calibration Records

JBS ENVIRONMENTAL

PROJECT NAME: ED PARK REM	**PROJECT NO:** 41945
FIELDWORK DATES:	**SAMPLERS:** AB, OM MP
TYPE OF INVESTIGATION (GME/ESA etc):	**PROJECT MANAGER:** JR

DATE	Initials	Calibration ok?	Signature	Comments
20/7/12	O.M	Yes		→ RRZWA → C2SRA
21/7/12	AB	✓		RRZW
22-8-12	AB	✓		C2SRA
24-8-12	MP	Yes	MP	C2SRA
27/8/12	AB	✓		C2SRA
28-8-12	AB	✓		C2SRA
29-8-12	AB	✓		C2SRA
3/9/12	AB	✓		C2SRA

Calibration Records

PROJECT NAME: Ed. Park Road	**PROJECT NO:** 44945
FIELDWORK DATES:	**SAMPLERS:** AB
TYPE OF INVESTIGATION (GME/ESA etc):	**PROJECT MANAGER:** JR

DATE	Initials	Calibration ok?	Signature	Comments
	~~AB~~			
21/5/12	AB	✓		RZNRR
22/5/12	AB	✓		"
22-6-12	AB	✓		CZSRR
23/6/12	AB	✓		"
27/6/12	AB	✓		"
28/6/12	AB	✓		"
3/7/12	AB	✓		"
10/7/12	AB	✓		"

Calibration Records

JBS ENVIRONMENTAL

PROJECT NAME: Ed. Parker Dam	PROJECT NO: 41465
FIELDWORK DATES:	SAMPLERS: AB
TYPE OF INVESTIGATION (GME/ESA etc):	PROJECT MANAGER: J Posner

DATE	Initials	Calibration ok?	Signature	Comments
7-5-12	AB	✓		~~NRA~~
8/5/12	AB	✓		"
9/5/12	AB	✓		"
10/5/12	AB	✓		"
11-5-12	AB	✓		"
12/5/12	AB	✓		"
14-5-12	AB	✓		"
15/5/12	AB	✓		"
16/5/12	AB	✓		"
17/5/12	AB	✓		"
18-5-12	AB	✓		"

Appendix K – Laboratory Reports and Chain of Custody Documents

© 2013 JBS Environmental Pty Ltd

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

CERTIFICATE OF ANALYSIS 70384

Client:
JBS Environmental Pty Ltd
P.O. Box 940
MASCOT
NSW 1460

Attention: Jo Rosner, A Boardman

Sample log in details:

Your Reference:	**41945, Edmondson Park - Clean SP**		
No. of samples:	16 soils		
Date samples received / completed instructions received	15/03/12	/	15/03/12

Analysis Details:
Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	22/03/12	/	22/03/12
Date of Preliminary Report:	Not issued		

NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Nancy Zhang
Chemist

Rhian Morgan
Reporting Supervisor

Paul Ching
Approved Signatory

ACCREDITED FOR TECHNICAL COMPETENCE

vTRH & BTEX in Soil						
Our Reference:	UNITS	70384-1	70384-2	70384-3	70384-4	70384-5
Your Reference	----------	SP14-1	QC02	SP15-1	SP4-1	SP5-1
Depth	----------	0.4	-	0.3	0.4	0.3
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	17/03/2012	17/03/2012	17/03/2012	17/03/2012	17/03/2012
vTRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	[NA]	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	[NA]	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	[NA]	<1	<1	<1
m+p-xylene	mg/kg	<2	[NA]	<2	<2	<2
o-Xylene	mg/kg	<1	[NA]	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	107	101	110	111	110

vTRH & BTEX in Soil						
Our Reference:	UNITS	70384-6	70384-7	70384-8	70384-9	70384-10
Your Reference	----------	SP17-1	SP16-1	SP11-1	SP10-1	SP9-1
Depth	----------	0.3	0.3	0.4	0.3	0.4
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	17/03/2012	17/03/2012	17/03/2012	17/03/2012	17/03/2012
vTRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	112	101	105	104	109

vTRH & BTEX in Soil						
Our Reference:	UNITS	70384-11	70384-12	70384-13	70384-14	70384-15
Your Reference	----------	SP7-1	SP8-1	SP1-1	SP2-1	SP3-1
Depth	----------	0.4	0.4	0.3	0.3	0.3
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	17/03/2012	17/03/2012	17/03/2012	17/03/2012	17/03/2012
vTRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	107	102	117	105	101

vTRH & BTEX in Soil		
Our Reference:	UNITS	70384-16
Your Reference	----------	SP12-1
Depth	----------	0.4
Date Sampled		14/03/2012
Type of sample		Soil
Date extracted	-	16/03/2012
Date analysed	-	17/03/2012
vTRH C_6 - C_9	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	102

sTRH in Soil (C10-C36)						
Our Reference:	UNITS	70384-1	70384-2	70384-3	70384-4	70384-5
Your Reference	----------	SP14-1	QC02	SP15-1	SP4-1	SP5-1
Depth	----------	0.4	-	0.3	0.4	0.3
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	17/03/2012	17/03/2012	17/03/2012	17/03/2012	17/03/2012
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	102	104	101	102	102

sTRH in Soil (C10-C36)						
Our Reference:	UNITS	70384-6	70384-7	70384-8	70384-9	70384-10
Your Reference	----------	SP17-1	SP16-1	SP11-1	SP10-1	SP9-1
Depth	----------	0.3	0.3	0.4	0.3	0.4
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	17/03/2012	17/03/2012	17/03/2012	17/03/2012	17/03/2012
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	101	101	101	101	101

sTRH in Soil (C10-C36)						
Our Reference:	UNITS	70384-11	70384-12	70384-13	70384-14	70384-15
Your Reference	----------	SP7-1	SP8-1	SP1-1	SP2-1	SP3-1
Depth	----------	0.4	0.4	0.3	0.3	0.3
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	17/03/2012	17/03/2012	17/03/2012	17/03/2012	17/03/2012
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	99	104	105	97	101

sTRH in Soil (C10-C36)		
Our Reference:	UNITS	70384-16
Your Reference	----------	SP12-1
Depth	----------	0.4
Date Sampled		14/03/2012
Type of sample		Soil
Date extracted	-	16/03/2012
Date analysed	-	17/03/2012
TRHC$_{10}$ - C$_{14}$	mg/kg	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100
Surrogate o-Terphenyl	%	101

PAHs in Soil						
Our Reference:	UNITS	70384-1	70384-2	70384-3	70384-4	70384-5
Your Reference	----------	SP14-1	QC02	SP15-1	SP4-1	SP5-1
Depth	----------	0.4	-	0.3	0.4	0.3
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	18/03/2012	18/03/2012	18/03/2012	18/03/2012	18/03/2012
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d_{14}	%	108	94	101	100	101

PAHs in Soil						
Our Reference:	UNITS	70384-6	70384-7	70384-8	70384-9	70384-10
Your Reference	----------	SP17-1	SP16-1	SP11-1	SP10-1	SP9-1
Depth	----------	0.3	0.3	0.4	0.3	0.4
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	18/03/2012	18/03/2012	18/03/2012	18/03/2012	18/03/2012
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d_{14}	%	102	102	99	103	101

PAHs in Soil						
Our Reference:	UNITS	70384-11	70384-12	70384-13	70384-14	70384-15
Your Reference	----------	SP7-1	SP8-1	SP1-1	SP2-1	SP3-1
Depth	----------	0.4	0.4	0.3	0.3	0.3
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	18/03/2012	18/03/2012	18/03/2012	18/03/2012	18/03/2012
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d$_{14}$	%	103	104	101	103	99

PAHs in Soil		
Our Reference:	UNITS	70384-16
Your Reference	----------	SP12-1
Depth	----------	0.4
Date Sampled		14/03/2012
Type of sample		Soil
Date extracted	-	16/03/2012
Date analysed	-	18/03/2012
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Surrogate p-Terphenyl-d$_{14}$	%	99

Organochlorine Pesticides in soil						
Our Reference:	UNITS	70384-1	70384-3	70384-4	70384-5	70384-6
Your Reference	----------	SP14-1	SP15-1	SP4-1	SP5-1	SP17-1
Depth	----------	0.4	0.3	0.4	0.3	0.3
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	17/03/2012	17/03/2012	17/03/2012	18/03/2012	18/03/2012
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	97	105	104	110	101

Organochlorine Pesticides in soil						
Our Reference:	UNITS	70384-7	70384-8	70384-9	70384-10	70384-11
Your Reference	----------	SP16-1	SP11-1	SP10-1	SP9-1	SP7-1
Depth	----------	0.3	0.4	0.3	0.4	0.4
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	18/03/2012	18/03/2012	18/03/2012	18/03/2012	18/03/2012
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	102	100	110	101	106

Organochlorine Pesticides in soil						
Our Reference:	UNITS	70384-12	70384-13	70384-14	70384-15	70384-16
Your Reference	----------	SP8-1	SP1-1	SP2-1	SP3-1	SP12-1
Depth	----------	0.4	0.3	0.3	0.3	0.4
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	18/03/2012	18/03/2012	18/03/2012	18/03/2012	18/03/2012
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	98	101	102	101	97

Acid Extractable metals in soil						
Our Reference:	UNITS	70384-1	70384-2	70384-3	70384-4	70384-5
Your Reference	----------	SP14-1	QC02	SP15-1	SP4-1	SP5-1
Depth	----------	0.4	-	0.3	0.4	0.3
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	19/03/2012	19/03/2012	19/03/2012	19/03/2012	19/03/2012
Arsenic	mg/kg	7	10	8	6	6
Cadmium	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	mg/kg	15	18	18	13	17
Copper	mg/kg	22	23	16	27	16
Lead	mg/kg	14	18	23	20	20
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	5	6	8	9	7
Zinc	mg/kg	26	29	32	49	33

Acid Extractable metals in soil						
Our Reference:	UNITS	70384-6	70384-7	70384-8	70384-9	70384-10
Your Reference	----------	SP17-1	SP16-1	SP11-1	SP10-1	SP9-1
Depth	----------	0.3	0.3	0.4	0.3	0.4
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	19/03/2012	19/03/2012	19/03/2012	19/03/2012	19/03/2012
Arsenic	mg/kg	<4	7	7	5	6
Cadmium	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	mg/kg	6	14	14	12	13
Copper	mg/kg	5	21	27	30	42
Lead	mg/kg	11	44	40	27	80
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	3	8	8	9	9
Zinc	mg/kg	13	52	43	48	51

Acid Extractable metals in soil						
Our Reference:	UNITS	70384-11	70384-12	70384-13	70384-14	70384-15
Your Reference	----------	SP7-1	SP8-1	SP1-1	SP2-1	SP3-1
Depth	----------	0.4	0.4	0.3	0.3	0.3
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	19/03/2012	19/03/2012	19/03/2012	19/03/2012	19/03/2012
Arsenic	mg/kg	7	<4	7	6	8
Cadmium	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	mg/kg	14	11	9	18	20
Copper	mg/kg	33	28	38	23	22
Lead	mg/kg	60	42	26	22	32
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	10	8	15	8	14
Zinc	mg/kg	52	47	57	34	51

Acid Extractable metals in soil		
Our Reference:	UNITS	70384-16
Your Reference	----------	SP12-1
Depth	----------	0.4
Date Sampled		14/03/2012
Type of sample		Soil
Date digested	-	16/03/2012
Date analysed	-	19/03/2012
Arsenic	mg/kg	6
Cadmium	mg/kg	<0.5
Chromium	mg/kg	14
Copper	mg/kg	12
Lead	mg/kg	18
Mercury	mg/kg	<0.1
Nickel	mg/kg	8
Zinc	mg/kg	36

Moisture						
Our Reference:	UNITS	70384-1	70384-2	70384-3	70384-4	70384-5
Your Reference	----------	SP14-1	QC02	SP15-1	SP4-1	SP5-1
Depth	----------	0.4	-	0.3	0.4	0.3
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	19/03/2012	19/03/2012	19/03/2012	19/03/2012	19/03/2012
Moisture	%	18	18	21	20	12

Moisture						
Our Reference:	UNITS	70384-6	70384-7	70384-8	70384-9	70384-10
Your Reference	----------	SP17-1	SP16-1	SP11-1	SP10-1	SP9-1
Depth	----------	0.3	0.3	0.4	0.3	0.4
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	19/03/2012	19/03/2012	19/03/2012	19/03/2012	19/03/2012
Moisture	%	17	25	18	14	12

Moisture						
Our Reference:	UNITS	70384-11	70384-12	70384-13	70384-14	70384-15
Your Reference	----------	SP7-1	SP8-1	SP1-1	SP2-1	SP3-1
Depth	----------	0.4	0.4	0.3	0.3	0.3
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	16/03/2012	16/03/2012	16/03/2012	16/03/2012	16/03/2012
Date analysed	-	19/03/2012	19/03/2012	19/03/2012	19/03/2012	19/03/2012
Moisture	%	19	18	13	21	26

Moisture		
Our Reference:	UNITS	70384-16
Your Reference	----------	SP12-1
Depth	----------	0.4
Date Sampled		14/03/2012
Type of sample		Soil
Date prepared	-	16/03/2012
Date analysed	-	19/03/2012
Moisture	%	20

Asbestos ID - soils						
Our Reference:	UNITS	70384-1	70384-2	70384-3	70384-4	70384-5
Your Reference	----------	SP14-1	QC02	SP15-1	SP4-1	SP5-1
Depth	----------	0.4	-	0.3	0.4	0.3
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	20/03/2012	20/03/2012	20/03/2012	20/03/2012	20/03/2012
Sample mass tested	g	Approx 40g	Approx 40g	Approx 40g	Approx 40g	Approx 40g
Sample Description	-	Red-brown clayey soil	Red-brown clayey soil	Brown fine-grained soil	Red-brown clayey soil	Red-brown clayey soil
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected

Asbestos ID - soils						
Our Reference:	UNITS	70384-6	70384-7	70384-8	70384-9	70384-10
Your Reference	----------	SP17-1	SP16-1	SP11-1	SP10-1	SP9-1
Depth	----------	0.3	0.3	0.4	0.3	0.4
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	20/03/2012	20/03/2012	20/03/2012	20/03/2012	20/03/2012
Sample mass tested	g	Approx 40g	Approx 40g	Approx 40g	Approx 40g	Approx 40g
Sample Description	-	Brown fine-grained soil	Brown fine-grained soil	Red-brown clayey soil	Red-brown clayey soil	Red-brown clayey soil
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected

Asbestos ID - soils						
Our Reference:	UNITS	70384-11	70384-12	70384-13	70384-14	70384-15
Your Reference	----------	SP7-1	SP8-1	SP1-1	SP2-1	SP3-1
Depth	----------	0.4	0.4	0.3	0.3	0.3
Date Sampled		14/03/2012	14/03/2012	14/03/2012	14/03/2012	14/03/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	20/03/2012	20/03/2012	20/03/2012	20/03/2012	20/03/2012
Sample mass tested	g	Approx 40g	Approx 40g	Approx 40g	Approx 40g	Approx 40g
Sample Description	-	Red-brown clayey soil	Red-brown clayey soil	Red-brown clayey soil	Red-brown clayey soil	Brown fine-grained soil
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected

Asbestos ID - soils		
Our Reference:	UNITS	70384-16
Your Reference	----------	SP12-1
Depth	----------	0.4
Date Sampled		14/03/2012
Type of sample		Soil
Date analysed	-	20/03/2012
Sample mass tested	g	Approx 40g
Sample Description	-	Brown fine-grained soil
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No respirable fibres detected

Method ID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Inorg-008	Moisture content determined by heating at 105 deg C for a minimum of 4 hours.
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.

QUALITY CONTROL vTRH & BTEX in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			16/03/2012	70384-1	16/03/2012 || 16/03/2012	LCS-7	16/03/2012
Date analysed	-			17/03/2012	70384-1	17/03/2012 || 17/03/2012	LCS-7	17/03/2012
vTRH C_6 - C_9	mg/kg	25	Org-016	<25	70384-1	<25 || <25	LCS-7	114%
Benzene	mg/kg	0.2	Org-016	<0.2	70384-1	<0.2 || <0.2	LCS-7	114%
Toluene	mg/kg	0.5	Org-016	<0.5	70384-1	<0.5 || <0.5	LCS-7	114%
Ethylbenzene	mg/kg	1	Org-016	<1	70384-1	<1 || <1	LCS-7	112%
m+p-xylene	mg/kg	2	Org-016	<2	70384-1	<2 || <2	LCS-7	116%
o-Xylene	mg/kg	1	Org-016	<1	70384-1	<1 || <1	LCS-7	116%
Surrogate aaa-Trifluorotoluene	%		Org-016	116	70384-1	107 || 108 || RPD: 1	LCS-7	113%

QUALITY CONTROL sTRH in Soil (C10-C36)	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			16/03/2012	70384-1	16/03/2012 || 16/03/2012	LCS-7	16/03/2012
Date analysed	-			17/03/2012	70384-1	17/03/2012 || 17/03/2012	LCS-7	17/03/2012
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	70384-1	<50 || <50	LCS-7	86%
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	70384-1	<100 || <100	LCS-7	106%
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	70384-1	<100 || <100	LCS-7	98%
Surrogate o-Terphenyl	%		Org-003	100	70384-1	102 || 104 || RPD: 2	LCS-7	96%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			16/03/2012	70384-1	16/03/2012 || 16/03/2012	LCS-7	16/03/2012
Date analysed	-			18/03/2012	70384-1	18/03/2012 || 18/03/2012	LCS-7	18/03/2012
Naphthalene	mg/kg	0.1	Org-012 subset	<0.1	70384-1	<0.1 || <0.1	LCS-7	121%
Acenaphthylene	mg/kg	0.1	Org-012 subset	<0.1	70384-1	<0.1 || <0.1	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012 subset	<0.1	70384-1	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012 subset	<0.1	70384-1	<0.1 || <0.1	LCS-7	110%
Phenanthrene	mg/kg	0.1	Org-012 subset	<0.1	70384-1	<0.1 || <0.1	LCS-7	99%
Anthracene	mg/kg	0.1	Org-012 subset	<0.1	70384-1	<0.1 || <0.1	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012 subset	<0.1	70384-1	<0.1 || <0.1	LCS-7	101%
Pyrene	mg/kg	0.1	Org-012 subset	<0.1	70384-1	<0.1 || <0.1	LCS-7	105%
Benzo(a)anthracene	mg/kg	0.1	Org-012 subset	<0.1	70384-1	<0.1 || <0.1	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012 subset	<0.1	70384-1	<0.1 || <0.1	LCS-7	114%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Benzo(b+k)fluoranthene	mg/kg	0.2	Org-012 subset	<0.2	70384-1	<0.2 || <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	Org-012 subset	<0.05	70384-1	<0.05 || <0.05	LCS-7	120%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012 subset	<0.1	70384-1	<0.1 || <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012 subset	<0.1	70384-1	<0.1 || <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012 subset	<0.1	70384-1	<0.1 || <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d_{14}	%		Org-012 subset	104	70384-1	108 || 106 || RPD: 2	LCS-7	101%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			16/03/2012	70384-1	16/03/2012 || 16/03/2012	LCS-7	16/03/2012
Date analysed	-			17/03/2012	70384-1	17/03/2012 || 17/03/2012	LCS-7	17/03/2012
HCB	mg/kg	0.1	Org-005	<0.1	70384-1	<0.1 || <0.1	[NR]	[NR]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	70384-1	<0.1 || <0.1	LCS-7	102%
gamma-BHC	mg/kg	0.1	Org-005	<0.1	70384-1	<0.1 || <0.1	[NR]	[NR]
beta-BHC	mg/kg	0.1	Org-005	<0.1	70384-1	<0.1 || <0.1	LCS-7	102%
Heptachlor	mg/kg	0.1	Org-005	<0.1	70384-1	<0.1 || <0.1	LCS-7	91%
delta-BHC	mg/kg	0.1	Org-005	<0.1	70384-1	<0.1 || <0.1	[NR]	[NR]
Aldrin	mg/kg	0.1	Org-005	<0.1	70384-1	<0.1 || <0.1	LCS-7	90%
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	70384-1	<0.1 || <0.1	LCS-7	99%
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	70384-1	<0.1 || <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	70384-1	<0.1 || <0.1	[NR]	[NR]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	70384-1	<0.1 || <0.1	[NR]	[NR]
pp-DDE	mg/kg	0.1	Org-005	<0.1	70384-1	<0.1 || <0.1	LCS-7	96%
Dieldrin	mg/kg	0.1	Org-005	<0.1	70384-1	<0.1 || <0.1	LCS-7	106%
Endrin	mg/kg	0.1	Org-005	<0.1	70384-1	<0.1 || <0.1	LCS-7	97%
pp-DDD	mg/kg	0.1	Org-005	<0.1	70384-1	<0.1 || <0.1	LCS-7	100%
Endosulfan II	mg/kg	0.1	Org-005	<0.1	70384-1	<0.1 || <0.1	[NR]	[NR]
pp-DDT	mg/kg	0.1	Org-005	<0.1	70384-1	<0.1 || <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	70384-1	<0.1 || <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	70384-1	<0.1 || <0.1	LCS-7	91%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	70384-1	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%		Org-005	99	70384-1	97 || 107 || RPD: 10	LCS-7	98%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date digested	-			16/03/2012	70384-1	16/03/2012 || 16/03/2012	LCS-1	16/003/2012
Date analysed	-			19/03/2012	70384-1	19/03/2012 || 19/03/2012	LCS-1	19/03/2012
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	70384-1	7 || 6 || RPD: 15	LCS-1	103%
Cadmium	mg/kg	0.5	Metals-020 ICP-AES	<0.5	70384-1	<0.5 || <0.5	LCS-1	104%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	70384-1	15 || 15 || RPD: 0	LCS-1	104%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	70384-1	22 || 21 || RPD: 5	LCS-1	104%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	70384-1	14 || 14 || RPD: 0	LCS-1	104%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	70384-1	<0.1 || <0.1	LCS-1	110%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	70384-1	5 || 4 || RPD: 22	LCS-1	106%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	70384-1	26 || 21 || RPD: 21	LCS-1	105%

QUALITY CONTROL Moisture	UNITS	PQL	METHOD	Blank
Date prepared	-			[NT]
Date analysed	-			[NT]
Moisture	%	0.1	Inorg-008	[NT]

QUALITY CONTROL Asbestos ID - soils	UNITS	PQL	METHOD	Blank
Date analysed	-			[NT]

QUALITY CONTROL vTRH & BTEX in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	70384-11	16/03/2012 || 16/03/2012	70384-3	16/03/2012
Date analysed	-	70384-11	17/03/2012 || 17/03/2012	70384-3	17/03/2012
vTRH C_6 - C_9	mg/kg	70384-11	<25 || <25	70384-3	97%
Benzene	mg/kg	70384-11	<0.2 || <0.2	70384-3	96%
Toluene	mg/kg	70384-11	<0.5 || <0.5	70384-3	96%
Ethylbenzene	mg/kg	70384-11	<1 || <1	70384-3	95%
m+p-xylene	mg/kg	70384-11	<2 || <2	70384-3	98%
o-Xylene	mg/kg	70384-11	<1 || <1	70384-3	98%
Surrogate aaa-Trifluorotoluene	%	70384-11	107 || 103 || RPD: 4	70384-3	103%

QUALITY CONTROL sTRH in Soil (C10-C36)	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	70384-11	16/03/2012 || 16/03/2012	70384-3	16/03/2012
Date analysed	-	70384-11	17/03/2012 || 17/03/2012	70384-3	17/03/2012
$TRHC_{10}$ - C_{14}	mg/kg	70384-11	<50 || <50	70384-3	87%
$TRHC_{15}$ - C_{28}	mg/kg	70384-11	<100 || <100	70384-3	107%
$TRHC_{29}$ - C_{36}	mg/kg	70384-11	<100 || <100	70384-3	99%
Surrogate o-Terphenyl	%	70384-11	99 || 104 || RPD: 5	70384-3	95%
QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	70384-11	16/03/2012 || 16/03/2012	70384-3	16/03/2012
Date analysed	-	70384-11	18/03/2012 || 18/03/2012	70384-3	18/03/2012
Naphthalene	mg/kg	70384-11	<0.1 || <0.1	70384-3	118%
Acenaphthylene	mg/kg	70384-11	<0.1 || <0.1	[NR]	[NR]
Acenaphthene	mg/kg	70384-11	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	70384-11	<0.1 || <0.1	70384-3	108%
Phenanthrene	mg/kg	70384-11	<0.1 || <0.1	70384-3	97%
Anthracene	mg/kg	70384-11	<0.1 || <0.1	[NR]	[NR]
Fluoranthene	mg/kg	70384-11	<0.1 || <0.1	70384-3	100%
Pyrene	mg/kg	70384-11	<0.1 || <0.1	70384-3	104%
Benzo(a)anthracene	mg/kg	70384-11	<0.1 || <0.1	[NR]	[NR]
Chrysene	mg/kg	70384-11	<0.1 || <0.1	70384-3	111%
Benzo(b+k)fluoranthene	mg/kg	70384-11	<0.2 || <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	70384-11	<0.05 || <0.05	70384-3	114%
Indeno(1,2,3-c,d)pyrene	mg/kg	70384-11	<0.1 || <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	70384-11	<0.1 || <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	70384-11	<0.1 || <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d_{14}	%	70384-11	103 || 100 || RPD: 3	70384-3	103%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	70384-11	16/03/2012 || 16/03/2012	70384-3	16/03/2012
Date analysed	-	70384-11	18/03/2012 || 18/03/2012	70384-3	17/03/2012
HCB	mg/kg	70384-11	<0.1 || <0.1	[NR]	[NR]
alpha-BHC	mg/kg	70384-11	<0.1 || <0.1	70384-3	105%
gamma-BHC	mg/kg	70384-11	<0.1 || <0.1	[NR]	[NR]
beta-BHC	mg/kg	70384-11	<0.1 || <0.1	70384-3	106%
Heptachlor	mg/kg	70384-11	<0.1 || <0.1	70384-3	95%
delta-BHC	mg/kg	70384-11	<0.1 || <0.1	[NR]	[NR]
Aldrin	mg/kg	70384-11	<0.1 || <0.1	70384-3	93%
Heptachlor Epoxide	mg/kg	70384-11	<0.1 || <0.1	70384-3	104%
gamma-Chlordane	mg/kg	70384-11	<0.1 || <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	70384-11	<0.1 || <0.1	[NR]	[NR]
Endosulfan I	mg/kg	70384-11	<0.1 || <0.1	[NR]	[NR]
pp-DDE	mg/kg	70384-11	<0.1 || <0.1	70384-3	101%
Dieldrin	mg/kg	70384-11	<0.1 || <0.1	70384-3	111%
Endrin	mg/kg	70384-11	<0.1 || <0.1	70384-3	101%
pp-DDD	mg/kg	70384-11	<0.1 || <0.1	70384-3	104%
Endosulfan II	mg/kg	70384-11	<0.1 || <0.1	[NR]	[NR]
pp-DDT	mg/kg	70384-11	<0.1 || <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	70384-11	<0.1 || <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	70384-11	<0.1 || <0.1	70384-3	100%
Methoxychlor	mg/kg	70384-11	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%	70384-11	106 || 102 || RPD: 4	70384-3	103%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	70384-11	16/03/2012 || 16/03/2012	LCS-2	16/03/2012
Date analysed	-	70384-11	19/03/2012 || 19/03/2012	LCS-2	19/03/2012
Arsenic	mg/kg	70384-11	7 || 7 || RPD: 0	LCS-2	109%
Cadmium	mg/kg	70384-11	<0.5 || <0.5	LCS-2	110%
Chromium	mg/kg	70384-11	14 || 14 || RPD: 0	LCS-2	111%
Copper	mg/kg	70384-11	33 || 36 || RPD: 9	LCS-2	110%
Lead	mg/kg	70384-11	60 || 69 || RPD: 14	LCS-2	110%
Mercury	mg/kg	70384-11	<0.1 || <0.1	LCS-2	112%
Nickel	mg/kg	70384-11	10 || 9 || RPD: 11	LCS-2	112%
Zinc	mg/kg	70384-11	52 || 51 || RPD: 2	LCS-2	111%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	[NT]	[NT]	70384-3	16/03/2012
Date analysed	-	[NT]	[NT]	70384-3	19/03/2012
Arsenic	mg/kg	[NT]	[NT]	70384-3	97%
Cadmium	mg/kg	[NT]	[NT]	70384-3	97%
Chromium	mg/kg	[NT]	[NT]	70384-3	97%
Copper	mg/kg	[NT]	[NT]	70384-3	106%
Lead	mg/kg	[NT]	[NT]	70384-3	99%
Mercury	mg/kg	[NT]	[NT]	70384-3	113%
Nickel	mg/kg	[NT]	[NT]	70384-3	94%
Zinc	mg/kg	[NT]	[NT]	70384-3	100%

Report Comments:

This report supersedes the previous report due to an amendment to sample ID #14.

Asbestos ID was analysed by Approved Identifier: Paul Ching
Asbestos ID was authorised by Approved Signatory: Paul Ching

INS: Insufficient sample for this test
NA: Test not required
<: Less than
PQL: Practical Quantitation Limit
RPD: Relative Percent Difference
>: Greater than
NT: Not tested
NA: Test not required
LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batched of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

CHAIN OF CUSTODY

JBS ENVIRONMENTAL

PROJECT NO.: 47945
PROJECT NAME: Edmondson Park Rezoning SP
SEND REPORT TO: J. Posner SEND INVOICE TO: A. Trayner
DATE NEEDED BY: Standard Turn Around

LABORATORY BATCH NO.
SAMPLERS AB
PHONE: 02 8338 1011
QC LEVEL: NEPM 1999 (✓)

J.posner@jbsgroup.com.au
EMAIL: abooldman@jbsgroup.com.au

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

	SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	Asbestos	TPH	BTEX	PAHs	Metals (6)	OCPs	NOTES
1	SP14-1 0.4m	Soil	14/3/12		B+J		X	X	X	X	X	X	
2	QC02						X	X		X	X		
	QA02												Send Bag + Pickford + Rhydr, Send Jar to SGS
3	SP15-1 0.3m						X	X	X	X	X	X	
4	SP4-1 0.4m						X	X	X	X	X	X	
5	SP5-1 0.3m						X	X	X	X	X	X	
6	SP17-1 0.3m						X	X	X	X	X	X	
7	SP16-1 0.3m						X	X	X	X	X	X	
8	SP11-1 0.4m						X	X	X	X	X	X	
9	SP10-1 0.3m						X	X	X	X	X	X	
10	SP9-1 0.4m						X	X	X	X	X	X	
11	SP7-1 0.4m						X	X	X	X	X	X	
12	SP8-1 0.4m						X	X	X	X	X	X	
13	SP1-1 0.3m						X	X	X	X	X	X	
14	SP2-1 0.3m						X	X	X	X	X	X	
15	SP3-1 0.3m						X	X	X	X	X	X	
16	SP12-1 0.4m						X	X	X	X	X	X	

Environmental Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 70384
Date Received: 15/03
Time Received: 14:30
Received by: SG
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: AB DATE: 15/3/12	CONSIGNMENT NOTE NO.	NAME: Soumi DATE: 15/03	COOLER SEAL - Yes..... No..... Intact..... Broken.....
OF: JBS Environmental	TRANSPORT CO.	OF: ES	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL - Yes..... No..... Intact..... Broken.....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

SAMPLE RECEIPT ADVICE

Client:

JBS Environmental Pty Ltd
P.O. Box 940
MASCOT NSW 1460

ph: 8338 1013
Fax: 8338 1700

Attention: Jo Rosner, A Boardman

Sample log in details:

Your reference:	**41945, Edmondson Park - Clean SP**
Envirolab Reference:	**70384**
Date received:	15/03/12
Date results expected to be reported:	**22/03/12**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	16 soils
Turnaround time requested:	Standard
Temperature on receipt	Cool
Cooling Method:	Ice

Comments:

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

Contact details:

Please direct any queries to Aileen Hie or Jacinta Hurst
ph: 02 9910 6200 fax: 02 9910 6201
email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

CERTIFICATE OF ANALYSIS 72549

Client:
JBS Environmental Pty Ltd
P.O. Box 940
MASCOT
NSW 1460

Attention: J Rosner, A Boardman

Sample log in details:

Your Reference:	**41945, Edmondson Park Remediation**
No. of samples:	2 Soils, 3 waters
Date samples received / completed instructions received	02/05/12 / 02/05/12

Analysis Details:
Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	9/05/12 / 28/05/12
Date of Preliminary Report:	Not issued

NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Jacinta Hurst
Laboratory Manager

Nancy Zhang
Chemist

Rhian Morgan
Reporting Supervisor

Hinoko Miyazaki
Chemist

Lulu Guo
Approved Signatory

Alex MacLean
Chemist

Jeremy Faircloth
Chemist

NATA
ACCREDITED FOR TECHNICAL COMPETENCE

vTRH & BTEX in Soil			
Our Reference:	UNITS	72549-1	72549-2
Your Reference	----------	UFSP10-1	UFSP09-1
Date Sampled	----------	01/05/2012	01/05/2012
Type of sample		Soil	Soil
Date extracted	-	3/5/2012	3/5/2012
Date analysed	-	4/5/2012	4/5/2012
vTRH C_6 - C_9	mg/kg	<25	<25
Benzene	mg/kg	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1
m+p-xylene	mg/kg	<2	<2
o-Xylene	mg/kg	<1	<1
Surrogate aaa-Trifluorotoluene	%	95	93

sTRH in Soil (C10-C36)			
Our Reference:	UNITS	72549-1	72549-2
Your Reference	----------	UFSP10-1	UFSP09-1
Date Sampled	----------	01/05/2012	01/05/2012
Type of sample		Soil	Soil
Date extracted	-	03/05/2012	03/05/2012
Date analysed	-	04/05/2012	04/05/2012
$TRHC_{10}$ - C_{14}	mg/kg	<50	<50
$TRHC_{15}$ - C_{28}	mg/kg	<100	<100
$TRHC_{29}$ - C_{36}	mg/kg	<100	<100
Surrogate o-Terphenyl	%	104	100

PAHs in Soil Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ---------- 	72549-1 UFSP10-1 01/05/2012 Soil	72549-2 UFSP09-1 01/05/2012 Soil
Date extracted	-	03/05/2012	03/05/2012
Date analysed	-	06/05/2012	06/05/2012
Naphthalene	mg/kg	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1
Surrogate p-Terphenyl-d_{14}	%	85	86

Organochlorine Pesticides in soil			
Our Reference:	UNITS	72549-1	72549-2
Your Reference	----------	UFSP10-1	UFSP09-1
Date Sampled	----------	01/05/2012	01/05/2012
Type of sample		Soil	Soil
Date extracted	-	03/05/2012	03/05/2012
Date analysed	-	04/05/2012	04/05/2012
HCB	mg/kg	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1
Surrogate TCLMX	%	100	102

PCBs in Soil			
Our Reference:	UNITS	72549-1	72549-2
Your Reference	----------	UFSP10-1	UFSP09-1
Date Sampled	----------	01/05/2012	01/05/2012
Type of sample		Soil	Soil
Date extracted	-	03/05/2012	03/05/2012
Date analysed	-	04/05/2012	04/05/2012
Arochlor 1016	mg/kg	<0.1	<0.1
Arochlor 1221	mg/kg	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1
Surrogate TCLMX	%	100	102

Acid Extractable metals in soil			
Our Reference:	UNITS	72549-1	72549-2
Your Reference	----------	UFSP10-1	UFSP09-1
Date Sampled	----------	01/05/2012	01/05/2012
Type of sample		Soil	Soil
Date digested	-	03/05/2012	03/05/2012
Date analysed	-	03/05/2012	03/05/2012
Arsenic	mg/kg	6	8
Cadmium	mg/kg	<0.5	<0.5
Chromium	mg/kg	17	15
Copper	mg/kg	18	20
Lead	mg/kg	23	74
Mercury	mg/kg	<0.1	<0.1
Nickel	mg/kg	9	12
Zinc	mg/kg	56	55

Moisture			
Our Reference:	UNITS	72549-1	72549-2
Your Reference	----------	UFSP10-1	UFSP09-1
Date Sampled	----------	01/05/2012	01/05/2012
Type of sample		Soil	Soil
Date prepared	-	3/05/2012	3/05/2012
Date analysed	-	4/05/2012	4/05/2012
Moisture	%	27	24

Asbestos ID - soils			
Our Reference:	UNITS	72549-1	72549-2
Your Reference	----------	UFSP10-1	UFSP09-1
Date Sampled	----------	01/05/2012	01/05/2012
Type of sample		Soil	Soil
Date analysed	-	7/05/2012	7/05/2012
Sample mass tested	g	Approx 50g	Approx 50g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No respirable fibres detected	No respirable fibres detected

vTRH & BTEX in Water				
Our Reference:	UNITS	72549-3	72549-4	72549-5
Your Reference	----------	TRIP SPIKE	TRIP BLANK	RINSATE
Date Sampled	----------	01/05/2012	01/05/2012	01/05/2012
Type of sample		Water	Water	Water
Date extracted	-	02/05/2012	02/05/2012	02/05/2012
Date analysed	-	03/05/2012	03/05/2012	03/05/2012
TRHC$_6$ - C$_9$	µg/L	[NA]	[NA]	<10
Benzene	µg/L	113%	<1	[NA]
Toluene	µg/L	113%	<1	[NA]
Ethylbenzene	µg/L	112%	<1	[NA]
m+p-xylene	µg/L	112%	<2	[NA]
o-xylene	µg/L	112%	<1	[NA]
Surrogate Dibromofluoromethane	%	101	112	115
Surrogate toluene-d8	%	101	99	101
Surrogate 4-BFB	%	95	84	80

sTRH in Water (C10-C36)		
Our Reference:	UNITS	72549-5
Your Reference	----------	RINSATE
Date Sampled	----------	01/05/2012
Type of sample		Water
Date extracted	-	07/05/2012
Date analysed	-	07/05/2012
$TRHC_{10}$ - C_{14}	µg/L	<50
$TRHC_{15}$ - C_{28}	µg/L	<100
$TRHC_{29}$ - C_{36}	µg/L	<100
Surrogate o-Terphenyl	%	99

PAHs in Water Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ----------	 72549-5 RINSATE 01/05/2012 Water
Date extracted	-	07/05/2012
Date analysed	-	08/05/2012
Naphthalene	µg/L	<1
Acenaphthylene	µg/L	<1
Acenaphthene	µg/L	<1
Fluorene	µg/L	<1
Phenanthrene	µg/L	<1
Anthracene	µg/L	<1
Fluoranthene	µg/L	<1
Pyrene	µg/L	<1
Benzo(a)anthracene	µg/L	<1
Chrysene	µg/L	<1
Benzo(b+k)fluoranthene	µg/L	<2
Benzo(a)pyrene	µg/L	<1
Indeno(1,2,3-c,d)pyrene	µg/L	<1
Dibenzo(a,h)anthracene	µg/L	<1
Benzo(g,h,i)perylene	µg/L	<1
Surrogate p-Terphenyl-d_{14}	%	86

Metals in Waters - Acid extractable		
Our Reference:	UNITS	72549-5
Your Reference	----------	RINSATE
Date Sampled	----------	01/05/2012
Type of sample		Water
Date prepared	-	03/05/2012
Date analysed	-	07/05/2012
Arsenic - Total	mg/L	<0.05
Cadmium - Total	mg/L	<0.01
Chromium - Total	mg/L	<0.01
Copper - Total	mg/L	<0.01
Lead - Total	mg/L	<0.03
Mercury - Total	mg/L	<0.0005
Nickel - Total	mg/L	<0.02
Zinc - Total	mg/L	<0.02

Method ID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Inorg-008	Moisture content determined by heating at 105 deg C for a minimum of 4 hours.
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.

QUALITY CONTROL vTRH & BTEX in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			3/5/2012	[NT]	[NT]	LCS-2	3/5/2012
Date analysed	-			4/5/2012	[NT]	[NT]	LCS-2	4/5/2012
vTRH C_6 - C_9	mg/kg	25	Org-016	<25	[NT]	[NT]	LCS-2	104%
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	LCS-2	102%
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	LCS-2	104%
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS-2	103%
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	LCS-2	105%
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS-2	107%
Surrogate aaa-Trifluorotoluene	%		Org-016	98	[NT]	[NT]	LCS-2	111%

QUALITY CONTROL sTRH in Soil (C10-C36)	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			03/05/2012	[NT]	[NT]	LCS-7	03/05/2012
Date analysed	-			04/05/2012	[NT]	[NT]	LCS-7	04/05/2012
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	[NT]	[NT]	LCS-7	112%
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-7	108%
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-7	99%
Surrogate o-Terphenyl	%		Org-003	71	[NT]	[NT]	LCS-7	87%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			03/05/2012	[NT]	[NT]	LCS-7	03/05/2012
Date analysed	-			06/05/2012	[NT]	[NT]	LCS-7	06/05/2012
Naphthalene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-7	93%
Acenaphthylene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-7	92%
Phenanthrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-7	100%
Anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-7	89%
Pyrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-7	94%
Benzo(a)anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-7	111%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Benzo(b+k)fluoranthene	mg/kg	0.2	Org-012 subset	<0.2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	Org-012 subset	<0.05	[NT]	[NT]	LCS-7	112%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d_{14}	%		Org-012 subset	75	[NT]	[NT]	LCS-7	97%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			03/05/2012	[NT]	[NT]	LCS-7	03/05/2012
Date analysed	-			04/05/2012	[NT]	[NT]	LCS-7	04/05/2012
HCB	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-7	90%
gamma-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
beta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-7	75%
Heptachlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-7	79%
delta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Aldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-7	92%
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-7	99%
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
pp-DDE	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-7	92%
Dieldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-7	107%
Endrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-7	97%
pp-DDD	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-7	99%
Endosulfan II	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
pp-DDT	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-7	97%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate TCLMX	%		Org-005	95	[NT]	[NT]	LCS-7	92%

QUALITY CONTROL PCBs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			03/05/2012	[NT]	[NT]	LCS-7	03/05/2012
Date analysed	-			04/05/2012	[NT]	[NT]	LCS-7	04/05/2012
Arochlor 1016	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Arochlor 1221	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Arochlor 1232	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Arochlor 1242	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Arochlor 1248	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Arochlor 1254	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	LCS-7	97%
Arochlor 1260	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate TCLMX	%		Org-006	95	[NT]	[NT]	LCS-7	88%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date digested	-			03/05/2012	[NT]	[NT]	LCS-2	03/05/2012
Date analysed	-			03/05/2012	[NT]	[NT]	LCS-2	03/05/2012
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	[NT]	[NT]	LCS-2	95%
Cadmium	mg/kg	0.5	Metals-020 ICP-AES	<0.5	[NT]	[NT]	LCS-2	100%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-2	100%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-2	103%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-2	97%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	[NT]	[NT]	LCS-2	106%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-2	100%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-2	99%

QUALITY CONTROL Moisture	UNITS	PQL	METHOD	Blank
Date prepared	-			[NT]
Date analysed	-			[NT]
Moisture	%	0.1	Inorg-008	[NT]

QUALITY CONTROL Asbestos ID - soils	UNITS	PQL	METHOD	Blank
Date analysed	-			[NT]

QUALITY CONTROL vTRH & BTEX in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			02/05/2012	[NT]	[NT]	LCS-W1	02/05/2012
Date analysed	-			03/05/2012	[NT]	[NT]	LCS-W1	03/05/2012
TRHC$_{6}$ - C$_{9}$	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-W1	123%
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	124%
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	124%
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	118%
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	LCS-W1	124%
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	124%
Surrogate Dibromofluoromethane	%		Org-016	93	[NT]	[NT]	LCS-W1	112%
Surrogate toluene-d8	%		Org-016	104	[NT]	[NT]	LCS-W1	99%
Surrogate 4-BFB	%		Org-016	91	[NT]	[NT]	LCS-W1	96%

QUALITY CONTROL sTRH in Water (C10-C36)	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			07/05/2012	[NT]	[NT]	LCS-W3	07/05/2012
Date analysed	-			07/05/2012	[NT]	[NT]	LCS-W3	07/05/2012
TRHC$_{10}$ - C$_{14}$	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W3	90%
TRHC$_{15}$ - C$_{28}$	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W3	96%
TRHC$_{29}$ - C$_{36}$	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W3	96%
Surrogate o-Terphenyl	%		Org-003	95	[NT]	[NT]	LCS-W3	139%

QUALITY CONTROL PAHs in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			07/05/2012	[NT]	[NT]	LCS-W1	07/05/2012
Date analysed	-			08/05/2012	[NT]	[NT]	LCS-W1	08/05/2012
Naphthalene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	102%
Acenaphthylene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Fluorene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	95%

QUALITY CONTROL PAHs in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Phenanthrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	94%
Anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	71%
Pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	75%
Benzo(a)anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Chrysene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	105%
Benzo(b+k)fluoranthene	µg/L	2	Org-012 subset	<2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	101%
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d_{14}	%		Org-012 subset	79	[NT]	[NT]	LCS-W1	81%

QUALITY CONTROL Metals in Waters - Acid extractable	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			03/05/2012	72549-5	03/05/2012 || 03/05/2012	LCS-W3	03/05/2012
Date analysed	-			03/05/2012	72549-5	07/05/2012 || 07/05/2012	LCS-W3	04/05/2012
Arsenic - Total	mg/L	0.05	Metals-020 ICP-AES	<0.05	72549-5	<0.05 || [N/T]	LCS-W3	88%
Cadmium - Total	mg/L	0.01	Metals-020 ICP-AES	<0.01	72549-5	<0.01 || [N/T]	LCS-W3	91%
Chromium - Total	mg/L	0.01	Metals-020 ICP-AES	<0.01	72549-5	<0.01 || [N/T]	LCS-W3	92%
Copper - Total	mg/L	0.01	Metals-020 ICP-AES	<0.01	72549-5	<0.01 || [N/T]	LCS-W3	94%
Lead - Total	mg/L	0.03	Metals-020 ICP-AES	<0.03	72549-5	<0.03 || [N/T]	LCS-W3	89%
Mercury - Total	mg/L	0.0005	Metals-021 CV-AAS	<0.0005	72549-5	<0.0005 || <0.0005	LCS-W3	116%
Nickel - Total	mg/L	0.02	Metals-020 ICP-AES	<0.02	72549-5	<0.02 || [N/T]	LCS-W3	92%
Zinc - Total	mg/L	0.02	Metals-020 ICP-AES	<0.02	72549-5	<0.02 || [N/T]	LCS-W3	92%

Report Comments:

Asbestos ID was analysed by Approved Identifier: Alex Tam
Asbestos ID was authorised by Approved Signatory: Lulu Guo

INS: Insufficient sample for this test
NA: Test not required
<: Less than

PQL: Practical Quantitation Limit
RPD: Relative Percent Difference
>: Greater than

NT: Not tested
NA: Test not required
LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batched of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

CHAIN OF CUSTODY

JBS ENVIRONMENTAL

PROJECT NO.: 47945
PROJECT NAME: Edmondson Park Remediation
SEND REPORT TO: AB + JR
SEND INVOICE TO: Accounts
DATE NEEDED BY: Standard Turn Around
COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

LABORATORY BATCH NO.
SAMPLERS AB
PHONE: 02 8338 1011
QC LEVEL: NEPM 1999 (✓)
EMAIL: JRosmore@jbsgroup.com.au
aboard man@jbsgroup.com.au

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	TPH	BTEX	PAHs	Metals (8)	OCPs	ABNs	NOTES
UESP10-1 (0.5m)	Soil	1/5/12		B+J		X	X	X	X	X	X	
UESP09-1 (0.3m)	Soil	1/5/12		B+J		X	X	X	X	X	X	
Trip Sple	Water	1/5/12		2x vials			X					Quote 11188
Trip Blank	Water	1/5/12		2x vials			X					
Rinsate	Water	1/5/12		2x vials, 1x enbn, 1x metals		X		X	X			

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 72549
Date Received: 2.5.12
Time Received: 14.30
Received by: Jia Liu
Temp: (Cool)/Ambient
Cooling: (Ice)/Gelpack
Security: (Intact)/Broken/None

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: AB DATE: 2/5/12	CONSIGNMENT NOTE NO.	NAME: Jia Liu DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS Environmental	TRANSPORT CO.	OF: Evs 2.5.12.	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

JBS Environmental Pty Ltd ABN 67 071 842 638
Phone: (02) 8338-1011
Fax: (02) 8338-1700
128 O'Riordan St, MASCOT NSW 2020
PO Box 940 MASCOT NSW 1460
www.jbsgroup.com.au

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

SAMPLE RECEIPT ADVICE

Client:

JBS Environmental Pty Ltd
P.O. Box 940
MASCOT NSW 1460

ph: 8338 1013
Fax: 8338 1700

Attention: J Rosner, A Boardman

Sample log in details:

Your reference:	**41945, Edmondson Park Remediation**
Envirolab Reference:	**72549**
Date received:	02/05/12
Date results expected to be reported:	**9/05/12**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	2 Soils, 3 waters
Turnaround time requested:	Standard
Temperature on receipt	Cool
Cooling Method:	Ice Pack
Sampling Date Provided:	YES

Comments:

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

Contact details:

Please direct any queries to Aileen Hie or Jacinta Hurst
ph: 02 9910 6200 fax: 02 9910 6201
email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au

CHAIN OF CUSTODY

JBS ENVIRONMENTAL

+1645
Edmondson Park Rem.
REPORT TO: AE + JR
SEND INVOICE TO: A. Taylor

LABORATORY BATCH NO.
SAMPLERS AE
PHONE: 02 8338 1011
QC LEVEL: NEPM 1999 (✓)
EMAIL: abcoordinator@jbsgroup.com.au
jrosner@jbsgroup.com.au

TURNAROUND TIME NEEDED BY: Standard Turn Around

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

B = Bag
J = Jar

	SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	TPH	BTEX	PAHs	Metals (6)	OCPs	Asbestos	NOTES
1	UFSP03-1 (1.0m)	Soil	11/4/12		B+J		X	X	X	X	X	X	
2	UFSP03-2 (0.5m)	Soil	11/4/12		B+J		X	X	X	X	X	X	
3	UFSP04-1 (0.5m)	Soil	11/4/12		B+J		X	X	X	X	X	X	
~~4~~	~~UFSP04-2~~												
4	UFSP05-1 (1.0m)	Soil	11/4/12		B+J		X	X	X	X	X	X	
~~5~~	~~UFSP05-2~~												
5	UFSP06-1 (1.0m)	Soil	11/4/12		B+J		X	X	X	X	X	X	
6	UFSP06-2 (1.0m)	Soil	11/4/12		B+J		X	X	X	X	X	X	
7	UFSP07-1 (0.4m)	Soil	11/4/12		B+J		X	X	X	X	X	X	
~~8~~	~~UFSP07-2~~												
8	UFSP08-1 (0.4m)	Soil	11/4/12		B+J			X					
9	Trip Spike	Water	11/4/12		2x vials			X					
10	Trip Blank	Water	11/4/12		2x vials		X		X	X			
11	Rinsate	Water	11/4/12		2x vials, metals, filter								

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 71679
Date Received: 12.4.12
Time Received: 16:50
Received by: Jia Liu
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

RELINQUISHED BY:
NAME: A. Boardman DATE: 12/4/12
OF: JBS Environmental
NAME: DATE:
OF:

METHOD OF SHIPMENT:
CONSIGNMENT NOTE NO.
TRANSPORT CO.
CONSIGNMENT NOTE NO.
TRANSPORT CO

RECEIVED BY:
NAME: Jia Liu DATE: 12.4.12
OF: ELS
NAME: DATE:
OF:

FOR RECEIVING LAB USE ONLY:
COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
COOLER TEMP ..... deg C
COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

JBS Environmental Pty Ltd ABN 67 071 842 638
Phone: (02) 8338-1011
Fax: (02) 8338-1700
128 O'Riordan St, MASCOT NSW 2020
PO Box 940 MASCOT NSW 1460
www.jbsgroup.com.au

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

CERTIFICATE OF ANALYSIS 71679

Client:
JBS Environmental Pty Ltd
P.O. Box 940
MASCOT
NSW 1460

Attention: Jo Rosner, A Boardman

Sample log in details:

Your Reference:	**41945, Edmondson Park**
No. of samples:	8 Soils, 3 waters
Date samples received / completed instructions received	12/04/12 / 12/04/12

Analysis Details:
Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	19/04/12 / 28/05/12
Date of Preliminary Report:	Not issued

NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Nancy Zhang
Chemist

Rhian Morgan
Reporting Supervisor

Giovanni Agosti
Technical Manager

Kim Femia
Approved Signatory

NATA
ACCREDITED FOR TECHNICAL COMPETENCE

vTRH & BTEX in Soil						
Our Reference:	UNITS	71679-1	71679-2	71679-3	71679-4	71679-5
Your Reference	----------	UFSP03-1	UFSP03-2	UFSP04-1	UFSP05-1	UFSP06-1
Depth	----------	1.0	0.5	0.5	1.0	1.0
Date Sampled		11/04/2012	11/04/2012	11/04/2012	11/04/2012	11/04/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/04/2012	13/04/2012	13/04/2012	13/04/2012	13/04/2012
Date analysed	-	13/04/2012	13/04/2012	13/04/2012	13/04/2012	13/04/2012
vTRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	66	81	80	94	89

vTRH & BTEX in Soil				
Our Reference:	UNITS	71679-6	71679-7	71679-8
Your Reference	----------	UFSP06-2	UFSP07-1	UFSP08-1
Depth	----------	1.0	0.4	0.4
Date Sampled		11/04/2012	11/04/2012	11/04/2012
Type of sample		Soil	Soil	Soil
Date extracted	-	13/04/2012	13/04/2012	13/04/2012
Date analysed	-	13/04/2012	13/04/2012	13/04/2012
vTRH C_6 - C_9	mg/kg	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	76	74	108

sTRH in Soil (C10-C36)						
Our Reference:	UNITS	71679-1	71679-2	71679-3	71679-4	71679-5
Your Reference	----------	UFSP03-1	UFSP03-2	UFSP04-1	UFSP05-1	UFSP06-1
Depth	----------	1.0	0.5	0.5	1.0	1.0
Date Sampled		11/04/2012	11/04/2012	11/04/2012	11/04/2012	11/04/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/04/2012	13/04/2012	13/04/2012	13/04/2012	13/04/2012
Date analysed	-	14/04/2012	14/04/2012	14/04/2012	14/04/2012	14/04/2012
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	97	95	94	95	95

sTRH in Soil (C10-C36)				
Our Reference:	UNITS	71679-6	71679-7	71679-8
Your Reference	----------	UFSP06-2	UFSP07-1	UFSP08-1
Depth	----------	1.0	0.4	0.4
Date Sampled		11/04/2012	11/04/2012	11/04/2012
Type of sample		Soil	Soil	Soil
Date extracted	-	13/04/2012	13/04/2012	13/04/2012
Date analysed	-	14/04/2012	14/04/2012	14/04/2012
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100
Surrogate o-Terphenyl	%	96	107	94

PAHs in Soil						
Our Reference:	UNITS	71679-1	71679-2	71679-3	71679-4	71679-5
Your Reference	----------	UFSP03-1	UFSP03-2	UFSP04-1	UFSP05-1	UFSP06-1
Depth	----------	1.0	0.5	0.5	1.0	1.0
Date Sampled		11/04/2012	11/04/2012	11/04/2012	11/04/2012	11/04/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/04/2012	13/04/2012	13/04/2012	13/04/2012	13/04/2012
Date analysed	-	13/04/2012	13/04/2012	13/04/2012	13/04/2012	13/04/2012
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	0.06	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d_{14}	%	126	108	117	123	102

PAHs in Soil				
Our Reference:	UNITS	71679-6	71679-7	71679-8
Your Reference	----------	UFSP06-2	UFSP07-1	UFSP08-1
Depth	----------	1.0	0.4	0.4
Date Sampled		11/04/2012	11/04/2012	11/04/2012
Type of sample		Soil	Soil	Soil
Date extracted	-	13/04/2012	13/04/2012	13/04/2012
Date analysed	-	13/04/2012	13/04/2012	13/04/2012
Naphthalene	mg/kg	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d_{14}	%	97	60	71

Organochlorine Pesticides in soil						
Our Reference:	UNITS	71679-1	71679-2	71679-3	71679-4	71679-5
Your Reference	----------	UFSP03-1	UFSP03-2	UFSP04-1	UFSP05-1	UFSP06-1
Depth	----------	1.0	0.5	0.5	1.0	1.0
Date Sampled		11/04/2012	11/04/2012	11/04/2012	11/04/2012	11/04/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/04/2012	13/04/2012	13/04/2012	13/04/2012	13/04/2012
Date analysed	-	14/04/2012	14/04/2012	14/04/2012	14/04/2012	14/04/2012
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	97	89	90	87	88

Organochlorine Pesticides in soil				
Our Reference:	UNITS	71679-6	71679-7	71679-8
Your Reference	----------	UFSP06-2	UFSP07-1	UFSP08-1
Depth	----------	1.0	0.4	0.4
Date Sampled		11/04/2012	11/04/2012	11/04/2012
Type of sample		Soil	Soil	Soil
Date extracted	-	13/04/2012	13/04/2012	13/04/2012
Date analysed	-	14/04/2012	14/04/2012	14/04/2012
HCB	mg/kg	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1
Surrogate TCLMX	%	91	91	89

PCBs in Soil						
Our Reference:	UNITS	71679-1	71679-2	71679-3	71679-4	71679-5
Your Reference	----------	UFSP03-1	UFSP03-2	UFSP04-1	UFSP05-1	UFSP06-1
Depth	----------	1.0	0.5	0.5	1.0	1.0
Date Sampled		11/04/2012	11/04/2012	11/04/2012	11/04/2012	11/04/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/04/2012	13/04/2012	13/04/2012	13/04/2012	13/04/2012
Date analysed	-	14/04/2012	14/04/2012	14/04/2012	14/04/2012	14/04/2012
Arochlor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	89	83	84	81	82

PCBs in Soil				
Our Reference:	UNITS	71679-6	71679-7	71679-8
Your Reference	----------	UFSP06-2	UFSP07-1	UFSP08-1
Depth	----------	1.0	0.4	0.4
Date Sampled		11/04/2012	11/04/2012	11/04/2012
Type of sample		Soil	Soil	Soil
Date extracted	-	13/04/2012	13/04/2012	13/04/2012
Date analysed	-	14/04/2012	14/04/2012	14/04/2012
Arochlor 1016	mg/kg	<0.1	<0.1	<0.1
Arochlor 1221	mg/kg	<0.1	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1	<0.1
Surrogate TCLMX	%	84	84	82

Acid Extractable metals in soil						
Our Reference:	UNITS	71679-1	71679-2	71679-3	71679-4	71679-5
Your Reference	----------	UFSP03-1	UFSP03-2	UFSP04-1	UFSP05-1	UFSP06-1
Depth	----------	1.0	0.5	0.5	1.0	1.0
Date Sampled		11/04/2012	11/04/2012	11/04/2012	11/04/2012	11/04/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	13/04/2012	13/04/2012	13/04/2012	13/04/2012	13/04/2012
Date analysed	-	13/04/2012	13/04/2012	13/04/2012	13/04/2012	13/04/2012
Arsenic	mg/kg	4	6	<4	6	6
Cadmium	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	mg/kg	11	17	6	17	20
Copper	mg/kg	32	34	23	17	15
Lead	mg/kg	98	79	50	26	29
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	6	9	4	7	7
Zinc	mg/kg	34	47	44	160	240

Acid Extractable metals in soil				
Our Reference:	UNITS	71679-6	71679-7	71679-8
Your Reference	----------	UFSP06-2	UFSP07-1	UFSP08-1
Depth	----------	1.0	0.4	0.4
Date Sampled		11/04/2012	11/04/2012	11/04/2012
Type of sample		Soil	Soil	Soil
Date digested	-	13/04/2012	13/04/2012	13/04/2012
Date analysed	-	13/04/2012	13/04/2012	13/04/2012
Arsenic	mg/kg	6	<4	<4
Cadmium	mg/kg	<0.5	<0.5	<0.5
Chromium	mg/kg	20	15	16
Copper	mg/kg	15	16	17
Lead	mg/kg	29	20	20
Mercury	mg/kg	<0.1	<0.1	<0.1
Nickel	mg/kg	7	8	8
Zinc	mg/kg	180	33	34

Moisture						
Our Reference:	UNITS	71679-1	71679-2	71679-3	71679-4	71679-5
Your Reference	----------	UFSP03-1	UFSP03-2	UFSP04-1	UFSP05-1	UFSP06-1
Depth	----------	1.0	0.5	0.5	1.0	1.0
Date Sampled		11/04/2012	11/04/2012	11/04/2012	11/04/2012	11/04/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	13/04/2012	13/04/2012	13/04/2012	13/04/2012	13/04/2012
Date analysed	-	16/04/2012	16/04/2012	16/04/2012	16/04/2012	16/04/2012
Moisture	%	14	14	14	9.3	11

Moisture				
Our Reference:	UNITS	71679-6	71679-7	71679-8
Your Reference	----------	UFSP06-2	UFSP07-1	UFSP08-1
Depth	----------	1.0	0.4	0.4
Date Sampled		11/04/2012	11/04/2012	11/04/2012
Type of sample		Soil	Soil	Soil
Date prepared	-	13/04/2012	13/04/2012	13/04/2012
Date analysed	-	16/04/2012	16/04/2012	16/04/2012
Moisture	%	8.5	10	13

Asbestos ID - soils						
Our Reference:	UNITS	71679-1	71679-2	71679-3	71679-4	71679-5
Your Reference	----------	UFSP03-1	UFSP03-2	UFSP04-1	UFSP05-1	UFSP06-1
Depth	----------	1.0	0.5	0.5	1.0	1.0
Date Sampled		11/04/2012	11/04/2012	11/04/2012	11/04/2012	11/04/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	13/04/2012	13/04/2012	13/04/2012	13/04/2012	13/04/2012
Sample mass tested	g	Approx 40g	Approx 40g	Approx 40g	Approx 40g	Approx 40g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown fine-grained soil	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected

Asbestos ID - soils				
Our Reference:	UNITS	71679-6	71679-7	71679-8
Your Reference	----------	UFSP06-2	UFSP07-1	UFSP08-1
Depth	----------	1.0	0.4	0.4
Date Sampled		11/04/2012	11/04/2012	11/04/2012
Type of sample		Soil	Soil	Soil
Date analysed	-	13/04/2012	13/04/2012	13/04/2012
Sample mass tested	g	Approx 40g	Approx 40g	Approx 40g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected

vTRH & BTEX in Water				
Our Reference:	UNITS	71679-9	71679-10	71679-11
Your Reference	----------	Trip Spike	Trip Blank	Rinsate
Depth	----------	-	-	-
Date Sampled		11/04/2012	11/04/2012	11/04/2012
Type of sample		Water	Water	Water
Date extracted	-	13/04/2012	13/04/2012	13/04/2012
Date analysed	-	13/04/2012	13/04/2012	13/04/2012
TRHC$_6$ - C$_9$	µg/L	[NA]	<10	<10
Benzene	µg/L	107%	<1	<1
Toluene	µg/L	106%	<1	<1
Ethylbenzene	µg/L	106%	<1	<1
m+p-xylene	µg/L	106%	<2	<2
o-xylene	µg/L	101%	<1	<1
Surrogate Dibromofluoromethane	%	95	101	108
Surrogate toluene-d8	%	99	100	100
Surrogate 4-BFB	%	101	91	90

sTRH in Water (C10-C36)		
Our Reference:	UNITS	71679-11
Your Reference	----------	Rinsate
Depth	----------	-
Date Sampled		11/04/2012
Type of sample		Water
Date extracted	-	13/04/2012
Date analysed	-	13/04/2012
TRHC$_{10}$ - C$_{14}$	µg/L	<50
TRHC$_{15}$ - C$_{28}$	µg/L	<100
TRHC$_{29}$ - C$_{36}$	µg/L	<100
Surrogate o-Terphenyl	%	110

PAHs in Water		
Our Reference:	UNITS	71679-11
Your Reference	----------	Rinsate
Depth	----------	-
Date Sampled		11/04/2012
Type of sample		Water
Date extracted	-	13/04/2012
Date analysed	-	15/04/2012
Naphthalene	µg/L	<1
Acenaphthylene	µg/L	<1
Acenaphthene	µg/L	<1
Fluorene	µg/L	<1
Phenanthrene	µg/L	<1
Anthracene	µg/L	<1
Fluoranthene	µg/L	<1
Pyrene	µg/L	<1
Benzo(a)anthracene	µg/L	<1
Chrysene	µg/L	<1
Benzo(b+k)fluoranthene	µg/L	<2
Benzo(a)pyrene	µg/L	<1
Indeno(1,2,3-c,d)pyrene	µg/L	<1
Dibenzo(a,h)anthracene	µg/L	<1
Benzo(g,h,i)perylene	µg/L	<1
Surrogate p-Terphenyl-d_{14}	%	113

Metals in Water - Dissolved		
Our Reference:	UNITS	71679-11
Your Reference	----------	Rinsate
Depth	----------	-
Date Sampled		11/04/2012
Type of sample		Water
Date digested	-	13/04/2012
Date analysed	-	13/04/2012
Arsenic - Dissolved	mg/L	<0.05
Cadmium - Dissolved	mg/L	<0.01
Chromium - Dissolved	mg/L	<0.01
Copper - Dissolved	mg/L	<0.01
Lead - Dissolved	mg/L	<0.03
Mercury - Dissolved	mg/L	<0.0005
Nickel - Dissolved	mg/L	<0.02
Zinc - Dissolved	mg/L	<0.02

Method ID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Inorg-008	Moisture content determined by heating at 105 deg C for a minimum of 4 hours.
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.

QUALITY CONTROL vTRH & BTEX in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			13/04/2012	71679-1	13/04/2012 || 13/04/2012	LCS-3	13/04/2012
Date analysed	-			13/04/2012	71679-1	13/04/2012 || 13/04/2012	LCS-3	13/04/2012
vTRH C_6 - C_9	mg/kg	25	Org-016	<25	71679-1	<25 || <25	LCS-3	72%
Benzene	mg/kg	0.2	Org-016	<0.2	71679-1	<0.2 || <0.2	LCS-3	65%
Toluene	mg/kg	0.5	Org-016	<0.5	71679-1	<0.5 || <0.5	LCS-3	73%
Ethylbenzene	mg/kg	1	Org-016	<1	71679-1	<1 || <1	LCS-3	71%
m+p-xylene	mg/kg	2	Org-016	<2	71679-1	<2 || <2	LCS-3	76%
o-Xylene	mg/kg	1	Org-016	<1	71679-1	<1 || <1	LCS-3	76%
Surrogate aaa-Trifluorotoluene	%		Org-016	81	71679-1	66 || 100 || RPD: 41	LCS-3	82%

QUALITY CONTROL sTRH in Soil (C10-C36)	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			13/04/2012	71679-1	13/04/2012 || 13/04/2012	LCS-3	13/04/2012
Date analysed	-			14/04/2012	71679-1	14/04/2012 || 14/04/2012	LCS-3	14/04/2012
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	71679-1	<50 || <50	LCS-3	106%
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	71679-1	<100 || <100	LCS-3	114%
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	71679-1	<100 || <100	LCS-3	106%
Surrogate o-Terphenyl	%		Org-003	105	71679-1	97 || 97 || RPD: 0	LCS-3	106%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base || Duplicate || %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			13/04/2012	71679-1	13/04/2012 || 13/04/2012	LCS-3	13/04/2012
Date analysed	-			13/04/2012	71679-1	13/04/2012 || 13/04/2012	LCS-3	13/04/2012
Naphthalene	mg/kg	0.1	Org-012 subset	<0.1	71679-1	<0.1 || <0.1	LCS-3	109%
Acenaphthylene	mg/kg	0.1	Org-012 subset	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012 subset	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012 subset	<0.1	71679-1	<0.1 || <0.1	LCS-3	121%
Phenanthrene	mg/kg	0.1	Org-012 subset	<0.1	71679-1	<0.1 || <0.1	LCS-3	123%
Anthracene	mg/kg	0.1	Org-012 subset	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012 subset	<0.1	71679-1	<0.1 || <0.1	LCS-3	112%
Pyrene	mg/kg	0.1	Org-012 subset	<0.1	71679-1	<0.1 || <0.1	LCS-3	107%
Benzo(a)anthracene	mg/kg	0.1	Org-012 subset	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012 subset	<0.1	71679-1	<0.1 || <0.1	LCS-3	133%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Benzo(b+k)fluoranthene	mg/kg	0.2	Org-012 subset	<0.2	71679-1	<0.2 || <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	Org-012 subset	<0.05	71679-1	<0.05 || <0.05	LCS-3	75%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012 subset	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012 subset	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012 subset	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d_{14}	%		Org-012 subset	79	71679-1	126 || 103 || RPD: 20	LCS-3	94%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			13/04/2012	71679-1	13/04/2012 || 13/04/2012	LCS-2	13/04/2012
Date analysed	-			14/04/2012	71679-1	14/04/2012 || 14/04/2012	LCS-2	14/04/2012
HCB	mg/kg	0.1	Org-005	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	71679-1	<0.1 || <0.1	LCS-2	94%
gamma-BHC	mg/kg	0.1	Org-005	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
beta-BHC	mg/kg	0.1	Org-005	<0.1	71679-1	<0.1 || <0.1	LCS-2	76%
Heptachlor	mg/kg	0.1	Org-005	<0.1	71679-1	<0.1 || <0.1	LCS-2	82%
delta-BHC	mg/kg	0.1	Org-005	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
Aldrin	mg/kg	0.1	Org-005	<0.1	71679-1	<0.1 || <0.1	LCS-2	81%
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	71679-1	<0.1 || <0.1	LCS-2	79%
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
pp-DDE	mg/kg	0.1	Org-005	<0.1	71679-1	<0.1 || <0.1	LCS-2	94%
Dieldrin	mg/kg	0.1	Org-005	<0.1	71679-1	<0.1 || <0.1	LCS-2	108%
Endrin	mg/kg	0.1	Org-005	<0.1	71679-1	<0.1 || <0.1	LCS-2	97%
pp-DDD	mg/kg	0.1	Org-005	<0.1	71679-1	<0.1 || <0.1	LCS-2	111%
Endosulfan II	mg/kg	0.1	Org-005	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
pp-DDT	mg/kg	0.1	Org-005	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	71679-1	<0.1 || <0.1	LCS-2	96%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%		Org-005	95	71679-1	97 || 85 || RPD: 13	LCS-2	87%

QUALITY CONTROL PCBs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			13/04/2012	71679-1	13/04/2012 || 13/04/2012	LCS-3	13/04/2012
Date analysed	-			14/04/2012	71679-1	14/04/2012 || 14/04/2012	LCS-3	14/04/2012
Arochlor 1016	mg/kg	0.1	Org-006	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1221	mg/kg	0.1	Org-006	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1232	mg/kg	0.1	Org-006	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1242	mg/kg	0.1	Org-006	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1248	mg/kg	0.1	Org-006	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
Arochlor 1254	mg/kg	0.1	Org-006	<0.1	71679-1	<0.1 || <0.1	LCS-3	102%
Arochlor 1260	mg/kg	0.1	Org-006	<0.1	71679-1	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%		Org-006	83	71679-1	89 || 79 || RPD: 12	LCS-3	82%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date digested	-			13/04/2012	71679-1	13/04/2012 || 13/04/2012	LCS-3	13/04/2012
Date analysed	-			13/04/2012	71679-1	13/04/2012 || 13/04/2012	LCS-3	13/04/2012
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	71679-1	4 || 4 || RPD: 0	LCS-3	93%
Cadmium	mg/kg	0.5	Metals-020 ICP-AES	<0.5	71679-1	<0.5 || <0.5	LCS-3	95%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	71679-1	11 || 10 || RPD: 10	LCS-3	98%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	71679-1	32 || 39 || RPD: 20	LCS-3	99%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	71679-1	98 || 110 || RPD: 12	LCS-3	95%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	71679-1	<0.1 || <0.1	LCS-3	113%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	71679-1	6 || 7 || RPD: 15	LCS-3	97%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	71679-1	34 || 37 || RPD: 8	LCS-3	97%

QUALITY CONTROL Moisture	UNITS	PQL	METHOD	Blank
Date prepared	-			[NT]
Date analysed	-			[NT]
Moisture	%	0.1	Inorg-008	[NT]

QUALITY CONTROL Asbestos ID - soils	UNITS	PQL	METHOD	Blank
Date analysed	-			[NT]

QUALITY CONTROL vTRH & BTEX in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			13/04/2012	[NT]	[NT]	LCS-W1	13/04/2012
Date analysed	-			13/04/2012	[NT]	[NT]	LCS-W1	13/04/2012
TRHC$_{6}$ - C$_{9}$	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-W1	114%
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	119%
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	114%
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	110%
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	LCS-W1	113%
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	112%
Surrogate Dibromofluoromethane	%		Org-016	94	[NT]	[NT]	LCS-W1	98%
Surrogate toluene-d8	%		Org-016	99	[NT]	[NT]	LCS-W1	99%
Surrogate 4-BFB	%		Org-016	93	[NT]	[NT]	LCS-W1	100%

QUALITY CONTROL sTRH in Water (C10-C36)	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			13/04/2012	[NT]	[NT]	LCS-W1	13/04/2012
Date analysed	-			13/04/2012	[NT]	[NT]	LCS-W1	13/04/2012
TRHC$_{10}$ - C$_{14}$	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W1	82%
TRHC$_{15}$ - C$_{28}$	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	104%
TRHC$_{29}$ - C$_{36}$	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	103%
Surrogate o-Terphenyl	%		Org-003	107	[NT]	[NT]	LCS-W1	71%

QUALITY CONTROL PAHs in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			13/04/2012	[NT]	[NT]	LCS-W1	13/04/2012
Date analysed	-			15/04/2012	[NT]	[NT]	LCS-W1	15/04/2012
Naphthalene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	109%
Acenaphthylene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Fluorene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	111%

QUALITY CONTROL PAHs in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Phenanthrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	105%
Anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	106%
Pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	112%
Benzo(a)anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Chrysene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	122%
Benzo(b+k)fluoranthene	µg/L	2	Org-012 subset	<2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	124%
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d_{14}	%		Org-012 subset	118	[NT]	[NT]	LCS-W1	110%

QUALITY CONTROL Metals in Water - Dissolved	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date digested	-			13/04/2012	[NT]	[NT]	LCS-W1	13/04/2012
Date analysed	-			13/04/2012	[NT]	[NT]	LCS-W1	13/04/2012
Arsenic - Dissolved	mg/L	0.05	Metals-020 ICP-AES	<0.05	[NT]	[NT]	LCS-W1	98%
Cadmium - Dissolved	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	LCS-W1	107%
Chromium - Dissolved	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	LCS-W1	104%
Copper - Dissolved	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	LCS-W1	103%
Lead - Dissolved	mg/L	0.03	Metals-020 ICP-AES	<0.03	[NT]	[NT]	LCS-W1	101%
Mercury - Dissolved	mg/L	0.0005	Metals-021 CV-AAS	<0.0005	[NT]	[NT]	LCS-W1	92%
Nickel - Dissolved	mg/L	0.02	Metals-020 ICP-AES	<0.02	[NT]	[NT]	LCS-W1	105%
Zinc - Dissolved	mg/L	0.02	Metals-020 ICP-AES	<0.02	[NT]	[NT]	LCS-W1	103%

Report Comments:

Asbestos ID was analysed by Approved Identifier: Alex Tam
Asbestos ID was authorised by Approved Signatory: Kim Femia

INS: Insufficient sample for this test
NA: Test not required
<: Less than

PQL: Practical Quantitation Limit
RPD: Relative Percent Difference
>: Greater than

NT: Not tested
NA: Test not required
LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batched of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

SAMPLE RECEIPT ADVICE

Client:

JBS Environmental Pty Ltd
P.O. Box 940
MASCOT NSW 1460

ph: 8338 1013
Fax: 8338 1700

Attention: Jo Rosner, A Boardman

Sample log in details:

Your reference:	**41945, Edmondson Park**
Envirolab Reference:	**71679**
Date received:	12/04/12
Date results expected to be reported:	**19/04/12**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	8 Soils, 3 waters
Turnaround time requested:	Standard
Temperature on receipt	Cool
Cooling Method:	Ice
Sampling Date Provided:	

Comments:

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

Contact details:

Please direct any queries to Aileen Hie or Jacinta Hurst
ph: 02 9910 6200 fax: 02 9910 6201
email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

CERTIFICATE OF ANALYSIS 71443

Client:
JBS Environmental Pty Ltd
P.O. Box 940
MASCOT
NSW 1460

Attention: Jo Rosner, A Boardman

Sample log in details:

Your Reference:	**41945, Edmondson Park**
No. of samples:	3 Soils, 3 waters
Date samples received / completed instructions received	05/04/12 / 05/04/12

Analysis Details:
Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	16/04/12 / 28/05/12
Date of Preliminary Report:	Not issued

NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Nancy Zhang
Chemist

Rhian Morgan
Reporting Supervisor

Giovanni Agosti
Technical Manager

Lulu Guo
Approved Signatory

NATA
ACCREDITED FOR TECHNICAL COMPETENCE

vTRH & BTEX in Soil				
Our Reference:	UNITS	71443-1	71443-2	71443-3
Your Reference	----------	SP19-1	SP18-3	QC06
Date Sampled	----------	04/04/2012	04/04/2012	04/04/2012
Type of sample		Soil	Soil	Soil
Date extracted	-	10/04/2012	10/04/2012	10/04/2012
Date analysed	-	11/04/2012	11/04/2012	11/04/2012
vTRH C_6 - C_9	mg/kg	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	[NA]
Toluene	mg/kg	<0.5	<0.5	[NA]
Ethylbenzene	mg/kg	<1	<1	[NA]
m+p-xylene	mg/kg	<2	<2	[NA]
o-Xylene	mg/kg	<1	<1	[NA]
Surrogate aaa-Trifluorotoluene	%	115	107	105

sTRH in Soil (C10-C36)				
Our Reference:	UNITS	71443-1	71443-2	71443-3
Your Reference	----------	SP19-1	SP18-3	QC06
Date Sampled	----------	04/04/2012	04/04/2012	04/04/2012
Type of sample		Soil	Soil	Soil
Date extracted	-	10/04/2012	10/04/2012	10/04/2012
Date analysed	-	11/04/2012	11/04/2012	11/04/2012
$TRHC_{10}$ - C_{14}	mg/kg	<50	<50	<50
$TRHC_{15}$ - C_{28}	mg/kg	<100	<100	<100
$TRHC_{29}$ - C_{36}	mg/kg	<100	<100	<100
Surrogate o-Terphenyl	%	93	100	92

PAHs in Soil Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ----------	71443-1 SP19-1 04/04/2012 Soil	71443-2 SP18-3 04/04/2012 Soil	71443-3 QC06 04/04/2012 Soil
Date extracted	-	10/04/2012	10/04/2012	10/04/2012
Date analysed	-	11/04/2012	11/04/2012	11/04/2012
Naphthalene	mg/kg	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d_{14}	%	111	103	114

Organochlorine Pesticides in soil			
Our Reference:	UNITS	71443-1	71443-2
Your Reference	----------	SP19-1	SP18-3
Date Sampled	----------	04/04/2012	04/04/2012
Type of sample		Soil	Soil
Date extracted	-	10/04/2012	10/04/2012
Date analysed	-	11/04/2012	11/04/2012
HCB	mg/kg	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1
Surrogate TCLMX	%	99	101

PCBs in Soil			
Our Reference:	UNITS	71443-1	71443-2
Your Reference	----------	SP19-1	SP18-3
Date Sampled	----------	04/04/2012	04/04/2012
Type of sample		Soil	Soil
Date extracted	-	10/04/2012	10/04/2012
Date analysed	-	10/04/2012	10/04/2012
Arochlor 1016	mg/kg	<0.1	<0.1
Arochlor 1221	mg/kg	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1
Surrogate TCLMX	%	95	100

Acid Extractable metals in soil				
Our Reference:	UNITS	71443-1	71443-2	71443-3
Your Reference	----------	SP19-1	SP18-3	QC06
Date Sampled	----------	04/04/2012	04/04/2012	04/04/2012
Type of sample		Soil	Soil	Soil
Date digested	-	10/04/2012	10/04/2012	10/04/2012
Date analysed	-	11/04/2012	11/04/2012	11/04/2012
Arsenic	mg/kg	<4	9	9
Cadmium	mg/kg	<0.5	<0.5	<0.5
Chromium	mg/kg	7	16	16
Copper	mg/kg	5	15	13
Lead	mg/kg	12	22	22
Mercury	mg/kg	<0.1	<0.1	<0.1
Nickel	mg/kg	4	8	8
Zinc	mg/kg	17	27	25

Asbestos ID - soils				
Our Reference:	UNITS	71443-1	71443-2	71443-3
Your Reference	----------	SP19-1	SP18-3	QC06
Date Sampled	----------	04/04/2012	04/04/2012	04/04/2012
Type of sample		Soil	Soil	Soil
Date analysed	-	12/04/2012	12/04/2012	12/04/2012
Sample mass tested	g	Approx 60g	Approx 60g	Approx 60g
Sample Description	-	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected

Moisture				
Our Reference:	UNITS	71443-1	71443-2	71443-3
Your Reference	----------	SP19-1	SP18-3	QC06
Date Sampled	----------	04/04/2012	04/04/2012	04/04/2012
Type of sample		Soil	Soil	Soil
Date prepared	-	10/04/12	10/04/12	10/04/12
Date analysed	-	11/04/12	11/04/12	11/04/12
Moisture	%	5.2	15	16

vTRH & BTEX in Water				
Our Reference:	UNITS	71443-4	71443-5	71443-6
Your Reference	----------	TRIP SPIKE	TRIP BLANK	RINSATE
Date Sampled	----------	04/04/2012	04/04/2012	04/04/2012
Type of sample		Water	Water	Water
Date extracted	-	05/04/2012	05/04/2012	05/04/2012
Date analysed	-	06/04/2012	06/04/2012	06/04/2012
TRHC$_6$ - C$_9$	µg/L	[NA]	[NA]	<10
Benzene	µg/L	99%	<1	[NA]
Toluene	µg/L	100%	<1	[NA]
Ethylbenzene	µg/L	102%	<1	[NA]
m+p-xylene	µg/L	99%	<2	[NA]
o-xylene	µg/L	99%	<1	[NA]
Surrogate Dibromofluoromethane	%	99	106	107
Surrogate toluene-d8	%	99	98	98
Surrogate 4-BFB	%	97	98	98

sTRH in Water (C10-C36)		
Our Reference:	UNITS	71443-6
Your Reference	----------	RINSATE
Date Sampled	----------	04/04/2012
Type of sample		Water
Date extracted	-	10/04/2012
Date analysed	-	10/04/2012
$TRHC_{10}$ - C_{14}	µg/L	<50
$TRHC_{15}$ - C_{28}	µg/L	<100
$TRHC_{29}$ - C_{36}	µg/L	<100
Surrogate o-Terphenyl	%	92

PAHs in Water		
Our Reference:	UNITS	71443-6
Your Reference	----------	RINSATE
Date Sampled	----------	04/04/2012
Type of sample		Water
Date extracted	-	10/04/2012
Date analysed	-	11/04/2012
Naphthalene	µg/L	<1
Acenaphthylene	µg/L	<1
Acenaphthene	µg/L	<1
Fluorene	µg/L	<1
Phenanthrene	µg/L	<1
Anthracene	µg/L	<1
Fluoranthene	µg/L	<1
Pyrene	µg/L	<1
Benzo(a)anthracene	µg/L	<1
Chrysene	µg/L	<1
Benzo(b+k)fluoranthene	µg/L	<2
Benzo(a)pyrene	µg/L	<1
Indeno(1,2,3-c,d)pyrene	µg/L	<1
Dibenzo(a,h)anthracene	µg/L	<1
Benzo(g,h,i)perylene	µg/L	<1
Surrogate p-Terphenyl-d_{14}	%	106

Metals in Water - Dissolved		
Our Reference:	UNITS	71443-6
Your Reference	----------	RINSATE
Date Sampled	----------	04/04/2012
Type of sample		Water
Date digested	-	11/04/2012
Date analysed	-	11/04/2012
Arsenic - Dissolved	mg/L	<0.05
Cadmium - Dissolved	mg/L	<0.01
Chromium - Dissolved	mg/L	<0.01
Copper - Dissolved	mg/L	<0.01
Lead - Dissolved	mg/L	<0.03
Mercury - Dissolved	mg/L	<0.0005
Nickel - Dissolved	mg/L	<0.02
Zinc - Dissolved	mg/L	<0.02

Method ID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
Inorg-008	Moisture content determined by heating at 105 deg C for a minimum of 4 hours.

QUALITY CONTROL vTRH & BTEX in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			10/04/2012	[NT]	[NT]	LCS-4	10/04/2012
Date analysed	-			11/04/2012	[NT]	[NT]	LCS-4	11/04/2012
vTRH C_6 - C_9	mg/kg	25	Org-016	<25	[NT]	[NT]	LCS-4	92%
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	LCS-4	85%
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	LCS-4	90%
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS-4	92%
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	LCS-4	96%
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS-4	97%
Surrogate aaa-Trifluorotoluene	%		Org-016	115	[NT]	[NT]	LCS-4	102%

QUALITY CONTROL sTRH in Soil (C10-C36)	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			10/04/2012	[NT]	[NT]	LCS-4	10/04/2012
Date analysed	-			11/04/2012	[NT]	[NT]	LCS-4	11/04/2012
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	[NT]	[NT]	LCS-4	83%
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-4	103%
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-4	100%
Surrogate o-Terphenyl	%		Org-003	94	[NT]	[NT]	LCS-4	73%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			10/04/2012	[NT]	[NT]	LCS-4	10/04/2012
Date analysed	-			11/04/2012	[NT]	[NT]	LCS-4	11/04/2012
Naphthalene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-4	100%
Acenaphthylene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-4	109%
Phenanthrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-4	99%
Anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-4	102%
Pyrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-4	106%
Benzo(a)anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-4	114%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Benzo(b+k)fluoranthene	mg/kg	0.2	Org-012 subset	<0.2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	Org-012 subset	<0.05	[NT]	[NT]	LCS-4	99%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d_{14}	%		Org-012 subset	113	[NT]	[NT]	LCS-4	100%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			10/04/2012	[NT]	[NT]	LCS-4	10/04/2012
Date analysed	-			10/04/2012	[NT]	[NT]	LCS-4	10/04/2012
HCB	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-4	110%
gamma-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
beta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-4	92%
Heptachlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-4	102%
delta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Aldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-4	110%
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-4	112%
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
pp-DDE	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-4	108%
Dieldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-4	114%
Endrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-4	108%
pp-DDD	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-4	109%
Endosulfan II	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
pp-DDT	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-4	112%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate TCLMX	%		Org-005	94	[NT]	[NT]	LCS-4	96%

QUALITY CONTROL PCBs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			10/04/2012	[NT]	[NT]	LCS-4	10/04/2012
Date analysed	-			10/04/2012	[NT]	[NT]	LCS-4	10/04/2012
Arochlor 1016	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Arochlor 1221	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Arochlor 1232	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Arochlor 1242	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Arochlor 1248	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Arochlor 1254	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	LCS-4	102%
Arochlor 1260	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate TCLMX	%		Org-006	94	[NT]	[NT]	LCS-4	91%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date digested	-			[NT]	[NT]	[NT]	LCS-2	10/04/2012
Date analysed	-			[NT]	[NT]	[NT]	LCS-2	11/04/2012
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	[NT]	[NT]	LCS-2	101%
Cadmium	mg/kg	0.5	Metals-020 ICP-AES	<0.5	[NT]	[NT]	LCS-2	104%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-2	104%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-2	104%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-2	101%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	[NT]	[NT]	LCS-2	118%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-2	104%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-2	105%

QUALITY CONTROL Asbestos ID - soils	UNITS	PQL	METHOD	Blank
Date analysed	-			[NT]

QUALITY CONTROL Moisture	UNITS	PQL	METHOD	Blank
Date prepared	-			[NT]
Date analysed	-			[NT]
Moisture	%	0.1	Inorg-008	<0.1

QUALITY CONTROL vTRH & BTEX in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			05/04/2012	[NT]	[NT]	LCS-W1	05/04/2012
Date analysed	-			06/04/2012	[NT]	[NT]	LCS-W1	06/04/2012
TRHC$_{6}$ - C$_{9}$	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-W1	112%
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	112%
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	112%
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	111%
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	LCS-W1	112%
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	111%
Surrogate Dibromofluoromethane	%		Org-016	96	[NT]	[NT]	LCS-W1	98%
Surrogate toluene-d8	%		Org-016	100	[NT]	[NT]	LCS-W1	99%
Surrogate 4-BFB	%		Org-016	99	[NT]	[NT]	LCS-W1	99%

QUALITY CONTROL sTRH in Water (C10-C36)	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			10/04/2012	[NT]	[NT]	LCS-W3	10/04/2012
Date analysed	-			10/04/2012	[NT]	[NT]	LCS-W3	10/04/2012
TRHC$_{10}$ - C$_{14}$	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W3	66%
TRHC$_{15}$ - C$_{28}$	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W3	97%
TRHC$_{29}$ - C$_{36}$	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W3	101%
Surrogate o-Terphenyl	%		Org-003	106	[NT]	[NT]	LCS-W3	139%

QUALITY CONTROL PAHs in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			10/04/2012	[NT]	[NT]	LCS-W1	10/04/2012
Date analysed	-			11/04/2012	[NT]	[NT]	LCS-W1	11/04/2012
Naphthalene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	100%
Acenaphthylene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Fluorene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	111%

QUALITY CONTROL PAHs in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Phenanthrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	98%
Anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	102%
Pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	105%
Benzo(a)anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Chrysene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	109%
Benzo(b+k)fluoranthene	µg/L	2	Org-012 subset	<2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	106%
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d_{14}	%		Org-012 subset	104	[NT]	[NT]	LCS-W1	97%

QUALITY CONTROL Metals in Water - Dissolved	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date digested	-			10/04/2012	71443-6	11/04/2012 || 11/04/2012	LCS-W2	10/04/2012
Date analysed	-			11/04/2012	71443-6	11/04/2012 || 11/04/2012	LCS-W2	11/04/2012
Arsenic - Dissolved	mg/L	0.05	Metals-020 ICP-AES	<0.05	71443-6	<0.05 || <0.05	LCS-W2	101%
Cadmium - Dissolved	mg/L	0.01	Metals-020 ICP-AES	<0.01	71443-6	<0.01 || <0.01	LCS-W2	107%
Chromium - Dissolved	mg/L	0.01	Metals-020 ICP-AES	<0.01	71443-6	<0.01 || <0.01	LCS-W2	103%
Copper - Dissolved	mg/L	0.01	Metals-020 ICP-AES	<0.01	71443-6	<0.01 || <0.01	LCS-W2	104%
Lead - Dissolved	mg/L	0.03	Metals-020 ICP-AES	<0.03	71443-6	<0.03 || <0.03	LCS-W2	101%
Mercury - Dissolved	mg/L	0.0005	Metals-021 CV-AAS	<0.0005	71443-6	<0.0005 || [N/T]	LCS-W2	118%
Nickel - Dissolved	mg/L	0.02	Metals-020 ICP-AES	<0.02	71443-6	<0.02 || <0.02	LCS-W2	104%
Zinc - Dissolved	mg/L	0.02	Metals-020 ICP-AES	<0.02	71443-6	<0.02 || <0.02	LCS-W2	103%

QUALITY CONTROL sTRH in Soil (C10-C36)	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date extracted	-	[NT]	[NT]
Date analysed	-	[NT]	[NT]
$TRHC_{10}$ - C_{14}	mg/kg	[NT]	[NT]
$TRHC_{15}$ - C_{28}	mg/kg	[NT]	[NT]
$TRHC_{29}$ - C_{36}	mg/kg	[NT]	[NT]
Surrogate o-Terphenyl	%	[NT]	[NT]
QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date extracted	-	[NT]	[NT]
Date analysed	-	[NT]	[NT]
Naphthalene	mg/kg	[NT]	[NT]
Acenaphthylene	mg/kg	[NT]	[NT]
Acenaphthene	mg/kg	[NT]	[NT]
Fluorene	mg/kg	[NT]	[NT]
Phenanthrene	mg/kg	[NT]	[NT]
Anthracene	mg/kg	[NT]	[NT]
Fluoranthene	mg/kg	[NT]	[NT]
Pyrene	mg/kg	[NT]	[NT]
Benzo(a)anthracene	mg/kg	[NT]	[NT]
Chrysene	mg/kg	[NT]	[NT]
Benzo(b+k)fluoranthene	mg/kg	[NT]	[NT]
Benzo(a)pyrene	mg/kg	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	[NT]	[NT]
Surrogate p-Terphenyl-d_{14}	%	[NT]	[NT]

Report Comments:

Asbestos ID was analysed by Approved Identifier: Alex Tam
Asbestos ID was authorised by Approved Signatory: Lulu Guo

INS: Insufficient sample for this test
NA: Test not required
<: Less than

PQL: Practical Quantitation Limit
RPD: Relative Percent Difference
>: Greater than

NT: Not tested
NA: Test not required
LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batched of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

CHAIN OF CUSTODY

JBS ENVIRONMENTAL

PROJECT NO.: 41945	LABORATORY BATCH NO.
PROJECT NAME: Edmondson Park	SAMPLERS RD
SEND REPORT TO: RD + TR SEND INVOICE TO: A Traynor	PHONE: 02 8338 1011 EMAIL: a.boccardi@jbsgroup.com.au
DATE NEEDED BY: Standard Turn Around	QC LEVEL: NEPM 1999 ✓ t.rosso@jbsgroup.com.au
COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:	

	SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	TPH	BTEX	PAHs	Metals (8)	OCPs	Asbestos	NOTES
1)	SP19 – 1	Soil	4/4/12		B+T		X	X	X	X	X	X	
2)	SP18 – 3	↓	↓		↓		X	X	X	X	X	X	
3)	QC06						X	X	X		X		
	QA06						Send	Bag	to	Ashford	+	Ryder	Jar to SGS
4)	Trip Spike	Water			2 x vials			X					
5)	Trip Blank				"			X					
6)	Rinsate	↓	↓		4 bottles		X		X	X			

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 71443

Date Received: 5/4/12
Time Received: 11:46
Received by: PT
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: RD DATE: 5/4/12	CONSIGNMENT NOTE NO.	NAME: Prateetha DATE: 5/4/12 11:46	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS Environmental	TRANSPORT CO.	OF: EL6	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

SAMPLE RECEIPT ADVICE

Client:

JBS Environmental Pty Ltd
P.O. Box 940
MASCOT NSW 1460

ph: 8338 1013
Fax: 8338 1700

Attention: Jo Rosner, A Boardman

Sample log in details:

Your reference:	**41945, Edmondson Park**
Envirolab Reference:	**71443**
Date received:	05/04/12
Date results expected to be reported:	**16/04/12**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	3 Soils, 3 waters
Turnaround time requested:	Standard
Temperature on receipt	Cool
Cooling Method:	Ice
Sampling Date Provided:	

Comments:

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

Contact details:

Please direct any queries to Aileen Hie or Jacinta Hurst
ph: 02 9910 6200 fax: 02 9910 6201
email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

CERTIFICATE OF ANALYSIS 71442

Client:
JBS Environmental Pty Ltd
P.O. Box 940
MASCOT
NSW 1460

Attention: Jo Rosner, A Boardman

Sample log in details:

Your Reference:	**41945, Edmondson Park**
No. of samples:	1 Soil
Date samples received / completed instructions received	05/04/12 / 05/04/12

Analysis Details:
Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	16/04/12 / 12/04/12
Date of Preliminary Report:	Not issued

NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Nancy Zhang
Chemist

Rhian Morgan
Reporting Supervisor

Giovanni Agosti
Technical Manager

Lulu Guo
Approved Signatory

NATA
ACCREDITED FOR TECHNICAL COMPETENCE

TRH in Soil (C6-C9)		
Our Reference:	UNITS	71442-1
Your Reference	----------	SP6-V1
Date Sampled	----------	04/04/2012
Type of sample		Soil
Date extracted	-	10/04/2012
Date analysed	-	10/04/2012
vTRH C_6 - C_9	mg/kg	<25
Surrogate aaa-Trifluorotoluene	%	105

sTRH in Soil (C10-C36)		
Our Reference:	UNITS	71442-1
Your Reference	----------	SP6-V1
Date Sampled	----------	04/04/2012
Type of sample		Soil
Date extracted	-	10/04/2012
Date analysed	-	10/04/2012
TRHC$_{10}$ - C$_{14}$	mg/kg	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100
Surrogate o-Terphenyl	%	98

PAHs in Soil		
Our Reference:	UNITS	71442-1
Your Reference	----------	SP6-V1
Date Sampled	----------	04/04/2012
Type of sample		Soil
Date extracted	-	10/04/2012
Date analysed	-	11/04/2012
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Surrogate p-Terphenyl-d_{14}	%	67

Acid Extractable metals in soil		
Our Reference:	UNITS	71442-1
Your Reference	----------	SP6-V1
Date Sampled	----------	04/04/2012
Type of sample		Soil
Date digested	-	10/04/2012
Date analysed	-	10/04/2012
Arsenic	mg/kg	7
Cadmium	mg/kg	0.5
Chromium	mg/kg	20
Copper	mg/kg	19
Lead	mg/kg	24
Mercury	mg/kg	<0.1
Nickel	mg/kg	12
Zinc	mg/kg	46

Asbestos ID - soils		
Our Reference:	UNITS	71442-1
Your Reference	----------	SP6-V1
Date Sampled	----------	04/04/2012
Type of sample		Soil
Date analysed	-	12/04/2012
Sample mass tested	g	Approx 65g
Sample Description	-	Brown fine-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No respirable fibres detected

Moisture		
Our Reference:	UNITS	71442-1
Your Reference	----------	SP6-V1
Date Sampled	----------	04/04/2012
Type of sample		Soil
Date prepared	-	10/04/12
Date analysed	-	11/04/12
Moisture	%	7.7

Method ID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
Inorg-008	Moisture content determined by heating at 105 deg C for a minimum of 4 hours.

QUALITY CONTROL TRH in Soil (C6-C9)	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			10/04/2012	[NT]	[NT]	LCS-1	10/04/2012
Date analysed	-			10/04/2012	[NT]	[NT]	LCS-1	10/04/2012
vTRH C_6 - C_9	mg/kg	25	Org-016	<25	[NT]	[NT]	LCS-1	93%
Surrogate aaa-Trifluorotoluene	%		Org-016	103	[NT]	[NT]	LCS-1	105%
QUALITY CONTROL sTRH in Soil (C10-C36)	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			10/04/2012	[NT]	[NT]	LCS-1	10/04/2012
Date analysed	-			10/04/2012	[NT]	[NT]	LCS-1	10/04/2012
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	[NT]	[NT]	LCS-1	103%
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-1	110%
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-1	100%
Surrogate o-Terphenyl	%		Org-003	103	[NT]	[NT]	LCS-1	118%
QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			10/04/2012	[NT]	[NT]	LCS-9	10/04/2012
Date analysed	-			11/04/2012	[NT]	[NT]	LCS-9	11/04/2012
Naphthalene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-9	110%
Acenaphthylene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-9	112%
Phenanthrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-9	106%
Anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-9	100%
Pyrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-9	111%
Benzo(a)anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-9	119%
Benzo(b+k)fluoranthene	mg/kg	0.2	Org-012 subset	<0.2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	Org-012 subset	<0.05	[NT]	[NT]	LCS-9	84%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d_{14}	%		Org-012 subset	105	[NT]	[NT]	LCS-9	97%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date digested	-			10/04/2012	[NT]	[NT]	LCS-1	10/04/2012
Date analysed	-			10/04/2012	[NT]	[NT]	LCS-1	10/04/2012
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	[NT]	[NT]	LCS-1	97%
Cadmium	mg/kg	0.5	Metals-020 ICP-AES	<0.5	[NT]	[NT]	LCS-1	97%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	101%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	101%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	97%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	[NT]	[NT]	LCS-1	120%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	100%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	99%

QUALITY CONTROL Asbestos ID - soils	UNITS	PQL	METHOD	Blank
Date analysed	-			[NT]
QUALITY CONTROL Moisture	UNITS	PQL	METHOD	Blank
Date prepared	-			[NT]
Date analysed	-			[NT]
Moisture	%	0.1	Inorg-008	[NT]

Report Comments:

Asbestos ID was analysed by Approved Identifier: Alex Tam
Asbestos ID was authorised by Approved Signatory: Lulu Guo

INS: Insufficient sample for this test
NA: Test not required
<: Less than

PQL: Practical Quantitation Limit
RPD: Relative Percent Difference
>: Greater than

NT: Not tested
NA: Test not required
LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batched of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

CHAIN OF CUSTODY

JBS ENVIRONMENTAL

PROJECT NO.: 41945
PROJECT NAME: Edmondson Park Remediation
SEND REPORT TO: RB + JR SEND INVOICE TO: A Traynor
DATE NEEDED BY: Standard Turn Around

LABORATORY BATCH NO.
SAMPLERS RB
PHONE: 02 8338 1011 EMAIL: sboordmore@jbsgroup.com.au
QC LEVEL: NEPM 1999 (T jbsreception@jbsgroup.com.au

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	Metals (8)	TPH	BTEX	PAHs	Asbestos	NOTES
SP6-V1	Soil	4/4/12		B+J		X	X	X	X	X	

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 7942
Date Received: 5/4/12
Time Received: 11:40
Received by: PT
Temp: Cool/Ambient
Cooling: Icepack
Security: Intact/Broken/None

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: RB DATE: 5/4/12	CONSIGNMENT NOTE NO.	NAME: Pratibha DATE: 5/4/12 11:40	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS Environmental	TRANSPORT CO.	OF: ELS	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Add Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

JBS Environmental Pty Ltd ABN 67 071 842 638
Phone: (02) 8338-1011
Fax: (02) 8338-1700
128 O'Riordan St, MASCOT NSW 2020
PO Box 940 MASCOT NSW 1460
www.jbsgroup.com.au

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

SAMPLE RECEIPT ADVICE

Client:

JBS Environmental Pty Ltd
P.O. Box 940
MASCOT NSW 1460

ph: 8338 1013
Fax: 8338 1700

Attention: Jo Rosner, A Boardman

Sample log in details:

Your reference:	**41945, Edmondson Park**
Envirolab Reference:	**71442**
Date received:	05/04/12
Date results expected to be reported:	**16/04/12**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	1 Soil
Turnaround time requested:	Standard
Temperature on receipt	Cool
Cooling Method:	Ice
Sampling Date Provided:	

Comments:

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

Contact details:

Please direct any queries to Aileen Hie or Jacinta Hurst
ph: 02 9910 6200 fax: 02 9910 6201
email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

CERTIFICATE OF ANALYSIS 72895

Client:
JBS Environmental Pty Ltd
P.O. Box 940
MASCOT
NSW 1460

Attention: J Rosner, A Boardman

Sample log in details:

Your Reference:	**41945, Edmondson Park**
No. of samples:	8 Soils, 1 Water
Date samples received / completed instructions received	08/05/12 / 08/05/12

Analysis Details:
Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	15/05/12 / 11/05/12
Date of Preliminary Report:	Not issued

NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Rhian Morgan
Reporting Supervisor

Acid Extractable metals in soil						
Our Reference:	UNITS	72895-1	72895-2	72895-3	72895-4	72895-5
Your Reference	----------	LPN-V001	QC07	LPN-VB001	LPN-VB002	LPN-V002
Date Sampled	----------	07/05/2012	07/05/2012	07/05/2012	07/05/2012	07/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	09/05/2012	09/05/2012	09/05/2012	09/05/2012	09/05/2012
Date analysed	-	09/05/2012	09/05/2012	09/05/2012	09/05/2012	09/05/2012
Lead	mg/kg	100	84	18	19	20

Acid Extractable metals in soil				
Our Reference:	UNITS	72895-6	72895-7	72895-8
Your Reference	----------	LPN-V003	LPN-VB003	LPN-V004
Date Sampled	----------	07/05/2012	07/05/2012	07/05/2012
Type of sample		Soil	Soil	Soil
Date digested	-	09/05/2012	09/05/2012	09/05/2012
Date analysed	-	09/05/2012	09/05/2012	09/05/2012
Lead	mg/kg	77	15	23

Metals in Water - Dissolved		
Our Reference:	UNITS	72895-9
Your Reference	----------	RINSATE
Date Sampled	----------	07/05/2012
Type of sample		Water
Date digested	-	09/05/2012
Date analysed	-	09/05/2012
Lead - Dissolved	mg/L	<0.03

Method ID	Methodology Summary
Metals-020 ICP-AES	Determination of various metals by ICP-AES.

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date digested	-			09/05/2012	[NT]	[NT]	LCS-1	09/05/2012
Date analysed	-			09/05/2012	[NT]	[NT]	LCS-1	09/05/2012
Lead	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	102%
QUALITY CONTROL Metals in Water - Dissolved	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date digested	-			09/05/2012	[NT]	[NT]	LCS-W1	09/05/2012
Date analysed	-			09/05/2012	[NT]	[NT]	LCS-W1	09/05/2012
Lead - Dissolved	mg/L	0.03	Metals-020 ICP-AES	<0.03	[NT]	[NT]	LCS-W1	103%

Report Comments:

Asbestos ID was analysed by Approved Identifier:	Not applicable for this job
Asbestos ID was authorised by Approved Signatory:	Not applicable for this job

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NA: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batched of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

CHAIN OF CUSTODY

JBS ENVIRONMENTAL

PROJECT NO.: 41945
PROJECT NAME: Edmondson Park Rec Centre
SEND REPORT TO: AB + TR
SEND INVOICE TO: A.Traynor
DATE NEEDED BY: Standard Turn Around
COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

LABORATORY BATCH NO.:
SAMPLERS AB
PHONE: 02 8338 1011
EMAIL: abroadmore@jbsgroup.com.au
QC LEVEL: NEPM 1999 ✓
JTraynor@jbsgroup.com.au

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	Lead	NOTES
LPN-VB001 1	Soil	7/5/12		Bag		X	
QC07 2	Soil	7/5/12		Bag		X	
QA07 3	Soil	7/5/12		Bag		Send to SGS	Quote 11/185
LPN-VB0013	Soil	7/5/12		Bag		X	
LPN-VB0024	Soil	7/5/12		Bag		X	
LPN-VB002 5	Soil	7/5/12		Bag		X	
LPN-VB003 6	Soil	7/5/12		Bag		X	
LPN-VB003 7	Soil	7/5/12		Bag		X	
LPN-VB004 8	Soil	7/5/12		Bag		X	
~~NANVB005~~	~~Soil~~	~~7/5/12~~		~~Bag~~		~~X~~	
Rinsate 9							

Enviroinb Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200
ENVIROLAB
Job No: 72895
Date Received: 8/5/12
Time Received: 14:30
Received by: PT
Temp: Cool/Ambient
Cooling: ice/icepack
Security: Intact/Broken/None

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: AB DATE: 8/5/12	CONSIGNMENT NOTE NO.	NAME: Prad DATE: 8/5/12	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS Environmental	TRANSPORT CO.	OF: ELS	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

SAMPLE RECEIPT ADVICE

Client:

JBS Environmental Pty Ltd
P.O. Box 940
MASCOT NSW 1460

ph: 8338 1013
Fax: 8338 1700

Attention: J Rosner, A Boardman

Sample log in details:

Your reference:	**41945, Edmondson Park**
Envirolab Reference:	**72895**
Date received:	08/05/12
Date results expected to be reported:	**15/05/12**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	8 Soils, 1 Water
Turnaround time requested:	Standard
Temperature on receipt	Ambient
Cooling Method:	None
Sampling Date Provided:	YES

Comments:

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

extra sample - rinsate

Contact details:

Please direct any queries to Aileen Hie or Jacinta Hurst
ph: 02 9910 6200 fax: 02 9910 6201
email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

CERTIFICATE OF ANALYSIS 72958

Client:
JBS Environmental Pty Ltd
P.O. Box 940
MASCOT
NSW 1460

Attention: J Rosner, A Boardman

Sample log in details:

Your Reference:	**41945, Edmondson Park**
No. of samples:	5 Soils, 1 Water
Date samples received / completed instructions received	09/05/12 / 09/05/12

Analysis Details:
Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	16/05/12 / 14/05/12
Date of Preliminary Report:	Not Issued

NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Rhian Morgan
Reporting Supervisor

Giovanni Agosti
Technical Manager

Alex MacLean
Chemist

NATA
ACCREDITED FOR TECHNICAL COMPETENCE

Acid Extractable metals in soil						
Our Reference:	UNITS	72958-1	72958-2	72958-3	72958-4	72958-5
Your Reference	----------	LPN-VB004	LPN-VB006	LPN-V006	LPN-V008	LPN-V009
Date Sampled	----------	08/05/2012	08/05/2012	08/05/2012	08/05/2012	08/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	10/05/2012	10/05/2012	10/05/2012	10/05/2012	10/05/2012
Date analysed	-	10/05/2012	10/05/2012	10/05/2012	10/05/2012	10/05/2012
Lead	mg/kg	10	17	18	7	19

Moisture Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ----------	72958-1 LPN-VB004 08/05/2012 Soil	72958-2 LPN-VB006 08/05/2012 Soil	72958-3 LPN-V006 08/05/2012 Soil	72958-4 LPN-V008 08/05/2012 Soil	72958-5 LPN-V009 08/05/2012 Soil
Date prepared	-	10/05/2012	10/05/2012	10/05/2012	10/05/2012	10/05/2012
Date analysed	-	11/05/2012	11/05/2012	11/05/2012	11/05/2012	11/05/2012
Moisture	%	15	9.9	21	7.0	3.8

Metals in Waters - Acid extractable		
Our Reference:	UNITS	72958-6
Your Reference	----------	Rinsate
Date Sampled	----------	08/05/2012
Type of sample		water
Date prepared	-	10/05/2012
Date analysed	-	10/05/2012
Lead - Total	mg/L	<0.03

Method ID	Methodology Summary
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Inorg-008	Moisture content determined by heating at 105 deg C for a minimum of 4 hours.

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date digested	-			10/05/2012	[NT]	[NT]	LCS-1	10/05/2012
Date analysed	-			10/05/2012	[NT]	[NT]	LCS-1	10/05/2012
Lead	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	101%

QUALITY CONTROL Moisture	UNITS	PQL	METHOD	Blank
Date prepared	-			[NT]
Date analysed	-			[NT]
Moisture	%	0.1	Inorg-008	[NT]

QUALITY CONTROL Metals in Waters - Acid extractable	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			10/05/2012	72958-6	10/05/2012 || 10/05/2012	LCS-W1	10/05/2012
Date analysed	-			10/05/2012	72958-6	10/05/2012 || 10/05/2012	LCS-W1	10/05/2012
Lead - Total	mg/L	0.03	Metals-020 ICP-AES	<0.03	72958-6	<0.03 || <0.03	LCS-W1	105%

Report Comments:

Asbestos ID was analysed by Approved Identifier:	Not applicable for this job
Asbestos ID was authorised by Approved Signatory:	Not applicable for this job

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NA: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batched of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

CHAIN OF CUSTODY

JBS ENVIRONMENTAL

PROJECT NO.: 4945
PROJECT NAME: Edmondson Park Remediation
SEND REPORT TO: AB + JR
SEND INVOICE TO: A. Treyvaud
DATE NEEDED BY: Standard Turn Around ✓
COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

LABORATORY BATCH NO.
SAMPLERS AB
PHONE: 02 8338 1011
QC LEVEL: NEPM 1999 ✓
EMAIL: aboardman@jbsgroup.com.au (JRosner@jbsgroup.com.au)

	SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	Lead	NOTES
1	LPN-VB004	Soil	8/5/12		Bag		X	
2	LPN-VB006	Soil	8/5/12		Bag		X	
3	LPN-V006	Soil	8/5/12		Bag		X	11/188
4	LPN-VB08	Soil	8/5/12		Bag		X	
5	LPN-V009	Soil	8/5/12		Bag		X	
6	Rinsate	Soil	8/5/12		Bottle		X	

Envirolab Services
12 Ashley St
Chatswood NSW 2067
PH: (02) 9910 6200

Job No: 72958
Date Received: 9/5/12
Time Received: 14:15
Received by: JHie
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: AB DATE: 8/5/12	CONSIGNMENT NOTE NO.	NAME: JHie DATE: 9/5/12	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS Environmental	TRANSPORT CO.	OF: ELS	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

JBS Environmental Pty Ltd ABN 67 071 842 638
Phone: (02) 8338-1011
Fax: (02) 8338-1700

128 O'Riordan St, MASCOT NSW 2020
PO Box 940 MASCOT NSW 1460
www.jbsgroup.com.au

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

SAMPLE RECEIPT ADVICE

Client:

JBS Environmental Pty Ltd
P.O. Box 940
MASCOT NSW 1460

ph: 8338 1013
Fax: 8338 1700

Attention: J Rosner, A Boardman

Sample log in details:

Your reference:	**41945, Edmondson Park**
Envirolab Reference:	**72958**
Date received:	09/05/12
Date results expected to be reported:	**16/05/12**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	5 Soils, 1 Water
Turnaround time requested:	Standard
Temperature on receipt	Ambient
Cooling Method:	None
Sampling Date Provided:	YES

Comments:

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

Contact details:

Please direct any queries to Aileen Hie or Jacinta Hurst
ph: 02 9910 6200 fax: 02 9910 6201
email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

CERTIFICATE OF ANALYSIS 73031

Client:
JBS Environmental Pty Ltd
P.O. Box 940
MASCOT
NSW 1460

Attention: Alex Boardman / Joanne Rosner

Sample log in details:

Your Reference:	**41945, Edmondson Park Remediation**
No. of samples:	12 Soils, 1 Water
Date samples received / completed instructions received	10/05/12 / 10/05/12

Analysis Details:
Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	17/05/12 / 16/05/12
Date of Preliminary Report:	Not Issued

NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Jacinta Hurst
Laboratory Manager

Giovanni Agosti
Technical Manager

NATA
ACCREDITED FOR TECHNICAL COMPETENCE

Acid Extractable metals in soil						
Our Reference:	UNITS	73031-1	73031-2	73031-3	73031-4	73031-5
Your Reference	----------	LPN-V010	LPN-V012	LPN-V013	LPN-V014	LPN-V015
Date Sampled	----------	9/05/2012	9/05/2012	9/05/2012	9/05/2012	9/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	10/05/2012	10/05/2012	10/05/2012	10/05/2012	10/05/2012
Date analysed	-	11/05/2012	11/05/2012	11/05/2012	11/05/2012	11/05/2012
Lead	mg/kg	38	14	19	20	25

Acid Extractable metals in soil						
Our Reference:	UNITS	73031-6	73031-7	73031-8	73031-9	73031-10
Your Reference	----------	LPN-V016	QC08	LPN-V017	LPN-V018	LPN-V019
Date Sampled	----------	9/05/2012	9/05/2012	9/05/2012	9/05/2012	9/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	10/05/2012	10/05/2012	10/05/2012	10/05/2012	10/05/2012
Date analysed	-	11/05/2012	11/05/2012	11/05/2012	11/05/2012	11/05/2012
Lead	mg/kg	11	14	15	17	16

Acid Extractable metals in soil			
Our Reference:	UNITS	73031-11	73031-12
Your Reference	----------	LPN-V020	LPN-V021
Date Sampled	----------	9/05/2012	9/05/2012
Type of sample		Soil	Soil
Date digested	-	10/05/2012	10/05/2012
Date analysed	-	11/05/2012	11/05/2012
Lead	mg/kg	17	31

Moisture						
Our Reference:	UNITS	73031-1	73031-2	73031-3	73031-4	73031-5
Your Reference	----------	LPN-V010	LPN-V012	LPN-V013	LPN-V014	LPN-V015
Date Sampled	----------	9/05/2012	9/05/2012	9/05/2012	9/05/2012	9/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	11/05/2012	11/05/2012	11/05/2012	11/05/2012	11/05/2012
Date analysed	-	14/05/2012	14/05/2012	14/05/2012	14/05/2012	14/05/2012
Moisture	%	5.2	16	21	12	5.6

Moisture						
Our Reference:	UNITS	73031-6	73031-7	73031-8	73031-9	73031-10
Your Reference	----------	LPN-V016	QC08	LPN-V017	LPN-V018	LPN-V019
Date Sampled	----------	9/05/2012	9/05/2012	9/05/2012	9/05/2012	9/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	11/05/2012	11/05/2012	11/05/2012	11/05/2012	11/05/2012
Date analysed	-	14/05/2012	14/05/2012	14/05/2012	14/05/2012	14/05/2012
Moisture	%	17	18	15	14	14

Moisture			
Our Reference:	UNITS	73031-11	73031-12
Your Reference	----------	LPN-V020	LPN-V021
Date Sampled	----------	9/05/2012	9/05/2012
Type of sample		Soil	Soil
Date prepared	-	11/05/2012	11/05/2012
Date analysed	-	14/05/2012	14/05/2012
Moisture	%	15	15

Metals in Water - Dissolved		
Our Reference:	UNITS	73031-13
Your Reference	----------	Rinsate 01
Date Sampled	----------	9/05/2012
Type of sample		water
Date digested	-	11/05/2012
Date analysed	-	14/05/2012
Lead - Dissolved	mg/L	<0.03

Method ID	Methodology Summary
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Inorg-008	Moisture content determined by heating at 105 deg C for a minimum of 4 hours.

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date digested	-			11/05/2012	73031-1	10/05/2012 || 10/05/2012	LCS-1	11/05/2012
Date analysed	-			11/05/2012	73031-1	11/05/2012 || 11/05/2012	LCS-1	11/05/2012
Lead	mg/kg	1	Metals-020 ICP-AES	<1	73031-1	38 || 43 || RPD: 12	LCS-1	98%

QUALITY CONTROL Moisture	UNITS	PQL	METHOD	Blank
Date prepared	-			[NT]
Date analysed	-			[NT]
Moisture	%	0.1	Inorg-008	[NT]

QUALITY CONTROL Metals in Water - Dissolved	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date digested	-			11/05/2012	[NT]	[NT]	LCS-W1	11/05/2012
Date analysed	-			14/05/2012	[NT]	[NT]	LCS-W1	14/05/2012
Lead - Dissolved	mg/L	0.03	Metals-020 ICP-AES	<0.03	[NT]	[NT]	LCS-W1	99%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	73031-12	10/05/2012 || 10/05/2012	73031-2	11/05/2012
Date analysed	-	73031-12	11/05/2012 || 11/05/2012	73031-2	11/05/2012
Lead	mg/kg	73031-12	31 || 32 || RPD: 3	73031-2	79%

Report Comments:

Asbestos ID was analysed by Approved Identifier:	Not applicable for this job
Asbestos ID was authorised by Approved Signatory:	Not applicable for this job

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NA: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batched of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

SAMPLE RECEIPT ADVICE

Client:

JBS Environmental Pty Ltd
P.O. Box 940
MASCOT NSW 1460

ph: 8338 1013
Fax: 8338 1700

Attention: Alex Boardman / Joanne Rosner

Sample log in details:

Your reference:	**41945, Edmondson Park Remediation**
Envirolab Reference:	**73031**
Date received:	10/05/12
Date results expected to be reported:	**17/05/12**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	12 Soils, 1 Water
Turnaround time requested:	Standard
Temperature on receipt	Cool
Cooling Method:	Ice
Sampling Date Provided:	YES

Comments:

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

Contact details:

Please direct any queries to Aileen Hie or Jacinta Hurst
ph: 02 9910 6200 fax: 02 9910 6201
email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au

CHAIN OF CUSTODY

JBS ENVIRONMENTAL

PROJECT NO.: 47945 | LABORATORY BATCH NO.
PROJECT NAME: Edmondson Park Remediation | SAMPLERS AB | aboardman@jbsgroup.com.au
SEND REPORT TO: AB & JR | SEND INVOICE TO: Accounts | PHONE: 02 8338 1011 | EMAIL: jbsnsw@jbsgroup.com.au
DATE NEEDED BY: Standard Turn Around | QC LEVEL: NEPM 1999 (✓)
COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	Lead	NOTES
LPN-V010	Soil	9/5/12		Bag		X	
LPN-V012	Soil	9/5/12		Bag		X	
LPN-V013	Soil	9/5/12		Bag		X	
LPN-V014	Soil	9/5/12		Bag		X	
LPN-V015	Soil	9/5/12		Bag		X	
LPN-V016	Soil	9/5/12		Bag		X	
QC08	Soil	9/5/12		Bag		Send to SGS	
QA08	Soil	9/5/12		Bag			
LPN-V017	Soil	9/5/12		Bag		X	
LPN-V018	Soil	9/5/12		Bag		X	
LPN-V019	Soil	9/5/12		Bag		X	
LPN-V020	Soil	9/5/12		Bag		X	
LPN-V021	Soil	9/5/12		Bag		X	
Rinsate 01	Soil	9/5/12		Bag		X	

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 73031.
Date Received: 10.05.12.
Time Received: 11:00
Received by: Dalia
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

RELINQUISHED BY:
NAME: AB DATE: 10/5/12
OF: JBS Environmental
NAME: DATE:
OF:

METHOD OF SHIPMENT:
CONSIGNMENT NOTE NO.
TRANSPORT CO.
CONSIGNMENT NOTE NO.
TRANSPORT CO

RECEIVED BY:
NAME: Dalia DATE:
OF: ELS 10.05.12
NAME: DATE:
OF:

FOR RECEIVING LAB USE ONLY:
COOLER SEAL - Yes..... No ..... Intact ..... Broken .....
COOLER TEMP ..... deg C
COOLER SEAL - Yes..... No ..... Intact ..... Broken .....
COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

JBS Environmental Pty Ltd ABN 67 071 842 638
Phone: (02) 8338-1011
Fax: (02) 8338-1700

128 O'Riordan St, MASCOT NSW 2020
PO Box 940 MASCOT NSW 1460
www.jbsgroup.com.au

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

CERTIFICATE OF ANALYSIS 73229

Client:
JBS Environmental Pty Ltd
P.O. Box 940
MASCOT
NSW 1460

Attention: Alex Boardman / Joanne Rosner

Sample log in details:

Your Reference:	**41945, Edmondson Park Remediation**
No. of samples:	11 Soils 2 Waters
Date samples received / completed instructions received	14/05/2012 / 14/05/2012

Analysis Details:
Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	21/05/12 / 17/05/12
Date of Preliminary Report:	Not Issued

NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Giovanni Agosti
Technical Manager

Alex MacLean
Chemist

NATA
ACCREDITED FOR TECHNICAL COMPETENCE

Acid Extractable metals in soil						
Our Reference:	UNITS	73229-1	73229-2	73229-3	73229-4	73229-5
Your Reference	----------	LPN_VB013	LPN_VB014	LPN_VB015	LPN_VB016	LPN_VB017
Date Sampled	----------	11/05/2012	11/05/2012	11/05/2012	11/05/2012	11/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	15/05/2012	15/05/2012	15/05/2012	15/05/2012	15/05/2012
Date analysed	-	15/05/2012	15/05/2012	15/05/2012	15/05/2012	15/05/2012
Lead	mg/kg	16	19	18	17	27

Acid Extractable metals in soil						
Our Reference:	UNITS	73229-7	73229-8	73229-9	73229-10	73229-11
Your Reference	----------	LPN_VB018	LPN_VB019	LPN_VB020	LPN_VB021	LPN_VB022
Date Sampled	----------	12/05/2012	12/05/2012	12/05/2012	12/05/2012	12/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	15/05/2012	15/05/2012	15/05/2012	15/05/2012	15/05/2012
Date analysed	-	15/05/2012	15/05/2012	15/05/2012	15/05/2012	15/05/2012
Lead	mg/kg	17	17	20	19	18

Acid Extractable metals in soil		
Our Reference:	UNITS	73229-12
Your Reference	----------	LPN_VB023
Date Sampled	----------	12/05/2012
Type of sample		Soil
Date digested	-	15/05/2012
Date analysed	-	15/05/2012
Lead	mg/kg	12

Moisture						
Our Reference:	UNITS	73229-1	73229-2	73229-3	73229-4	73229-5
Your Reference	----------	LPN_VB013	LPN_VB014	LPN_VB015	LPN_VB016	LPN_VB017
Date Sampled	----------	11/05/2012	11/05/2012	11/05/2012	11/05/2012	11/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/05/12	15/05/12	15/05/12	15/05/12	15/05/12
Date analysed	-	16/05/12	16/05/12	16/05/12	16/05/12	16/05/12
Moisture	%	11	13	15	19	13

Moisture						
Our Reference:	UNITS	73229-7	73229-8	73229-9	73229-10	73229-11
Your Reference	----------	LPN_VB018	LPN_VB019	LPN_VB020	LPN_VB021	LPN_VB022
Date Sampled	----------	12/05/2012	12/05/2012	12/05/2012	12/05/2012	12/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/05/12	15/05/12	15/05/12	15/05/12	15/05/12
Date analysed	-	16/05/12	16/05/12	16/05/12	16/05/12	16/05/12
Moisture	%	17	16	12	18	13

Moisture		
Our Reference:	UNITS	73229-12
Your Reference	----------	LPN_VB023
Date Sampled	----------	12/05/2012
Type of sample		Soil
Date prepared	-	15/05/12
Date analysed	-	16/05/12
Moisture	%	13

Metals in Water - Dissolved			
Our Reference:	UNITS	73229-6	73229-13
Your Reference	----------	Rinsate 01	Rinsate 02
Date Sampled	----------	11/05/2012	12/05/2012
Type of sample		Water	Water
Date digested	-	15/05/2012	15/05/2012
Date analysed	-	15/05/2012	15/05/2012
Lead - Dissolved	mg/L	<0.03	<0.03

Method ID	Methodology Summary
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Inorg-008	Moisture content determined by heating at 105 deg C for a minimum of 4 hours.

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date digested	-			15/05/2012	73229-10	15/05/2012 || 15/05/2012	LCS-1	15/05/2012
Date analysed	-			15/05/2012	73229-10	15/05/2012 || 15/05/2012	LCS-1	15/05/2012
Lead	mg/kg	1	Metals-020 ICP-AES	<1	73229-10	19 || 22 || RPD: 15	LCS-1	92%

QUALITY CONTROL Moisture	UNITS	PQL	METHOD	Blank
Date prepared	-			[NT]
Date analysed	-			[NT]
Moisture	%	0.1	Inorg-008	[NT]

QUALITY CONTROL Metals in Water - Dissolved	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date digested	-			15/05/2012	[NT]	[NT]	LCS-1	15/05/2012
Date analysed	-			15/05/2012	[NT]	[NT]	LCS-1	15/05/2012
Lead - Dissolved	mg/L	0.03	Metals-020 ICP-AES	<0.03	[NT]	[NT]	LCS-1	100%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	[NT]	[NT]	73229-1	15/05/2012
Date analysed	-	[NT]	[NT]	73229-1	15/05/2012
Lead	mg/kg	[NT]	[NT]	73229-1	83%

Report Comments:

Asbestos ID was analysed by Approved Identifier:	Not applicable for this job
Asbestos ID was authorised by Approved Signatory:	Not applicable for this job

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NA: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batched of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

CHAIN OF CUSTODY

JBS ENVIRONMENTAL

PROJECT NO.: 42645
PROJECT NAME: Edmondson Park Remediation
SEND REPORT TO: AB + JR SEND INVOICE TO: A. Traynor
DATE NEEDED BY: Standard Turn Around

LABORATORY BATCH NO.
SAMPLERS AB
PHONE: 02 8338 1011
QC LEVEL: NEPM 1999 (✓)
EMAIL: ahoodman@jbsgroup.com.au
jrosero@jbsgroup.com.au

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

	SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	Lead	NOTES
1	LPN-VB013	Soil	11/5/12		Bag		X	
2	LPN-VB014	Soil	11/5/12		Bag		X	
3	LPN-VB015	Soil	11/5/12		Bag		X	
4	LPN-VB016	Soil	11/5/12		Bag		X	
5	LPN-VB017	Soil	11/5/12		Bag		X	
6	Rinsate 01	Water	11/5/12		Metals Bottle		X	
7	LPN-VB018	Soil	12/5/12		Bag		X	
8	LPN-VB019	Soil	12/5/12		Bag		X	
9	LPN-VB020	Soil	12/5/12		Bag		X	
10	LPN-VB021	Soil	12/5/12		Bag		X	
11	LPN-VB022	Soil	12/5/12		Bag		X	
12	LPN-VB023	Soil	12/5/12		Bag		X	
13	Rinsate 02	Water	12/5/12		Metals Bottle		X	

ENVIROLAB
Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200
Job No: 73229.
Date Received: 14.5.12.
Time Received: 15.00.
Received by: J.H Liu.
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

RELINQUISHED BY:
NAME: AB DATE: 12/5/12
OF: JBS Environmental
NAME: DATE:
OF:

METHOD OF SHIPMENT:
CONSIGNMENT NOTE NO.
TRANSPORT CO.
CONSIGNMENT NOTE NO.
TRANSPORT CO

RECEIVED BY:
NAME: Jia Liu DATE: 14.5.12.
OF: ELS
NAME: DATE:
OF:

FOR RECEIVING LAB USE ONLY:
COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
COOLER TEMP..... deg C
COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
COOLER TEMP..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

JBS Environmental Pty Ltd ABN 67 071 842 638
Phone: (02) 8338-1011
Fax: (02) 8338-1700
128 O'Riordan St, MASCOT NSW 2020
PO Box 940 MASCOT NSW 1460
www.jbsgroup.com.au

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

SAMPLE RECEIPT ADVICE

Client:

JBS Environmental Pty Ltd
P.O. Box 940
MASCOT NSW 1460

ph: 8338 1013
Fax: 8338 1700

Attention: Alex Boardman / Joanne Rosner

Sample log in details:

Your reference:	**41945, Edmondson Park Remediation**
Envirolab Reference:	**73229**
Date received:	14/05/2012
Date results expected to be reported:	**21/05/12**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	11 Soils 2 Waters
Turnaround time requested:	Standard
Temperature on receipt	Ambient
Cooling Method:	None
Sampling Date Provided:	YES

Comments:

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

Contact details:

Please direct any queries to Aileen Hie or Jacinta Hurst
ph: 02 9910 6200 fax: 02 9910 6201
email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

CERTIFICATE OF ANALYSIS 73147

Client:
JBS Environmental Pty Ltd
P.O. Box 940
MASCOT
NSW 1460

Attention: Alex Boardman / Joanne Rosner

Sample log in details:

Your Reference:	**41945, Edmondson Park Remediation**
No. of samples:	11 Soils, 1 Water
Date samples received / completed instructions received	11/05/12 / 11/05/12

Analysis Details:
Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	17/05/12 / 17/05/12
Date of Preliminary Report:	Not Issued

NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Giovanni Agosti
Technical Manager

Alex MacLean
Chemist

NATA
ACCREDITED FOR TECHNICAL COMPETENCE

Acid Extractable metals in soil						
Our Reference:	UNITS	73147-1	73147-2	73147-3	73147-4	73147-5
Your Reference	----------	LPN-V005	LPN-V007	LPN-VB005	LPN-VB007	LPN-V11
Date Sampled	----------	10/05/2012	10/05/2012	10/05/2012	10/05/2012	10/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	14/05/2012	14/05/2012	14/05/2012	14/05/2012	14/05/2012
Date analysed	-	14/05/2012	14/05/2012	14/05/2012	14/05/2012	14/05/2012
Lead	mg/kg	24	17	14	10	58

Acid Extractable metals in soil						
Our Reference:	UNITS	73147-6	73147-7	73147-8	73147-9	73147-10
Your Reference	----------	LPN-VB008	LPN-VB009	LPN-V022	LPN-VB010	LPN-VB011
Date Sampled	----------	10/05/2012	10/05/2012	10/05/2012	10/05/2012	10/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	14/05/2012	14/05/2012	14/05/2012	14/05/2012	14/05/2012
Date analysed	-	14/05/2012	14/05/2012	14/05/2012	14/05/2012	14/05/2012
Lead	mg/kg	13	15	140	12	18

Acid Extractable metals in soil		
Our Reference:	UNITS	73147-12
Your Reference	----------	LPN-VB012
Date Sampled	----------	10/05/2012
Type of sample		Soil
Date digested	-	14/05/2012
Date analysed	-	14/05/2012
Lead	mg/kg	10

Moisture						
Our Reference:	UNITS	73147-1	73147-2	73147-3	73147-4	73147-5
Your Reference	----------	LPN-V005	LPN-V007	LPN-VB005	LPN-VB007	LPN-V11
Date Sampled	----------	10/05/2012	10/05/2012	10/05/2012	10/05/2012	10/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/05/2012	14/05/2012	14/05/2012	14/05/2012	14/05/2012
Date analysed	-	15/05/2012	15/05/2012	15/05/2012	15/05/2012	15/05/2012
Moisture	%	16	15	17	7.1	8.6

Moisture						
Our Reference:	UNITS	73147-6	73147-7	73147-8	73147-9	73147-10
Your Reference	----------	LPN-VB008	LPN-VB009	LPN-V022	LPN-VB010	LPN-VB011
Date Sampled	----------	10/05/2012	10/05/2012	10/05/2012	10/05/2012	10/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/05/2012	14/05/2012	14/05/2012	14/05/2012	14/05/2012
Date analysed	-	15/05/2012	15/05/2012	15/05/2012	15/05/2012	15/05/2012
Moisture	%	12	12	6.1	14	15

Moisture		
Our Reference:	UNITS	73147-12
Your Reference	----------	LPN-VB012
Date Sampled	----------	10/05/2012
Type of sample		Soil
Date prepared	-	14/05/2012
Date analysed	-	15/05/2012
Moisture	%	13

Metals in Water - Dissolved		
Our Reference:	UNITS	73147-11
Your Reference	----------	Rinsate
Date Sampled	----------	10/05/2012
Type of sample		Water
Date digested	-	14/05/2012
Date analysed	-	15/05/2012
Lead - Dissolved	mg/L	<0.03

Method ID	Methodology Summary
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Inorg-008	Moisture content determined by heating at 105 deg C for a minimum of 4 hours.

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date digested	-			14/05/2012	73147-7	14/05/2012 || 14/05/2012	LCS-1	14/05/2012
Date analysed	-			15/05/2012	73147-7	14/05/2012 || 14/05/2012	LCS-1	14/05/2012
Lead	mg/kg	1	Metals-020 ICP-AES	<1	73147-7	15 || 21 || RPD: 33	LCS-1	96%

QUALITY CONTROL Moisture	UNITS	PQL	METHOD	Blank
Date prepared	-			[NT]
Date analysed	-			[NT]
Moisture	%	0.1	Inorg-008	[NT]

QUALITY CONTROL Metals in Water - Dissolved	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date digested	-			14/05/2012	[NT]	[NT]	LCS-W1	14/05/2012
Date analysed	-			15/05/2012	[NT]	[NT]	LCS-W1	15/05/2012
Lead - Dissolved	mg/L	0.03	Metals-020 ICP-AES	<0.03	[NT]	[NT]	LCS-W1	95%

QUALITY CONTROL Metals in Water - Dissolved	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	[NT]	[NT]	73147-11	14/05/2012
Date analysed	-	[NT]	[NT]	73147-11	15/05/2012
Lead - Dissolved	mg/L	[NT]	[NT]	73147-11	94%

Report Comments:

Asbestos ID was analysed by Approved Identifier:	Not applicable for this job
Asbestos ID was authorised by Approved Signatory:	Not applicable for this job

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NA: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batched of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

SAMPLE RECEIPT ADVICE

Client:

JBS Environmental Pty Ltd
P.O. Box 940
MASCOT NSW 1460

ph: 8338 1013
Fax: 8338 1700

Attention: Alex Boardman / Joanne Rosner

Sample log in details:

Your reference:	**41945, Edmondson Park Remediation**
Envirolab Reference:	**73147**
Date received:	11/05/12
Date results expected to be reported:	**17/05/12**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	11 Soils, 1 Water
Turnaround time requested:	Standard
Temperature on receipt	Cool
Cooling Method:	Ice
Sampling Date Provided:	YES

Comments:

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

Contact details:

Please direct any queries to Aileen Hie or Jacinta Hurst
ph: 02 9910 6200 fax: 02 9910 6201
email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au

CHAIN OF CUSTODY

JBS ENVIRONMENTAL

PROJECT NO.: 41945
PROJECT NAME: Edmondson Park Remediation
SEND REPORT TO: MBJTR SEND INVOICE TO: As req'd
DATE NEEDED BY: Standard Turn Around

LABORATORY BATCH NO.
SAMPLERS AB
PHONE: 02 8338 1011
QC LEVEL: NEPM 1999 (✓)

EMAIL: aboardman@jbsenv.com.au; jlasner@jbsenv.com.au

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

	SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	Lead	NOTES
1	LPN-V005	Soil	10-5-12		Bag		X	
2	LPN-V007	Soil	10-5-12		Bag		X	
3	LPN-VB005	Soil	10-5-12		Bag		X	
4	LPN-VB007	Soil	10-5-12		Bag		X	
5	LPN-V011	Soil	10-5-12		Bag		X	
6	LPN-VB008	Soil	10-5-12		Bag		X	
7	LPN-VB009	Soil	10-5-12		Bag		X	
8	LPN-V022	Soil	10-5-12		Bag		X	
9	LPN-VB010	Soil	10-5-12		Bag		X	
10	LPN-VB011	Soil	10-5-12		Bag		X	
11	Rinsate	Water	10-5-12		Metals bottle		X	
12	LPN-VB012	Soil	10-5-12		Bag		X	

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 73147

Date Received: 11-5-12
Time Received: 1500
Received by: Jia Liu
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

RELINQUISHED BY:
NAME: AB DATE: 11-5-12
OF: JBS Environmental
NAME: DATE:
OF:

METHOD OF SHIPMENT:
CONSIGNMENT NOTE NO.
TRANSPORT CO.
CONSIGNMENT NOTE NO.
TRANSPORT CO

RECEIVED BY:
NAME: Jia Liu DATE: 11-5-12
OF: ENS
NAME: DATE:
OF:

FOR RECEIVING LAB USE ONLY:
COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
COOLER TEMP ..... deg C
COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

JBS Environmental Pty Ltd ABN 67 071 842 638
Phone: (02) 8338-1011
Fax: (02) 8338-1700

128 O'Riordan St, MASCOT NSW 2020
PO Box 940 MASCOT NSW 1460
www.jbsgroup.com.au

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

CERTIFICATE OF ANALYSIS 73437

Client:
JBS Environmental Pty Ltd
P.O. Box 940
MASCOT
NSW 1460

Attention: Alex Boardman / Joanne Rosner

Sample log in details:

Your Reference:	**41945, Edmondson Park Remediation**
No. of samples:	62 Soils, 3 Waters
Date samples received / completed instructions received	16/05/12 / 16/05/12

Analysis Details:
Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	24/05/12 / 23/05/12
Date of Preliminary Report:	Not Issued

NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Rhian Morgan
Reporting Supervisor

Giovanni Agosti
Technical Manager

Alex MacLean
Chemist

Acid Extractable metals in soil						
Our Reference:	UNITS	73437-1	73437-2	73437-3	73437-4	73437-5
Your Reference	----------	LPN-V023	QC09	LPN-V024	LPN-V025	LPN-VB024
Date Sampled	----------	14/05/2012	14/05/2012	14/05/2012	14/05/2012	14/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	21/05/2012	21/05/2012	21/05/2012	21/05/2012	21/05/2012
Date analysed	-	21/05/2012	21/05/2012	21/05/2012	21/05/2012	21/05/2012
Lead	mg/kg	22	21	15	24	26

Acid Extractable metals in soil						
Our Reference:	UNITS	73437-6	73437-7	73437-8	73437-9	73437-10
Your Reference	----------	LPN-VB025	LPN-V026	LPN-V027	LPN-V028	LPN-V029
Date Sampled	----------	14/05/2012	14/05/2012	14/05/2012	14/05/2012	14/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	21/05/2012	21/05/2012	21/05/2012	21/05/2012	21/05/2012
Date analysed	-	21/05/2012	21/05/2012	21/05/2012	21/05/2012	21/05/2012
Lead	mg/kg	18	29	7	14	15

Acid Extractable metals in soil						
Our Reference:	UNITS	73437-11	73437-12	73437-13	73437-15	73437-16
Your Reference	----------	LPN-V030	LPN-V031	LPN-V032	LPN-VB026	LPN-V034
Date Sampled	----------	14/05/2012	14/05/2012	14/05/2012	15/05/2012	15/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	21/05/2012	21/05/2012	21/05/2012	21/05/2012	21/05/2012
Date analysed	-	21/05/2012	21/05/2012	21/05/2012	21/05/2012	21/05/2012
Lead	mg/kg	22	26	16	19	25

Acid Extractable metals in soil						
Our Reference:	UNITS	73437-17	73437-18	73437-19	73437-20	73437-21
Your Reference	----------	LPN-V035	LPN-V036	LPN-VB027	LPN-VB028	LPN-VB029
Date Sampled	----------	15/05/2012	15/05/2012	15/05/2012	15/05/2012	15/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	21/05/2012	21/05/2012	21/05/2012	21/05/2012	21/05/2012
Date analysed	-	21/05/2012	21/05/2012	21/05/2012	21/05/2012	21/05/2012
Lead	mg/kg	32	19	17	27	12

Acid Extractable metals in soil						
Our Reference:	UNITS	73437-22	73437-23	73437-24	73437-25	73437-26
Your Reference	----------	LPN-V037	LPN-V038	LPN-V039	LPN-VB030	LPN-VB031
Date Sampled	----------	15/05/2012	15/05/2012	15/05/2012	15/05/2012	15/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	21/05/2012	21/05/2012	21/05/2012	21/05/2012	21/05/2012
Date analysed	-	21/05/2012	21/05/2012	21/05/2012	21/05/2012	21/05/2012
Lead	mg/kg	18	20	20	14	15

Acid Extractable metals in soil						
Our Reference:	UNITS	73437-27	73437-28	73437-29	73437-30	73437-31
Your Reference	----------	LPN-V040	LPN-V041	LPN-VB032	LPN-VB033	LPN-VB034
Date Sampled	----------	15/05/2012	15/05/2012	15/05/2012	15/05/2012	15/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	21/05/2012	21/05/2012	21/05/2012	21/05/2012	21/05/2012
Date analysed	-	21/05/2012	21/05/2012	21/05/2012	21/05/2012	21/05/2012
Lead	mg/kg	24	19	12	22	17

Acid Extractable metals in soil						
Our Reference:	UNITS	73437-32	73437-33	73437-34	73437-35	73437-36
Your Reference	----------	LPN-V042	LPN-V043	LPN-VB035	LPN-V044	LPN-V045
Date Sampled	----------	15/05/2012	15/05/2012	15/05/2012	15/05/2012	15/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	21/05/2012	21/05/2012	21/05/2012	21/05/2012	21/05/2012
Date analysed	-	21/05/2012	21/05/2012	21/05/2012	21/05/2012	21/05/2012
Lead	mg/kg	25	16	15	26	24

Acid Extractable metals in soil						
Our Reference:	UNITS	73437-37	73437-38	73437-39	73437-40	73437-41
Your Reference	----------	QC10	LPN-V046	LPN-V053	LPN-V054	LPN-VB036
Date Sampled	----------	15/05/2012	16/05/2012	16/05/2012	16/05/2012	16/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	21/05/2012	21/05/2012	21/05/2012	21/05/2012	21/05/2012
Date analysed	-	21/05/2012	21/05/2012	21/05/2012	21/05/2012	21/05/2012
Lead	mg/kg	23	25	29	17	12

Acid Extractable metals in soil						
Our Reference:	UNITS	73437-42	73437-43	73437-44	73437-45	73437-46
Your Reference	----------	LPN-VB037	LPN-V056	LPN-V055	LPN-VB038	LPN-V033
Date Sampled	----------	16/05/2012	16/05/2012	16/05/2012	16/05/2012	16/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	21/05/2012	21/05/2012	21/05/2012	21/05/2012	21/05/2012
Date analysed	-	21/05/2012	21/05/2012	21/05/2012	21/05/2012	21/05/2012
Lead	mg/kg	17	22	22	13	28

Acid Extractable metals in soil						
Our Reference:	UNITS	73437-47	73437-48	73437-49	73437-50	73437-51
Your Reference	----------	LPN-V057	LPN-V058	LPN-V059	LPN-V047	LPN-V048
Date Sampled	----------	16/05/2012	16/05/2012	16/05/2012	16/05/2012	16/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	21/05/2012	21/05/2012	21/05/2012	21/05/2012	21/05/2012
Date analysed	-	21/05/2012	21/05/2012	21/05/2012	21/05/2012	21/05/2012
Lead	mg/kg	61	66	22	35	23

Acid Extractable metals in soil						
Our Reference:	UNITS	73437-52	73437-53	73437-54	73437-55	73437-56
Your Reference	----------	LPN-V049	LPN-V050	LPN-V051	LPN-V052	LPN-V060
Date Sampled	----------	16/05/2012	16/05/2012	16/05/2012	16/05/2012	16/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	21/05/2012	21/05/2012	21/05/2012	21/05/2012	21/05/2012
Date analysed	-	21/05/2012	21/05/2012	21/05/2012	21/05/2012	21/05/2012
Lead	mg/kg	47	37	71	70	25

Acid Extractable metals in soil						
Our Reference:	UNITS	73437-57	73437-58	73437-59	73437-60	73437-61
Your Reference	----------	LPN-V061	LPN-VB039	LPN-V062	LPN-V063	LPN-VB040
Date Sampled	----------	16/05/2012	16/05/2012	16/05/2012	16/05/2012	16/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	21/05/2012	21/05/2012	21/05/2012	21/05/2012	21/05/2012
Date analysed	-	21/05/2012	21/05/2012	21/05/2012	21/05/2012	21/05/2012
Lead	mg/kg	13	16	23	15	18

Acid Extractable metals in soil			
Our Reference:	UNITS	73437-62	73437-63
Your Reference	----------	QC11	QC12
Date Sampled	----------	16/05/2012	16/05/2012
Type of sample		Soil	Soil
Date digested	-	21/05/2012	21/05/2012
Date analysed	-	21/05/2012	21/05/2012
Lead	mg/kg	21	17

Moisture						
Our Reference:	UNITS	73437-1	73437-2	73437-3	73437-4	73437-5
Your Reference	----------	LPN-V023	QC09	LPN-V024	LPN-V025	LPN-VB024
Date Sampled	----------	14/05/2012	14/05/2012	14/05/2012	14/05/2012	14/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	21/05/12	21/05/12	21/05/12	21/05/12	21/05/12
Date analysed	-	22/05/12	22/05/12	22/05/12	22/05/12	22/05/12
Moisture	%	8.9	9.1	13	9.3	16

Moisture						
Our Reference:	UNITS	73437-6	73437-7	73437-8	73437-9	73437-10
Your Reference	----------	LPN-VB025	LPN-V026	LPN-V027	LPN-V028	LPN-V029
Date Sampled	----------	14/05/2012	14/05/2012	14/05/2012	14/05/2012	14/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	21/05/12	21/05/12	21/05/12	21/05/12	21/05/12
Date analysed	-	22/05/12	22/05/12	22/05/12	22/05/12	22/05/12
Moisture	%	17	11	17	19	11

Moisture						
Our Reference:	UNITS	73437-11	73437-12	73437-13	73437-15	73437-16
Your Reference	----------	LPN-V030	LPN-V031	LPN-V032	LPN-VB026	LPN-V034
Date Sampled	----------	14/05/2012	14/05/2012	14/05/2012	15/05/2012	15/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	21/05/12	21/05/12	21/05/12	21/05/12	21/05/12
Date analysed	-	22/05/12	22/05/12	22/05/12	22/05/12	22/05/12
Moisture	%	10	13	8.2	9.6	14

Moisture						
Our Reference:	UNITS	73437-17	73437-18	73437-19	73437-20	73437-21
Your Reference	----------	LPN-V035	LPN-V036	LPN-VB027	LPN-VB028	LPN-VB029
Date Sampled	----------	15/05/2012	15/05/2012	15/05/2012	15/05/2012	15/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	21/05/12	21/05/12	21/05/12	21/05/12	21/05/12
Date analysed	-	22/05/12	22/05/12	22/05/12	22/05/12	22/05/12
Moisture	%	18	13	12	13	11

Moisture						
Our Reference:	UNITS	73437-22	73437-23	73437-24	73437-25	73437-26
Your Reference	----------	LPN-V037	LPN-V038	LPN-V039	LPN-VB030	LPN-VB031
Date Sampled	----------	15/05/2012	15/05/2012	15/05/2012	15/05/2012	15/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	21/05/12	21/05/12	21/05/12	21/05/12	21/05/12
Date analysed	-	22/05/12	22/05/12	22/05/12	22/05/12	22/05/12
Moisture	%	14	12	17	12	13

Moisture						
Our Reference:	UNITS	73437-27	73437-28	73437-29	73437-30	73437-31
Your Reference	----------	LPN-V040	LPN-V041	LPN-VB032	LPN-VB033	LPN-VB034
Date Sampled	----------	15/05/2012	15/05/2012	15/05/2012	15/05/2012	15/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	21/05/12	21/05/12	21/05/12	21/05/12	21/05/12
Date analysed	-	22/05/12	22/05/12	22/05/12	22/05/12	22/05/12
Moisture	%	14	18	11	6.4	13

Moisture						
Our Reference:	UNITS	73437-32	73437-33	73437-34	73437-35	73437-36
Your Reference	----------	LPN-V042	LPN-V043	LPN-VB035	LPN-V044	LPN-V045
Date Sampled	----------	15/05/2012	15/05/2012	15/05/2012	15/05/2012	15/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	21/05/12	21/05/12	21/05/12	21/05/12	21/05/12
Date analysed	-	22/05/12	22/05/12	22/05/12	22/05/12	22/05/12
Moisture	%	17	7.7	14	17	18

Moisture						
Our Reference:	UNITS	73437-37	73437-38	73437-39	73437-40	73437-41
Your Reference	----------	QC10	LPN-V046	LPN-V053	LPN-V054	LPN-VB036
Date Sampled	----------	15/05/2012	16/05/2012	16/05/2012	16/05/2012	16/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	21/05/12	21/05/12	21/05/12	21/05/12	21/05/12
Date analysed	-	22/05/12	22/05/12	22/05/12	22/05/12	22/05/12
Moisture	%	17	16	17	13	13

Moisture						
Our Reference:	UNITS	73437-42	73437-43	73437-44	73437-45	73437-46
Your Reference	----------	LPN-VB037	LPN-V056	LPN-V055	LPN-VB038	LPN-V033
Date Sampled	----------	16/05/2012	16/05/2012	16/05/2012	16/05/2012	16/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	21/05/12	21/05/12	21/05/12	21/05/12	21/05/12
Date analysed	-	22/05/12	22/05/12	22/05/12	22/05/12	22/05/12
Moisture	%	15	13	14	12	18

Moisture						
Our Reference:	UNITS	73437-47	73437-48	73437-49	73437-50	73437-51
Your Reference	----------	LPN-V057	LPN-V058	LPN-V059	LPN-V047	LPN-V048
Date Sampled	----------	16/05/2012	16/05/2012	16/05/2012	16/05/2012	16/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	21/05/12	21/05/12	21/05/12	21/05/12	21/05/12
Date analysed	-	22/05/12	22/05/12	22/05/12	22/05/12	22/05/12
Moisture	%	9.0	13	8.0	15	14

Moisture						
Our Reference:	UNITS	73437-52	73437-53	73437-54	73437-55	73437-56
Your Reference	----------	LPN-V049	LPN-V050	LPN-V051	LPN-V052	LPN-V060
Date Sampled	----------	16/05/2012	16/05/2012	16/05/2012	16/05/2012	16/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	21/05/12	21/05/12	21/05/12	21/05/12	21/05/12
Date analysed	-	22/05/12	22/05/12	22/05/12	22/05/12	22/05/12
Moisture	%	14	14	9.9	17	10

Moisture						
Our Reference:	UNITS	73437-57	73437-58	73437-59	73437-60	73437-61
Your Reference	----------	LPN-V061	LPN-VB039	LPN-V062	LPN-V063	LPN-VB040
Date Sampled	----------	16/05/2012	16/05/2012	16/05/2012	16/05/2012	16/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	21/05/12	21/05/12	21/05/12	21/05/12	21/05/12
Date analysed	-	22/05/12	22/05/12	22/05/12	22/05/12	22/05/12
Moisture	%	12	11	12	9.9	12

Moisture			
Our Reference:	UNITS	73437-62	73437-63
Your Reference	----------	QC11	QC12
Date Sampled	----------	16/05/2012	16/05/2012
Type of sample		Soil	Soil
Date prepared	-	21/05/12	21/05/12
Date analysed	-	22/05/12	22/05/12
Moisture	%	10	12

Metals in Water - Dissolved				
Our Reference:	UNITS	73437-14	73437-64	73437-65
Your Reference	----------	Rinsate 01	Rinsate 02	Rinsate 03
Date Sampled	----------	14/05/2012	15/05/2012	15/05/2012
Type of sample		Water	Water	Water
Date digested	-	17/05/2012	17/05/2012	17/05/2012
Date analysed	-	18/05/2012	18/05/2012	18/05/2012
Lead - Dissolved	mg/L	<0.03	<0.03	<0.03

Method ID	Methodology Summary
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Inorg-008	Moisture content determined by heating at 105 deg C for a minimum of 4 hours.

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date digested	-			21/05/2012	73437-1	21/05/2012 || 21/05/2012	LCS-1	21/05/2012
Date analysed	-			21/05/2012	73437-1	21/05/2012 || 21/05/2012	LCS-1	21/05/2012
Lead	mg/kg	1	Metals-020 ICP-AES	<1	73437-1	22 || 20 || RPD: 10	LCS-1	100%

QUALITY CONTROL Moisture	UNITS	PQL	METHOD	Blank
Date prepared	-			[NT]
Date analysed	-			[NT]
Moisture	%	0.1	Inorg-008	[NT]

QUALITY CONTROL Metals in Water - Dissolved	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date digested	-			17/05/2012	[NT]	[NT]	LCS-W1	17/05/2012
Date analysed	-			18/05/2012	[NT]	[NT]	LCS-W1	18/05/2012
Lead - Dissolved	mg/L	0.03	Metals-020 ICP-AES	<0.03	[NT]	[NT]	LCS-W1	107%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	73437-11	21/05/2012 || 21/05/2012	LCS-2	21/05/2012
Date analysed	-	73437-11	21/05/2012 || 21/05/2012	LCS-2	21/05/2012
Lead	mg/kg	73437-11	22 || 19 || RPD: 15	LCS-2	98%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	73437-21	21/05/2012 || 21/05/2012	LCS-3	21/05/2012
Date analysed	-	73437-21	21/05/2012 || 21/05/2012	LCS-3	21/05/2012
Lead	mg/kg	73437-21	12 || 17 || RPD: 34	LCS-3	98%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	73437-31	21/05/2012 || 21/05/2012	LCS-4	21/05/2012
Date analysed	-	73437-31	21/05/2012 || 21/05/2012	LCS-4	21/05/2012
Lead	mg/kg	73437-31	17 || 19 || RPD: 11	LCS-4	100%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	73437-41	21/05/2012 || 21/05/2012	73437-2	21/05/2012
Date analysed	-	73437-41	21/05/2012 || 21/05/2012	73437-2	21/05/2012
Lead	mg/kg	73437-41	12 || 13 || RPD: 8	73437-2	76%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	73437-51	21/05/2012 || 21/05/2012	73437-22	21/05/2012
Date analysed	-	73437-51	21/05/2012 || 21/05/2012	73437-22	21/05/2012
Lead	mg/kg	73437-51	23 || 25 || RPD: 8	73437-22	73%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	73437-61	21/05/2012 || 21/05/2012	73437-42	21/05/2012
Date analysed	-	73437-61	21/05/2012 || 21/05/2012	73437-42	21/05/2012
Lead	mg/kg	73437-61	18 || 14 || RPD: 25	73437-42	86%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	[NT]	[NT]	73437-62	21/05/2012
Date analysed	-	[NT]	[NT]	73437-62	21/05/2012
Lead	mg/kg	[NT]	[NT]	73437-62	80%

Report Comments:

Asbestos ID was analysed by Approved Identifier:	Not applicable for this job
Asbestos ID was authorised by Approved Signatory:	Not applicable for this job

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NA: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batched of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

CHAIN OF CUSTODY

JBS ENVIRONMENTAL

PROJECT NO.: 41945
PROJECT NAME: Edmondson Park Remediation
SEND REPORT TO: AB + JR SEND INVOICE TO: A.Trajanac
DATE NEEDED BY: Standard Turn Around

LABORATORY BATCH NO.
SAMPLERS AB
PHONE: 02 8338 1011
QC LEVEL: NEPM 1999 (✓)
aboardman@jbsgroup.com.au
EMAIL: jrosner@jbsgroup.com.au

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

SAMPLE ID	MATRIX	DATE	ID	TYPE & PRESERVATIVE	pH	Lead	NOTES
LPN-V023	Soil	14/5/12	1	Bag		X	
QC09	Soil	14/5/12	2	Bag		X	
QA09	Soil	14/5/12	3	Bag		■	Send to SGS
LPN-V024	Soil	14/5/12	#3	Bag		X	
LPN-V025	Soil	14/5/12	04	Bag		X	
LPN-VB024	Soil	14/5/12	05	Bag		X	
LPN-VB025	Soil	14/5/12	06	Bag		X	
LPN-V026	Soil	14/5/12	#7	Bag		X	
LPN-V027	Soil	14/5/12	8	Bag		X	
LPN-V028	Soil	14/5/12	#09	Bag		X	
LPN-V029	Soil	14/5/12	10	Bag		X	
LPN-V030	Soil	14/5/12	11	Bag		X	
LPN-V031	Soil	14/5/12	12	Bag		X	
LPN-V032	Soil	14/5/12	13	Bag			
~~LPN-V036~~	~~Soil~~		14				
~~QA09~~							
Rinsate 01	Water	14/5/12	15	water bottle		X	

Enviroslab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 73437
Date Received: 17/5/12
Time Received: 11:00
Received by: PT
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: AB DATE: 17/5/12	CONSIGNMENT NOTE NO.	NAME: Patricia DATE: 17/5/12 11:00	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS Environmental	TRANSPORT CO.	OF: EnS	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP .....deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

JBS Environmental Pty Ltd ABN 67 071 842 638
Phone: (02) 8338-1011
Fax: (02) 8338-1700
128 O'Riordan St, MASCOT NSW 2020
PO Box 940 MASCOT NSW 1460
www.jbsgroup.com.au

CHAIN OF CUSTODY

JBS ENVIRONMENTAL

PROJECT NO.: 4945
PROJECT NAME: Edmondson Park REM
SEND REPORT TO: AB + JR SEND INVOICE TO: A.Traynor
DATE NEEDED BY: Standard Turn Around
COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

LABORATORY BATCH NO.
SAMPLERS AB
PHONE: 02 8338 1011 EMAIL: aboardman@jbsgroup.com.au
QC LEVEL: NEPM 1999 (✓) jrosner@jbsgroup.com.au

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	Lead	NOTES
LPN-VB026	Soil	15/5/12	15	Bag		X	
LPN-VB034	Soil	15/5/12	16	Bag		X	
LPN-VB035	Soil	15/5/12	17	Bag		X	
LPN-VB036	Soil	15/5/12	18	Bag		X	
LPN-VB037							
LPN-VB027	Soil	15/5/12	19	Bag		X	
LPN-VB028	Soil	15/5/12	20	Bag		X	
LPN-VB029	Soil	15/5/12	21	Bag		X	
LPN-VB037	Soil	15/5/12	22	Bag		X	
LPN-VB038	Soil	15/5/12	23	Bag		X	
LPN-VB039	Soil	15/5/12	24	Bag		X	
LPN-VB030	Soil	15/5/12	25	Bag		X	
LPN-VB031	Soil	15/5/12	26	Bag		X	
LPN-VB040	Soil	15/5/12	27	Bag		X	
LPN-VB041	Soil	15/5/12	28	Bag		X	
LPN-VB032	Soil	15/5/12	29	Bag		X	
LPN-VB033	Soil	15/5/12	30	Bag		X	
LPN-VB034	Soil	15/5/12	31	Bag		X	

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: ABoardman DATE: 16/5/12	CONSIGNMENT NOTE NO.	NAME: Prathiba DATE: 17/5/12	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS Environmental	TRANSPORT CO.	OF: ALS	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

JBS Environmental Pty Ltd ABN 67 071 842 638
Phone: (02) 8338-1011
Fax: (02) 8338-1700

128 O'Riordan St, MASCOT NSW 2020
PO Box 940 MASCOT NSW 1460
www.jbsgroup.com.au

CHAIN OF CUSTODY

JBS ENVIRONMENTAL

PROJECT NO.: 41945
PROJECT NAME: Edmondson Park Rem.
SEND REPORT TO: AB + TR SEND INVOICE TO: A. Traynor
DATE NEEDED BY: Standard Turn Around
COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

LABORATORY BATCH NO.
SAMPLERS AB
PHONE: 02 8338 1011
QC LEVEL: NEPM 1999 (✓)
EMAIL: aboodmane@jbsgroup.com.au
traynor@jbsgroup.com.au

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	Lead	NOTES
LPN-V042	Soil	15-5-12	32	Bag		X	
LPN-V043	Soil	15-5-12	33	Bag		X	
LPN-VB035	Soil	15-5-12	34	Bag		X	
LPN-V044	Soil	15-5-12	35	Bag		X	
LPN-V045	Soil	15/5/12	36	Bag		X	
~~LPN-~~ QC16	Soil	15/5/12	37	Bag		X	
QA10	Soil	15/5/12		Bag		Send to SGS	
LPN-V046	Soil	16/5/12	38	Bag		X	
~~LPN-V049~~	Soil	16/5/12		~~Bag~~			
~~LPN-V050~~	Soil	16/5/12		~~Bag~~			
LPN-V051	Soil	16/5/12		Bag			
~~LPN-V052~~							
LPN-V053	Soil	16-5-12	39	Bag		X	
LPN-V054	Soil	16-5-12	40	Bag		X	
LPN-VB036	Soil	16-5-12	41	Bag		X	
LPN-VB037	Soil	16-5-12	42	Bag		X	
LPN-V056	Soil	16-5-12	43	Bag		X	
LPN-V055	Soil	16-5-12	44	Bag		X	

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: AB DATE: 16-5-12	CONSIGNMENT NOTE NO.	NAME: Brad DATE: 17/5/12	COOLER SEAL – Yes..... No..... Intact..... Broken.....
OF: JBS Environmental	TRANSPORT CO.	OF: GLS	COOLER TEMP .....deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No..... Intact..... Broken.....
OF:	TRANSPORT CO	OF:	COOLER TEMP .....deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

JBS Environmental Pty Ltd ABN 67 071 842 638
Phone: (02) 8338-1011
Fax: (02) 8338-1700

128 O'Riordan St, MASCOT NSW 2020
PO Box 940 MASCOT NSW 1460
www.jbsgroup.com.au

CHAIN OF CUSTODY

JBS ENVIRONMENTAL

PROJECT NO.: 47945
PROJECT NAME: Edmondson Park Dem.
SEND REPORT TO: AB + TR SEND INVOICE TO: A. Traynor
DATE NEEDED BY: Standard Turn Around

LABORATORY BATCH NO.
SAMPLERS AB
PHONE: 02 8338 1011
EMAIL: dboardman@jbsgroup.com.au
QC LEVEL: NEPM 1999 (V) jrosner@jbsgroup.com.au

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	Lead	NOTES
LPN-VB038	Soil	16-5-12	45	Bag		X	
LPN-V033	Soil	16-5-12	46	Bag		X	
LPN-V057	Soil	16-5-12	47	Bag		X	
LPN-V058	Soil	16-5-12	48	Bag		X	
LPN-V059	Soil	16-5-12	49	Bag		X	
LPN-V047	Soil	16-5-12	50	Bag		X	
LPN-V048	Soil	16-5-12	51	Bag		X	
LPN-V049	Soil	16-5-12	52	Bag		X	
LPN-V050	Soil	16-5-12	53	Bag		X	
LPN-V051	Soil	16-5-12	54	Bag		X	
LPN-V052	Soil	16-5-12	55	Bag		X	
LPN-V060	Soil	16-5-12	56	Bag		X	
LPN-V061	Soil	16-5-12	57	Bag		X	
LPN-VB039	Soil	16-5-12	58	Bag		X	
LPN-V062	Soil	16-5-12	59	Bag		X	
LPN-V063	Soil	16-5-12	60	Bag		X	
LPN-VB040	Soil	16-5-12	61	Bag		X	
QC11	Soil	16-5-12	62	Bag		X	

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: AB DATE: 18-5-12	CONSIGNMENT NOTE NO.	NAME: Paul DATE: 19/5/12	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS Environmental	TRANSPORT CO.	OF: ELS	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

JBS Environmental Pty Ltd ABN 67 071 842 638
Phone: (02) 8338-1011
Fax: (02) 8338-1700

128 O'Riordan St, MASCOT NSW 2020
PO Box 940 MASCOT NSW 1460
www.jbsgroup.com.au

CHAIN OF CUSTODY

JBS ENVIRONMENTAL

PROJECT NO.: 41965	LABORATORY BATCH NO.
PROJECT NAME: Edmondson Park Rem	SAMPLERS AB
SEND REPORT TO: AB + TR	SEND INVOICE TO: Mr Trapman
DATE NEEDED BY: Standard Turn Around	PHONE: 02 8338 1011
	QC LEVEL: NEPM 1999 ✓

EMAIL: abcordinen@jbsgroup.com.au; tros@jbsgroup.com.au

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	Lead	NOTES
QA11	Soil	16-5-12		Bag		Send to SGS	
QC12	Soil	16-5-12	63	Bag		Send to SGS	
QA12	Soil	16-5-12		Bag			
Rinsate 02	Water	16-5-12	64	Water bottle		X	
Rinsate 03	Water	16-5-12	65	Water bottle		X	

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: AB DATE: 17-5-12	CONSIGNMENT NOTE NO.	NAME: Patricia DATE: 17/5/12	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS Environmental	TRANSPORT CO.	OF: GES	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

JBS Environmental Pty Ltd ABN 67 071 842 638
Phone: (02) 8338-1011
Fax: (02) 8338-1700
128 O'Riordan St, MASCOT NSW 2020
PO Box 940 MASCOT NSW 1460
www.jbsgroup.com.au

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

SAMPLE RECEIPT ADVICE

Client:

JBS Environmental Pty Ltd
P.O. Box 940
MASCOT NSW 1460

ph: 8338 1013
Fax: 8338 1700

Attention: Alex Boardman / Joanne Rosner

Sample log in details:

Your reference:	**41945, Edmondson Park Remediation**
Envirolab Reference:	**73437**
Date received:	16/05/12
Date results expected to be reported:	**24/05/12**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	62 Soils, 3 Waters
Turnaround time requested:	Standard
Temperature on receipt	Not applicable
Cooling Method:	None
Sampling Date Provided:	YES

Comments:

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

Contact details:

Please direct any queries to Aileen Hie or Jacinta Hurst
ph: 02 9910 6200 fax: 02 9910 6201
email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

CERTIFICATE OF ANALYSIS 73480

Client:
JBS Environmental Pty Ltd
P.O. Box 940
MASCOT
NSW 1460

Attention: Alex Boardman / Joanne Rosner

Sample log in details:

Your Reference:	**41945, Edmondson Park Remediation**
No. of samples:	14 Soils, 1 Waters
Date samples received / completed instructions received	17/05/12 / 17/05/12

Analysis Details:
Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	24/05/12 / 24/05/12
Date of Preliminary Report:	Not issued

NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Rhian Morgan
Reporting Supervisor

Alex MacLean
Chemist

NATA
ACCREDITED FOR TECHNICAL COMPETENCE

Acid Extractable metals in soil						
Our Reference:	UNITS	73480-1	73480-2	73480-3	73480-4	73480-5
Your Reference	----------	LPN-VB041	LPN-VB042	LPN-V064	LPN-V065	LPN-VB043
Date Sampled	----------	17/05/2012	17/05/2012	17/05/2012	17/05/2012	17/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	22/05/2012	22/05/2012	22/05/2012	22/05/2012	22/05/2012
Date analysed	-	22/05/2012	22/05/2012	22/05/2012	22/05/2012	22/05/2012
Lead	mg/kg	14	19	21	17	17

Acid Extractable metals in soil						
Our Reference:	UNITS	73480-6	73480-7	73480-8	73480-9	73480-11
Your Reference	----------	LPN-VB044	LPN-V066	LPN-V067	LPN-VB045	LPN-V068
Date Sampled	----------	17/05/2012	17/05/2012	17/05/2012	17/05/2012	17/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	22/05/2012	22/05/2012	22/05/2012	22/05/2012	22/05/2012
Date analysed	-	22/05/2012	22/05/2012	22/05/2012	22/05/2012	22/05/2012
Lead	mg/kg	25	26	21	20	32

Acid Extractable metals in soil					
Our Reference:	UNITS	73480-12	73480-13	73480-14	73480-15
Your Reference	----------	LPN-V069	LPN-VB046	LPN-V070	LPN-V071
Date Sampled	----------	17/05/2012	17/05/2012	17/05/2012	17/05/2012
Type of sample		Soil	Soil	Soil	Soil
Date digested	-	22/05/2012	22/05/2012	22/05/2012	22/05/2012
Date analysed	-	22/05/2012	22/05/2012	22/05/2012	22/05/2012
Lead	mg/kg	27	27	35	18

Moisture						
Our Reference:	UNITS	73480-1	73480-2	73480-3	73480-4	73480-5
Your Reference	----------	LPN-VB041	LPN-VB042	LPN-V064	LPN-V065	LPN-VB043
Date Sampled	----------	17/05/2012	17/05/2012	17/05/2012	17/05/2012	17/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	22/05/12	22/05/12	22/05/12	22/05/12	22/05/12
Date analysed	-	23/05/12	23/05/12	23/05/12	23/05/12	23/05/12
Moisture	%	8.2	8.5	8.0	4.0	12

Moisture						
Our Reference:	UNITS	73480-6	73480-7	73480-8	73480-9	73480-11
Your Reference	----------	LPN-VB044	LPN-V066	LPN-V067	LPN-VB045	LPN-V068
Date Sampled	----------	17/05/2012	17/05/2012	17/05/2012	17/05/2012	17/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	22/05/12	22/05/12	22/05/12	22/05/12	22/05/12
Date analysed	-	23/05/12	23/05/12	23/05/12	23/05/12	23/05/12
Moisture	%	11	8.6	5.4	10	9.6

Moisture					
Our Reference:	UNITS	73480-12	73480-13	73480-14	73480-15
Your Reference	----------	LPN-V069	LPN-VB046	LPN-V070	LPN-V071
Date Sampled	----------	17/05/2012	17/05/2012	17/05/2012	17/05/2012
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	22/05/12	22/05/12	22/05/12	22/05/12
Date analysed	-	23/05/12	23/05/12	23/05/12	23/05/12
Moisture	%	3.3	7.6	7.9	9.1

Metals in Water - Dissolved		
Our Reference:	UNITS	73480-10
Your Reference	----------	RINSATE
Date Sampled	----------	17/05/2012
Type of sample		Water
Date digested	-	18/05/2012
Date analysed	-	18/05/2012
Lead - Dissolved	mg/L	<0.03

Method ID	Methodology Summary
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Inorg-008	Moisture content determined by heating at 105 deg C for a minimum of 4 hours.

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date digested	-			22/05/2012	73480-2	22/05/2012 || 22/05/2012	LCS-1	22/05/2012
Date analysed	-			22/05/2012	73480-2	22/05/2012 || 22/05/2012	LCS-1	22/05/2012
Lead	mg/kg	1	Metals-020 ICP-AES	<1	73480-2	19 || 18 || RPD: 5	LCS-1	100%

QUALITY CONTROL Moisture	UNITS	PQL	METHOD	Blank
Date prepared	-			[NT]
Date analysed	-			[NT]
Moisture	%	0.1	Inorg-008	[NT]

QUALITY CONTROL Metals in Water - Dissolved	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date digested	-			18/05/2012	[NT]	[NT]	LCS-W1	18/05/2012
Date analysed	-			18/05/2012	[NT]	[NT]	LCS-W1	18/05/2012
Lead - Dissolved	mg/L	0.03	Metals-020 ICP-AES	<0.03	[NT]	[NT]	LCS-W1	107%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	73480-13	22/05/2012 || 22/05/2012	73480-3	22/05/2012
Date analysed	-	73480-13	22/05/2012 || 22/05/2012	73480-3	22/05/2012
Lead	mg/kg	73480-13	27 || 20 || RPD: 30	73480-3	76%

Report Comments:

Asbestos ID was analysed by Approved Identifier:	Not applicable for this job
Asbestos ID was authorised by Approved Signatory:	Not applicable for this job

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NA: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batched of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

SAMPLE RECEIPT ADVICE

Client:

JBS Environmental Pty Ltd
P.O. Box 940
MASCOT NSW 1460

ph: 8338 1013
Fax: 8338 1700

Attention: Alex Boardman / Joanne Rosner

Sample log in details:

Your reference:	**41945, Edmondson Park Remediation**
Envirolab Reference:	**73480**
Date received:	17/05/12
Date results expected to be reported:	**24/05/12**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	14 Soils, 1 Waters
Turnaround time requested:	Standard
Temperature on receipt	Not applicable
Cooling Method:	None
Sampling Date Provided:	YES

Comments:

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

Contact details:

Please direct any queries to Aileen Hie or Jacinta Hurst
ph: 02 9910 6200 fax: 02 9910 6201
email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au

CHAIN OF CUSTODY

JBS ENVIRONMENTAL

PROJECT NO.: 43945
PROJECT NAME: Edmondson Park Dem.
SEND REPORT TO: AE + TE SEND INVOICE TO: A. Traynor
DATE NEEDED BY: Standard Turn Around

LABORATORY BATCH NO.
SAMPLERS A-B
PHONE: 02 8338 1011
QC LEVEL: NEPM 1999 (✓)
EMAIL: aboardman@jbsgroup.com.au; jrosner@jbsgroup.com.au

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	Lead	NOTES
LPN-VB041	Soil	17-5-12	1	Bag		X	
LPN-VB042	Soil	17-5-12	2	Bag		X	
LPN-V064	Soil	17-5-12	3	Bag		X	
LPN-V065	Soil	17-5-12	4	Bag		X	
LPN-VB043	Soil	17-5-12	5	Bag		X	
LPN-VB044	Soil	17-5-12	6	Bag		X	
LPN-V066	Soil	17-5-12	7	Bag		X	
LPN-V067	Soil	17-5-12	8	Bag		X	
LPN-VB045	Soil	17-5-12	9	Bag		X	
Rinsate	Water	17-5-12	10	~~Bag~~ Plastic bottle		X	
LPN-V068	Soil	17-5-12	11	Bag		X	
LPN-V069	Soil	17-5-12	12	Bag		X	
LPN-VB046	Soil	17-5-12	13	Bag		X	
LPN-V070	Soil	17-5-12	14	Bag		X	
LPN-V071	Soil	17-5-12	15	Bag		X	

Environmental Laboratory Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 73480
Date Received: 17/5/12
Time Received: 16:30
Received by: P
Temp: Cool/Ambient
Cooling: ice/icepack
Security: Intact/Broken/None

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: ABO DATE: 18-5-12	CONSIGNMENT NOTE NO.	NAME: Peter DATE: 17/5/12	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS Environmental	TRANSPORT CO.	OF: ELS	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

CERTIFICATE OF ANALYSIS 73607

Client:
JBS Environmental Pty Ltd
P.O. Box 940
MASCOT
NSW 1460

Attention: Alex Boardman, Joanne Rosner

Sample log in details:

Your Reference:	**41945, Edmondson Park**
No. of samples:	6 Soils, 1 Water
Date samples received / completed instructions received	21/05/12 / 21/05/12

Analysis Details:
Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	28/05/12 / 25/05/12
Date of Preliminary Report:	Not issued

NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Rhian Morgan
Reporting Supervisor

NATA
ACCREDITED FOR TECHNICAL COMPETENCE

Acid Extractable metals in soil						
Our Reference:	UNITS	73607-1	73607-2	73607-3	73607-4	73607-5
Your Reference	----------	LPN-V072	LPN-V073	QC13	LPN-V075	LPN-V077
Date Sampled	----------	17/05/2012	17/05/2012	17/05/2012	17/05/2012	18/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	22/05/2012	22/05/2012	22/05/2012	22/05/2012	22/05/2012
Date analysed	-	22/05/2012	22/05/2012	22/05/2012	22/05/2012	22/05/2012
Lead	mg/kg	39	41	31	77	45

Acid Extractable metals in soil		
Our Reference:	UNITS	73607-6
Your Reference	----------	LPN-V078
Date Sampled	----------	18/05/2012
Type of sample		Soil
Date digested	-	22/05/2012
Date analysed	-	22/05/2012
Lead	mg/kg	23

Moisture						
Our Reference:	UNITS	73607-1	73607-2	73607-3	73607-4	73607-5
Your Reference	----------	LPN-V072	LPN-V073	QC13	LPN-V075	LPN-V077
Date Sampled	----------	17/05/2012	17/05/2012	17/05/2012	17/05/2012	18/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	22/05/12	22/05/12	22/05/12	22/05/12	22/05/12
Date analysed	-	23/05/12	23/05/12	23/05/12	23/05/12	23/05/12
Moisture	%	12	19	14	12	12

Moisture		
Our Reference:	UNITS	73607-6
Your Reference	----------	LPN-V078
Date Sampled	----------	18/05/2012
Type of sample		Soil
Date prepared	-	22/05/12
Date analysed	-	23/05/12
Moisture	%	0.99

Metals in Water - Dissolved		
Our Reference:	UNITS	73607-7
Your Reference	----------	Rinsate
Date Sampled	----------	18/05/2012
Type of sample		Water
Date digested	-	22/05/2012
Date analysed	-	24/05/2012
Lead - Dissolved	mg/L	<0.03

Method ID	Methodology Summary
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Inorg-008	Moisture content determined by heating at 105 deg C for a minimum of 4 hours.

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date digested	-			22/05/2012	[NT]	[NT]	LCS-1	22/05/2012
Date analysed	-			22/05/2012	[NT]	[NT]	LCS-1	22/05/2012
Lead	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	99%

QUALITY CONTROL Moisture	UNITS	PQL	METHOD	Blank
Date prepared	-			[NT]
Date analysed	-			[NT]
Moisture	%	0.1	Inorg-008	[NT]

QUALITY CONTROL Metals in Water - Dissolved	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date digested	-			22/05/2012	[NT]	[NT]	LCS-W1	2/05/2012
Date analysed	-			22/05/2012	[NT]	[NT]	LCS-W1	24/05/2012
Lead - Dissolved	mg/L	0.03	Metals-020 ICP-AES	<0.03	[NT]	[NT]	LCS-W1	103%

Report Comments:

Asbestos ID was analysed by Approved Identifier:	Not applicable for this job
Asbestos ID was authorised by Approved Signatory:	Not applicable for this job

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NA: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batched of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

SAMPLE RECEIPT ADVICE

Client:

JBS Environmental Pty Ltd
P.O. Box 940
MASCOT NSW 1460

ph: 8338 1013
Fax: 8338 1700

Attention: Alex Boardman, Joanne Rosner

Sample log in details:

Your reference:	**41945, Edmondson Park**
Envirolab Reference:	**73607**
Date received:	21/05/12
Date results expected to be reported:	**28/05/12**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	6 Soils, 1 Water
Turnaround time requested:	Standard
Temperature on receipt	Not applicable
Cooling Method:	None
Sampling Date Provided:	YES

Comments:

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

Contact details:

Please direct any queries to Aileen Hie or Jacinta Hurst
ph: 02 9910 6200 fax: 02 9910 6201
email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au

CHAIN OF CUSTODY

JBS ENVIRONMENTAL

PROJECT NO.: 46994-5
PROJECT NAME: Edmondson Park Rem.
SEND REPORT TO: AB + JR
SEND INVOICE TO: A. Traynor
DATE NEEDED BY: Standard Turn Around
COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

LABORATORY BATCH NO.
SAMPLERS AB
PHONE: 02 8338 1011
QC LEVEL: NEPM 1999 (A)
EMAIL: abeadman@jbsgroup.com.au
jrosner@jbsgroup.com.au

	SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	Lead	NOTES
1	LPN-V072	Soil	17-5-12		Bag		X	
2	LPN-V073	Soil	17-5-12		Bag		X	
3	QC13	Soil	17-5-12		Bag		X	
4	QA13	Soil	17-5-12		Bag		X	Send to SGS
5	LPN-V075	Soil	17-5-12		Bag		X	
6	LPN-V077	Soil	18-5-12		Bag		X	
7	LPN-V078	Soil	18-5-12		Bag		X	
	Rinsate	Water	18-5-12		Bottle		X	

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910-6200

Job No: 73607
Date Received: 21/5/12
Time Received: 11:45
Received by: PT
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

RELINQUISHED BY:
NAME: AB DATE: 21/5/12
OF: JBS Environmental
NAME: DATE:
OF:

METHOD OF SHIPMENT:
CONSIGNMENT NOTE NO.
TRANSPORT CO.
CONSIGNMENT NOTE NO.
TRANSPORT CO

RECEIVED BY:
NAME: Phat DATE: 21/5/12
OF: ELS 11:45
NAME: DATE:
OF:

FOR RECEIVING LAB USE ONLY:
COOLER SEAL – Yes..... No..... Intact..... Broken.....
COOLER TEMP ..... deg C
COOLER SEAL – Yes..... No..... Intact..... Broken.....
COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

JBS Environmental Pty Ltd ABN 67 071 842 638
Phone: (02) 8338-1011
Fax: (02) 8338-1700
128 O'Riordan St, MASCOT NSW 2020
PO Box 940 MASCOT NSW 1460
www.jbsgroup.com.au

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

CERTIFICATE OF ANALYSIS 73701

Client:
JBS Environmental Pty Ltd
P.O. Box 940
MASCOT
NSW 1460

Attention: Alex Boardman, Joanne Rosner

Sample log in details:

Your Reference:	**41945, Edmondson Park**		
No. of samples:	17 Soils		
Date samples received / completed instructions received	22/05/12	/	22/05/12

Analysis Details:
Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	29/05/12	/	25/05/12
Date of Preliminary Report:	Not Issued		

NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Rhian Morgan
Reporting Supervisor

NATA
ACCREDITED FOR TECHNICAL COMPETENCE

Acid Extractable metals in soil						
Our Reference:	UNITS	73701-1	73701-2	73701-3	73701-4	73701-5
Your Reference	----------	LPN-V089	LPN-V091	LPN-VB052	LPN-VB053	LPN-VB054
Date Sampled	----------	21/05/2012	21/05/2012	21/05/2012	21/05/2012	21/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	23/04/2012	23/04/2012	23/04/2012	23/04/2012	23/04/2012
Date analysed	-	23/04/2012	23/04/2012	23/04/2012	23/04/2012	23/04/2012
Lead	mg/kg	15	19	36	18	19

Acid Extractable metals in soil						
Our Reference:	UNITS	73701-6	73701-7	73701-8	73701-9	73701-10
Your Reference	----------	LPN-VB055	LPN-VB056	LPN-VB057	LPN-VB058	LPN-VB050 (051)
Date Sampled	----------	21/05/2012	21/05/2012	21/05/2012	21/05/2012	21/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	23/04/2012	23/04/2012	23/04/2012	23/04/2012	23/04/2012
Date analysed	-	23/04/2012	23/04/2012	23/04/2012	23/04/2012	23/04/2012
Lead	mg/kg	16	23	25	17	16

Acid Extractable metals in soil						
Our Reference:	UNITS	73701-11	73701-12	73701-13	73701-14	73701-15
Your Reference	----------	LPN-V076	LPN-V074	LPN-VB061	LPN-VB062	LPN-VB063
Date Sampled	----------	21/05/2012	21/05/2012	21/05/2012	21/05/2012	21/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	23/04/2012	23/04/2012	23/04/2012	23/04/2012	23/04/2012
Date analysed	-	23/04/2012	23/04/2012	23/04/2012	23/04/2012	23/04/2012
Lead	mg/kg	53	85	18	22	24

Acid Extractable metals in soil			
Our Reference:	UNITS	73701-16	73701-17
Your Reference	----------	LPN-VB59	LPN-VB60
Date Sampled	----------	21/05/2012	21/05/2012
Type of sample		Soil	Soil
Date digested	-	23/04/2012	23/04/2012
Date analysed	-	23/04/2012	23/04/2012
Lead	mg/kg	19	18

Method ID	Methodology Summary
Metals-020 ICP-AES	Determination of various metals by ICP-AES.

Client Reference: 41945, Edmondson Park

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date digested	-			23/04/2012	73701-1	23/04/2012 || 23/04/2012	LCS-1	23/04/2012
Date analysed	-			23/04/2012	73701-1	23/04/2012 || 23/04/2012	LCS-1	23/04/2012
Lead	mg/kg	1	Metals-020 ICP-AES	<1	73701-1	15 || 13 || RPD: 14	LCS-1	102%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	73701-11	23/04/2012 || 23/04/2012	LCS-2	23/04/2012
Date analysed	-	73701-11	23/04/2012 || 23/04/2012	LCS-2	23/04/2012
Lead	mg/kg	73701-11	53 || 48 || RPD: 10	LCS-2	103%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	[NT]	[NT]	73701-2	23/04/2012
Date analysed	-	[NT]	[NT]	73701-2	23/04/2012
Lead	mg/kg	[NT]	[NT]	73701-2	90%

Report Comments:

Asbestos ID was analysed by Approved Identifier:	Not applicable for this job
Asbestos ID was authorised by Approved Signatory:	Not applicable for this job

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NA: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batched of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

CHAIN OF CUSTODY

JBS ENVIRONMENTAL

PROJECT NO.: 43145
PROJECT NAME: Edmondson Park Rem.
SEND REPORT TO: AB + TR SEND INVOICE TO: A. Trajan
DATE NEEDED BY: Standard Turn Around
COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

LABORATORY BATCH NO.
SAMPLERS AB
PHONE: 02 8338 1011
QC LEVEL: NEPM 1999 ✓
EMAIL: aboardman@jbsgroup.com.au; jrosner@jbsgroup.com.au

	SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	Lead
1-	LPN-VO80	Soil	21-5-12		Bag		X
2-	LPN-VO81	Soil	21-5-12		Bag		X
3-	LPN-VO82	Soil	21-5-12		Bag		X
4-	QC 14	Soil	21-5-12		Bag		X
	QC 15	Soil	21-5-12		Bag		X
5-	LPN-VB083	Soil	21-5-12		Bag		X
6-	LPN-VB084	Soil	21-5-12		Bag		X
7-	LPN-VO85	Soil	21-5-12		Bag		X
8-	LPN-VO86	Soil	21-5-12		Bag		X
9-	LPN-VO87	Soil	21-5-12		Bag		X
10-	LPN-VO88	Soil	21-5-12		Bag		X
11-	LPN-VO90	Soil	21-5-12		Bag		X
12-	LPN-VO92	Soil	21-5-12		Bag		X
13-	LPN-VB047	Soil	21-5-12		Bag		X
14-	LPN-VB048	Soil	21-5-12		Bag		X
15-	LPN-VB049	Soil	21-5-12		Bag		X
16-	QC15	Soil	21-5-12		Bag		X
	QC 16	Soil	21-5-12		Bag		X

NOTES

Environs
Endeavour Geotechnics
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 73702
Date Received: 22/5/12
Time Received: 11:45
Received by: AW
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

RELINQUISHED BY:
NAME: AB DATE: 21-5-12
OF: JBS Environmental
NAME: DATE:
OF:

METHOD OF SHIPMENT:
CONSIGNMENT NOTE NO.
TRANSPORT CO.
CONSIGNMENT NOTE NO.
TRANSPORT CO

RECEIVED BY:
NAME: Alex J. DATE: 22/5/12
OF: ELS
NAME: DATE:
OF:

FOR RECEIVING LAB USE ONLY:
COOLER SEAL - Yes..... No..... Intact ..... Broken .....
COOLER TEMP ..... deg C
COOLER SEAL - Yes..... No..... Intact ..... Broken .....
COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

17- R01
18- R02

JBS Environmental Pty Ltd ABN 67 071 842 638
Phone: (02) 8338-1011
Fax: (02) 8338-1700
128 O'Riordan St, MASCOT NSW 2020
PO Box 940 MASCOT NSW 1460
www.jbsgroup.com.au

CHAIN OF CUSTODY

JBS ENVIRONMENTAL

PROJECT NO.: 41945
PROJECT NAME: Edmondson Park Rem.
SEND REPORT TO: RB + TR SEND INVOICE TO: A. Mayer
DATE NEEDED BY: Standard Turn Around
COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

LABORATORY BATCH NO.
SAMPLERS RB aboardman@jbsgroup.com.au
PHONE: 02 8338 1011 EMAIL:
QC LEVEL: NEPM 1999 (✓) jrosner@jbsgroup.com.au

	SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	Lead
1-	LPN-VO80	Soil	21-5-12		Bag		X
2-	LPN-VO91	Soil	21-5-12		Bag		X
3-	LPN-VB052	Soil	21-5-12		Bag		X
4-	LPN-VB053	Soil	21-5-12		Bag		X
5-	LPN-VB054	Soil	21-5-12		Bag		X
6-	LPN-VB055	Soil	21-5-12		Bag		X
7-	LPN-VB056	Soil	21-5-12		Bag		X
8-	LPN-VB057	Soil	21-5-12		Bag		X
9-	LPN-VB058	Soil	21-5-12		Bag		X
10-	LPN-VB059	Soil	21-5-12		Bag		X
11-	LPN-VO76	Soil	21-5-12		Bag		X
12-	LPN-VO74	Soil	21-5-12		Bag		X
13-	LPN-VB061	Soil	21-5-12		Bag		X
14-	LPN-VB62	Soil	21-5-12		Bag		X
15-	LPN-VB63	Soil	21-5-12		Bag		X
16-	LPN-VB59	Soil	21-5-12		Bag		X
17-	LPN-VB60	Soil	21-5-12		Bag		X

NOTES
Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph. (02) 9910 6200
Job No: 73701
Date Received: 22/5/12
Time Received: 11:45
Received by: AV
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None
*Labelled VB051 on bag.

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: RB DATE: 21-5-12	CONSIGNMENT NOTE NO.	NAME: Alex V. DATE: 22/5/12	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS Environmental	TRANSPORT CO.	OF: ELS	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

JBS Environmental Pty Ltd ABN 67 071 842 638
Phone: (02) 8338-1011
Fax: (02) 8338-1700
128 O'Riordan St, MASCOT NSW 2020
PO Box 940 MASCOT NSW 1460
www.jbsgroup.com.au

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

SAMPLE RECEIPT ADVICE

Client:

JBS Environmental Pty Ltd
P.O. Box 940
MASCOT NSW 1460

ph: 8338 1013
Fax: 8338 1700

Attention: Alex Boardman, Joanne Rosner

Sample log in details:

Your reference:	**41945, Edmondson Park**
Envirolab Reference:	**73701**
Date received:	22/05/12
Date results expected to be reported:	**29/05/12**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	17 Soils
Turnaround time requested:	Standard
Temperature on receipt	Not applicable
Cooling Method:	None
Sampling Date Provided:	YES

Comments:

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

Contact details:

Please direct any queries to Aileen Hie or Jacinta Hurst
ph: 02 9910 6200 fax: 02 9910 6201
email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

CERTIFICATE OF ANALYSIS 73702

Client:
JBS Environmental Pty Ltd
P.O. Box 940
MASCOT
NSW 1460

Attention: Alex Boardman, Joanne Rosner

Sample log in details:

Your Reference:	**41945, Edmondson Park Rem**
No. of samples:	16 Soils, 2 Waters
Date samples received / completed instructions received	22/05/2012 / 22/05/2012

Analysis Details:
Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	29/05/12 / 25/05/12
Date of Preliminary Report:	Not issued

NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Rhian Morgan
Reporting Supervisor

Acid Extractable metals in soil						
Our Reference:	UNITS	73702-1	73702-2	73702-3	73702-4	73702-5
Your Reference	----------	LPN-V080	LPN-V081	LPN-V082	QC14	LPN-VB083
Date Sampled	----------	21/05/2012	21/05/2012	21/05/2012	21/05/2012	21/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	23/04/2012	23/04/2012	23/04/2012	23/04/2012	23/04/2012
Date analysed	-	23/04/2012	23/04/2012	23/04/2012	23/04/2012	23/04/2012
Lead	mg/kg	29	57	33	31	15

Acid Extractable metals in soil						
Our Reference:	UNITS	73702-6	73702-7	73702-8	73702-9	73702-10
Your Reference	----------	LPN-VB084	LPN-V085	LPN-V086	LPN-V087	LPN-V088
Date Sampled	----------	21/05/2012	21/05/2012	21/05/2012	21/05/2012	21/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	23/04/2012	23/04/2012	23/04/2012	23/04/2012	23/04/2012
Date analysed	-	23/04/2012	23/04/2012	23/04/2012	23/04/2012	23/04/2012
Lead	mg/kg	17	16	21	19	17

Acid Extractable metals in soil						
Our Reference:	UNITS	73702-11	73702-12	73702-13	73702-14	73702-15
Your Reference	----------	LPN-V090	LPN-V092	LPN-VB047	LPN-VB048	LPN-VB049
Date Sampled	----------	21/05/2012	21/05/2012	21/05/2012	21/05/2012	21/05/2012
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	23/04/2012	23/04/2012	23/04/2012	23/04/2012	23/04/2012
Date analysed	-	23/04/2012	23/04/2012	23/04/2012	23/04/2012	23/04/2012
Lead	mg/kg	14	15	20	19	11

Acid Extractable metals in soil		
Our Reference:	UNITS	73702-16
Your Reference	----------	QC15
Date Sampled	----------	21/05/2012
Type of sample		Soil
Date digested	-	23/04/2012
Date analysed	-	23/04/2012
Lead	mg/kg	13

Metals in Water - Dissolved			
Our Reference:	UNITS	73702-17	73702-18
Your Reference	----------	R01	R02
Date Sampled	----------	21/05/2012	21/05/2012
Type of sample		Soil	Soil
Date digested	-	23/05/2012	23/05/2012
Date analysed	-	23/05/2012	23/05/2012
Lead - Dissolved	mg/L	<0.03	<0.03

Method ID	Methodology Summary
Metals-020 ICP-AES	Determination of various metals by ICP-AES.

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date digested	-			23/04/2012	73702-3	23/04/2012 || 23/04/2012	LCS-1	23/04/2012
Date analysed	-			23/04/2012	73702-3	23/04/2012 || 23/04/2012	LCS-1	23/04/2012
Lead	mg/kg	1	Metals-020 ICP-AES	<1	73702-3	33 || 35 || RPD: 6	LCS-1	103%
QUALITY CONTROL Metals in Water - Dissolved	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date digested	-			23/05/2012	73702-17	23/05/2012 || 23/05/2012	LCS-W2	23/05/2012
Date analysed	-			23/05/2012	73702-17	23/05/2012 || 23/05/2012	LCS-W2	23/05/2012
Lead - Dissolved	mg/L	0.03	Metals-020 ICP-AES	<0.03	73702-17	<0.03 || <0.03	LCS-W2	95%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	73702-13	23/04/2012 || 23/04/2012	LCS-2	23/04/2012
Date analysed	-	73702-13	23/04/2012 || 23/04/2012	LCS-2	23/04/2012
Lead	mg/kg	73702-13	20 || 16 || RPD: 22	LCS-2	101%
QUALITY CONTROL Metals in Water - Dissolved	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	[NT]	[NT]	73702-18	23/05/2012
Date analysed	-	[NT]	[NT]	73702-18	23/05/2012
Lead - Dissolved	mg/L	[NT]	[NT]	73702-18	92%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	[NT]	[NT]	73702-4	23/04/2012
Date analysed	-	[NT]	[NT]	73702-4	23/04/2012
Lead	mg/kg	[NT]	[NT]	73702-4	94%

Report Comments:

Asbestos ID was analysed by Approved Identifier:	Not applicable for this job
Asbestos ID was authorised by Approved Signatory:	Not applicable for this job

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NA: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batched of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

SAMPLE RECEIPT ADVICE

Client:

JBS Environmental Pty Ltd
P.O. Box 940
MASCOT NSW 1460

ph: 8338 1013
Fax: 8338 1700

Attention: Alex Boardman, Joanne Rosner

Sample log in details:

Your reference:	**41945, Edmondson Park Rem**
Envirolab Reference:	**73702**
Date received:	22/05/2012
Date results expected to be reported:	**29/05/12**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	16 Soils, 2 Waters
Turnaround time requested:	Standard
Temperature on receipt	Ambient
Cooling Method:	None
Sampling Date Provided:	YES

Comments:

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

Contact details:

Please direct any queries to Aileen Hie or Jacinta Hurst
ph: 02 9910 6200 fax: 02 9910 6201
email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

CERTIFICATE OF ANALYSIS 73843

Client:
JBS Environmental Pty Ltd
P.O. Box 940
MASCOT
NSW 1460

Attention: Alex Boardman, Joanne Rosner

Sample log in details:

Your Reference:	**41945, Edmondson Park**		
No. of samples:	2 soils		
Date samples received / completed instructions received	23/05/12	/	23/05/12

Analysis Details:
Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	30/05/12	/	28/05/12
Date of Preliminary Report:	Not issued		

NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Rhian Morgan
Reporting Supervisor

Alex MacLean
Chemist

Acid Extractable metals in soil			
Our Reference:	UNITS	73843-1	73843-2
Your Reference	----------	LPN-VB050	LPN-V079
Date Sampled	----------	22/05/2012	22/05/2012
Type of sample		Soil	Soil
Date digested	-	24/05/2012	24/05/2012
Date analysed	-	24/05/2012	24/05/2012
Lead	mg/kg	12	26

Moisture Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- ----------	73843-1 LPN-VB050 22/05/2012 Soil	73843-2 LPN-V079 22/05/2012 Soil
Date prepared	-	24/05/2012	24/05/2012
Date analysed	-	25/05/2012	25/05/2012
Moisture	%	13	15

Method ID	Methodology Summary
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Inorg-008	Moisture content determined by heating at 105 deg C for a minimum of 4 hours.

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date digested	-			24/05/2012	[NT]	[NT]	LCS-1	24/05/2012
Date analysed	-			24/05/2012	[NT]	[NT]	LCS-1	24/05/2012
Lead	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	98%

QUALITY CONTROL Moisture	UNITS	PQL	METHOD	Blank
Date prepared	-			[NT]
Date analysed	-			[NT]
Moisture	%	0.1	Inorg-008	[NT]

QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	[NT]	[NT]	73843-1	24/05/2012
Date analysed	-	[NT]	[NT]	73843-1	24/05/2012
Lead	mg/kg	[NT]	[NT]	73843-1	90%

Report Comments:

Asbestos ID was analysed by Approved Identifier:	Not applicable for this job
Asbestos ID was authorised by Approved Signatory:	Not applicable for this job

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NA: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batched of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

CHAIN OF CUSTODY

JBS ENVIRONMENTAL

PROJECT NO.: 41945
PROJECT NAME: Edmondson Park Rem
SEND REPORT TO: KB + JR SEND INVOICE TO: A. Trayan
DATE NEEDED BY: Standard Turn Around
COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

LABORATORY BATCH NO.
SAMPLERS KB aboardman@jbsgroup.com.au
PHONE: 02 8338 1011 EMAIL: JRosner@jbsgroup.com.au
QC LEVEL: NEPM 1999 (✓

	SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	1 Lead	NOTES
1	LPN-VB050	Soil	22-5-12		Bag		X	
2	LPH-V079	Soil	22-5-12		Bag		X	
	QA14	Soil	22-5-12		Bag		3 Send to SGS	Quote 11/158
	QA15	Soil	22-5-12		Bag			

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 73843
Date Received: 23/05
Time Received: 17:00
Received by:
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: KB DATE: 23-5-12	CONSIGNMENT NOTE NO.	NAME: Sophie DATE: 23/05	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS Environmental	TRANSPORT CO.	OF: ES	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

JBS Environmental Pty Ltd ABN 67 071 842 638
Phone: (02) 8338-1011
Fax: (02) 8338-1700
128 O'Riordan St, MASCOT NSW 2020
PO Box 940 MASCOT NSW 1460
www.jbsgroup.com.au

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

SAMPLE RECEIPT ADVICE

Client:

JBS Environmental Pty Ltd
P.O. Box 940
MASCOT NSW 1460

ph: 8338 1013
Fax: 8338 1700

Attention: Alex Boardman, Joanne Rosner

Sample log in details:

Your reference:	**41945, Edmondson Park**
Envirolab Reference:	**73843**
Date received:	23/05/12
Date results expected to be reported:	**30/05/12**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	2 soils
Turnaround time requested:	Standard
Temperature on receipt	Cool
Cooling Method:	Ice
Sampling Date Provided:	YES

Comments:

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

Contact details:

Please direct any queries to Aileen Hie or Jacinta Hurst
ph: 02 9910 6200 fax: 02 9910 6201
email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

CERTIFICATE OF ANALYSIS 77808

Client:
JBS Environmental Pty Ltd
P.O. Box 940
MASCOT
NSW 1460

Attention: Joanne Rosner / Alex Boardman

Sample log in details:

Your Reference:	**41945, Edmondson Park Remediation**
No. of samples:	3 Soils
Date samples received / completed instructions received	22/08/12 / 22/08/12

Analysis Details:
Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	29/08/12 / 23/08/12
Date of Preliminary Report:	Not Issued

NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Kim Femia
Approved Signatory

NATA
ACCREDITED FOR TECHNICAL COMPETENCE

Asbestos ID - soils				
Our Reference:	UNITS	77808-1	77808-2	77808-3
Your Reference	----------	VF04-V1	VF04-V2	VF04-V3
Date Sampled	----------	21/08/2012	21/08/2012	21/08/2012
Type of sample		Soil	Soil	Soil
Date analysed	-	23/08/2012	23/08/2012	23/08/2012
Sample mass tested	g	Approx 50g	Approx 50g	Approx 50g
Sample Description	-	Light brown coarse-grained soil & rocks	Light brown coarse-grained soil & rocks	Light brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.

Report Comments:

Asbestos ID was analysed by Approved Identifier: Kim Femia
Asbestos ID was authorised by Approved Signatory: Kim Femia

INS: Insufficient sample for this test
NA: Test not required
<: Less than

PQL: Practical Quantitation Limit
RPD: Relative Percent Difference
>: Greater than

NT: Not tested
NA: Test not required
LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batched of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

SAMPLE RECEIPT ADVICE

Client:

JBS Environmental Pty Ltd
P.O. Box 940
MASCOT NSW 1460

ph: 8338 1013
Fax: 8338 1700

Attention: Joanne Rosner / Alex Boardman

Sample log in details:

Your reference:	**41945, Edmondson Park Remediation**
Envirolab Reference:	**77808**
Date received:	22/08/12
Date results expected to be reported:	**29/08/12**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	3 Soils
Turnaround time requested:	Standard
Temperature on receipt	Not applicable
Cooling Method:	None
Sampling Date Provided:	

Comments:

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

Contact details:

Please direct any queries to Aileen Hie or Jacinta Hurst
ph: 02 9910 6200 fax: 02 9910 6201
email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au

CHAIN OF CUSTODY

JBS ENVIRONMENTAL

PROJECT NO.: 41945
PROJECT NAME: Edmondson Park Remediation
SEND REPORT TO: BB + SB
SEND INVOICE TO: A. Trevaskis
DATE NEEDED BY: ~~Standard Turn Around~~ Standard
COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

LABORATORY BATCH NO.
SAMPLERS BB
PHONE: 02 8338 1011
EMAIL: jrosner@jbsgroup.com.au; atrevaskis@jbsgroup.com.au
QC LEVEL: NEPM 1999 (S)

	SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	Asbestos	NOTES
1-	VF04-V1	Soil	21/8/12		Bag		X	
2-	VF04-V2	Soil	21/8/12		Bag		X	
3-	VF04-V3	Soil	21/8/12		Bag		X	

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 77808
~~Date Received:~~ 22/8/12
Time Received: 16:15
Received by: AW
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: RB DATE: 22/8/12	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS Environmental	TRANSPORT CO.	OF:	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

Appendix L – Summary of Statistical Calculation Sheets

© 2013 JBS Environmental Pty Ltd

General UCL Statistics for Full Data Sets

User Selected Options	
From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Pb walls

General Statistics

Number of Valid Observations	90	Number of Distinct Observations	40

Raw Statistics		Log-transformed Statistics	
Minimum	7	Minimum of Log Data	1.946
Maximum	140	Maximum of Log Data	4.942
Mean	29.73	Mean of log Data	3.222
Median	23	SD of log Data	0.547
SD	21.52		
Coefficient of Variation	0.724		
Skewness	2.581		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.247	Lilliefors Test Statistic	0.151
Lilliefors Critical Value	0.0934	Lilliefors Critical Value	0.0934
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	33.5	95% H-UCL	32.46
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	36.84
95% Adjusted-CLT UCL (Chen-1995)	34.12	97.5% Chebyshev (MVUE) UCL	40.2
95% Modified-t UCL (Johnson-1978)	33.61	99% Chebyshev (MVUE) UCL	46.81
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	2.992	Data do not follow a Discernable Distribution (0.05)	
Theta Star	9.939		
MLE of Mean	29.73		
MLE of Standard Deviation	17.19		
nu star	538.5		
Approximate Chi Square Value (.05)	485.7	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0473	95% CLT UCL	33.46
Adjusted Chi Square Value	484.8	95% Jackknife UCL	33.5
		95% Standard Bootstrap UCL	33.41
Anderson-Darling Test Statistic	4.05	95% Bootstrap-t UCL	34.49
Anderson-Darling 5% Critical Value	0.759	95% Hall's Bootstrap UCL	34.48
Kolmogorov-Smirnov Test Statistic	0.193	95% Percentile Bootstrap UCL	33.68
Kolmogorov-Smirnov 5% Critical Value	0.0948	95% BCA Bootstrap UCL	34.52
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	39.62
		97.5% Chebyshev(Mean, Sd) UCL	43.9
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	52.3
95% Approximate Gamma UCL	32.97		
95% Adjusted Gamma UCL	33.02		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	39.62

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

Pb Base

General Statistics

Number of Valid Observations	65	Number of Distinct Observations	18

Raw Statistics		Log-transformed Statistics	
Minimum	10	Minimum of Log Data	2.303
Maximum	36	Maximum of Log Data	3.584
Mean	17.66	Mean of log Data	2.838
Median	17	SD of log Data	0.261
SD	4.777		
Coefficient of Variation	0.27		
Skewness	1.096		

Relevant UCL Statistics

Normal Distribution Test		Lognormal Distribution Test	
Lilliefors Test Statistic	0.174	Lilliefors Test Statistic	0.125
Lilliefors Critical Value	0.11	Lilliefors Critical Value	0.11
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	18.65	95% H-UCL	18.69
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	20.18
95% Adjusted-CLT UCL (Chen-1995)	18.72	97.5% Chebyshev (MVUE) UCL	21.27
95% Modified-t UCL (Johnson-1978)	18.66	99% Chebyshev (MVUE) UCL	23.42
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	14.28	Data do not follow a Discernable Distribution (0.05)	
Theta Star	1.237		
MLE of Mean	17.66		
MLE of Standard Deviation	4.674		
nu star	1856		
Approximate Chi Square Value (.05)	1757	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0463	95% CLT UCL	18.64
Adjusted Chi Square Value	1755	95% Jackknife UCL	18.65
		95% Standard Bootstrap UCL	18.66
Anderson-Darling Test Statistic	0.879	95% Bootstrap-t UCL	18.79
Anderson-Darling 5% Critical Value	0.75	95% Hall's Bootstrap UCL	18.8
Kolmogorov-Smirnov Test Statistic	0.14	95% Percentile Bootstrap UCL	18.72
Kolmogorov-Smirnov 5% Critical Value	0.11	95% BCA Bootstrap UCL	18.69
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	20.24
		97.5% Chebyshev(Mean, Sd) UCL	21.36
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	23.56
95% Approximate Gamma UCL	18.66		
95% Adjusted Gamma UCL	18.68		
Potential UCL to Use		Use 95% Student's-t UCL	18.65
		or 95% Modified-t UCL	18.66

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

© JBS Environmental Pty Ltd 2013

This document is and shall remain the property of JBS Environmental Pty Ltd. The document may only be used for the purposes for which it was commissioned and in accordance with the Terms of Engagement for the commission. Un-authorised use of this document in any form whatsoever is prohibited.

Document Distribution

Rev No.	Copies	Recipient	Date:
A	1 x Electronic Copy	David Schofield, Landcom Via email: dschofield@landcom.nsw.gov.au	19/03/2013
A	1 X Electronic Copy	David Riddell, Aver Pty Ltd Via email: driddell@aver.com.au	19/03/2013
A	1 x Electronic Copy 1 x Hard copy	Graeme Nyland, Environ Corp Via email: gnyland@environcorp.com PO BOX 560 North Sydney NSW 2060	19/03/2013
0	1 x Electronic Copy	David Schofield, Landcom Via email: dschofield@landcom.nsw.gov.au	24/09/2013
0	1 X Electronic Copy	David Riddell, Aver Pty Ltd Via email: driddell@aver.com.au	24/09/2013
0	1 x Electronic Copy	Graeme Nyland, Environ Corp Via email: gnyland@environcorp.com	24/09/2013

Document Status

Rev No.	Author	Reviewer	Approved for Issue		
		Name	Name	Signature	Date
A	Joanne Rosner	Matthew Bennett	For Client/Auditor Review		19/03/2013
0	Joanne Rosner	Matthew Bennett	Matthew Bennett		24/09/2013

JBS
ENVIRONMENTAL

SYDNEY | PERTH
www.jbsgroup.com.au