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PHASE 2: ENVIRONMENTAL SITE ASSESSMENT

17-23 Merriwa Street, Gordon NSW

prepared for

Meissen Properties Pty Ltd

July 2013



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REFERENCES

- Australian and New Zealand Environment and Conservation Council (ANZECC) (1996)
– *Drinking Water Guidelines*.
- Australian and New Zealand Environment and Conservation Council (ANZECC) (2000)
– *Guidelines for Fresh and Marine Waters*.
- Department of Urban Affairs and Planning – EPA (1998) “*Managing Land Contamination – Planning Guidelines – SEPP 55 – Remediation of Land*”.
- National Environmental Protection Council (NEPC) (1999) – *National Environmental Protection (Assessment of Site Contamination) Measure*.
- NSW EPA (1994) “*Guidelines for Assessing Service Station Sites*”.
- NSW EPA (1995) “*Sampling Design Guidelines*”.
- NSW EPA (1997) “*Guidelines for Consultants Reporting on Contaminated Sites*”.
- NSW DEC (2006) “*Guidelines for the NSW Site Auditor Scheme*”.
- NSW EPA (2009) “*Guidelines on Significant Risk of Harm from contaminated land and the duty to report*”.
- NSW DECC “*Waste Classification Guidelines, Part 1: Classifying Waste*” (2009).
Department of Environment and Climate Change NSW, Sydney

ABBREVIATIONS

AIP	Australian Institute of Petroleum Ltd
ANZECC	Australian and New Zealand Environment and Conservation Council
AST	Aboveground Storage Tank
BGL	Below Ground Level
BTEX	Benzene, Toluene, Ethyl benzene and Xylene
COC	Chain of Custody
DA	Development Approval
DP	Deposited Plan
DQOs	Data Quality Objectives
EPA	Environment Protection Authority
ESA	Environmental Site Assessment
HIL	Health-Based Soil Investigation Level
LGA	Local Government Area
NEHF	National Environmental Health Forum
NEPC	National Environmental Protection Council
NHMRC	National Health and Medical Research Council
OCP	Organochlorine Pesticides
OPP	Organophosphate Pesticides
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PID	Photo Ionisation Detector
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance, Quality Control
RAC	Remediation Acceptance Criteria
RAP	Remediation Action Plan
RPD	Relative Percentage Difference
SAC	Site Assessment Criteria
SVC	Site Validation Criteria
TCLP	Toxicity Characteristics Leaching Procedure
TPH	Total Petroleum Hydrocarbons
UCL	Upper Confidence Limit
UST	Underground Storage Tank
VHC	Volatile Halogenated Compounds
VOC	Volatile Organic Compounds

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EXECUTIVE SUMMARY

Benviron Group was commissioned by Meissen Properties Pty Ltd to prepare a Phase 2 - Detailed Environmental Site Assessment, which incorporates the properties identified as Lots 40 DP 803006, located at 17-23 Merriwa Street, Gordon NSW (Site). The Site consists of an area of approximately 4241m² and is zoned B4 – Mixed Use in accordance with the State Environmental Planning Policy 2006.

The land is currently occupied by a commercial office building. The redevelopment consists of the construction of a high density residential complex. The Site Assessment forms part of SEPP 55 Guideline (Remediation of Land) with a proposed redevelopment to determine the end land-use suitability of the property.

Soils sampled across the Site were assessed against the Site Acceptance Criteria (SAC) provided by the National Environment Protection (Assessment of Site Contamination) Measure (NEPM) 1999 Table 5-A Column D – Residential with Minimal Access to Soils.

The project objectives of this Phase 2 Detailed Environmental Site Assessment are to satisfy the stated OEH Detailed Site Investigation requirements in accordance with *NSW EPA Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites, 2000*. Specifically this investigation will consider the potential for suspected historical activities to have caused contamination at the Site and determine land use suitability for the current land use.

A number of potential areas of environmental concerns were identified at the site, particularly:

- Historical uses;

- Where pesticides were potentially utilised;
- Carpark areas / driveways where leaks and spills from cars may have occurred;
- Vicinity of degrading building features

Laboratory Results for all samples were below detection limits or relevant guideline criteria - NEPM D "Residential with access to soils". This indicates that the areas of concern identified are of minimal concern and are unlikely to have impacted the site.

As the site is mostly concrete covered and limited fill was identified, the potential for migration of contamination is low and any infiltration of contaminants is also expected to be low. The potential for significant impact of site soils, if contaminated, on the water bodies collecting surface water run-off from the region is considered low.

NSW EPA Ecological Investigation Levels (EIL) were not considered due to the lack of ecological community on the site and based on the scope of the redevelopment it is not expected there will be an ongoing impact on the surrounding ecology.

A hazardous material survey was not undertaken as part of the scope of this investigation, however based on the age of the building it is recommended that a Hazardous material investigation be carried out to provide information for demolition of the building.

Based on the results of this investigation it is considered that the risks to human health and the environment associated with soil contamination at the site are low in the context of the proposed use of the site. The site is therefore considered **to be suitable** for the proposed development, subject to the following recommendations:

- Any soils proposed for removal from the site should initially be classified in accordance with the *“Waste Classification Guidelines, Part 1: Classifying Waste”* NSW DECC (2009).

If during any potential site works, significant odours and / or evidence of gross contamination (including asbestos) not previously detected are encountered, or any other significant unexpected occurrence, site works should cease in that area, at least temporarily, and the environmental consultant should be notified immediately to set up a response to this unexpected occurrence.

1.0 INTRODUCTION

Benviron Group was commissioned by Meissen Properties Pty Ltd to prepare a Phase 2 - Detailed Environmental Site Assessment, which incorporates the properties identified as Lots 40 DP 803006, located at 17-23 Merriwa Street, Gordon NSW (Site). The Site consists of an area of approximately 4241m² and is zoned B4 – Mixed Use in accordance with the State Environmental Planning Policy 2006.

Refer to **Figure 1 and 2- Site Plan and Site Location**.

The land is currently occupied by a commercial office building. The redevelopment consists of the construction of a high density residential complex. The Site Assessment forms part of SEPP 55 Guideline (Remediation of Land) with a proposed redevelopment to determine the end land-use suitability of the property.

Soils sampled across the Site were assessed against the Site Acceptance Criteria (SAC) provided by the National Environment Protection (Assessment of Site Contamination) Measure (NEPM) 1999 Table 5-A Column D – Residential with Minimal Access to Soils.

2.0 OBJECTIVE

The NSW Office of Environment and Heritage (OEH) indicate that a Detailed Site Environmental Investigation should provide comprehensive information on:

- Any issues raised in preliminary investigations;
- The type, extent and level of contamination;
- Contaminant dispersal in the air, surface water, soil and dust;
- The potential effects of contaminants on public health and the environment;
- Where applicable, off-site impacts on soil, sediment and biota; and
- The adequacy and completeness of all information available to be used in making decisions on remediation.

The project objectives of this Phase 2 Detailed Environmental Site Assessment are to satisfy the stated OEH Detailed Site Investigation requirements in accordance with *NSW EPA Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites, 2000*. Specifically this investigation will consider the potential for suspected historical activities to have caused contamination at the Site and determine land use suitability for the current land use.

The proposed investigation program and the Detailed Site Assessment are designed to assess the presence of any unacceptable on site or off site risk to human health or the environment. The report will draw conclusions regarding the land use suitability of the Site for the current commercial land use or provide recommendations to enable such conclusions and determine the need for a Remediation Action Plan.

3.0 SCOPE OF WORKS

The scope of works for this Detailed ESA included:

- Collecting site information, review of historical information and past site practices, (site surveys, site records on waste management practices, NSW Land Titles Office records of ownership, aerial photographs obtained from the NSW Department of Lands, WorkCover NSW records and site interviews);
- A site inspection to identify areas of environmental concern, on-site waste disposal practices and location of sewers, drains, holding tanks, Underground Storage Tanks, Aboveground Storage Tanks and pits, spills and ground discolouration etc.;
- A targeted soil boring/sampling investigative study – formulating and conducting a sampling plan and borehole investigation; the soil samples are taken and submitted for analysis on particular contaminants;
- Laboratory analysis and results from sample analysis – findings and comparison to regulatory guidelines;
- Quality Assurance/Quality Control (QA/QC) – all QA/QC procedures were undertaken in accordance with the Benviron Group Quality Assurance/Quality Control manual;
- Interpretation of results and findings; and
- Recommendations and final conclusions drawn from interpretation of the results.

4.0 SITE IDENTIFICATION AND SITE HISTORY REVIEW

4.1 Site identification

The site is identified as follows:

Table 1: Site Identification Review

Site Identifier	Site Details
Site Location	17-23 Merriwa Street, Gordon
Lot/DP	Lots 40 DP 803006
Nearest Survey Marker	SS61949
Parish	Gordon
County	Cumberland
Site Area	4241m ²
Local Government Area (LGA)	Kuringai Council
Current Zoning	B4 Mixed Use
Future Zoning	No proposed change
Surrounding Land Uses	North – Fitzsimons Lane followed by Commercial Properties South – Merriwa Street followed by Low Density Residential. East – Commercial Properties West – Commercial Properties

4.2 Review of aerial photographs

A number of aerial photographs obtained from the NSW Department of Lands were reviewed as part of this ESA. Copies of the aerial photographs are kept in the offices of Benviron Group and are available for examination upon request. The results of this review are presented in the following table:

Table 2 Review of Aerial Photographs

Year	Site		Surrounding areas
1931	Residential	The site is occupied by a small residential building.	The surrounding areas are mostly residential with some vacant areas on the east of the site.
1951	Commercial	Two large commercial buildings occupy the site.	The surrounding areas to the north are becoming more commercial in nature.
1961	Commercial	No major modifications.	Surrounding areas are mostly commercial in nature at this point in time, with the exception of residential properties to the south of the site.
1970	Commercial	No major modifications.	No major changes
1991	Commercial	No major modifications.	No major changes with the exception of the road development to the north of the site.
2009	Commercial	As above	The surrounding area is now becoming a high density residential area.

In summary, the aerial photographs reveal that the site has been residential up until the 1950s until it was redeveloped into commercial and remains as this until the present day.

4.3 Title search

A review of historical documents held at the NSW Department of Lands offices was undertaken to characterise the previous land use and occupiers of the site.

As reported above, the site is made of Lot 40 DP 803006. The results of the title search indicate that Stourton properties are now the owners of the property purchased in 2006. In summary, the site was originally owned by private owners up until the early 1950s until the a commercial property was constructed on the site.

Refer to **Appendix B – Land Title Information**

4.4 Anecdotal Evidence

No Anecdotal Evidence was available at the time of the investigation.

4.5 NSW OEH records

The NSW DECC publishes records of contaminated sites under Section 58 of the Contaminated Land Management (CLM) Act 1997. The notices relate to investigation and/or remediation of site contamination considered to pose a significant risk of harm under the definition in the CLM Act.

A search of the database revealed that the subject site is not listed. However, there are three listed properties within the Kuringai Council Area, which have several notices relating to remediation orders. All sites are located more than 1km away from the site and therefore are not considered cause for concern.

It should be noted that the OEH record of Notices for Contaminated Land does not provide a record of all contaminated land in NSW.

Refer to **Appendix C – OEH Notice Summary**.

4.6 Previous Reports

No Previous reports were identified during this investigation.

4.7 Summary of site history

In summary:

- Land title information shows that the site was originally owned by private owners in the early 1920-30s until the land was subdivided and then the site was transferred to a succession of commercial owners up until the current period.
- Aerial photographs support that the site has been predominantly commercial up until the present day.
- The information found in the historical sources has been found to be in general concurrence. It is therefore considered that accuracy of this data is acceptable for this investigation.

5.0 REVIEW OF ENVIRONMENTAL INFORMATION

5.1 Topography

The site is located in an undulating area in Gordon. The site slopes in a southerly direction approximately 5-10° at the Merriwa St side of the site and increases to approximately 15-20° at the Fitzsimons Lane side of the site. Site runoffs are expected to flow in a southerly direction towards Merriwa Street.

5.2 Localised geology

The Geological Map of Sydney (Geological Series Sheet 9130, Scale 1:100,000, 1983), published by the Department of Mineral Resources indicates the residual soils within the site may be underlain by two bordering geological profiles. The site is either underlain by Triassic Age Shale of the Wianamatta Group, comprising black to dark grey shale and laminite, or possibly Hawkesbury Sandstone comprising medium to coarse grained quartz sandstone, very minor shale and laminite lenses.

5.3 Local Hydrogeology and Surface waters

A groundwater bore search from the Department of Land and Water Conservation database revealed six bores within a 1km radius of the site. The majority of the bores were located approximately 400m to the north. The final depth of the bores ranged was 10m with a standing water level approximately 7.5m. The bores are listed as being authorised and intended for monitoring purposes.

As outlined above the nearest surface water body is Amaroo Gully. This creek is a small tributary downgradient of the site and stormwater from the local and surrounding areas would be expected to flow towards this water body.

5.4 Acid Sulphate Soils

In order to determine whether there is a potential for acid sulphate soils to be present within a site, reference was made to the NSW Department of Land & Water Conservation (DLWC) *Acid Sulphate Soil Risk Maps* (Edition Two, December 1997, Scale 1:250,000), in particular Map 90 – “Prospect/Parramatta”. A review of the aforementioned map indicated that there is a no known occurrence of Acid Sulphate Soils within the area.

6.0 REVIEW OF CONSTRUCTION AND SERVICE INFORMATION

6.1 Proposed Development

The site is currently occupied by a commercial office building. The site is proposed to be redeveloped into a high density residential housing complex. The development consists of two connected towers with a double basement carpark which is to be excavated during construction.

Refer to **Appendix E** - *Proposed Development Plans*

7.0 SITE VISIT

7.1 General

The site was visited on 21st June 2013 by Benviron Group Environmental Scientists to inspect the site for any potential sources of contamination.

The following items were considered as part of the site visit:

- Description of the building structures;
- Site surroundings;
- Present and past industrial processes and operations at the site;
- Surface water, groundwater, stormwater and sewer;
- Present and past storage of chemicals and wastes associated with site use and their on-site location;
- Waste management practices and management of hazardous materials;
- Presence of Underground Storage Tanks or Above Ground Storage Tanks;
- Odour; and
- Occupational health and safety.

7.2 Site observations

The site is located at 17-23 Merriwa Street, Gordon NSW, in the Kuringai Council municipality. At the time of the site visit the following observations were made:

- The site is mostly rectangular in shape.
- The site was occupied by a two (2) commercial office buildings occupying the site which consisted of general office workers such as engineers and consultants. A spilt level double carpark was also present within the site.
- The building consisted of concrete, timber and steel structure with a metal roof.
- All built areas within the site were in good condition.
- There were no signs of soil staining, plant distress or any other visible indicators of potential contamination.
- There were no olfactory indicators of potential contamination.
- The storage of chemicals was not noted within site.
- There were no visual indicators of underground storage tanks (past or present).
- The only site discharges include stormwater and sewer. Stormwater run-off from the site is collected by drains directly bordering the site. Sewer is most likely to be connected to the mains.

Refer to **Figure 2 – Site Plans**

8.0 AREAS OF ENVIRONMENTAL CONCERNS

Based on the above information, site history and site walkover, the areas of environmental concern (AEC) or associated chemicals of concern (CoC) for the site were identified. These are summarised in the following table.

Table 3: Summary of potential areas and chemicals of concerns

Potential AEC	Description of potentially contaminating activity	CoC	Likelihood of contamination	Remarks
Whole Site	Historical and Current Uses	Various	Moderate	Previous historical uses may have impacted the site. The site is impacts from historical uses are expected to be low-medium as the site may have been industrial since the 1960s.
Whole Site	Imported Fill	Various	Low	The site was mostly concrete covered and minimal imported fill material was detected during the investigation.
Car park areas / driveways	Vehicles may have leaked oil, petrol and other chemicals over time.	Metals, TPH, BTEX	Low	No significant staining was noted on any surfaces.
Vicinity of building Features	Degradation of metal features and asbestos	Metals	Low	If this has occurred, the impact is likely to be restricted to the surface fill. All metal building features appeared in good condition. No Asbestos was noted in the immediate vicinity of the building.

9.0 REVIEW OF DATA QUALITY OBJECTIVES

The DQOs were also prepared using Appendix IV of the Site Auditor Guidelines. These require 7 steps. The steps being

- a. State the problem
- b. Identify the decisions
- c. Identify inputs to decision
- d. Define the study boundaries
- e. Develop a decision rule
- f. Specify limits on decision errors
- g. Optimise the design for obtaining data

9.1 State the Problem

The site requires to be confirmed suitable for the proposed development. The site is proposed to be redeveloped and has had some areas of potential concern, those being possible areas of imported fill of unknown origin, possible spraying of pesticides, degradation of the building materials and leakages from vehicles on site.

Technically defensible evidence needs to be provided so that the identified Site does not present an unacceptable risk to human health or the environment and is suitable for the intended land use.

9.2 Identify the Decisions

The decisions to be made on the contamination and the new environmental data required includes considering relevant site contamination criteria for each medium (fill, soil and sediment). A proposed use of the 95% UCL on the mean concentrations for all soil chemicals of potential concern must be less than the site criteria identified for the relevant land use suitability.

The decisions made in completing this assessment are as follows:

- Does the site or is the site likely to present a risk of harm to humans or the environment
- Is the site currently suitable for the proposed land use being residential with minimal access
- Is there a potential for soil and groundwater contamination
- Is there a potential for offsite migration issues
- Does the sampling results meet the site criteria proposed
- If not, does the site require remediation works

9.3 Identify Inputs to Decision

This step requires the identification of the environmental variables/characteristics that need measuring, identification of which media (fill, soil etc.) need to be collected, identification of the site criteria for each medium of concern and appropriate analytical testing. Inputs include:

- Existing site information
- Site history

- Regional geology, topography and hydrogeology
- Potential contaminants
- Proposed Land Use
- Site assessment criteria
- Results as measured against criteria

9.4 Define the Study Boundaries

Specific spatial and temporal aspects must be provided to identify the boundaries of the investigation and to identify any restrictions that may hinder the assessment process. The site is located at 17-23 Merriwa Street, Gordon NSW and is currently registered as Lots 40 DP 803006. The site is rectangular in shape and is approximately 4241m² in area.

Refer to **Figure 1** - Site Locality and **Figure 2** – Site Layout Plan.

9.5 Develop a Decision Rule

The information obtained through this assessment will be used to characterise the soils and the groundwater on the site in terms of contamination issues and risks to human health and the environment. The decision rule in characterising the site will be as follows:

- Laboratory test results will be measured against the criteria provided within this report
- The site will be deemed not contaminated if the following criteria are fulfilled:
 - Soil and groundwater concentrations are within background levels

- QA/QC shows data can be relied upon
- Results generally meet regulatory criteria
- Results are from NATA accredited laboratories
- Detection limits are below assessment criteria
- Results can be shown to be of minimal concern

9.6 Specify Limits on Decision Errors

The limits on decision errors for this assessment are as follows:

- The assessment criteria adopted from the guidelines within this report have risk probabilities already incorporated.
- The acceptable limits for inter/intra laboratory duplicate sample comparisons are laid out within our protocols.
- The acceptable limits for laboratory QA/QC parameters are based upon the laboratory reported acceptable limits and those stated within the NEPM 1999 Guidelines.

9.7 Optimise the Design for Obtaining Data

A resource-effective sampling and analysis design was undertaken for data collection that satisfies the DQO's. The sampling and analytical plan is designed to avoid Type 1 and Type 2 errors and includes defining minimum sample numbers required to detect contamination as determined with procedures provided in the NSW EPA 1995 Sampling Design Guidelines and AS 4482.1 - 2005 and appropriate quality control procedures.

Furthermore, only laboratories accredited by NATA for the analysis undertaken were used. The laboratory data was assessed from quality data calculated during this

assessment. Field QA/QC protocols adopted and incorporate traceable documentation of procedures used in the sampling and analytical program and in data verification procedures.

10.0 SAMPLING PLAN AND FIELD SAMPLING QA/QC

During the preliminary site assessment of contaminated sites the integrity of data collected is considered vital. With the assessment of the site, a number of measures were taken to ensure the quality of the data. These are as follows:

10.1 Sample Containers

Soil samples collected during the investigation were placed immediately into laboratory prepared glass jars with Teflon lid inserts. Standard identification labels were adhered to each individual container and labelled according to depth, date, sampling team and media collected.

10.2 Decontamination

All equipment used in the sampling program which includes a hand auger, spades and mixing bowl was decontaminated prior to use and between samples to prevent cross contamination. Decontamination of equipment involved the following procedures:

- Cleaning equipment in potable water to remove gross contamination;
- Cleaning in a solution of Decon 90;
- Rinsing in clean demineralised water then wiping with clean lint free cloths;

Water sampling equipment consisted of single use disposable bailer and Low Flow Peristaltic pump with replaceable Teflon tubing.

Benviron Group also adopted a sampling gradient of lowest to highest potential contamination to minimise the impact of cross contamination. This gradient was determined from the historical review and the on-site inspection that was carried out prior to sampling.

Although Benviron Group maintains consistent sampling procedures, a rinsate sample is obtained to ensure false positive samples are not generated and that decontamination procedures are effective in preventing cross contamination. The Rinsate water is collected after being in contact generally with the trowel used for sampling. Analytical results that target the contaminants of concern are compared to a blank sample, which is taken directly from the rinsate water container supplied by the laboratory.

Rinsate sample results are provided in the following table:

Table 4: Rinsate Sample Results

ANALYTE	RINSATE R1 (mg/L) 21.06.12	Practical Quantitation Limits (PQL)
HEAVY METALS		
Arsenic	< 0.005	0.005
Cadmium	< 0.0005	0.0005
Chromium	< 0.005	0.005
Copper	< 0.005	0.005
Lead	< 0.005	0.005
Mercury	< 0.0001	0.0001
Nickel	< 0.005	0.005
Zinc	< 0.005	0.005
BTEX		
Benzene	< 0.001	0.001
Toluene	< 0.001	0.001
Ethyl Benzene	< 0.001	0.001
Xylenes	< 0.003	0.003
TRH		
C6-C9	< 0.02	0.02
C10-C14	< 0.05	0.05
C15-C28	< 0.1	0.1
C29-C36	< 0.1	0.1
PAH		
Benzo(a)pyrene	< 0.001	0.001
Total PAH	< 0.002	0.002
OCP		
Heptachlor	< 0.0005	0.0005
Aldrin	< 0.0005	0.0005
Dieldrin	< 0.0005	0.0005
DDD	< 0.0005	0.0005
DDE	< 0.0005	0.0005
DDT	< 0.002	0.002
Chlordane (trans & cis)	< 0.0005	0.0005
PCB		
Total PCB	< 0.005	0.005

10.3 Sample Tracking, Identification and Holding Times

All samples were forwarded to MGT Labmark and Envirolab under recognised chain of custodies with clear identification outlining the date, location, sampler and sample ID. All samples were recorded by the laboratory as meeting their respective holding times. The sample tracking system is considered adequate for the purposes of sample collection.

10.4 Sample Transport

All samples were packed into an esky with ice from the time of collection. A trip blank and trip spike are collected where appropriate. These were transported under chain of custody from the site to MGT Labmark Pty Ltd a NATA registered laboratory located in Lane Cove. During the project, the laboratory reported that all the samples arrived intact and were analysed within holding times for the respective analytes.

Samples were kept below 4°C at all times, soil samples submitted for asbestos analysis are not required to be kept below 4°C.

10.5 Trip Spike

Trip Spike samples were obtained from the laboratory prior to conducting field sampling where volatile substances are suspected. Benviron Group QA/QC procedures for the collection of environmental samples involves the collection of trip blanks, trip spikes and duplicate samples both intra and inter laboratory.

Trip Spike samples were not collected as part of this investigation. Results indicate that no volatile hydrocarbons were present within the samples and therefore losses most likely would not have occurred.

10.6 Trip Blank

A trip blank accompanied the sampling for the sampling process and is not separated from the sample collection and transportation process. The purpose of the trip blank is to identify whether cross-contamination is occurring during the sample collection and transport process.

Trip Blank samples were not collected as part of this investigation. Results indicate that no volatile hydrocarbons were present within the samples and therefore cross contamination most likely would not have occurred.

10.7 Field Duplicate Samples

Field duplicate samples for soil were prepared in the field through the following process:

- A larger than normal quantity of soil is recovered from the sample location selected for duplication.
- The sample is placed in a decontaminated stainless bowl and mixed as thoroughly as practicable before being divided into equal parts.
- Two Portions of the sub-sample are immediately transferred, one for an intra-laboratory duplicate and another as a sample.
- Samples are placed into a labelled, laboratory supplied 250ml glass jar and sealed with an airtight, Teflon screw top lid. The fully filled jars are labelled as the sample and duplicate and immediately placed in a chilled esky.

Intra-Laboratory duplicate samples were sent to MGT Labmark Pty Ltd while Inter-Laboratory duplicate samples were sent to Envirolab Pty Ltd.

Intra Laboratory Duplicate

Two intra-laboratory duplicate sample (soils) were collected and analysed in order to assess the variation in analyte concentration between samples collected from the same sampling point. The duplicate sample frequency was computed using the total number of samples analysed as part of this assessment.

The duplicate sample frequencies computed are presented in the following table.

Table 5: Intra Laboratory Duplicate Frequencies

Analyte – Discrete Soil	Samples Analysed	Duplicate Samples	Frequency
Heavy Metals	16	2	12.5%
TPH/BTEX	16	2	12.5%
PAH	5	1	20%
OCP	4	1	25%
PCB	4	1	25%

The duplicate frequency for the analytical suite adopted complies with the NEPM, which recommends a duplicate frequency of at least 5%.

It is considered that the number of duplicate samples collected is adequate to assess the variation in analyte concentration between samples collected from the same sampling point. A summary of the test results with the Relative Percentage Difference (RPD) is presented in the following tables.

Inter Laboratory Duplicate

Two inter-laboratory duplicate sample (soils) were collected and analysed in order to assess the variation in analyte concentration between laboratories in samples collected from the same sampling point. The duplicate sample frequency was computed using the total number of samples analysed as part of this assessment.

The duplicate sample frequencies computed are presented in the following table.

Table 6: Inter Laboratory Duplicate Frequencies

Analyte – Discrete Soil	Samples Analysed	Duplicate Samples	Frequency
Heavy Metals	16	2	12.5%
TPH/BTEX	16	2	12.5%
PAH	5	1	20%
OCP	4	1	25%
PCB	4	1	25%

The duplicate frequency for the analytical suite adopted complies with the NEPM, which recommends a duplicate frequency of at least 5%.

It is considered that the number of split samples collected is adequate to assess the variation in analyte concentration between samples collected from the same sampling point. A summary of the test results with the Relative Percentage Difference (RPD) is presented in the following tables.

The comparisons between the duplicates and original samples indicate acceptable RPDs when they comply with criteria which are commonly set at:

- less than 30% for inorganics and 50% for organics
- greater than five (5) times the laboratory limit of recording (LOR)
- greater than 5% of the relevant health investigation level (HIL) concentration.

Tables 5 and 6, above, give details of intra laboratory and inter laboratory duplicates.

Table 7: Intralab Sample RPDs

ANALYTE	BH2 0.4m mg/kg	DUPLICATE D1 mg/kg	RELATIVE PERCENTAGE DIFFERENCE %
HEAVY METALS			
Arsenic	4.1	3.7	10
Cadmium	0.7	0.8	13
Chromium	16	19	17
Copper	34	40	16
Lead	62	67	8
Mercury	0.05	0.06	18
Nickel	16	17	6
Zinc	78	98	23
TOTAL PETROLEUM HYDROCARBONS (TPH)			
C6 - C9	< 20	< 20	-
C10 - C14	< 20	< 20	-
C15 - C28	< 50	< 50	-
C29-C36	< 50	< 50	-
BTEX			
Benzene	< 0.1	< 0.1	-
Toluene	< 0.1	< 0.1	-
Ethyl Benzene	< 0.1	< 0.1	-
Total Xylenes	< 0.3	< 0.3	-
POLYCYCLIC AROMATIC HYDROCARBONS (PAH)			
BENZO(a)PYRENE	< 0.5	<0.5	-
Total PAH	<0.5	<0.5	-
ORGANOCHLORINE PESTICIDES (OCP)			
Heptachlor	<0.05	<0.05	-
Aldrin	<0.05	<0.05	-
Dieldrin	<0.05	<0.05	-
DDD	<0.05	<0.05	-
DDE	<0.05	<0.05	-
DDT	<0.2	<0.2	-
Chlordane (trans & cis)	<0.05	<0.05	-
TOTAL PCB			
Total PCB	<0.5	<0.5	-

Table 8: Intralab Sample RPDs

ANALYTE	BH6 0.1m mg/kg	DUPLICATE D2 mg/kg	RELATIVE PERCENTAGE DIFFERENCE %
HEAVY METALS			
Arsenic	2.6	5.7	75
Cadmium	0.7	0.7	0
Chromium	15	14	7
Copper	22	30	31
Lead	120	190	45
Mercury	0.09	0.11	20
Nickel	7.9	5.8	31
Zinc	130	110	17
TOTAL PETROLEUM HYDROCARBONS (TPH)			
C6 - C9	< 20	< 20	-
C10 - C14	< 20	< 20	-
C15 - C28	< 50	< 50	-
C29-C36	< 50	< 50	-
BTEX			
Benzene	< 0.1	< 0.1	-
Toluene	< 0.1	< 0.1	-
Ethyl Benzene	< 0.1	< 0.1	-
Total Xylenes	< 0.3	< 0.3	-

The comparisons between the intra-laboratory duplicates and corresponding original samples for soil indicated generally acceptable RPD overall, with the exception of concentrations of Arsenic (75%), Copper (31%), Lead (45%) and Nickel (31%) in Table 8 which exceed the DQOs for this project, however this exceedance is not considered significant because the concentrations are most likely due to the heterogeneous soils which were sampled and the values detected are at generally low concentrations.

Table 9: Interlab Sample RPDs

ANALYTE	BH2 0.4m m g/kg	SPLIT SS1 mg/kg	RELATIVE PERCENTAGE DIFFERENCE %
HEAVY METALS			
Arsenic	4.1	5	-
Cadmium	0.7	<0.4	-
Chromium	16	14	13
Copper	34	29	16
Lead	62	48	25
Mercury	0.05	<0.1	-
Nickel	16	11	37
Zinc	78	69	12
TOTAL PETROLEUM HYDROCARBONS (TPH)			
C6 - C9	< 20	<25	-
C10 - C14	< 20	<50	-
C15 - C28	< 50	<100	-
C29-C36	< 50	<100	-
BTEX			
Benzene	< 0.1	<0.2	-
Toluene	< 0.1	<0.5	-
Ethyl Benzene	< 0.1	<1	-
Total Xylenes	< 0.3	<3	-
POLYCYCLIC AROMATIC HYDROCARBONS (PAH)			
BENZO(a)PYRENE	< 0.5	0.07	-
Total PAH	<0.5	0.27	-
ORGANOCHLORINE PESTICIDES (OCP)			
Heptachlor	<0.05	<0.1	-
Aldrin	<0.05	<0.1	-
Dieldrin	<0.05	<0.1	-
DDD	<0.05	<0.1	-
DDE	<0.05	<0.1	-
DDT	<0.2	<0.1	-
Chlordane (trans & cis)	<0.05	<0.1	-
TOTAL PCB			
Total PCB	<0.5	<0.1	-

The comparisons between the inter-laboratory duplicates and corresponding original samples for soil indicated generally acceptable RPD overall, with the exception of concentrations of Nickel (37%) which exceed the DQOs for this project, however this exceedance is not considered significant because the concentrations are most likely due to the heterogeneous soils which were sampled and the values detected are at generally low concentrations.

Field duplicates provide an indication of the whole investigation process, including the sampling process, sample preparation and analysis. The accuracy of the data is considered to be adequate due to the effect on confidence intervals with low concentrations in the samples and their duplicates.

11.0 LABORATORY QA/QC

The integrity of analytical data provides the second step in the QA/QC process for total data compliance. The data validation techniques adopted by Benviron Group are based upon techniques published by the US EPA and in line with methods and guidelines adopted by the NSW EPA and outlined in the NEPM, 1999.

Descriptions are provided of the specific mechanisms used in the assessment of accuracy, precision and useability of analytical data within the project.

Refer to **Appendix D- NATA Accredited Analytical Results**

11.1 Blanks

Blanks were used for the identification of false positive data. Laboratory blank samples were analysed.

No cross contamination of samples is said to have occurred as a result of laboratory techniques provided all blanks show concentrations below the levels of detection. No results on blank samples were above the level of reporting for any determination during the project.

11.2 Spikes and Control Samples

Control sample spikes were utilised for determination of matrix recovery analysis. This involves analysis of spiked control samples and their duplicates, spiked with a known concentration of relative analyte.

Accuracy was assessed by calculation of the percent recovery (%R). The duplicate sample spikes were used to assess the precision of the methods used. The recoveries for all matrix spike analysis were within the acceptance criteria of 60-140%.

11.3 Duplicates

Laboratory Duplicates are tested to ensure the results meet the requirements of QA/QC. The samples from the Site showed a percent recovery for all analytes not exceeding the respective laboratory criteria.

11.4 Surrogates

To assess the performance of individual organic analysis the laboratory used surrogates. Recoveries were calculated for each surrogate providing an indication of analytical accuracy. Surrogate recoveries for soil samples were all within recommended control limits, indicating that there was an acceptable degree of accuracy in analysing for organic compounds.

11.5 Laboratory Detection Limits

Laboratory detection limits for soil and water analyses by MGT Labmark are outlined in the tables below:

Table 10: Method of Soil Analysis - MGT Labmark

Analyte	Method	Level of Reporting Soil mg/kg
Polycyclic Aromatic Hydrocarbons	USEPA SW-846 Method 8270,	0.1 (Ind. Analyte)
Metals	USEPA 200.7 USEPA 7471A	As, Ni - <1 Hg <0.05 Cd - <2 Pb-Cr-Cu- <0.10 Zn <5
Pesticides	USEPA SW-846 Method 8081 USEPA SW-846 Method 8140 USEPA SW-846 Method 8080 USEPA SW-846 Method 8870	OCP 0.05 OPP 0.05
PCB	USEPA SW-846 Method 8080 USEPA SW-846 Method 8081	PCB 0.50
BTEX	USEPA SW-846 Method 8260	Benzene 0.5 Toluene 0.5 Ethylbenzene 0.5 Total Xylene 1.5
TPH	USEPA SW-846 Method 8260 USEPA SW-846 Method 8000	C6-C9 10 C10-C14 50 C15-C28 100 C29-C36 100

Table 11: Method of Water Analysis - MGT Labmark

Analyte	Method	Level of Reporting Water µg/L
Metals	USEPA 200.7 USEPA 3005A	As-Cu-Cr-Ni-Pb-Zn- 0.01
		Cd 0.1
		Hg 0.5
BTEX	USEPA 8260 USEPA 5030	Benzene 1.0
		Toluene 1.0
		Ethylbenzene 1.0
		m&p -xylene 1.0
		Ortho-xylene 1.0
TPH	USEPA 8020A USEPA 8000	C6-C9 10
		C10-C14 50
		C15-C28 100
		C29-C36 100
PAH	USEPA 8310 USEPA 8270	Benzo (b)&(k) fluoranthene 2
		Each other Analyte 1
Pesticides	USEPA 8081	OCP 1
		OPP 1
PCB	USEPA 8082	1
VOC	USEPA 8260B	
VHC	USEPA 8260B	

12.0 SITE ASSESSMENT CRITERIA

To assess the contamination status of soils at a site, the NSW EPA refers to the document entitled National Environmental Protection Council (1999) *National Environmental Protection (Assessment of Site Contamination) Measure* (NEPM).

The site is to be redeveloped for a residential apartment development, so the site will be assessed against the NEPM exposure scenario 'D' health investigation levels (HIL) of the above mentioned guidelines for '*residential land use with minimal soil access*'. The NEPM 1999 does not include investigation levels for TPH and BTEX.

For assessing TPH and BTEX contamination at sites used for sensitive land use, such as residential, the NSW EPA refers to the NSW EPA (1994) "*Guidelines for Assessing Services Station Sites*".

For standard residential sites, the NSW DEC (2006) "*Guidelines for the NSW Site Auditor Scheme*" notes that concentrations at the site should also be assessed against the environmental investigation levels (EIL) if some parts of the site are used for growing plants or grass, however as part of this development no soils are proposed to be used for landscaping use.

The soil regulatory guidelines are presented in the Table below.

Table 12: Soil Regulatory Criteria

Contaminant	Assessment Criteria (mg/kg)			Source
	HIL 'D'	EIL/PPBILL	NSW EPA	
Inorganics				
Arsenic	400	20	-	NEPM, 1999; NSW EPA, 2006
Cadmium	80	3	-	NEPM, 1999; NSW EPA, 2006
Chromium (III)	48,000	400	-	NEPM, 1999; NSW EPA, 2006
Copper	4,000	100	-	NEPM, 1999; NSW EPA, 2006
Lead	1,200	600	-	NEPM, 1999; NSW EPA, 2006
Nickel	28,000	60	-	NEPM, 1999; NSW EPA, 2006
Zinc	2400	200	-	NEPM, 1999; NSW EPA, 2006
Mercury	60	1	-	NEPM, 1999; NSW EPA, 2006
Organics				
<i>TPH/BTEX</i>				
C ₆ to C ₉ Fraction	-	-	65	NSW EPA, 1994
C ₁₀ to C ₃₆ Fraction	-	-	1,000	NSW EPA, 1994
Benzene	-	-	1	NSW EPA, 1994
Toluene	-	-	1.4	NSW EPA, 1994
Ethylbenzene	-	-	3.1	NSW EPA, 1994
Total Xylenes	-	-	14	NSW EPA, 1994
PAH				
Benzo(a)pyrene	4	-	-	NEPM, 1999
Total PAH	80	-	-	NEPM, 1999
Asbestos	Non Detect		Non Detect	NSW EPA

Notes

- 1 – NEPM A - Health Investigation Level
- 2 – NSW EPA (1994) Guidelines for assessing service station sites
- 3 – Ecological Investigation Level
- 4 – Phyto-toxicity Based Investigation Levels

The EPA guidelines indicate that the assessment of soil test results and comparison with defined soil criteria should include consideration of a number of factors such as:

1. Land uses, e.g. residential, agricultural/horticultural, recreation or commercial/industrial.
2. Potential child occupancy.
3. Potential environmental effects including leaching into groundwater.

4. Single or multiple contaminants.
5. Depth of contamination.
6. Level and distribution of contamination.
7. Bioavailability of contaminant(s), e.g. Related to speciation, route of exposure.
8. Toxicological assessment of the contaminant(s), e.g. Toxicokinetics, carcinogenicity, acute and chronic toxicity.
9. Physico-chemical properties of the contaminant(s).
10. State of the site surface, e.g. paved or grassed exposed.
11. Potential exposure pathways.
12. Uncertainties with the sampling methodology and toxicological assessment.

12.1 Phytotoxicity

The phytotoxicity criteria are intended as a screen guide and indicate that certain plant species may have limited growth potential or increased mortality in a small proportion of the Site. Copper and zinc are common in soils, due to the use of pesticide and the presence of galvanised materials from buildings etc. These contaminants at the observed concentrations are unlikely to increase the risk to human health or the local ecology

12.2 Groundwater

Groundwater seepage was not encountered within the boreholes during the drilling process at depths ranging from 2m to 7m below ground level (BGL). Groundwater was not assessed as part of this investigation.

13.0 SITE ASSESSMENT

Samples were recovered from twelve (12) locations within the site and can be seen in the attached site plan (Figure 2) and tables below. These locations were selected to detect any contamination that may have originated from past and present activities, and due to future excavation (basement) in these areas.

Table 13: Sampling Information

Analyte / Analyte Group		TYPE	SAMPLING DATE	DUPLICATE	SPLIT	MET-8	MET-12	TPH & BTEX	PAH	OCP	PCB	VOC
Sample	Depth (m)											
BH1	0.5	N	21/06/2013			▼		▼		▼	▼	
BH2	0.4	F	21/06/2013	D1	SS1	▼		▼	▼	▼	▼	
BH2	1.4	N	21/06/2013			▼		▼				
BH3	0.3	F	21/06/2013			▼		▼				
BH4	0.5	F	21/06/2013			▼		▼				
BH5	0.4	F	21/06/2013			▼		▼	▼			
BH5	0.7	N	21/06/2013			▼		▼				
BH6	0.1	F	21/06/2013	D2		▼		▼		▼	▼	
BH6	0.5	N	21/06/2013			▼		▼		▼	▼	
BH7	0.2	F	21/06/2013			▼		▼				
BH8	0.2	F	21/06/2013			▼		▼	▼			
BH8	0.5	N	21/06/2013			▼		▼				
BH9	0.4	F	21/06/2013			▼		▼				
BH10	0.1	N	21/06/2013			▼		▼	▼			
BH11	0.2	N	21/06/2013			▼		▼				
BH12	0.3	F	21/06/2013			▼		▼	▼			

Notes

MET-8: arsenic, cadmium, chromium, copper, lead, mercury, nickel, zinc
antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, cobalt, lead,
managnese, molybdenum, mercury, nickel, zinc, selenium, tin, vanadium

MET-18:

OCP: Organochlorine Pesticides

PCB: Polychlorinated Biphenyls

PAH: Polycyclic Aromatic Hydrocarbons

TPH: Total Petroleum Hydrocarbons

BTEX: Benzene, Toluene, Ethyl Benzene, Xylene

F,T,N: Fill, Topsoil, Natural

The locations of the boreholes and samples are shown in **Figure 2 – Site Plans** and details of the boreholes are presented in **Appendix F – Borehole Logs**.

Based on information from all boreholes, the surface and sub-surface profile across the site is generalised as follows:

- Fill, Silty Sand, low plasticity, medium grained, brown, moist with some gravels.
- Fill, Silty Sand, low-medium plasticity, dark brown, moist with some root fibres and inert building materials.
- Natural, Sandy Clay, medium plasticity, yellow/brown, moist.
- Natural, Sandy Clay, medium plasticity, red/brown/grey, moist underlying the concrete in each of the boreholes.
- Natural, Sandstone, Hard, red/yellow/brown.

Selected samples were dispatched under chain of custody (CoC) conditions to MGT Labmark Pty Ltd (NATA 1261). The samples were selected for analysis based on the sample location and the material encountered. The laboratory information for the samples collected is shown in the following table below.

14.0 RESULTS

The original laboratory test results certificates are presented in Appendix D – NATA Laboratory Test Results. A summary of the test results together with the assessment criteria adopted are discussed below.

Table 14: Heavy Metals Results

Analyte		METALS (mg/kg)							
		ARSENIC	CADMIUM	CHROMIUM	COPPER	LEAD	MERCURY	NICKEL	ZINC
Sample Reference	Depth(m)								
BH 1	0.5	3	0.4	21	< 5	8.8	< 0.05	< 5	7.2
BH 2	0.4	4.1	0.7	16	34	62	0.05	16	78
BH 2	1.4	6.2	0.7	21	19	18	< 0.05	< 5	14
BH 3	0.3	< 2	< 0.4	7.3	20	13	0.06	< 5	44
BH 4	0.5	3.3	0.5	14	43	110	0.72	48	170
BH 5	0.4	< 2	< 0.4	< 5	11	20	< 0.05	6.7	49
BH 5	0.7	< 2	< 0.4	< 5	7.7	22	< 0.05	< 5	49
BH 6	0.1	2.6	0.7	15	22	120	0.09	7.9	130
BH 6	0.5	3.2	0.6	18	18	47	0.06	8.7	53
BH 7	0.2	17	0.4	14	18	84	0.1	5.3	78
BH 8	0.2	5.2	< 0.4	5.7	8.8	20	< 0.05	< 5	25
BH 8	0.5	4.2	0.5	21	11	20	< 0.05	< 5	7.3
BH 9	0.4	5.3	< 0.4	16	46	29	0.12	7.8	82
BH 10	0.1	2.9	0.6	15	11	25	< 0.05	< 5	16
BH 11	0.2	3.4	0.4	13	7.8	26	< 0.05	< 5	12
BH 12	0.3	< 2	< 0.4	5.4	12	10	< 0.05	10	39
Practical Quantitation Limits (PQL)		2	0.4	2	2	2	0.05	5	5
NATIONAL ENVIRONMENT PROTECTION MEASURE (1999)									
Ecological Investigation Levels (EIL)		20	3	400/1 ^e	100	600	1	60	200
Health Investigation Levels (HIL) ^a (HIL 'A')		100	20	12%/100 ^f	1000	300	10/15 ^g	600	7000
HIL 'D' ^b		400	80	48%/400	4000	1200	40/60	2400	28000
HIL 'E' ^c		200	40	24%/200	2000	600	20/30	600	14000
HIL 'F' ^d		500	100	60%/500	5000	1500	50/75	3000	35000

- Notes
- a: Residential development with accessible soils, including childrens day care centres, kindergartens, preschools and primary
 - b: Residential with minimal opportunities for soil access, including high-rise, apartments and flats
 - c: Parks, recreational open space and playing fields, including secondary schools
 - d: Commercial or industrial development
 - e: 400 mg/kg for Chromium (+3) and 1 mg/kg for Chromium (+6).
 - f: 12% (12000mg/kg) for Chromium (+3) and 100mg/kg for Chromium (+6).
 - g: 10mg/kg for Methyl Mercury and 15mg/kg for Inorganic Mercury.

Sixteen (16) samples were analysed for the Priority Heavy Metals. There were no concentrations of Heavy Metals recorded above the relevant assessment criteria.

Table 15: BTEX and TRH Results

Sixteen (16) samples were analysed for Monocyclic Aromatic Hydrocarbons (BTEX fractions), associated with petrol contamination and Total Recoverable Hydrocarbons (TRH). There were no concentrations of BTEX fractions or TRH recorded above the relevant assessment criteria.

Analyte		TPH (mg/kg)					BTEX (mg/kg)			
		C6-C9	C10-C14	C15-C28	C29-C36	C10-C36 ^b	BENZENE	TOLUENE	ETHYL BENZENE	TOTAL XYLENES
Sample Location	Depth (m)									
BH1	0.5	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.3
BH2	0.4	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.3
BH2	1.4	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.3
BH3	0.3	< 20	< 20	< 50	67	67	< 0.1	< 0.1	< 0.1	< 0.3
BH4	0.5	< 20	< 20	< 50	110	110	< 0.1	< 0.1	< 0.1	< 0.3
BH5	0.4	< 20	< 20	< 50	60	60	< 0.1	< 0.1	< 0.1	< 0.3
BH5	0.7	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.3
BH6	0.1	< 20	< 20	< 50	72	72	< 0.1	< 0.1	< 0.1	< 0.3
BH6	0.5	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.3
BH7	0.2	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.3
BH8	0.2	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.3
BH8	0.5	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.3
BH9	0.4	< 20	< 20	< 50	79	79	< 0.1	< 0.1	< 0.1	< 0.3
BH10	0.1	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.3
BH11	0.2	< 20	< 20	< 50	< 50	< 50	< 0.1	< 0.1	< 0.1	< 0.3
BH12	0.3	< 20	< 20	100	71	170	< 0.1	< 0.1	< 0.1	< 0.3
Practical Quantitation Limits (PQL)		10	50	100	100	NA	0.1	0.1	0.1	0.3
NSW EPA Levels ^a		65	C10-C36 = 1000				1	1.4	3.1	14
NATIONAL ENVIRONMENT PROTECTION MEASURE (1999)										
Aliphatic - HIL D			2240							
Aromatic - HIL D			360							

Notes

- a: Contaminated Sites: "Guidelines for Assessing Service Station Sites", 1994, EPA
b: C10-C36 = (C10-C14) + (C15-C28) + (C29-C36); concentrations less than PQL are assumed equal to PQL.
c: Contaminated Sites: "Sampling Design Guidelines", 1995, EPA
d: For statistical purposes, any concentrations less than PQL are assumed equal to PQL
e: Concentrations in **bold** are greater than 250% of the minimal guideline value and are not considered a part of the final
NA: Not Applicable

Slight detections of C₂₉-C₃₆ were detected as part of this investigation, however, results are below the relevant trigger levels.

Table 16: PAH, OCP and PCB Results

Analyte		PAH (mg/kg)		Organochlorine Pesticides (mg/kg)							TOTAL PCB (mg/kg)
		BENZO(a)PYRENE (mg/kg)	TOTAL PAH (mg/kg)	HEPTACHLOR	ALDRIN	DIELDRIN	DDD	DDE	DDT	CHLORDANE (trans & cis)	
Sample Location	Depth (m)										
BH1	0.5	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.2	< 0.05	< 0.5
BH2	0.4	< 0.5	< 0.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.2	< 0.05	< 0.5
BH5	0.4	< 0.5	< 0.5	-	-	-	-	-	-	-	-
BH6	0.1	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.2	< 0.05	< 0.5
BH6	0.5	-	-	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.2	< 0.05	< 0.5
BH8	0.2	< 0.5	< 0.5	-	-	-	-	-	-	-	-
BH10	0.1	< 0.5	1.1	-	-	-	-	-	-	-	-
BH12	0.3	< 0.5	< 0.5	-	-	-	-	-	-	-	-
Practical Quantitation Limits (PQL)		0.05	NA	0.05	0.05	0.05	0.05	0.05	0.2	0.05	0.5
NATIONAL ENVIRONMENT PROTECTION MEASURE (1999)											
Health Investigation Levels (HIL) ^a (HIL 'A')		1	20	10	10 ^e	10 ^e		200 ^f		50	10
HIL 'D' ^b		4	80	40	40	40		800		200	20
HIL 'E' ^c		2	40	20	20	20		400		100	40
HIL 'F' ^d		5	100	50	50	50		1000		250	50
GUIDELINES FOR THE NSW SITE AUDITOR SCHEME (2006)											
Provisional Phytotoxicity-Based Investigation Level											

- Notes
- a: Residential with gardens and accessible soil including children's day-care centres, preschools, primary schools, townhouses and villas.
 - b: Residential with minimal opportunities for soil access, including high-rise, apartments and flats
 - c: Parks, recreational open space and playing fields, including secondary schools
 - d: Commercial or industrial development
 - e: Aldrin + Dieldrin
 - f: Total of DDD + DDE + DDT
 - g: Cyanide (free)
 - h: Cyanide (complex)
 - NSL: No Set Level
 - NA: Not Applicable

Five (5) samples were analysed for the Polycyclic Aromatic Hydrocarbons (PAH) while four (4) samples were analysed for Organochlorine Pesticides (OCP) and Polychlorinated Biphenyls (PCB). There were no concentrations of these analytes recorded above the relevant assessment criteria.

15.0 DISCUSSION

A number of potential areas of environmental concerns were identified at the site, particularly:

- Historical uses;
- Where pesticides were potentially utilised;
- Carpark areas / driveways where leaks and spills from cars may have occurred;
- Vicinity of degrading building features

Laboratory Results for all samples were below detection limits or relevant guideline criteria - NEPM D "Residential with access to soils". This indicates that the areas of concern identified are of minimal concern and are unlikely to have impacted the site.

As the site is mostly concrete covered and limited fill was identified, the potential for migration of contamination is low and any infiltration of contaminants is also expected to be low. The potential for significant impact of site soils, if contaminated, on the water bodies collecting surface water run-off from the region is considered low.

NSW EPA Ecological Investigation Levels (EIL) were not considered due to the lack of ecological community on the site and based on the scope of the redevelopment it is not expected there will be an ongoing impact on the surrounding ecology.

A hazardous material survey was not undertaken as part of the scope of this investigation, however based on the age of the building it is recommended that a Hazardous material investigation be carried out to provide information for demolition of the building.

16.0 CONCLUSION AND RECCOMENDATION

Based on the results of this investigation it is considered that the risks to human health and the environment associated with soil contamination at the site are low in the context of the proposed use of the site. The site is therefore considered ***to be suitable*** for the proposed development, subject to the following recommendations:

- Any soils proposed for removal from the site should initially be classified in accordance with the "*Waste Classification Guidelines, Part 1: Classifying Waste*" NSW DECC (2009).

If during any potential site works, significant odours and / or evidence of gross contamination (including asbestos) not previously detected are encountered, or any other significant unexpected occurrence, site works should cease in that area, at least temporarily, and the environmental consultant should be notified immediately to set up a response to this unexpected occurrence.

Thank you for the opportunity of undertaking this work. We would be pleased to provide further information on any aspects of this report

For and on behalf of

Benviron Group



Ben Buckley

Director
Environmental Forensic Scientist

17.0 LIMITATIONS

To the best of our knowledge information contained in this report is accurate at the date of issue, however, subsurface conditions, including groundwater levels and contaminant concentrations, can change in a limited time. This should be borne in mind if the report is used after a protracted delay.

There is always some disparity in subsurface conditions across a site that cannot be fully defined by investigation. Hence it is unlikely that measurements and values obtained from sampling and testing during environmental works carried out at a site will characterise the extremes of conditions that exist within the site.

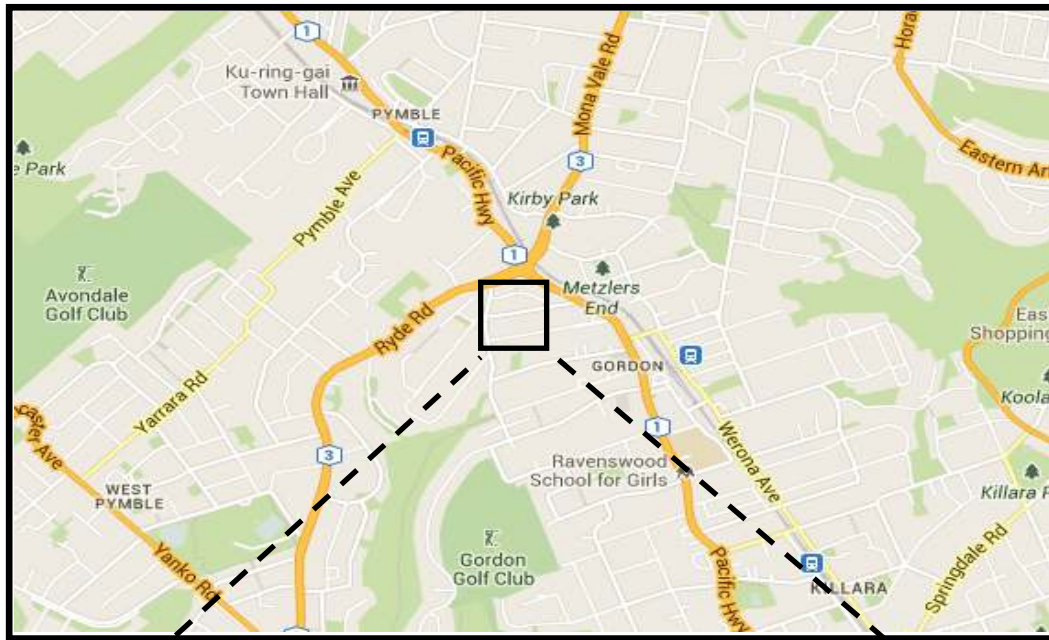
There is no investigation that is thorough enough to preclude the presence of material that presently or in the future, may be considered hazardous at the site. Since regulatory criteria are constantly changing, concentrations of contaminants presently considered low may, in the future, fall under different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

Opinions expressed herein are judgements and are based on our understanding and interpretation of current regulatory standards and should not be construed as legal opinions.

Appendix A – Important information about your environmental site report should also be read in conjunction with this report.

FIGURE 1 SITE LOCATION

LOCALITY MAP



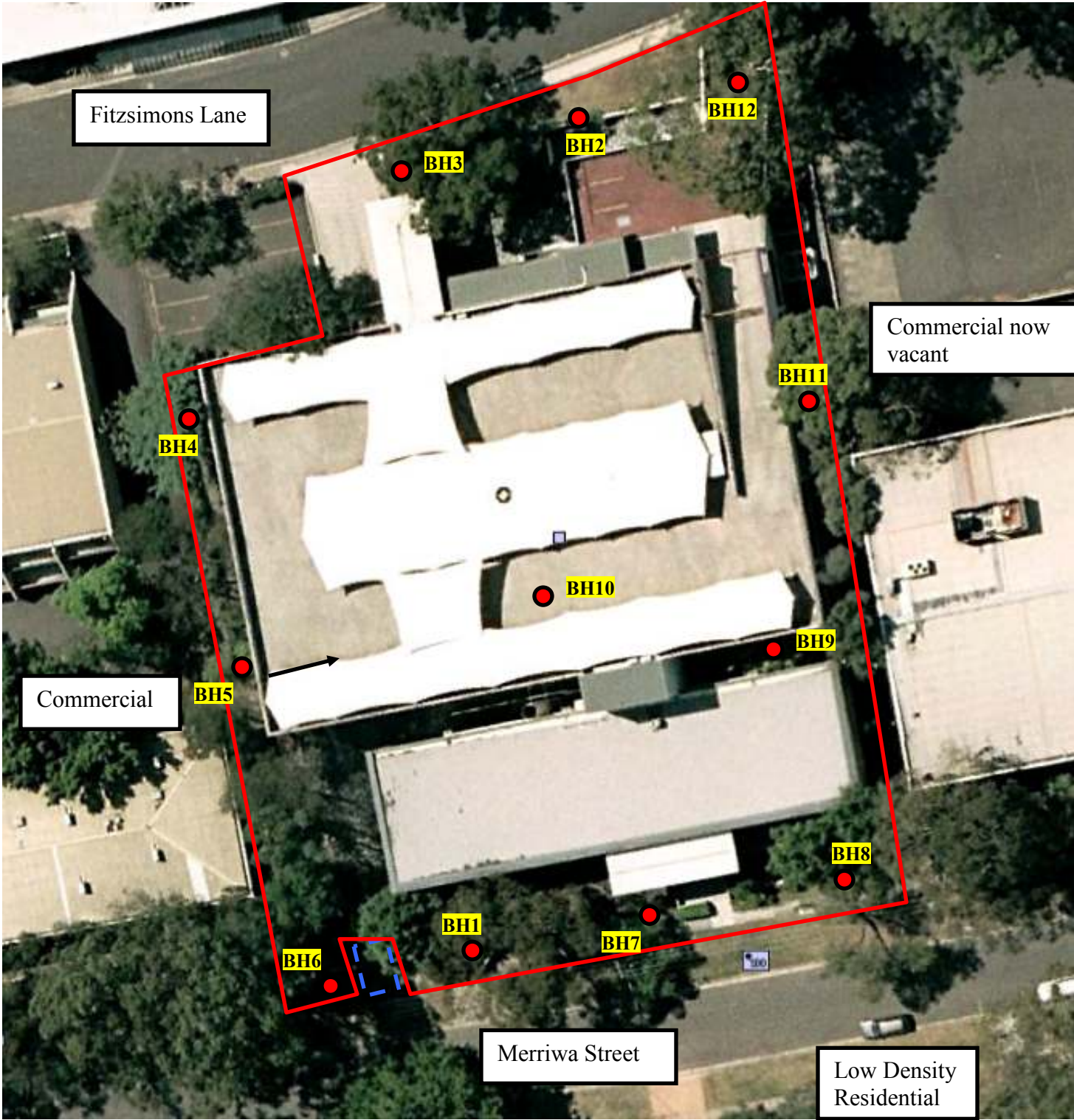
Site Location

Reference: Google Maps 2013

Drawn	BB	Meissen Properties Pty Ltd Environmental Site Assessment (ESA) 17-23 Merriwa Street, Gordon NSW		Figure 1
Approved	BB			Job No: E46
Date	02/07/13			
Scale	As shown			

FIGURE 2: SITE PLAN AND SAMPLING LOCATIONS

SITE PLAN





N

Expected
Groundwater Flow



Key

 Borehole Location

 Site Boundary

 Electrical Transformer

Drawn	BB
Job #	E46
Date	02.07.2013
Approx Scale	NTS

Site Plan
Meissen Properties Pty Ltd
17-23 Merriwa Street, Gordon NSW



Figure 2

APPENDIX A: IMPORTANT INFORMATION ABOUT YOUR ENVIRONMENTAL REPORT

IMPORTANT INFORMATION ABOUT YOUR ENVIRONMENTAL SITE ASSESSMENT

These notes have been prepared by Benviron Group Pty Ltd and its associated companies using guidelines prepared by ASFE (The Association) of Engineering Firms Practising in the Geo-sciences. They are offered to help you in the interpretation of your Environmental Site Assessment (ESA) reports.

REASONS FOR CONDUCTING AN ESA

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

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

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

THE LIMITATIONS OF AN ESA

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

or may migrate to areas which showed no signs of contamination when sampled.

AN ESA REPORT IS BASED ON A UNIQUE SET OF PROJECT SPECIFIC FACTORS

Your environmental report should not be used:

- when the nature of the proposed development is changed, for example, if a residential development is proposed instead of a commercial one;
- when the size or configuration of the proposed development is altered;
- when the location or orientation of the proposed structure is modified;
- when there is a change of ownership
- or for application to an adjacent site.

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

ESA "FINDINGS" ARE PROFESSIONAL ESTIMATES

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

through the development stage, to identify variances, conduct additional tests which may be needed, and to recommend solutions to problems encountered on site.

SUBSURFACE CONDITIONS CAN CHANGE

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

ESA SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND PERSONS

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

AN ESA REPORT IS SUBJECT TO MISINTERPRETATION

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

LOGS SHOULD NOT BE SEPARATED FROM THE ENGINEERING REPORT

Final borehole or test pit logs are developed by environmental scientists, engineers or geologists based upon their interpretation of field logs (assembled by site personnel) and laboratory evaluation of field samples. Only final logs customarily included in our reports. These logs should not under any circumstances be redrawn for inclusion in site remediation or other design drawings, because drafters may commit errors or omissions in the transfer process. Although photographic reproduction eliminates this problem, it does nothing to minimise the possibility of contractors misinterpreting the logs during bid preparation. When this occurs, delays, disputes and unanticipated costs are the all-too-frequent result.

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

READ RESPONSIBILITY CLAUSES CLOSELY

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

APPENDIX B: LAND TITLE INFORMATION

TITLE SEARCH

Title Reference: 40/803006

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 40/803006

SEARCH DATE	TIME	EDITION NO	DATE
2/7/2013	2:25 PM	23	4/12/2008

LAND

LOT 40 IN DEPOSITED PLAN 803006
AT GORDON
LOCAL GOVERNMENT AREA KU-RING-GAI
PARISH OF GORDON COUNTY OF CUMBERLAND
TITLE DIAGRAM DP803006

FIRST SCHEDULE

STOURTON PROPERTIES PTY LTD (T AC579786)

SECOND SCHEDULE (9 NOTIFICATIONS)

- 1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
- 2 9346209 LEASE TO C.I. TECHNOLOGIES PTY LIMITED OF LEVEL 3, 3 FITZSIMONS LANE, GORDON. EXPIRES: 7/4/2009. OPTION OF RENEWAL: 5 YEARS.
- 3 AC579787 MORTGAGE TO NATIONAL AUSTRALIA BANK LIMITED
- 4 AD70966 LEASE TO CITECT PROPRIETARY LIMITED OF LEVEL 3, 17-23 MERRIWA STREET, GORDON. EXPIRES: 7/4/2009. OPTION OF RENEWAL: 5 YEARS.
- * 5 AG149471 LEASE TO MCS GROUP HOLDINGS PTY LIMITED BEING SUITE 1, LEVEL 1, 17-23 MERRIWA STREET. EXPIRES: 31/8/2013. OPTION OF RENEWAL: 3 YEARS.
- * 6 AG293714 LEASE TO ANDREW R POOLE PTY LIMITED BEING SUITE 1, GROUND FLOOR. EXPIRES: 28/2/2014.
- * 7 AG485456 LEASE TO PROJECTCORP AUSTRALIA PTY LIMITED BEING SUITE 2, LEVEL 1, 17-23 MERRIWA STREET. EXPIRES: 31/7/2015. OPTION OF RENEWAL: 4 YEARS.
- * 8 AH364605 LEASE TO LEADING EDGE GROUP LIMITED BEING LEVEL 1, 3 FITZSIMONS LANE AND SUITES 2 & 3, GROUND FLOOR AND LEVEL 2, 17-23 MERRIWA STREET. EXPIRES: 31/7/2014. OPTION OF RENEWAL: 5 YEARS.
- * AH364602 MORTGAGE OF LEASE AH364605 TO WESTPAC BANKING CORPORATION
- * 9 AH465907 MORTGAGE TO TAVERNERS NO.9 PTY LTD

NOTATIONS

REFER ALL DEALINGS TO SD2. FOLIO IDENTIFIER IS PERMANENTLY HELD.
UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

PRINTED ON 2/7/2013

HISTORY OF TITLE TRANSACTION

Title Reference: 40/803006

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE

2/7/2013 2:25PM

FOLIO: 40/803006

First Title(s): OLD SYSTEM

Prior Title(s): 11/7197 12-13/249171
D/385871 4/577938

Recorded	Number	Type of Instrument	C.T. Issue
-----	-----	-----	-----
14/6/1990	DP803006	DEPOSITED PLAN	FOLIO CREATED EDITION 1
19/9/1990	Z228140	CAVEAT	
12/8/1991	Z800862	WITHDRAWAL OF CAVEAT	
28/5/1992	E491707	DEPARTMENTAL DEALING	
28/5/1992	E399963	LEASE	EDITION 2
5/2/1993	I98511	DISCHARGE OF MORTGAGE	
5/2/1993	I98512	VARIATION OF LEASE	
5/2/1993	I98513	LEASE	
5/2/1993	I98514	MORTGAGE	EDITION 3
5/6/1995	0219747	DETERMINATION OF LEASE	
5/6/1995	0219748	LEASE	EDITION 4
21/4/1997	2992320	VARIATION OF LEASE	
11/3/1999	5631353	LEASE	
11/3/1999	5631357	LEASE	EDITION 5
16/4/1999	5753922	VARIATION OF LEASE	EDITION 6
30/8/1999	6142879	DEPARTMENTAL DEALING	
24/7/2001	7794017	LEASE	EDITION 7
23/12/2002	9242838	VARIATION OF MORTGAGE	EDITION 8
4/2/2003	9346209	LEASE	EDITION 9
29/4/2003	9559048	DETERMINATION OF LEASE	
29/4/2003	9559049	LEASE	EDITION 10
8/1/2004	AA306108	LEASE	EDITION 11
21/3/2004	AA501351	DEPARTMENTAL DEALING	

END OF PAGE 1 - CONTINUED OVER

PRINTED ON 2/7/2013

Land and Property Information Division

ABN: 84 104 377 806

GPO BOX 15

Sydney NSW 2001

DX 17 SYDNEY

Telephone: 1300 052 637



Land & Property Information

A division of the Department of Finance & Services

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE

2/7/2013 2:25PM

FOLIO: 40/803006

PAGE 2

Recorded	Number	Type of Instrument	C.T. Issue
28/4/2004	AA592548	LEASE	EDITION 12
5/8/2004	AA856475	LEASE	EDITION 13
17/11/2004	AB98904	LEASE	EDITION 14
22/11/2004	AB108159	VARIATION OF MORTGAGE	
22/11/2004	AB108160	VARIATION OF MORTGAGE	EDITION 15
13/12/2004	AB154774	LEASE	EDITION 16
7/9/2005	AB723360	CHANGE OF NAME	
7/9/2005	AB723361	LEASE	EDITION 17
5/4/2006	AC201871	LEASE	EDITION 18
27/6/2006	AC411701	VARIATION OF LEASE	EDITION 19
6/9/2006	AC579785	DISCHARGE OF MORTGAGE	
6/9/2006	AC579786	TRANSFER	
6/9/2006	AC579787	MORTGAGE	EDITION 20
24/4/2007	AD70966	LEASE	EDITION 21
7/8/2008	AE136271	DETERMINATION OF LEASE	
9/9/2008	AE152689	DEPARTMENTAL DEALING	EDITION 22
23/9/2008	AE227178	LEASE	
30/10/2008	AE298239	MORTGAGE OF LEASE	
4/12/2008	AE239406	LEASE	EDITION 23
17/3/2010	AF376364	DEPARTMENTAL DEALING	
28/7/2010	AF388750	REJECTED - DETERMINATION OF LEASE	
28/7/2010	AF388751	REJECTED - LEASE	
4/8/2010	AF670352	LEASE	
31/3/2011	AG149471	LEASE	

END OF PAGE 2 - CONTINUED OVER

PRINTED ON 2/7/2013

Land and Property Information Division

ABN: 84 104 377 806

GPO BOX 15

Sydney NSW 2001

DX 17 SYDNEY

Telephone: 1300 052 637



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LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE

2/7/2013 2:25PM

FOLIO: 40/803006

PAGE 3

Recorded -----	Number -----	Type of Instrument -----	C.T. Issue -----
10/6/2011	AG293714	LEASE	
12/9/2011	AG485456	LEASE	
16/9/2011	AG502241	DETERMINATION OF LEASE	
15/11/2012	AH364604	DETERMINATION OF LEASE	
15/11/2012	AH364605	LEASE	
15/11/2012	AH364602	MORTGAGE OF LEASE	
15/1/2013	AH465907	MORTGAGE	

*** END OF SEARCH ***

PRINTED ON 2/7/2013

①



Form: 01T
Release: 3.0
www.lands.nsw.gov.au

TRANSFER

New South Wales
Real Property Act 1900

AC579786W

PRIVACY NOTE: Section 31B of the Real Property Act 1900 (RP Act) authorises the Registrar General to collect the information required by this form for the establishment and maintenance of the Real Property Act Register. Section 96B RP Act requires that the Register is made available to any person for search upon payment of a fee, if any.

STAMP DUTY

Office of State Revenue use only

Duty: \$ 200 Trans No: 3605142

Asst details:

(A) TORRENS TITLE

FOLIO IDENTIFIER 40/803006

(B) LODGED BY

Document
Collection
Box

Name, Address or DX and Telephone

National Australia Bank
107 Prospect Highway
SEVEN HILLS NSW 2147
Box 45A

CODES

T
TW
(Sheriff)

LLPN: 123011G

Reference:

06UD 6502

(C) TRANSFEROR

DUNNET PROPERTIES PTY LIMITED ACN 001 072 206 and
LILYWOOD PTY. LIMITED ACN 003 826 408

(D) CONSIDERATION

The transferor acknowledges receipt of the consideration of \$ 19,753,201.14 and as regards

(E) ESTATE

the land specified above transfers to the transferee an estate in fee simple

(F) SHARE

TRANSFERRED

(G)

Encumbrances (if applicable):

(H) TRANSFeree

STOURTON PROPERTIES PTY. LTD. ABN 74 367 619 656

(I)

~~TENANCY:~~

DATE

- (J) Certified correct for the purposes of the Real Property Act 1900 and executed on behalf of the corporation named below by the authorised person(s) whose signature(s) appear(s) below pursuant to the authority specified.

Corporation:

Authority: See Annexure A for signing by the transferors

Signature of authorised person:

Signature of authorised person:

Name of authorised person:

Name of authorised person:

Office held:

Office held:

Certified correct for the purposes of the Real Property Act 1900 by the person whose signature appears below.

Signature:

Signatory's name:

Vince Baudille

Signatory's capacity:

transferee's solicitor

Annexure A to Transfer

Parties

**From DUNNET PROPERTIES PTY LIMITED ACN 001 072 206 and
LILYWOOD PTY. LIMITED ACN 003 826 408**

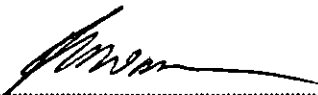
To STOURTON PROPERTIES PTY. LTD. ABN 74 367 619 656

Dated 2006

Text

Certified correct for the purposes of the Real Property Act 1900 and executed on behalf of the corporation named below by the authorised persons whose signatures appear below pursuant to the authority specified

**Corporation: Dunnet Properties Pty Limited ACN 001 072 206
Authority: Section 127 of the Corporations Act 2001**


Signature of authorised person

ROBERT DUNNET
Name of authorised person

DIRECTOR
Office held

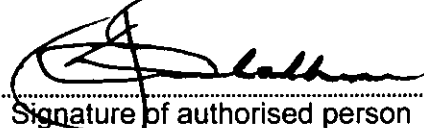

Signature of authorised person

KIM KILROY
Name of authorised person

SECRETARY
Office held

Certified correct for the purposes of the Real Property Act 1900 and executed on behalf of the corporation named below by the authorised persons whose signatures appear below pursuant to the authority specified

**Corporation: Lilywood Pty. Limited ACN 003 826 408
Authority: Section 127 of the Corporations Act 2001**


Signature of authorised person

JOHN DAVID WALKER
Name of authorised person

SOLE DIRECTOR / SECRETARY
Office held

Signature of authorised person

Name of authorised person

Office held

APPENDIX C: OEH NOTICE SUMMARY



Healthy Environment, Healthy Community, Healthy Business

You are here: [Home](#) > [Contaminated land](#) > [Record of notices](#)

Search results

Your search for:LGA: Ku-ring-gai Council

Matched 23 notices
relating to 3 sites.

[Search Again](#)[Refine Search](#)

Suburb	Address	Site Name	Notices related to this site
Killara	684-696 Pacific Highway	Area Adjacent to Former Caltex Service Station	12 current and 8 former
Killara	692B-694 Pacific Highway	Former Caltex Service Station	1 current
St Ives	179-181 Mona Vale Road	Shell Service Station	1 current and 1 former

Page 1 of 1

2 July 2013

NSW Environment Protection Authority

Feedback

Web support
Public consultation

Contact

Contact us
Offices
Report pollution

Government

NSW Government
[jobs.nsw](#)

About

Accessibility
Disclaimer
Privacy
Copyright

APPENDIX D: NATA ACCREDITED LAB RESULTS

Benviron Group
64 Glenrock Parade
Koolewong
NSW 2256

Attention: **Ben Buckley**

Report **383565-W**
Client Reference GORDON E46
Received Date Jun 24, 2013



Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025.
The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Client Sample ID			R1
Sample Matrix			Water
Eurofins mgt Sample No.			S13-Jn16741
Date Sampled			Jun 21, 2013
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
TRH C6-C9	0.02	mg/L	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1
TRH C10-36 (Total)	0.1	mg/L	< 0.1
BTEX			
Benzene	0.001	mg/L	< 0.001
Toluene	0.001	mg/L	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002
o-Xylene	0.001	mg/L	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003
4-Bromofluorobenzene (surr.)	1	%	106
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene ^{N02}	0.02	mg/L	< 0.02
TRH C6-C10	0.02	mg/L	< 0.02
TRH C6-C10 less BTEX (F1) ^{N04}	0.02	mg/L	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05
TRH >C10-C16 less Naphthalene (F2) ^{N01}	0.05	mg/L	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1
Polycyclic Aromatic Hydrocarbons			
Acenaphthene	0.001	mg/L	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001
Anthracene	0.001	mg/L	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001
Benzo(b&j)fluoranthene ^{N07}	0.001	mg/L	< 0.001
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001
Chrysene	0.001	mg/L	< 0.001
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001
Fluoranthene	0.001	mg/L	< 0.001
Fluorene	0.001	mg/L	< 0.001
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001
Naphthalene	0.001	mg/L	< 0.001

Client Sample ID			R1
Sample Matrix			Water
Eurofins mgt Sample No.			S13-Jn16741
Date Sampled			Jun 21, 2013
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Phenanthrene	0.001	mg/L	< 0.001
Pyrene	0.001	mg/L	< 0.001
Total PAH	0.002	mg/L	< 0.001
p-Terphenyl-d14 (surr.)	1	%	88
2-Fluorobiphenyl (surr.)	1	%	106
Polychlorinated Biphenyls (PCB)			
Aroclor-1016	0.005	mg/L	< 0.005
Aroclor-1232	0.005	mg/L	< 0.005
Aroclor-1242	0.005	mg/L	< 0.005
Aroclor-1248	0.005	mg/L	< 0.005
Aroclor-1254	0.005	mg/L	< 0.005
Aroclor-1260	0.005	mg/L	< 0.005
Total PCB	0.005	mg/L	< 0.005
Dibutylchloredate (surr.)	1	%	85
Organochlorine Pesticides (OC)			
4,4'-DDD	0.0005	mg/L	< 0.0005
4,4'-DDE	0.0005	mg/L	< 0.0005
4,4'-DDT	0.002	mg/L	< 0.002
α-BHC	0.0005	mg/L	< 0.0005
α-Chlordane	0.0005	mg/L	< 0.0005
Aldrin	0.0005	mg/L	< 0.0005
β-BHC	0.0005	mg/L	< 0.0005
δ-BHC	0.0005	mg/L	< 0.0005
Dieldrin	0.0005	mg/L	< 0.0005
Endosulfan I	0.0005	mg/L	< 0.0005
Endosulfan II	0.0005	mg/L	< 0.0005
Endosulfan sulphate	0.0005	mg/L	< 0.0005
Endrin	0.0005	mg/L	< 0.0005
Endrin aldehyde	0.0005	mg/L	< 0.0005
Endrin ketone	0.0005	mg/L	< 0.0005
γ-BHC (Lindane)	0.0005	mg/L	< 0.0005
γ-Chlordane	0.0005	mg/L	< 0.0005
Heptachlor	0.0005	mg/L	< 0.0005
Heptachlor epoxide	0.0005	mg/L	< 0.0005
Hexachlorobenzene	0.0005	mg/L	< 0.0005
Methoxychlor	0.002	mg/L	< 0.002
Dibutylchloredate (surr.)	1	%	85
Tetrachloro-m-xylene (surr.)	1	%	88
Heavy Metals			
Arsenic	0.005	mg/L	< 0.005
Cadmium	0.0005	mg/L	< 0.0005
Chromium	0.005	mg/L	< 0.005
Copper	0.005	mg/L	< 0.005
Lead	0.005	mg/L	< 0.005
Mercury	0.0001	mg/L	< 0.0001
Nickel	0.005	mg/L	< 0.005
Zinc	0.005	mg/L	< 0.005

Description	Testing Site	Extracted	Holding Time
Eurofins mgt Suite 7			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Jun 27, 2013	7 Day
- Method: E004 Petroleum Hydrocarbons (TPH)			
BTEX	Sydney	Jun 27, 2013	14 Day
- Method: E029/E016 BTEX			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jun 27, 2013	7 Day
- Method: LM-LTM-ORG2010			
Polycyclic Aromatic Hydrocarbons	Sydney	Jun 24, 2013	7 Day
- Method: E007 Polyaromatic Hydrocarbons (PAH)			
Metals M8	Sydney	Jun 25, 2013	28 Day
- Method: E022/E030 Unfiltered Metals in Water & E026 Mercury			
Eurofins mgt Suite 13			
Polychlorinated Biphenyls (PCB)	Sydney	Jun 24, 2013	7 Day
- Method: E013 Polychlorinated Biphenyls (PCB)			
Organochlorine Pesticides (OC)	Sydney	Jun 24, 2013	7 Day
- Method: E013 Organochlorine Pesticides (OC)			

Company Name: Benviron Group
Address: 64 Glenrock Parade
Koolewong
NSW 2256
Client Job No.: GORDON E46

Order No.:
Report #: 383565
Phone:
Fax:

Received: Jun 24, 2013 1:20 PM
Due: Jun 27, 2013
Priority: 3 Day
Contact Name: Ben Buckley

Eurofins | mgt Client Manager: Jean Heng

Sample Detail					% Moisture	Eurofins mgt Suite 13	Eurofins mgt Suite 6	Eurofins mgt Suite 7
Laboratory where analysis is conducted								
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217					X	X	X	X
Brisbane Laboratory - NATA Site # 20794								
External Laboratory								
Sample ID	Sample Date	Sampling Time	Matrix	LAB ID				
BH1 0.5	Jun 21, 2013		Soil	S13-Jn16723	X	X	X	
BH2 0.4	Jun 21, 2013		Soil	S13-Jn16724	X	X		X
BH2 1.4	Jun 21, 2013		Soil	S13-Jn16725	X		X	
BH3 0.3	Jun 21, 2013		Soil	S13-Jn16726	X		X	
BH4 0.5	Jun 21, 2013		Soil	S13-Jn16727	X		X	
BH5 0.4	Jun 21, 2013		Soil	S13-Jn16728	X			X
BH5 0.7	Jun 21, 2013		Soil	S13-Jn16729	X		X	
BH6 0.1	Jun 21, 2013		Soil	S13-Jn16730	X	X	X	
BH6 0.5	Jun 21, 2013		Soil	S13-Jn16731	X	X	X	
BH7 0.2	Jun 21, 2013		Soil	S13-Jn16732	X		X	

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Sample Detail					% Moisture	Eurofins mgt Suite 13	Eurofins mgt Suite 6	Eurofins mgt Suite 7
Laboratory where analysis is conducted								
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217					X	X	X	X
Brisbane Laboratory - NATA Site # 20794								
External Laboratory								
BH8 0.2	Jun 21, 2013		Soil	S13-Jn16733	X			X
BH8 0.5	Jun 21, 2013		Soil	S13-Jn16734	X		X	
BH9 0.4	Jun 21, 2013		Soil	S13-Jn16735	X		X	
BH10 0.1	Jun 21, 2013		Soil	S13-Jn16736	X			X
BH11 0.2	Jun 21, 2013		Soil	S13-Jn16737	X		X	
BH12 0.3	Jun 21, 2013		Soil	S13-Jn16738	X			X
D1	Jun 21, 2013		Soil	S13-Jn16739	X	X		X
D2	Jun 21, 2013		Soil	S13-Jn16740	X		X	
R1	Jun 21, 2013		Water	S13-Jn16741		X		X

Eurofins | mgt Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual PQLs are matrix dependant. Quoted PQLs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Acknowledgment.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

UNITS

mg/kg: milligrams per Kilogram

ug/l: micrograms per litre

ppb: Parts per billion

org/100ml: Organisms per 100 millilitres

MPN/100mL: Most Probable Number of organisms per 100 millilitres

mg/l: milligrams per litre

ppm: Parts per million

%: Percentage

NTU: Units

TERMS

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environment Protection Authority
APHA	American Public Health Association
ASLP	Australian Standard Leaching Procedure (AS4439.3)
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within

QC - ACCEPTANCE CRITERIA

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC DATA GENERAL COMMENTS

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxophene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxophene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Arochlor 1260 in Matrix Spikes and LCS's.
9. For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPD's are calculated from raw analytical data thus it is possible to have two sets of data.

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions E004 Petroleum Hydrocarbons (TPH)							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX E029/E016 BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions LM-LTM-ORG2010							
Naphthalene	mg/L	< 0.02			0.02	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH C6-C10 less BTEX (F1)	mg/L	< 0.02			0.02	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons E007 Polyaromatic Hydrocarbons (PAH)							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g,h,i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a,h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1,2,3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Polychlorinated Biphenyls (PCB) E013 Polychlorinated Biphenyls (PCB)							
Aroclor-1016	mg/L	< 0.005			0.005	Pass	
Aroclor-1232	mg/L	< 0.005			0.005	Pass	
Aroclor-1242	mg/L	< 0.005			0.005	Pass	
Aroclor-1248	mg/L	< 0.005			0.005	Pass	
Aroclor-1254	mg/L	< 0.005			0.005	Pass	
Aroclor-1260	mg/L	< 0.005			0.005	Pass	
Total PCB	mg/L	< 0.005			0.005	Pass	
Method Blank							
Metals M8 E022/E030 Unfiltered Metals in Water & E026 Mercury							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Arsenic	mg/L	< 0.005			0.005	Pass	
Cadmium	mg/L	< 0.0005			0.0005	Pass	
Chromium	mg/L	< 0.005			0.005	Pass	
Copper	mg/L	< 0.005			0.005	Pass	
Lead	mg/L	< 0.005			0.005	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.005			0.005	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions E004 Petroleum Hydrocarbons (TPH)							
TRH C6-C9	%	91			70-130	Pass	
TRH C10-C14	%	125			70-130	Pass	
LCS - % Recovery							
BTEX E029/E016 BTEX							
Benzene	%	103			70-130	Pass	
Toluene	%	84			70-130	Pass	
Ethylbenzene	%	118			70-130	Pass	
m&p-Xylenes	%	107			70-130	Pass	
o-Xylene	%	113			70-130	Pass	
Xylenes - Total	%	109			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions LM-LTM-ORG2010							
Naphthalene	%	102			70-130	Pass	
TRH C6-C10	%	93			70-130	Pass	
TRH >C10-C16	%	130			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons E007 Polyaromatic Hydrocarbons (PAH)							
Acenaphthene	%	95			70-130	Pass	
Acenaphthylene	%	94			70-130	Pass	
Anthracene	%	102			70-130	Pass	
Benz(a)anthracene	%	96			70-130	Pass	
Benzo(a)pyrene	%	81			70-130	Pass	
Benzo(b&j)fluoranthene	%	97			70-130	Pass	
Benzo(g,h,i)perylene	%	87			70-130	Pass	
Benzo(k)fluoranthene	%	96			70-130	Pass	
Chrysene	%	96			70-130	Pass	
Dibenz(a,h)anthracene	%	79			70-130	Pass	
Fluoranthene	%	98			70-130	Pass	
Fluorene	%	96			70-130	Pass	
Indeno(1,2,3-cd)pyrene	%	81			70-130	Pass	
Naphthalene	%	95			70-130	Pass	
Phenanthrene	%	98			70-130	Pass	
Pyrene	%	96			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls (PCB) E013 Polychlorinated Biphenyls (PCB)							
Aroclor-1260	%	81			70-130	Pass	
LCS - % Recovery							
Metals M8 E022/E030 Unfiltered Metals in Water & E026 Mercury							
Arsenic	%	83			70-130	Pass	
Cadmium	%	86			70-130	Pass	
Chromium	%	84			70-130	Pass	
Copper	%	83			70-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Lead			%	81			70-130	Pass	
Mercury			%	97			70-130	Pass	
Nickel			%	85			70-130	Pass	
Zinc			%	84			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S13-Jn16243	NCP	%	83			70-130	Pass	
TRH C10-C14	S13-Jn16244	NCP	%	102			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S13-Jn16243	NCP	%	88			70-130	Pass	
Toluene	S13-Jn16243	NCP	%	100			70-130	Pass	
Ethylbenzene	S13-Jn16243	NCP	%	111			70-130	Pass	
m&p-Xylenes	S13-Jn16243	NCP	%	105			70-130	Pass	
o-Xylene	S13-Jn16243	NCP	%	106			70-130	Pass	
Xylenes - Total	S13-Jn16243	NCP	%	105			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S13-Jn16243	NCP	%	117			70-130	Pass	
TRH C6-C10	S13-Jn16243	NCP	%	89			70-130	Pass	
TRH >C10-C16	S13-Jn16244	NCP	%	114			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S13-Jn16243	NCP	%	103			70-130	Pass	
Acenaphthylene	S13-Jn16243	NCP	%	98			70-130	Pass	
Anthracene	S13-Jn16243	NCP	%	105			70-130	Pass	
Benz(a)anthracene	S13-Jn16243	NCP	%	94			70-130	Pass	
Benzo(a)pyrene	S13-Jn16243	NCP	%	95			70-130	Pass	
Benzo(b&j)fluoranthene	S13-Jn16243	NCP	%	90			70-130	Pass	
Benzo(g,h,i)perylene	S13-Jn16243	NCP	%	91			70-130	Pass	
Benzo(k)fluoranthene	S13-Jn16243	NCP	%	99			70-130	Pass	
Chrysene	S13-Jn16243	NCP	%	100			70-130	Pass	
Dibenz(a,h)anthracene	S13-Jn16243	NCP	%	79			70-130	Pass	
Fluoranthene	S13-Jn16243	NCP	%	101			70-130	Pass	
Fluorene	S13-Jn16243	NCP	%	98			70-130	Pass	
Indeno(1,2,3-cd)pyrene	S13-Jn16243	NCP	%	80			70-130	Pass	
Naphthalene	S13-Jn16243	NCP	%	104			70-130	Pass	
Phenanthrene	S13-Jn16243	NCP	%	102			70-130	Pass	
Pyrene	S13-Jn16243	NCP	%	98			70-130	Pass	
Spike - % Recovery									
Metals M8				Result 1					
Arsenic	S13-Jn17174	NCP	%	100			70-130	Pass	
Cadmium	S13-Jn17174	NCP	%	93			70-130	Pass	
Chromium	S13-Jn17174	NCP	%	95			70-130	Pass	
Copper	S13-Jn17174	NCP	%	88			70-130	Pass	
Lead	S13-Jn17174	NCP	%	90			70-130	Pass	
Mercury	S13-Jn13038	NCP	%	96			70-130	Pass	
Nickel	S13-Jn17174	NCP	%	85			70-130	Pass	
Zinc	S13-Jn17174	NCP	%	88			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code

Duplicate								
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD		
TRH C6-C9	S13-Jn16242	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass
TRH C10-C14	S13-Jn16242	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass
TRH C15-C28	S13-Jn16242	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass
TRH C29-C36	S13-Jn16242	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass
Duplicate								
BTEX				Result 1	Result 2	RPD		
Benzene	S13-Jn16242	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Toluene	S13-Jn16242	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Ethylbenzene	S13-Jn16242	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
m&p-Xylenes	S13-Jn16242	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass
o-Xylene	S13-Jn16242	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Xylenes - Total	S13-Jn16242	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD		
Naphthalene	S13-Jn16242	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass
TRH C6-C10	S13-Jn16242	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass
TRH C6-C10 less BTEX (F1)	S13-Jn16242	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass
TRH >C10-C16	S13-Jn16242	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass
TRH >C16-C34	S13-Jn16242	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass
TRH >C34-C40	S13-Jn16242	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass
Duplicate								
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD		
Acenaphthene	S13-Jn16242	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Acenaphthylene	S13-Jn16242	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Anthracene	S13-Jn16242	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benz(a)anthracene	S13-Jn16242	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benzo(a)pyrene	S13-Jn16242	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benzo(b&j)fluoranthene	S13-Jn16242	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benzo(g,h,i)perylene	S13-Jn16242	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Benzo(k)fluoranthene	S13-Jn16242	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Chrysene	S13-Jn16242	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Dibenz(a,h)anthracene	S13-Jn16242	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Fluoranthene	S13-Jn16242	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Fluorene	S13-Jn16242	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Indeno(1,2,3-cd)pyrene	S13-Jn16242	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Naphthalene	S13-Jn16242	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Phenanthrene	S13-Jn16242	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Pyrene	S13-Jn16242	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass
Duplicate								
Metals M8				Result 1	Result 2	RPD		
Arsenic	S13-Jn16741	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass
Cadmium	S13-Jn16741	CP	mg/L	< 0.0005	< 0.0005	<1	30%	Pass
Chromium	S13-Jn16741	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass
Copper	S13-Jn16741	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass
Lead	S13-Jn16741	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass
Mercury	S13-Jn13035	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass
Nickel	S13-Jn16741	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass
Zinc	S13-Jn16741	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Organic samples had Teflon liners	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs

Authorised By

Jean Heng	Client Services
James Norford	Senior Analyst-Metal (NSW)
Ryan Hamilton	Senior Analyst-Organic (NSW)
Ryan Hamilton	Senior Analyst-Volatile (NSW)



Dr. Bob Symons

Laboratory Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Uncertainty data is available on request

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Benviron Group
64 Glenrock Parade
Koolewong
NSW 2256

Attention: **Ben Buckley**

Report **383565-S**
Client Reference **GORDON E46**
Received Date **Jun 24, 2013**



Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025.
The results of the tests, calibrations and/or
measurements included in this document are traceable
to Australian/national standards.

Client Sample ID			BH1 0.5	BH2 0.4	BH2 1.4	BH3 0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S13-Jn16723	S13-Jn16724	S13-Jn16725	S13-Jn16726
Date Sampled			Jun 21, 2013	Jun 21, 2013	Jun 21, 2013	Jun 21, 2013
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	67
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	< 50	67
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	124	123	123	125
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.5	mg/kg	-	< 0.5	-	-
Acenaphthylene	0.5	mg/kg	-	< 0.5	-	-
Anthracene	0.5	mg/kg	-	< 0.5	-	-
Benz(a)anthracene	0.5	mg/kg	-	< 0.5	-	-
Benzo(a)pyrene	0.5	mg/kg	-	< 0.5	-	-
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	-	< 0.5	-	-
Benzo(g,h,i)perylene	0.5	mg/kg	-	< 0.5	-	-
Benzo(k)fluoranthene	0.5	mg/kg	-	< 0.5	-	-
Chrysene	0.5	mg/kg	-	< 0.5	-	-
Dibenz(a,h)anthracene	0.5	mg/kg	-	< 0.5	-	-
Fluoranthene	0.5	mg/kg	-	< 0.5	-	-
Fluorene	0.5	mg/kg	-	< 0.5	-	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	< 0.5	-	-
Naphthalene	0.5	mg/kg	-	< 0.5	-	-

Client Sample ID			BH1 0.5	BH2 0.4	BH2 1.4	BH3 0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S13-Jn16723	S13-Jn16724	S13-Jn16725	S13-Jn16726
Date Sampled			Jun 21, 2013	Jun 21, 2013	Jun 21, 2013	Jun 21, 2013
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Phenanthrene	0.5	mg/kg	-	< 0.5	-	-
Pyrene	0.5	mg/kg	-	< 0.5	-	-
Total PAH	1	mg/kg	-	< 0.5	-	-
p-Terphenyl-d14 (surr.)	1	%	-	109	-	-
2-Fluorobiphenyl (surr.)	1	%	-	125	-	-
Polychlorinated Biphenyls (PCB)						
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	-	-
Aroclor-1232	0.5	mg/kg	< 0.5	< 0.5	-	-
Aroclor-1242	0.5	mg/kg	< 0.5	< 0.5	-	-
Aroclor-1248	0.5	mg/kg	< 0.5	< 0.5	-	-
Aroclor-1254	0.5	mg/kg	< 0.5	< 0.5	-	-
Aroclor-1260	0.5	mg/kg	< 0.5	< 0.5	-	-
Total PCB	0.5	mg/kg	< 0.5	< 0.5	-	-
Dibutylchloredate (surr.)	1	%	124	96	-	-
Organochlorine Pesticides (OC)						
4,4'-DDD	0.05	mg/kg	< 0.05	< 0.05	-	-
4,4'-DDE	0.05	mg/kg	< 0.05	< 0.05	-	-
4,4'-DDT	0.2	mg/kg	< 0.2	< 0.2	-	-
a-BHC	0.05	mg/kg	< 0.05	< 0.05	-	-
a-Chlordane	0.05	mg/kg	< 0.05	< 0.05	-	-
Aldrin	0.05	mg/kg	< 0.05	< 0.05	-	-
b-BHC	0.05	mg/kg	< 0.05	< 0.05	-	-
d-BHC	0.05	mg/kg	< 0.05	< 0.05	-	-
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	-	-
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	-	-
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	-	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	-	-
Endrin	0.05	mg/kg	< 0.05	< 0.05	-	-
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	-	-
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	-	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	-	-
g-Chlordane	0.05	mg/kg	< 0.05	< 0.05	-	-
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	-	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	-	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	-	-
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2	-	-
Dibutylchloredate (surr.)	1	%	124	96	-	-
Tetrachloro-m-xylene (surr.)	1	%	73	77	-	-
Heavy Metals						
Arsenic	2	mg/kg	3.0	4.1	6.2	< 2
Cadmium	0.4	mg/kg	0.4	0.7	0.7	< 0.4
Chromium	5	mg/kg	21	16	21	7.3
Copper	5	mg/kg	< 5	34	19	20
Lead	5	mg/kg	8.8	62	18	13
Mercury	0.05	mg/kg	< 0.05	0.05	< 0.05	0.06
Nickel	5	mg/kg	< 5	16	< 5	< 5
Zinc	5	mg/kg	7.2	78	14	44

Client Sample ID			BH1 0.5	BH2 0.4	BH2 1.4	BH3 0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S13-Jn16723	S13-Jn16724	S13-Jn16725	S13-Jn16726
Date Sampled			Jun 21, 2013	Jun 21, 2013	Jun 21, 2013	Jun 21, 2013
Test/Reference	LOR	Unit				
% Moisture	0.1	%	19	13	16	8.0

Client Sample ID			BH4 0.5	BH5 0.4	BH5 0.7	BH6 0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S13-Jn16727	S13-Jn16728	S13-Jn16729	S13-Jn16730
Date Sampled			Jun 21, 2013	Jun 21, 2013	Jun 21, 2013	Jun 21, 2013
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	110	60	< 50	72
TRH C10-36 (Total)	50	mg/kg	110	60	< 50	72
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	117	118	124	123
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.5	mg/kg	-	< 0.5	-	-
Acenaphthylene	0.5	mg/kg	-	< 0.5	-	-
Anthracene	0.5	mg/kg	-	< 0.5	-	-
Benz(a)anthracene	0.5	mg/kg	-	< 0.5	-	-
Benzo(a)pyrene	0.5	mg/kg	-	< 0.5	-	-
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	-	< 0.5	-	-
Benzo(g,h,i)perylene	0.5	mg/kg	-	< 0.5	-	-
Benzo(k)fluoranthene	0.5	mg/kg	-	< 0.5	-	-
Chrysene	0.5	mg/kg	-	< 0.5	-	-
Dibenz(a,h)anthracene	0.5	mg/kg	-	< 0.5	-	-
Fluoranthene	0.5	mg/kg	-	< 0.5	-	-
Fluorene	0.5	mg/kg	-	< 0.5	-	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	< 0.5	-	-
Naphthalene	0.5	mg/kg	-	< 0.5	-	-
Phenanthrene	0.5	mg/kg	-	< 0.5	-	-

Client Sample ID			BH4 0.5	BH5 0.4	BH5 0.7	BH6 0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S13-Jn16727	S13-Jn16728	S13-Jn16729	S13-Jn16730
Date Sampled			Jun 21, 2013	Jun 21, 2013	Jun 21, 2013	Jun 21, 2013
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Pyrene	0.5	mg/kg	-	< 0.5	-	-
Total PAH	1	mg/kg	-	< 0.5	-	-
p-Terphenyl-d14 (surr.)	1	%	-	101	-	-
2-Fluorobiphenyl (surr.)	1	%	-	118	-	-
Polychlorinated Biphenyls (PCB)						
Aroclor-1016	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1232	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1242	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1248	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1254	0.5	mg/kg	-	-	-	< 0.5
Aroclor-1260	0.5	mg/kg	-	-	-	< 0.5
Total PCB	0.5	mg/kg	-	-	-	< 0.5
Dibutylchloredate (surr.)	1	%	-	-	-	Q09A ₁
Organochlorine Pesticides (OC)						
4,4'-DDD	0.05	mg/kg	-	-	-	< 0.05
4,4'-DDE	0.05	mg/kg	-	-	-	< 0.05
4,4'-DDT	0.2	mg/kg	-	-	-	< 0.2
α-BHC	0.05	mg/kg	-	-	-	< 0.05
α-Chlordane	0.05	mg/kg	-	-	-	< 0.05
Aldrin	0.05	mg/kg	-	-	-	< 0.05
β-BHC	0.05	mg/kg	-	-	-	< 0.05
δ-BHC	0.05	mg/kg	-	-	-	< 0.05
Dieldrin	0.05	mg/kg	-	-	-	< 0.05
Endosulfan I	0.05	mg/kg	-	-	-	< 0.05
Endosulfan II	0.05	mg/kg	-	-	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	-	-	< 0.05
Endrin	0.05	mg/kg	-	-	-	< 0.05
Endrin aldehyde	0.05	mg/kg	-	-	-	< 0.05
Endrin ketone	0.05	mg/kg	-	-	-	< 0.05
γ-BHC (Lindane)	0.05	mg/kg	-	-	-	< 0.05
γ-Chlordane	0.05	mg/kg	-	-	-	< 0.05
Heptachlor	0.05	mg/kg	-	-	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	-	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	-	-	< 0.05
Methoxychlor	0.2	mg/kg	-	-	-	< 0.2
Dibutylchloredate (surr.)	1	%	-	-	-	1
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	90
Heavy Metals						
Arsenic	2	mg/kg	3.3	< 2	< 2	2.6
Cadmium	0.4	mg/kg	0.5	< 0.4	< 0.4	0.7
Chromium	5	mg/kg	14	< 5	< 5	15
Copper	5	mg/kg	43	11	7.7	22
Lead	5	mg/kg	110	20	22	120
Mercury	0.05	mg/kg	0.72	< 0.05	< 0.05	0.09
Nickel	5	mg/kg	48	6.7	< 5	7.9
Zinc	5	mg/kg	170	49	49	130
% Moisture	0.1	%	25	11	7.2	27

Client Sample ID			BH6 0.5	BH7 0.2	BH8 0.2	BH8 0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S13-Jn16731	S13-Jn16732	S13-Jn16733	S13-Jn16734
Date Sampled			Jun 21, 2013	Jun 21, 2013	Jun 21, 2013	Jun 21, 2013
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	118	122	113	109
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.5	mg/kg	-	-	< 0.5	-
Acenaphthylene	0.5	mg/kg	-	-	< 0.5	-
Anthracene	0.5	mg/kg	-	-	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	-	-	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	-	-	< 0.5	-
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	-	-	< 0.5	-
Benzo(g,h,i)perylene	0.5	mg/kg	-	-	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	-	-	< 0.5	-
Chrysene	0.5	mg/kg	-	-	< 0.5	-
Dibenz(a,h)anthracene	0.5	mg/kg	-	-	< 0.5	-
Fluoranthene	0.5	mg/kg	-	-	< 0.5	-
Fluorene	0.5	mg/kg	-	-	< 0.5	-
Indeno(1,2,3-cd)pyrene	0.5	mg/kg	-	-	< 0.5	-
Naphthalene	0.5	mg/kg	-	-	< 0.5	-
Phenanthrene	0.5	mg/kg	-	-	< 0.5	-
Pyrene	0.5	mg/kg	-	-	< 0.5	-
Total PAH	1	mg/kg	-	-	< 0.5	-
p-Terphenyl-d14 (surr.)	1	%	-	-	112	-
2-Fluorobiphenyl (surr.)	1	%	-	-	127	-
Polychlorinated Biphenyls (PCB)						
Aroclor-1016	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1232	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1242	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1248	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1254	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1260	0.5	mg/kg	< 0.5	-	-	-

Client Sample ID			BH6 0.5	BH7 0.2	BH8 0.2	BH8 0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S13-Jn16731	S13-Jn16732	S13-Jn16733	S13-Jn16734
Date Sampled			Jun 21, 2013	Jun 21, 2013	Jun 21, 2013	Jun 21, 2013
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls (PCB)						
Total PCB	0.5	mg/kg	< 0.5	-	-	-
Dibutylchloredate (surr.)	1	%	91	-	-	-
Organochlorine Pesticides (OC)						
4.4'-DDD	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDT	0.2	mg/kg	< 0.2	-	-	-
a-BHC	0.05	mg/kg	< 0.05	-	-	-
a-Chlordane	0.05	mg/kg	< 0.05	-	-	-
Aldrin	0.05	mg/kg	< 0.05	-	-	-
b-BHC	0.05	mg/kg	< 0.05	-	-	-
d-BHC	0.05	mg/kg	< 0.05	-	-	-
Dieldrin	0.05	mg/kg	< 0.05	-	-	-
Endosulfan I	0.05	mg/kg	< 0.05	-	-	-
Endosulfan II	0.05	mg/kg	< 0.05	-	-	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	-	-
Endrin	0.05	mg/kg	< 0.05	-	-	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	-	-
Endrin ketone	0.05	mg/kg	< 0.05	-	-	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	-	-
g-Chlordane	0.05	mg/kg	< 0.05	-	-	-
Heptachlor	0.05	mg/kg	< 0.05	-	-	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	-	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	-	-
Methoxychlor	0.2	mg/kg	< 0.2	-	-	-
Dibutylchloredate (surr.)	1	%	91	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	81	-	-	-
Heavy Metals						
Arsenic	2	mg/kg	3.2	17	5.2	4.2
Cadmium	0.4	mg/kg	0.6	0.4	< 0.4	0.5
Chromium	5	mg/kg	18	14	5.7	21
Copper	5	mg/kg	18	18	8.8	11
Lead	5	mg/kg	47	84	20	20
Mercury	0.05	mg/kg	0.06	0.10	< 0.05	< 0.05
Nickel	5	mg/kg	8.7	5.3	< 5	< 5
Zinc	5	mg/kg	53	78	25	7.3
% Moisture	0.1	%	16	16	15	23

Client Sample ID			BH9 0.4	BH10 0.1	BH11 0.2	BH12 0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S13-Jn16735	S13-Jn16736	S13-Jn16737	S13-Jn16738
Date Sampled			Jun 21, 2013	Jun 21, 2013	Jun 21, 2013	Jun 21, 2013
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20

Client Sample ID Sample Matrix Eurofins mgt Sample No. Date Sampled Test/Reference	LOR	Unit	BH9 0.4 Soil S13-Jn16735 Jun 21, 2013	BH10 0.1 Soil S13-Jn16736 Jun 21, 2013	BH11 0.2 Soil S13-Jn16737 Jun 21, 2013	BH12 0.3 Soil S13-Jn16738 Jun 21, 2013
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	100
TRH C29-C36	50	mg/kg	79	< 50	< 50	71
TRH C10-36 (Total)	50	mg/kg	79	< 50	< 50	170
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	114	108	111	120
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	150
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.5	mg/kg	-	< 0.5	-	< 0.5
Acenaphthylene	0.5	mg/kg	-	< 0.5	-	< 0.5
Anthracene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benz(a)anthracene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(a)pyrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	-	0.6	-	< 0.5
Benzo(g,h,i)perylene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	-	< 0.5	-	< 0.5
Chrysene	0.5	mg/kg	-	< 0.5	-	< 0.5
Dibenz(a,h)anthracene	0.5	mg/kg	-	< 0.5	-	< 0.5
Fluoranthene	0.5	mg/kg	-	< 0.5	-	< 0.5
Fluorene	0.5	mg/kg	-	< 0.5	-	< 0.5
Indeno(1,2,3-cd)pyrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Naphthalene	0.5	mg/kg	-	< 0.5	-	< 0.5
Phenanthrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Pyrene	0.5	mg/kg	-	0.5	-	< 0.5
Total PAH	1	mg/kg	-	1.1	-	< 0.5
p-Terphenyl-d14 (surr.)	1	%	-	85	-	127
2-Fluorobiphenyl (surr.)	1	%	-	100	-	129
Heavy Metals						
Arsenic	2	mg/kg	5.3	2.9	3.4	< 2
Cadmium	0.4	mg/kg	< 0.4	0.6	0.4	< 0.4
Chromium	5	mg/kg	16	15	13	5.4
Copper	5	mg/kg	46	11	7.8	12
Lead	5	mg/kg	29	25	26	10
Mercury	0.05	mg/kg	0.12	< 0.05	< 0.05	< 0.05
Nickel	5	mg/kg	7.8	< 5	< 5	10

Client Sample ID			BH9 0.4	BH10 0.1	BH11 0.2	BH12 0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins mgt Sample No.			S13-Jn16735	S13-Jn16736	S13-Jn16737	S13-Jn16738
Date Sampled			Jun 21, 2013	Jun 21, 2013	Jun 21, 2013	Jun 21, 2013
Test/Reference	LOR	Unit				
Heavy Metals						
Zinc	5	mg/kg	82	16	12	39
% Moisture	0.1	%	15	21	20	2.0

Client Sample ID			D1	D2
Sample Matrix			Soil	Soil
Eurofins mgt Sample No.			S13-Jn16739	S13-Jn16740
Date Sampled			Jun 21, 2013	Jun 21, 2013
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				
TRH C6-C9	20	mg/kg	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50
BTEX				
Benzene	0.1	mg/kg	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	115	112
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene ^{N02}	0.5	mg/kg	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20
TRH C6-C10 less BTEX (F1) ^{N04}	20	mg/kg	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50
TRH >C10-C16 less Naphthalene (F2) ^{N01}	50	mg/kg	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100
Polycyclic Aromatic Hydrocarbons				
Acenaphthene	0.5	mg/kg	< 0.5	-
Acenaphthylene	0.5	mg/kg	< 0.5	-
Anthracene	0.5	mg/kg	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-
Benzo(b&j)fluoranthene ^{N07}	0.5	mg/kg	< 0.5	-
Benzo(g,h,i)perylene	0.5	mg/kg	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-
Chrysene	0.5	mg/kg	< 0.5	-
Dibenz(a,h)anthracene	0.5	mg/kg	< 0.5	-
Fluoranthene	0.5	mg/kg	< 0.5	-
Fluorene	0.5	mg/kg	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-

Client Sample ID			D1	D2
Sample Matrix			Soil	Soil
Eurofins mgt Sample No.			S13-Jn16739	S13-Jn16740
Date Sampled			Jun 21, 2013	Jun 21, 2013
Test/Reference	LOR	Unit		
Polycyclic Aromatic Hydrocarbons				
Naphthalene	0.5	mg/kg	< 0.5	-
Phenanthrene	0.5	mg/kg	< 0.5	-
Pyrene	0.5	mg/kg	< 0.5	-
Total PAH	1	mg/kg	< 0.5	-
p-Terphenyl-d14 (surr.)	1	%	102	-
2-Fluorobiphenyl (surr.)	1	%	119	-
Polychlorinated Biphenyls (PCB)				
Aroclor-1016	0.5	mg/kg	< 0.5	-
Aroclor-1232	0.5	mg/kg	< 0.5	-
Aroclor-1242	0.5	mg/kg	< 0.5	-
Aroclor-1248	0.5	mg/kg	< 0.5	-
Aroclor-1254	0.5	mg/kg	< 0.5	-
Aroclor-1260	0.5	mg/kg	< 0.5	-
Total PCB	0.5	mg/kg	< 0.5	-
Dibutylchloredate (surr.)	1	%	89	-
Organochlorine Pesticides (OC)				
4,4'-DDD	0.05	mg/kg	< 0.05	-
4,4'-DDE	0.05	mg/kg	< 0.05	-
4,4'-DDT	0.2	mg/kg	< 0.2	-
α-BHC	0.05	mg/kg	< 0.05	-
α-Chlordane	0.05	mg/kg	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	-
β-BHC	0.05	mg/kg	< 0.05	-
δ-BHC	0.05	mg/kg	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	-
γ-BHC (Lindane)	0.05	mg/kg	< 0.05	-
γ-Chlordane	0.05	mg/kg	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-
Methoxychlor	0.2	mg/kg	< 0.2	-
Dibutylchloredate (surr.)	1	%	89	-
Tetrachloro-m-xylene (surr.)	1	%	76	-
Heavy Metals				
Arsenic	2	mg/kg	3.7	5.7
Cadmium	0.4	mg/kg	0.8	0.7
Chromium	5	mg/kg	19	14
Copper	5	mg/kg	40	30
Lead	5	mg/kg	67	190
Mercury	0.05	mg/kg	0.06	0.11
Nickel	5	mg/kg	17	5.8
Zinc	5	mg/kg	98	110

Client Sample ID			D1	D2
Sample Matrix			Soil	Soil
Eurofins mgt Sample No.			S13-Jn16739	S13-Jn16740
Date Sampled			Jun 21, 2013	Jun 21, 2013
Test/Reference	LOR	Unit		
% Moisture	0.1	%	12	15

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported. A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

Description	Testing Site	Extracted	Holding Time
Eurofins mgt Suite 7			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Jun 27, 2013	14 Day
- Method: E004 Petroleum Hydrocarbons (TPH)			
BTEX	Sydney	Jun 27, 2013	14 Day
- Method: E029/E016 BTEX			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jun 27, 2013	14 Day
- Method: LM-LTM-ORG2010			
Polycyclic Aromatic Hydrocarbons	Sydney	Jun 25, 2013	14 Day
- Method: E007 Polyaromatic Hydrocarbons (PAH)			
Metals M8	Sydney	Jun 25, 2013	28 Day
- Method: E022 Acid Extractable metals in Soils & E026 Mercury			
Eurofins mgt Suite 13			
Polychlorinated Biphenyls (PCB)	Sydney	Jun 25, 2013	28 Day
- Method: E013 Polychlorinated Biphenyls (PCB)			
Organochlorine Pesticides (OC)	Sydney	Jun 25, 2013	14 Day
- Method: E013 Organochlorine Pesticides (OC)			
% Moisture	Sydney	Jun 25, 2013	28 Day
- Method: E005 Moisture Content			

Company Name: Benviron Group
Address: 64 Glenrock Parade
Koolewong
NSW 2256
Client Job No.: GORDON E46

Order No.:
Report #: 383565
Phone:
Fax:

Received: Jun 24, 2013 1:20 PM
Due: Jun 27, 2013
Priority: 3 Day
Contact Name: Ben Buckley

Eurofins | mgt Client Manager: Jean Heng

Sample Detail					% Moisture	Eurofins mgt Suite 13	Eurofins mgt Suite 6	Eurofins mgt Suite 7
Laboratory where analysis is conducted								
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217					X	X	X	X
Brisbane Laboratory - NATA Site # 20794								
External Laboratory								
Sample ID	Sample Date	Sampling Time	Matrix	LAB ID				
BH1 0.5	Jun 21, 2013		Soil	S13-Jn16723	X	X	X	
BH2 0.4	Jun 21, 2013		Soil	S13-Jn16724	X	X		X
BH2 1.4	Jun 21, 2013		Soil	S13-Jn16725	X		X	
BH3 0.3	Jun 21, 2013		Soil	S13-Jn16726	X		X	
BH4 0.5	Jun 21, 2013		Soil	S13-Jn16727	X		X	
BH5 0.4	Jun 21, 2013		Soil	S13-Jn16728	X			X
BH5 0.7	Jun 21, 2013		Soil	S13-Jn16729	X		X	
BH6 0.1	Jun 21, 2013		Soil	S13-Jn16730	X	X	X	
BH6 0.5	Jun 21, 2013		Soil	S13-Jn16731	X	X	X	
BH7 0.2	Jun 21, 2013		Soil	S13-Jn16732	X		X	

Company Name: Benviron Group
Address: 64 Glenrock Parade
Koolewong
NSW 2256
Client Job No.: GORDON E46

Order No.:
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Phone:
Fax:

Received: Jun 24, 2013 1:20 PM
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Eurofins | mgt Client Manager: Jean Heng

Sample Detail					% Moisture	Eurofins mgt Suite 13	Eurofins mgt Suite 6	Eurofins mgt Suite 7
Laboratory where analysis is conducted								
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217					X	X	X	X
Brisbane Laboratory - NATA Site # 20794								
External Laboratory								
BH8 0.2	Jun 21, 2013		Soil	S13-Jn16733	X			X
BH8 0.5	Jun 21, 2013		Soil	S13-Jn16734	X		X	
BH9 0.4	Jun 21, 2013		Soil	S13-Jn16735	X		X	
BH10 0.1	Jun 21, 2013		Soil	S13-Jn16736	X			X
BH11 0.2	Jun 21, 2013		Soil	S13-Jn16737	X		X	
BH12 0.3	Jun 21, 2013		Soil	S13-Jn16738	X			X
D1	Jun 21, 2013		Soil	S13-Jn16739	X	X		X
D2	Jun 21, 2013		Soil	S13-Jn16740	X		X	
R1	Jun 21, 2013		Water	S13-Jn16741		X		X

Eurofins | mgt Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual PQLs are matrix dependant. Quoted PQLs may be raised where sample extracts are diluted due to interferences.
4. Results are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
6. Samples were analysed on an 'as received' basis. 7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Acknowledgment.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

UNITS

mg/kg: milligrams per Kilogram

ug/l: micrograms per litre

ppb: Parts per billion

org/100ml: Organisms per 100 millilitres

MPN/100mL: Most Probable Number of organisms per 100 millilitres

mg/l: milligrams per litre

ppm: Parts per million

%: Percentage

NTU: Units

TERMS

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery
CRM	Certified Reference Material - reported as percent recovery
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environment Protection Authority
APHA	American Public Health Association
ASLP	Australian Standard Leaching Procedure (AS4439.3)
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within

QC - ACCEPTANCE CRITERIA

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC DATA GENERAL COMMENTS

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxophene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxophene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Arochlor 1260 in Matrix Spikes and LCS's.
9. For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPD's are calculated from raw analytical data thus it is possible to have two sets of data.

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions E004 Petroleum Hydrocarbons (TPH)							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX E029/E016 BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions LM-LTM-ORG2010							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH C6-C10 less BTEX (F1)	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons E007 Polyaromatic Hydrocarbons (PAH)							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g,h,i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a,h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Polychlorinated Biphenyls (PCB) E013 Polychlorinated Biphenyls (PCB)							
Aroclor-1016	mg/kg	< 0.5			0.5	Pass	
Aroclor-1232	mg/kg	< 0.5			0.5	Pass	
Aroclor-1242	mg/kg	< 0.5			0.5	Pass	
Aroclor-1248	mg/kg	< 0.5			0.5	Pass	
Aroclor-1254	mg/kg	< 0.5			0.5	Pass	
Aroclor-1260	mg/kg	< 0.5			0.5	Pass	
Total PCB	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides (OC) E013 Organochlorine Pesticides (OC)							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
4,4'-DDD	mg/kg	< 0.05			0.05	Pass	
4,4'-DDE	mg/kg	< 0.05			0.05	Pass	
4,4'-DDT	mg/kg	< 0.2			0.2	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
a-Chlordane	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
g-Chlordane	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Metals M8 E022 Acid Extractable metals in Soils & E026 Mercury							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.05			0.05	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions E004 Petroleum Hydrocarbons (TPH)							
TRH C6-C9	%	92			70-130	Pass	
TRH C10-C14	%	111			70-130	Pass	
LCS - % Recovery							
BTEX E029/E016 BTEX							
Benzene	%	127			70-130	Pass	
Toluene	%	110			70-130	Pass	
Ethylbenzene	%	101			70-130	Pass	
m&p-Xylenes	%	101			70-130	Pass	
o-Xylene	%	99			70-130	Pass	
Xylenes - Total	%	101			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions LM-LTM-ORG2010							
Naphthalene	%	77			70-130	Pass	
TRH C6-C10	%	104			70-130	Pass	
TRH >C10-C16	%	120			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons E007 Polyaromatic Hydrocarbons (PAH)							
Acenaphthene	%	110			70-130	Pass	
Acenaphthylene	%	111			70-130	Pass	
Anthracene	%	101			70-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benz(a)anthracene			%	100			70-130	Pass	
Benzo(a)pyrene			%	87			70-130	Pass	
Benzo(b&j)fluoranthene			%	105			70-130	Pass	
Benzo(g,h,i)perylene			%	72			70-130	Pass	
Benzo(k)fluoranthene			%	93			70-130	Pass	
Chrysene			%	110			70-130	Pass	
Dibenz(a,h)anthracene			%	86			70-130	Pass	
Fluoranthene			%	101			70-130	Pass	
Fluorene			%	110			70-130	Pass	
Indeno(1,2,3-cd)pyrene			%	84			70-130	Pass	
Naphthalene			%	111			70-130	Pass	
Phenanthrene			%	103			70-130	Pass	
Pyrene			%	103			70-130	Pass	
LCS - % Recovery									
Polychlorinated Biphenyls (PCB) E013 Polychlorinated Biphenyls (PCB)									
Aroclor-1260			%	82			70-130	Pass	
LCS - % Recovery									
Organochlorine Pesticides (OC) E013 Organochlorine Pesticides (OC)									
4,4'-DDD			%	90			70-130	Pass	
4,4'-DDE			%	95			70-130	Pass	
4,4'-DDT			%	95			70-130	Pass	
a-BHC			%	95			70-130	Pass	
a-Chlordane			%	90			70-130	Pass	
Aldrin			%	95			70-130	Pass	
b-BHC			%	85			70-130	Pass	
d-BHC			%	80			70-130	Pass	
Dieldrin			%	95			70-130	Pass	
Endosulfan I			%	90			70-130	Pass	
Endosulfan II			%	85			70-130	Pass	
Endosulfan sulphate			%	70			70-130	Pass	
Endrin			%	95			70-130	Pass	
Endrin aldehyde			%	70			70-130	Pass	
Endrin ketone			%	80			70-130	Pass	
g-BHC (Lindane)			%	85			70-130	Pass	
g-Chlordane			%	90			70-130	Pass	
Heptachlor			%	95			70-130	Pass	
Heptachlor epoxide			%	90			70-130	Pass	
Hexachlorobenzene			%	95			70-130	Pass	
Methoxychlor			%	75			70-130	Pass	
LCS - % Recovery									
Metals M8 E022 Acid Extractable metals in Soils & E026 Mercury									
Arsenic			%	96			70-130	Pass	
Cadmium			%	103			70-130	Pass	
Chromium			%	100			70-130	Pass	
Copper			%	105			70-130	Pass	
Lead			%	100			70-130	Pass	
Mercury			%	101			70-130	Pass	
Nickel			%	103			70-130	Pass	
Zinc			%	103			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S13-Jn16723	CP	%	92			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
TRH C10-C14	S13-Jn16723	CP	%	75			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S13-Jn16723	CP	%	128			70-130	Pass	
Toluene	S13-Jn16723	CP	%	109			70-130	Pass	
Ethylbenzene	S13-Jn16723	CP	%	101			70-130	Pass	
m&p-Xylenes	S13-Jn16723	CP	%	101			70-130	Pass	
o-Xylene	S13-Jn16723	CP	%	98			70-130	Pass	
Xylenes - Total	S13-Jn16723	CP	%	100			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S13-Jn16723	CP	%	84			70-130	Pass	
TRH C6-C10	S13-Jn16723	CP	%	104			70-130	Pass	
TRH >C10-C16	S13-Jn16723	CP	%	77			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls (PCB)				Result 1					
Aroclor-1260	S13-My15386	NCP	%	74			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides (OC)				Result 1					
4,4'-DDD	S13-Jn16723	CP	%	95			70-130	Pass	
4,4'-DDE	S13-Jn16723	CP	%	105			70-130	Pass	
4,4'-DDT	S13-Jn16723	CP	%	100			70-130	Pass	
α-BHC	S13-Jn16723	CP	%	95			70-130	Pass	
α-Chlordane	S13-Jn16723	CP	%	95			70-130	Pass	
Aldrin	S13-Jn16723	CP	%	105			70-130	Pass	
β-BHC	S13-Jn16723	CP	%	80			70-130	Pass	
δ-BHC	S13-Jn16723	CP	%	80			70-130	Pass	
Dieldrin	S13-Jn16723	CP	%	100			70-130	Pass	
Endosulfan I	S13-Jn16723	CP	%	100			70-130	Pass	
Endosulfan II	S13-Jn16723	CP	%	90			70-130	Pass	
Endosulfan sulphate	S13-Jn16723	CP	%	75			70-130	Pass	
Endrin	S13-Jn16723	CP	%	100			70-130	Pass	
Endrin aldehyde	S13-Jn16723	CP	%	70			70-130	Pass	
Endrin ketone	S13-Jn16723	CP	%	80			70-130	Pass	
γ-BHC (Lindane)	S13-Jn16723	CP	%	90			70-130	Pass	
γ-Chlordane	S13-Jn16723	CP	%	95			70-130	Pass	
Heptachlor	S13-Jn16723	CP	%	105			70-130	Pass	
Heptachlor epoxide	S13-Jn16723	CP	%	95			70-130	Pass	
Hexachlorobenzene	S13-Jn16723	CP	%	110			70-130	Pass	
Methoxychlor	S13-Jn16723	CP	%	70			70-130	Pass	
Spike - % Recovery									
Metals M8				Result 1					
Arsenic	S13-Jn16723	CP	%	93			70-130	Pass	
Cadmium	S13-Jn16723	CP	%	109			70-130	Pass	
Chromium	S13-Jn16723	CP	%	109			70-130	Pass	
Copper	S13-Jn16723	CP	%	118			70-130	Pass	
Lead	S13-Jn16723	CP	%	118			70-130	Pass	
Mercury	S13-Jn16723	CP	%	105			70-130	Pass	
Nickel	S13-Jn16723	CP	%	109			70-130	Pass	
Zinc	S13-Jn16723	CP	%	130			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S13-Jn16733	CP	%	110			70-130	Pass	
TRH C10-C14	S13-Jn16733	CP	%	83			70-130	Pass	
Spike - % Recovery									

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
BTEX				Result 1					
Benzene	S13-Jn16733	CP	%	128			70-130	Pass	
Toluene	S13-Jn16733	CP	%	105			70-130	Pass	
Ethylbenzene	S13-Jn16733	CP	%	95			70-130	Pass	
m&p-Xylenes	S13-Jn16733	CP	%	88			70-130	Pass	
o-Xylene	S13-Jn16733	CP	%	92			70-130	Pass	
Xylenes - Total	S13-Jn16733	CP	%	89			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S13-Jn16733	CP	%	86			70-130	Pass	
TRH C6-C10	S13-Jn16733	CP	%	106			70-130	Pass	
TRH >C10-C16	S13-Jn16733	CP	%	88			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S13-Jn16733	CP	%	125			70-130	Pass	
Acenaphthylene	S13-Jn16733	CP	%	130			70-130	Pass	
Anthracene	S13-Jn16733	CP	%	125			70-130	Pass	
Benz(a)anthracene	S13-Jn16733	CP	%	122			70-130	Pass	
Benzo(a)pyrene	S13-Jn16733	CP	%	108			70-130	Pass	
Benzo(b&j)fluoranthene	S13-Jn16733	CP	%	127			70-130	Pass	
Benzo(g,h,i)perylene	S13-Jn16733	CP	%	70			70-130	Pass	
Benzo(k)fluoranthene	S13-Jn16733	CP	%	120			70-130	Pass	
Chrysene	S13-Jn16733	CP	%	129			70-130	Pass	
Dibenz(a,h)anthracene	S13-Jn16733	CP	%	88			70-130	Pass	
Fluoranthene	S13-Jn16733	CP	%	129			70-130	Pass	
Fluorene	S13-Jn16733	CP	%	120			70-130	Pass	
Indeno(1,2,3-cd)pyrene	S13-Jn16733	CP	%	83			70-130	Pass	
Naphthalene	S13-Jn16733	CP	%	125			70-130	Pass	
Phenanthrene	S13-Jn16733	CP	%	127			70-130	Pass	
Pyrene	S13-Jn16733	CP	%	122			70-130	Pass	
Spike - % Recovery									
Metals M8				Result 1					
Arsenic	S13-Jn16733	CP	%	103			70-130	Pass	
Cadmium	S13-Jn16733	CP	%	105			70-130	Pass	
Chromium	S13-Jn16733	CP	%	116			70-130	Pass	
Copper	S13-Jn16733	CP	%	103			70-130	Pass	
Lead	S13-Jn16733	CP	%	103			70-130	Pass	
Mercury	S13-Jn16733	CP	%	106			70-130	Pass	
Nickel	S13-Jn16733	CP	%	105			70-130	Pass	
Zinc	S13-Jn16733	CP	%	100			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S13-Jn16723	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S13-Jn16723	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S13-Jn16723	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S13-Jn16723	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S13-Jn16723	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S13-Jn16723	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S13-Jn16723	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S13-Jn16723	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S13-Jn16723	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	

Duplicate								
BTEX				Result 1	Result 2	RPD		
Xylenes - Total	S13-Jn16723	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD		
Naphthalene	S13-Jn16723	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
TRH C6-C10	S13-Jn16723	CP	mg/kg	< 20	< 20	<1	30%	Pass
TRH C6-C10 less BTEX (F1)	S13-Jn16723	CP	mg/kg	< 20	< 20	<1	30%	Pass
TRH >C10-C16	S13-Jn16723	CP	mg/kg	< 50	< 50	<1	30%	Pass
TRH >C16-C34	S13-Jn16723	CP	mg/kg	< 100	< 100	<1	30%	Pass
TRH >C34-C40	S13-Jn16723	CP	mg/kg	< 100	< 100	<1	30%	Pass
Duplicate								
Polychlorinated Biphenyls (PCB)				Result 1	Result 2	RPD		
Aroclor-1016	S13-Jn16723	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1232	S13-Jn16723	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1242	S13-Jn16723	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1248	S13-Jn16723	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1254	S13-Jn16723	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Aroclor-1260	S13-Jn16723	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
Organochlorine Pesticides (OC)				Result 1	Result 2	RPD		
4,4'-DDD	S13-Jn16723	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
4,4'-DDE	S13-Jn16723	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
4,4'-DDT	S13-Jn16723	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
a-BHC	S13-Jn16723	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
a-Chlordane	S13-Jn16723	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Aldrin	S13-Jn16723	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
b-BHC	S13-Jn16723	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
d-BHC	S13-Jn16723	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Dieldrin	S13-Jn16723	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan I	S13-Jn16723	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan II	S13-Jn16723	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan sulphate	S13-Jn16723	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin	S13-Jn16723	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin aldehyde	S13-Jn16723	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin ketone	S13-Jn16723	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
g-BHC (Lindane)	S13-Jn16723	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
g-Chlordane	S13-Jn16723	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Heptachlor	S13-Jn16723	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Heptachlor epoxide	S13-Jn16723	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Hexachlorobenzene	S13-Jn16723	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Methoxychlor	S13-Jn16723	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Duplicate								
Metals M8				Result 1	Result 2	RPD		
Arsenic	S13-Jn16723	CP	mg/kg	3.0	3.3	11	30%	Pass
Cadmium	S13-Jn16723	CP	mg/kg	0.4	0.4	6.0	30%	Pass
Chromium	S13-Jn16723	CP	mg/kg	21	19	12	30%	Pass
Copper	S13-Jn16723	CP	mg/kg	< 5	< 5	<1	30%	Pass
Lead	S13-Jn16723	CP	mg/kg	8.8	9.1	3.0	30%	Pass
Mercury	S13-Jn16723	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Nickel	S13-Jn16723	CP	mg/kg	< 5	< 5	<1	30%	Pass
Zinc	S13-Jn16723	CP	mg/kg	7.2	8.2	14	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD		
TRH C6-C9	S13-Jn16733	CP	mg/kg	< 20	< 20	<1	30%	Pass
TRH C10-C14	S13-Jn16733	CP	mg/kg	< 20	< 20	<1	30%	Pass

Duplicate								
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD		
TRH C15-C28	S13-Jn16733	CP	mg/kg	< 50	< 50	<1	30%	Pass
TRH C29-C36	S13-Jn16733	CP	mg/kg	< 50	< 50	<1	30%	Pass
Duplicate								
BTEX				Result 1	Result 2	RPD		
Benzene	S13-Jn16733	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Toluene	S13-Jn16733	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Ethylbenzene	S13-Jn16733	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
m&p-Xylenes	S13-Jn16733	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
o-Xylene	S13-Jn16733	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Xylenes - Total	S13-Jn16733	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD		
Naphthalene	S13-Jn16733	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
TRH C6-C10	S13-Jn16733	CP	mg/kg	< 20	< 20	<1	30%	Pass
TRH C6-C10 less BTEX (F1)	S13-Jn16733	CP	mg/kg	< 20	< 20	<1	30%	Pass
TRH >C10-C16	S13-Jn16733	CP	mg/kg	< 50	< 50	<1	30%	Pass
TRH >C16-C34	S13-Jn16733	CP	mg/kg	< 100	< 100	<1	30%	Pass
TRH >C34-C40	S13-Jn16733	CP	mg/kg	< 100	< 100	<1	30%	Pass
Duplicate								
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD		
Acenaphthene	S13-Jn16733	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Acenaphthylene	S13-Jn16733	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Anthracene	S13-Jn16733	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benz(a)anthracene	S13-Jn16733	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(a)pyrene	S13-Jn16733	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(b&j)fluoranthene	S13-Jn16733	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(g,h,i)perylene	S13-Jn16733	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(k)fluoranthene	S13-Jn16733	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Chrysene	S13-Jn16733	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dibenz(a,h)anthracene	S13-Jn16733	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluoranthene	S13-Jn16733	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluorene	S13-Jn16733	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Indeno(1,2,3-cd)pyrene	S13-Jn16733	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Naphthalene	S13-Jn16733	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Phenanthrene	S13-Jn16733	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Pyrene	S13-Jn16733	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
Metals M8				Result 1	Result 2	RPD		
Arsenic	S13-Jn16733	CP	mg/kg	5.2	4.5	16	30%	Pass
Cadmium	S13-Jn16733	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Chromium	S13-Jn16733	CP	mg/kg	5.7	< 5	19	30%	Pass
Copper	S13-Jn16733	CP	mg/kg	8.8	8.1	8.0	30%	Pass
Lead	S13-Jn16733	CP	mg/kg	20	20	<1	30%	Pass
Mercury	S13-Jn16733	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Nickel	S13-Jn16733	CP	mg/kg	< 5	< 5	<1	30%	Pass
Zinc	S13-Jn16733	CP	mg/kg	25	22	15	30%	Pass

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Organic samples had Teflon liners	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q09A	The Surrogate recovery is outside of the recommended acceptance criteria due to matrix interference and is unquantifiable. A result of 1 has been reported for the purposes of providing a numerical result. Acceptance criteria were met for all other QC.

Authorised By

Jean Heng	Client Services
James Norford	Senior Analyst-Metal (NSW)
Ryan Hamilton	Senior Analyst-Organic (NSW)
Ryan Hamilton	Senior Analyst-Volatile (NSW)



Dr. Bob Symons

Laboratory Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Uncertainty data is available on request

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CERTIFICATE OF ANALYSIS

92758

Client:

Benviron Group
64 Glenrock Pde
Koolewong
NSW 2256

Attention: Ben Buckley

Sample log in details:

Your Reference:	<u>E46, Fairy Meadow</u>
No. of samples:	1 Soil
Date samples received / completed instructions received	24/06/13 / 24/06/13

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:	27/06/13 / 27/06/13
Date of Preliminary Report:	Not issued

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Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:



Jacinta Hurst
Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil		
Our Reference:	UNITS	92758-1
Your Reference	-----	SS1
Date Sampled	-----	21/06/2013
Type of sample		Soil
Date extracted	-	25/06/2013
Date analysed	-	25/06/2013
TRHC ₆ - C ₉	mg/kg	<25
TRHC ₆ - C ₁₀	mg/kg	<25
vTPHC ₆ - C ₁₀ less BTEX (F1)	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
naphthalene	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	103

svTRH (C10-C40) in Soil		
Our Reference:	UNITS	92758-1
Your Reference	-----	SS1
Date Sampled	-----	21/06/2013
Type of sample		Soil
Date extracted	-	25/06/2013
Date analysed	-	26/06/2013
TRHC ₁₀ - C ₁₄	mg/kg	<50
TRHC ₁₅ - C ₂₈	mg/kg	<100
TRHC ₂₉ - C ₃₆	mg/kg	<100
TRH>C ₁₀ -C ₁₆	mg/kg	<50
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50
TRH>C ₁₆ -C ₃₄	mg/kg	<100
TRH>C ₃₄ -C ₄₀	mg/kg	<100
Surrogate o-Terphenyl	%	85

PAHs in Soil		
Our Reference:	UNITS	92758-1
Your Reference	-----	SS1
Date Sampled	-----	21/06/2013
Type of sample		Soil
Date extracted	-	25/06/2013
Date analysed	-	26/06/2013
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	0.07
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
Benzo(a)pyrene TEQ NEPMB1	mg/kg	<0.5
Total +ve PAH's	mg/kg	0.27
Surrogate p-Terphenyl-d14	%	97

Organochlorine Pesticides in soil		
Our Reference:	UNITS	92758-1
Your Reference	-----	SS1
Date Sampled	-----	21/06/2013
Type of sample		Soil
Date extracted	-	25/06/2013
Date analysed	-	25/06/2013
HCB	mg/kg	<0.1
alpha-BHC	mg/kg	<0.1
gamma-BHC	mg/kg	<0.1
beta-BHC	mg/kg	<0.1
Heptachlor	mg/kg	<0.1
delta-BHC	mg/kg	<0.1
Aldrin	mg/kg	<0.1
Heptachlor Epoxide	mg/kg	<0.1
gamma-Chlordane	mg/kg	<0.1
alpha-chlordane	mg/kg	<0.1
Endosulfan I	mg/kg	<0.1
pp-DDE	mg/kg	<0.1
Dieldrin	mg/kg	<0.1
Endrin	mg/kg	<0.1
pp-DDD	mg/kg	<0.1
Endosulfan II	mg/kg	<0.1
pp-DDT	mg/kg	<0.1
Endrin Aldehyde	mg/kg	<0.1
Endosulfan Sulphate	mg/kg	<0.1
Methoxychlor	mg/kg	<0.1
Surrogate TCMX	%	87

PCBs in Soil	UNITS	92758-1
Our Reference:	-----	SS1
Your Reference	-----	21/06/2013
Date Sampled		Soil
Type of sample		
Date extracted	-	25/06/2013
Date analysed	-	25/06/2013
Arochlor 1016	mg/kg	<0.1
Arochlor 1221	mg/kg	<0.1
Arochlor 1232	mg/kg	<0.1
Arochlor 1242	mg/kg	<0.1
Arochlor 1248	mg/kg	<0.1
Arochlor 1254	mg/kg	<0.1
Arochlor 1260	mg/kg	<0.1
Surrogate TCLMX	%	87

Acid Extractable metals in soil		
Our Reference:	UNITS	92758-1
Your Reference	-----	SS1
Date Sampled	-----	21/06/2013
Type of sample		Soil
Date digested	-	25/6/2013
Date analysed	-	25/6/2013
Arsenic	mg/kg	5
Cadmium	mg/kg	<0.4
Chromium	mg/kg	14
Copper	mg/kg	29
Lead	mg/kg	48
Mercury	mg/kg	<0.1
Nickel	mg/kg	11
Zinc	mg/kg	69

Moisture		
Our Reference:	UNITS	92758-1
Your Reference	-----	SS1
Date Sampled	-----	21/06/2013
Type of sample		Soil
Date prepared	-	25/06/2013
Date analysed	-	26/06/2013
Moisture	%	12

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. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
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+/-5 deg C for a minimum of 4 hours.

Client Reference: E46, Fairy Meadow

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
vTRH(C6-C10)/BTEXN in Soil						Base II Duplicate II %RPD		
Date extracted	-			25/06/2013	[NT]	[NT]	LCS-1	25/06/2013
Date analysed	-			25/06/2013	[NT]	[NT]	LCS-1	25/06/2013
TRHC ₆ - C ₉	mg/kg	25	Org-016	<25	[NT]	[NT]	LCS-1	103%
TRHC ₆ - C ₁₀	mg/kg	25	Org-016	<25	[NT]	[NT]	LCS-1	103%
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	LCS-1	111%
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	LCS-1	98%
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS-1	106%
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	LCS-1	98%
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS-1	104%
naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	99	[NT]	[NT]	LCS-1	106%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
svTRH (C10-C40) in Soil						Base II Duplicate II %RPD		
Date extracted	-			25/06/2013	[NT]	[NT]	LCS-1	25/06/2013
Date analysed	-			26/06/2013	[NT]	[NT]	LCS-1	26/06/2013
TRHC ₁₀ - C ₁₄	mg/kg	50	Org-003	<50	[NT]	[NT]	LCS-1	106%
TRHC ₁₅ - C ₂₈	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-1	110%
TRHC ₂₈ - C ₃₆	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-1	91%
TRH>C ₁₀ -C ₁₆	mg/kg	50	Org-003	<50	[NT]	[NT]	LCS-1	106%
TRH>C ₁₆ -C ₃₄	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-1	110%
TRH>C ₃₄ -C ₄₀	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-1	91%
Surrogate o-Terphenyl	%		Org-003	81	[NT]	[NT]	LCS-1	108%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Date extracted	-			25/06/2013	[NT]	[NT]	LCS-1	25/06/2013
Date analysed	-			26/06/2013	[NT]	[NT]	LCS-1	26/06/2013
Naphthalene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-1	106%
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-1	111%
Phenanthrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-1	103%
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-1	105%

Client Reference: E46, Fairy Meadow

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Pyrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-1	112%
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-1	100%
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-1	120%
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-d14	%		Org-012 subset	97	[NT]	[NT]	LCS-1	101%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Organochlorine Pesticides in soil						Base II Duplicate II %RPD		
Date extracted	-			25/06/2013	[NT]	[NT]	LCS-1	25/06/2013
Date analysed	-			25/06/2013	[NT]	[NT]	LCS-1	25/06/2013
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-1	98%
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-1	91%
Heptachlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-1	97%
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-1	101%
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-1	102%
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-1	96%
Dieldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-1	102%
Endrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-1	92%
pp-DDD	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-1	95%
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-1	99%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate TCMX	%		Org-005	90	[NT]	[NT]	LCS-1	89%

Client Reference: E46, Fairy Meadow

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PCBs in Soil						Base II Duplicate II %RPD		
Date extracted	-			25/06/2013	[NT]	[NT]	LCS-1	25/06/2013
Date analysed	-			25/06/2013	[NT]	[NT]	LCS-1	25/06/2013
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-1	92%
Arochlor 1260	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate TCLMX	%		Org-006	90	[NT]	[NT]	LCS-1	79%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Acid Extractable metals in soil						Base II Duplicate II %RPD		
Date digested	-			[NT]	[NT]	[NT]	LCS-1	25/06/2013
Date analysed	-			[NT]	[NT]	[NT]	LCS-1	25/06/2013
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	[NT]	[NT]	LCS-1	97%
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	[NT]	[NT]	LCS-1	102%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	103%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	106%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	95%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	[NT]	[NT]	LCS-1	108%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	104%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-1	103%

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

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 batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

APPENDIX E PROPOSED DEVELOPMENT PLANS



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Sketch Design
19 Merriwa Street,
Gordon

Baement 2 Floor Plan

JUN 2013
13_5472
1 : 250

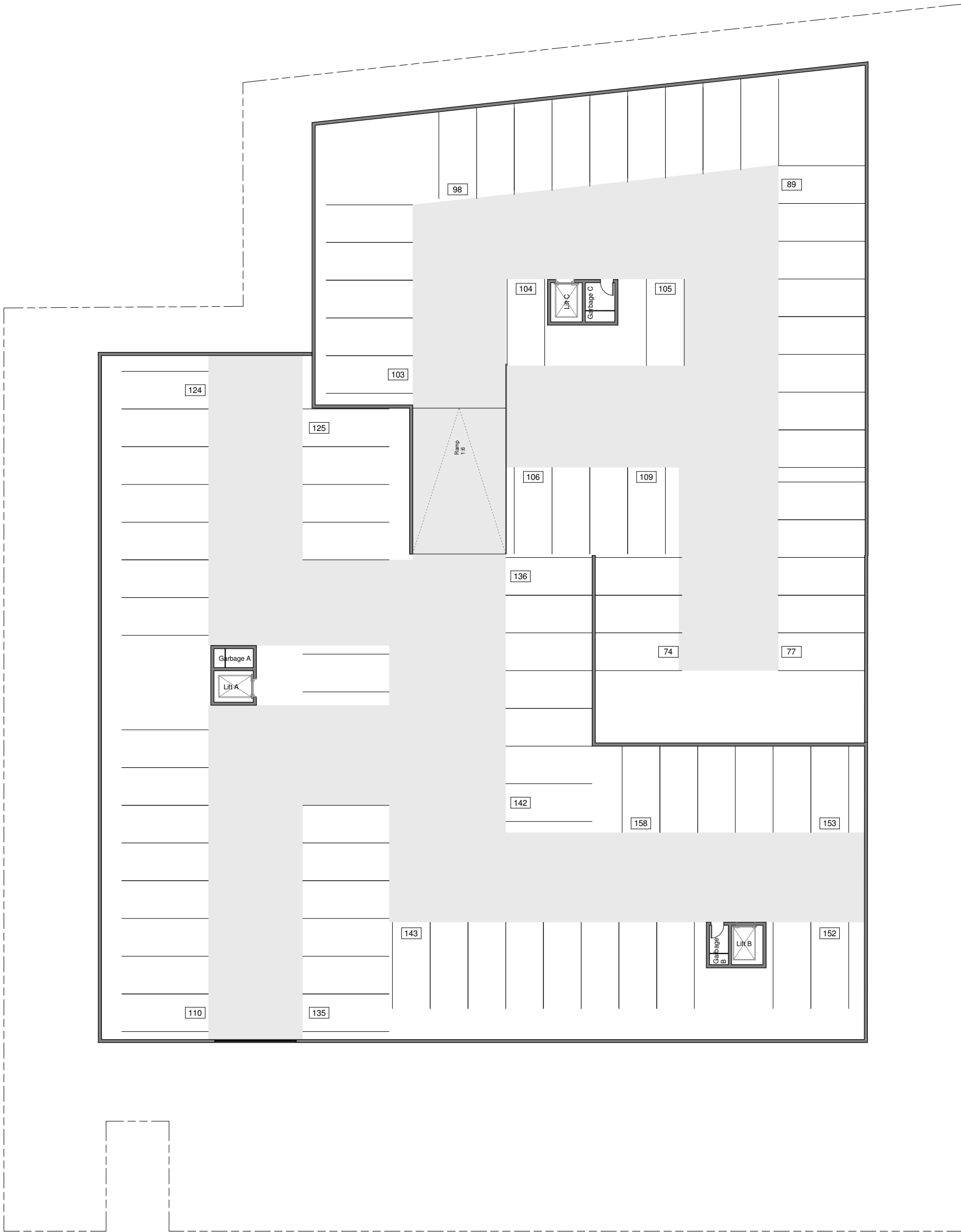
SK02

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Sketch Design
19 Merriwa Street,
Gordon

Basement 1 Floor Plan

JUN 2013
13_5472
1 : 250

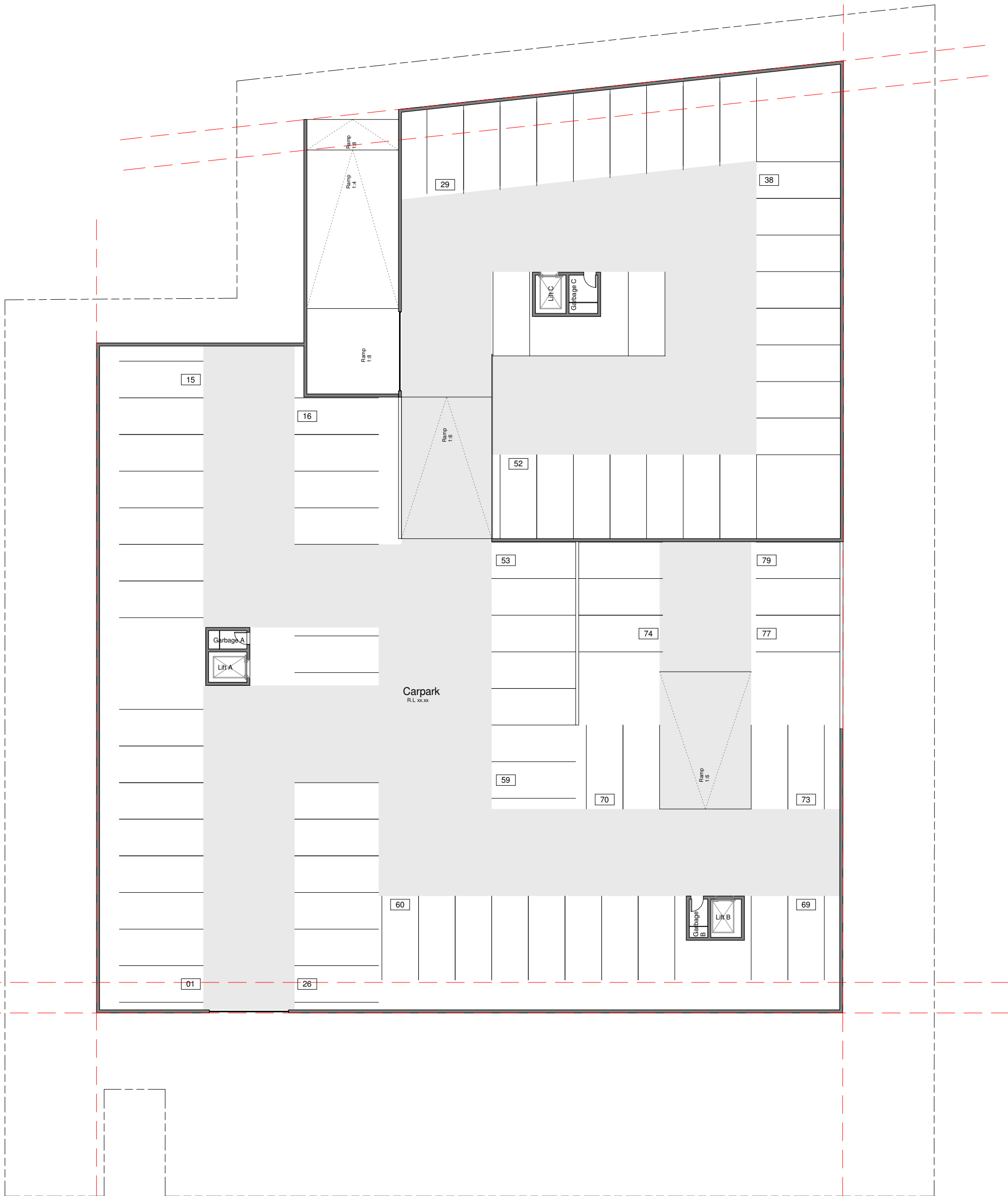
SK03

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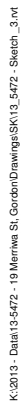


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MERRIWA STREET



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Sketch Design

19 Merriwa Street,
Gordon

Levels 1-3 Floor Plan

JUN 2013
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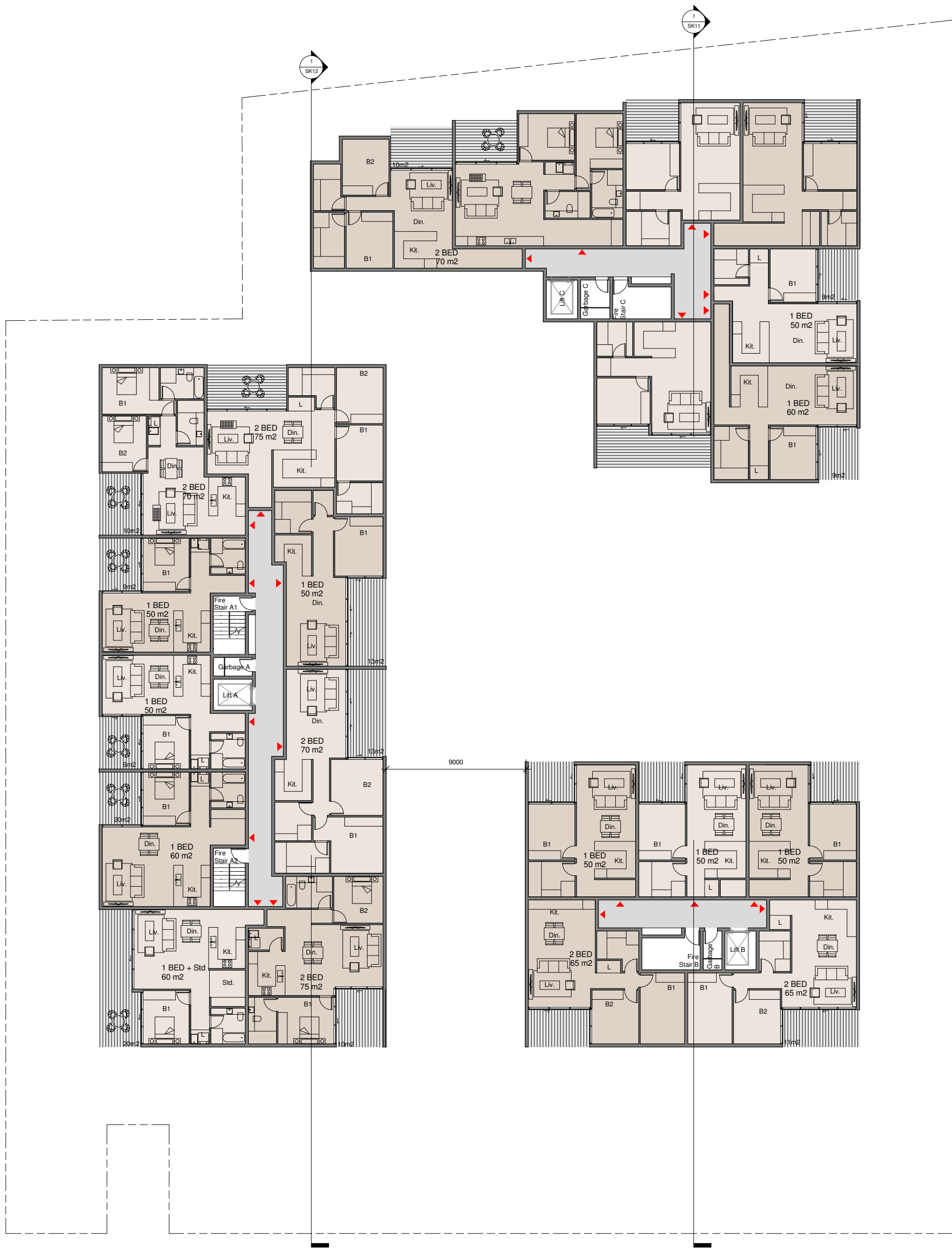
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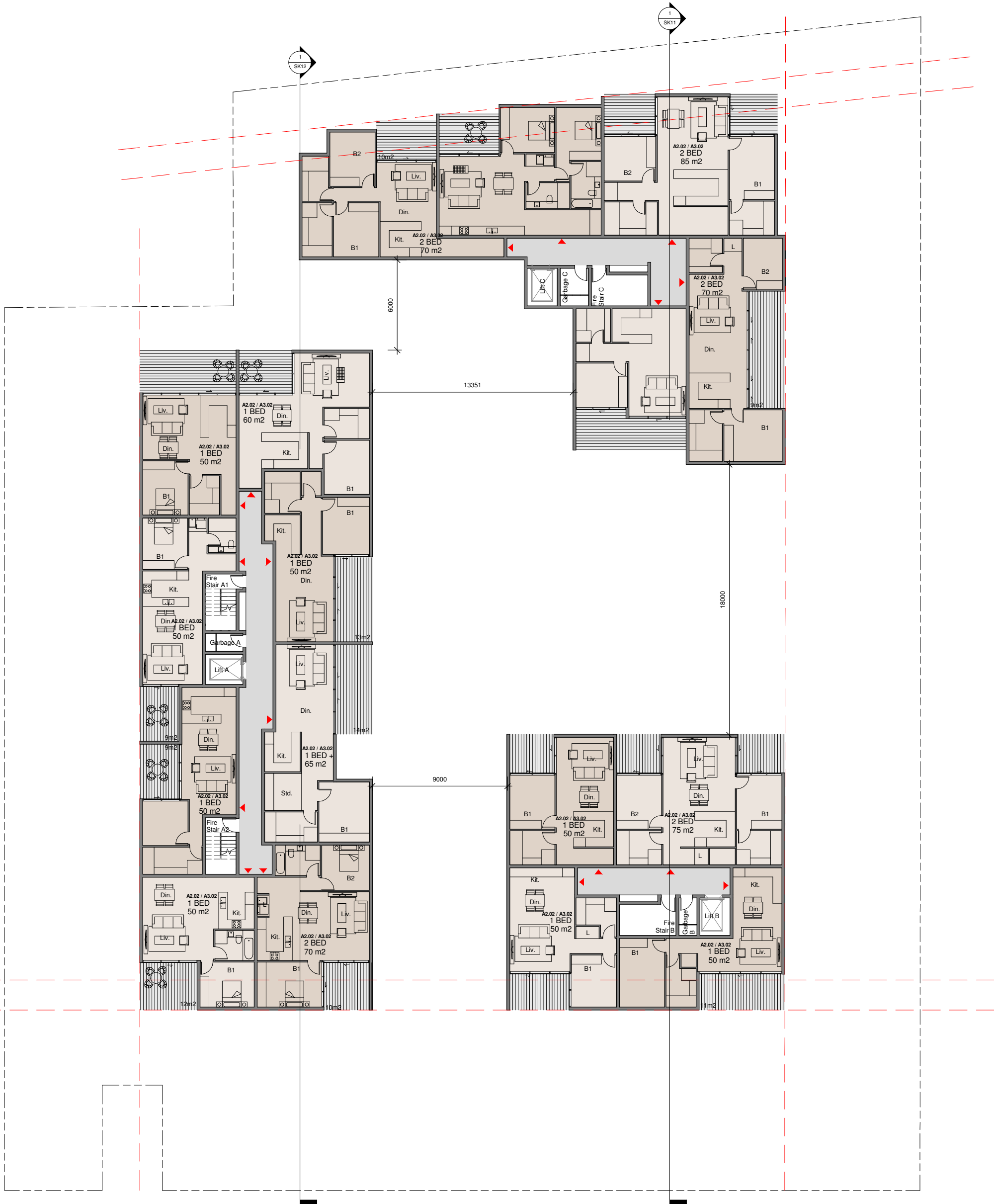
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1 Level 4 A
1 : 250



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Gordon

**Levels 4-5 Floor
Plan**

JUN 2013
13.5472
1 : 250

SK06



2

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Sketch Design

19 Merriwa Street,
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Level 6 Floor Plan

JUN 2013
13_5472
1 : 250

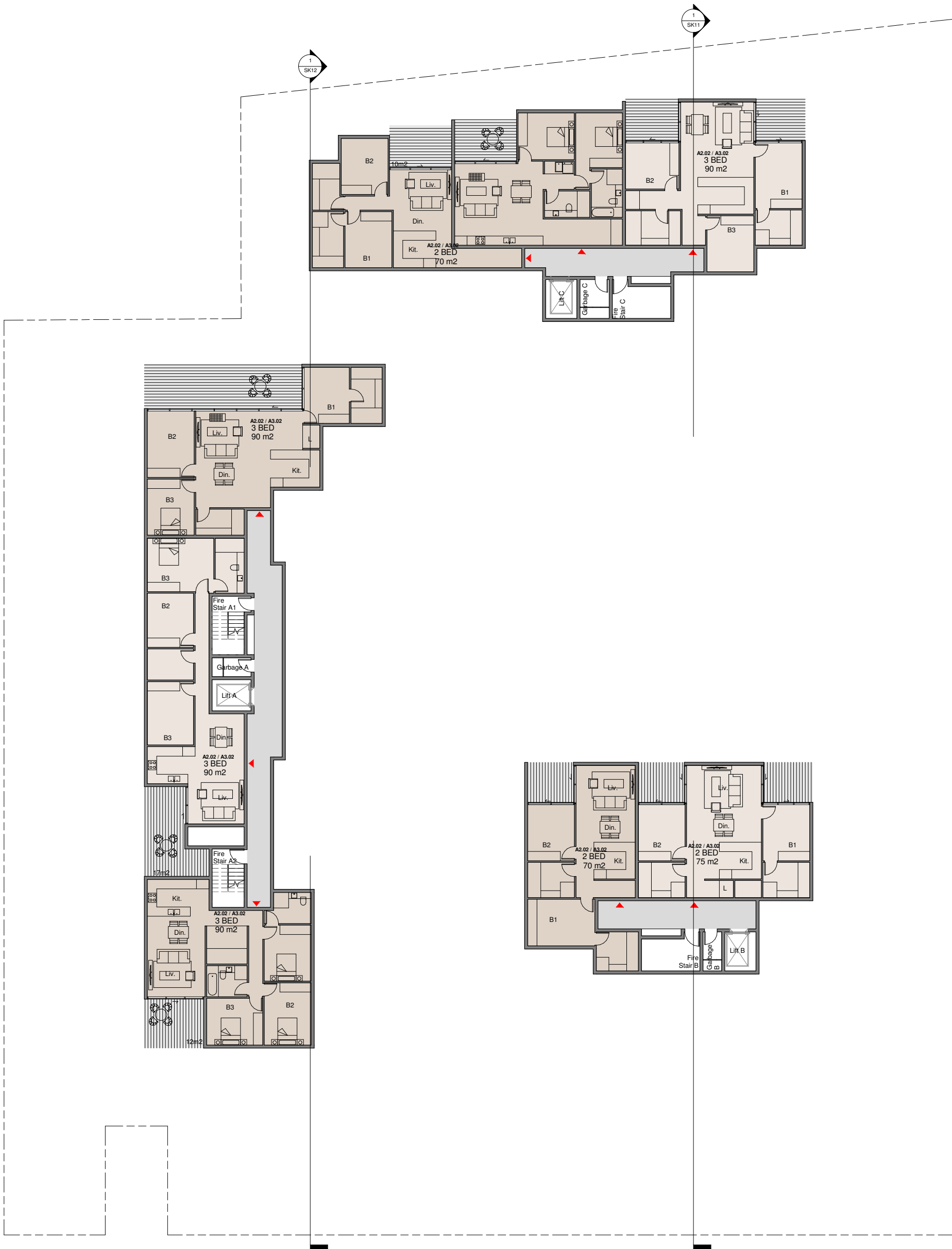
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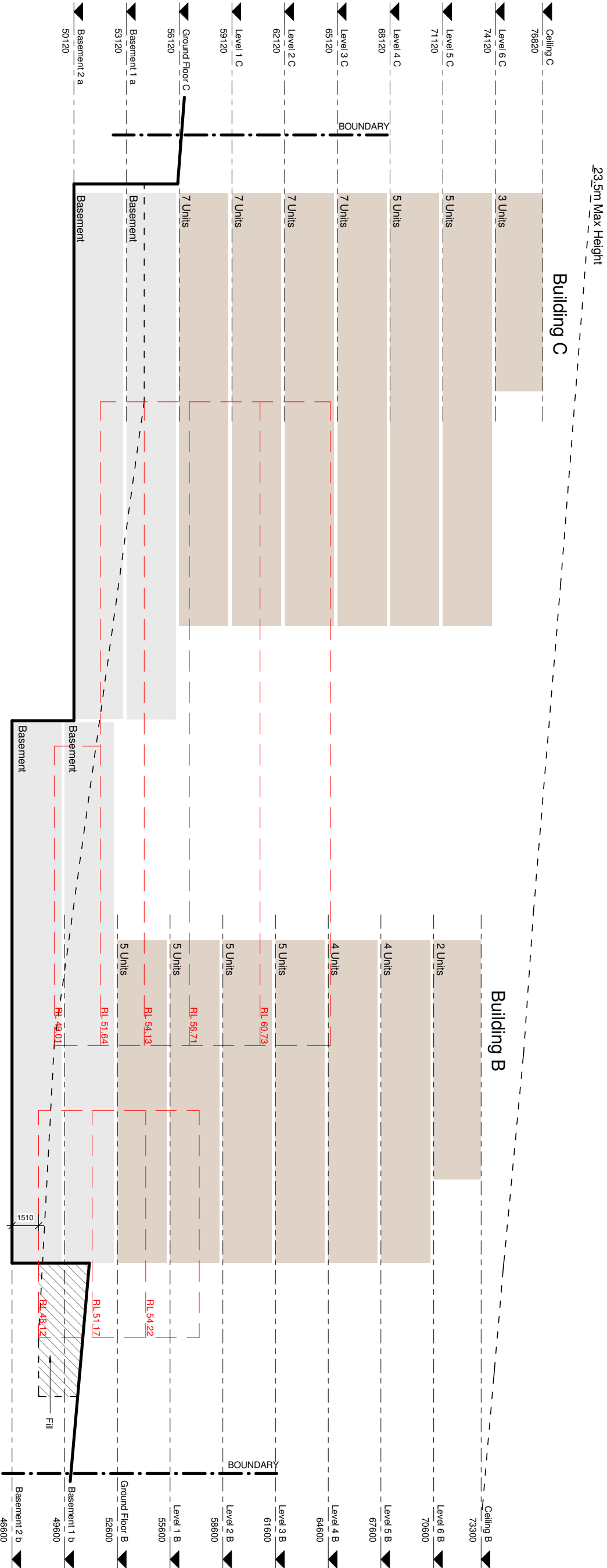
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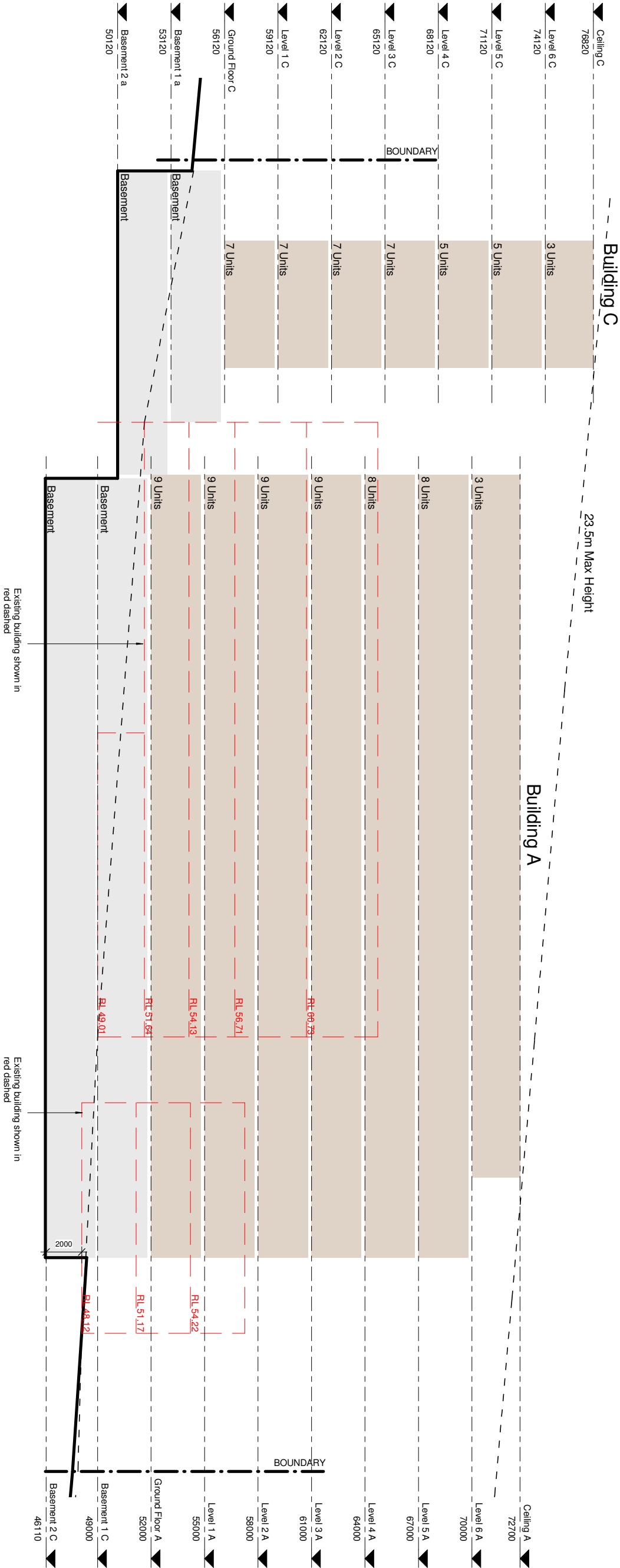
Section 1

SK11

2

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19 Merriwa Street,
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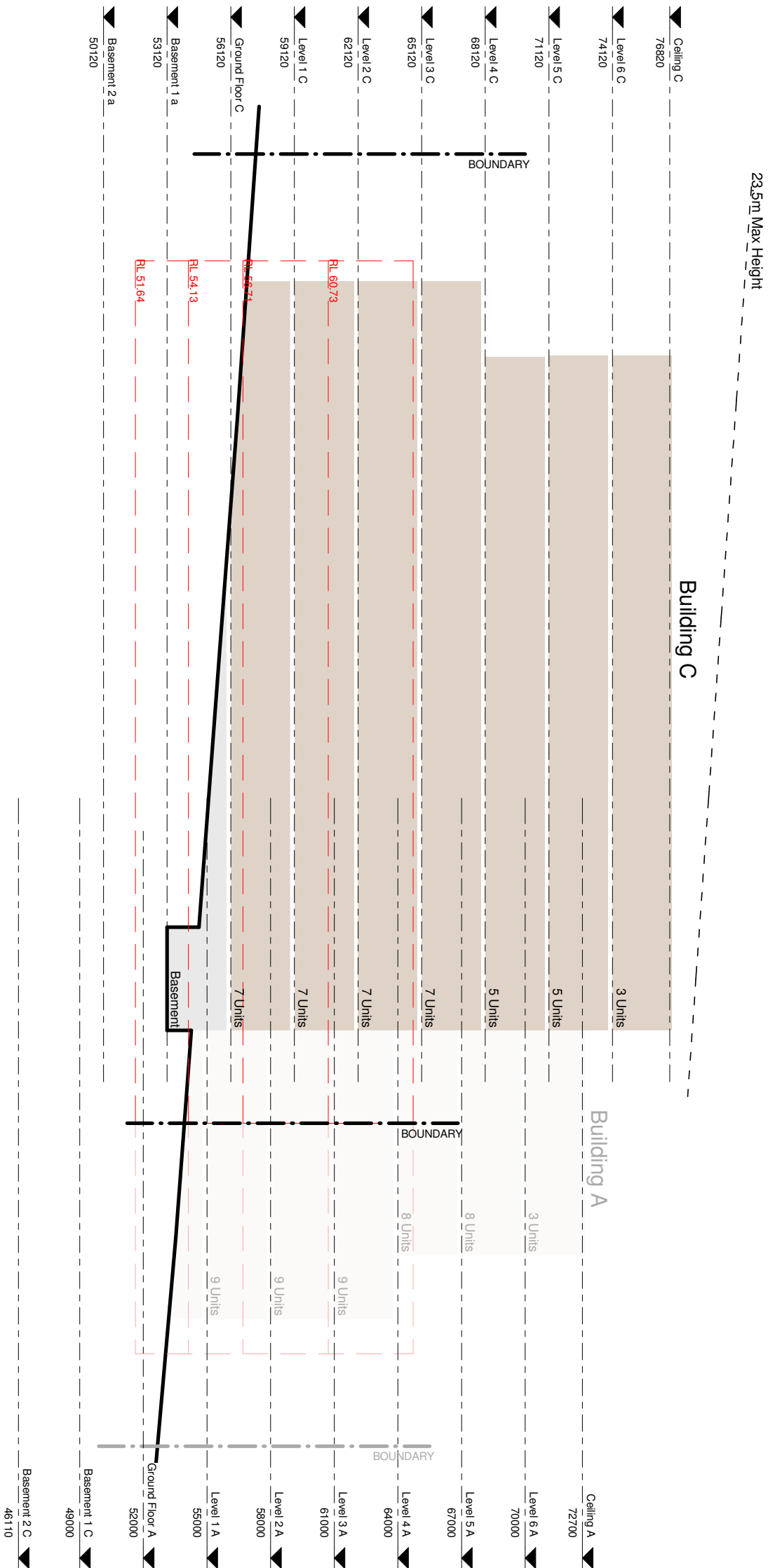
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Sketch Design

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Gordon



JUN 2013
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SK13

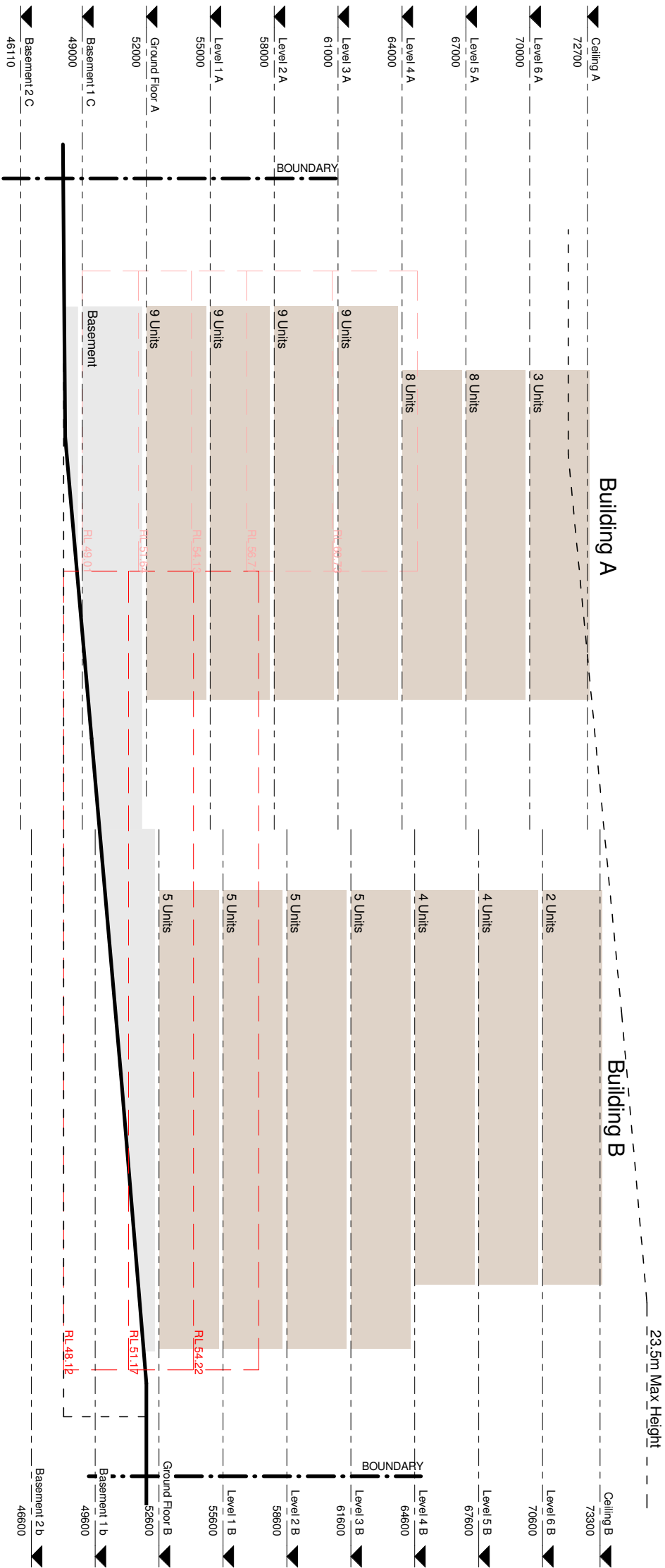
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North Elevation

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Gordon



JUN 2013
13_5472
1 : 250

SK14

2

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South Elevation

APPENDIX F BOREHOLE LOGS

BOREHOLE LOG

CLIENT	Meissen Properties Pty Ltd	BOREHOLE NO.	BH1
PROJECT	Phase 2 ESA	DATE.	21/06/2013
LOCATION	17-23 Merriwa Street, Gordon NSW	JOB NO.	E46
METHOD	Drill Rig	SURFACE ELEV.	N/A
LOGGED BY	BB	CHECKED BY	BB



Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	Soil Description (Colour, particle characteristics, strength, plasticity, moisture, etc)	Observations
				C	Concrete	
0.5				SC	Natural, Sandy Clay, medium plasticity, yellow/brown, moist	No HC Odour No Asbestos
1				R	Natural, Sandstone, weathered, red/yellow/brown, moist	
1.5						
2						
2.5					End of Borehole @ 2.0m BGL	
3						
3.5						
4						
4.5						
5						
5.5						
6						

Log Symbols

- Standing groundwater level in borehole
- Water seepage in borehole (wet)

Samples

- BH1.0.5 - Soil sample taken at indicated depth
- S - Surface water sample
- GW/W - Groundwater sample/water sample

Moisture Condition

- D Dry - Runs freely through fingers
- M Moist - Does not run freely but no free water visible on soil surface
- W Wet - Free water visible on soil surface

Soil Classification

- Clay - Particle size less than 0.002mm
- Silt - Particle size between 0.002 and 0.06mm
- Sand - Particle size between 0.06 and 2.0mm
- Gravel - Particle size between 2.0 and 60mm

Strength

- VS Very Soft - Unconfined compressive strength less than 25kPa
- S Soft - Unconfined compressive strength 25-50kPa
- F Firm - Unconfined compressive strength 50-100kPa
- St Stiff - Unconfined compressive strength 100-200kPa
- VSt Very Stiff - Unconfined compressive strength 200-400kPa
- H Hard - Unconfined compressive strength greater than 400kPa

BOREHOLE LOG

CLIENT	Meissen Properties Pty Ltd	BOREHOLE NO.	BH2
PROJECT	Phase 2 ESA	DATE.	21/06/2013
LOCATION	17-23 Merriwa Street, Gordon NSW	JOB NO.	E46
METHOD	Drill Rig	SURFACE ELEV.	N/A
LOGGED BY	BB	CHECKED BY	BB



Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	Soil Description (Colour, particle characteristics, strength, plasticity, moisture, etc)	Observations
0.5				F	Fill, Silty Sand, low plasticity, brown dry with some gravels	No HC Odour No Asbestos
1.5				SC	Natural, Sandy Clay, medium plasticity, yellow/brown, moist	
2.5				R	Natural, Sandstone, weathered, red/yellow/brown, moist	
3.5					End of Borehole @ 7.0m BGL	

Log Symbols

- Standing groundwater level in borehole
- Water seepage in borehole (wet)

Samples

- BH1.0.5 - Soil sample taken at indicated depth
- S - Surface water sample
- GW/W - Groundwater sample/water sample

Moisture Condition

- D Dry - Runs freely through fingers
- M Moist - Does not run freely but no free water visible on soil surface
- W Wet - Free water visible on soil surface

Soil Classification

- Clay - Particle size less than 0.002mm
- Silt - Particle size between 0.002 and 0.06mm
- Sand - Particle size between 0.06 and 2.0mm
- Gravel - Particle size between 2.0 and 60mm

Strength

- VS Very Soft - Unconfined compressive strength less than 25kPa
- S Soft - Unconfined compressive strength 25-50kPa
- F Firm - Unconfined compressive strength 50-100kPa
- St Stiff - Unconfined compressive strength 100-200kPa
- VSt Very Stiff - Unconfined compressive strength 200-400kPa
- H Hard - Unconfined compressive strength greater than 400kPa

BOREHOLE LOG

CLIENT	Meissen Properties Pty Ltd	BOREHOLE NO.	BH3
PROJECT	Phase 2 ESA	DATE.	21/06/2013
LOCATION	17-23 Merriwa Street, Gordon NSW	JOB NO.	E46
METHOD	Drill Rig	SURFACE ELEV.	N/A
LOGGED BY	BB	CHECKED BY	BB



Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	Soil Description (Colour, particle characteristics, strength, plasticity, moisture, etc)	Observations
				F	Fill, Silty Sand, low plasticity, brown dry with some gravels	No HC Odour No Asbestos
0.5					End of Borehole @ 0.5m BGL	
1						
1.5						
2						
2.5						
3						
3.5						
4						
4.5						
5						
5.5						
6						

Log Symbols

- Standing groundwater level in borehole
- Water seepage in borehole (wet)

Samples

- BH1.0.5 - Soil sample taken at indicated depth
- S - Surface water sample
- GW/W - Groundwater sample/water sample

Moisture Condition

- D Dry - Runs freely through fingers
- M Moist - Does not run freely but no free water visible on soil surface
- W Wet - Free water visible on soil surface

Soil Classification

- Clay - Particle size less than 0.002mm
- Silt - Particle size between 0.002 and 0.06mm
- Sand - Particle size between 0.06 and 2.0mm
- Gravel - Particle size between 2.0 and 60mm

Strength

- VS Very Soft - Unconfined compressive strength less than 25kPa
- S Soft - Unconfined compressive strength 25-50kPa
- F Firm - Unconfined compressive strength 50-100kPa
- St Stiff - Unconfined compressive strength 100-200kPa
- VSt Very Stiff - Unconfined compressive strength 200-400kPa
- H Hard - Unconfined compressive strength greater than 400kPa

BOREHOLE LOG

CLIENT	Meissen Properties Pty Ltd	BOREHOLE NO.	BH4
PROJECT	Phase 2 ESA	DATE.	21/06/2013
LOCATION	17-23 Merriwa Street, Gordon NSW	JOB NO.	E46
METHOD	Drill Rig	SURFACE ELEV.	N/A
LOGGED BY	BB	CHECKED BY	BB



Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	Soil Description (Colour, particle characteristics, strength, plasticity, moisture, etc)	Observations
0.5				F	Fill, Silty Sand, low-med plasticity, dark brown dry with root fibres, mulch and some inert building materials	No HC Odour No Asbestos
1					End of Borehole @ 0.6m BGL	
1.5						
2						
2.5						
3						
3.5						
4						
4.5						
5						
5.5						
6						

Log Symbols

- Standing groundwater level in borehole
- Water seepage in borehole (wet)

Samples

- BH1.0.5 - Soil sample taken at indicated depth
- S - Surface water sample
- GW/W - Groundwater sample/water sample

Moisture Condition

- D Dry - Runs freely through fingers
- M Moist - Does not run freely but no free water visible on soil surface
- W Wet - Free water visible on soil surface

Soil Classification

- Clay - Particle size less than 0.002mm
- Silt - Particle size between 0.002 and 0.06mm
- Sand - Particle size between 0.06 and 2.0mm
- Gravel - Particle size between 2.0 and 60mm

Strength

- VS Very Soft - Unconfined compressive strength less than 25kPa
- S Soft - Unconfined compressive strength 25-50kPa
- F Firm - Unconfined compressive strength 50-100kPa
- St Stiff - Unconfined compressive strength 100-200kPa
- VSt Very Stiff - Unconfined compressive strength 200-400kPa
- H Hard - Unconfined compressive strength greater than 400kPa

BOREHOLE LOG

CLIENT	Meissen Properties Pty Ltd	BOREHOLE NO.	BH4
PROJECT	Phase 2 ESA	DATE.	21/06/2013
LOCATION	17-23 Merriwa Street, Gordon NSW	JOB NO.	E46
METHOD	Drill Rig	SURFACE ELEV.	N/A
LOGGED BY	BB	CHECKED BY	BB



Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	Soil Description (Colour, particle characteristics, strength, plasticity, moisture, etc)	Observations
				F	Fill, Silty Sand, low-med plasticity, dark brown dry with root fibres, mulch and some inert building materials	No HC Odour No Asbestos
0.5				SC	Natural, Sandy Clay, medium plasticity, yellow/brown, moist	
1					End of Borehole @ 0.8m BGL	
1.5						
2						
2.5						
3						
3.5						
4						
4.5						
5						
5.5						
6						

Log Symbols

- Standing groundwater level in borehole
- Water seepage in borehole (wet)

Samples

- BH1.0.5 - Soil sample taken at indicated depth
- S - Surface water sample
- GW/W - Groundwater sample/water sample

Moisture Condition

- D Dry - Runs freely through fingers
- M Moist - Does not run freely but no free water visible on soil surface
- W Wet - Free water visible on soil surface

Soil Classification

- Clay - Particle size less than 0.002mm
- Silt - Particle size between 0.002 and 0.06mm
- Sand - Particle size between 0.06 and 2.0mm
- Gravel - Particle size between 2.0 and 60mm

Strength

- VS Very Soft - Unconfined compressive strength less than 25kPa
- S Soft - Unconfined compressive strength 25-50kPa
- F Firm - Unconfined compressive strength 50-100kPa
- St Stiff - Unconfined compressive strength 100-200kPa
- VSt Very Stiff - Unconfined compressive strength 200-400kPa
- H Hard - Unconfined compressive strength greater than 400kPa

BOREHOLE LOG

CLIENT	Meissen Properties Pty Ltd	BOREHOLE NO.	BH6
PROJECT	Phase 2 ESA	DATE.	21/06/2013
LOCATION	17-23 Merriwa Street, Gordon NSW	JOB NO.	E46
METHOD	Drill Rig	SURFACE ELEV.	N/A
LOGGED BY	BB	CHECKED BY	BB



Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	Soil Description (Colour, particle characteristics, strength, plasticity, moisture, etc)	Observations
				F	Fill, Silty Sand, low-med plasticity, dark brown dry with root fibres, mulch and some inert building materials	No HC Odour No Asbestos
0.5				SC	Natural, Sandy Clay, medium plasticity, yellow/brown, moist	
1					End of Borehole @ 0.8m BGL	
1.5						
2						
2.5						
3						
3.5						
4						
4.5						
5						
5.5						
6						

Log Symbols

- Standing groundwater level in borehole
- Water seepage in borehole (wet)

Samples

- BH1.0.5 - Soil sample taken at indicated depth
- S - Surface water sample
- GW/W - Groundwater sample/water sample

Moisture Condition

- D Dry - Runs freely through fingers
- M Moist - Does not run freely but no free water visible on soil surface
- W Wet - Free water visible on soil surface

Soil Classification

- Clay - Particle size less than 0.002mm
- Silt - Particle size between 0.002 and 0.06mm
- Sand - Particle size between 0.06 and 2.0mm
- Gravel - Particle size between 2.0 and 60mm

Strength

- VS Very Soft - Unconfined compressive strength less than 25kPa
- S Soft - Unconfined compressive strength 25-50kPa
- F Firm - Unconfined compressive strength 50-100kPa
- St Stiff - Unconfined compressive strength 100-200kPa
- VSt Very Stiff - Unconfined compressive strength 200-400kPa
- H Hard - Unconfined compressive strength greater than 400kPa

BOREHOLE LOG

CLIENT	Meissen Properties Pty Ltd	BOREHOLE NO.	BH7
PROJECT	Phase 2 ESA	DATE.	21/06/2013
LOCATION	17-23 Merriwa Street, Gordon NSW	JOB NO.	E46
METHOD	Drill Rig	SURFACE ELEV.	N/A
LOGGED BY	BB	CHECKED BY	BB



Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	Soil Description (Colour, particle characteristics, strength, plasticity, moisture, etc)	Observations
				F	Fill, Silty Sand, low-med plasticity, dark brown dry with root fibres, mulch and some inert building materials	No HC Odour No Asbestos
0.5					End of Borehole @ 0.3m BGL	
1						
1.5						
2						
2.5						
3						
3.5						
4						
4.5						
5						
5.5						
6						

Log Symbols

- Standing groundwater level in borehole
- Water seepage in borehole (wet)

Samples

- BH1.0.5 - Soil sample taken at indicated depth
- S - Surface water sample
- GW/W - Groundwater sample/water sample

Moisture Condition

- D Dry - Runs freely through fingers
- M Moist - Does not run freely but no free water visible on soil surface
- W Wet - Free water visible on soil surface

Soil Classification

- Clay - Particle size less than 0.002mm
- Silt - Particle size between 0.002 and 0.06mm
- Sand - Particle size between 0.06 and 2.0mm
- Gravel - Particle size between 2.0 and 60mm

Strength

- VS Very Soft - Unconfined compressive strength less than 25kPa
- S Soft - Unconfined compressive strength 25-50kPa
- F Firm - Unconfined compressive strength 50-100kPa
- St Stiff - Unconfined compressive strength 100-200kPa
- VSt Very Stiff - Unconfined compressive strength 200-400kPa
- H Hard - Unconfined compressive strength greater than 400kPa

BOREHOLE LOG

CLIENT	Meissen Properties Pty Ltd	BOREHOLE NO.	BH8
PROJECT	Phase 2 ESA	DATE.	21/06/2013
LOCATION	17-23 Merriwa Street, Gordon NSW	JOB NO.	E46
METHOD	Drill Rig	SURFACE ELEV.	N/A
LOGGED BY	BB	CHECKED BY	BB



Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	Soil Description (Colour, particle characteristics, strength, plasticity, moisture, etc)	Observations
				F	Fill, Silty Sand, low-med plasticity, dark brown dry with root fibres, mulch and some inert building materials	No HC Odour No Asbestos
0.5				SC	Natural, Sandy Clay, medium plasticity, red/brown, moist	
1					End of Borehole @ 0.8m BGL	
1.5						
2						
2.5						
3						
3.5						
4						
4.5						
5						
5.5						
6						

Log Symbols

- Standing groundwater level in borehole
- Water seepage in borehole (wet)

Samples

- BH1.0.5 - Soil sample taken at indicated depth
- S - Surface water sample
- GW/W - Groundwater sample/water sample

Moisture Condition

- D Dry - Runs freely through fingers
- M Moist - Does not run freely but no free water visible on soil surface
- W Wet - Free water visible on soil surface

Soil Classification

- Clay - Particle size less than 0.002mm
- Silt - Particle size between 0.002 and 0.06mm
- Sand - Particle size between 0.06 and 2.0mm
- Gravel - Particle size between 2.0 and 60mm

Strength

- VS Very Soft - Unconfined compressive strength less than 25kPa
- S Soft - Unconfined compressive strength 25-50kPa
- F Firm - Unconfined compressive strength 50-100kPa
- St Stiff - Unconfined compressive strength 100-200kPa
- VSt Very Stiff - Unconfined compressive strength 200-400kPa
- H Hard - Unconfined compressive strength greater than 400kPa

BOREHOLE LOG

CLIENT	Meissen Properties Pty Ltd	BOREHOLE NO.	BH9
PROJECT	Phase 2 ESA	DATE.	21/06/2013
LOCATION	17-23 Merriwa Street, Gordon NSW	JOB NO.	E46
METHOD	Drill Rig	SURFACE ELEV.	N/A
LOGGED BY	BB	CHECKED BY	BB



Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	Soil Description (Colour, particle characteristics, strength, plasticity, moisture, etc)	Observations
				F	Fill, Silty Sand, low-med plasticity, dark brown dry with root fibres, mulch and some inert building materials	No HC Odour No Asbestos
0.5					End of Borehole @ 0.5m BGL	
1						
1.5						
2						
2.5						
3						
3.5						
4						
4.5						
5						
5.5						
6						

Log Symbols

- Standing groundwater level in borehole
- Water seepage in borehole (wet)

Samples

- BH1.0.5 - Soil sample taken at indicated depth
- S - Surface water sample
- GW/W - Groundwater sample/water sample

Moisture Condition

- D Dry - Runs freely through fingers
- M Moist - Does not run freely but no free water visible on soil surface
- W Wet - Free water visible on soil surface

Soil Classification

- Clay - Particle size less than 0.002mm
- Silt - Particle size between 0.002 and 0.06mm
- Sand - Particle size between 0.06 and 2.0mm
- Gravel - Particle size between 2.0 and 60mm

Strength

- VS Very Soft - Unconfined compressive strength less than 25kPa
- S Soft - Unconfined compressive strength 25-50kPa
- F Firm - Unconfined compressive strength 50-100kPa
- St Stiff - Unconfined compressive strength 100-200kPa
- VSt Very Stiff - Unconfined compressive strength 200-400kPa
- H Hard - Unconfined compressive strength greater than 400kPa

BOREHOLE LOG

CLIENT	Meissen Properties Pty Ltd	BOREHOLE NO.	BH10
PROJECT	Phase 2 ESA	DATE.	21/06/2013
LOCATION	17-23 Merriwa Street, Gordon NSW	JOB NO.	E46
METHOD	Drill Rig	SURFACE ELEV.	N/A
LOGGED BY	BB	CHECKED BY	BB



Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	Soil Description (Colour, particle characteristics, strength, plasticity, moisture, etc)	Observations
				SC	Natural, Sandy Clay, medium plasticity, red/brown, moist	No HC Odour No Asbestos
0.5					End of Borehole @ 0.3m BGL	
1						
1.5						
2						
2.5						
3						
3.5						
4						
4.5						
5						
5.5						
6						

Log Symbols

- Standing groundwater level in borehole
- Water seepage in borehole (wet)

Samples

- BH1.0.5 - Soil sample taken at indicated depth
- S - Surface water sample
- GW/W - Groundwater sample/water sample

Moisture Condition

- D Dry - Runs freely through fingers
- M Moist - Does not run freely but no free water visible on soil surface
- W Wet - Free water visible on soil surface

Soil Classification

- Clay - Particle size less than 0.002mm
- Silt - Particle size between 0.002 and 0.06mm
- Sand - Particle size between 0.06 and 2.0mm
- Gravel - Particle size between 2.0 and 60mm

Strength

- VS Very Soft - Unconfined compressive strength less than 25kPa
- S Soft - Unconfined compressive strength 25-50kPa
- F Firm - Unconfined compressive strength 50-100kPa
- St Stiff - Unconfined compressive strength 100-200kPa
- VSt Very Stiff - Unconfined compressive strength 200-400kPa
- H Hard - Unconfined compressive strength greater than 400kPa

BOREHOLE LOG

CLIENT	Meissen Properties Pty Ltd	BOREHOLE NO.	BH11
PROJECT	Phase 2 ESA	DATE.	21/06/2013
LOCATION	17-23 Merriwa Street, Gordon NSW	JOB NO.	E46
METHOD	Drill Rig	SURFACE ELEV.	N/A
LOGGED BY	BB	CHECKED BY	BB



Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	Soil Description (Colour, particle characteristics, strength, plasticity, moisture, etc)	Observations
				SC	Natural, Sandy Clay, medium plasticity, red/brown, moist	No HC Odour No Asbestos
0.5					End of Borehole @ 0.3m BGL	
1						
1.5						
2						
2.5						
3						
3.5						
4						
4.5						
5						
5.5						
6						

Log Symbols

- Standing groundwater level in borehole
- Water seepage in borehole (wet)

Samples

- BH1.0.5 - Soil sample taken at indicated depth
- S - Surface water sample
- GW/W - Groundwater sample/water sample

Moisture Condition

- D Dry - Runs freely through fingers
- M Moist - Does not run freely but no free water visible on soil surface
- W Wet - Free water visible on soil surface

Soil Classification

- Clay - Particle size less than 0.002mm
- Silt - Particle size between 0.002 and 0.06mm
- Sand - Particle size between 0.06 and 2.0mm
- Gravel - Particle size between 2.0 and 60mm

Strength

- VS Very Soft - Unconfined compressive strength less than 25kPa
- S Soft - Unconfined compressive strength 25-50kPa
- F Firm - Unconfined compressive strength 50-100kPa
- St Stiff - Unconfined compressive strength 100-200kPa
- VSt Very Stiff - Unconfined compressive strength 200-400kPa
- H Hard - Unconfined compressive strength greater than 400kPa

BOREHOLE LOG

CLIENT	Meissen Properties Pty Ltd	BOREHOLE NO.	BH12
PROJECT	Phase 2 ESA	DATE.	21/06/2013
LOCATION	17-23 Merriwa Street, Gordon NSW	JOB NO.	E46
METHOD	Drill Rig	SURFACE ELEV.	N/A
LOGGED BY	BB	CHECKED BY	BB



Depth (m)	Sample	Graphic Symbol	Ground Water	Classification Symbol	Soil Description (Colour, particle characteristics, strength, plasticity, moisture, etc)	Observations
				F	Fill, Sand, fine grain, low plasticity, brown dry with gravels and some inert building materials	No HC Odour No Asbestos
0.5					End of Borehole @ 0.3m BGL	
1						
1.5						
2						
2.5						
3						
3.5						
4						
4.5						
5						
5.5						
6						

Log Symbols

- Standing groundwater level in borehole
- Water seepage in borehole (wet)

Samples

- BH1.0.5 - Soil sample taken at indicated depth
- S - Surface water sample
- GW/W - Groundwater sample/water sample

Moisture Condition

- D Dry - Runs freely through fingers
- M Moist - Does not run freely but no free water visible on soil surface
- W Wet - Free water visible on soil surface

Soil Classification

- Clay - Particle size less than 0.002mm
- Silt - Particle size between 0.002 and 0.06mm
- Sand - Particle size between 0.06 and 2.0mm
- Gravel - Particle size between 2.0 and 60mm

Strength

- VS Very Soft - Unconfined compressive strength less than 25kPa
- S Soft - Unconfined compressive strength 25-50kPa
- F Firm - Unconfined compressive strength 50-100kPa
- St Stiff - Unconfined compressive strength 100-200kPa
- VSt Very Stiff - Unconfined compressive strength 200-400kPa
- H Hard - Unconfined compressive strength greater than 400kPa