coffey environments
SPECIALISTS IN ENVIRONMENTAL, SOCIAL AND SAFETY PERFORMANCE

1st November 2012

University of New South Wales
C/o Capital Insight Pty Ltd
Level 6, 77 Berry Street,
North Sydney
NSW 2060

**Attention: Frank Tong**

Dear Frank

**RE: Assessment of Waste Classification, UNSW Material Sciences Building, Kensington Campus**

## 1 INTRODUCTION

Coffey Environments Australia Pty Ltd (Coffey) was engaged by Capital Insight Pty Ltd (Capital Insight) on behalf of the University of New South Wales (UNSW) to provide waste classification consultancy services for the proposed Material Science Building (MSB) development at the UNSW's campus on Union Road, Kensington NSW (the site).

This assessment was prepared following Coffey's fee proposal dated 4th September 2012 (ref: ENAURHOD04414AA-P01).

## 2 BACKGROUND & OBJECTIVE

Coffey understands that UNSW are seeking to develop the site with a structure referred to as the MSB development, which reportedly comprises a 7 storey building with a single storey basement with formation level established approximately 3m below current ground levels.

A geotechnical and limited environmental assessment at the site was previously undertaken for the site and reported in Coffey Geotechnics 2012, 'Geotechnical and Environmental Report, Proposed MSB Building' dated October 2012, ref: GEOTLCOV24080AC-AB.

This report indicated that fill may be present across the site to a depth of approximately 0.2m below ground level, with deeper fill present in the south eastern corner of the site (greater than 1.5m below ground level). The report also included a preliminary waste classification of soils at the site of general solid waste, with some uncertainty as to the waste classification of soils at location BHMSB-4.

The objective of this project was to make an assessment of the waste classification of soils within the MSB development footprint.

# 3 SCOPE OF WORK

The scope of work undertaken to address the project objective included:

- project planning and management;
- fieldwork;
- laboratory analysis; and
- data assessment and waste classification reporting.

The methodology for the work was based on NSW DECC 2009, 'Waste Classification Guidelines - Part 1: Classifying Waste'

## 3.1 Site Description

The site was located on Union Street in the north western portion of the University of the New South Wales campus in Kensington (refer to Figures 1 and 2). The site comprises an asphalt surfaced car park. Concrete footpaths with occasional landscaped strips were located in the southern edge of the site along Union Road and in the eastern part of the site. Electrical light poles were located within some of these nature strips within the site.

## 3.2 Fieldwork

The fieldwork was undertaken by Priya Dass, a suitably experienced environmental scientist, on 13 October 2012 (in general accordance with Coffey's Standard Operating Procedures (SOPs)).

### 3.2.1 Drilling

Seven soil bores were drilled using a combination of a Geoprobe drilling rig fitted with push tube augers, and a stainless steel hand auger, to depths of between 1.0m and 5.7m below ground surface (bgs).

The locations of boreholes were selected by Coffey, in consideration of the findings in Coffey Geotechnics (2010). The borehole locations are presented in Figure 2. It is noted that borehole location CBH1 is located slightly outside of the 'proposed' MSB footprint boundary, due to constraints associated with cars parked in the car park at the time of the fieldwork and underground services located in that part of the site.

A summary of soil observations made during drilling is presented in Table 3.2.1.

**Table 3.2.1: Sampling Location Observations**

| Unit Description | Material Description | Thickness (m) |
|---|---|---|
| Fill | Fill materials were encountered in each borehole and comprised a number of individual surface layers as follows:<br>• asphalt was encountered in boreholes CBH1, CBH3, CBH4, CBH6 and CBH7 with thicknesses ranging between 50mm and 200mm. | 0.4 – 1.5 |

| Unit Description | Material Description | Thickness (m) |
|---|---|---|
| | • at locations CBH3 and CBH4, the asphalt was underlain by a concrete slab approximately 100mm thick<br>• a thin veneer (<0.05m) of topsoil was encountered in CBH5.<br>Underlying these surface layers, fill materials comprised predominantly a gravelly sand. Occasional fragments of concrete were noted in CBH3 and CBH4.<br>No apparent evidence of odours or staining were observed within the fill materials encountered on site. | |
| Sand | Fine grained sand was observed underlying the fill materials at each borehole location.<br>No apparent evidence of odours or staining were observed within the sand encountered on site. | >3.2 |

Copies of soil bore logs from these assessment works, as well as from Coffey Geotechnics (2010) are attached to this letter.

### 3.2.2 Soil Sampling

Samples were collected from the Geoprobe push tube casings or directly from the hand auger cutting head. A clean pair of nitrile gloves was used to collect each sample.

Samples were placed in laboratory prepared glass jars and zip lock bags. Samples were labelled using the relevant sampling location identifier, depth and date of collection.

Samples were screened using a calibrated photoionisation detector (PID) to assess the potential presence of ionisable volatile organic compounds (VOC) in the samples. The results of the sample screening are presented in the soil bore logs. In summary, PID readings ranged between 4.0ppm and 16.4ppm, indicating a low likelihood for ionisable VOC to be present in the samples collected.

Three samples were split for the purpose of collecting field duplicates and triplicates. Care was taken to minimise disturbance to the samples during splitting, to mitigate risk of volatile losses. Parent samples and their field duplicates and triplicates are identified in Table 3.2.2.

**Table 3.2.2: Summary of Field Duplicate and Triplicate Samples**

| Parent Sample Reference | Duplicate Sample Reference | Triplicate Sample Reference |
|---|---|---|
| CBH3_(0.35-0.4m) | DUP1 | DUP1A |
| CBH7_(0.05-0.2m) | DUP2 | - |
| CBH7_(0.5-0.6m) | DUP3 | DUP3A |

One trip blank (TB) and one trip spike (TS) were used. A rinsate blank (RB) was collected following decontamination of the hand auger.

Samples were stored in an insulated container with ice bricks and transported to the laboratory under chain of custody (COC) protocols.

## 3.3 Laboratory Analysis

Primary soil samples and duplicate soil samples were analysed by MGTLabmark Environmental Laboratories. Triplicate soil samples were analysed by Envirolab. The samples were submitted for analysis for contaminants of concern, in general accordance with the analytical schedule presented in Table 3.3.

**Table 3.3 Laboratory Analytical Schedule**

| Analytes | Sample Quantity |
|---|---|
| Total Petroleum Hydrocarbons (TPH) | 9 |
| Benzene, Toluene, Ethylbenzene, Xylene (BTEX) | 9 |
| Polycyclic Aromatic Hydrocarbons (PAH) | 9 |
| Heavy Metals (As, Cd, Cr, Cu, Pb, Hg, Ni and Zn) | 9 |
| Organochlorine Pesticides (OCP) | 2 |
| Polychlorinated Biphenyls (PCB) | 2 |
| Asbestos (absence/presence) | 7 |

## 3.4 QA/QC

### 3.4.1 Laboratory Data

An assessment of laboratory data quality was undertaken. The results of this assessment indicated that:

- samples were analysed by a NATA accredited laboratory for the methods used;
- samples were extracted and analysed within appropriate holding times;
- contaminant concentrations in method blanks were less than the laboratory limit of reporting (LOR);
- relative percentage differences (RPD) between laboratory duplicates, were within acceptance limits;
- percentage recoveries in lab control samples were within acceptance limits.
- percentage recoveries in laboratory spikes were within acceptance limits.

Coffey considers the laboratory data used for this waste classification to be suitable for the purposes of this assessment.

### 3.4.2 Fieldwork Data

An assessment of field data quality was undertaken. The results of this assessment indicated the following:

- fieldwork and sample storage/transport was undertaken in general accordance with Coffey standard operating procedures, which are based on industry accepted practice;
- relative percentage differences (RPD) between parent field samples and duplicate field samples, were within acceptance limits for all analytes with the exception of the following:

- RPD of 67% for cadmium for primary sample CBH7_(0.5-0.6m) and duplicate sample DUP3;
- RPD of 176% for lead for primary sample CBH7_(0.5-0.6m) and triplicate sample DUP3A.

This RPD exceedence is considered to be attributable to heterogeneity within the sample of fill material from CBH7 at 0.5-0.6m. As concentrations of cadmium and lead within the primary and duplicate/triplicate samples fall below the general solid waste assessment thresholds, the reported variability is not considered to affect the overall outcome of the waste classification.

- Concentrations of TPH and BTEX in the trip blanks were reported to be below the laboratory limit of reporting (LOR).
- Concentrations of all chemical constituents within the rinsate blank sample RB were below the laboratory LOR with the exception of TPH C6-C10. Concentrations of TPH C6-C10 within sample RB reported a concentration of 0.02mg/L, which is equal to the laboratory LOR. However, given that TPH C6-C10 was reported below the laboratory LOR in all soil samples, it is assessed that the potential effects of cross contamination between borehole locations has not influenced the assessment results.

Coffey has assessed the field data as being generally accurate, reliable and suitable for interpretative purposes.

## 3.5 Soil Assessment

### 3.5.1 Waste Classification Procedure

The waste classification of the material was conducted in general accordance with the procedures for classifying waste as detailed in NSW DECC 2009, 'Waste Classification Guidelines - Part 1: Classifying Waste'.

According to the waste classification procedure:

- Step 1: The material assessed is not considered to be Special Waste;
- Step 2: The material assessed is not considered to be a liquid waste;
- Step 3: The soil material assessed is not considered to be pre-classified. However, the concrete and asphalt materials observed at the site would be pre-classified as general solid waste (non-putrescible), following the demolition of these materials;
- Step 4: The material assessed is not considered to possess hazardous characteristics;
- Step 5: The soil material has been assessed by chemical analysis. Copies of laboratory certificates of analysis are attached.

  Results of laboratory analyses were compared to the relevant contaminant threshold (CT1) values listed in Table 1 and specific contaminant concentration (SCC) values in Table 2 of NSW DECC (2009). The assessment is presented as Table 1, attached to this report. Soil laboratory analytical data from Coffey Geotechnics (2010) is also presented in Table 1.

  Concentrations of chemical constituents were reported below the relevant CT1 values, with the exception of:

  - benzo(a)pyrene in sample CBH4_(1.0-1.1m) of 1.1mg/kg and benzo(a)pyrene in sample BHMSB-4 1.00-1.10 of 1.3mg/kg. Both borehole locations CBH4 and BHMSB-4 are located in close proximity to each other, at the eastern end of the site (refer to Figure 2);
  - lead in sample CBH4_(1.0-1.1m) of 100mg/kg; and

- nickel in sample CBH2_(0.3-0.4m) of 40mg/kg.

Detected concentrations of TPH $C_6$-$C_9$, TPH $C_{10}$-$C_{36}$, total PAH, relevant OCP compounds and PCB was reported below the relevant SCC1 values.

Samples CBH4_(1.0-1.1m) and CBH2_(0.3-0.4m) were submitted for relevant toxicity characteristic leachate procedure (TCLP) analysis. The TCLP results for benzo(a)pyrene (<0.001mg/L), lead (0.27mg/L) and nickel (<0.005mg/L) were less than the TCLP1 values in Table 2 of DECC (2009).

This indicates a classification of General Solid Waste.

- Step 6: The material is comprised of gravelly sand, gravelly sandy silt and sands. NSW DECC (2009) notes that materials that are generally not classified as putrescible include soils, timber, garden trimmings, agricultural, forestry and crop materials, and natural fibrous organic and vegetative materials. Based on Coffey's observations, the material is considered non-putrescible.

### 3.5.2 Virgin Excavated Natural Material Assessment

Virgin excavated natural material has been defined as natural material (such as clay, gravel, sand, soil or rock fines):

- that has been excavated or quarried from areas that are not contaminated with manufactured chemicals, or with process residues, as a result of industrial, commercial, mining or agricultural activities; and
- that does not contain sulfidic ores or soils, or any other waste,

and includes excavated natural material that meets such criteria for virgin excavated natural material as may be approved from time to time by a notice published in the NSW Government Gazette.

A review of NSW Department of Land and Water Conservation 1997, 'Botany Bay Acid Sulfate Soil Risk Map – Edition Two' indicates that the site is located in an area of no known occurrence of acid sulfate soil materials.

Field observations and laboratory analytical results indicate that the material assessed appeared to be natural sands with no evidence of wastes observed.

Sample analysis for CBH4_(3.0-3.1) and CBH7_(0.9-1.0) reported concentrations of:

- organic contaminants analysed for, less than the laboratory limit of reporting; and
- metals analysed for, within background ranges published in Table 5-A of NEPC 1999, 'Schedule B (1) Guideline on the Investigation Levels for Soil and Groundwater',

indicating the soils have not been contaminated with manufactured chemicals or process residues.

## 4 CONCLUSION

Based on observations, available analytical data and the NSW DECC (2009) six step waste classification procedures, Coffey considers that:

- the assessed asphalt material would classify as general solid waste (non putrescible) for the purpose of offsite disposal
- the assessed concrete material would classify as general solid waste (non putrescible) for the purpose of offsite disposal
- the assessed fill material comprised of a mix of gravelly sand, gravelly sandy silt and sand, with some topsoil, would classify as General Solid Waste (non putrescible), for the purpose of off-site disposal.

- the assessed natural sand material underlying the fill material would classify as virgin excavated natural material (VENM), provided the natural sand is not mixed with fill materials, wastes or any other materials that display evidence of contamination (e.g. anthropogenic material, staining, discolouration or odours).

If material being excavated is observed to be different from that described in this assessment and/or shows evidence of potential contamination (e.g. staining, odours, discolouration, buried wastes), the material should be further assessed by a suitably qualified environmental consultant.

## 5 CLOSING

This advice must be read in conjunction with the attached Important Information About Your Coffey Environmental Report.

For and on behalf of Coffey Environments Australia Pty Ltd

Priya Dass
Environmental Scientist

Craig Cowper
Senior Associate

**Attachments:** Figures

Tables

Appendix A – Borehole logs

Appendix B – Laboratory Certificates of Analysis

Appendix C – Chain of Custody Documents

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# Important information about your **Coffey** Environmental Report

## Uncertainties as to what lies below the ground on potentially contaminated sites can lead to remediation costs blow outs, reduction in the value of the land and to delays in the redevelopment of land. These uncertainties are an inherent part of dealing with land contamination. The following notes have been prepared by Coffey to help you interpret and understand the limitations of your report.

### Your report has been written for a specific purpose

Your report has been developed on the basis of a specific purpose as understood by Coffey and applies only to the site or area investigated. For example, the purpose of your report may be:

- To assess the environmental effects of an on-going operation.
- To provide due diligence on behalf of a property vendor.
- To provide due diligence on behalf of a property purchaser.
- To provide information related to redevelopment of the site due to a proposed change in use, for example, industrial use to a residential use.
- To assess the existing baseline environmental, and sometimes geological and hydrological conditions or constraints of a site prior to an activity which may alter the sites environmental, geological or hydrological condition.

For each purpose, a specific approach to the assessment of potential soil and groundwater contamination is required. In most cases, a key objective is to identify, and if possible, quantify risks that both recognised and unrecognised contamination pose to the proposed activity. Such risks may be both financial (for example, clean up costs or limitations to the site use) and physical (for example, potential health risks to users of the site or the general public).

### Scope of Investigations

The work was conducted, and the report has been prepared, in response to specific instructions from the client to whom this report is addressed, within practical time and budgetary constraints, and in reliance on certain data and information made available to Coffey.

The analyses, evaluations, opinions and conclusions presented in this report are based on those instructions, requirements, data or information, and they could change if such instructions etc. are in fact inaccurate or incomplete.

### Subsurface conditions can change

Subsurface conditions are created by natural processes and the activity of man and may change with time.

For example, groundwater levels can vary with time, fill may be placed on a site and pollutants may migrate with time.

Because a report is based on conditions which existed at the time of the subsurface exploration, decisions should not be based on a report whose adequacy may have been affected by time.

Consult Coffey to be advised how time may have impacted on the project and/or on the property.

### Interpretation of factual data

Environmental site assessments identify actual subsurface conditions only at those points where samples are taken and when they are taken. Data derived from indirect field measurements and sometimes other reports on the site are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact with respect to the report purpose and recommended actions.

Actual conditions may differ from those inferred to exist, because no professional, no matter how well qualified, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions.

For this reason, parties involved with land acquisition, management and/or redevelopment should retain the services of Coffey through the development and use of the site to identify variances, conduct additional tests if required, and recommend solutions to unexpected conditions or other problems encountered on site.

### Your report will only give preliminary recommendations

Your report is based on the assumption that the site conditions as revealed through selective point sampling are indicative of actual conditions throughout an area.

This assumption cannot be substantiated until project implementation has commenced and therefore your report recommendations can only be regarded as preliminary. Only Coffey, who prepared the report, is fully familiar with the background information needed to assess whether or not the report's recommendations are valid and whether or not changes should be considered with redevelopment or on-going use of the site. If another party undertakes the implementation of the recommendations of this report there is a risk that the report will be misinterpreted and Coffey cannot be held responsible for such misinterpretation.

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# Important information about your **Coffey** Environmental Report

## Your report is prepared for specific purposes and persons

To avoid misuse of the information contained in your report it is recommended that you confer with Coffey before passing your report on to another party who may not be familiar with the background and the purpose of the report. In particular, a due diligence report for a property vendor may not be suitable for satisfying the needs of a purchaser. Your report should not be applied for any purpose other than that originally specified at the time the report was issued.

## Interpretation by other professionals

Costly problems can occur when other professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, retain Coffey to work with other professionals who are affected by the report. Have Coffey explain the report implications to professionals affected by them and then review plans and specifications produced to see how they have incorporated the report findings.

## Data should not be separated from the report

The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way. Logs, figures, laboratory data, drawings, etc. are customarily included in our reports and are developed by scientists, engineers or geologists based on their interpretation of field logs (assembled by field personnel), field testing and laboratory evaluation of field samples. This information should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

## Contact Coffey for additional assistance

Coffey is familiar with a variety of techniques and approaches that can be used to help reduce risks for all parties to land development and land use. It is common that not all approaches will be necessarily dealt with in your environmental site assessment report due to concepts proposed at that time. As a project progresses through planning and design toward construction and/or maintenance, speak with Coffey to develop alternative approaches to problems that may be of genuine benefit both in time and cost.

## Responsibility

Environmental reporting relies on interpretation of factual information based on judgement and opinion and has a level of uncertainty attached to it, which is far less exact than other design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. To help prevent this problem, a number of clauses have been developed for use in contracts, reports and other documents.

Responsibility clauses do not transfer appropriate liabilities from Coffey to other parties but are included to identify where Coffey's responsibilities begin and end. Their use is intended to help all parties involved to recognise their individual responsibilities. Read all documents from Coffey closely and do not hesitate to ask any questions you may have.

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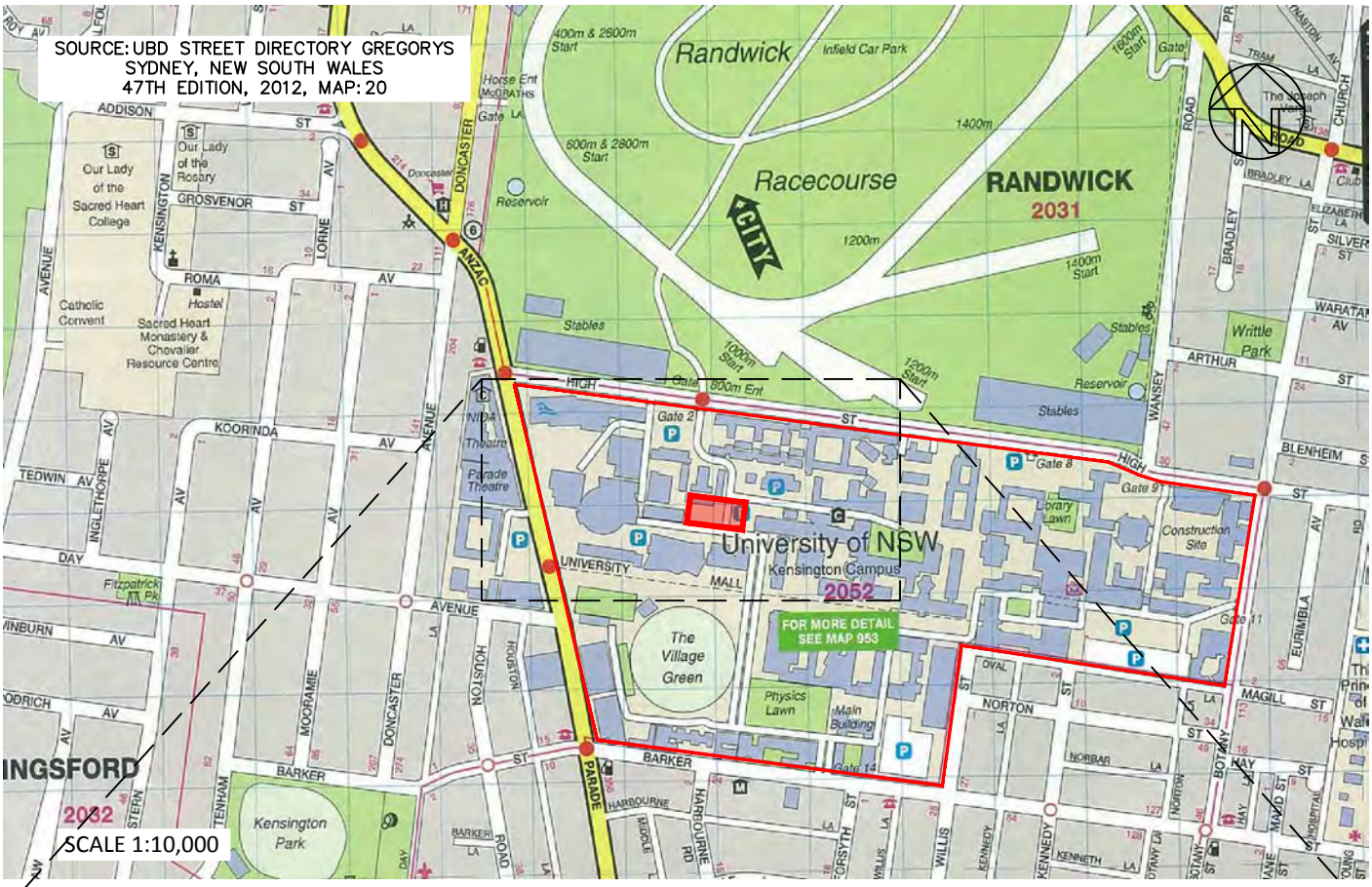
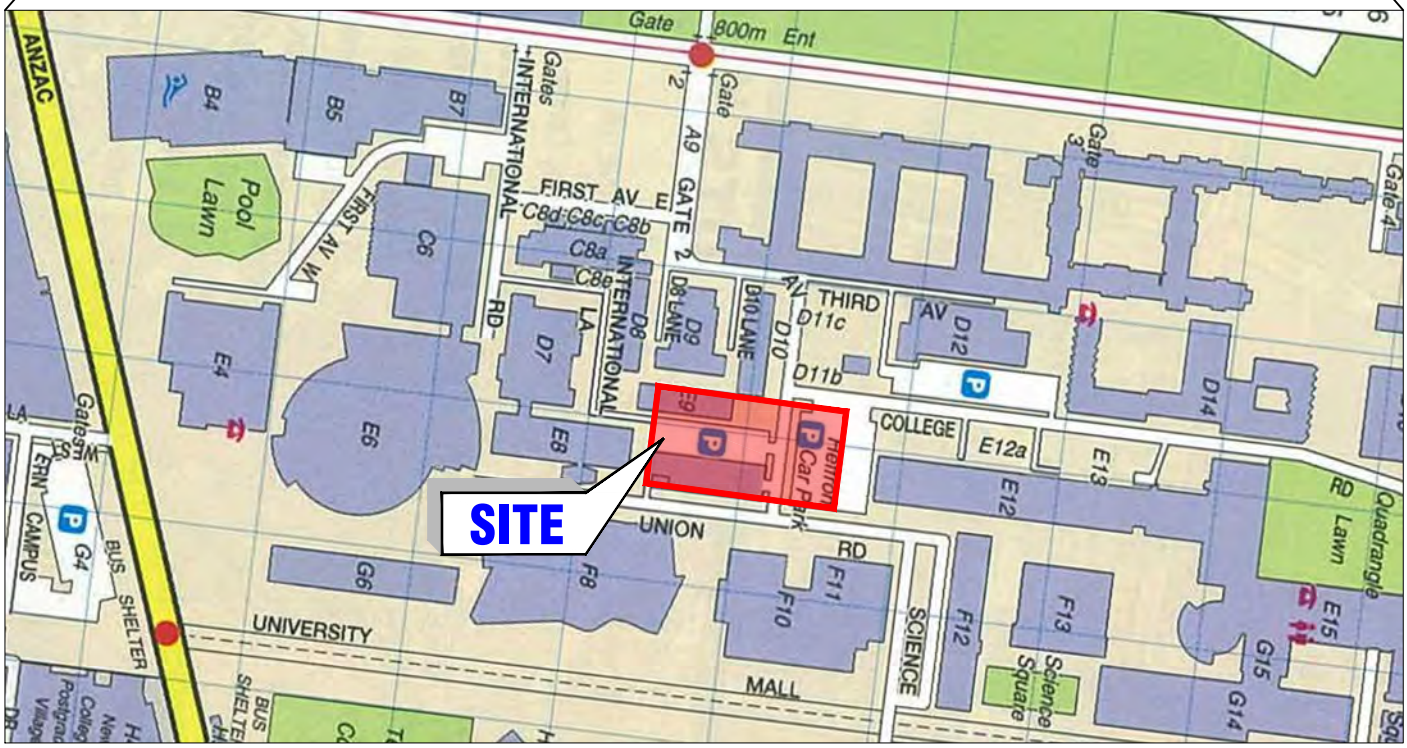
# Figures

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SYDNEY, NEW SOUTH WALES
47TH EDITION, 2012, MAP: 953

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| approved | ML | | project: | WASTE CLASSIFICATION INVESTIGATION, UNSW, PROPOSED MSB BUILDING UNSW, RANDWICK NSW |
| date | 29/10/12 | | title: | SITE LOCATION PLAN |
| scale | AS SHOWN | | project no: ENAURHOD04414AA-D01 | figure no: FIGURE 1 |
| original size | A4 | | | |

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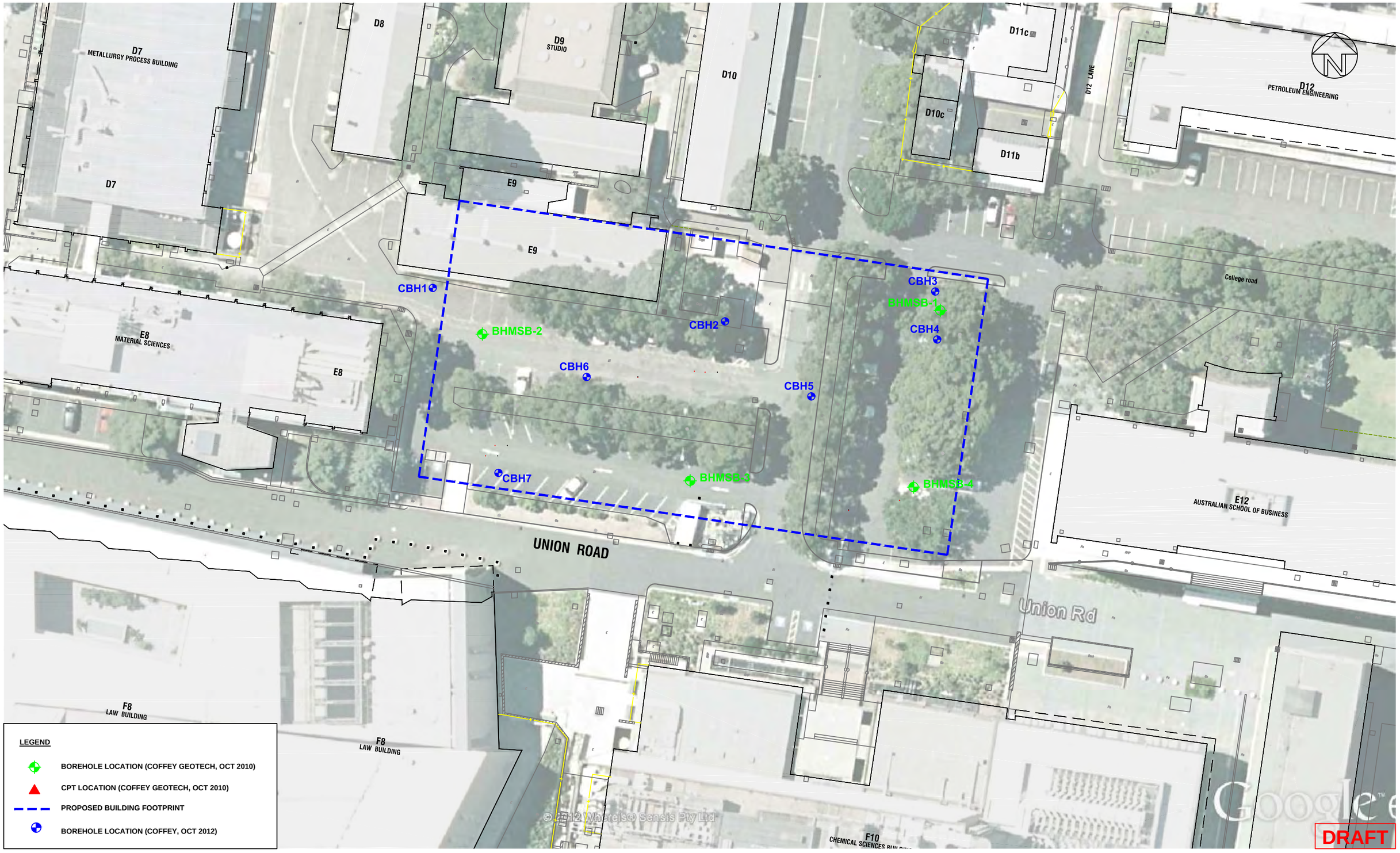


LEGEND

- BOREHOLE LOCATION (COFFEY GEOTECH, OCT 2010)
- CPT LOCATION (COFFEY GEOTECH, OCT 2010)
- PROPOSED BUILDING FOOTPRINT
- BOREHOLE LOCATION (COFFEY, OCT 2012)

| revision | description | drawn | approved | date |
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client: UNSW

project: WASTE CLASSIFICATION INVESTIGATION, UNSW, PROPOSED MSB BUILDING UNSW, RANDWICK NSW

title: BOREHOLE LOCATION PLAN

project no: ENAURHOD04414AA-D01

figure no: FIGURE 2

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# Tables

Table 1
Waste Classification
University of New South Wales, Kensington

| | | | | | | | | | Coffey Investigation - October 2012 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Field_ID** | | | | | | | | | CBH1 (0.5-0.6M) | CBH2 (0.3-0.4M) | CBH2 (0.3-0.4M) TCLP | CBH3 (1.0-1.1M) | CBH4 (1.0-1.1M) | CBH4 (1.0-1.1M) TCLP | CBH4 (3.0-3.1M) | CBH5 (1.0-1.1M) | CBH6 (0.4-0.5M) | CBH7 (0.5-0.6M) |
| **Sample_Depth_Range** | | | | | | | | | 0.5-0.6 | 0.3-0.4 | 0.3-0.4 | 1-1.1 | 1-1.1 | 1-1.1 | 3-3.1 | 1-1.1 | 0.4-0.5 | 0.5-0.6 |
| **Sampled_Date-Time** | | | | | | | | | 13/10/2012 | 13/10/2012 | 13/10/2012 | 13/10/2012 | 13/10/2012 | 13/10/2012 | 13/10/2012 | 13/10/2012 | 13/10/2012 | 13/10/2012 |
| **Lab_Report_Number** | | | | | | | | | 355476 | 355476 | 356462-L | 355476 | 355476 | 356462-L | 355476 | 355476 | 355476 | 355476 |
| **Chem_Group** | **ChemName** | **Units** | **EQL** | **General Solid Waste (CT1)** | **Restricted Solid Waste (CT2)** | **General Solid Waste (SCC1)** | **Restricted Solid Waste (SCC2)** | **General Solid Waste (TCLP1)** | | | | | | | | | | |
| TPH | C6 - C9 | mg/kg | 10 | | | 650 | 2600 | | <10 | <10 | - | <10 | <10 | - | <10 | <10 | <10 | <10 |
| | C10 - C14 | mg/kg | 50 | | | | | | <50 | <50 | - | <50 | <50 | - | <50 | <50 | <50 | <50 |
| | C15 - C28 | mg/kg | 100 | | | | | | <100 | <100 | - | <100 | <100 | - | <100 | <100 | <100 | <100 |
| | C29 - C36 | mg/kg | 100 | | | | | | <100 | <100 | - | <100 | <100 | - | <100 | <100 | 170 | <100 |
| | C10 - C36 (Sum of total) | mg/kg | 100 | | | 10000 | 40000 | | <100 | <100 | - | <100 | <100 | - | <100 | <100 | 170 | <100 |
| BTEX | Benzene | mg/kg | 0.5 | 10 | 40 | 18 | 72 | 0.5 | <0.5 | <0.5 | - | <0.5 | <0.5 | - | <0.5 | <0.5 | <0.5 | <0.5 |
| | Ethylbenzene | mg/kg | 0.5 | 600 | 2400 | 1080 | 4320 | 30 | <0.5 | <0.5 | - | <0.5 | <0.5 | - | <0.5 | <0.5 | <0.5 | <0.5 |
| | Toluene | mg/kg | 0.5 | 288 | 1152 | 518 | 2073 | 14.4 | <0.5 | <0.5 | - | <0.5 | <0.5 | - | <0.5 | <0.5 | <0.5 | <0.5 |
| | Xylene (m & p) | mg/kg | 1 | | | | | | <1 | <1 | - | <1 | <1 | - | <1 | <1 | <1 | <1 |
| | Xylene (o) | mg/kg | 0.5 | | | | | | <0.5 | <0.5 | - | <0.5 | <0.5 | - | <0.5 | <0.5 | <0.5 | <0.5 |
| | Xylene Total | mg/kg | 1.5 | 1000 | 4000 | 1800 | 7200 | 50 | <1.5 | <1.5 | - | <1.5 | <1.5 | - | <1.5 | <1.5 | <1.5 | <1.5 |
| | Total BTEX | mg/kg | 1.5 | | | | | | <1.5 | <1.5 | - | <1.5 | <1.5 | - | <1.5 | <1.5 | <1.5 | <1.5 |
| PAH | 1-Methylnaphthalene | mg/kg | 0.1 | | | | | | - | - | - | - | - | - | - | - | - | - |
| | 2-methylnaphthalene | mg/kg | 0.1 | | | | | | - | - | - | - | - | - | - | - | - | - |
| | Acenaphthene | mg/kg | 0.5 | | | | | | <0.5 | <0.5 | - | <0.5 | <0.5 | - | <0.5 | <0.5 | <0.5 | <0.5 |
| | Acenaphthylene | mg/kg | 0.5 | | | | | | <0.5 | <0.5 | - | <0.5 | <0.5 | - | <0.5 | <0.5 | <0.5 | <0.5 |
| | Anthracene | mg/kg | 0.5 | | | | | | <0.5 | <0.5 | - | <0.5 | <0.5 | - | <0.5 | <0.5 | <0.5 | <0.5 |
| | Benzo(a)anthracene | mg/kg | 0.5 | | | | | | <0.5 | <0.5 | - | 0.6 | 0.8 | - | <0.5 | <0.5 | <0.5 | <0.5 |
| | Benzo(a)pyrene | mg/kg | 0.5 | 0.8 | 3.2 | 10 | 23 | 0.04 | <0.5 | <0.5 | - | 0.5 | 1.1 | <0.001 | <0.5 | <0.5 | <0.5 | <0.5 |
| | Benzo(b)&(k)fluoranthene | mg/kg | 1 | | | | | | <1 | <1 | - | 1 | 2 | - | <1 | <1 | <1 | <1 |
| | Benzo(g,h,i)perylene | mg/kg | 0.5 | | | | | | <0.5 | <0.5 | - | 0.5 | 1.1 | - | <0.5 | <0.5 | <0.5 | <0.5 |
| | Chrysene | mg/kg | 0.5 | | | | | | <0.5 | <0.5 | - | 0.9 | 1.4 | - | <0.5 | <0.5 | <0.5 | <0.5 |
| | Dibenz(a,h)anthracene | mg/kg | 0.5 | | | | | | <0.5 | <0.5 | - | <0.5 | <0.5 | - | <0.5 | <0.5 | <0.5 | <0.5 |
| | Fluoranthene | mg/kg | 0.5 | | | | | | 1 | <0.5 | - | 1.4 | 2.5 | - | <0.5 | 0.8 | <0.5 | <0.5 |
| | Fluorene | mg/kg | 0.5 | | | | | | <0.5 | <0.5 | - | <0.5 | <0.5 | - | <0.5 | <0.5 | <0.5 | <0.5 |
| | Indeno(1,2,3-c,d)pyrene | mg/kg | 0.5 | | | | | | <0.5 | <0.5 | - | <0.5 | 0.7 | - | <0.5 | <0.5 | <0.5 | <0.5 |
| | Naphthalene | mg/kg | 0.5 | | | | | | <0.5 | <0.5 | - | <0.5 | <0.5 | - | <0.5 | <0.5 | <0.5 | <0.5 |
| | Phenanthrene | mg/kg | 0.5 | | | | | | <0.5 | <0.5 | - | 0.9 | 1.7 | - | <0.5 | <0.5 | <0.5 | <0.5 |
| | Pyrene | mg/kg | 0.5 | | | | | | 0.9 | <0.5 | - | 1.5 | 2.3 | - | <0.5 | 0.8 | <0.5 | <0.5 |
| | Total PAHs | mg/kg | 1 | | | 200 | 800 | | 1.9 | <1 | - | 7.3 | 14 | - | <1 | 1.6 | <1 | <1 |
| OCP | 4,4-DDE | mg/kg | 0.05 | | | | | | - | <0.05 | - | - | <0.05 | - | - | - | - | - |
| | a-BHC | mg/kg | 0.05 | | | | | | - | <0.05 | - | - | <0.05 | - | - | - | - | - |
| | Aldrin | mg/kg | 0.05 | | | | | | - | <0.05 | - | - | <0.05 | - | - | - | - | - |
| | Aldrin + Dieldrin | mg/kg | | | | | | | - | <0.1 | - | - | <0.1 | - | - | - | - | - |
| | b-BHC | mg/kg | 0.05 | | | | | | - | <0.05 | - | - | <0.05 | - | - | - | - | - |
| | cis-Chlordane | mg/kg | 0.05 | | | | | | - | <0.05 | - | - | <0.05 | - | - | - | - | - |
| | d-BHC | mg/kg | 0.05 | | | | | | - | <0.05 | - | - | <0.05 | - | - | - | - | - |
| | DDD | mg/kg | 0.05 | | | | | | - | <0.05 | - | - | <0.05 | - | - | - | - | - |
| | DDT | mg/kg | 0.2 | | | | | | - | <0.2 | - | - | <0.2 | - | - | - | - | - |
| | DDT+DDE+DDD | mg/kg | | | | | | | - | <0.3 | - | - | <0.3 | - | - | - | - | - |
| | Dieldrin | mg/kg | 0.05 | | | | | | - | <0.05 | - | - | <0.05 | - | - | - | - | - |
| | Endosulfan I | mg/kg | 0.05 | | | | | | - | <0.05 | - | - | <0.05 | - | - | - | - | - |
| | Endosulfan II | mg/kg | 0.05 | | | | | | - | <0.05 | - | - | <0.05 | - | - | - | - | - |
| | Endosulfan sulphate | mg/kg | 0.05 | | | | | | - | <0.05 | - | - | <0.05 | - | - | - | - | - |
| | Endrin | mg/kg | 0.05 | | | | | | - | <0.05 | - | - | <0.05 | - | - | - | - | - |
| | Endrin aldehyde | mg/kg | 0.05 | | | | | | - | <0.05 | - | - | <0.05 | - | - | - | - | - |
| | Endrin ketone | mg/kg | 0.05 | | | | | | - | <0.05 | - | - | <0.05 | - | - | - | - | - |
| | g-BHC (Lindane) | mg/kg | 0.05 | | | | | | - | <0.05 | - | - | <0.05 | - | - | - | - | - |
| | Heptachlor | mg/kg | 0.05 | | | | | | - | <0.05 | - | - | <0.05 | - | - | - | - | - |
| | Heptachlor epoxide | mg/kg | 0.05 | | | | | | - | <0.05 | - | - | <0.05 | - | - | - | - | - |
| | Hexachlorobenzene | mg/kg | 0.05 | | | | | | - | <0.05 | - | - | <0.05 | - | - | - | - | - |
| | Methoxychlor | mg/kg | 0.2 | | | | | | - | <0.2 | - | - | <0.2 | - | - | - | - | - |
| | trans-chlordane | mg/kg | 0.05 | | | | | | - | <0.05 | - | - | <0.05 | - | - | - | - | - |
| Polychlorinated Biphenyls | Aroclor 1016 | mg/kg | 0.5 | | | | | | - | <0.5 | - | - | <0.5 | - | - | - | - | - |
| | Aroclor 1232 | mg/kg | 0.5 | | | | | | - | <0.5 | - | - | <0.5 | - | - | - | - | - |
| | Aroclor 1242 | mg/kg | 0.5 | | | | | | - | <0.5 | - | - | <0.5 | - | - | - | - | - |
| | Aroclor 1248 | mg/kg | 0.5 | | | | | | - | <0.5 | - | - | <0.5 | - | - | - | - | - |
| | Aroclor 1254 | mg/kg | 0.5 | | | | | | - | <0.5 | - | - | <0.5 | - | - | - | - | - |
| | Aroclor 1260 | mg/kg | 0.5 | | | | | | - | <0.5 | - | - | <0.5 | - | - | - | - | - |
| | PCBs (Sum of total) | mg/kg | 0.5 | | | 50 | 50 | | - | <0.5 | - | - | <0.5 | - | - | - | - | - |
| Metals | Arsenic | mg/kg | 1 | 100 | 400 | 500 | 2000 | 5 | <1 | <1 | - | 3 | 1.5 | - | 1.6 | 1.6 | 1 | 2.3 |
| | Cadmium | mg/kg | 0.1 | 20 | 80 | 100 | 400 | 1 | 0.2 | 0.4 | - | 0.2 | 0.2 | - | 0.1 | 0.1 | 0.5 | 0.1 |
| | Chromium | mg/kg | 2 | | | | | | <2 | <2 | - | <2 | 3.1 | - | <2 | <2 | <2 | 2 |
| | Copper | mg/kg | 2 | | | | | | 9.4 | 45 | - | 6.5 | 13 | - | <2 | 13 | 32 | 4.8 |
| | Lead | mg/kg | 2 | 100 | 400 | 1500 | 6000 | 5 | 44 | 43 | - | 44 | 100 | 0.27 | 2.3 | 41 | 23 | 7.6 |
| | Mercury | mg/kg | 0.05 | 4 | 16 | 50 | 200 | 0.2 | 0.16 | 0.09 | - | 0.13 | 0.29 | - | <0.05 | 0.13 | 0.68 | <0.05 |
| | Nickel | mg/kg | 1 | 40 | 160 | 1050 | 4200 | 2 | 3.4 | 40 | <0.05 | 1.4 | 2.1 | - | <1 | 2.3 | 34 | <1 |
| | Zinc | mg/kg | 5 | | | | | | 33 | 71 | - | 32 | 62 | - | <5 | 26 | 40 | 11 |
| Material | Asbestos | | | | | | | | Not Detected | Not Detected | - | Not Detected | Not Detected | - | - | Not Detected | Not Detected | Not Detected |

Notes:
* Reported in mg/L
- Not Analysed/Reported

Table 1
Waste Classification
University of New South Wales, Kensington

| Field_ID | CBH7_(0.9-1.0M) | DUP3 | TB | TS |
|---|---|---|---|---|
| Sample_Depth_Range | 0.9-1 | | | |
| Sampled_Date-Time | 13/10/2012 | 13/10/2012 | 13/10/2012 | 13/10/2012 |
| Lab_Report_Number | 355476 | 355476 | 355476 | 355476 |

| Chem_Group | ChemName | Units | EQL | General Solid Waste (CT1) | Restricted Solid Waste (CT2) | General Solid Waste (SCC1) | Restricted Solid Waste (SCC2) | General Solid Waste (TCLP1) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPH | C6 - C9 | mg/kg | 10 | | | 650 | 2600 | | <10 | <10 | <10 | - |
| | C10 - C14 | mg/kg | 50 | | | | | | <50 | <50 | - | - |
| | C15 - C28 | mg/kg | 100 | | | | | | <100 | <100 | - | - |
| | C29 - C36 | mg/kg | 100 | | | | | | <100 | <100 | - | - |
| | C10 - C36 (Sum of total) | mg/kg | 100 | | | 10000 | 40000 | | <100 | <100 | - | - |
| BTEX | Benzene | mg/kg | 0.5 | 10 | 40 | 18 | 72 | 0.5 | <0.5 | <0.5 | <0.5 | 104% |
| | Ethylbenzene | mg/kg | 0.5 | 600 | 2400 | 1080 | 4320 | 30 | <0.5 | <0.5 | <0.5 | 101% |
| | Toluene | mg/kg | 0.5 | 288 | 1152 | 518 | 2073 | 14.4 | <0.5 | <0.5 | <0.5 | 102% |
| | Xylene (m & p) | mg/kg | 1 | | | | | | <1 | <1 | <1 | 101% |
| | Xylene (o) | mg/kg | 0.5 | | | | | | <0.5 | <0.5 | <0.5 | 100% |
| | Xylene Total | mg/kg | 1.5 | 1000 | 4000 | 1800 | 7200 | 50 | <1.5 | <1.5 | <1.5 | 100% |
| | Total BTEX | mg/kg | 1.5 | | | | | | <1.5 | <1.5 | <1.5 | 101% |
| PAH | 1-Methylnaphthalene | mg/kg | 0.1 | | | | | | - | - | - | - |
| | 2-methylnaphthalene | mg/kg | 0.1 | | | | | | - | - | - | - |
| | Acenaphthene | mg/kg | 0.5 | | | | | | <0.5 | <0.5 | - | - |
| | Acenaphthylene | mg/kg | 0.5 | | | | | | <0.5 | <0.5 | - | - |
| | Anthracene | mg/kg | 0.5 | | | | | | <0.5 | <0.5 | - | - |
| | Benzo(a)anthracene | mg/kg | 0.5 | | | | | | <0.5 | <0.5 | - | - |
| | Benzo(a)pyrene | mg/kg | 0.5 | 0.8 | 3.2 | 10 | 23 | 0.04 | <0.5 | <0.5 | - | - |
| | Benzo(b)&(k)fluoranthene | mg/kg | 1 | | | | | | <1 | <1 | - | - |
| | Benzo(g,h,i)perylene | mg/kg | 0.5 | | | | | | <0.5 | <0.5 | - | - |
| | Chrysene | mg/kg | 0.5 | | | | | | <0.5 | <0.5 | - | - |
| | Dibenz(a,h)anthracene | mg/kg | 0.5 | | | | | | <0.5 | <0.5 | - | - |
| | Fluoranthene | mg/kg | 0.5 | | | | | | <0.5 | <0.5 | - | - |
| | Fluorene | mg/kg | 0.5 | | | | | | <0.5 | <0.5 | - | - |
| | Indeno(1,2,3-c,d)pyrene | mg/kg | 0.5 | | | | | | <0.5 | <0.5 | - | - |
| | Naphthalene | mg/kg | 0.5 | | | | | | <0.5 | <0.5 | - | - |
| | Phenanthrene | mg/kg | 0.5 | | | | | | <0.5 | <0.5 | - | - |
| | Pyrene | mg/kg | 0.5 | | | | | | <0.5 | <0.5 | - | - |
| | Total PAHs | mg/kg | 1 | | | 200 | 800 | | <1 | <1 | - | - |
| OCP | 4,4-DDE | mg/kg | 0.05 | | | | | | - | - | - | - |
| | a-BHC | mg/kg | 0.05 | | | | | | - | - | - | - |
| | Aldrin | mg/kg | 0.05 | | | | | | - | - | - | - |
| | Aldrin + Dieldrin | mg/kg | | | | | | | - | - | - | - |
| | b-BHC | mg/kg | 0.05 | | | | | | - | - | - | - |
| | cis-Chlordane | mg/kg | 0.05 | | | | | | - | - | - | - |
| | d-BHC | mg/kg | 0.05 | | | | | | - | - | - | - |
| | DDD | mg/kg | 0.05 | | | | | | - | - | - | - |
| | DDT | mg/kg | 0.2 | | | | | | - | - | - | - |
| | DDT+DDE+DDD | mg/kg | | | | | | | - | - | - | - |
| | Dieldrin | mg/kg | 0.05 | | | | | | - | - | - | - |
| | Endosulfan I | mg/kg | 0.05 | | | | | | - | - | - | - |
| | Endosulfan II | mg/kg | 0.05 | | | | | | - | - | - | - |
| | Endosulfan sulphate | mg/kg | 0.05 | | | | | | - | - | - | - |
| | Endrin | mg/kg | 0.05 | | | | | | - | - | - | - |
| | Endrin aldehyde | mg/kg | 0.05 | | | | | | - | - | - | - |
| | Endrin ketone | mg/kg | 0.05 | | | | | | - | - | - | - |
| | g-BHC (Lindane) | mg/kg | 0.05 | | | | | | - | - | - | - |
| | Heptachlor | mg/kg | 0.05 | | | | | | - | - | - | - |
| | Heptachlor epoxide | mg/kg | 0.05 | | | | | | - | - | - | - |
| | Hexachlorobenzene | mg/kg | 0.05 | | | | | | - | - | - | - |
| | Methoxychlor | mg/kg | 0.2 | | | | | | - | - | - | - |
| | trans-chlordane | mg/kg | 0.05 | | | | | | - | - | - | - |
| Polychlorinated Biphenyls | Aroclor 1016 | mg/kg | 0.5 | | | | | | - | - | - | - |
| | Aroclor 1232 | mg/kg | 0.5 | | | | | | - | - | - | - |
| | Aroclor 1242 | mg/kg | 0.5 | | | | | | - | - | - | - |
| | Aroclor 1248 | mg/kg | 0.5 | | | | | | - | - | - | - |
| | Aroclor 1254 | mg/kg | 0.5 | | | | | | - | - | - | - |
| | Aroclor 1260 | mg/kg | 0.5 | | | | | | - | - | - | - |
| | PCBs (Sum of total) | mg/kg | 0.5 | | | 50 | 50 | | - | - | - | - |
| Metals | Arsenic | mg/kg | 1 | 100 | 400 | 500 | 2000 | 5 | <1 | 3.3 | - | - |
| | Cadmium | mg/kg | 0.1 | 20 | 80 | 100 | 400 | 1 | 0.1 | 0.2 | - | - |
| | Chromium | mg/kg | 2 | | | | | | <2 | 2.1 | - | - |
| | Copper | mg/kg | 2 | | | | | | <2 | 4.7 | - | - |
| | Lead | mg/kg | 2 | 100 | 400 | 1500 | 6000 | 5 | <2 | 7 | - | - |
| | Mercury | mg/kg | 0.05 | 4 | 16 | 50 | 200 | 0.2 | <0.05 | <0.05 | - | - |
| | Nickel | mg/kg | 1 | 40 | 160 | 1050 | 4200 | 2 | <1 | 1.4 | - | - |
| | Zinc | mg/kg | 5 | | | | | | <5 | 11 | - | - |
| Material | Asbestos | | | | | | | | - | - | - | - |

Notes:
* Reported in mg/L
- Not Analysed/Reported

Table 1
Waste Classification
University of New South Wales, Kensington

| | | | | | | | | Coffey Geotechnics Investigation - 2010 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Field_ID** | | | | | | | | BH MSB-2 0.20-0.30 | BH MSB-2 1.00-1.10 | BH MSB-3 0.20-0.30 | BH MSB-3 0.50-0.60 | BH MSB-4 0.20-0.30 | BH MSB-4 1.00-1.10 | BH MSB-4 1.50-1.60 |
| **Sample_Depth_Range** | | | | | | | | BH MSB-2 0.20-0.30 | BH MSB-2 1.00-1.10 | BH MSB-3 0.20-0.30 | BH MSB-3 0.50-0.60 | BH MSB-4 0.20-0.30 | BH MSB-4 1.00-1.10 | BH MSB-4 1.50-1.60 |
| **Sampled_Date-Time** | | | | | | | | 18/02/2010 | 18/02/2010 | 18/02/2010 | 18/02/2010 | 18/02/2010 | 18/02/2010 | 18/02/2010 |
| **Lab_Report_Number** | | | | | | | | SE81592 | SE81592 | SE81592 | SE81592 | SE81592 | SE81592 | SE81592 |
| **Chem_Group** | **ChemName** | **Units** | **EQL** | **General Solid Waste (CT1)** | **Restricted Solid Waste (CT2)** | **General Solid Waste (SCC1)** | **Restricted Solid Waste (SCC2)** | **General Solid Waste (TCLP1)** | | | | | | |
| TPH | C6 - C9 | mg/kg | 10 | | | 650 | 2600 | | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| | C10 - C14 | mg/kg | 50 | | | | | | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| | C15 - C28 | mg/kg | 100 | | | | | | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| | C29 - C36 | mg/kg | 100 | | | | | | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| | C10 - C36 (Sum of total) | mg/kg | 100 | | | 10000 | 40000 | | <100 | <100 | <100 | <100 | <100 | <100 | <100 |
| BTEX | Benzene | mg/kg | 0.5 | 10 | 40 | 18 | 72 | 0.5 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| | Ethylbenzene | mg/kg | 0.5 | 600 | 2400 | 1080 | 4320 | 30 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| | Toluene | mg/kg | 0.5 | 288 | 1152 | 518 | 2073 | 14.4 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| | Xylene (m & p) | mg/kg | 1 | | | | | | - | - | - | - | - | - | - |
| | Xylene (o) | mg/kg | 0.5 | | | | | | - | - | - | - | - | - | - |
| | Xylene Total | mg/kg | 1.5 | 1000 | 4000 | 1800 | 7200 | 50 | <0.3 | <0.3 | <0.3 | <0.3 | <0.3 | <0.3 | <0.3 |
| | Total BTEX | mg/kg | 1.5 | | | | | | - | - | - | - | - | - | - |
| PAH | 1-Methylnaphthalene | mg/kg | 0.1 | | | | | | 0.11 | <0.1 | <0.1 | - | 0.23 | <0.1 | - |
| | 2-methylnaphthalene | mg/kg | 0.1 | | | | | | <0.1 | <0.1 | <0.1 | - | 0.21 | <0.1 | - |
| | Acenaphthene | mg/kg | 0.5 | | | | | | <0.1 | <0.1 | <0.1 | - | <0.1 | <0.1 | - |
| | Acenaphthylene | mg/kg | 0.5 | | | | | | <0.1 | <0.1 | <0.1 | - | 0.59 | 0.59 | - |
| | Anthracene | mg/kg | 0.5 | | | | | | <0.1 | <0.1 | 0.15 | - | 0.52 | 0.72 | - |
| | Benzo(a)anthracene | mg/kg | 0.5 | | | | | | 0.11 | <0.1 | 0.72 | - | 0.99 | 1.6 | - |
| | Benzo(a)pyrene | mg/kg | 0.5 | 0.8 | 3.2 | 10 | 23 | 0.04 | 0.06 | <0.05 | 0.59 | - | 0.79 | 1.3 | - |
| | Benzo(b)&(k)fluoranthene | mg/kg | 1 | | | | | | <0.2 | <0.2 | 1 | - | 1.3 | 2.2 | - |
| | Benzo(g,h,i)perylene | mg/kg | 0.5 | | | | | | <0.1 | <0.1 | 0.32 | - | 0.35 | 0.88 | - |
| | Chrysene | mg/kg | 0.5 | | | | | | 0.12 | <0.1 | 0.59 | - | 0.7 | 1.1 | - |
| | Dibenz(a,h)anthracene | mg/kg | 0.5 | | | | | | <0.1 | <0.1 | <0.1 | - | <0.1 | <0.1 | - |
| | Fluoranthene | mg/kg | 0.5 | | | | | | 0.22 | <0.1 | 1.3 | - | 2.4 | 3.8 | - |
| | Fluorene | mg/kg | 0.5 | | | | | | <0.1 | <0.1 | <0.1 | - | 0.42 | 0.35 | - |
| | Indeno(1,2,3-c,d)pyrene | mg/kg | 0.5 | | | | | | <0.1 | <0.1 | 0.36 | - | 0.49 | 0.83 | - |
| | Naphthalene | mg/kg | 0.5 | | | | | | <0.1 | <0.1 | <0.1 | - | 0.13 | <0.1 | - |
| | Phenanthrene | mg/kg | 0.5 | | | | | | 0.23 | <0.1 | 0.59 | - | 2.8 | 3.8 | - |
| | Pyrene | mg/kg | 0.5 | | | | | | 0.17 | <0.1 | 1.3 | - | 1.8 | 3.2 | - |
| | Total PAHs | mg/kg | 1 | | | 200 | 800 | | 1.02 | <1.75 | 6.82 | - | 13.72 | 20.17 | - |
| OCP | 4,4-DDE | mg/kg | 0.05 | | | | | | <0.1 | - | <0.1 | - | - | - | - |
| | a-BHC | mg/kg | 0.05 | | | | | | <0.1 | - | <0.1 | - | - | - | - |
| | Aldrin | mg/kg | 0.05 | | | | | | <0.1 | - | <0.1 | - | - | - | - |
| | Aldrin + Dieldrin | mg/kg | | | | | | | <0.1 | - | <0.1 | - | - | - | - |
| | b-BHC | mg/kg | 0.05 | | | | | | <0.1 | - | <0.1 | - | - | - | - |
| | cis-Chlordane | mg/kg | 0.05 | | | | | | <0.1 | - | <0.1 | - | - | - | - |
| | d-BHC | mg/kg | 0.05 | | | | | | <0.1 | - | <0.1 | - | - | - | - |
| | DDD | mg/kg | 0.05 | | | | | | <0.1 | - | <0.1 | - | - | - | - |
| | DDT | mg/kg | 0.2 | | | | | | <0.1 | - | <0.1 | - | - | - | - |
| | DDT+DDE+DDD | mg/kg | | | | | | | <0.1 | - | <0.1 | - | - | - | - |
| | Dieldrin | mg/kg | 0.05 | | | | | | <0.1 | - | <0.1 | - | - | - | - |
| | Endosulfan I | mg/kg | 0.05 | | | | | | <0.1 | - | <0.1 | - | - | - | - |
| | Endosulfan II | mg/kg | 0.05 | | | | | | <0.1 | - | <0.1 | - | - | - | - |
| | Endosulfan sulphate | mg/kg | 0.05 | | | | | | <0.1 | - | <0.1 | - | - | - | - |
| | Endrin | mg/kg | 0.05 | | | | | | <0.1 | - | <0.1 | - | - | - | - |
| | Endrin aldehyde | mg/kg | 0.05 | | | | | | <0.1 | - | <0.1 | - | - | - | - |
| | Endrin ketone | mg/kg | 0.05 | | | | | | <0.1 | - | <0.1 | - | - | - | - |
| | g-BHC (Lindane) | mg/kg | 0.05 | | | | | | <0.1 | - | <0.1 | - | - | - | - |
| | Heptachlor | mg/kg | 0.05 | | | | | | <0.1 | - | <0.1 | - | - | - | - |
| | Heptachlor epoxide | mg/kg | 0.05 | | | | | | <0.1 | - | <0.1 | - | - | - | - |
| | Hexachlorobenzene | mg/kg | 0.05 | | | | | | <0.1 | - | <0.1 | - | - | - | - |
| | Methoxychlor | mg/kg | 0.2 | | | | | | <0.1 | - | <0.1 | - | - | - | - |
| | trans-chlordane | mg/kg | 0.05 | | | | | | <0.1 | - | <0.1 | - | - | - | - |
| Polychlorinated Biphenyls | Aroclor 1016 | mg/kg | 0.5 | | | | | | <0.1 | - | <0.1 | - | - | - | - |
| | Aroclor 1232 | mg/kg | 0.5 | | | | | | <0.1 | - | <0.1 | - | - | - | - |
| | Aroclor 1242 | mg/kg | 0.5 | | | | | | <0.1 | - | <0.1 | - | - | - | - |
| | Aroclor 1248 | mg/kg | 0.5 | | | | | | <0.1 | - | <0.1 | - | - | - | - |
| | Aroclor 1254 | mg/kg | 0.5 | | | | | | <0.1 | - | <0.1 | - | - | - | - |
| | Aroclor 1260 | mg/kg | 0.5 | | | | | | <0.1 | - | <0.1 | - | - | - | - |
| | PCBs (Sum of total) | mg/kg | 0.5 | | | 50 | 50 | | <0.9 | - | <0.9 | - | - | - | - |
| Metals | Arsenic | mg/kg | 1 | 100 | 400 | 500 | 2000 | 5 | <3 | <3 | <3 | <3 | <3 | <3 | <3 |
| | Cadmium | mg/kg | 0.1 | 20 | 80 | 100 | 400 | 1 | 0.3 | <0.3 | <0.3 | <0.3 | <0.3 | <0.3 | <0.3 |
| | Chromium | mg/kg | 2 | | | | | | 6 | 1.2 | 2.8 | 0.6 | 3.6 | 1.5 | 0.9 |
| | Copper | mg/kg | 2 | | | | | | 32 | <0.5 | 19 | 2.5 | 17 | 4.6 | 2 |
| | Lead | mg/kg | 2 | 100 | 400 | 1500 | 6000 | 5 | 25 | 1 | 45 | 6 | 18 | 12 | 5 |
| | Mercury | mg/kg | 0.05 | 4 | 16 | 50 | 200 | 0.2 | 0.28 | <0.05 | 0.18 | <0.05 | 0.06 | <0.05 | <0.05 |
| | Nickel | mg/kg | 1 | 40 | 160 | 1050 | 4200 | 2 | 34 | 0.7 | 3.8 | 0.8 | 13 | 1.4 | 0.5 |
| | Zinc | mg/kg | 5 | | | | | | 39 | <0.5 | 40 | 3.9 | 25 | 11 | 4.8 |
| Material | Asbestos | | | | | | | | Not Detected | - | Not Detected | - | Not Detected | - | - |

Notes:
* Reported in mg/L
- Not Analysed/Reported

Table 2
Field QAQC
University of New South Wales, Kensington

Field Duplicates (SOIL)
Filter: SDG in('103753-103754')

| | | | | Coffey Investigation - October 2012 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | **SDG** | 103753-103754 | 103753-103754 | | 103753-103754 | Interlab_D | |
| | | | | **Field_ID** | CBH7_(0.5-0.6M) | DUP3 | **RPD** | CBH7_(0.5-0.6M) | Dup 3A | **RPD** |
| | | | | **Sampled_Date-Time** | 13/10/2012 | 13/10/2012 | | 13/10/2012 | 13/10/2012 | |
| **Chem_Group** | **ChemName** | **Units** | **EQL** | | | | | | | |
| BTEX | Benzene | mg/kg | 0.5 (Primary): 0.2 (Interlab) | <0.5 | <0.5 | 0 | | <0.5 | <0.2 | 0 |
| | Ethylbenzene | mg/kg | 0.5 (Primary): 1 (Interlab) | <0.5 | <0.5 | 0 | | <0.5 | <1.0 | 0 |
| | Toluene | mg/kg | 0.5 | <0.5 | <0.5 | 0 | | <0.5 | <0.5 | 0 |
| | Total BTEX | mg/kg | 1.5 | <1.5 | <1.5 | 0 | | <1.5 | | |
| | Xylene (m & p) | mg/kg | 1 (Primary): 2 (Interlab) | <1.0 | <1.0 | 0 | | <1.0 | <2.0 | 0 |
| | Xylene (o) | mg/kg | 0.5 (Primary): 1 (Interlab) | <0.5 | <0.5 | 0 | | <0.5 | <1.0 | 0 |
| | Xylene Total | mg/kg | 1.5 | <1.5 | <1.5 | 0 | | <1.5 | | |
| | C6-C10 less BTEX (F1) | mg/kg | 20 | <20.0 | <20.0 | 0 | | <20.0 | | |
| | | | | | | | | | | |
| Inorganics | Moisture Content (dried @ 103°C) | % | 0.1 | 5.3 | 5.6 | 6 | | 5.3 | | |
| | | | | | | | | | | |
| Metals | Arsenic | mg/kg | 1 (Primary): 4 (Interlab) | 2.3 | 3.3 | 36 | | 2.3 | <4.0 | 0 |
| | Cadmium | mg/kg | 0.1 (Primary): 0.5 (Interlab) | 0.1 | 0.2 | **67** | | 0.1 | <0.5 | 0 |
| | Chromium | mg/kg | 2 (Primary): 1 (Interlab) | 2.0 | 2.1 | 5 | | 2.0 | 3.0 | 40 |
| | Copper | mg/kg | 2 (Primary): 1 (Interlab) | 4.8 | 4.7 | 2 | | 4.8 | 6.0 | 22 |
| | Lead | mg/kg | 2 (Primary): 1 (Interlab) | 7.6 | 7.0 | 8 | | **7.6** | **120.0** | **176** |
| | Mercury | mg/kg | 0.05 (Primary): 0.1 (Interlab) | <0.05 | <0.05 | 0 | | <0.05 | <0.1 | 0 |
| | Nickel | mg/kg | 1 | <1.0 | 1.4 | 33 | | <1.0 | 1.0 | 0 |
| | Zinc | mg/kg | 5 (Primary): 1 (Interlab) | 11.0 | 11.0 | 0 | | 11.0 | 13.0 | 17 |
| | | | | | | | | | | |
| PAH | Acenaphthene | mg/kg | 0.5 (Primary): 0.1 (Interlab) | <0.5 | <0.5 | 0 | | <0.5 | <0.1 | 0 |
| | Acenaphthylene | mg/kg | 0.5 (Primary): 0.1 (Interlab) | <0.5 | <0.5 | 0 | | <0.5 | <0.1 | 0 |
| | Anthracene | mg/kg | 0.5 (Primary): 0.1 (Interlab) | <0.5 | <0.5 | 0 | | <0.5 | <0.1 | 0 |
| | Benzo(a)anthracene | mg/kg | 0.5 (Primary): 0.1 (Interlab) | <0.5 | <0.5 | 0 | | <0.5 | <0.1 | 0 |
| | Benzo(a)pyrene | mg/kg | 0.5 (Primary): 0.05 (Interlab) | <0.5 | <0.5 | 0 | | <0.5 | <0.05 | 0 |
| | Benzo(b)&(k)fluoranthene | mg/kg | 1 (Primary): 0.2 (Interlab) | <1.0 | <1.0 | 0 | | <1.0 | <0.2 | 0 |
| | Benzo(g,h,i)perylene | mg/kg | 0.5 (Primary): 0.1 (Interlab) | <0.5 | <0.5 | 0 | | <0.5 | <0.1 | 0 |
| | Chrysene | mg/kg | 0.5 (Primary): 0.1 (Interlab) | <0.5 | <0.5 | 0 | | <0.5 | <0.1 | 0 |
| | Dibenz(a,h)anthracene | mg/kg | 0.5 (Primary): 0.1 (Interlab) | <0.5 | <0.5 | 0 | | <0.5 | <0.1 | 0 |
| | Fluoranthene | mg/kg | 0.5 (Primary): 0.1 (Interlab) | <0.5 | <0.5 | 0 | | <0.5 | <0.1 | 0 |
| | Fluorene | mg/kg | 0.5 (Primary): 0.1 (Interlab) | <0.5 | <0.5 | 0 | | <0.5 | <0.1 | 0 |
| | Indeno(1,2,3-c,d)pyrene | mg/kg | 0.5 (Primary): 0.1 (Interlab) | <0.5 | <0.5 | 0 | | <0.5 | <0.1 | 0 |
| | Naphthalene | mg/kg | 0.5 (Primary): 0.1 (Interlab) | <0.5 | <0.5 | 0 | | <0.5 | <0.1 | 0 |
| | Naphthalene | mg/kg | 0.5 (Primary): 0.1 (Interlab) | <0.5 | <0.5 | 0 | | <0.5 | <0.1 | 0 |
| | Phenanthrene | mg/kg | 0.5 (Primary): 0.1 (Interlab) | <0.5 | <0.5 | 0 | | <0.5 | <0.1 | 0 |
| | Pyrene | mg/kg | 0.5 (Primary): 0.1 (Interlab) | <0.5 | <0.5 | 0 | | <0.5 | <0.1 | 0 |
| | Total PAHs | mg/kg | 1 | <1.0 | <1.0 | 0 | | <1.0 | | |
| | | | | | | | | | | |
| TPH | F2-NAPHTHALENE | mg/kg | 50 | <50.0 | <50.0 | 0 | | <50.0 | | |
| | C6 - C9 | mg/kg | 10 (Primary): 25 (Interlab) | <10.0 | <10.0 | 0 | | <10.0 | <25.0 | 0 |
| | C10 - C14 | mg/kg | 50 | <50.0 | <50.0 | 0 | | <50.0 | <50.0 | 0 |
| | C15 - C28 | mg/kg | 100 | <100.0 | <100.0 | 0 | | <100.0 | <100.0 | 0 |
| | C29 - C36 | mg/kg | 100 | <100.0 | <100.0 | 0 | | <100.0 | <100.0 | 0 |
| | C10 - C36 (Sum of total) | mg/kg | 100 | <100.0 | <100.0 | 0 | | <100.0 | | |
| | C10 - C16 | mg/kg | 50 | <50.0 | <50.0 | 0 | | <50.0 | | |
| | C16 - C34 | mg/kg | 100 | <100.0 | <100.0 | 0 | | <100.0 | | |
| | C34 - C40 | mg/kg | 100 | <100.0 | <100.0 | 0 | | <100.0 | | |
| | C6 - C10 | mg/kg | 20 | <20.0 | <20.0 | 0 | | <20.0 | | |

*RPDs have only been considered where a concentration is greater than 5 times the EQL.
**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 50 (5-10 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

# Appendix A – Borehole Logs

coffey environments

# Environmental Log - Borehole

| | |
|---|---|
| Borehole No. | ***CBH1*** |
| Sheet | 1 of 1 |
| Office Job No.: | ***ENAURHOD04414AA*** |
| Date started: | ***13.10.2012*** |
| Date completed: | ***13.10.2012*** |
| Logged by: | ***PD*** |
| Checked by: | ***ML*** |

Client: ***University of NSW***

Principal:

Project: ***Assessment of Waste Classification, MSB Development***

Borehole Location: ***Union Street Carpark, Kensington Campus, UNSW***

drill model and mounting: | Easting: | slope: -90° | R.L. Surface:

hole diameter: 250 mm | Northing | bearing: | datum:

| drilling information | | | | | | | material substance | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| method | penetration 1 2 3 | support | water | notes samples, tests, etc | RL | depth metres | graphic log | classification symbol | material: soil type: plasticity or particle characteristics, colour, secondary and minor components. | moisture condition | consistency/ density index | pocket penetro-meter kPa 100 200 300 400 | structure and additional observations |
| | | | | | | | | | **ASPHALT** | | | | |
| HA | | | | E+5.1ppm | | | | | **FILL:** Gravelly SAND: Fine grained, dark grey, medium gravel, dark grey igneous rocks. | D | F | | No odour or staining |
| | | | | | | 0.5 | | | Becoming pale brown to grey, less gravelly. | | | | |
| | | | | E+5.4ppm | | | | SW | **SAND:** Fine grained, yellow to brown. | M | S | | No odour or staining |
| | | | | | | 1.0 | | | | | | | |
| | | | | | | | | | Borehole CBH1 terminated at 1.2m | | | | |
| | | | | | | 1.5 | | | | | | | |

**method**

| | |
|---|---|
| AS | auger screwing* |
| AD | auger drilling* |
| RR | roller/tricone |
| W | washbore |
| CT | cable tool |
| HA | hand auger |
| DT | diatube |
| B | blank bit |
| V | V bit |
| T | TC bit |

*bit shown by suffix e.g. ADT

**support**

M mud N nil
C casing

**penetration**

1 2 3 4 no resistance ranging to refusal

**water**

10/1/98 water level on date shown
water inflow
water outflow

**notes, samples, tests**

| | |
|---|---|
| $U_{50}$ | undisturbed sample 50mm diameter |
| $U_{63}$ | undisturbed sample 63mm diameter |
| D | disturbed sample |
| N | standard penetration test (SPT) |
| N* | SPT - sample recovered |
| Nc | SPT with solid cone |
| V | vane shear (kPa) |
| P | pressuremeter |
| Bs | bulk sample |
| E | environmental sample |
| R | refusal |

**classification symbols and soil description**

based on unified classification system

**moisture**

| | |
|---|---|
| D | dry |
| M | moist |
| W | wet |
| Wp | plastic limit |
| $W_L$ | liquid limit |

**consistency/density index**

| | |
|---|---|
| VS | very soft |
| S | soft |
| F | firm |
| St | stiff |
| VSt | very stiff |
| H | hard |
| Fb | friable |
| VL | very loose |
| L | loose |
| MD | medium dense |
| D | dense |
| VD | very dense |

coffey environments

# Environmental Log - Borehole

| | |
|---|---|
| Borehole No. | ***CBH2*** |
| Sheet | 1 of 1 |
| Office Job No.: | ***ENAURHOD04414AA*** |
| Client: ***University of NSW*** | Date started: ***13.10.2012*** |
| Principal: | Date completed: ***13.10.2012*** |
| Project: ***Assessment of Waste Classification, MSB Development*** | Logged by: ***PD*** |
| Borehole Location: ***Union Street Carpark, Kensington Campus, UNSW*** | Checked by: ***ML*** |

drill model and mounting: | Easting: | slope: -90° | R.L. Surface:

hole diameter: 250 mm | Northing | bearing: | datum:

**drilling information** | **material substance**

| method | penetration 1 2 3 | support | water | notes samples, tests, etc | RL | depth metres | graphic log | classification symbol | material: soil type: plasticity or particle characteristics, colour, secondary and minor components. | moisture condition | consistency/ density index | pocket penetro-meter kPa 100 200 300 400 | structure and additional observations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HA | | | | E+4.5ppm | | | | | **FILL:** Gravelly SAND: Medium to fine grained, yellow to brown. Medium gravel, yellow, brown to dark grey rock pieces. | D | F | | No odour or staining |
| | | | | E+4.4ppm | | | | | | | | | |
| | | | | | | 0.5 | | SW | **SAND:** Fine grained, grey. | D | S | | No odour or staining |
| | | | | | | | | | Becoming yellow to brown. | | | | |
| | | | | | | 1.0 | | | Becoming grey. | | | | |
| | | | | | | | | | Becoming pale grey. | | | | |
| | | | | | | 1.5 | | | Borehole CBH2 terminated at 1.2m | | | | |

**method**

| | |
|---|---|
| AS | auger screwing* |
| AD | auger drilling* |
| RR | roller/tricone |
| W | washbore |
| CT | cable tool |
| HA | hand auger |
| DT | diatube |
| B | blank bit |
| V | V bit |
| T | TC bit |

*bit shown by suffix e.g. ADT

**support**

M mud N nil
C casing

**penetration**

1 2 3 4 no resistance ranging to refusal

**water**

10/1/98 water level on date shown
water inflow
water outflow

**notes, samples, tests**

| | |
|---|---|
| $U_{50}$ | undisturbed sample 50mm diameter |
| $U_{63}$ | undisturbed sample 63mm diameter |
| D | disturbed sample |
| N | standard penetration test (SPT) |
| N* | SPT - sample recovered |
| Nc | SPT with solid cone |
| V | vane shear (kPa) |
| P | pressuremeter |
| Bs | bulk sample |
| E | environmental sample |
| R | refusal |

**classification symbols and soil description**

based on unified classification system

**moisture**

| | |
|---|---|
| D | dry |
| M | moist |
| W | wet |
| Wp | plastic limit |
| $W_L$ | liquid limit |

**consistency/density index**

| | |
|---|---|
| VS | very soft |
| S | soft |
| F | firm |
| St | stiff |
| VSt | very stiff |
| H | hard |
| Fb | friable |
| VL | very loose |
| L | loose |
| MD | medium dense |
| D | dense |
| VD | very dense |

coffey environments

# Environmental Log - Borehole

| | |
|---|---|
| Borehole No. | ***CBH3*** |
| Sheet | 1 of 1 |
| Office Job No.: | ***ENAURHOD04414AA*** |
| Client: ***University of NSW*** | Date started: ***13.10.2012*** |
| Principal: | Date completed: ***13.10.2012*** |
| Project: ***Assessment of Waste Classification, MSB Development*** | Logged by: ***PD*** |
| Borehole Location: ***Union Street Carpark, Kensington Campus, UNSW*** | Checked by: ***ML*** |

drill model and mounting: Geoprobe Track | Easting: | slope: -90° | R.L. Surface:

hole diameter: 250 mm | Northing | bearing: | datum:

**drilling information** | **material substance**

| method | penetration 1 2 3 | support | water | notes samples, tests, etc | RL | depth metres | graphic log | classification symbol | material: soil type: plasticity or particle characteristics, colour, secondary and minor components. | moisture condition | consistency/ density index | pocket penetro-meter kPa 100 200 300 400 | structure and additional observations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | **ASPHALT** | | | | |
| | | | | | | | | | **CONCRETE SLAB** | D | S | | No odour or staining |
| HA | | | | E,DUP1,DUP1a+5.3ppm | | 0.5 | | | **FILL:** Gravelly SAND: Fine grained, grey to brown. Gravel medium, crushed concrete and dark grey stones | | | | |
| | | | | E+6.5ppm | | | | | Less crushed concrete | | | | |
| | | | | E+9.1ppm | | 1.0 | | | | | | | |
| PT | | | | | | 1.5 | | SW | **SAND:** Fine grained, pale yellow to cream with streaks of grey and orange | D | S | | No odour or staining |
| | | | | | | 2.0 | | | Borehole CBH3 terminated at 2.1m | | | | |
| | | | | | | 2.5 | | | | | | | |

**method**

| | |
|---|---|
| AS | auger screwing* |
| AD | auger drilling* |
| RR | roller/tricone |
| W | washbore |
| CT | cable tool |
| HA | hand auger |
| DT | diatube |
| B | blank bit |
| V | V bit |
| T | TC bit |

*bit shown by suffix e.g. ADT

**support**

M mud N nil
C casing

**penetration** 1 2 3 4 — no resistance ranging to refusal

**water**

10/1/98 water level on date shown
water inflow
water outflow

**notes, samples, tests**

| | |
|---|---|
| $U_{50}$ | undisturbed sample 50mm diameter |
| $U_{63}$ | undisturbed sample 63mm diameter |
| D | disturbed sample |
| N | standard penetration test (SPT) |
| N* | SPT - sample recovered |
| Nc | SPT with solid cone |
| V | vane shear (kPa) |
| P | pressuremeter |
| Bs | bulk sample |
| E | environmental sample |
| R | refusal |

**classification symbols and soil description** based on unified classification system

**moisture**

| | |
|---|---|
| D | dry |
| M | moist |
| W | wet |
| Wp | plastic limit |
| $W_L$ | liquid limit |

**consistency/density index**

| | |
|---|---|
| VS | very soft |
| S | soft |
| F | firm |
| St | stiff |
| VSt | very stiff |
| H | hard |
| Fb | friable |
| VL | very loose |
| L | loose |
| MD | medium dense |
| D | dense |
| VD | very dense |

BOREHOLE ENAURHOD04414AA.GPJ COFFEY.GDT 1.11.12

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coffey environments

# Environmental Log - Borehole

| | |
|---|---|
| Borehole No. | ***CBH4*** |
| Sheet | 1 of 1 |
| Office Job No.: | ***ENAURHOD04414AA*** |
| Client: ***University of NSW*** | Date started: ***13.10.2012*** |
| Principal: | Date completed: ***13.10.2012*** |
| Project: ***Assessment of Waste Classification, MSB Development*** | Logged by: ***PD*** |
| Borehole Location: ***Union Street Carpark, Kensington Campus, UNSW*** | Checked by: ***ML*** |

drill model and mounting: Geoprobe Track | Easting: | slope: -90° | R.L. Surface:

hole diameter: 250 mm | Northing | bearing: | datum:

**drilling information** | **material substance**

| method | penetration 1 2 3 | support | water | notes samples, tests, etc | RL | depth metres | graphic log | classification symbol | material: soil type: plasticity or particle characteristics, colour, secondary and minor components. | moisture condition | consistency/ density index | pocket penetro-meter kPa 100 200 300 400 | structure and additional observations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | **ASPHALT** | | | | |
| | | | | | | | | | **CONCRETE SLAB** | | | | |
| HA | | | | E+4.0ppm | | | | | **FILL:** Gravelly SAND: Fine grained, grey to brown. Gravel medium, crushed concrete and dark grey stones. | D | S | | No odour or staining |
| | | | | E+4.3ppm | | | | | | | | | |
| | | | | | | 1 | | | | | | | |
| | | | | E+4.8ppm | | | | | Becoming less gravelly, some minor cream shale gravel. | | | | |
| PT | | | | | | | | SW | **SAND:** Fine grained, cream with streaks of orange. | D | S | | No odour or staining |
| | | | | E+5.2ppm | | 2 | | | | | | | |
| | | | | | | | | | Becoming grey. | | | | |
| | | | | E+6.4ppm | | 3 | | | | | | | |
| | | | | | | | | | Becomes white. | | | | |
| | | | | E+5.5ppm | | 4 | | | | | | | |
| | | | | | | | | | Becomes dark brown. | | F | | |
| | | | | | | | | | Becomes white. | | | | |
| | | | | E+10.3ppm | | 5 | | | Becomes dark brown sand which gradually becomes cream with depth. | M | F | | |
| | | | | | | 6 | | | Borehole CBH4 terminated at 5.7m | | | | |

**method**

| | |
|---|---|
| AS | auger screwing* |
| AD | auger drilling* |
| RR | roller/tricone |
| W | washbore |
| CT | cable tool |
| HA | hand auger |
| DT | diatube |
| B | blank bit |
| V | V bit |
| T | TC bit |

*bit shown by suffix e.g. ADT

**support**

M mud N nil
C casing

**penetration**

1 2 3 4 — no resistance ranging to refusal

**water**

10/1/98 water level on date shown
water inflow
water outflow

**notes, samples, tests**

| | |
|---|---|
| $U_{50}$ | undisturbed sample 50mm diameter |
| $U_{63}$ | undisturbed sample 63mm diameter |
| D | disturbed sample |
| N | standard penetration test (SPT) |
| N* | SPT - sample recovered |
| Nc | SPT with solid cone |
| V | vane shear (kPa) |
| P | pressuremeter |
| Bs | bulk sample |
| E | environmental sample |
| R | refusal |

**classification symbols and soil description**

based on unified classification system

**moisture**

| | |
|---|---|
| D | dry |
| M | moist |
| W | wet |
| Wp | plastic limit |
| $W_L$ | liquid limit |

**consistency/density index**

| | |
|---|---|
| VS | very soft |
| S | soft |
| F | firm |
| St | stiff |
| VSt | very stiff |
| H | hard |
| Fb | friable |
| VL | very loose |
| L | loose |
| MD | medium dense |
| D | dense |
| VD | very dense |

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coffey environments

# Environmental Log - Borehole

| | |
|---|---|
| Borehole No. | ***CBH5*** |
| Sheet | 1 of 1 |
| Office Job No.: | ***ENAURHOD04414AA*** |
| Client: ***University of NSW*** | Date started: ***13.10.2012*** |
| Principal: | Date completed: ***13.10.2012*** |
| Project: ***Assessment of Waste Classification, MSB Development*** | Logged by: ***PD*** |
| Borehole Location: ***Union Street Carpark, Kensington Campus, UNSW*** | Checked by: ***ML*** |

drill model and mounting: Geoprobe Track | Easting: | slope: -90° | R.L. Surface:

hole diameter: 250 mm | Northing | bearing: | datum:

**drilling information** | **material substance**

| method | penetration 1 2 3 | support | water | notes samples, tests, etc | RL | depth metres | graphic log | classification symbol | material: soil type: plasticity or particle characteristics, colour, secondary and minor components. | moisture condition | consistency/ density index | pocket penetro-meter kPa 100 200 300 400 | structure and additional observations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HA | | | | E+8.0ppm | | 0.5 | | | **TOPSOIL**<br>**FILL:** Gravelly Sandy SILT: Brown, medium grained sand. Minor fine gravel, brown and dark grey rock pieces. | D | S | | No odour or staining |
| | | | | E+15.1ppm | | 1.0 | | | Material grey to brown, less gravel and gravel is smaller in size, tree rootlets and wood fragments. | | | | |
| | | | | E+16.4ppm | | | | | | | | | |
| PT | | | | | | 1.5 | | SW | **SAND:** Fine grained, pale yellow to cream. | D | S | | No odour or staining |
| | | | | | | 2.0 | | | Becoming grey. | | | | |
| | | | | | | 2.5 | | | Borehole CBH5 terminated at 2m | | | | |

**method**

| | |
|---|---|
| AS | auger screwing* |
| AD | auger drilling* |
| RR | roller/tricone |
| W | washbore |
| CT | cable tool |
| HA | hand auger |
| DT | diatube |
| B | blank bit |
| V | V bit |
| T | TC bit |

*bit shown by suffix e.g. ADT

**support**

M mud N nil
C casing

**penetration** 1 2 3 4 — no resistance ranging to refusal

**water**

10/1/98 water level on date shown
water inflow
water outflow

**notes, samples, tests**

| | |
|---|---|
| $U_{50}$ | undisturbed sample 50mm diameter |
| $U_{63}$ | undisturbed sample 63mm diameter |
| D | disturbed sample |
| N | standard penetration test (SPT) |
| N* | SPT - sample recovered |
| Nc | SPT with solid cone |
| V | vane shear (kPa) |
| P | pressuremeter |
| Bs | bulk sample |
| E | environmental sample |
| R | refusal |

**classification symbols and soil description** based on unified classification system

**moisture**

| | |
|---|---|
| D | dry |
| M | moist |
| W | wet |
| Wp | plastic limit |
| $W_L$ | liquid limit |

**consistency/density index**

| | |
|---|---|
| VS | very soft |
| S | soft |
| F | firm |
| St | stiff |
| VSt | very stiff |
| H | hard |
| Fb | friable |
| VL | very loose |
| L | loose |
| MD | medium dense |
| D | dense |
| VD | very dense |

BOREHOLE ENAURHOD04414AA.GPJ COFFEY.GDT 1.11.12

Form GEO 5.3 Issue 3 Rev.2

coffey environments

# Environmental Log - Borehole

| | |
|---|---|
| Borehole No. | ***CBH6*** |
| Sheet | 1 of 1 |
| Office Job No.: | ***ENAURHOD04414AA*** |
| Date started: | ***13.10.2012*** |
| Date completed: | ***13.10.2012*** |
| Logged by: | ***PD*** |
| Checked by: | ***ML*** |

Client: ***University of NSW***

Principal:

Project: ***Assessment of Waste Classification, MSB Development***

Borehole Location: ***Union Street Carpark, Kensington Campus, UNSW***

drill model and mounting: | Easting: | slope: -90° | R.L. Surface:

hole diameter: 250 mm | Northing | bearing: | datum:

**drilling information** | **material substance**

| method | penetration 1 2 3 | support | water | notes samples, tests, etc | RL | depth metres | graphic log | classification symbol | material: soil type: plasticity or particle characteristics, colour, secondary and minor components. | moisture condition | consistency/ density index | pocket penetro-meter kPa 100 200 300 400 | structure and additional observations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | **ASPHALT** | | | | |
| HA | | | | E+4.2ppm | | | | | **FILL:** Gravelly SAND: Fine grained, dark grey, medium gravel, dark grey rocks. | D | F | | No odour or staining |
| | | | | E+4.9ppm | | 0.5 | | SW | **SAND:** Fine grained, pale yellow to brown. | D | S | | No odour or staining |
| | | | | | | 1.0 | | | | | | | |
| | | | | | | | | | Borehole CBH6 terminated at 1.2m | | | | |
| | | | | | | 1.5 | | | | | | | |

**method**

| | |
|---|---|
| AS | auger screwing* |
| AD | auger drilling* |
| RR | roller/tricone |
| W | washbore |
| CT | cable tool |
| HA | hand auger |
| DT | diatube |
| B | blank bit |
| V | V bit |
| T | TC bit |

*bit shown by suffix e.g. ADT

**support**

M mud N nil
C casing

**penetration**

1 2 3 4 — no resistance ranging to refusal

**water**

10/1/98 water level on date shown
water inflow
water outflow

**notes, samples, tests**

| | |
|---|---|
| $U_{50}$ | undisturbed sample 50mm diameter |
| $U_{63}$ | undisturbed sample 63mm diameter |
| D | disturbed sample |
| N | standard penetration test (SPT) |
| N* | SPT - sample recovered |
| Nc | SPT with solid cone |
| V | vane shear (kPa) |
| P | pressuremeter |
| Bs | bulk sample |
| E | environmental sample |
| R | refusal |

**classification symbols and soil description**

based on unified classification system

**moisture**

| | |
|---|---|
| D | dry |
| M | moist |
| W | wet |
| Wp | plastic limit |
| $W_L$ | liquid limit |

**consistency/density index**

| | |
|---|---|
| VS | very soft |
| S | soft |
| F | firm |
| St | stiff |
| VSt | very stiff |
| H | hard |
| Fb | friable |
| VL | very loose |
| L | loose |
| MD | medium dense |
| D | dense |
| VD | very dense |

coffey environments

# Environmental Log - Borehole

| | |
|---|---|
| Borehole No. | ***CBH7*** |
| Sheet | 1 of 1 |
| Office Job No.: | ***ENAURHOD04414AA*** |
| Client: ***University of NSW*** | Date started: ***13.10.2012*** |
| Principal: | Date completed: ***13.10.2012*** |
| Project: ***Assessment of Waste Classification, MSB Development*** | Logged by: ***PD*** |
| Borehole Location: ***Union Street Carpark, Kensington Campus, UNSW*** | Checked by: ***ML*** |

drill model and mounting: Geoprobe Track | Easting: | slope: -90° | R.L. Surface:

hole diameter: 250 mm | Northing | bearing: | datum:

**drilling information** | **material substance**

| method | penetration 1 2 3 | support | water | notes samples, tests, etc | RL | depth metres | graphic log | classification symbol | material: soil type: plasticity or particle characteristics, colour, secondary and minor components. | moisture condition | consistency/ density index | pocket penetro-meter kPa 100 200 300 400 | structure and additional observations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | **ASPHALT** | | | | |
| HA | | | | E,DUP2+5.2ppm | | | | | **FILL:** Gravelly SAND: Fine grained, medium gravel, fine to medium dark grey rock pieces. | D | F | | No odour or staining |
| | | | | | | 0.5 | | | Becomes pale grey, less gravel. | | | | |
| | | | | E,DUP3,DUP3A+5.9ppm | | | | SW | **SAND:** Fine grained, orange to brown. | D | S | | No odour or staining |
| | | | | E+6.7ppm | | 1.0 | | | Becomes more pale yellow to brown. | | | | |
| | | | | | | 1.5 | | | Borehole CBH7 terminated at 1m | | | | |

**method**

| | |
|---|---|
| AS | auger screwing* |
| AD | auger drilling* |
| RR | roller/tricone |
| W | washbore |
| CT | cable tool |
| HA | hand auger |
| DT | diatube |
| B | blank bit |
| V | V bit |
| T | TC bit |

*bit shown by suffix e.g. ADT

**support**

M mud N nil
C casing

**penetration**

1 2 3 4 no resistance ranging to refusal

**water**

10/1/98 water level on date shown
water inflow
water outflow

**notes, samples, tests**

| | |
|---|---|
| $U_{50}$ | undisturbed sample 50mm diameter |
| $U_{63}$ | undisturbed sample 63mm diameter |
| D | disturbed sample |
| N | standard penetration test (SPT) |
| N* | SPT - sample recovered |
| Nc | SPT with solid cone |
| V | vane shear (kPa) |
| P | pressuremeter |
| Bs | bulk sample |
| E | environmental sample |
| R | refusal |

**classification symbols and soil description**

based on unified classification system

**moisture**

| | |
|---|---|
| D | dry |
| M | moist |
| W | wet |
| Wp | plastic limit |
| $W_L$ | liquid limit |

**consistency/density index**

| | |
|---|---|
| VS | very soft |
| S | soft |
| F | firm |
| St | stiff |
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| H | hard |
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| L | loose |
| MD | medium dense |
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BOREHOLE ENAURHOD04414AA.GPJ COFFEY.GDT 1.11.12

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coffey geotechnics

# Engineering Log - Borehole

| | |
|---|---|
| Borehole No. | ***BH MSB-1*** |
| Sheet | 1 of 1 |
| Project No: | ***GEOTLCOV24080AC*** |
| Client: | ***University of New South Wales C/- Taylor Thomson Whitting*** |
| Date started: | ***18.9.2010*** |
| Principal: | |
| Date completed: | ***18.9.2010*** |
| Project: | ***UNSW, Proposed MSB Building*** |
| Logged by: | ***DB*** |
| Borehole Location: | ***Car Park behind Applied Sciences Building*** |
| Checked by: | ***DG*** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| drill model and mounting: | Edson 3000 Truck | Easting: | 336269.68 | slope: | -90° | R.L. Surface: | 29.41 |
| hole diameter: | 200 mm | Northing | 6245687.56 | bearing: | N/A | datum: | AHD |

**drilling information** | **material substance**

| method | penetration 1 2 3 | support | water | notes samples, tests, etc | RL | depth metres | graphic log | classification symbol | material: soil type: plasticity or particle characteristics, colour, secondary and minor components. | moisture condition | consistency/ density index | pocket penetro-meter kPa 100 200 300 400 | structure and additional observations |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DT | | | | | 29 | 0 | | | **FILL: BITUMEN** | | | | PAVEMENT |
| | | | | | | | | | **FILL:CONCRETE** | | | | REINFORCED CONCRETE SLAB |
| | | | | | | | | | **FILL: CONCRETE** | | | | REINFORCED CONCRETE SLAB |
| | | | | | | | | | **FILL:CONCRETE** | | | | UNREINFORCED CONCRETE |
| | | | | | 28 | 1 | | | | | | | |
| | | | | | | | | | Borehole BH MSB-1 terminated at 1.5m | | | | |
| | | | | | 27 | 2 | | | | | | | |
| | | | | | 26 | 3 | | | | | | | |
| | | | | | 25 | 4 | | | | | | | |
| | | | | | 24 | 5 | | | | | | | |
| | | | | | 23 | 6 | | | | | | | |
| | | | | | 22 | 7 | | | | | | | |
| | | | | | | 8 | | | | | | | |

**method**

| | |
|---|---|
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| AD | auger drilling* |
| RR | roller/tricone |
| W | washbore |
| CT | cable tool |
| HA | hand auger |
| DT | diatube |
| B | blank bit |
| V | V bit |
| T | TC bit |
| *bit shown by suffix e.g. | ADT |

**support**

M mud N nil
C casing

**penetration**

1 2 3 4 no resistance ranging to refusal

**water**

10/1/98 water level on date shown
water inflow
water outflow

**notes, samples, tests**

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**classification symbols and soil description**
based on unified classification system

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| VSt | very stiff |
| H | hard |
| Fb | friable |
| VL | very loose |
| L | loose |
| MD | medium dense |
| D | dense |
| VD | very dense |