



# **Douglas Partners**

*Geotechnics | Environment | Groundwater*

Report on  
Detailed Site Investigation for Contamination

Proposed Memorial Park  
167 - 177 St Andrews Road, Varroville, NSW

Prepared for  
Catholic Metropolitan Cemeteries Trust

Project 92237.00  
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**Integrated Practical Solutions**





# Douglas Partners

Geotechnics / Environment / Groundwater

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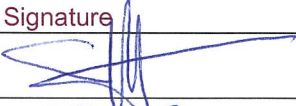

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## Executive Summary

Douglas Partners Pty Ltd (DP) was commissioned by Catholic Metropolitan Cemeteries Trust (CMCT) to carry out a Detailed Site Investigation for contamination (DSI) for the proposed memorial park development of 167-177 St Andrews Road, Varroville, NSW ('the site'). The works were carried out in accordance with DP's proposal MAC170219 dated 5 July 2017. DP understands that the investigations are required to support Development Applications (DA) being made to Campbelltown Council ('Council') for the development of the site.

The following scope of works was carried out as part of the DSI:

- Undertake a desk top study, of relevant site history information;
- Conduct a site walkover;
- Using a backhoe, excavate 35 test pits to 0.5 m into the underlying natural strata. A further six test pits were carried out by hand (hand auger) owing to the close proximity of services. Soil samples were collected representative of the surface soil and filling, where present;
- A total of 41 soil samples were analysed for identified contaminants of potential concern; and
- Preparation of this DSI report.

Potential sources of contamination were identified by the historical review in association with the former vineyard area, stockpiles, storage and use of fuels / oils, timber power poles, residual building material on ground surface, agricultural land use and areas of potential filling/ground disturbance. The site walkover identified localised areas of possible contamination where ACM was observed, or where localised oil/fuel use and spillages were observed. The scope of limited soil testing undertaken included targeting areas where possible contamination sources were observed, as well as low density testing over the balance of the site. Soil analytical results identified the following areas where contaminants exceeded the adopted SAC:

- TPH C16-C34 (F3) and C34-C40 (F4) in surface soils from TP14 exceeded the corresponding ESL, Management Limit and Direct Contact HSLs.
- Benzo(a)pyrene and total PAH in surface soils from TP21 exceeded the corresponding HIL and ESL. Several other PAHs were detected significantly above the laboratory LOR; and
- Localised impact surrounding the former homestead and sheds comprising:
  - Lead, zinc and aldrin and dieldrin in surface soils from TP17;
  - Zinc in surface soils from TP39;
  - Zinc in surface soils from TP41; and
  - Fragments of ACM on the site surface observed at TP39.

Based on the findings of this DSI, DP concludes that the potential for contamination constraints outside of the identified impact areas (listed above) is considered to be low. To mitigate identified impact areas, DP recommends a Remediation Action Plan (RAP) is prepared to inform how the identified impact areas will be remediated and validated. The RAP shall include a rationale for localised more detailed and / or delineation sampling, where required (e.g. power poles). A hazardous material survey should be conducted prior to demolition of the existing buildings, particularly the former homestead area and nearby sheds. Demolition of structures containing hazardous materials should be carried out by a licenced asbestos removal contractor. An Unexpected Finds Protocol will also need to be established for use during earthworks during redevelopment, in order to ensure that due process is carried out in the event of a possible contaminated find.



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# **Report on Detailed Site Investigation for Contamination**

## **Proposed Memorial Park**

### **167 - 177 St Andrews Road, Varroville, NSW**

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## **1. Introduction**

Douglas Partners Pty Ltd (DP) was commissioned by Catholic Metropolitan Cemeteries Trust (CMCT) to carry out a Detailed Site Investigation for contamination (DSI) for the proposed memorial park development of 167 - 177 St Andrews Road, Varroville, NSW ('the site'). The works were carried out in accordance with DP's proposal MAC170219 dated 5 July 2017. DP understands that the investigations are required to support Development Applications (DA) being made to Campbelltown Council ('Council') for the development of the site. The site location is presented on Drawing 1, Appendix A. A copy of the proposed development plan is provided in Appendix B.

This DSI was conducted concurrently with a salinity investigation which has been reported separately under Project 92237.01. This DSI report has been completed with reference to NSW EPA guidelines under the Contaminated Land Management (CLM) Act 1997, NSW State Environmental Planning Policy No. 55 – *Remediation of Land* (SEPP 55) for a Preliminary Site Investigation and National Environment Protection Council *National Environment Protection (Assessment of Site Contamination) Measure*, 1999, as amended 2013 (NEPC, 2013). This report includes recommendations regarding the suitability of the site for the proposed development and the need for further work, as required.

### **1.1 Purpose**

The purpose of this DSI is to assess the contamination status of the site and comment on its suitability, from a contamination standpoint, for the proposed development (memorial park).

## **2. Scope of Work**

The scope of works completed by DP as set out in proposal MAC170219 (dated 5 July 2017) was as follows:

- Review historic site information, comprising;
  - o Recent aerial photographs;
  - o Public databases held under the Contaminated Land Management Act 1997 and the Protection of the Environment Operations Act 1997; and
  - o Council's Section 149(2) and (5) Certificate.
- Review of site information, including;
  - o Published maps of acid sulfate soil (ASS) potential;
  - o Geological and topographical maps/drawings; and
  - o Groundwater bores registration with the NSW Office of Water;

- Conduct a site walkover;
- Using a backhoe, excavate 35 test pits (TP1 - TP15, TP22 - TP41) to 0.5 m into the underlying natural strata. A further six test pits (TP16 - TP21) were carried out by hand (hand auger) owing to the close proximity of services. Soil samples were collected representative of the surface soil and filling, where present;
- A total of 41 soil samples (plus QC samples) were submitted to a National Association of Testing Authorities (NATA) accredited analytical laboratory for analysis of a combination of the following common contaminants;
  - o Metals (arsenic, cadmium, chromium, copper, manganese, lead, mercury, nickel, zinc);
  - o Total recoverable hydrocarbons (TRH);
  - o Monocyclic aromatic hydrocarbons (benzene, toluene methylbenzene and xylenes - BTEX)
  - o Polycyclic aromatic hydrocarbons (PAH);
  - o Total phenols;
  - o Organochlorine pesticides (OCP), organophosphorus pesticides (OPP), polychlorinated biphenyls (PCB); and
  - o Asbestos.
- Field sampling and laboratory analysis in compliance with standard environmental protocols, including a Quality Assurance/Quality Control (QA/QC) plan consisting of 10 % replicate sampling (intra-laboratory replicate samples); and
- Preparation of this report detailing the methodology and results of the investigation and assessment of the site's suitability for the proposed development.

### 3. Site Information

#### 3.1 Site Identification and Description

The site which includes three lots (Lot B on DP 370979, Lot 22 on DP 564065 & Lot 1 on DP 218016) is an irregular shaped area of approximately 113 ha located 10 km north of Campbelltown. Maximum north-south and east-west dimensions are approximately 2100 m and 800 m respectively. The site is bounded by St Andrews Road to the west and rural land to the north, east and south directions. A heritage listed building is located in the central portion of the site, outside of the site boundary and will therefore not be subject to development. A historic vineyard is located in the eastern central portion of the site which was constructed and operated in the early 19<sup>th</sup> Century<sup>1</sup>; DP understands the vineyard will be retained as part of the proposed development.

The site is currently used for the purpose of cattle grazing and onsite vegetation noted as sparse grass and scattered trees with communities of medium size trees (<10 m) noted across flat areas of the site. The south-facing slope of Bunbury Curran Hill (in the north of the site) is covered by dense medium size and large trees.

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<sup>1</sup> <http://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=5045252>. Last accessed 29 August 2017

The site encompasses ridgelines and areas of undulating terrains. The ridgelines border the northern and north-eastern ends of the site and slope steeply (15 - 30%) toward south and east. The ground slope then decreases in grade becoming undulating terrains sloping gently (less than 10%) and relatively level to the central and southern portions of the site. The areas of moderate to steep land with slopes greater than 10%, occupies approximately 25 - 30% of the site.

The site has an overall relief of approximately 85 m from the highest point, known as Bunbury Curran Hill (approximately RL 150 relative to Australian Height Datum - AHD) to the lowest part within the manmade ponds close the western boundary of the site (approximately RL 65).

Mount Carmel Retreat Centre and Mount Carmel High School are located west and south west of the site respectively.

### 3.2 Acid Sulfate Soil Potential

Reference of NSW acid sulfate soils risk mapping indicates that the site is classified as 'no known occurrence of acid sulphate soil'.

### 3.3 Regional Geology, Soils, Hydrogeology and Hydrology

Reference to the Wollongong – Port Hacking and Penrith Sheets 1:100 000 Geological Series Sheet indicates that the site is underlain by Bringelly Shale (mapping unit Rwb) of the Wianamatta Group of Triassic age. This formation typically comprises shale, carbonaceous claystone, laminite and fine to medium grained, lithic sandstone members.

Reference to the 1:100,000 Soil Landscapes of the Wollongong–Port Hacking and Penrith Sheets indicates that the site is mapped as the Blacktown or Luddenham Soil Landscape with localised Picton (red/brown podzolic soils).

Blacktown is characterised by topography of *"undulating to rolling low hills on Wianamatta Group Shale, with local relief to 50 – 80 m and slopes usually less than 5 - 20%"*. This landscape comprises yellow soils on lower slopes and drainage lines and dark soils or earthy clays on crests and upper slopes. These soils are typically impermeable, are moderately reactive and highly plastic.

South Creek landscape is characterised by its presence in undulating to rolling low hills on Wianamatta Group shales. Local relief is typically 50 – 80 m, slopes 5 - 20%. South Creek soils are typically observed along narrow ridges, hillcrests and valleys.

General features of the hydrogeology of western Sydney which are relevant to this site are described in the following and summarised further below:

- Old (1942) The Wianamatta Shale Waters of the Sydney District, NSW Agricultural Gazette, pp 215 - 221;
- Wooley (1991) Groundwater in Jones DC and Clark NR (editors) Geology of the Penrith 1:100,000 sheet, pp 119 - 121. NSW Geological Survey, Sydney, 202p;
- McNally (2004) Shale, Salinity and Groundwater in Western Sydney, Australian Geomechanics 39(3), pp 109 - 123;

- McNally (2009) Soil and Groundwater Salinity in the Shales of Western Sydney, Groundwater in the Sydney Basin Symposium, International Association of Hydrogeologists, pp 228 - 235; and
- Russell G, McKibbin D, Williams J and Gates G A (2009) Groundwater Resource Assessment of the Triassic rocks of the Sydney Basin, Groundwater in the Sydney Basin Symposium, International Association of Hydrogeologists, pp 312 - 328.

The shale terrain of much of western Sydney is known for saline groundwater, resulting either from the release of connate salt in shales of marine origin or from the accumulation of windblown sea salt. Seasonal groundwater level changes of 1.0 m to 2.0 m can occur in a shallow regolith aquifer or a deeper shale aquifer due to natural influences.

The unweathered shale rock unit is effectively impermeable and the few bores drilled into the unweathered shales in the Sydney area are generally dry or yielding small flows of saline groundwater, typically with total dissolved salts (TDS) contents of 10,000 mg/L to 30,000 mg/L (Old, 1942; McNally, 2004). Groundwater flow is likely to be dominated by fracture flow with resultant low yields (typically <1 L/s) in bores.

A search of the NSW Department of Primary Industries (DPI) groundwater bore database confirms that there is no registered groundwater bores located within 1 km of the site boundary.

### 3.4 Statutory Notices and Licenses

A search on the NSW EPA Land Information records<sup>2</sup> confirmed that there are no current statutory notices under the *Contaminated Land Management Act* (1997) for the site.

A search of the NSW EPA current list of activities licensed by the EPA under Schedule 1 of the *Protection of the Environment Operations* (POEO) Act 1997 confirmed that there are no current licenses for the site.

A search of the NSW EPA list of contaminated sites notified to the EPA confirmed that no sites located within the Varroville area (therefore including the site) have been notified to the EPA.

### 3.5 Section 149 (2 and 5) Certificate

DP has conducted a review of the site Section 149 (2 and 5) certificates obtained from Council under the Environmental Planning and Assessment Act 1979. Based on DP's review of the planning certificates provided for the site (see Appendix C), there are no known issues with regard to land contamination associated with the site.

The planning certificate indicates that the site is affected by flood related development controls that restrict development of the subject land due to the likelihood of flooding.

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<sup>2</sup> Completed on 25 July 2017.

## 4. Review of Historical Aerial Photograph

Historical aerial photographs are provided in Appendix A (Drawings 3 to 8). Key findings of the historical aerial photograph review are provided below.

### 4.1 1969

The aerial photograph for 1969 is of low resolution however it is evident that the site appears to comprise cleared bushland areas. Three large dams are visible next to the western site boundary and land scarring or bare earth / rock is visible in the vicinity of the vineyard and the former homestead area. Bushland appears to be present along the northern boundary, and in the central southern portion of the site.

The immediate surrounding area appears to be of similar layout to the site, comprising cleared bushland with some cultivated fields evident. Mount Carmel Retreat Centre is visible to the west of the site.

### 4.2 1975

Cultivated fields are evident in the central portion of the site. Land scarring/bare earth or rock associated with the vineyard, east of the vineyard and the former homestead is more clearly seen than in the previous historical aerial photograph. Access paths across the site are also evident and the extent of the bushland visible in the previous aerial photograph appears to have reduced in size.

### 4.3 1984

No aerial photograph was available for the western half of the site. The homestead, associated sheds and land clearance associated with the vineyard is more discernible in this aerial photograph compared to previous years. Localised bushland clearance is visible near small dams located in the south eastern portion of the site.

Bushland clearance including paddocks are visible to the east of the site; an access road appears to run across the site toward the eastern site boundary, indicating land to the east is accessed via this route, and vice versa.

### 4.4 1994

This image indicated that the land scarring/bare earth/rock appears to be relatively stable and unchanged. The site was subject to an increase in paths/tracks connecting various landscape features. These were predominantly found in the centre to northern half of the site. The area along the northern boundary is one of the few locations that have not been cleared and maintained. This location has characteristics of a young vegetation assemblage attempting to establish itself within the landscape.



The surrounding landscape remained similar to the site, cleared and maintained rural residential lots to the north, east and west. The southern direction maintained a high density residential and commercial landscape. The envelope of the industrial zone to the east and south-east has also increased in area, and narrowed the distance between the site and the various industrial enterprises to 800m.

#### **4.5 2005**

Much of the land use and visible land features remains consistent with the previous two aerial photographs. Mount Carmel High School is visible south west of the site.

#### **4.6 2017**

The most recent aerial indicates that the site holds at least 9 dams, livestock and remains cleared and maintained in the majority of locations on site. The high resolution image also indicates a surrounding landscape that is steeply contoured.

### **5. Site Walkover**

A site walkover was undertaken by a DP Environmental Scientist on 25 July 2017. Photographs were taken during the walkover and are presented on Plates 1 - 4, Appendix D.

A summary of key observations from the site walkover are presented below and on Drawing 2, attached:

#### **Northern Ridgeline**

- The northern ridgeline area located north of the tree line was actively used for cattle grazing at the time of the walkover;
- Car remains, loose timber fence posts and cattle bones were visible on the ground surface in the north eastern portion of the site. A timber power line (likely active) is also located here; and
- Immediately west of the site (outside of the site boundary) suspected fly-tipping of potential ACM containing pipe fragment, scrap metal and a soil stockpile was observed. The fly-tipping area does not appear to impact the site and this area is separated from the site by the site fence line.

#### **Former Vineyard**

- The former vineyard located in the eastern central portion of the site comprises terraced, contoured slopes and was generally cleared of vegetation; and
- Scattered cattle bones were observed throughout the area. Road base material including blue metal gravel and possible coal wash material was observed on the hill top and on access roads around the vineyard (Photograph 1).

### **Dams and Surrounding Low Lying Paddocks**

- A total of 10 dams were observed across the site during the walkover. The largest dams were located within the western centre of the site. The dams appeared to be well maintained with no evidence of fly tipping, and all pump systems appeared to be well maintained and free from odour or soil staining (Photograph 2). Many of the dams appeared to be connected by ephemeral channels likely active during high rainfall events;
- Across the low lying paddock regions located across the south western portion of the site, agricultural equipment, construction and fencing material and soil stockpiles appeared to be stored in several locations. Localised fuel/oil leakage onto the soil surface was observed next to drums/achinery; and
- Access tracks and paths across the site were generally covered with road base containing red brick and/or blue gravel material;

### **Former Homestead and Sheds**

- In the south eastern part of the site was located a house (former homestead) constructed with brick and timber (Photograph 3). The former homestead was not occupied and was in a dilapidated state, with paint flakes visible on the surface of the surrounding soil. The surrounding ground surface was partially covered with concrete paving stones. Suspected asbestos containing material (ACM) was observed in part of the structure including eaves and corrugated roofing panels (Photograph 4). For safety reasons, the interior of the house was not inspected at the time of the walkover;
- Near to the former homestead were 5 - 7 sheds / storage facilities which appeared to have been constructed with primarily corrugated steel and brick. Two of the structures appeared to have been constructed from suspected ACM. Empty chemical drums were observed in some of the sheds. An above ground fuel storage tank (AST) was also visible here, and various agricultural machinery were also stored here. A large mound of potential ACM and private power pole were also located in close proximity to the sheds;
- A suspected septic tank was observed to the southeast of the house, a second tank was recognised west of the homestead and sheds, in close proximity to potential mound of ACM; and
- To the south of the paved homestead and shedding area was a large collection of motor vehicle tyres, brick and sand fill and road base material.

It is noted that the densely vegetated part of the site located near the northern site boundary could not be accessed at the time of the walkover. Based on the review of historical aerial photographs (refer to Section 4) this portion of the site has consistently been covered with dense vegetation throughout the time period assessed.

## **6. Preliminary Conceptual Site Model**

A conceptual site model (CSM) is a representation of site-related information regarding contamination sources, receptors and exposure pathways between those sources and receptors (linkages). A preliminary CSM provides a framework to identify potential contamination sources and how potential receptors may be exposed to contamination either in the present or the future (i.e. it enables an assessment of the potential source - pathway - receptor linkages).

## 6.1 Potential Sources

Based on the review of site history information and the site walkover, the identified potential sources, description of sources and COPC at the site have been summarised in Table 1 below.

**Table 1: Potential Contamination Sources and COPC**

Potential Source	Description of Potential Source	Contaminants of Potential Concern
Former vineyard (S1)	The former vineyard operated in the 19 <sup>th</sup> Century, before manufactured organochlorine / organophosphorus pesticides were available. However, historic pesticides / herbicides are known to have contained elevated heavy metals.	Heavy metals
Stockpiles (S2)	Stockpiles of construction and demolition materials observed throughout site.	Metals, petroleum hydrocarbons, pesticides, PAHs, phenols and asbestos
Storage and use of fuels and oils (S3)	Fuels / oils stored and used at the site.	Metals, TRH, BTEX, PAHs, cresol, phenols and MTBE
Timber power poles (S4)	Historical timber power lines are located throughout site	Metals, pesticides, petroleum hydrocarbons, PAHs, creosote and ammonia
Residual building materials from homestead / sheds (S5)	Fragments of ACM and paint flakes were observed on the site surface.	Asbestos, lead
Agricultural land use (S6)	The site has historically been used for agricultural (pastoral) purposes.	Heavy metals, nutrients, pesticides, herbicides and insecticides
Potential filling (S7)	Localised ground disturbance observed on historical aerial photographs may potentially have been historically filled.	Metals, petroleum hydrocarbons, pesticides, PAHs, phenols and asbestos
Suspected ACM in homestead and adjacent structures	Not further assessed here. Refer to Section 0.	

## 6.2 Potential Receptors

The following potential human receptors (R) have been identified for the site:

- R1 – Construction and maintenance workers (during site redevelopment);
- R2 – Future site users (workers and visitors) following development of the site;
- R3 – Recreational users of on-site dams; and
- R4 – Land users in adjacent areas.

The following potential ecological receptors (R) have been identified for the site:

- R5 – Local groundwater;
- R6 – Surface water bodies (on-site farm dams); and
- R7 – Terrestrial ecology.

### 6.3 Potential Pathways

Potential pathways for contamination include the following:

- P1 – Ingestion and dermal contact;
- P2 – Inhalation of fibres, dust and/or vapours;
- P3 – Leaching of contaminants and vertical migration into groundwater;
- P4 – Surface water run-off;
- P5 – Lateral migration of groundwater providing base flow to watercourses; and
- P6 – Contact with terrestrial ecology.

### 6.4 Summary of Preliminary CSM

A 'source – pathway - receptor' approach has been used to assess the potential risks of harm being caused to human or ecological receptors from contamination sources on or in the vicinity of the site, via exposure pathways. The possible exposure pathways between the above sources (S1 to S7) and receptors (R1 to R6) are provided in Table 2 below. Assessment of the preliminary CSM was used to determine data gaps and the requirement for sampling and analysis to assess the suitability of the site for the proposed development.

**Table 2: Preliminary Conceptual Site Model**

Source	Exposure Pathway	Receptor	Recommended Risk Management Action
S1 – Former vineyard	P1 – Ingestion P2 – Inhalation of dust, fibres and/or vapours P3 – Dermal contact P4 – Leaching of contaminants and vertical migration into soils at greater depth or groundwater P5 – Surface water run-off P6 – Lateral	R1 – Construction workers during the development process R2 – Future site users R3 – Recreational site users R4 – Land users in adjacent areas R5 – Local groundwater	Undertake targeted soil sampling (TP16) and analysis for COPC as part of the DSI
S2 – Stockpiles			Undertake targeted soil sampling (TP20) and analysis for COPC as part of the DSI
S3 – Storage and use of fuels / oils			Undertake targeted soil sampling (TP14) and analysis for COPC as part of the DSI
S4 – Timber power poles			Undertake targeted soil sampling (TP21) and analysis for COPC as part of the DSI
S5 – Residual building materials on ground surface			Undertake targeted soil sampling (TP14 – TP19 and TP41) and analysis for COPC as part of the DSI

Source	Exposure Pathway	Receptor	Recommended Risk Management Action
S6 – Agricultural land use	migration of perched groundwater providing base flow to watercourses	R6 – Surface water bodies R7 – Terrestrial ecology	Undertake low density grid-based sampling and analysis for COPC across the balance of the site as part of the DSI.
S7 – Potential filling / ground disturbance	P7 – Direct contact with terrestrial ecology		Undertake targeted soil sampling (TP14 – TP19 and TP41) and analysis for COPC as part of the DSI

## 7. Fieldwork Methodology

### 7.1 Data Quality Objectives

The overall objective of the DSI is to assess the potential for soil impact at the site and comment on its suitability, from a contamination standpoint, for the proposed development (memorial park with accessible gardens and soils).

The DSI scope has been devised broadly in accordance with the seven step data quality objective (DQO) process which is provided in Appendix B, Schedule B2 of the *National Environment Protection (Assessment of Site Contamination) Measure 1999 as amended 2013* (NEP, 2013). The DQO process is outlined as follows:

#### 7.1.1 State the Problem

The site is to be redeveloped for the proposed memorial park. At the time of report preparation, the site was used for agricultural (pastoral) purposes.

The “problem” under consideration is the characterisation of the type, extent and nature of contamination that may exist at the site, if any, and the suitability of the site, from a contamination standpoint, for the proposed development and use as a memorial park.

#### 7.1.2 Identify the Decision

The available site history indicates the site was previously used for rural residential and livestock grazing. Localised potential contamination sources have been identified (see Table 1).

The analytical data were compared to relevant site assessment criteria (SAC) (refer to Section 0). The suitability of the site for use as a memorial park was based on a comparison of the analytical results for all contaminants of concern to the adopted SAC and, if necessary, compared to the 95% upper confidence limit (UCL) of the mean concentrations.

The following specific decisions were made, as appropriate:

- Do the existing fill materials (if present) and/or natural soils pose a potential risk to identified receptors?
- Is the data sufficient to make a decision regarding the abovementioned risks and the suitability of the site for the proposed development or are additional investigations required?
- Does contamination at the site, if encountered, trigger the Duty to Report requirements under the *Contaminated Land Management Act 1997* (CLM Act 1997)?
- Are there any off-site migration issues that need to be considered?
- Is the data sufficient to enable the preparation of a Remediation Action Plan (RAP) and/or Environmental Management Plan (EMP) should the data suggest these are required?

### **7.1.3 Identify Inputs to the Decision**

The inputs into the decision process were as follows:

- Historical information regarding past land uses and features;
- Site operations and observation details;
- Soil profile information obtained through the sampling phase;
- The conceptual site model;
- Chemical test data on analysed soil samples;
- Assessment of test data against applicable SAC; and
- Details of the proposed development.

### **7.1.4 Define the Assessment Boundaries**

The boundary of the assessment was the boundary of the 'site' as shown on Drawing 1, Appendix A and to the depth of potential contamination.

### **7.1.5 Develop a Decision Rule**

The information obtained through this DSI was used to assess the suitability of the site (from a contamination standpoint) for the proposed development. The decision rule in conducting this DSI was as follows:

- Laboratory test results were assessed individually, and/or statistically where appropriate;
- The SAC have been endorsed by the NSW Environment Protection Authority (EPA);
- The soil analytical results provide an indication of the likely potential for contamination at the site;
- Relevant site information, observations and exceedances of the SAC were used to evaluate whether the site is suitable for the proposed development, from a contamination standpoint; and
- Further targeted investigations and/or remediation works will be recommended, if required.

Field and laboratory test results were considered useable for the assessment after evaluation against the following data quality indicators (DQIs):

- Precision – a measure of variability or reproducibility of data;
- Accuracy – a measure of closeness of the data to the ‘true’ value;
- Representativeness – the confidence (qualitative) of data representativeness of media present on site;
- Completeness – a measure of the amount of usable data from a data collection activity; and
- Comparability – the confidence (qualitative) that data may be considered to be equivalent for each sampling and analytical event.

The specific limits (their acceptable range, where applicable) are outlined in the data QA/QC procedures and results (Appendix E).

#### **7.1.6 Specify Limits on the Decision Error**

Considering that the future site development will involve memorial park/cemetery based land use (with accessible soils), decision errors for the respective contaminants of concern in fill or soils are:

1. Deciding that the site’s fill/soils exceed the SAC when they truly do not; and
2. Deciding that the site’s fill/soils are within the SAC when they are truly not.

Decision errors for the DSI were minimised and measured by the following:

- Sample collection and handling techniques were in accordance with DP’s *Field Procedures Manual*;
- Samples were prepared and analysed by a NATA accredited laboratory with the acceptance limits for laboratory QA/QC parameters based on the laboratory reported acceptance limits and those stated in NEPC (2013);
- The analyte selection was based on the available site history, past site activities, site features, site walkover observations and the findings of previous investigations. The potential for contaminants other than those to be analysed was considered to be low;
- The SAC adopted were from NSW EPA endorsed guidelines. The SAC have risk probabilities already incorporated; and
- A NATA accredited laboratory using NATA endorsed methods were used to perform laboratory analysis. Where NATA endorsed methods were not used, the reasons are stated. The effect of using non-NATA methods on the decision making process is explained.

#### **7.1.7 Optimise the Design for Obtaining Data**

Sampling design and procedures that were implemented to optimise data collection for achieving the DQOs included the following;

- A NATA accredited laboratory using NATA endorsed methods was used to perform laboratory analysis whenever possible;
- Diffuse sources of contamination, such as the application of pesticides, was evaluated under a grid-based soil contamination sampling programme;



- Target potential sources of contamination were evaluated under a primarily targeted sampling programme, and soil analysis; and
- Adequately experienced environmental scientists/engineers conducted field work and sample analysis interpretation.

## 7.2 Sampling Density and Test Locations

Taking into account test pit locations that were subject to sample analysis (i.e. 41 test pit locations), a sampling density of approximately one test pit per 2.76 ha was adopted for this investigation. A limited test pitting strategy was adopted for both general site cover and to target the areas of concern identified in the CSM, including stockpiles (TP20), potential filling/ground disturbance (TP14 - TP19 and TP41), the homestead, AST and sheds (TP17 - TP19, TP39 and TP41), observed staining / odour near drums and machinery (TP14), vineyard (TP16), and power poles (TP21).

Test pit locations are shown on Drawing 9, Appendix A.

## 7.3 Soil Sampling

Test pits were undertaken using a backhoe mounted with a 400mm bucket to depths of up to 3 m bgl.

All sampling data was recorded on DP test pit logs, with samples also recorded on chain-of-custody sheets. The general sampling procedure adopted for the collection of environmental samples is summarised below:

- Collect soil samples from the freshly exposed test pit surface using disposable sampling equipment (new nitrile glove for each sample);
- Transfer samples into laboratory-prepared glass jars, completely filled so that the headspace within the sample jar is minimised, and capping immediately with a Teflon lined lid to minimise loss of volatiles;
- Label sample containers with individual and unique identification, including project number, sample location and sample depth;
- Place the glass jars into a cooled, insulated and sealed container for transport to the laboratory; and
- Collection of additional replicate samples at a rate of 10% for QA/QC requirements.

Samples designated for analysis were dispatched to Envirolab Services Pty Ltd for analysis of primary samples and intra-laboratory replicates. After backfilling each test pit, the surface was reinstated to its previous level.

## 8. Site Assessment Criteria

The proposed use for the site after development will be for a memorial park with associated recreational areas. Therefore the most appropriate criteria selected is 'public open space/recreational' land use. The relevant Site Assessment Criteria (SAC) have been selected accordingly.

Analytical results were assessed (as a Tier 1 assessment) against the SAC comprising the investigation and screening levels of Schedule B1, NEPC (2013). The NEPC guidelines are endorsed by the EPA under the CLM Act 1997. Petroleum based health screening levels for direct contact have been adopted from the CRC CARE (2011) *Technical Report No.10 Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater* as referenced by NEPC (2013).

### 8.1 Health Investigation and Screening Levels

The Health Investigation Levels (HILs) and Health Screening Levels (HSLs) are scientifically-based, generic assessment criteria designed to be used in the first stage (Tier1) of an assessment of potential risks to human health from chronic exposure to contaminants. HILs are applicable to assessing health risks arising from direct contact (dermal contact and incidental ingestion and inhalation of soil particles) to a range of contaminants. HSLs are used to assess selected petroleum compounds and fractions to assess the risk to human health via inhalation and direct contact with affected soils.

HSLs have been developed for a range of petroleum hydrocarbons as either petrol or diesel mixtures, and for different land uses, media, pathways, soil types and depths to contamination.

The investigation and screening levels are not intended to be used as clean up levels. They establish concentrations above which further appropriate investigation (e.g. Tier 2) should be undertaken. They are intentionally conservative and are based on a reasonable worst-case scenario for four generic land uses.

Potential exposure pathways considered were:

- Soil vapour intrusion and vapour inhalation (for hydrocarbon contamination) in relation to any structures that will be constructed as part of the memorial park; and
- Direct contact (dermal contact and incidental ingestion and inhalation of soil particles).

Soil types (relevant to HSL only) considered were:

- Clay, given the predominance of clay and silty clay soils at the site (Section 9.1).

Depth to contamination considered was:

- 0 to <1 m for soil HSLs have been adopted as an initial conservative screen; and
- HILs apply generally to the top 3 m of soil.

Relevant land use criteria considered were:

- HIL C – Recreational; and
- HSL C – Recreational/open space.

Only those contaminants common to both Table 1A (1) (NEPC, 2013) and the list of potential contaminants have been included.

The adopted soil HIL and HSL for the potential contaminants of concern are included in Tables F1 to F3 (Appendix F).

## 8.2 Ecological Investigation and Screening Levels

Ecological Investigation Levels (EIL) have been derived for selected metals and organic compounds and are applicable for assessing risk to terrestrial ecosystems (NEPC, 2013). EIL depend on specific soil physiochemical properties and land use scenarios and generally apply to the top 2 m of soil, which corresponds to the root zone and habitation zone of many species. The EIL is determined for a contaminant based on the sum of the ambient background concentration (ABC) and an added contaminant limit (ACL). The ABC of a contaminant is the soil concentration in a specific locality that is the sum of naturally occurring background levels and the contaminants levels that have been introduced from diffuse or non-point sources (eg: motor vehicle emissions). The ACL is the added concentration (above the ABC) of a contaminant above which further appropriate investigation and evaluation of the impact on ecological values is required.

The EIL is calculated using the following formula:

$EIL = ABC + ACL$ , where

ABC = Ambient Background Concentration

ACL = Added Contaminant Limit

The ABC is determined through direct measurement at an appropriate reference site (preferred) or through the use of methods defined by Olszowy et al *Trace element concentrations in soils from rural and urban areas of Australia*, Contaminated Sites monograph no.4, South Australian Health Commission, Adelaide, Australia 1995 (Olszowy, 1995) or Hamon et al, *Geochemical indices allow estimation of heavy metal background concentrations in soils*, Global Biogeochemical Cycles, vol.18, GB1014, (Hamon, 2004). ACL is based on the soil characteristics of pH, CEC and clay content.

EIL (and ACLs where appropriate) have been derived in NEPC (2013) for only a short list of contaminants comprising As, Cu, Cr (III), DDT, naphthalene, Ni, Pb and Zn. An *Interactive (Excel) Calculation Spreadsheet* was used for calculating site-specific EIL for these contaminants, and has been provided in the ASC NEPM Toolbox available on the SCEW (Standing Council on Environment and Water) website (<http://www.scew.gov.au/node/941>).

The adopted EIL, derived from the Interactive (Excel) Calculation Spreadsheet are provided in Tables F1 to F3 (Appendix F). The following site specific data and assumptions have been used to determine the EILs:

- A protection level of 80% has been adopted;
- The EILs will apply to the top 2 m of the soil profile;
- Given the potential sources of soil contaminants are from historic use, the contamination is considered as “aged” (>2 years);

- ABCs have been derived using the Interactive (Excel) Calculation Spreadsheet using input parameters of the State of NSW in which the Site is located, and low for traffic volumes. No background concentration is assumed for lead (conservative); and
- Site specific pH and CEC values obtained as part of the salinity investigation (DP, 2016) have been used as input parameters in the Interactive (Excel) Calculation Spreadsheet. The pH and CEC values for the upper soil layers have an average pH of 6.06 and average CEC of 12.2 cmol<sub>e</sub>/kg.

### 8.3 Management Limits – Petroleum Hydrocarbons

In addition to appropriate consideration and application of the HSL and ESL, there are additional considerations which reflect the nature and properties of petroleum hydrocarbons, including:

- Formation of observable light non-aqueous phase liquids (LNAPL);
- Fire and explosion hazards; and
- Effects on buried infrastructure e.g. penetration of, or damage to, in-ground services.

Management Limits (MLs) to avoid or minimise these potential effects have been adopted in NEPC (2013) as interim Tier 1 guidance where TRH has been recorded. MLs have been derived in NEPC (2013) for the same four petroleum fractions as the HSL (F1 to F4). The adopted Management Limits, from Table 1B (7), Schedule B1 of NEPC (2013) are shown in Tables F1 and F3 (Appendix F). The following site specific data and assumptions have been used to determine the MLs:

- The MLs will apply to any depth within the soil profile;
- The MLs for residential, parkland and public open space apply; and
- A fine soil texture has been adopted.

### 8.4 Asbestos in Soil

Bonded asbestos-containing material (ACM) is the most common form of asbestos contamination across Australia, generally arising from:

- Inadequate removal and disposal practices during demolition of buildings containing asbestos products;
- Widespread dumping of asbestos products and asbestos containing fill on vacant land and development sites; and
- Commonly occurring in historical fill containing unsorted demolition materials.

Mining, manufacturing or distribution of asbestos products may result in sites being contaminated by friable asbestos including free fibres. Severe weathering or damage to bonded ACM may also result in the formation of friable asbestos comprising fibrous asbestos (FA) and/or asbestos fines (AF).

Asbestos only poses a risk to human health when asbestos fibres are made airborne and inhaled. If asbestos is bound in a matrix, such as cement or resin, it is not readily made airborne, except through substantial physical damage. Bonded ACM in sound condition represents a low human health risk, whilst both FA and AF materials have the potential to generate or be associated with, free asbestos fibres. Consequently, FA and AF must be carefully managed to prevent the release of asbestos fibres into the air.

A detailed asbestos assessment as outlined in NEPC (2013) was not undertaken as part of the investigation. Asbestos was screened from samples taken for general analysis and assessment of contaminants. The presence or absence of asbestos at a limit of reporting of 0.1 g/kg has been adopted for this assessment as an initial screen.

## 9. Results

### 9.1 Field Results

The test pit logs are included in Appendix G and should be read in conjunction with the accompanying standard notes defining classification methods and descriptive terms.

The succession of strata is broadly summarised as follows with respect to key topographical zones observed at the site:

**CRESTS:** brown mottled grey silty clay/silt top soil to depths of up to 0.2 m underlain by stiff silty clay to depths of 1.0 m, in turn underlain by low strength, highly weathered brown and grey shale/siltstone. Refusal on medium strength shale/siltstone.

**UPPER SLOPES;** Silty clay top soil to depths of up to 0.3 m underlain by stiff silty clay/clay to depths of between 0.4 m to 1.5 m in TP31, TP32, TP33 and TP37. In TP11, silty clay was underlain by low strength, moderately weathered siltstone to depths of 2.5 m, in turn underlain by very low strength shale. Fragments of bonded ACM were encountered on the surface, in the vicinity of TP39 (Photograph 5 – Appendix D).

**LOWER SLOPES:** Silty clay/silt top soil to depths of up to 0.4 m underlain by stiff to very stiff silty clay/gravelly silty clay/clay to depths in the range of 0.4 m to 3 m in TP1, TP4, TP22 to TP24, TP 26 to TP28, TP30, TP34, and 38. Some sand was encountered in TP1 and TP4. Extremely low strength to low strength shale/siltstone was encountered in TP3, TP6, TP9, TP10 and TP25 at depths in the range of 1.5 to 3 m, with refusal on medium strength shale/siltstone. Very low strength, highly weathered sandstone was encountered in TP2 to depths of 2.5 m, with refusal on medium strength sandstone.

**CHANNELS:** Silty clay/silt top soil to depths of 0.3 m underlain by stiff silty clay/clay to depths in the range of 0.6 m to 3 m in TP5, TP7, TP15 and TP36. In TP5, some sand was encountered at depths below 2 m. Bands of extremely low strength, extremely weathered shale were encountered in TP 12 and TP13 at depths below 2 m, with refusal on medium strength shale. Filling, comprised of porcelain tile and porcelain fragments was encountered in TP40 to a depth of 0.3 m. Silty clay filling was also encountered in TP20 to a depth of 0.4 m.

Where observed, stockpiles generally comprised light brown mottled grey silty clays (reworked natural materials). No stockpiles containing construction and demolition materials were observed.

No free groundwater was observed in the pits during excavation for the short time that they were left open. It is noted, however, that the pits were immediately backfilled following excavation which precluded longer term monitoring of groundwater levels that might be present. Groundwater levels are affected by factors such as soil permeability and weather conditions and will vary with time.

## 9.2 Analytical Results

The uppermost samples from all test pit locations, either from current or former topsoil, from fill material or from underlying natural soil were scheduled for analysis for the identified COPC (refer to Section 6.4). The analytical results are summarised in Appendix F, together with the SAC. The laboratory certificates of analysis are provided in Appendix H.

### 9.2.1 Heavy Metals

All samples analysed had metals concentrations below the laboratory limit of reporting (LOR) and/or the adopted SAC with the exception of the following:

- Lead in surface soils from TP17 (790 mg/kg) exceeded the corresponding HIL C (600 mg/kg);
- Zinc in surface soils from TP17 (1,700 mg/kg) exceeded the corresponding EIL C (500 mg/kg);
- Zinc in surface soils from TP39 (750 mg/kg) exceeded the corresponding EIL C (500 mg/kg); and
- Zinc in surface soils from TP41 (2,000 mg/kg) exceeded the corresponding EIL C (500 mg/kg).

### 9.2.2 PAH and Phenols

All samples analysed had PAH and phenols concentrations below the laboratory LOR and/or the adopted SAC with the exception of the following:

- Benzo(a)pyrene in surface soils from TP21 (240 mg/kg) exceeded the corresponding ESL C (0.7 mg/kg);
- Benzo(a)pyrene TEQ in surface soils from TP21 (360 mg/kg) exceeded the corresponding HIL C (3 mg/kg); and
- Total PAH in surface soils from TP21 (1,800 mg/kg) exceeded the corresponding HIL C (300 mg/kg);

A number of other PAHs were also recorded in surface soils from TP21 at concentrations significantly above the LOR.

### 9.2.3 TRH, TPH and BTEX

TRH were recorded above the LOR and adopted SAC in the following samples:

- Surface soils from TP14 recorded concentrations of F1 (250 mg/kg), F2 (47,000 mg/kg), F3 (160,000 mg/kg) and F4 (19,000 mg/kg) above the corresponding ESL C (180 mg/kg, 120 mg/kg, 1,300 mg/kg and 5,600 mg/kg respectively) and Direct Contact HSL C and Management Limits (F2 / C10 - C16 to F4 / C34 - C40 only: 1,000, 5,000 and 10,000 (Management Limits) and 3,800, 5,300 and 7,400 mg/kg respectively);
- Surface soils from TP17 recorded concentrations of F2 (170 mg/kg) marginally above the corresponding ESL C (120 mg/kg); and
- Surface soils from TP21 recorded concentrations of F2 (280 mg/kg) and F3 (10,000 mg/kg) above the corresponding ESL C (120 mg/kg and 1,300 mg/kg respectively).

The above referenced soil samples were subject to silica gel clean-up and analysis for Total Petroleum Hydrocarbons (TPH) so to establish the concentration of petroleum hydrocarbons in the soil samples. The results are summarised below:

- TPH C16-C34 (F3) and C34-C40 (F4) analytical results for surface soils from TP14 (160,000 mg/kg and 15,000 mg/kg respectively) exceeded the corresponding ESL C, Management Limit and Direct Contact HSL C; and
- TPH analytical results for surface soils from TP17 and TP21 were below the corresponding SAC.

BTEX were below the LOR and/or the SAC for all soil samples analysed.

### 9.2.4 OCP, OPP and PCB

OCP, OPP and PCB analytical results were below the LOR and / or the SAC with the exception of aldrin and dieldrin in surface soils from TP17 (26.2 mg/kg) which exceeded the corresponding HIL C (10 mg/kg).

### 9.2.5 Asbestos

No asbestos was reported in any of the samples analysed. A fragment of suspected ACM from TP39/0-0.15 m was tested by the laboratory and confirmed to contain chrysotile asbestos.

## 9.3 Quality Assurance and Quality Control Results

The methodology, results and discussion of the field and laboratory QA/QC assessment are provided in Appendix E. Based on the results of the QA/QC assessment the data is considered to be suitable for use in assessing the contamination status of the site.



## 10. Discussion

The scope of this DSI included a review of site history information, a site walkover and soil testing. The historical aerial photograph review indicated that the site was predominantly used for agricultural (pastoral) purposes and historically a vineyard. Potential sources of contamination were identified by the historical review in association with the former vineyard area, stockpiles, storage and use of fuels/oils, timber power poles, residual building material on ground surface, agricultural land use and areas of potential filling/ground disturbance. The site walkover identified localised areas of possible contamination where ACM was observed, or where localised oil/fuel use and spillages were observed. The scope of limited soil testing undertaken included targeting areas where possible contamination sources were observed, as well as low density testing over the balance of the site. Soil analytical results identified the following areas where contaminants exceeded the adopted SAC:

- TPH C16-C34 (F3) and C34-C40 (F4) in surface soils from TP14 (where localised spillage near drums were noted during the walkover) exceeded the corresponding ESL, Management Limit and Direct Contact HSLs;
- Benzo(a)pyrene and total PAH in surface soils from TP21 (located next to timber power pole) exceeded the corresponding HIL and ESL. Several other PAHs were detected significantly above the laboratory LOR; and
- Localised impact surrounding the former homestead and sheds comprising:
  - o Lead, zinc and aldrin and dieldrin in surface soils from TP17;
  - o Zinc in surface soils from TP39;
  - o Zinc in surface soils from TP41; and
  - o Fragments of ACM on the site surface observed at TP39.

### 10.1 Revised CSM

The revised CSM is presented in Table 3 below based on the findings of this DSI.

**Table 3: Revised Conceptual Site Model**

Source	Exposure Pathway	Receptor	Recommended Risk Management Action
1 - Fuel / oil spillage near TP14	P1 – Ingestion P2 – Inhalation of dust, fibres and/or vapours	R1 – Construction workers during the development process	Prepare a RAP to inform how impact identified impact to be remediated. Remediate and validate impacted soils in accordance with the RAP.
2 – Metal (lead, zinc) and pesticide (aldrin and dieldrin) impact near homestead and sheds	P3 – Dermal contact P4 – Leaching of contaminants and vertical migration into soils at greater depth or groundwater	R2 – Future site users R3 – Recreational site users R4 – Land users in adjacent areas	Include scope of remediation in RAP. Remediate and validate impacted soils in accordance with the RAP.

Source	Exposure Pathway	Receptor	Recommended Risk Management Action
3 – Surface ACM near former homestead and sheds	P5 – Surface water run-off P6 – Lateral migration of perched groundwater providing baseflow to watercourses P7 – Direct contact with terrestrial ecology	R5 – Local groundwater R6 – Surface water bodies R7 – Terrestrial ecology	Conduct Hazmat Survey for structures prior to demolition.  Hazardous materials to be removed and disposed of by suitably licensed asbestos removal contractor.  Include scope of remediation in RAP.  Ground surface to be inspected after demolition and residual ACM fragments to be hand-removed.
4 – PAH impact in surface soils next to timber power poles			Investigate and delineate impact for power poles at the site.  Include scope of remediation in RAP.  Remediate and validate impacted soils in accordance with the RAP.

## 11. Conclusions and Recommendations

DP concludes that the potential for contamination constraints outside of the identified impact areas (refer to Table 3) is considered to be low. To mitigate identified impact areas, DP recommends a Remediation Action Plan (RAP) is prepared to inform how the identified impact areas will be remediated and validated. The RAP shall include a rationale for localised more detailed and/or delineation sampling, where required (e.g. power poles). A hazardous material survey should be conducted prior to demolition of the existing buildings, particularly the former homestead area and nearby sheds. Demolition of structures containing hazardous materials should be carried out by a licenced asbestos removal contractor.

### 11.1 Unexpected Finds

There is the potential that hidden, below ground structures (such as fuel tanks, septic tanks, filled gullies, ACM pipes and ACM fence footings) may be present at the site and this should be considered accordingly during bulk earthworks for the proposed development. An Unexpected Finds Protocol will therefore need to be established for use during earthworks during redevelopment, in order to ensure that due process is carried out in the event of a possible contaminated find. This would also apply to areas of the site that could not be appropriately accessed during the site walkover, as discussed in Section 5, if these areas become cleared and/or accessible to the identified human receptors under the proposed development.

## 12. Limitations

Douglas Partners (DP) has prepared this report (or services) for this project at 167 - 177 St Andrews Road, Varroville in accordance with DP's proposal MAC170219 dated 20 July 2017 and acceptance received from John Richardson dated 18 July 2017. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of Catholic Metropolitan Cemeteries Trust for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific sampling and/or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after DP's field testing has been completed.

DP's advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.

This report has been produced with reference to the National Environmental Protection (Assessment of Site Contamination) Measure 1999 (ASC NEPM 1999) as originally issued and does not take into account the amendments made to ASC NEPM 1999 in 16 May 2013 and as approved by the NSW EPA on 11 June 2013 [or other state approvals as appropriate]. This is because this report was commenced and substantially completed prior to 16 May 2013; and significant additional works and/or cost would be necessary to meet the amended ASC NEPM; and the information available to DP to date indicates that any possible risks associated with applying the original ASC NEPM are likely to be relatively low.

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**Douglas Partners Pty Ltd**

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## Appendix A

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About This Report and Drawings

# About this Report

# Douglas Partners



## Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

## Copyright

This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Conditions of Engagement for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

## Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

## Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;

- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

## Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

# *About this Report*

## **Site Anomalies**

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

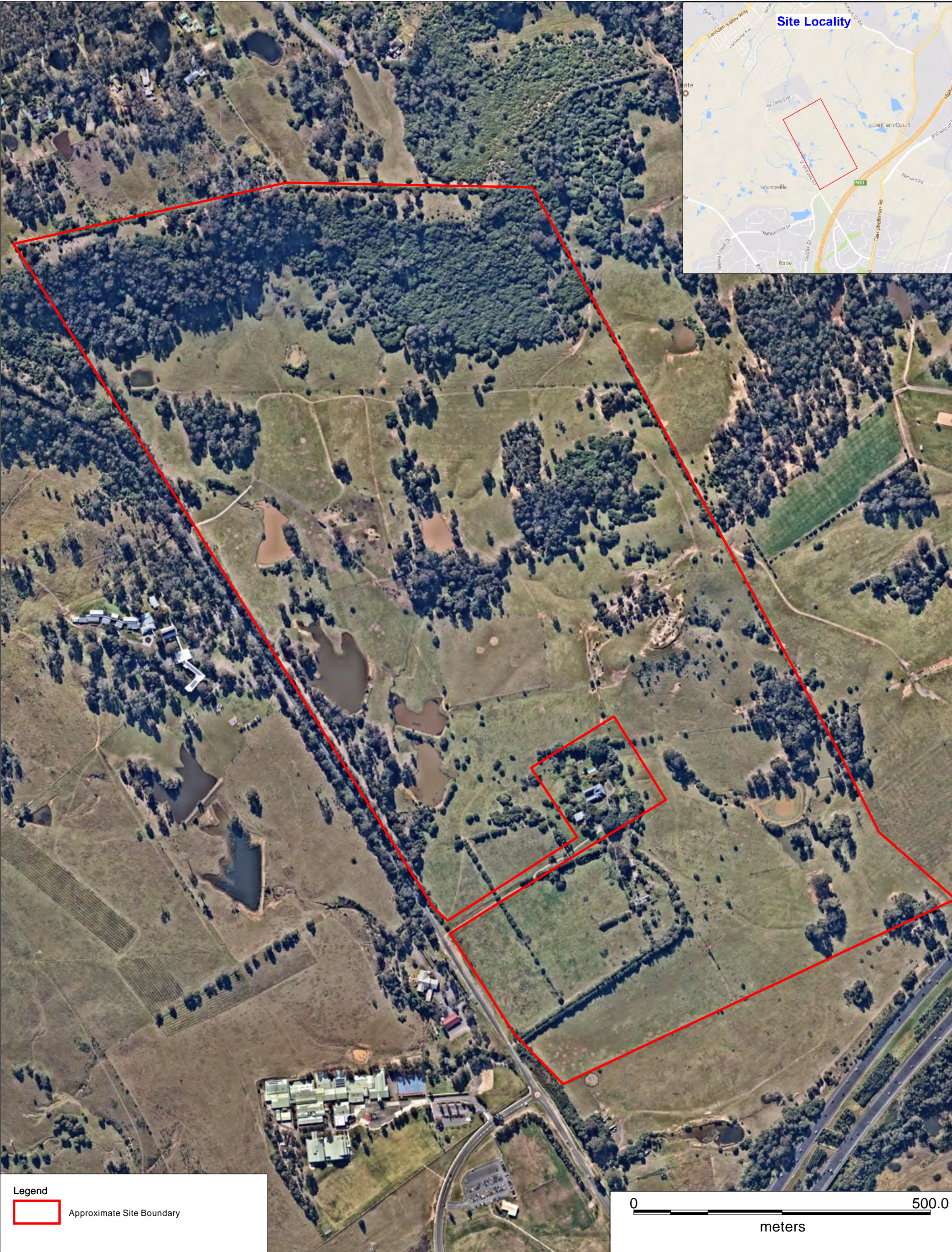
## **Information for Contractual Purposes**



Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

## **Site Inspection**

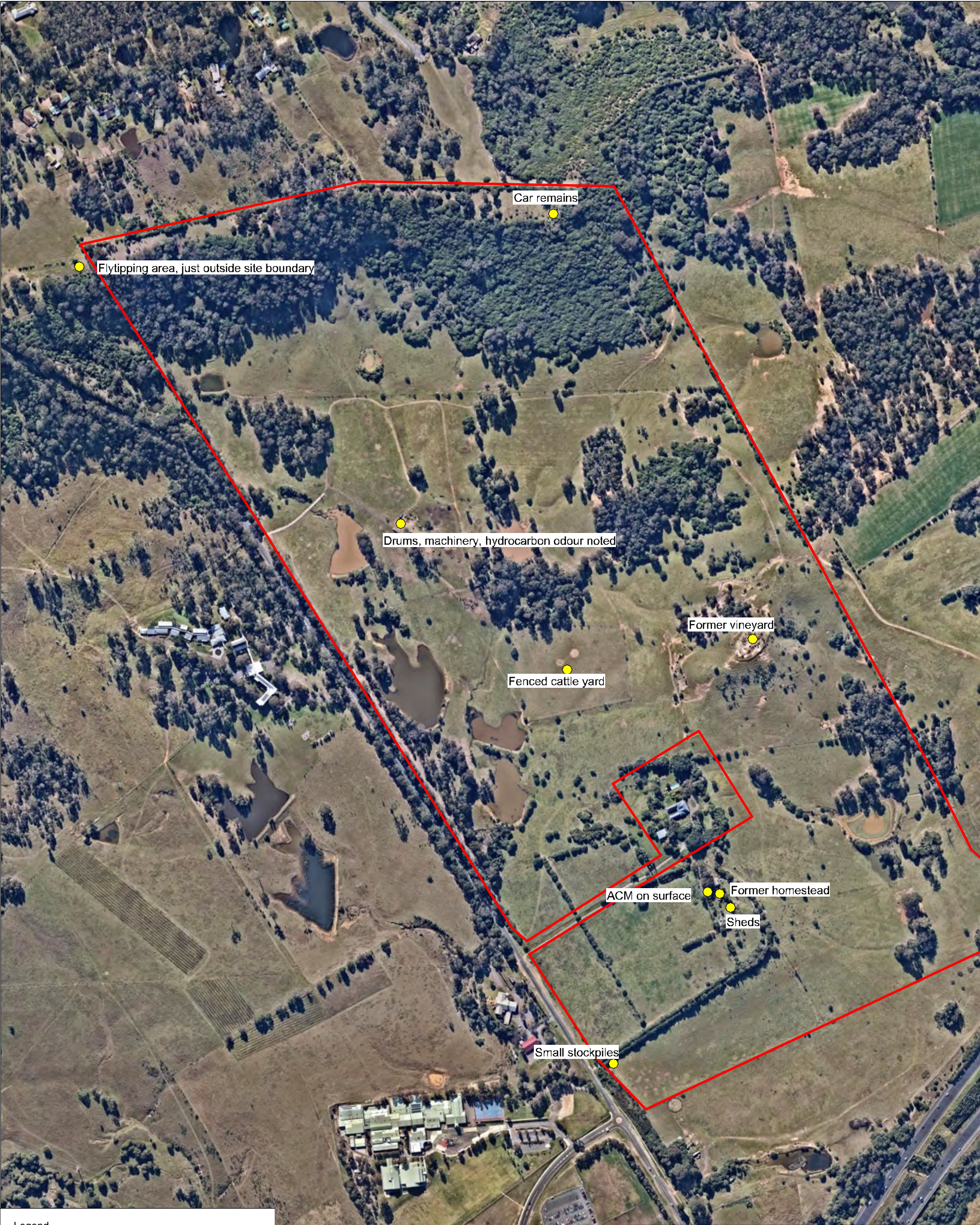
The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.





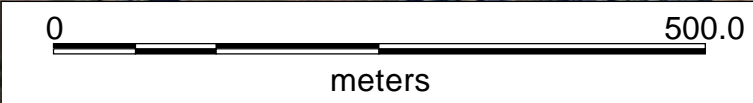
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					DRAWN BY: CLN
					DATE: 30.08.2017
CLIENT: Catholic Metropolitan Cemeteries Trust	PROJECT No: 92237.00	DRAWING No: 1	REVISION: A	SCALE: As shown	





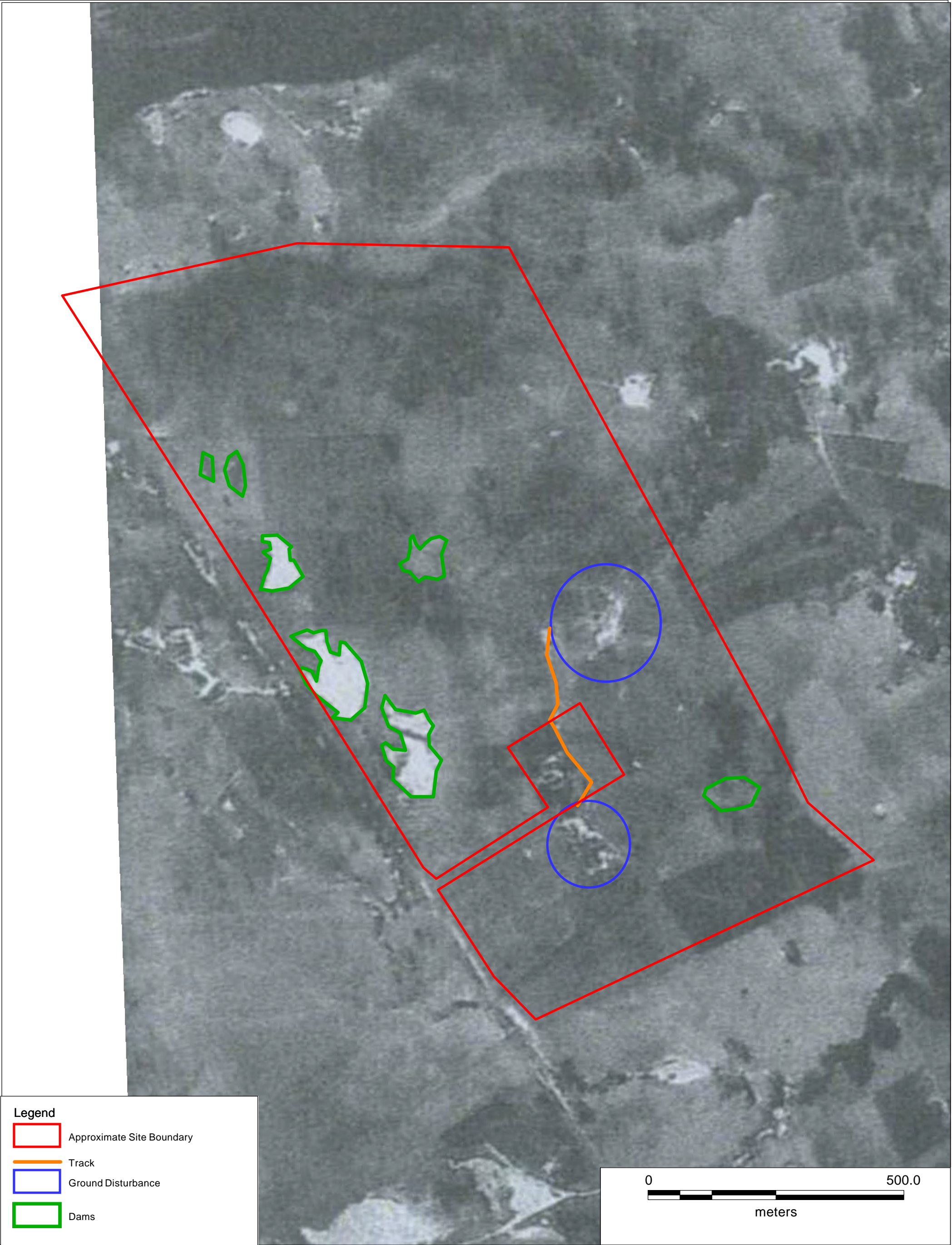
Legend

Approximate Site Boundary







	TITLE: Key Observations Detailed Site Investigation 167 to 177 St Andrews Rd, Varroville, NSW				OFFICE: Macarthur
					DRAWN BY: CLN
					DATE: 30.08.2017
					SCALE: As shown
CLIENT: Catholic Metropolitan Cemeteries Trust	PROJECT No: 92237.00	DRAWING No: 2	REVISION: A		


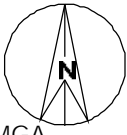




**Legend**

-  Approximate Site Boundary
-  Track
-  Ground Disturbance
-  Dams

0 500.0  
meters

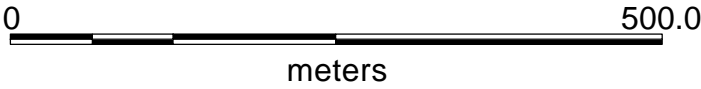
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					DRAWN BY: HG
					DATE: 26.07.2017
					SCALE: As shown
CLIENT: Catholic Metropolitan Cemeteries Trust	PROJECT No: 92237.00	DRAWING No: 3	REVISION: A		


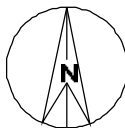




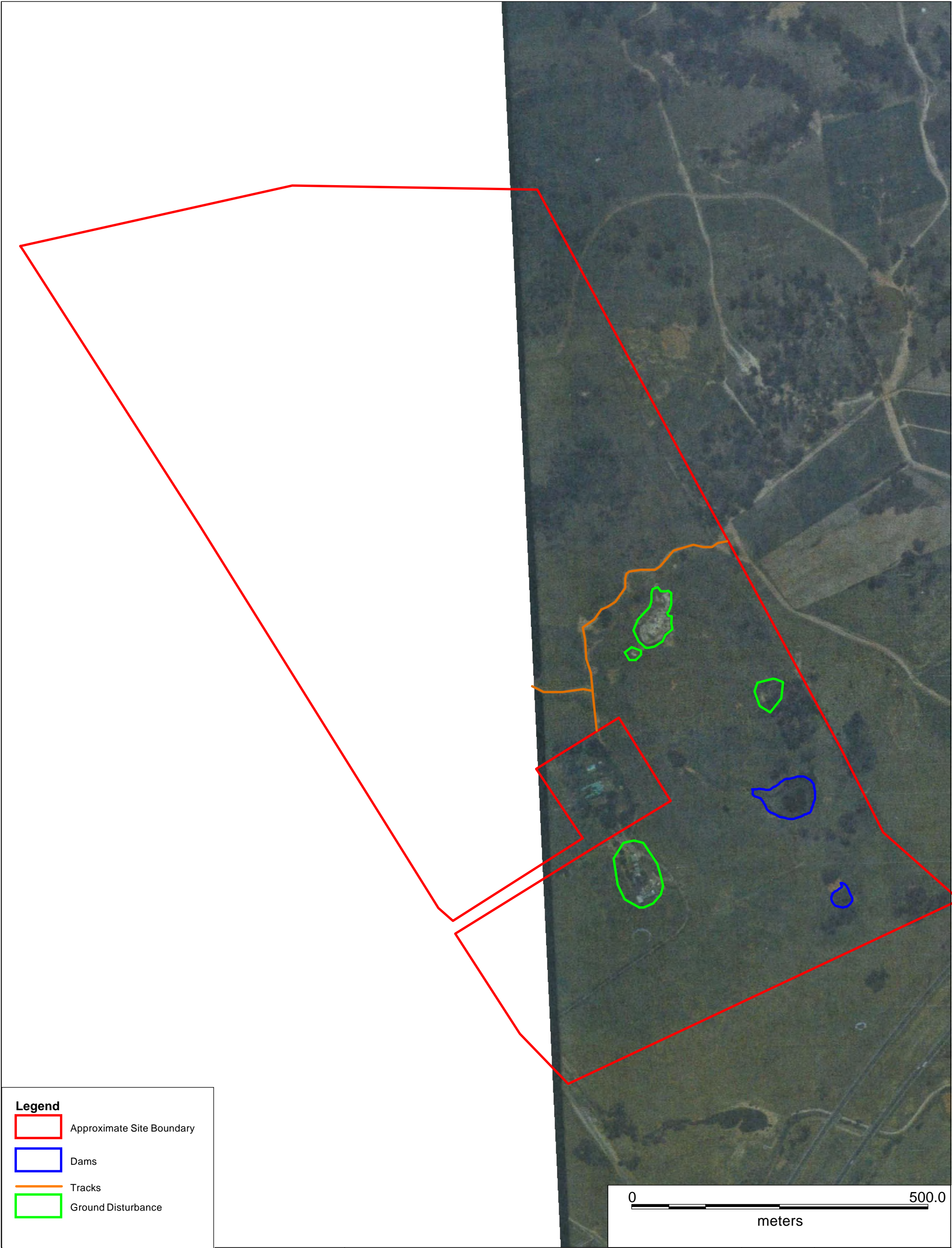
Legend



- Approximate Site Boundary
- Dams
- Tracks
- Ground Disturbance



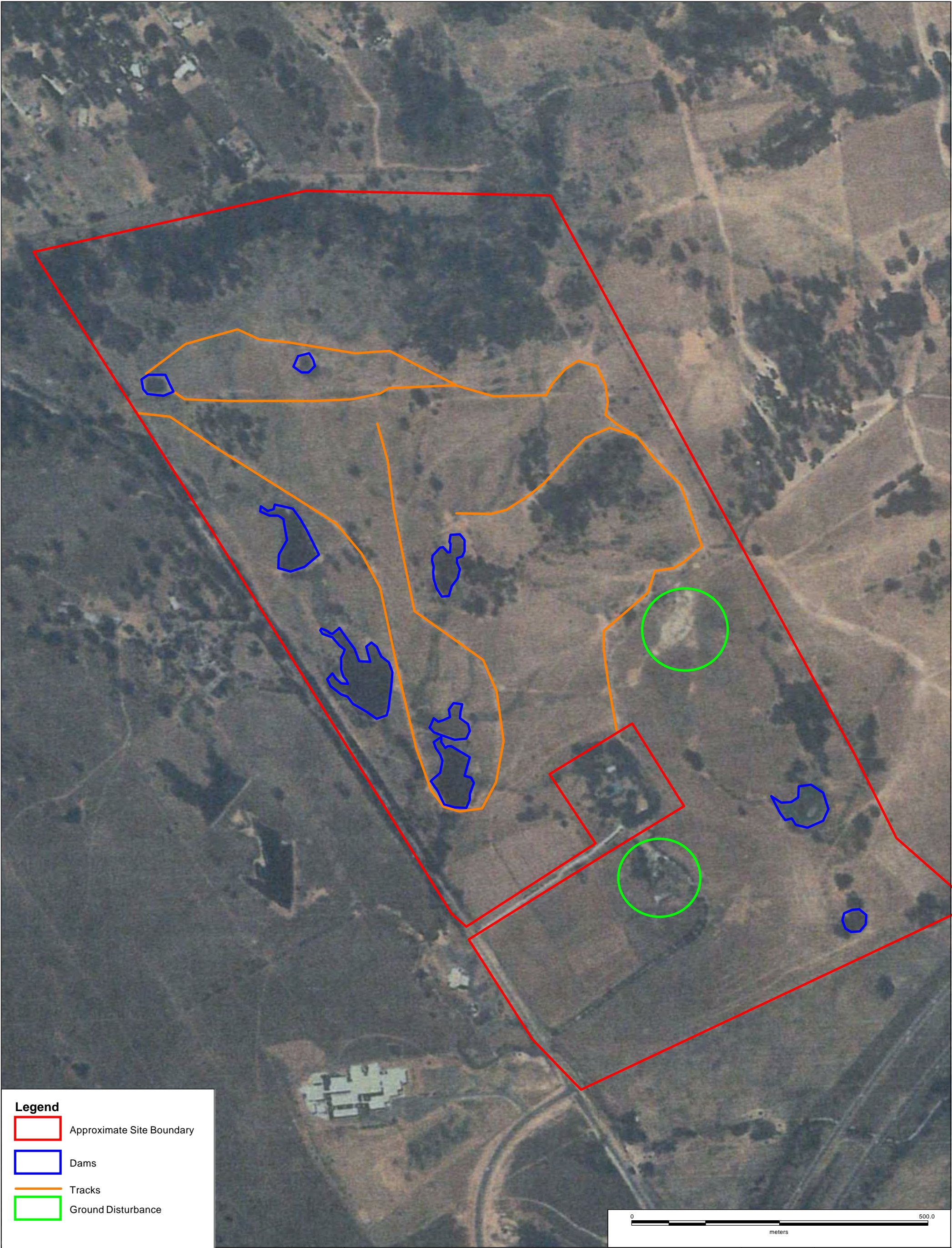
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	DRAWN BY: HG				
	DATE: 30.08.2017				
CLIENT: Catholic Metropolitan Cemeteries Trust	PROJECT No: 92237.00	DRAWING No: 4	REVISION: A	SCALE: As shown	





	TITLE: Historical Aerial Photograph - 1984 Detailed Site Investigation 167 - 177 St Andrews Rd, Varroville, NSW			 MGA	OFFICE: Macarthur
	DRAWN BY: HG				
	DATE: 30.08.2017				
CLIENT: Catholic Metropolitan Cemeteries Trust	PROJECT No: 92237.00	DRAWING No: 5	REVISION: A	SCALE: As shown	







Legend

Approximate Site Boundary

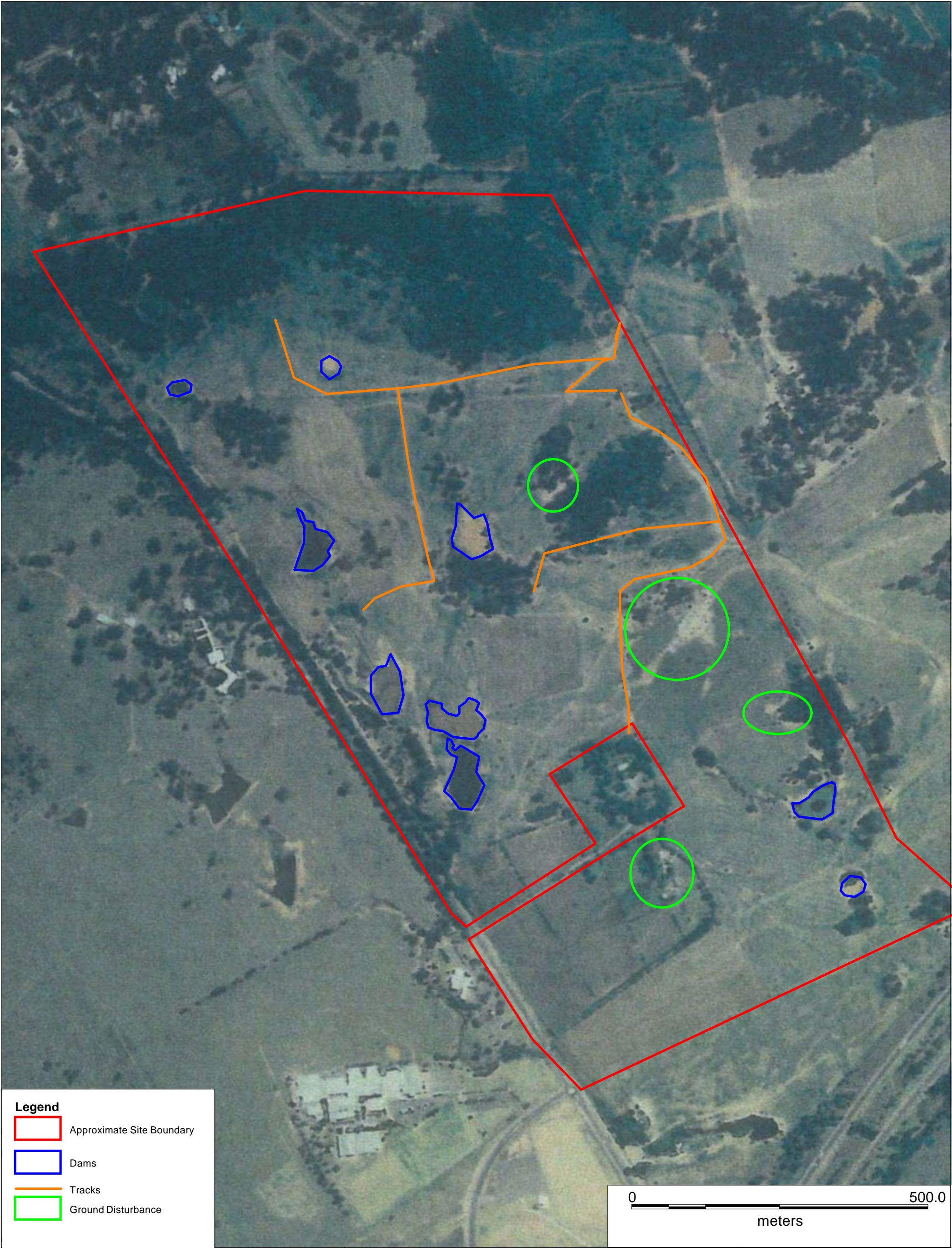
Dams



Tracks

Ground Disturbance

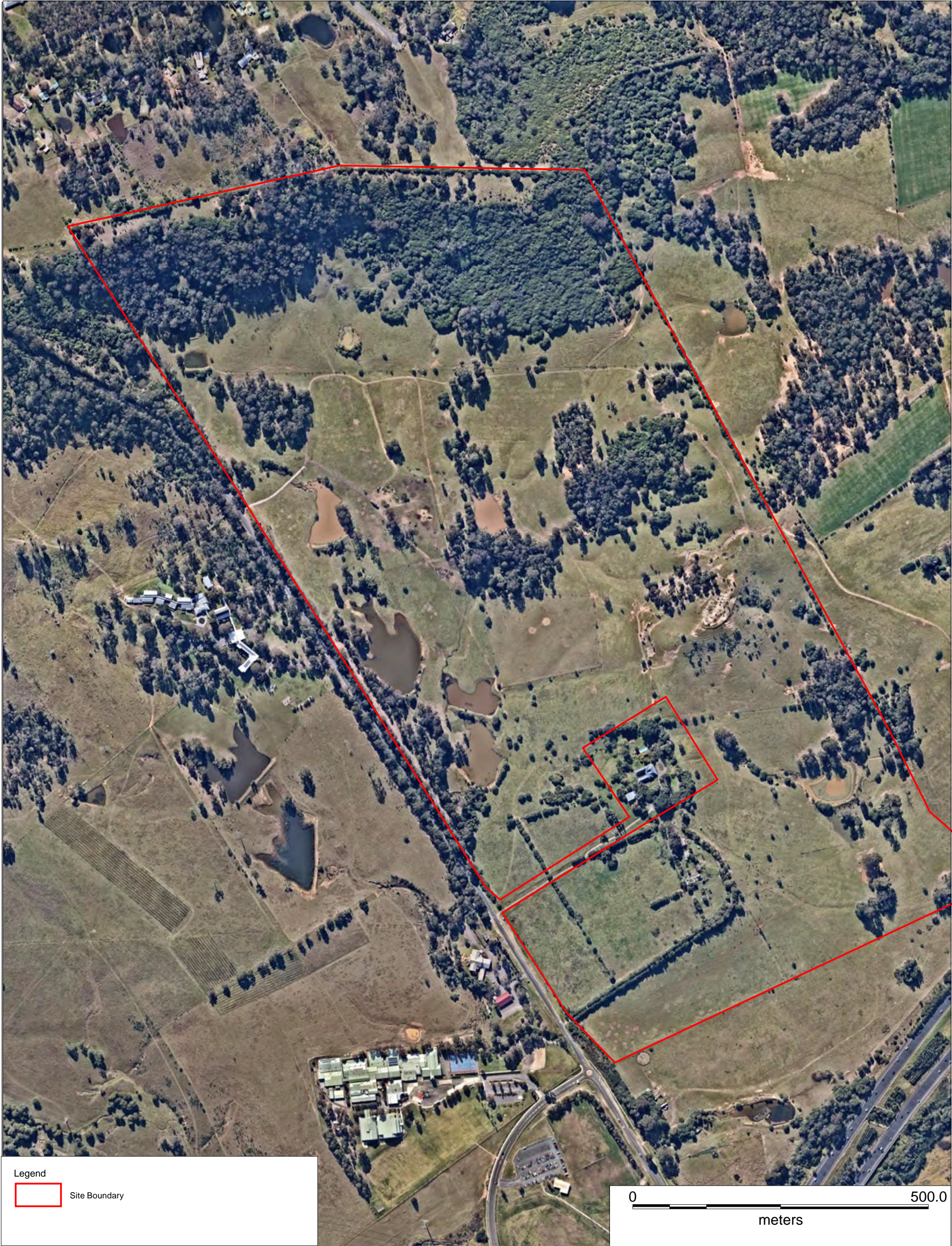
 <b>Douglas Partners</b> <i>Geotechnics   Environment   Groundwater</i>	TITLE: Historical Aerial Photograph - 1994				OFFICE: Macarthur
	Detailed Site Investigation				DRAWN BY: HG
	167 - 177 St Andrews Rd, Varroville, NSW				DATE: 30.08.2017
	CLIENT: Catholic Metropolitan Cemeteries Trust	PROJECT No: 92237.00	DRAWING No: 6		REVISION: A





 <b>Douglas Partners</b> <i>Geotechnics   Environment   Groundwater</i>	TITLE: Historical Aerial Photograph - 2005			 MGA	OFFICE: Macarthur
	Detailed Site Investigation				DRAWN BY: HG
	167 - 177 St Andrews Rd, Varroville, NSW				DATE: 30.08.2017
					SCALE: As shown
CLIENT: Catholic Metropolitan Cemeteries Trust	PROJECT No: 92237.00	DRAWING No: 7	REVISION: A		





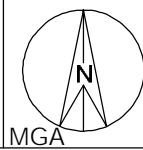
Legend

Site Boundary

0 500.0  
meters



TITLE: **Current Aerial Photograph - 2017**  
**Detailed Site Investigation**  
**167 to 177 St Andrews Rd, Varroville, NSW**



OFFICE: Macarthur  
DRAWN BY: HG  
DATE: 26.07.2017  
SCALE: As shown

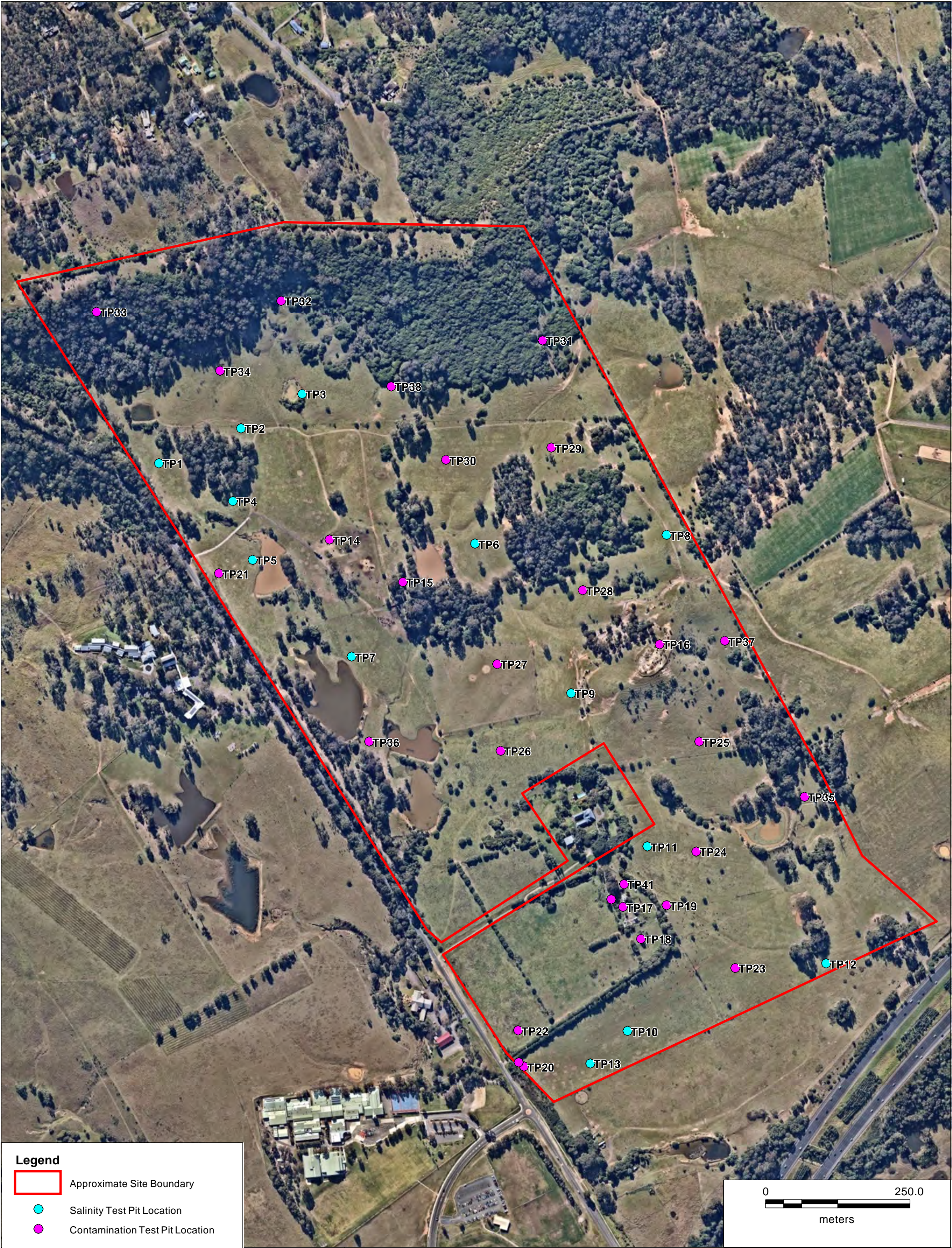
CLIENT: Catholic Metropolitan Cemeteries Trust



PROJECT No: 92237.00

DRAWING No: 8

REVISION: A





 <b>Douglas Partners</b> <i>Geotechnics   Environment   Groundwater</i>		TITLE: <b>Test Pit Locations</b> <b>Detailed Site Investigation</b> <b>167 to 177 St Andrews Rd, Varoville, NSW</b>			 MGA	OFFICE: Macarthur
CLIENT: Catholic Metropolitan Cemeteries Trust		PROJECT No: 92237.00	DRAWING No: 9	REVISION: A		DRAWN BY: CLN
						DATE: 25.08.2017
						SCALE: As shown



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## **Appendix B**

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Proposed Development Plan



# Macarthur Memorial Park Masterplan

ST ANDREWS ROAD, VARROVILLE





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## **Appendix C**

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### Section 149 Certificate



**Issue Date:** 28 July 2017  
**Application Number:** 201703111  
**Receipt Number:** 3701856

Douglas Partners  
18 Waler Crescent  
SMEATON GRANGE NSW 2567

Your Reference:

## **PLANNING CERTIFICATE UNDER SECTION 149 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979**

Section 149 Planning Certificate phone enquiries: (02) 4645 4560.

**Property Address:** 166 St Andrews Road  
VARROVILLE NSW 2566

**Property Description:** Lot 1 DP 218016

As at the date of issue, the following matters apply to the land subject of this certificate:

### **INFORMATION PROVIDED UNDER SECTION 149(2) OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979 (the Act)**

#### **PART 1 – Names of relevant planning instruments and DCPs**

**Planning Instrument:** Campbelltown LEP 2015

**Effect:** E3 Environmental Management

- (1) The following environmental planning instruments apply to the carrying out of development on the land subject of this certificate:

#### **Local environmental plans (LEPs) and deemed environmental planning instruments**

Campbelltown LEP 2015

For further information about these local environmental plans and deemed environmental planning instruments, contact Council's Environmental Planning Section on (02) 4645 4601.

#### **State environmental planning policies (SEPPs)**

SEPP No.21 – Caravan Parks

SEPP No.30 – Intensive Agriculture

SEPP No.33 – Hazardous and Offensive Development

SEPP No.44 – Koala Habitat Protection

SEPP No.50 – Canal Estate Development  
SEPP No.55 – Remediation of Land  
SEPP No.64 – Advertising and Signage  
SEPP No.65 – Design Quality of Residential Apartment Development  
SEPP No.70 – Affordable Housing (Revised Schemes)  
SEPP No.19 - Bushland in Urban Areas  
SEPP (Building Sustainability Index: BASIX) 2004  
SEPP (State Significant Precincts) 2005  
SEPP (Mining, Petroleum Production and Extractive Industries) 2007  
SEPP (Miscellaneous Consent Provisions) 2007  
SEPP (Infrastructure) 2007  
SEPP (Exempt and Complying Development Codes) 2008  
SEPP (Affordable Rental Housing) 2009  
SEPP (State and Regional Development) 2011  
Greater Metropolitan REP No.2 - Georges River Catchment

For further information about these State environmental planning policies, contact the Department of Planning and Environment ([www.planning.nsw.gov.au](http://www.planning.nsw.gov.au)).

- (2) The following proposed environmental planning instruments, which are or have been the subject of community consultation or on public exhibition under the Act (unless the Director-General has notified Council that the making of the proposed instrument has been deferred indefinitely or has not been approved), will apply to the carrying out of development on the land subject of this certificate:

**Draft local environmental plans (LEPs)**

None

For further information about these draft local environmental plans, contact Council's Environmental Planning Section on (02) 4645 4601.

**Draft State environmental planning policies (SEPPs)**

None

For further information about these draft State environmental planning policies, contact the Department of Planning and Environment ([www.planning.nsw.gov.au](http://www.planning.nsw.gov.au)).

- (3) The following development control plans (DCPs) apply to the carrying out of development on the land subject of this certificate:

Campbelltown (Sustainable City) DCP 2015

**PLANNING CERTIFICATE UNDER SECTION 149  
ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979**

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For further information about these development control plans, contact Council's Environmental Planning Section on (02) 4645 4601. Please note that the names of any draft development control plans that apply to the land subject of this certificate, that have been placed on exhibiton by Council but have not yet come into effect, are provided as advice under section 149(5) of the Act.

**PART 2 – Zoning and land use under relevant LEPs**

- a) The following zone(s) apply to the land subject of this certificate:

E3 Environmental Management

- b) The purposes for which the plan or instrument provides that development may be carried out without the need for development consent are detailed in the land use table for each zone. Reference should be made to either Attachment 1 to this certificate or the appropriate section of the attached copy of the plan or instrument.

In addition, SEPP (Exempt and Complying Development Codes) 2008 and clause 3.1 of the Campbelltown LEP 2015 allow certain types of development to be carried out as exempt development within the Campbelltown City local government area.

- c) The purposes for which the plan or instrument provides that development may not be carried out except with development consent are detailed in the land use table for each zone. Reference should be made to either Attachment 1 to this certificate or the appropriate section of the attached copy of the plan or instrument.

In addition, SEPP (Exempt and Complying Development Codes) 2008 and clause 3.2 of the Campbelltown LEP 2015 allow certain types of development to be carried out as complying development within the Campbelltown City local government area after a complying development certificate has been obtained from Council or from an accredited certifier. Clause 2.5 of the Campbelltown LEP 2015 also allows for additional permitted uses with development consent on particular land.

- d) The purposes for which the plan or instrument provides that development is prohibited are detailed in the land use table for each zone. Reference should be made to either Attachment 1 to this certificate or the appropriate section of the attached copy of the plan or instrument.
- e) Any development standards applying to the land subject of this certificate that fix minimum land dimensions for the erection of a dwelling-house and, if so, the minimum land dimensions so fixed are detailed in the relevant section of the plan or instrument. Reference should be made to either Attachment 2 to this certificate or the appropriate section(s) of the attached copy of the plan or instrument. In addition, certain Council development control plans may impose minimum development standards for the creation of allotments and/or minimum site area and dimensions for the erection of a dwelling-house.

For further information about items a), b), c), d) and e) above, contact Council's Environmental Planning Section on (02) 4645 4601.

- f) The land subject of this certificate does not include or comprise critical habitat.
- g) The land subject of this certificate is not in a conservation area (however described).



- h) An item of environmental heritage (however described) is situated on the land subject of this certificate.

**PART 2A – Zoning and land use under State Environmental Planning Policy (Sydney Region Growth Centres) 2006**

None

**PART 3 – Complying development**

- (1) Complying development may be carried out on the land subject of this certificate under each of the following codes for complying development, to the extent shown, because of the provisions of clauses 1.17A(1)(c) to (e), (2), (3) and (4), 1.18(1)(c3) and 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008:

None

Please note that reference should also be made to the relevant parts of this policy for the general requirements for complying development and to the relevant codes for complying development which may also include provisions relating to zoning, lot size etc.

- (2) Complying development may not be carried out on the land subject of this certificate under each of the following codes for complying development, to the extent shown and for the reason(s) stated, because of the provisions of clauses 1.17A(1)(c) to (e), (2), (3) and (4), 1.18(1)(c3) and 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008:

Housing Code – on any part of the land

Housing Alterations Code – on any part of the land

Commercial and Industrial Alterations Code – on any part of the land

Subdivisions Code – on any part of the land

Rural Housing Code – on any part of the land

General Development Code – on any part of the land

Demolition Code – on any part of the land

Commercial and Industrial (New Buildings and Additions) Code – on any part of the land

Fire Safety Code – on any part of the land

Because all of the land comprises, or has located on it, an item of environmental heritage or a heritage item identified by an environmental planning instrument (unless the development meets the requirements and standards specified by SEPP (Exempt and Complying Development Codes) 2008 and that development has been granted an exemption under section 57(2) of the Heritage Act 1977, or is subject to an exemption under section 57(1A) or (3) of that Act).

**PART 4 – Coastal protection**

The land subject of this certificate is not affected by the operation of section 38 or 39 of the Coastal Protection Act 1979, but only to the extent that Council has been notified by the Department of Finance, Services and Innovation.

Please note that Campbelltown City Council is not defined as a coastal council under the Coastal Protection Act 1979.

**PART 5 – Mine subsidence**

The land subject of this certificate is not within a proclaimed Mine Subsidence District within the meaning of section 15 of the Mine Subsidence Compensation Act 1961.

**PART 6 – Road widening and road realignment**

The land subject of this certificate is not affected by any road widening or road realignment under Division 2 of Part 3 of the Roads Act 1993, any environmental planning instrument or any resolution of Council.

**PART 7 – Council and other public authority policies on hazard risk restrictions**

- a) Council has adopted a policy with respect to all land within the Campbelltown City local government area with unusual site conditions. This policy restricts the development of land where extensive earthworks and/or filling has been carried out. Land, the development of which is restricted by this policy, has a restriction as to user placed on the title of the land stating the details of any restriction. Building lots can be affected by excessive land gradient, filling, reactive or dispersive soils, overland flow and/or mine subsidence. Buildings, structures or site works may require specific structural design to ensure proper building construction. Consequently, some applications may require the submission of structural design details and geotechnical reports. It is suggested that prior to lodging an application, enquiries be made to Council's Planning and Environment Division to ascertain any specific requirements.
- b) Council has adopted by resolution the certified Campbelltown LGA Bush Fire Prone Land Map. This map identifies bush fire prone land within the Campbelltown City local government area as defined in section 4(1) of the Act. Where the land subject of this certificate is identified as bush fire prone land, the document entitled "Planning for Bush Fire Protection" prepared by the NSW Rural Fire Service in co-operation with the Department of Planning and dated December 2006 should be consulted with regards to possible restrictions on the development of the land because of the likelihood of bushfire.
- c) The land subject of this certificate is not affected by a policy adopted by Council or adopted by any other public authority and notified to Council for reference in a planning certificate that restricts the development of the land because of the likelihood of tidal inundation.
- d) The land subject of this certificate is not affected by a policy adopted by Council or adopted by any other public authority and notified to Council for reference in a planning certificate that restricts the development of the land because of the likelihood of acid sulphate soils.
- e) Council has adopted by resolution a policy on contaminated land which may restrict the development of the land subject of this certificate. This policy is implemented when zoning or



land use changes are proposed on lands which have previously been used for certain purposes. Council records do not have sufficient information about previous use of this land to determine whether the land is contaminated. Consideration of Council's adopted policy and the application of provisions under relevant State legislation is warranted.

**PART 7A – Flood related development controls information**

- (1) Development on all or part of the land subject of this certificate for the purposes of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (not including development for the purposes of group homes or seniors housing) is subject to flood related controls.
- (2) Development on all or part of the land subject of this certificate for any other purpose is subject to flood related development controls.
- (3) Words and expressions in this clause have the same meanings as in the instrument set out in the Schedule to the Standard Instrument (Local Environmental Plans) Order 2006.

Please note that some additional information regarding flooding and flood related development controls may be provided as advice under section 149(5) of the Act.

**PART 8 – Land reserved for acquisition**

No environmental planning instrument, deemed environmental planning instrument or draft environmental planning instrument applying to the land subject of this certificate provides for the acquisition of this land by a public authority, as referred to in section 27 of the Act.

**PART 9 – Contribution plans**

The following contribution plan(s) apply to the land subject of this certificate:

Campbelltown City Council Section 94A Development Contributions Plan

For further information about these contribution plans, contact Council's Environmental Planning Section on (02) 4645 4601.

**PART 9A – Biodiversity certified land**

The land subject of this certificate is not biodiversity certified land (within the meaning of Part 7AA of the Threatened Species Conservation Act 1995).

**PART 10 – Biobanking agreement**

The land subject of this certificate is not land to which a biobanking agreement under Part 7A of the Threatened Species Conservation Act 1995 relates (but only in so far as Council has been notified of the existence of any such agreement by the Director-General of the Department of Environment, Climate Change and Water).

**PART 11 – Bush fire prone land**

All of the land subject of this certificate has been identified as bush fire prone land on the Campbelltown City Council - Bush Fire Prone Land Map that has been certified for the purposes of section 146(2) of the Act.

Please note that in accordance with section 66 of the Rural Fires Act 1997 and relevant regulations, a Bush Fire Hazard Reduction Notice may have been issued on this land. It is recommended that advice be obtained from the Macarthur Zone Rural Fire Service.

**PART 12 – Property vegetation plans**

No property vegetation plan applies to the land subject of this certificate.

Please note that the whole of the Campbelltown City local government area is excluded from the operation of the Native Vegetation Act 2003.

**PART 13 – Orders under Trees (Disputes Between Neighbours) Act 2006**

No order has been made under the Trees (Disputes Between Neighbours) Act 2006 to carry out work in relation to a tree on the land subject of this certificate (but only to the extent that Council has been notified of any such orders).

**PART 14 – Directions under Part 3A**

No direction, in force under section 75P(2)(c1) of the Act, that a provision of an environmental planning instrument prohibiting or restricting the carrying out of a project or a stage of a project on the land subject of this certificate under Part 4 of the Act does not have effect, has been issued by the Minister.

**PART 15 – Site compatibility certificates and conditions for seniors housing**

- a) No current site compatibility certificate (seniors housing), of which Council is aware, exists in respect of proposed development on the land subject of this certificate.
- b) No conditions of consent to a development application, granted after 11 October 2007, of the kind referred to in clause 18(2) of State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 have been imposed in respect of proposed development on the land subject of this certificate.

**PART 16 – Site compatibility certificates for infrastructure**

No valid site compatibility certificate (infrastructure), of which Council is aware, exists in respect of proposed development on the land subject of this certificate.

**PART 17 – Site compatibility certificates and conditions for affordable rental housing**

- (1) No current site compatibility certificate (affordable rental housing), of which Council is aware, exists in respect of proposed development on the land subject of this certificate.

- (2) No conditions of consent to a development application of the kind referred to in clause 17(1) or 37(1) of State Environmental Planning Policy (Affordable Rental Housing) 2009 have been imposed in respect of proposed development on the land subject of this certificate.

**PART 18 – Paper subdivision information**

- (1) No adopted development plan or development plan that is proposed to be subject to a consent ballot apply to the land subject of this certificate.
- (2) No subdivision order applies to the land subject of this certificate.

**PART 19 – Site verification certificates**

No current site verification certificate issued under Division 3 of Part 4AA of State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007 (of which Council is aware) applies to the land subject of this certificate.

**PART 20 – Loose-fill asbestos insulation**

No residential dwelling erected on the land subject of this certificate has been identified in the Loose-Fill Asbestos Insulation Register as containing loose-fill asbestos ceiling insulation.

For more information contact NSW Fair Trading ([www.fairtrading.nsw.gov.au](http://www.fairtrading.nsw.gov.au))

**Matters prescribed by section 59(2) of the Contaminated Land Management Act 1997**

- (a) The land subject of this certificate is not significantly contaminated land within the meaning of the Contaminated Land Management Act 1997.
- (b) The land subject of this certificate is not subject to a management order within the meaning of the Contaminated Land Management Act 1997.
- (c) The land subject of this certificate is not the subject of an approved voluntary management proposal within the meaning of the Contaminated Land Management Act 1997.
- (d) The land subject of this certificate is not subject to an ongoing maintenance order within the meaning of the Contaminated Land Management Act 1997.
- (e) The land subject of this certificate is not the subject of a site audit statement within the meaning of the Contaminated Land Management Act 1997 provided to Council.

**INFORMATION PROVIDED UNDER SECTION 149(5) OF THE ENVIRONMENTAL  
PLANNING AND ASSESSMENT ACT 1979**

All properties within the Campbelltown City local government area may be affected by flooding caused by overland flow or local topography. Applicants will need to make their own assessment of the risk associated with these matters. For more information, please complete



**PLANNING CERTIFICATE UNDER SECTION 149  
ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979**

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a Stormwater Advice Request Form that is available on Council's website or by contacting Council on 4645 4000.

Council has completed a flood study of the Bow Bowling / Bunbury Curran Creek Catchment, of which this property is a part. The results of this study have improved Council's understanding of flood behaviour in the catchment. The next stage is preparation of a Floodplain Risk Management Study and Plan which are anticipated to be finalised by the end of 2018.

Council has received a copy of the map "Salinity Potential in Western Sydney - 2002" from the Department of Infrastructure, Planning and Natural Resources (DIPNR). This map classifies the land within the Campbelltown City local government area as having either known salinity, high salinity potential, moderate salinity potential or low salinity potential. Salinity issues may be of relevance to any development of the land subject of this certificate. For further information, contact the Department of Infrastructure, Planning and Natural Resources ([www.dipnr.nsw.gov.au](http://www.dipnr.nsw.gov.au)).

It should be noted that the Commonwealth Department of Infrastructure and Regional Development has released a document titled "Preliminary Flight Paths" purporting to provide preliminary information on jet aircraft flight paths and flight zones for each of the design options for the Second Sydney Airport Proposals. Some of the flight paths and flight zones shown in this document may, if implemented, impact upon the environment in the vicinity of the land subject of this certificate. Further enquiries in respect of this document should be directed initially to the Commonwealth Department of Infrastructure and Regional Development.

The land subject of this certificate does not have a boundary to a controlled access road.

The Local Government (General) Regulation, 2005 requires all owners of property that contain a wastewater management system (for example a septic tank system, aerated wastewater treatment system or similar wastewater treatment device) to have a current "Approval to Operate a Wastewater Management System".

In particular, new purchasers of properties should be aware of the following:

1. It is the responsibility of new property owners to apply to Council for a new Approval to Operate.
2. An existing Approval to Operate becomes void upon a change of property ownership. A new owner may operate a wastewater management system for up to three (3) months without obtaining a new approval.

New property owners should make their own enquiries to ensure any wastewater management system is performing satisfactorily and in accordance with legislative requirements. For further information please contact Council's Compliance Services Section on (02) 4645 4604.



The following draft development control plans (DCPs), that have been placed on exhibition by Council but which have not yet come into effect, apply to the land subject of this certificate:

None

**PLANNING CERTIFICATE UNDER SECTION 149  
ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979**

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For further information about these draft development control plans, contact Council's Environmental Planning Section on (02) 4645 4601.

  
Jim Baldwin, per   
**Director City Development**

## Attachment 1

### Campbelltown Local Environmental Plan 2015

#### Zone E3 Environmental Management

##### 1 Objectives of zone

- To protect, manage and restore areas with special ecological, scientific, cultural or aesthetic values.
- To provide for a limited range of development that does not have an adverse effect on those values.
- To enable development for purposes other than rural-residential only if that development is compatible and complementary, in terms of design, size and scale, with the character of land in the zone.
- To allow cellar door premises, restaurants and cafes only where they are directly associated with the agricultural use of the land.
- To protect, and maintain the environmental, ecological and visual amenity of, the Scenic Hills, the Wedderburn Plateau and environmentally sensitive lands in the vicinity of the Georges River from inappropriate development.
- To preserve the rural heritage landscape character of the Scenic Hills.
- To protect and enhance areas of scenic value and the visual amenity of prominent ridgelines.
- To protect bushland, wildlife corridors and natural habitat, including waterways and riparian lands.
- To ensure the preservation and maintenance of environmentally significant and environmentally sensitive land.

##### 2 Permitted without consent

Home occupations

##### 3 Permitted with consent

Animal boarding or training establishments; Bed and breakfast accommodation; Building identification signs; Business identification signs; Cellar door premises; Dual occupancies (attached); Dwelling houses; Educational establishments; Emergency services facilities; Environmental facilities; Environmental protection works; Extensive agriculture; Farm buildings; Farm stay accommodation; Flood mitigation works; Home-based child care; Home businesses; Home industries; Horticulture; Places of public worship; Recreation areas; Restaurants or cafes; Roads; Roadside stalls; Rural workers' dwellings; Viticulture; Water supply systems

**4 Prohibited**

Industries; Multi dwelling housing; Residential flat buildings; Retail premises; Seniors housing; Service stations; Warehouse or distribution centres; Any other development not specified in item 2 or 3

*NOTE: A copy of the complete written instrument for the Campbelltown Local Environmental Plan 2015 is available on the NSW Legislation website at: <http://www.legislation.nsw.gov.au>*

## Attachment 2

### Campbelltown Local Environmental Plan 2015

#### 4.1 Minimum subdivision lot size

- (1) The objectives of this clause are as follows:
  - (a) to ensure that the density of development is compatible with the capacity of existing and proposed infrastructure,
  - (b) to ensure that the density of settlement will be compatible with the objectives of the zone,
  - (c) to limit the density of settlement in environmentally, scenically or historically sensitive areas,
  - (d) to ensure lot sizes are compatible with the conservation of natural systems, including waterways, riparian land and groundwater dependent ecosystems,
  - (e) to facilitate viable agricultural undertakings,
  - (f) to protect the curtilage of heritage items and heritage conservation areas,
  - (g) to facilitate a diversity of housing forms.
- (2) This clause applies to a subdivision of any land shown on the Lot Size Map that requires development consent and that is carried out after the commencement of this Plan.
- (3) The size of any lot resulting from a subdivision of land to which this clause applies is not to be less than the minimum size shown on the Lot Size Map in relation to that land.
- (4) This clause does not apply in relation to the subdivision of individual lots in a strata plan or community title scheme.
- (4A) If a lot is a battle-axe lot or other lot with an access handle, the area of the access handle is not to be included in calculating the lot size.
- (4B) Despite subclause (3), development consent may be granted for the subdivision of land into lots that do not meet the minimum size shown on the Lot Size Map if the lots are residue lots resulting

#### 4.1AA Minimum subdivision lot size for community title schemes

- (1) The objectives of this clause are as follows:
  - (a) to provide for the proper and orderly development of land,
  - (b) to ensure that land developed under the *Community Land Development Act 1989* will achieve densities consistent with the objectives of the zone,
  - (c) to protect the curtilage of heritage items and heritage conservation areas.



- (2) This clause applies to a subdivision (being a subdivision that requires development consent) under the *Community Land Development Act 1989* of land in any of the following zones:
- (a) Zone RU2 Rural Landscape,
  - (b) Zone R2 Low Density Residential,
  - (c) Zone R3 Medium Density Residential,
  - (d) Zone R5 Large Lot Residential,
  - (e) Zone E3 Environmental Management,
  - (f) Zone E4 Environmental Living.
- (3) The size of any lot resulting from a subdivision of land to which this clause applies (other than any lot comprising association property within the meaning of the *Community Land Development Act 1989*) is not to be less than the minimum size shown on the Lot Size Map in relation to that land.

#### **4.1A Maximum dwelling density in certain residential areas**

- (1) The objectives of this clause are as follows:
- (a) to restrict the dwelling yield on certain land,
  - (b) to ensure that infrastructure is not overburdened,
  - (c) to provide for a diversity of dwelling types.
- (2) This clause applies to land identified as "Restricted dwelling yield" on the Restricted Dwelling Yield Map.
- (3) Despite clauses 4.1, 4.1AA, 4.1B and 4.1C, the total number of dwellings that may be created by the development of land specified in Column 1 of the table to this clause must not exceed the number specified in Column 2 of the table.

Column 1	Column 2
"Area 1" on the Restricted Dwelling Yield Map, being land at Airds-Bradbury	2104
"Area 2" on the Restricted Dwelling Yield Map, being land at Claymore	1490
"Area 3" on the Restricted Dwelling Yield Map, being land at the Western Sydney University	850

#### **4.1B Minimum subdivision lot sizes for dual occupancies in certain zones**

- (1) The objectives of this clause are as follows:
- (a) to achieve planned residential density in certain zones,
  - (b) to ensure that lot sizes are consistent with the predominant subdivision pattern of the area and maintain a low density residential character in existing neighbourhoods,
  - (c) to facilitate development applications seeking concurrent approval for dual occupancy development and subdivision,

- (d) to prevent the fragmentation of land.
- (2) Despite clause 4.1, development consent may be granted to development for the purpose of a dual occupancy if the development will be on a lot that is at least the minimum size shown on the Lot Size for Dual Occupancy Development Map in relation to that land.
- (3) Despite clause 4.1 and subclause (2), development consent may be granted for the subdivision of land in Zone R2 Low Density Residential into lots that are less than the minimum lot size shown on the Lot Size Map in relation to that land if:
  - (a) there is an existing dual occupancy on the land that was lawfully erected under an environmental planning instrument or there is a development application for the concurrent approval of a dual occupancy and its subdivision into 2 lots, and
  - (b) the lot size of each resulting lot will be at least 300 square metres, and
  - (c) the subdivision will not result in more than one principal dwelling on each resulting lot.

#### **4.1C Minimum qualifying site area and lot size for certain residential and child care centre development in residential zones**

- (1) The objectives of this clause are as follows:
  - (a) to achieve planned residential densities in certain zones,
  - (b) to achieve satisfactory environmental and infrastructure outcomes,
  - (c) to minimise any adverse impact of development on residential amenity,
  - (d) to minimise land use conflicts.
- (2) Development consent may be granted to development for a purpose specified in the table to this clause on land in a zone listed beside the purpose, if the area of the lot is equal to or greater than the area specified in Column 3 of the table.
- (3) Development consent may be granted to the subdivision of land in a zone that is specified in the table to this clause for a purpose listed beside the zone, if the area of the lot to be created is equal to or greater than the area specified in Column 4 of the table.

Column 1	Column 2	Column 3	Column 4
Dwelling house	Zone R2 Low Density Residential	500 square metres	500 square metres
Dual occupancy	Zone R2 Low Density Residential	700 square metres	300 square metres
Semi-detached dwelling	Zone R2 Low Density Residential	700 square metres	300 square metres
Attached dwelling	Zone R2 Low	1,000 square metres	300 square metres

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	Density Residential		
Multi dwelling housing	Zone R2 Low Density Residential	1,000 square metres	300 square metres
Child care centres	Zone R2 Low Density Residential or Zone R3 Medium Density Residential	800 square metres	N/A
Residential flat buildings	Zone R4 High Density Residential	1,200 square metres	1,200 square metres

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#### **4.1D Minimum lot sizes for certain land uses in certain environment protection zones**

- (1) The objectives of this clause are as follows:
  - (a) to allow for certain non-residential land uses,
  - (b) to minimise any adverse impact on local amenity and the natural environment,
  - (c) to achieve satisfactory environmental and infrastructure outcomes,
  - (d) to minimise land use conflicts.
- (2) This clause applies to land in the following zones:
  - (a) Zone E3 Environmental Management,
  - (b) Zone E4 Environmental Living.
- (3) Development consent may be granted to development for a purpose specified in the table to this clause on land in a zone listed beside the purpose, if the area of the lot is equal to or greater than the area specified in the table.

Column 1	Column 2	Column 3
Animal boarding or training establishments	Zone E3 Environmental Management	5 hectares
Educational establishments	Zone E3 Environmental Management or Zone E4 Environmental Living	10 hectares
Places of public worship	Zone E3 Environmental Management	10 hectares

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#### **4.2 Rural subdivision**

- (1) The objective of this clause is to provide flexibility in the application of standards for subdivision in rural zones to allow land owners a greater chance to achieve the objectives for development in the relevant zone.
- (2) This clause applies to the following rural zones:
  - (a) Zone RU1 Primary Production,
  - (b) Zone RU2 Rural Landscape,

(c) Zone RU4 Primary Production Small Lots,

(d) Zone RU6 Transition.

**Note.** When this Plan was made it did not include all of these zones.

(3) Land in a zone to which this clause applies may, with development consent, be subdivided for the purpose of primary production to create a lot of a size that is less than the minimum size shown on the Lot Size Map in relation to that land.

(4) However, such a lot cannot be created if an existing dwelling would, as the result of the subdivision, be situated on the lot.

(5) A dwelling cannot be erected on such a lot.

**Note.** A dwelling includes a rural worker's dwelling (see definition of that term in the Dictionary).

#### **4.2A Erection of dwelling houses or dual occupancies (attached) on land in certain rural and environment protection zones**

(1) The objectives of this clause are as follows:

(a) to enable the replacement of lawfully erected dwelling houses and dual occupancies (attached), and the realisation of dwelling entitlements in rural and environment protection zones,

(b) to restrict the extent of residential development in rural and environment protection zones to maintain the existing character,

(c) to recognise the contribution that development density in these zones makes to the landscape and environmental character of those places.

(2) This clause applies to land in the following zones:

(a) Zone RU2 Rural Landscape,

(b) Zone E3 Environmental Management,

(c) Zone E4 Environmental Living.

(3) Development consent must not be granted for the erection of a dwelling house or a dual occupancy (attached) on land to which this clause applies unless the land:

(a) is a lot that has at least the minimum lot size shown on the Lot Size Map in relation to that land, or

(b) is a lot created under this Plan (other than clause 4.2 (3)), or

(c) is a lot created under an environmental planning instrument before this Plan commenced and on which the erection of a dwelling house or a dual occupancy (attached) was permissible immediately before that commencement, or

(d) is a lot resulting from a subdivision for which development consent (or its equivalent) was granted before this Plan commenced and on which the erection of a dwelling house or a dual occupancy (attached) would have been permissible if the

plan of subdivision had been registered before that commencement, or

- (e) is an existing holding, or
- (f) would have been a lot or holding referred to in paragraph (a), (b), (c), (d) or (e) had it not been affected by:
  - (i) a minor realignment of its boundaries that did not create an additional lot, or
  - (ii) a subdivision creating or widening a public road or public reserve or for another public purpose, or
  - (iii) a consolidation with an adjoining public road or public reserve or for another public purpose.

**Note.** A dwelling cannot be erected on a lot created under clause 9 of *State Environmental Planning Policy (Rural Lands) 2008* or clause 4.2.

- (4) Development consent must not be granted under subclause (3) unless:
  - (a) no dwelling house or dual occupancy (attached) has been erected on the land, and
  - (b) if a development application has been made for development for the purposes of a dwelling house or dual occupancy (attached) on the land—the application has been refused or it was withdrawn before it was determined, and
  - (c) if development consent has been granted in relation to such an application—the consent has been surrendered or it has lapsed.
- (5) Development consent may be granted for the erection of a dwelling house or a dual occupancy (attached) on land to which this clause applies if there is a lawfully erected dwelling house or dual occupancy (attached) on the land and the dwelling house or dual occupancy (attached) proposed to be erected is intended only to replace the existing dwelling house or dual occupancy (attached).
- (6) Development consent may be granted to convert a dwelling house into, or to replace a dwelling house with, a dual occupancy (attached) on land to which this clause applies if no dual occupancy (attached) exists on the land and the dual occupancy (attached) is designed and will be constructed to have the appearance of a single dwelling.
- (7) In this clause:

**existing holding** means land that:

- (a) was a holding on the relevant date, and
- (b) is a holding at the time the application for development consent referred to in subclause (3) is lodged,

whether or not there has been a change in the ownership of the holding since the relevant date, and includes any other land adjoining that land acquired by the owner since the relevant date.

**holding** means all adjoining land, even if separated by a road or railway, held by the same person or persons.

**relevant date** means:



- (a) in the case of land to which *Campbelltown (Urban Area) Local Environmental Plan 2002* applied immediately before the commencement of this Plan:
  - (i) for land identified as “25 February 1977” on the Former LEP and IDO Boundaries Map—25 February 1977, or
  - (ii) for land identified as “15 July 1977” on the Former LEP and IDO Boundaries Map—15 July 1977, or
  - (iii) for land identified as “3 November 1978” on the Former LEP and IDO Boundaries Map—3 November 1978, or
- (b) in the case of land to which *Campbelltown Local Environmental Plan—District 8 (Central Hills Lands)* applied immediately before the commencement of this Plan—20 September 1974, or
- (c) in the case of land to which *Campbelltown Local Environmental Plan No 1* applied immediately before the commencement of this Plan—26 June 1981, or
- (d) in the case of land to which *Interim Development Order No 13—City of Campbelltown* applied immediately before the commencement of this Plan—20 September 1974, or
- (e) in the case of land to which *Interim Development Order No 15—City of Campbelltown* applied immediately before the commencement of this Plan—27 September 1974, or
- (f) in the case of land to which *Interim Development Order No 28—City of Campbelltown* applied immediately before the commencement of this Plan—3 November 1978.

**Note.** The owner in whose ownership all the land is at the time the application is lodged need not be the same person as the owner in whose ownership all the land was on the stated date.

#### **4.2B Erection of rural workers’ dwellings on land in Zones RU2 and E3**

- (1) The objectives of this clause are as follows:
  - (a) to facilitate, on the same land, the provision of adequate accommodation for employees involved in existing agricultural activities, including agricultural produce industries,
  - (b) to maintain the non-urban landscape and development characters of certain rural and environment protection zones.
- (2) This clause applies to land in the following zones:
  - (a) Zone RU2 Rural Landscape,
  - (b) Zone E3 Environmental Management.
- (3) Development consent must not be granted for the erection of a rural worker’s dwelling on land to which this clause applies unless the consent authority is satisfied that:
  - (a) the development will be on the same lot as an existing lawfully erected dwelling house or dual occupancy (attached), and

- (b) the development will not impair the use of the land for agricultural activities, including agricultural produce industries, and
- (c) the agricultural activity or agricultural produce industry has an economic capacity to support the ongoing employment of rural workers, and
- (d) the development is necessary considering the nature of the existing or proposed agricultural activity or agricultural produce industry occurring on the land or as a result of the remote or isolated location of the land, and
- (e) there will be not more than one rural worker's dwelling on the lot, and
- (f) the development will be a single storey building with a maximum floor area of 120 square metres or not more than 20% of the floor area of any existing dwelling house on that land, whichever is greater.

#### **4.2C Exceptions to minimum subdivision lot sizes for certain land in Zones RU2 and E3**

- (1) The objective of this clause is to allow the owners of certain land to which the following environmental planning instruments applied to excise a home-site area from an existing lot (or existing holding) by the means of a subdivision:
  - (a) *Campbelltown Local Environmental Plan No 1*,
  - (b) *Interim Development Order No 15—City of Campbelltown*.
- (2) Subclause (3) applies to each lot to which *Campbelltown Local Environmental Plan No 1* applied immediately before its repeal that:
  - (a) was in existence on 26 June 1981, and
  - (b) is in Zone E3 Environmental Management, and
  - (c) has an area of at least 10 hectares.
- (3) Development consent must not be granted to the subdivision of the land to which this subclause applies unless the proposed subdivision will result in the creation of only 2 lots, each of which must have an area of at least 2 hectares.
- (4) Subclause (5) applies to each lot to which *Interim Development Order No 15—City of Campbelltown* applied immediately before its repeal that:
  - (a) was in existence on 18 July 1973, and
  - (b) is in Zone RU2 Rural Landscape.
- (5) Development consent must not be granted to the subdivision of the land to which this subclause applies unless the smallest lot to be created has an area of at least 2 hectares and is required for the erection of a dwelling house for occupation by:
  - (a) the person who owned the land on 18 July 1973, or
  - (b) a relative of that owner, or

- (c) a person employed or engaged by that owner in the use of land of the owner adjoining or adjacent to that lot for the purpose of agriculture.
- (6) The total number of lots that may be created by the subdivision of land to which subclause (5) applies, whether by one or more subdivisions, must not exceed:
  - (a) if the land to be subdivided had an area of less than 10 hectares—nil, or
  - (b) if the land to be subdivided had an area of at least 10 hectares but less than 40 hectares—1, or
  - (c) if the land to be subdivided had an area of at least 40 hectares but less than 80 hectares—2, or
  - (d) if the land to be subdivided had an area of at least 80 hectares—3.

#### **4.2D Exceptions to minimum subdivision lot sizes for certain land in Zone E4**

- (1) The objective of this clause is to permit the subdivision of certain land in the East Edge Scenic Protection Lands Area to create lots of a size that are less than the minimum lot size shown on the Lot Size Map in relation to that land.
- (2) This clause applies to land identified as “1 ha” on the Lot Averaging Map.
- (3) Despite clause 4.1, development consent may be granted to the subdivision of land to which this clause applies if the subdivision will not create a number of lots that is more than the number resulting from multiplying the total area of the land being subdivided by the maximum density control number specified on the Lot Averaging Map in relation to that land.
- (4) Development consent must not be granted under this clause unless the consent authority is satisfied that:
  - (a) the pattern of lots created by the subdivision, the provision of access and services and the location of any future buildings on the land will not have a significant detrimental impact on native vegetation, and
  - (b) each lot to be created by the subdivision contains a suitable land area for:
    - (i) a dwelling house, and
    - (ii) an appropriate asset protection zone relating to bush fire hazard, and
    - (iii) if reticulated sewerage is not available to the lot—on-site sewage treatment, management and disposal, and
    - (iv) other services related to the use of the land for residential occupation, and
  - (c) if reticulated sewerage is not available to the lot—a geotechnical assessment demonstrates to the consent

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authority's satisfaction that the lot can suitably accommodate the on-site treatment, management and disposal of effluent, and

- (d) adequate arrangements are in place for the provision of infrastructure to service the needs of development in the locality.

***NOTE:** A copy of the complete written instrument for the Campbelltown Local Environmental Plan 2015 is available on the NSW Legislation website at: <http://www.legislation.nsw.gov.au>*

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## **Appendix D**

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Site Photographs





Photograph 1 - Access road to and around former vineyard.



Photograph 2 - Dam bank and loose pipe from pump system


 <b>Douglas Partners</b> Geotechnics   Environment   Groundwater	Site Photographs DSI 167-170 St Andrews, Varroville, NSW CLIENT: Calothic Metropolitan Cemeteries Trust	PROJECT: 92237.00
		PLATE No: 1
		REV: A
		DATE: 26.07.17



Photo 3 - Former homestead



Photo 4 - Suspected ACM eaves visible in former homestead structure





Photo 5 - Fragments of bonded ACM visible at TP39

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## Appendix E

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QAQC

## Appendix E - DATA QUALITY ASSESSMENT

### Q1. Data Quality Indicators

The reliability of field procedures and analytical results were assessed against the following data quality indicators (DQIs):

- Completeness – a measure of the amount of usable data from a data collection activity;
- Comparability – the confidence (qualitative) that data may be considered to be equivalent for each sampling and analytical event;
- Representativeness – the confidence (qualitative) of data representativeness of media present on-site;
- Precision – a measure of variability or reproducibility of data; and
- Accuracy – a measure of closeness of the data to the ‘true’ value.

The DQIs were assessed as outlined in the following table.

DQI	Considerations with reference to NEPC (2013) Schedule B2	Comment
<b>Completeness</b>		
Field Considerations	Critical locations sampled	Samples were collected from target areas identified during the site inspection and from the CSM, and from grid based sampling locations for site coverage (background areas).
	Samples collected (from grid and at depth)	A total of 41 test pits were excavated across the 113 ha site; potentially impacted media (topsoil, fill) were sampled in background areas and targeted areas.
	Standard operating procedures (SOPs) appropriate and complied with	Field staff followed SOPs, as discussed further in Report Section 7
	Experienced sampler	Experienced DP environmental scientists led the field team and were given guidance from the project manager.
	Documentation correct	The DP environmental scientist completed a safe work method statement (SWMS), chain of custody, and test pit logs. The project manager reviewed the documentation.
Laboratory Considerations	Critical samples analysed according to the proposal	The DP Proposal MAC170219 dated 5 July 2017 (the proposal) was followed in the selection of samples for analysis. Samples of media initially considered to be potentially impacted by COPC were analysed. Any variation to the proposal was recorded in the report.
	Analytes analysed	The analytes were selected on the basis of the COPC



<b>DQI</b>	<b>Considerations with reference to NEPC (2013) Schedule B2</b>	<b>Comment</b>
	according to the proposal	as outlined in the proposal, and the CSM. Any variation has been recorded in the report.
	Appropriate methods and PQLs/LOR	NATA approved methods were adopted by the selected analytical laboratory. Any non-NATA methods are detailed in Section Q3.4. Limits of reporting (LORs) and practical quantitation limits (PQLs) in accordance with the method have been used by the contract laboratory.
	Sample documentation complete	Chain-of-custody (CoC) maintained and appended to the Certificates of Analysis. Certificates of Analysis complete and appended to the report.
	Sample holding times complied with	All samples were analysed within the holding times, as discussed in Section Q3.3.
<b>Comparability</b>		
Field Considerations	Same SOPs used on each occasion	Field staff followed the same SOPs for each day of sampling as defined in the proposal.
	Same types of samples collected	At all test pit locations, soil samples were collected from the test pit wall. At hand-augured locations, samples were collected from soils that were not in contact with the auger head.  Samples were placed in laboratory supplied jars.
Laboratory Considerations	Sample analytical methods used	The laboratory used is accredited by NATA for the analyses undertaken. Laboratory analytical methods were the same for each sample, for the same analyte, in the same laboratory, and are as stated on the Certificates of Analysis.
	Sample PQLs / LORs	PQL or LOR set by the laboratory are generally below the adopted SAC.
	Same laboratories	EnviroLab Services Pty Ltd (ELS) was used for sample analysis.  The reliability of the data provided by the laboratory is discussed in Section Q3.
	Same units	Laboratory results are expressed in consistent units for each media / analyte.
<b>Representativeness</b>		
Field Considerations	Appropriate media sampled according to the proposal	Appropriate media were sampled with reference to the proposal and the CSM. This included media considered to be potentially impacted by the COPC such as topsoil and fill.
	Media identified in the proposal sampled	Media identified as requiring investigation in the proposal were sampled.
Laboratory Considerations	Samples analysed according to the proposal	Samples were analysed according to the proposal, and as stipulated in the COC.

<b>DQI</b>	<b>Considerations with reference to NEPC (2013) Schedule B2</b>	<b>Comment</b>
<b>Precision</b>		
Field Considerations	SOPs appropriate and complied with	Field staff followed SOPs as defined in the proposal. SOPs specific for contamination investigation purposes.
Laboratory Considerations	Analysis of laboratory duplicates	Refer to Section Q3.5. The majority of duplicate results were within the laboratory acceptance standards. The relevance of those outside the standards are discussed in the same section.
	Field duplicates	Two field samples were sub-sampled for QAQC purposes. Analysis is pending.
<b>Accuracy (bias)</b>		
Field Considerations	SOPs appropriate and complied with	Field staff followed SOPs as defined in the proposal. SOPs specific for contamination investigation purposes.
	Analysis of reagent blanks	Refer to Section Q3.6. The reagent blank samples were generally within laboratory acceptance standards. The implications of those outside the standards are discussed in Section Q3.10.
	Analysis of matrix spikes	Refer to Section Q3.7. The matrix spike samples were generally within laboratory acceptance standards. The implications of those outside the standards are discussed in Section Q3.10.
	Analysis of surrogate spikes	Refer to Section Q3.8. The surrogate spike samples were generally within laboratory acceptance standards. The implications of those outside the standards are discussed in Section Q3.10.
	Analysis of laboratory control samples	Refer to Section Q3.9. The LCS were generally within laboratory acceptance standards. The implications of those outside the standards are discussed in Section Q3.10.

## Q2. FIELD QUALITY ASSURANCE AND QUALITY CONTROL

The field QC procedures for sampling as prescribed in the DP *Field Procedures Manual* were followed at all times during the investigation.

### Q2.1 Sampling Team and Weather Conditions

Field sampling was undertaken by a DP Environmental Scientist. Fieldwork was undertaken on 4, 7 and 8 August 2017. The DP environmental scientist was instructed by the Project Manager regarding the sampling methods to be adopted. The same approach to the sampling was applied by each team member, minimising the potential for field sampling related variations in test outcomes.

Climatic or weather conditions are not considered to have impeded or significantly impacted the investigation.

### Q2.2 Sample Collection

#### Soil

At test pit locations, samples were collected from the test pit walls, at regular intervals or where a change in soil stratification was observed. Further details of the excavation and sampling methodology are presented in Report Section 7.

At certain locations, samples were collected using a hand-auger. Samples were collected from soils that were not in contact with the auger head.

The QA / QC samples collected during the course of soil sampling comprised the following:

- 2 intra-laboratory replicates

### Q2.3 Logs and Field Sheets

Logs for each soil sampling location were recorded in the field. The individual samples were recorded on the field logs along with the sample identity, depth, replicate sample locations, and observations. Logs are presented in Appendix G.

### Q2.4 Chain of Custody

Chain of custody information was recorded on the Chain-of-Custody (COC) sheets which accompanied samples to the analytical laboratory. Signed copies of COCs are presented in Appendix H.

The COC documented, *inter alia*, the analytical laboratory, dispatch courier, DP dispatcher, date, sample identifications, sample type and analysis to be performed on each sample.

## Q2.5 Field Replicates

Replicate samples were collected in the field as a measure of accuracy, precision and repeatability of the results.

Field replicate samples for soil were collected from the same location and an identical depth to the primary sample. Equal portions of the subject material were placed into the primary and replicate sampling jars and sealed. The sample was not homogenised so as to minimise the possible loss of volatiles. Replicate samples were labelled with a DP identification number, recorded on DP's field logs, so as to conceal their relationship to their primary sample from the analytical laboratory.

Results are pending.

**Table E1: Relative Percentage Difference Results – Intra-laboratory Replicates**  
(Pending)



### Q3. LABORATORY QUALITY ASSURANCE AND QUALITY CONTROL

#### Q3.1 Chain of Custody

Chain-of-custody procedures are discussed in Section Q2.4.

#### Q3.2 Analytical Laboratories

Samples were submitted to the following laboratory for analysis:

- Envirolab Services Pty Ltd (ELS)

The laboratory is NATA accredited for the analysis undertaken. ELS's accreditation number is 2901 and it is accredited for compliance with ISO/IEC 17025.

#### Q3.3 Holding Times

A review of the laboratory certificates of analysis and chain-of-custody documentation indicated that holding times were met.

#### Q3.4 Analytical Methods

The laboratory analytical methods are provided on the laboratory certificates of analysis in Appendix H, along with the PQL/LOR.

It is noted, however, that some of the test methods (i.e. 500 ml asbestos analysis) adopted are not NATA accredited. Where no NATA accredited method exists standard international analytical methods were adopted.

#### Q3.5 Laboratory Replicate Results

Laboratory replicates are additional portions of a sample which are analysed in the same manner as the other samples. Laboratory replicate samples were generally analysed at a rate of 1 for every 10 samples in a batch. The laboratory acceptance criteria for replicate samples is as follows:

**Table H4: Laboratory Replicate Acceptance Criteria**

Laboratory	PQL / LOR Range	Acceptance Criteria
ELS	<5 x PQL	Any RPD
	>5 x PQL	0 – 50%

The laboratory QC for laboratory replicate results, were generally within the acceptance criteria. Any non-conformities with the acceptance criteria are discussed in Section Q3.10

### Q3.6 Laboratory Blank (Reagent Blank) Results

The laboratory blank, sometimes referred to as the method blank or reagent blank is the sample prepared and analysed at the beginning of every analytical run, following calibration of the analytical apparatus. This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, it can be determined by processing solvents and reagents in the same manner as for samples. Laboratory blanks are generally analysed at a frequency of 1 in 20, with a minimum of one per batch.

All results should be less than the method PQL or LOR. The report results for the method blanks were generally within the acceptance criteria. Any non-conformities with the acceptance criteria are discussed in Section Q3.10.

### Q3.7 Matrix Spike

The matrix spike is a sample replicate prepared by adding a known amount of analyte prior to analysis, and then treated exactly the same as all other samples. The recovery result indicates the proportion of the known concentration of the analyte that is detected during analysis. The laboratory acceptance criteria for matrix spike recoveries is as follows:

**Table H5: Laboratory Matrix Spike Acceptance Criteria**

Laboratory	Analyte(s)	Accepted Recoveries
ELS	Inorganics / metals	70 – 130%
	organics	60 – 140%
	SVOC and speciated phenols	10 – 140%

The laboratory QC for matrix spikes were generally within the acceptance criteria. Any non-conformities with the acceptance criteria are discussed in Section Q3.10.

### Q3.8 Surrogate Spike

The surrogate spike sample is prepared by adding a known amount of surrogate, which behaves similarly to the analyte, prior to analysis of each sample. The recovery result indicates the proportion of the known concentration of the surrogate that is detected during analysis. The laboratory acceptance criteria for surrogate spike recoveries is as follows:

**Table H6: Laboratory Surrogate Spike Acceptance Criteria**

Laboratory	Analyte(s)	Accepted Recoveries
ELS	Inorganics / metals	70 – 130%
	organics	60 – 140%
	SVOC and speciated phenols	10 – 140%

The laboratory QC for surrogate spikes were generally within the acceptance. Any non-conformities with the acceptance criteria are discussed in Section Q3.10.

### **Q3.9 Reference / Laboratory Control Sample (LCS)**

This sample comprises spiking either a standard reference material or a control matrix (such as a blank of sand or water) with a known concentration of specific analytes. The LCS is then analysed and results compared against each other to determine how the laboratory has performed with regard to sample preparation and analytical procedure. LCSs are generally analysed at a frequency of 1 in 20, with a minimum of one analysed per batch.

The laboratory acceptance criteria for LCS recoveries is as follows:

**Table H7: Laboratory LCS Acceptance Criteria**

Laboratory	Analyte(s)	Accepted Recoveries
ELS	Inorganics / metals	70 – 130%
	organics	60 – 140%
	SVOC and speciated phenols	10 – 140%

The laboratory QC for LCSs were generally within the acceptance criteria. Any non-conformities with the acceptance criteria are discussed in Section Q3.10.

### **Q3.10 Laboratory Comments**

The laboratory QC for laboratory replicate results, reagent blanks, matrix spikes, surrogate spikes and LCS results are reported in the laboratory certificate of analysis.

The laboratory quality control samples were within the laboratory acceptance criteria. It is considered that an acceptable level of laboratory precision and accuracy was achieved and that surrogate spikes, LCS, laboratory duplicate results, laboratory blanks and matrix spike results were of an acceptable level overall. On the basis of this assessment, the laboratory data set is considered to have complied with the DQIs.

## **Q4. QA/QC DATA EVALUATION**

An evaluation of field and laboratory QA/QC information against the stated DQOs has been undertaken. Overall, the SOPs were generally complied with in the field, and the laboratory quality control samples were generally within the laboratory acceptance criteria. The QC non-conformances, where they occurred, are not considered to have significantly impacted the quality of the results overall as they were generally minor in number compared to the overall QC data. On this basis, it is considered that an acceptable level of laboratory precision and consistency was achieved and that the laboratory data sets are reliable and useable for this assessment.

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## Appendix F

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Summary Table

Table F1 - Summary of Soil Laboratory Analysis (All results in mg/kg unless otherwise stated)

Test Pit/ Sample ID <sup>a</sup>	Depth	Sampling Date	Metals									PAH				Phenols	Total Recoverable Hydrocarbons								BTEX				Organochlorine Pesticides (OCP)											OPP	PCB	Asbestos
			Arsenic	Cadmium	Chromium (VI) <sup>b</sup>	Copper	Lead	Mercury	Nickel	Zinc	Manganese	Naphthalene	Benzo(a) Pyrene (BaP)	BaP TEQ	Total PAH	Phenol	TRH C <sub>5</sub> -C <sub>10</sub>	TRH >C <sub>10</sub> -C <sub>16</sub>	F1	F2	F3	F4	Benzene	Toluene	Ethylbenzene	Total xylenes	DDT + DDE	Aldrin and Dieldrin	Chlordane	Endosulfan	Endrin	Heptachlor	HCB	Methoxychlor	Chlorpyrifos	PCB	Asbestos					
	Practical Quantitation Limit (PQL)		4	0.4	1	1	1	0.1	1	1		0.1	0.05	0.5	0.05	5	25	50	25	50	100	100	0.2	0.5	1	3	0.3	0.2	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.7					
Site Assessment Criteria (SAC)																																										
HIL C			300	90	300	17000	600	80	1200	30 000	19000	-	-	3	300	120	-	-	-	-	-	-	-	-	-	400	10	70	340	20	10	10	400	250	1	-						
HSL C			-	-	-	-	-	-	-	-	NL	-	-	-	-	-	-	NL	NL	-	-	NL	NL	NL	NL	-	-	-	-	-	-	-	-	-	-	-	-					
EIL (urban residential and public open space)			100	-	410	220	1100	-	200	500	-	170	-	-	-	-	-	-	-	-	-	-	-	-	180	-	-	-	-	-	-	-	-	-	-	-	-					
ESL (Urban residential and public open space)			-	-	-	-	-	-	-	-	-	0.7	-	-	-	-	-	180	120	1300	5600	65	105	125	45	-	-	-	-	-	-	-	-	-	-	-	-					
1	0.0-0.2	7/08/2017	8	<0.4	14	24	23	<0.1	12	53	780	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-					
2	0.0-0.2	7/08/2017	9	<0.4	16	22	25	<0.1	13	49	-	<0.1	<0.05	<0.5	<0.05	-	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	NAD					
3	0.0-0.3	7/08/2017	8	<0.4	15	26	21	<0.1	16	53	-	<0.1	<0.05	<0.5	<0.05	<5	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD				
4	0.0-0.2	7/08/2017	7	<0.4	16	17	20	<0.1	11	33	2000	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-					
5	0.0-0.4	7/08/2017	5	<0.4	13	21	17	<0.1	19	39	1200	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-					
6	0.0-0.2	8/08/2017	9	<0.4	13	12	20	<0.1	8	25	1300	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-					
7	0.0-0.3	7/08/2017	7	<0.4	13	15	24	<0.1	9	33	1400	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-					
8	0.0-0.5	7/08/2017	6	<0.4	11	34	18	<0.1	13	54	650	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-					
9	0.0-0.2	7/08/2017	9	<0.4	13	24	24	<0.1	15	53	1900	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-					
10	0.0-0.3	7/08/2017	10	<0.4	11	27	21	<0.1	32	67	3100	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-					
11	0.0-0.5	7/08/2017	8	<0.4	12	23	30	<0.1	11	47	1500	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-					
12	0.0-0.2	7/08/2017	6	<0.4	7	18	15	<0.1	8	33	700	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-					
13	0.0-0.3	7/08/2017	11	<0.4	12	27	22	<0.1	18	64	3200	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-					
14	0.0-0.05	7/08/2017	<4	0.6	11	14	20	<0.1	7	160	-	<1.0	<0.50	<5	<0.5	<5	260	47000	250	47000	160000	19000	<0.2	<0.5	1	9	<1.0	<2.0	<0.2	<3.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1	NAD					
15	0.0-0.1	4/08/2017	9	<0.4	15	24	27	<0.1	16	42	-	<0.1	<0.05	<0.5	<0.05	<5	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD					
16	0.0-0.08	4/08/2017	4	<0.4	4	18	11	<0.1	16	42	-	<0.1	<0.05	<0.5	<0.05	<5	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD					
17	0.0-0.15	7/08/2017	9	2	91	97	790	0.4	17	1700	-	<0.1	<0.05	<0.5	<0.05	8	<25	170	<25	170	1000	370	<0.2	<0.5	<1	<1	<0.1	26.2	3	<0.3	0.1	0.5	<0.1	<0.1	0.2	<1	NAD					
18	0.0-0.2	7/08/2017	9	<0.4	9	84	70	0.3	10	160	-	<0.1	<0.05	<0.5	<0.05	<5	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD					
19	0.0-0.15	7/08/2017	10	<0.4	12	30	51	2.6	14	100	-	<0.1	<0.05	<0.5	<0.05	<5	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.2	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD					
20	0.0-0.1	7/08/2017	8	<0.4	18	12	19	<0.1	8	19	-	<0.1	<0.05	<0.5	<0.05	<5	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-						
21	0.0-0.1	4/08/2017	4	<0.4	23	28	18	<0.1	14	89	-	<1	240	360	1800	<5	<25	280	<25	280	10000	1100	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	-					
22	0.0-0.2	7/08/2017	12	<0.4	13	23	22	<0.1	15	55	2000	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-					
23	0.0-0.4	7/08/2017	13	<0.4	16	19	25	<0.1	13	45	1900	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-					
24	0.0-0.4	4/08/2017	12	<0.4	15	14	23	<0.1	9	45	1800	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-					
25	0.0-0.6	4/08/2017	10	<0.4	10	17	19	<0.1	10	36	1100	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-						



Table F1 - Summary of Soil Laboratory Analysis (All results in mg/kg unless otherwise stated)

Test Pit/ Sample ID <sup>a</sup>	Depth	Sampling Date	Metals									PAH				Phenols	Total Recoverable Hydrocarbons							BTEX				Organochlorine Pesticides (OCP)										OPP	PCB	Asbestos
			Arsenic	Cadmium	Chromium (VI) <sup>b</sup>	Copper	Lead	Mercury	Nickel	Zinc	Manganese	Naphthalene	Benzo(a) Pyrene (BaP)	BaP TEQ	Total PAH	Phenol	TRH C <sub>5</sub> -C <sub>10</sub>	TRH >C <sub>10</sub> -C <sub>16</sub>	F1	F2	F3	F4	Benzene	Toluene	Ethylbenzene	Total xylenes	DDT + DDD + DDE	Aldrin and Dieldrin	Chlordane	Endosulfan	Endrin	Heptachlor	HCB	Methoxychlor	Chlorpyrifos	PCB	Asbestos			
	Practical Quantitation Limit (PQL)		4	0.4	1	1	1	0.1	1	1		0.1	0.05	0.5	0.05	5	25	50	25	50	100	100	0.2	0.5	1	3	0.3	0.2	0.2	0.3	0.1	0.1	0.1	0.1	0.1	0.7				
Site Assessment Criteria (SAC)																																								
HIL C			300	90	300	17000	600	80	1200	30 000	19000	-	-	3	300	120	-	-	-	-	-	-	-	-	-	400	10	70	340	20	10	10	400	250	1	-				
HSL C			-	-	-	-	-	-	-	-	-	NL	-	-	-	-	-	NL	NL	-	-	NL	NL	NL	NL	-	-	-	-	-	-	-	-	-	-	-	-			
EIL (urban residential and public open space)			100	-	410	220	1100	-	200	500	-	170	-	-	-	-	-	-	-	-	-	-	-	-	180	-	-	-	-	-	-	-	-	-	-	-	-			
ESL (Urban residential and public open space)			-	-	-	-	-	-	-	-	-	0.7	-	-	-	-	-	180	120	1300	5600	65	105	125	45	-	-	-	-	-	-	-	-	-	-	-	-			
26	0.0-0.4	4/08/2017	8	<0.4	15	17	26	<0.1	12	42	1300	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-			
27	0.0-0.3	4/08/2017	9	<0.4	14	19	20	<0.1	9	44	-	<0.1	<0.05	<0.5	<0.05	-	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	NAD			
28	0.0-0.4	4/08/2017	8	<0.4	10	11	17	<0.1	6	21	940	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-		
29	0.0-0.2	4/08/2017	5	<0.4	10	20	17	<0.1	11	35	1100	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-		
30	0.0-0.3	4/08/2017	8	<0.4	13	12	19	<0.1	10	46	940	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-		
31	0.0-0.2	4/08/2017	9	<0.4	10	25	14	<0.1	17	48	1200	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-		
32	0.0-0.2	4/08/2017	9	<0.4	17	36	22	<0.1	26	79	3000	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-		
33	0.0-0.1	4/08/2017	9	<0.4	13	33	18	<0.1	19	64	1100	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-		
34	0.1-0.3	4/08/2017	7	<0.4	14	33	19	<0.1	30	72	3700	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-		
35	0.0-0.5	4/08/2017	10	<0.4	11	27	30	<0.1	13	88	1000	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-		
36	0.0-0.4	7/08/2017	8	<0.4	16	16	20	<0.1	7	21	-	<0.1	<0.05	<0.5	<0.05		<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	NAD			
37	0.0-0.5	4/08/2017	7	<0.4	11	22	18	<0.1	20	51	2500	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-		
38	0.0-0.15	4/08/2017	7	<0.4	18	19	21	<0.1	19	38	2200	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-		
39	0.0-0.15	8/08/2017	5	1	17	100	390	3.7	16	750	-	<0.1	<0.05	<0.5	<0.05		<25	<50	<25	<50	140	120	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	NAD			
40	0.0-0.2	8/08/2017	8	<0.4	10	22	15	<0.1	16	46	290	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-			
41	0.0-0.15	8/08/2017	9	2	24	94	200	<0.1	21	2000	-	<0.1	<0.05	<0.5	0.2	-	<25	<50	<25	<50	240	150	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	NAD			

Notes  
<PQL Concentration comprises of sum of a number of individual analytes. All individual analytes below reported PQL  
a QA/QC replicate of sample listed directly below the primary sample.  
b All Chromium are assumed to exist in the stable Cr(III) oxidation state, as Cr(VI) will be too reactive and unstable under the normal environment  
HIL C / HSL C HIL / HSL for soil contaminants - NEPC 2013, Schedule B1, (Recreational C)  
EIL / ESL EIL / ESL soil for soil contaminant - NEPC 2013, Schedule B1.  
NAD No asbestos detected  
\* For purposes of assigning NEPM criteria  
- Not Analysed

Table F2 - Summary of Soil Laboratory Analysis - PAH (All results in mg/kg unless otherwise stated)

Test Pit/ Sample ID <sup>a</sup>	Depth	Sampling Date	Soil Type <sup>c</sup>	PAH Suite																		
				Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b,j+k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-c,d)pyrene	Dibenzo(a,h)anthracene	Benzo(g,h,i)perylene	Benzo(a)pyrene TEQ calc (zero)	Benzo(a)pyrene TEQ calc(half)	Benzo(a)pyrene TEQ calc(PQL)	Total <sup>4</sup> vePAH's
	Practical Quantitation Limit (PQL)			0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.05	0.1	0.1	0.1	0.5	0.5	0.5	0.05
Site Assessment Criteria (SAC)																						
HIL C				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	300
HSL C				NL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
EIL (urban residential and public open space)				170	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ESL (Urban residential and public open space)				-	-	-	-	-	-	-	-	-	-	-	0.7	-	-	-	-	-	-	-
2	0.0-0.2	7/08/2017		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.05
3	0.0-0.3	7/08/2017		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.05
14	0.0-0.05	7/08/2017		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	<0.50	<1.0	<1.0	<1.0	<5	<5	<5	<0.5
15	0.0-0.1	4/08/2017		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.05
16	0.0-0.08	4/08/2017		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.05
17	0.0-0.15	7/08/2017		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.05
18	0.0-0.2	7/08/2017		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.05
19	0.0-0.15	7/08/2017		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.05
20	0.0-0.1	7/08/2017		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.05
21	0.0-0.1	4/08/2017		<1	26	1.1	3	20	1.5	130	180	300	220	530	240	88	27	76	360	360	360	1800
27	0.0-0.3	4/08/2017		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.05
36	0.0-0.4	7/08/2017		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.05
39	0.0-0.15	8/08/2017		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	<0.05
41	0.0-0.15	8/08/2017		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	0.1	<0.1	<0.1	<0.2	<0.05	<0.1	<0.1	<0.1	<0.5	<0.5	<0.5	0.2

Notes

HIL C / HSL C

EIL / ESL

\*

-

HIL / HSL for soil contaminants - NEPC 2013, Schedule B1, (Recreational C)

EIL / ESL soil for soil contaminant - NEPC 2013, Schedule B1.

For purposes of assigning NEPM criteria

Not Analysed

Table F3 - Summary of Soil Laboratory Analysis - TRH, TPH, BTEX (All results in mg/kg unless otherwise stated)

Test Pit/ Sample ID <sup>a</sup>	Depth	Sampling Date	Soil Type*	TPH Silica Gel Clean Up Analysis												
				TRH C10 - C14	TRH C15 - C28	TRH C29 - C36	TRH >C10-C16	TRH >C16-C34	TRH >C34-C40	Total +ve TRH (>C10-C40)	TPH C10 - C14	TPH C15 - C28	TPH C29 - C36	TPH >C10-C16	TPH >C16-C34	TPH >C34-C40
	Practical Quantitation Limit (PQL)			50	100	100	50	100	100	50	50	100	100	50	100	100
Site Assessment Criteria (SAC)																
HIL C				-	-	-	-	-	-	-	-	-	-	-	-	-
HSL C				-	-	-	-	-	-	-	-	-	-	-	-	-
EIL (urban residential and public open space)				-	-	-	-	-	-	-	-	-	-	-	-	-
ESL (Urban residential and public open space)				-	-	-	-	1300	5600	-	-	-	-	-	1300	5600
Management Limit (residential, parkland and public open space)				-	-	-	1000	5000	10000	-	-	-	-	-	5000	10000
Direct Contact HSL C (recreational / open space)				-	-	-	3800	5300	7400	-	-	-	-	-	-	-
14	0.0-0.05	7/08/2017		29000	220000	66000	81000	220000	41000	340000	16000	170000	42000	55000	160000	15000
17	0.0-0.15	7/08/2017		180	1100	1000	270	1600	680	2600	<50	<100	<100	<50	<100	<100
21	0.0-0.1	4/08/2017		150	4200	3200	230	6800	930	8000	<50	960	120	<50	1100	<100

Notes

HIL C / HSL C	HIL / HSL for soil contaminants - NEPC 2013, Schedule B1, (Recreational C)
EIL / ESL	EIL / ESL soil for soil contaminant - NEPC 2013, Schedule B1.
*	For purposes of assigning NEPM criteria
-	Not Analysed

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## Appendix G

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


Test Pit Logs

# TEST PIT LOG

**CLIENT:** Catholic Metropolitan Cemeteries Trust  
**PROJECT:** Proposed Memorial Park  
**LOCATION:** 167 - 177 St Andrews Road, Varroville, NSW

**SURFACE LEVEL:** --  
**EASTING:** 298483  
**NORTHING:** 6235871

**PIT No:** 1  
**PROJECT No:** 92237.00  
**DATE:** 7/8/2017  
**SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.2	TOPSOIL - loose, dark brown mottled grey silty clay with rootlets, MC<PL		D	0.0							
		SILTY CLAY - brown mottled grey and orange silty clay, MC<PL		D	0.2							
				D	0.5							
				D	0.6							
1				D	1.0							
				D	1.5							
2		- becoming stiff, with some sand below 2.0m		D	2.0							
		- becoming very stiff, dark brown, red and grey mottling with some ironstone fragments below 2.5m		D	2.5							
3	3.0	Pit discontinued at 3.0m - limit of investigation		D	3.0							

**RIG:** Takeuchi TB145 5 tonne excavator - 300mm bucket

**LOGGED:** HG

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** No odours, no staining noted

☐ Sand Penetrometer AS1289.6.3.3  
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	sp	Standard penetration test
E	Environmental sample	W	Water level	S	Shear vane (kPa)



# TEST PIT LOG

**CLIENT:** Catholic Metropolitan Cemeteries Trust  
**PROJECT:** Proposed Memorial Park  
**LOCATION:** 167 - 177 St Andrews Road, Varroville, NSW

**SURFACE LEVEL:** --  
**EASTING:** 298625  
**NORTHING:** 6235931

**PIT No:** 2  
**PROJECT No:** 92237.00  
**DATE:** 7/8/2017  
**SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.2	TOPSOIL - loose, dark brown mottled grey silty clay with rootlets, MC<PL		D	0.0							
		SILTY CLAY - stiff, red mottled brown silty clay, MC<PL		D	0.2							
		- becoming light grey below 0.5m		D	0.4							
				D	0.5							
1	1.0	SHALE/SANDSTONE - very low strength, highly weathered, grey mottled orange shale/sandstone with a trace of ironstone fragments		D	1.0			1				
				D	1.5							
2		- with extremely low strength, extremely weathered bands		D	2.0			2				
		- becoming medium strength shale below 2.4m		D	2.5							
	2.5	Pit discontinued at 2.5m - refusal on medium strength shale		D	2.5							
3				D	3.0			3				

**RIG:** Takeuchi TB145 5 tonne excavator - 300mm bucket

**LOGGED:** HG

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** No odours, no staining noted

☐ Sand Penetrometer AS1289.6.3.3  
☐ Cone Penetrometer AS1289.6.3.2




SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

# TEST PIT LOG

**CLIENT:** Catholic Metropolitan Cemeteries Trust  
**PROJECT:** Proposed Memorial Park  
**LOCATION:** 167 - 177 St Andrews Road, Varroville, NSW

**SURFACE LEVEL:** --  
**EASTING:** 298730  
**NORTHING:** 6235990

**PIT No:** 3  
**PROJECT No:** 92237.00  
**DATE:** 7/8/2017  
**SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		TOPSOIL - dark brown mottled grey silty clay with rootlets, MC<PL		D	0.0							
	0.3	SILTY CLAY - brown and red mottled grey silty clay, MC<PL		D	0.3							
				D	0.5							
1				D	1.0							
				D	1.5							
2		- becoming red mottled grey below 2.0m		D	2.0							
		- becoming grey mottled orange and red below 2.5m		D	2.5							
2.9												
3	3.0	SHALE - extremely low strength, extremely weathered, grey-orange shale with some low strength bands Pit discontinued at 3.0m - refusal on medium strength shale		D	3.0							

**RIG:** Takeuchi TB145 5 tonne excavator - 300mm bucket

**LOGGED:** HG

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** No odours, no staining noted

☐ Sand Penetrometer AS1289.6.3.3  
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

# TEST PIT LOG

**CLIENT:** Catholic Metropolitan Cemeteries Trust  
**PROJECT:** Proposed Memorial Park  
**LOCATION:** 167 - 177 St Andrews Road, Varroville, NSW

**SURFACE LEVEL:** --  
**EASTING:** 298611  
**NORTHING:** 6235806

**PIT No:** 4  
**PROJECT No:** 92237.00  
**DATE:** 7/8/2017  
**SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.1	TOPSOIL - dark brown mottled grey gravel with some silty clay, MC<PL		D	0.0							
		SILTY CLAY - stiff, red brown silty clay with some rootlets and a trace of shale gravel, MC<PL		D	0.2							
				D								
				D	0.5							
1		- becoming orange brown with some sand below 1.0m		D	1.0			1				
				D	1.5							
2	2.0	GRAVELLY SILTY CLAY - red brown mottled grey gravelly silty clay		D	2.0			2				
				D	2.5							
3	3.0	Pit discontinued at 3.0m - limit of investigation		D	3.0			3				

**RIG:** Takeuchi TB145 5 tonne excavator - 300mm bucket

**LOGGED:** HG

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** No odours, no staining noted

☐ Sand Penetrometer AS1289.6.3.3  
☐ Cone Penetrometer AS1289.6.3.2



SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	sp	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

# TEST PIT LOG

**CLIENT:** Catholic Metropolitan Cemeteries Trust  
**PROJECT:** Proposed Memorial Park  
**LOCATION:** 167 - 177 St Andrews Road, Varroville, NSW

**SURFACE LEVEL:** --  
**EASTING:** 298645  
**NORTHING:** 6235705

**PIT No:** 5  
**PROJECT No:** 92237.00  
**DATE:** 7/8/2017  
**SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		TOPSOIL - loose, dark brown mottled red brown silty clay with rootlets, MC<PL		D	0.0							
	0.3	SILTY CLAY - stiff, brown mottled orange silty clay, MC<PL		D	0.4							
				D	0.5							
				D								
	1			D	0.9							
				D	1.0							
				D								
				D	1.5							
	2	- with some sand, MC<PL below 2.0m		D	2.0							
				D								
		- becoming brown mottled grey below 2.5m		D	2.5							
				D								
3	3.0	Pit discontinued at 3.0m - limit of investigation		D	3.0							

**RIG:** Takeuchi TB145 5 tonne excavator - 300mm bucket

**LOGGED:** HG

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** No odours, no staining noted

☐ Sand Penetrometer AS1289.6.3.3  
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	sp	Standard penetration test
E	Environmental sample	WL	Water level	S	Shear vane (kPa)



# TEST PIT LOG

**CLIENT:** Catholic Metropolitan Cemeteries Trust  
**PROJECT:** Proposed Memorial Park  
**LOCATION:** 167 - 177 St Andrews Road, Varroville, NSW

**SURFACE LEVEL:** --  
**EASTING:** 299028  
**NORTHING:** 6235732

**PIT No:** 6  
**PROJECT No:** 92237.00  
**DATE:** 8/8/2017  
**SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.2	TOPSOIL - loose, dark brown mottled grey silty clay with rootlets, MC<PL		D	0.0							
		SILTY CLAY - stiff, red silty clay with light grey brown mottling, MC<PL		D	0.2							
		- becoming very stiff, grey mottled brown below 0.4m		D	0.4							
				D	0.5							
	0.8	SHALE - low strength, moderately weathered, grey shale										
		- becoming medium strength, grey below 0.9m		D	1.0							
	1.5	Pit discontinued at 1.5m		D	1.5							
		- refusal on medium strength shale										
	2											
	3											

**RIG:** Takeuchi TB145 5 tonne excavator - 300mm bucket

**LOGGED:** HG

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** No odours, no staining noted

☐ Sand Penetrometer AS1289.6.3.3  
☐ Cone Penetrometer AS1289.6.3.2



SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	sp	Standard penetration test
E	Environmental sample	W	Water level	S	Shear vane (kPa)

# TEST PIT LOG

**CLIENT:** Catholic Metropolitan Cemeteries Trust  
**PROJECT:** Proposed Memorial Park  
**LOCATION:** 167 - 177 St Andrews Road, Varroville, NSW

**SURFACE LEVEL:** --  
**EASTING:** 298815  
**NORTHING:** 6235538

**PIT No:** 7  
**PROJECT No:** 92237.00  
**DATE:** 7/8/2017  
**SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		TOPSOIL - loose, light brown mottled grey silty clay with rootlets, MC<PL		D	0.0							
	0.3	SILTY CLAY - orange brown mottled brown silty clay		D	0.3							
				D	0.5							
1				D	1.0							
		- becoming stiff, brown mottled orange, MC<PL below 1.5m		D	1.5							
2				D	2.0							
		- becoming grey mottled brown below 2.0m		D	2.5							
3	3.0	Pit discontinued at 3.0m - limit of investigation		D	3.0							

**RIG:** Takeuchi TB145 5 tonne excavator - 300mm bucket

**LOGGED:** HG

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** No odours, no staining noted

☐ Sand Penetrometer AS1289.6.3.3  
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U <sub>s</sub>	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

# TEST PIT LOG

**CLIENT:** Catholic Metropolitan Cemeteries Trust  
**PROJECT:** Proposed Memorial Park  
**LOCATION:** 167 - 177 St Andrews Road, Varroville, NSW

**SURFACE LEVEL:** --  
**EASTING:** 299357  
**NORTHING:** 6235747

**PIT No:** 8  
**PROJECT No:** 92237.00  
**DATE:** 7/8/2017  
**SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.2	TOPSOIL - loose, light brown mottled grey silty clay with some cobbles, MC<PL			0.0							
		SILTY CLAY - stiff, brown mottled grey silty clay, MC<PL		D								
				D	0.5							
				B								
					0.7							
1	1.0	SHALE/SILTSTONE - low strength, highly weathered, brown and grey shale/siltstone with silt and some gravel		D	1.0			1				
	1.4	- becoming medium strength below 1.3m										
		Pit discontinued at 1.4m - refusal on medium strength shale/siltstone		D	1.5							
2								2				
3								3				

**RIG:** Takeuchi TB145 5 tonne excavator - 300mm bucket

**LOGGED:** HG

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** No odours, no staining noted

☐ Sand Penetrometer AS1289.6.3.3  
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	Sp	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

# TEST PIT LOG

**CLIENT:** Catholic Metropolitan Cemeteries Trust  
**PROJECT:** Proposed Memorial Park  
**LOCATION:** 167 - 177 St Andrews Road, Varroville, NSW

**SURFACE LEVEL: --**  
**EASTING: 299193**  
**NORTHING: 6235475**

**PIT No:** 9  
**PROJECT No:** 92237.00  
**DATE:** 7/8/2017  
**SHEET** 1 OF 1

[illegible]

**RIG:** Takeuchi TB145 5 tonne excavator - 300mm bucket

**LOGGED:** HG

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** No odours, no staining noted

- ☐ Sand Penetrometer AS1289.6.3.3
- ☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test ls(50) (MPa)
		PL(D)	Point load diametral test ls(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)





# TEST PIT LOG

**CLIENT:** Catholic Metropolitan Cemeteries Trust  
**PROJECT:** Proposed Memorial Park  
**LOCATION:** 167 - 177 St Andrews Road, Varroville, NSW

**SURFACE LEVEL:** --  
**EASTING:** 299290  
**NORTHING:** 6234894

**PIT No:** 10  
**PROJECT No:** 92237.00  
**DATE:** 7/8/2017  
**SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		TOPSOIL - loose, dark brown mottled grey silty clay with some rootlets, MC<PL		D	0.0							
	0.3	SILTY CLAY - stiff, red mottled brown silty clay		D	0.3							
		- becoming brown and grey at 0.5m		D	0.5							
	0.8	SHALE AND SILTSTONE - very low strength, highly weathered shale and siltstone		D	1.0							
1				D	1.5							
2		- becoming low strength with very low and medium strength bands		D	2.0							
2.2		Pit discontinued at 2.2m - refusal on medium strength shale/siltstone										
3												

**RIG:** Takeuchi TB145 5 tonne excavator - 300mm bucket

**LOGGED:** HG

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** No odours, no staining noted

☐ Sand Penetrometer AS1289.6.3.3  
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	sp	Standard penetration test
E	Environmental sample	≡	Water level	S	Shear vane (kPa)
		V		V	Shear vane (kPa)

# TEST PIT LOG

**CLIENT:** Catholic Metropolitan Cemeteries Trust  
**PROJECT:** Proposed Memorial Park  
**LOCATION:** 167 - 177 St Andrews Road, Varroville, NSW

**SURFACE LEVEL:** --  
**EASTING:** 299324  
**NORTHING:** 6235211

**PIT No:** 11  
**PROJECT No:** 92237.00  
**DATE:** 7/8/2017  
**SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		TOPSOIL - loose, dark brown mottled grey silty clay with rootlets, MC<PL			0.0							
	0.3	SILTY CLAY - stiff, red mottled brown silty clay		D								
				D	0.5							
				B	0.6							
	0.9	SILTSTONE - low strength, moderately weathered, grey siltstone										
1				D	1.0			1				
		- becoming very low strength, highly weathered with extremely low strength, highly weathered shale bands										
				D	1.5							
				D	2.0			2				
	2.5	SHALE - very low strength, highly weathered, grey shale with extremely low strength, highly weathered bands and ironstone bands										
		- becoming very low strength with medium strength, grey shale bands		D	2.5							
3	3.0	Pit discontinued at 3.0m - limit of investigation						3				

**RIG:** Takeuchi TB145 5 tonne excavator - 300mm bucket

**LOGGED:** HG

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** No odours, no staining noted

☐ Sand Penetrometer AS1289.6.3.3  
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)

# TEST PIT LOG

**CLIENT:** Catholic Metropolitan Cemeteries Trust  
**PROJECT:** Proposed Memorial Park  
**LOCATION:** 167 - 177 St Andrews Road, Varroville, NSW

**SURFACE LEVEL:** --  
**EASTING:** 299632  
**NORTHING:** 6235009

**PIT No:** 12  
**PROJECT No:** 92237.00  
**DATE:** 7/8/2017  
**SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		TOPSOIL - loose, dark brown mottled red brown silty clay with some rootlets, MC<PL		D	0.0							
	0.3	SILTY CLAY - stiff, brown mottled red silty clay, MC<PL		D	0.2							
				D	0.5							
	1	- becoming brown mottled grey and orange below 0.8m		D	1.0							
				D	1.5							
	2	- becoming very stiff, orange mottled grey and red below 1.5m		D	2.0							
	2.5	- with extremely low strength, extremely weathered, orange and grey shale bands below 2.0m		D	2.5							
		Pit discontinued at 2.5m - refusal on medium strength shale										
	3											

**RIG:** Takeuchi TB145 5 tonne excavator - 300mm bucket

**LOGGED:** HG

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** No odours, no staining noted

☐ Sand Penetrometer AS1289.6.3.3  
☐ Cone Penetrometer AS1289.6.3.2


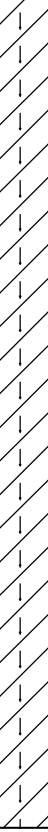
SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	sp	Standard penetration test
E	Environmental sample	≡	Water level	S	Shear vane (kPa)
		V		V	Shear vane (kPa)

# TEST PIT LOG

**CLIENT:** Catholic Metropolitan Cemeteries Trust  
**PROJECT:** Proposed Memorial Park  
**LOCATION:** 167 - 177 St Andrews Road, Varroville, NSW

**SURFACE LEVEL:** --  
**EASTING:** 299226  
**NORTHING:** 6234838

**PIT No:** 13  
**PROJECT No:** 92237.00  
**DATE:** 7/8/2017  
**SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		TOPSOIL - loose, light brown mottled grey silty clay with some rootlets, MC<PL		D	0.0							
	0.3	SILTY CLAY - stiff, brown mottled red and grey silty clay, MC<PL		D	0.3							
				D	0.5							
	1			D	1.0							
				D	1.5							
	2	- with extremely low strength, extremely weathered, grey shale bands below 2.0m		D	2.0							
	2.5	Pit discontinued at 2.5m - refusal on medium strength shale		D	2.5							
	3											

**RIG:** Takeuchi TB145 5 tonne excavator - 300mm bucket

**LOGGED:** HG

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** No odours, no staining noted

☐ Sand Penetrometer AS1289.6.3.3  
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	sp	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)




# TEST PIT LOG

**CLIENT:** Catholic Metropolitan Cemeteries Trust  
**PROJECT:** Proposed Memorial Park  
**LOCATION:** 167 - 177 St Andrews Road, Varroville, NSW

**SURFACE LEVEL:** --  
**EASTING:** 298777  
**NORTHING:** 6235739

**PIT No:** 14  
**PROJECT No:** 92237.00  
**DATE:** 7/8/2017  
**SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.1	TOPSOIL - loose, light brown mottled grey silty clay with rootlets, MC<PL		D	0.0							
				D	0.05							
				D*	0.1							
		SILTY CLAY - stiff, red mottled grey silty clay, MC<PL		D	0.2							
				D	0.3							
	0.4	Pit discontinued at 0.4m - limit of investigation										
	1											
	2											
	3											

**RIG:** Takeuchi TB145 5 tonne excavator - 300mm bucket

**LOGGED:** HG

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** \* Replicate sample BD1/080817 collected; Staining and odour noted

☐ Sand Penetrometer AS1289.6.3.3  
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

# TEST PIT LOG

**CLIENT:** Catholic Metropolitan Cemeteries Trust  
**PROJECT:** Proposed Memorial Park  
**LOCATION:** 167 - 177 St Andrews Road, Varroville, NSW

**SURFACE LEVEL:** --  
**EASTING:** 298903  
**NORTHING:** 6235666

**PIT No:** 15  
**PROJECT No:** 92237.00  
**DATE:** 4/8/2017  
**SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.1	TOPSOIL - light brown mottled grey clayey silt with a trace of rootlets, MC<PL		D	0.0							
		SILTY CLAY - red mottled grey silty clay, friable, MC<PL		D	0.1							
	0.6	Pit discontinued at 0.6m - limit of investigation			0.6							
	1											
	2											
	3											

**RIG:** Takeuchi TB145 5 tonne excavator - 300mm bucket

**LOGGED:** HG

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** No odours, no staining noted

☐ Sand Penetrometer AS1289.6.3.3  
☐ Cone Penetrometer AS1289.6.3.2



SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

# TEST PIT LOG

**CLIENT:** Catholic Metropolitan Cemeteries Trust  
**PROJECT:** Proposed Memorial Park  
**LOCATION:** 167 - 177 St Andrews Road, Varroville, NSW

**SURFACE LEVEL:** --  
**EASTING:** 299345  
**NORTHING:** 6235559

**PIT No:** 16  
**PROJECT No:** 92237.00  
**DATE:** 4/8/2017  
**SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.08	FILLING - ironstone gravel with some cobbles		D	0.0							
	0.15	TOPSOIL - light grey mottled light brown silty clay		D	0.08							
		Pit discontinued at 0.15m - limit of investigation			0.15							
1												
2												
3												

**RIG:** Hand auger

**LOGGED:** HG

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** No odours, no staining noted

☐ Sand Penetrometer AS1289.6.3.3  
☐ Cone Penetrometer AS1289.6.3.2


SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

# TEST PIT LOG

**CLIENT:** Catholic Metropolitan Cemeteries Trust  
**PROJECT:** Proposed Memorial Park  
**LOCATION:** 167 - 177 St Andrews Road, Varroville, NSW

**SURFACE LEVEL:** --  
**EASTING:** 299301  
**NORTHING:** 6235079

**PIT No:** 17  
**PROJECT No:** 92237.00  
**DATE:** 4/8/2017  
**SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		TOPSOIL - loose, dark brown mottled grey silt, MC<PL		D	0.0							
	0.15	Pit discontinued at 0.15m - limit of investigation			0.15							
	1											
	2											
	3											

**RIG:** Hand auger

**LOGGED:** HG

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Paint chips in soil

☐ Sand Penetrometer AS1289.6.3.3  
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)





# TEST PIT LOG

**CLIENT:** Catholic Metropolitan Cemeteries Trust  
**PROJECT:** Proposed Memorial Park  
**LOCATION:** 167 - 177 St Andrews Road, Varroville, NSW

**SURFACE LEVEL:** --  
**EASTING:** 299313  
**NORTHING:** 6235052

**PIT No:** 18  
**PROJECT No:** 92237.00  
**DATE:** 8/8/2017  
**SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		TOPSOIL - loose, dark brown mottled grey silty clay, MC<PL		D	0.0							
	0.2	SILTY CLAY - stiff, brown mottled red silty clay		D	0.2							
	0.4	Pit discontinued at 0.4m - limit of investigation			0.4							
	1											
	2											
	3											

**RIG:** Hand auger

**LOGGED:** HG

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** No odours, no staining noted

☐ Sand Penetrometer AS1289.6.3.3  
☐ Cone Penetrometer AS1289.6.3.2


SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

# TEST PIT LOG

**CLIENT:** Catholic Metropolitan Cemeteries Trust  
**PROJECT:** Proposed Memorial Park  
**LOCATION:** 167 - 177 St Andrews Road, Varroville, NSW

**SURFACE LEVEL:** --  
**EASTING:** 299357  
**NORTHING:** 6235110

**PIT No:** 19  
**PROJECT No:** 92237.00  
**DATE:** 8/8/2017  
**SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.1	TOPSOIL - loose, light brown mottled grey silty clay, MC<PL Pit discontinued at 0.1m - limit of investigation		D	0.0							
					0.15							
	1											
	2											
	3											

**RIG:** Hand auger

**LOGGED:** HG

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** No odours, no staining noted

☐ Sand Penetrometer AS1289.6.3.3  
☐ Cone Penetrometer AS1289.6.3.2


SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

# TEST PIT LOG

**CLIENT:** Catholic Metropolitan Cemeteries Trust  
**PROJECT:** Proposed Memorial Park  
**LOCATION:** 167 - 177 St Andrews Road, Varroville, NSW

**SURFACE LEVEL:** --  
**EASTING:** 299112  
**NORTHING:** 6234832

**PIT No:** 20  
**PROJECT No:** 92237.00  
**DATE:** 8/8/2017  
**SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		FILLING - loose, light brown mottled grey silty clay, MC<PL		D	0.0							
					0.1							
					0.3							
	0.4	Pit discontinued at 0.4m - limit of investigation		D	0.4							
	1											
	2											
	3											

**RIG:** Hand auger

**LOGGED:** HG

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** No odours, no staining noted

☐ Sand Penetrometer AS1289.6.3.3  
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)




# TEST PIT LOG

**CLIENT:** Catholic Metropolitan Cemeteries Trust  
**PROJECT:** Proposed Memorial Park  
**LOCATION:** 167 - 177 St Andrews Road, Varroville, NSW

**SURFACE LEVEL:** --  
**EASTING:** 298586  
**NORTHING:** 6235681

**PIT No:** 21  
**PROJECT No:** 92237.00  
**DATE:** 4/8/2017  
**SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.2	TOPSOIL - light brown mottled grey silty clay with some rootlets, MC<PL		D	0.0							
				D	0.1							
		Pit discontinued at 0.2m - limit of investigation			0.2							
	1											
	2											
	3											

**RIG:** Hand auger

**LOGGED:** HG

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** No odours, no staining noted

☐ Sand Penetrometer AS1289.6.3.3  
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U <sub>s</sub>	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W <sub>L</sub>	Water level	V	Shear vane (kPa)

# TEST PIT LOG

**CLIENT:** Catholic Metropolitan Cemeteries Trust  
**PROJECT:** Proposed Memorial Park  
**LOCATION:** 167 - 177 St Andrews Road, Varroville, NSW

**SURFACE LEVEL:** --  
**EASTING:** 299101  
**NORTHING:** 6234894

**PIT No:** 22  
**PROJECT No:** 92237.00  
**DATE:** 8/8/2017  
**SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.0	TOPSOIL - loose, dark brown mottled brown orange silty clay with some roots, MC<PL		D	0.0							
	0.2	SILTY CLAY - stiff, red brown silty clay, MC<PL		D	0.2							
	0.4			D	0.4							
	0.5	Pit discontinued at 0.5m - limit of investigation										
1												
2												
3												

**RIG:** Takeuchi TB145 5 tonne excavator - 300mm bucket

**LOGGED:** HG

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** No odours, no staining noted

☐ Sand Penetrometer AS1289.6.3.3  
☐ Cone Penetrometer AS1289.6.3.2



SAMPLING & IN SITU TESTING LEGEND			
A Auger sample	G Gas sample	PID Photo ionisation detector (ppm)	
B Bulk sample	P Piston sample	PL(A) Point load axial test Is(50) (MPa)	
BLK Block sample	U Tube sample (x mm dia.)	PL(D) Point load diametral test Is(50) (MPa)	
C Core drilling	W Water sample	pp Pocket penetrometer (kPa)	
D Disturbed sample	> Water seep	S Standard penetration test	
E Environmental sample	≡ Water level	V Shear vane (kPa)	

# TEST PIT LOG

**CLIENT:** Catholic Metropolitan Cemeteries Trust  
**PROJECT:** Proposed Memorial Park  
**LOCATION:** 167 - 177 St Andrews Road, Varroville, NSW

**SURFACE LEVEL:** --  
**EASTING:** 299476  
**NORTHING:** 6235002

**PIT No:** 23  
**PROJECT No:** 92237.00  
**DATE:** 8/8/2017  
**SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		TOPSOIL - loose, dark brown mottled grey silty clay, MC<PL		D	0.0							
	0.4	SILTY CLAY - stiff, brown mottled red and grey silty clay, MC<PL		D	0.4							
	0.6	Pit discontinued at 0.6m - limit of investigation			0.6							
1												
2												
3												

**RIG:** Takeuchi TB145 5 tonne excavator - 300mm bucket

**LOGGED:** HG

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** No odours, no staining noted

☐ Sand Penetrometer AS1289.6.3.3  
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)





# TEST PIT LOG

**CLIENT:** Catholic Metropolitan Cemeteries Trust  
**PROJECT:** Proposed Memorial Park  
**LOCATION:** 167 - 177 St Andrews Road, Varroville, NSW

**SURFACE LEVEL:** --  
**EASTING:** 299408  
**NORTHING:** 6235202

**PIT No:** 24  
**PROJECT No:** 92237.00  
**DATE:** 4/8/2017  
**SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		TOPSOIL - dark brown mottled grey silty clay with rootlets, moist		D	0.0							
	0.4	CLAY - red mottled brown clay, MC<PL		D	0.4							
	0.7	Pit discontinued at 0.7m - limit of investigation			0.7							
1												
2												
3												

**RIG:** Takeuchi TB145 5 tonne excavator - 300mm bucket

**LOGGED:** HG

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** No odours, no staining noted

☐ Sand Penetrometer AS1289.6.3.3  
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

# TEST PIT LOG

**CLIENT:** Catholic Metropolitan Cemeteries Trust  
**PROJECT:** Proposed Memorial Park  
**LOCATION:** 167 - 177 St Andrews Road, Varroville, NSW

**SURFACE LEVEL:** --  
**EASTING:** 299414  
**NORTHING:** 6235391

**PIT No:** 25  
**PROJECT No:** 92237.00  
**DATE:** 4/8/2017  
**SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		TOPSOIL - dark brown mottled grey silty clay with rootlets, MC<PL			0.0							
	0.3	CLAY - dark brown mottled grey clay		D								
		- becoming grey mottled red and brown with some rootlets, MC<PL below 0.6m			0.6							
	1			D								
	1.2	SHALE - low strength, highly weathered, grey shale with ironstone fragments			1.2							
	1.5	Pit discontinued at 1.5m - limit of investigation										
	2											
	3											

**RIG:** Takeuchi TB145 5 tonne excavator - 300mm bucket

**LOGGED:** HG

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** No odours, no staining noted

☐ Sand Penetrometer AS1289.6.3.3  
☐ Cone Penetrometer AS1289.6.3.2



SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

# TEST PIT LOG

**CLIENT:** Catholic Metropolitan Cemeteries Trust  
**PROJECT:** Proposed Memorial Park  
**LOCATION:** 167 - 177 St Andrews Road, Varroville, NSW

**SURFACE LEVEL:** --  
**EASTING:** 299072  
**NORTHING:** 6235376

**PIT No:** 26  
**PROJECT No:** 92237.00  
**DATE:** 4/8/2017  
**SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		TOPSOIL - light brown mottled grey silty clay, MC<PL		D	0.0							
	0.4	CLAY - red mottled brown clay, MC>PL		D	0.4							
	0.7	Pit discontinued at 0.7m - limit of investigation			0.7							
1												
2												
3												

**RIG:** Takeuchi TB145 5 tonne excavator - 300mm bucket

**LOGGED:** HG

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** No odours, no staining noted

☐ Sand Penetrometer AS1289.6.3.3  
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)





# TEST PIT LOG

**CLIENT:** Catholic Metropolitan Cemeteries Trust  
**PROJECT:** Proposed Memorial Park  
**LOCATION:** 167 - 177 St Andrews Road, Varroville, NSW

**SURFACE LEVEL:** --  
**EASTING:** 299066  
**NORTHING:** 6235525

**PIT No:** 27  
**PROJECT No:** 92237.00  
**DATE:** 4/8/2017  
**SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		TOPSOIL - light brown mottled grey silty clay with some rootlets, slightly moist		D	0.0							
	0.3	CLAY - red mottled brown clay with rootlets, MC<PL		D	0.3							
	0.6	Pit discontinued at 0.6m - limit of investigation			0.6							
1												
2												
3												

**RIG:** Takeuchi TB145 5 tonne excavator - 300mm bucket

**LOGGED:** HG

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** No odours, no staining noted

- ☐ Sand Penetrometer AS1289.6.3.3  
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

# TEST PIT LOG

**CLIENT:** Catholic Metropolitan Cemeteries Trust  
**PROJECT:** Proposed Memorial Park  
**LOCATION:** 167 - 177 St Andrews Road, Varroville, NSW

**SURFACE LEVEL:** --  
**EASTING:** 299213  
**NORTHING:** 6235652

**PIT No:** 28  
**PROJECT No:** 92237.00  
**DATE:** 4/8/2017  
**SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		TOPSOIL - light brown mottled grey clayey silt, MC<PL		D	0.0							
	0.4	SILTY CLAY - red mottled grey and orange silty clay with some rootlets		D	0.4							
	0.7	Pit discontinued at 0.7m - limit of investigation			0.7							
1												
2												
3												

**RIG:** Takeuchi TB145 5 tonne excavator - 300mm bucket

**LOGGED:** HG

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** No odours, no staining noted

☐ Sand Penetrometer AS1289.6.3.3  
☐ Cone Penetrometer AS1289.6.3.2



SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

# TEST PIT LOG

**CLIENT:** Catholic Metropolitan Cemeteries Trust  
**PROJECT:** Proposed Memorial Park  
**LOCATION:** 167 - 177 St Andrews Road, Varroville, NSW

**SURFACE LEVEL:** --  
**EASTING:** 299159  
**NORTHING:** 6235897

**PIT No:** 29  
**PROJECT No:** 92237.00  
**DATE:** 4/8/2017  
**SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.0	TOPSOIL - light brown mottled grey silty clay with rootlets, slightly moist		D	0.0							
	0.2	CLAY - orange mottled brown clay		D	0.2							
	0.5	Pit discontinued at 0.5m - limit of investigation			0.5							
1												
2												
3												

**RIG:** Takeuchi TB145 5 tonne excavator - 300mm bucket

**LOGGED:** HG

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** No odours, no staining noted

☐ Sand Penetrometer AS1289.6.3.3  
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U <sub>s</sub>	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W <sub>L</sub>	Water level	V	Shear vane (kPa)



# TEST PIT LOG

**CLIENT:** Catholic Metropolitan Cemeteries Trust  
**PROJECT:** Proposed Memorial Park  
**LOCATION:** 167 - 177 St Andrews Road, Varroville, NSW

**SURFACE LEVEL:** --  
**EASTING:** 298977  
**NORTHING:** 6235877

**PIT No:** 30  
**PROJECT No:** 92237.00  
**DATE:** 4/8/2017  
**SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		TOPSOIL - light brown mottled grey silty clay with rootlets, slightly moist		D	0.0							
	0.3	CLAY - red mottled brown clay, MC<PL		D	0.3							
	0.6	Pit discontinued at 0.6m - limit of investigation			0.6							
	1											
	2											
	3											

**RIG:** Takeuchi TB145 5 tonne excavator - 300mm bucket

**LOGGED:** HG

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** No odours, no staining noted

☐ Sand Penetrometer AS1289.6.3.3  
☐ Cone Penetrometer AS1289.6.3.2


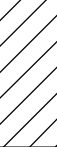
SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)

# TEST PIT LOG

**CLIENT:** Catholic Metropolitan Cemeteries Trust  
**PROJECT:** Proposed Memorial Park  
**LOCATION:** 167 - 177 St Andrews Road, Varroville, NSW

**SURFACE LEVEL:** --  
**EASTING:** 299144  
**NORTHING:** 6236083

**PIT No:** 31  
**PROJECT No:** 92237.00  
**DATE:** 4/8/2017  
**SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		TOPSOIL - dark brown mottled red brown silty clay with rootlets, moist		D	0.0							
	0.2	CLAY - light brown clay, dry		D	0.2							
	0.6	Pit discontinued at 0.6m - limit of investigation			0.6							
1												
2												
3												

**RIG:** Takeuchi TB145 5 tonne excavator - 300mm bucket

**LOGGED:** HG

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** No odours, no staining noted

☐ Sand Penetrometer AS1289.6.3.3  
☐ Cone Penetrometer AS1289.6.3.2



SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U <sub>s</sub>	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W <sub>s</sub>	Water seep	S	Standard penetration test
E	Environmental sample	W <sub>L</sub>	Water level	V	Shear vane (kPa)

# TEST PIT LOG

**CLIENT:** Catholic Metropolitan Cemeteries Trust  
**PROJECT:** Proposed Memorial Park  
**LOCATION:** 167 - 177 St Andrews Road, Varroville, NSW

**SURFACE LEVEL:** --  
**EASTING:** 298694  
**NORTHING:** 6236151

**PIT No:** 32  
**PROJECT No:** 92237.00  
**DATE:** 4/8/2017  
**SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		TOPSOIL - dark brown mottled grey silty clay with rootlets		D	0.0							
	0.15	CLAY - brown and grey clay with sandstone cobbles		D	0.2							
					0.5							
	0.6	Pit discontinued at 0.6m - limit of investigation										
	1											
	2											
	3											

**RIG:** Takeuchi TB145 5 tonne excavator - 300mm bucket

**LOGGED:** HG

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** No odours, no staining noted

☐ Sand Penetrometer AS1289.6.3.3  
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)






# TEST PIT LOG

**CLIENT:** Catholic Metropolitan Cemeteries Trust  
**PROJECT:** Proposed Memorial Park  
**LOCATION:** 167 - 177 St Andrews Road, Varroville, NSW

**SURFACE LEVEL:** --  
**EASTING:** 298377  
**NORTHING:** 6236132

**PIT No:** 33  
**PROJECT No:** 92237.00  
**DATE:** 8/8/2017  
**SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.1	TOPSOIL - dark brown mottled grey silty clay with rootlets		D	0.0							
		SILTY CLAY - stiff, orange brown mottled grey silty clay, MC<PL		D	0.1							
					0.2							
	0.4	Pit discontinued at 0.4m - limit of investigation										
	1											
	2											
	3											

**RIG:** Takeuchi TB145 5 tonne excavator - 300mm bucket

**LOGGED:** HG

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** No odours, no staining noted

☐ Sand Penetrometer AS1289.6.3.3  
☐ Cone Penetrometer AS1289.6.3.2



SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)

# TEST PIT LOG

**CLIENT:** Catholic Metropolitan Cemeteries Trust  
**PROJECT:** Proposed Memorial Park  
**LOCATION:** 167 - 177 St Andrews Road, Varroville, NSW

**SURFACE LEVEL:** --  
**EASTING:** 298588  
**NORTHING:** 6236030

**PIT No:** 34  
**PROJECT No:** 92237.00  
**DATE:** 4/8/2017  
**SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		TOPSOIL - loose, dark brown mottled grey silty clay with rootlets and a trace of gravel, moist			0.1							
	0.3	CLAY - grey brown mottled light orange clay, slightly moist		D	0.3							
	0.5	Pit discontinued at 0.5m - limit of investigation		D	0.5							
1												
2												
3												

**RIG:** Takeuchi TB145 5 tonne excavator - 300mm bucket

**LOGGED:** HG

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** No odours, no staining noted

☐ Sand Penetrometer AS1289.6.3.3  
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U <sub>s</sub>	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W <sub>s</sub>	Water seep	S	Standard penetration test
E	Environmental sample	W <sub>L</sub>	Water level	V	Shear vane (kPa)

# TEST PIT LOG

**CLIENT:** Catholic Metropolitan Cemeteries Trust  
**PROJECT:** Proposed Memorial Park  
**LOCATION:** 167 - 177 St Andrews Road, Varroville, NSW

**SURFACE LEVEL:** --  
**EASTING:** 299595  
**NORTHING:** 6235297

**PIT No:** 35  
**PROJECT No:** 92237.00  
**DATE:** 4/8/2017  
**SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		TOPSOIL - dark brown mottled grey silty clay with some rootlets, MC>PL		D	0.0							
	0.3	SILTY CLAY - dark brown mottled grey silty clay			0.5							
	1.0	Pit discontinued at 1.0m - limit of investigation			1.0							
	2											
	3											

**RIG:** Takeuchi TB145 5 tonne excavator - 300mm bucket

**LOGGED:** HG

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** No odours, no staining noted

☐ Sand Penetrometer AS1289.6.3.3  
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)





# TEST PIT LOG

**CLIENT:** Catholic Metropolitan Cemeteries Trust  
**PROJECT:** Proposed Memorial Park  
**LOCATION:** 167 - 177 St Andrews Road, Varroville, NSW

**SURFACE LEVEL:** --  
**EASTING:** 298845  
**NORTHING:** 6235391

**PIT No:** 36  
**PROJECT No:** 92237.00  
**DATE:** 7/8/2017  
**SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		TOPSOIL - dark brown mottled grey clay with some silt, MC<PL		D	0.0							
	0.4	CLAY - brown mottled red clay, MC<PL		D	0.4							
	0.6	Pit discontinued at 0.6m - limit of investigation			0.6							
1												
2												
3												

**RIG:** Takeuchi TB145 5 tonne excavator - 300mm bucket

**LOGGED:** HG

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** No odours, no staining noted

☐ Sand Penetrometer AS1289.6.3.3  
☐ Cone Penetrometer AS1289.6.3.2




SAMPLING & IN SITU TESTING LEGEND			
A Auger sample	G Gas sample	PID Photo ionisation detector (ppm)	
B Bulk sample	P Piston sample	PL(A) Point load axial test Is(50) (MPa)	
BLK Block sample	U Tube sample (x mm dia.)	PL(D) Point load diametral test Is(50) (MPa)	
C Core drilling	W Water sample	pp Pocket penetrometer (kPa)	
D Disturbed sample	> Water seep	S Standard penetration test	
E Environmental sample	≡ Water level	V Shear vane (kPa)	

# TEST PIT LOG

**CLIENT:** Catholic Metropolitan Cemeteries Trust  
**PROJECT:** Proposed Memorial Park  
**LOCATION:** 167 - 177 St Andrews Road, Varroville, NSW

**SURFACE LEVEL:** --  
**EASTING:** 299457  
**NORTHING:** 6235565

**PIT No:** 37  
**PROJECT No:** 92237.00  
**DATE:** 4/8/2017  
**SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		TOPSOIL - loose, dark brown mottled grey silty clay with some rootlets, MC>PL			0.0							
	0.3	CLAY - dark brown mottled grey clay		D								
					0.5							
				D								
	1	- becoming grey mottled red and brown, MC>PL below 1.0m			1.0							
				D								
	1.5	Pit discontinued at 1.5m - limit of investigation			1.5							
	2											
	3											

**RIG:** Takeuchi TB145 5 tonne excavator - 300mm bucket

**LOGGED:** HG

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** No odours, no staining noted

☐ Sand Penetrometer AS1289.6.3.3  
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	>	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

# TEST PIT LOG

**CLIENT:** Catholic Metropolitan Cemeteries Trust  
**PROJECT:** Proposed Memorial Park  
**LOCATION:** 167 - 177 St Andrews Road, Varroville, NSW

**SURFACE LEVEL:** --  
**EASTING:** 298883  
**NORTHING:** 6236003

**PIT No:** 38  
**PROJECT No:** 92237.00  
**DATE:** 4/8/2017  
**SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.0	TOPSOIL - dark brown mottled brown orange silty clay with rootlets, slightly moist		D	0.0							
	0.15	CLAY - red mottled grey clay, slightly moist		D	0.15							
	0.5	Pit discontinued at 0.5m - limit of investigation			0.5							
	1											
	2											
	3											

**RIG:** Takeuchi TB145 5 tonne excavator - 300mm bucket

**LOGGED:** HG

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** No odours, no staining noted

☐ Sand Penetrometer AS1289.6.3.3  
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U <sub>s</sub>	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W <sub>L</sub>	Water level	V	Shear vane (kPa)




# TEST PIT LOG

**CLIENT:** Catholic Metropolitan Cemeteries Trust  
**PROJECT:** Proposed Memorial Park  
**LOCATION:** 167 - 177 St Andrews Road, Varroville, NSW

**SURFACE LEVEL:** --  
**EASTING:** 299271  
**NORTHING:** 6235115

**PIT No:** 39  
**PROJECT No:** 92237.00  
**DATE:** 8/8/2017  
**SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.15	FILLING - loose, light brown and grey silt with broken shards of ACM  Pit discontinued at 0.15m - limit of investigation		D	0.0 0.15							
1												
2												
3												

**RIG:** Takeuchi TB145 5 tonne excavator - 300mm bucket

**LOGGED:** HG

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** Large quantities of suspected ACM next to Test Pit 39

☐ Sand Penetrometer AS1289.6.3.3  
☐ Cone Penetrometer AS1289.6.3.2


SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U <sub>s</sub>	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W <sub>L</sub>	Water level	V	Shear vane (kPa)

# TEST PIT LOG

**CLIENT:** Catholic Metropolitan Cemeteries Trust  
**PROJECT:** Proposed Memorial Park  
**LOCATION:** 167 - 177 St Andrews Road, Varroville, NSW

**SURFACE LEVEL:** --  
**EASTING:** 299101  
**NORTHING:** 6234838

**PIT No:** 40  
**PROJECT No:** 92237.00  
**DATE:** 8/8/2017  
**SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		FILLING - loose, dark brown and orange silty clay with gravel, tiles and porcelain		D*	0.0							
					0.2							
	0.3	Pit discontinued at 0.3m - limit of investigation										
	1											
	2											
	3											

**RIG:** Takeuchi TB145 5 tonne excavator - 300mm bucket

**LOGGED:** HG

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** \* Replicate sample BD2/080817 collected; No odours, no staining noted

☐ Sand Penetrometer AS1289.6.3.3  
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U <sub>s</sub>	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	≡	Water level	V	Shear vane (kPa)

# TEST PIT LOG

**CLIENT:** Catholic Metropolitan Cemeteries Trust  
**PROJECT:** Proposed Memorial Park  
**LOCATION:** 167 - 177 St Andrews Road, Varroville, NSW

**SURFACE LEVEL:** --  
**EASTING:** 299290  
**NORTHING:** 6235149

**PIT No:** 41  
**PROJECT No:** 92237.00  
**DATE:** 8/8/2017  
**SHEET** 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.15	TOPSOIL - loose, light brown mottled grey silty clay with rootlets, Mc<PL Pit discontinued at 0.15m - limit of investigation		D	0.0							
					0.15							
	1											
	2											
	3											

**RIG:** Takeuchi TB145 5 tonne excavator - 300mm bucket

**LOGGED:** HG

**SURVEY DATUM:** MGA94 Zone 56

**WATER OBSERVATIONS:** No free groundwater observed

**REMARKS:** No odours, no staining noted

☐ Sand Penetrometer AS1289.6.3.3  
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	W	Water level	V	Shear vane (kPa)



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## **Appendix H**

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Laboratory Analytical Reports

## CERTIFICATE OF ANALYSIS 173257

### Client Details

<b>Client</b>	Douglas Partners Pty Ltd Smeaton Grange
<b>Attention</b>	Hugh Goymour, Emily McGinty
<b>Address</b>	18 Waler Crescent, Smeaton Grange, NSW, 2567

### Sample Details

<b>Your Reference</b>	<b>92237.00, 167-170 St Andrews, Varroville</b>
<b>Number of Samples</b>	107 Soils, 1 Material
<b>Date samples received</b>	11/08/2017
<b>Date completed instructions received</b>	11/08/2017

### 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

<b>Date results requested by</b>	18/08/2017
<b>Date of Issue</b>	18/08/2017
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. <b>Tests not covered by NATA are denoted with *</b>	

#### Asbestos Approved By

Analysed by Asbestos Approved Identifier: Jessica Hie, Paul Ching  
 Authorised by Asbestos Approved Signatory: Lulu Scott

#### Results Approved By

Jeremy Faircloth, Organics Supervisor  
 Long Pham, Team Leader, Metals  
 Lulu Scott, Asbestos Supervisor  
 Nick Sarlamis, Inorganics Supervisor  
 Paul Ching, Senior Analyst  
 Priya Samarawickrama, Senior Chemist  
 Steven Luong, Chemist

#### Authorised By



David Springer, General Manager

## vTRH(C6-C10)/BTEXN in Soil

Our Reference		173257-2	173257-3	173257-14	173257-15	173257-16
Your Reference	UNITS	2	3	14	15	16
Depth		0.0-0.2	0.0-0.3	0.0-0.05	0.0-0.1	0.0-0.08
Date Sampled		07/08/2017	07/08/2017	07/08/2017	04/08/2017	04/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Date analysed	-	16/08/2017	16/08/2017	16/08/2017	16/08/2017	16/08/2017
TRH C <sub>6</sub> - C <sub>9</sub>	mg/kg	<25	<25	68	<25	<25
TRH C <sub>6</sub> - C <sub>10</sub>	mg/kg	<25	<25	260	<25	<25
vTPH C <sub>6</sub> - C <sub>10</sub> less BTEX (F1)	mg/kg	<25	<25	250	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	1	<1	<1
m+p-xylene	mg/kg	<2	<2	5	<2	<2
o-Xylene	mg/kg	<1	<1	3	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	9	<1	<1
naphthalene	mg/kg	<1	<1	<10	<1	<1
Surrogate aaa-Trifluorotoluene	%	99	102	91	101	101

## vTRH(C6-C10)/BTEXN in Soil

Our Reference		173257-17	173257-18	173257-19	173257-20	173257-21
Your Reference	UNITS	17	18	19	20	21
Depth		0.0-0.15	0.0-0.2	0.0-0.15	0.0-0.1	0.0-0.1
Date Sampled		07/08/2017	07/08/2017	07/08/2017	07/08/2017	04/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Date analysed	-	16/08/2017	16/08/2017	16/08/2017	16/08/2017	16/08/2017
TRH C <sub>6</sub> - C <sub>9</sub>	mg/kg	<25	<25	<25	<25	<25
TRH C <sub>6</sub> - C <sub>10</sub>	mg/kg	<25	<25	<25	<25	<25
vTPH C <sub>6</sub> - C <sub>10</sub> less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	92	84	102	100	99



vTRH(C6-C10)/BTEXN in Soil					
Our Reference		173257-27	173257-36	173257-39	173257-41
Your Reference	UNITS	27	36	39	41
Depth		0.0-0.3	0.0-0.4	0.0-0.15	0.0-0.15
Date Sampled		04/08/2017	07/08/2017	08/08/2017	08/08/2017
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Date analysed	-	16/08/2017	16/08/2017	16/08/2017	16/08/2017
TRH C <sub>6</sub> - C <sub>9</sub>	mg/kg	<25	<25	<25	<25
TRH C <sub>6</sub> - C <sub>10</sub>	mg/kg	<25	<25	<25	<25
vTPH C <sub>6</sub> - C <sub>10</sub> less BTEX (F1)	mg/kg	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	100	101	98	98

## svTRH (C10-C40) in Soil

Our Reference		173257-2	173257-3	173257-14	173257-15	173257-16
Your Reference	UNITS	2	3	14	15	16
Depth		0.0-0.2	0.0-0.3	0.0-0.05	0.0-0.1	0.0-0.08
Date Sampled		07/08/2017	07/08/2017	07/08/2017	04/08/2017	04/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Date analysed	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
TRH C <sub>10</sub> - C <sub>14</sub>	mg/kg	<50	<50	21,000	<50	<50
TRH C <sub>15</sub> - C <sub>28</sub>	mg/kg	<100	<100	150,000	<100	<100
TRH C <sub>29</sub> - C <sub>36</sub>	mg/kg	<100	<100	40,000	<100	<100
TRH >C <sub>10</sub> -C <sub>16</sub>	mg/kg	<50	<50	47,000	<50	<50
TRH >C <sub>10</sub> - C <sub>16</sub> less Naphthalene (F2)	mg/kg	<50	<50	47,000	<50	<50
TRH >C <sub>16</sub> -C <sub>34</sub>	mg/kg	<100	<100	160,000	<100	<100
TRH >C <sub>34</sub> -C <sub>40</sub>	mg/kg	<100	<100	19,000	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	220,000	<50	<50
Surrogate o-Terphenyl	%	93	97	#	94	95

## svTRH (C10-C40) in Soil

Our Reference		173257-17	173257-18	173257-19	173257-20	173257-21
Your Reference	UNITS	17	18	19	20	21
Depth		0.0-0.15	0.0-0.2	0.0-0.15	0.0-0.1	0.0-0.1
Date Sampled		07/08/2017	07/08/2017	07/08/2017	07/08/2017	04/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Date analysed	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
TRH C <sub>10</sub> - C <sub>14</sub>	mg/kg	110	<50	<50	<50	160
TRH C <sub>15</sub> - C <sub>28</sub>	mg/kg	670	<100	<100	<100	6,700
TRH C <sub>29</sub> - C <sub>36</sub>	mg/kg	590	<100	<100	<100	4,500
TRH >C <sub>10</sub> -C <sub>16</sub>	mg/kg	170	<50	<50	<50	280
TRH >C <sub>10</sub> - C <sub>16</sub> less Naphthalene (F2)	mg/kg	170	<50	<50	<50	280
TRH >C <sub>16</sub> -C <sub>34</sub>	mg/kg	1,000	<100	<100	<100	10,000
TRH >C <sub>34</sub> -C <sub>40</sub>	mg/kg	370	<100	<100	<100	1,100
Total +ve TRH (>C10-C40)	mg/kg	1,500	<50	<50	<50	11,000
Surrogate o-Terphenyl	%	115	95	94	96	#

svTRH (C10-C40) in Soil					
Our Reference		173257-27	173257-36	173257-39	173257-41
Your Reference	UNITS	27	36	39	41
Depth		0.0-0.3	0.0-0.4	0.0-0.15	0.0-0.15
Date Sampled		04/08/2017	07/08/2017	08/08/2017	08/08/2017
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Date analysed	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017
TRH C <sub>10</sub> - C <sub>14</sub>	mg/kg	<50	<50	<50	<50
TRH C <sub>15</sub> - C <sub>28</sub>	mg/kg	<100	<100	<100	<100
TRH C <sub>29</sub> - C <sub>36</sub>	mg/kg	<100	<100	170	220
TRH >C <sub>10</sub> -C <sub>16</sub>	mg/kg	<50	<50	<50	<50
TRH >C <sub>10</sub> - C <sub>16</sub> less Naphthalene (F2)	mg/kg	<50	<50	<50	<50
TRH >C <sub>16</sub> -C <sub>34</sub>	mg/kg	<100	<100	140	240
TRH >C <sub>34</sub> -C <sub>40</sub>	mg/kg	<100	<100	120	150
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	270	390
Surrogate o-Terphenyl	%	91	90	93	90



PAHs in Soil						
Our Reference		173257-2	173257-3	173257-14	173257-15	173257-16
Your Reference	UNITS	2	3	14	15	16
Depth		0.0-0.2	0.0-0.3	0.0-0.05	0.0-0.1	0.0-0.08
Date Sampled		07/08/2017	07/08/2017	07/08/2017	04/08/2017	04/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Date analysed	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Naphthalene	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<2.0	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.50	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<5	<0.5	<0.5
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.5	<0.05	<0.05
Surrogate <i>p</i> -Terphenyl-d14	%	90	90	75	99	98

PAHs in Soil						
Our Reference		173257-17	173257-18	173257-19	173257-20	173257-21
Your Reference	UNITS	17	18	19	20	21
Depth		0.0-0.15	0.0-0.2	0.0-0.15	0.0-0.1	0.0-0.1
Date Sampled		07/08/2017	07/08/2017	07/08/2017	07/08/2017	04/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Date analysed	-	15/08/2017	15/08/2017	15/08/2017	16/08/2017	16/08/2017
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	26
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	1.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	3.0
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	20
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	1.5
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	130
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	180
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	300
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	220
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	530
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	240
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	88
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	27
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	76
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	360
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	360
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	360
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	1,800
Surrogate p-Terphenyl-d14	%	94	100	92	97	#

PAHs in Soil					
Our Reference		173257-27	173257-36	173257-39	173257-41
Your Reference	UNITS	27	36	39	41
Depth		0.0-0.3	0.0-0.4	0.0-0.15	0.0-0.15
Date Sampled		04/08/2017	07/08/2017	08/08/2017	08/08/2017
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Date analysed	-	16/08/2017	16/08/2017	16/08/2017	16/08/2017
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	0.2
Surrogate <i>p</i> -Terphenyl-d14	%	92	92	89	92



Organochlorine Pesticides in soil						
Our Reference		173257-1	173257-3	173257-4	173257-5	173257-6
Your Reference	UNITS	1	3	4	5	6
Depth		0.0-0.2	0.0-0.3	0.0-0.2	0.0-0.4	0.0-0.2
Date Sampled		07/08/2017	07/08/2017	07/08/2017	07/08/2017	08/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Date analysed	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	94	96	91	93	93

Organochlorine Pesticides in soil						
Our Reference		173257-7	173257-8	173257-9	173257-10	173257-11
Your Reference	UNITS	7	8	9	10	11
Depth		0.0-0.3	0.0-0.5	0.0-0.2	0.0-0.3	0.0-0.5
Date Sampled		07/08/2017	07/08/2017	07/08/2017	07/08/2017	07/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Date analysed	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	101	95	95	94	91

Organochlorine Pesticides in soil						
Our Reference		173257-12	173257-13	173257-14	173257-15	173257-16
Your Reference	UNITS	12	13	14	15	16
Depth		0.0-0.2	0.0-0.3	0.0-0.05	0.0-0.1	0.0-0.08
Date Sampled		07/08/2017	07/08/2017	07/08/2017	04/08/2017	04/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Date analysed	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
HCB	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
Surrogate TCMX	%	93	95	69	94	96



Organochlorine Pesticides in soil						
Our Reference		173257-17	173257-18	173257-19	173257-22	173257-23
Your Reference	UNITS	17	18	19	22	23
Depth		0.0-0.15	0.0-0.2	0.0-0.15	0.0-0.2	0.0-0.4
Date Sampled		07/08/2017	07/08/2017	07/08/2017	07/08/2017	07/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Date analysed	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.5	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	1.2	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	1.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	2.6	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	0.4	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	25	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.3	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	126	94	93	91	91

Organochlorine Pesticides in soil						
Our Reference		173257-24	173257-25	173257-26	173257-28	173257-29
Your Reference	UNITS	24	25	26	28	29
Depth		0.0-0.4	0.0-0.6	0.0-0.4	0.0-0.4	0.0-0.2
Date Sampled		04/08/2017	04/08/2017	04/08/2017	04/08/2017	04/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Date analysed	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	89	91	91	92	94

Organochlorine Pesticides in soil						
Our Reference		173257-30	173257-31	173257-32	173257-33	173257-34
Your Reference	UNITS	30	31	32	33	34
Depth		0.0-0.3	0.0-0.2	0.0-0.2	0.0-0.1	0.1-0.3
Date Sampled		04/08/2017	04/08/2017	04/08/2017	04/08/2017	04/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Date analysed	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	93	91	91	92	93



Organochlorine Pesticides in soil					
Our Reference		173257-35	173257-37	173257-38	173257-40
Your Reference	UNITS	35	37	38	40
Depth		0.0-0.5	0.0-0.5	0.0-0.15	0.0-0.2
Date Sampled		04/08/2017	04/08/2017	04/08/2017	08/08/2017
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Date analysed	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	93	95	93	89

Organophosphorus Pesticides						
Our Reference		173257-1	173257-3	173257-4	173257-5	173257-6
Your Reference	UNITS	1	3	4	5	6
Depth		0.0-0.2	0.0-0.3	0.0-0.2	0.0-0.4	0.0-0.2
Date Sampled		07/08/2017	07/08/2017	07/08/2017	07/08/2017	08/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Date analysed	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	94	96	91	93	93

Organophosphorus Pesticides						
Our Reference		173257-7	173257-8	173257-9	173257-10	173257-11
Your Reference	UNITS	7	8	9	10	11
Depth		0.0-0.3	0.0-0.5	0.0-0.2	0.0-0.3	0.0-0.5
Date Sampled		07/08/2017	07/08/2017	07/08/2017	07/08/2017	07/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Date analysed	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	101	95	95	94	91

**Organophosphorus Pesticides**

Our Reference		173257-12	173257-13	173257-14	173257-15	173257-16
Your Reference	UNITS	12	13	14	15	16
Depth		0.0-0.2	0.0-0.3	0.0-0.05	0.0-0.1	0.0-0.08
Date Sampled		07/08/2017	07/08/2017	07/08/2017	04/08/2017	04/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Date analysed	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<1.0	<0.1	<0.1
Surrogate TCMX	%	93	95	69	94	96

**Organophosphorus Pesticides**

Our Reference		173257-17	173257-18	173257-19	173257-22	173257-23
Your Reference	UNITS	17	18	19	22	23
Depth		0.0-0.15	0.0-0.2	0.0-0.15	0.0-0.2	0.0-0.4
Date Sampled		07/08/2017	07/08/2017	07/08/2017	07/08/2017	07/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Date analysed	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos	mg/kg	0.2	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	126	94	93	91	91

**Organophosphorus Pesticides**

Our Reference		173257-24	173257-25	173257-26	173257-28	173257-29
Your Reference	UNITS	24	25	26	28	29
Depth		0.0-0.4	0.0-0.6	0.0-0.4	0.0-0.4	0.0-0.2
Date Sampled		04/08/2017	04/08/2017	04/08/2017	04/08/2017	04/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Date analysed	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	89	91	91	92	94

**Organophosphorus Pesticides**

Our Reference		173257-30	173257-31	173257-32	173257-33	173257-34
Your Reference	UNITS	30	31	32	33	34
Depth		0.0-0.3	0.0-0.2	0.0-0.2	0.0-0.1	0.1-0.3
Date Sampled		04/08/2017	04/08/2017	04/08/2017	04/08/2017	04/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Date analysed	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	93	91	91	92	93



Organophosphorus Pesticides					
Our Reference		173257-35	173257-37	173257-38	173257-40
Your Reference	UNITS	35	37	38	40
Depth		0.0-0.5	0.0-0.5	0.0-0.15	0.0-0.2
Date Sampled		04/08/2017	04/08/2017	04/08/2017	08/08/2017
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Date analysed	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	93	95	93	89

PCBs in Soil						
Our Reference		173257-3	173257-14	173257-15	173257-16	173257-17
Your Reference	UNITS	3	14	15	16	17
Depth		0.0-0.3	0.0-0.05	0.0-0.1	0.0-0.08	0.0-0.15
Date Sampled		07/08/2017	07/08/2017	04/08/2017	04/08/2017	07/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Date analysed	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Aroclor 1016	mg/kg	<0.1	<1	<0.1	<0.1	<1
Aroclor 1221	mg/kg	<0.1	<1	<0.1	<0.1	<1
Aroclor 1232	mg/kg	<0.1	<1	<0.1	<0.1	<1
Aroclor 1242	mg/kg	<0.1	<1	<0.1	<0.1	<1
Aroclor 1248	mg/kg	<0.1	<1	<0.1	<0.1	<1
Aroclor 1254	mg/kg	<0.1	<1	<0.1	<0.1	<1
Aroclor 1260	mg/kg	<0.1	<1	<0.1	<0.1	<1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<1	<0.1	<0.1	<1
Surrogate TCLMX	%	96	69	94	96	126

PCBs in Soil			
Our Reference		173257-18	173257-19
Your Reference	UNITS	18	19
Depth		0.0-0.2	0.0-0.15
Date Sampled		07/08/2017	07/08/2017
Type of sample		Soil	Soil
Date extracted	-	15/08/2017	15/08/2017
Date analysed	-	15/08/2017	15/08/2017
Aroclor 1016	mg/kg	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1
Surrogate TCLMX	%	94	93

Acid Extractable metals in soil						
Our Reference	UNITS	173257-1	173257-2	173257-3	173257-4	173257-5
Your Reference		1	2	3	4	5
Depth		0.0-0.2	0.0-0.2	0.0-0.3	0.0-0.2	0.0-0.4
Date Sampled		07/08/2017	07/08/2017	07/08/2017	07/08/2017	07/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Date analysed	-	16/08/2017	16/08/2017	16/08/2017	16/08/2017	16/08/2017
Arsenic	mg/kg	8	9	8	7	5
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	14	16	15	16	13
Lead	mg/kg	23	25	21	20	17
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	12	13	16	11	19
Zinc	mg/kg	53	49	53	33	39
Copper	mg/kg	24	22	26	17	21
Manganese	mg/kg	780	[NA]	[NA]	2,000	1,200

Acid Extractable metals in soil						
Our Reference	UNITS	173257-6	173257-7	173257-8	173257-9	173257-10
Your Reference		6	7	8	9	10
Depth		0.0-0.2	0.0-0.3	0.0-0.5	0.0-0.2	0.0-0.3
Date Sampled		08/08/2017	07/08/2017	07/08/2017	07/08/2017	07/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Date analysed	-	16/08/2017	16/08/2017	16/08/2017	16/08/2017	16/08/2017
Arsenic	mg/kg	9	7	6	9	10
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	13	13	11	13	11
Lead	mg/kg	20	24	18	24	21
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	8	9	13	15	32
Zinc	mg/kg	25	33	54	53	67
Copper	mg/kg	12	15	34	24	27
Manganese	mg/kg	1,300	1,400	650	1,900	3,100

## Acid Extractable metals in soil

Our Reference		173257-11	173257-12	173257-13	173257-14	173257-15
Your Reference	UNITS	11	12	13	14	15
Depth		0.0-0.5	0.0-0.2	0.0-0.3	0.0-0.05	0.0-0.1
Date Sampled		07/08/2017	07/08/2017	07/08/2017	07/08/2017	04/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Date analysed	-	16/08/2017	16/08/2017	16/08/2017	16/08/2017	16/08/2017
Arsenic	mg/kg	8	6	11	<4	9
Cadmium	mg/kg	<0.4	<0.4	<0.4	0.6	<0.4
Chromium	mg/kg	12	7	12	11	15
Lead	mg/kg	30	15	22	20	27
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	11	8	18	7	16
Zinc	mg/kg	47	33	64	160	42
Copper	mg/kg	23	18	27	14	24
Manganese	mg/kg	1,500	700	3,200	[NA]	[NA]

## Acid Extractable metals in soil

Our Reference		173257-16	173257-17	173257-18	173257-19	173257-20
Your Reference	UNITS	16	17	18	19	20
Depth		0.0-0.08	0.0-0.15	0.0-0.2	0.0-0.15	0.0-0.1
Date Sampled		04/08/2017	07/08/2017	07/08/2017	07/08/2017	07/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Date analysed	-	16/08/2017	16/08/2017	16/08/2017	16/08/2017	16/08/2017
Arsenic	mg/kg	4	9	9	10	8
Cadmium	mg/kg	<0.4	2	<0.4	<0.4	<0.4
Chromium	mg/kg	4	91	9	12	18
Lead	mg/kg	11	790	70	51	19
Mercury	mg/kg	<0.1	0.4	0.3	2.6	<0.1
Nickel	mg/kg	16	17	10	14	8
Zinc	mg/kg	42	1,700	160	100	19
Copper	mg/kg	18	97	84	30	12



## Acid Extractable metals in soil

Our Reference		173257-21	173257-22	173257-23	173257-24	173257-25
Your Reference	UNITS	21	22	23	24	25
Depth		0.0-0.1	0.0-0.2	0.0-0.4	0.0-0.4	0.0-0.6
Date Sampled		04/08/2017	07/08/2017	07/08/2017	04/08/2017	04/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Date analysed	-	16/08/2017	16/08/2017	16/08/2017	16/08/2017	16/08/2017
Arsenic	mg/kg	4	12	13	12	10
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	23	13	16	15	10
Lead	mg/kg	18	22	25	23	19
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	14	15	13	9	10
Zinc	mg/kg	89	55	45	45	36
Copper	mg/kg	28	23	19	14	17
Manganese	mg/kg	[NA]	2,000	1,900	1,800	1,100

## Acid Extractable metals in soil

Our Reference		173257-26	173257-27	173257-28	173257-29	173257-30
Your Reference	UNITS	26	27	28	29	30
Depth		0.0-0.4	0.0-0.3	0.0-0.4	0.0-0.2	0.0-0.3
Date Sampled		04/08/2017	04/08/2017	04/08/2017	04/08/2017	04/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Date analysed	-	16/08/2017	16/08/2017	16/08/2017	16/08/2017	16/08/2017
Arsenic	mg/kg	8	9	8	5	8
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	15	14	10	10	13
Lead	mg/kg	26	20	17	17	19
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	12	9	6	11	10
Zinc	mg/kg	42	44	21	35	46
Copper	mg/kg	17	19	11	20	11
Manganese	mg/kg	1,300	[NA]	940	1,100	940

## Acid Extractable metals in soil

Our Reference		173257-31	173257-32	173257-33	173257-34	173257-35
Your Reference	UNITS	31	32	33	34	35
Depth		0.0-0.2	0.0-0.2	0.0-0.1	0.1-0.3	0.0-0.5
Date Sampled		04/08/2017	04/08/2017	04/08/2017	04/08/2017	04/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Date analysed	-	16/08/2017	16/08/2017	16/08/2017	16/08/2017	16/08/2017
Arsenic	mg/kg	9	9	9	7	10
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	10	17	13	14	11
Lead	mg/kg	14	22	18	19	30
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	17	26	19	30	13
Zinc	mg/kg	48	79	64	72	88
Copper	mg/kg	25	36	33	33	27
Manganese	mg/kg	1,200	3,000	1,100	3,700	1,000

## Acid Extractable metals in soil

Our Reference		173257-36	173257-37	173257-38	173257-39	173257-40
Your Reference	UNITS	36	37	38	39	40
Depth		0.0-0.4	0.0-0.5	0.0-0.15	0.0-0.15	0.0-0.2
Date Sampled		07/08/2017	04/08/2017	04/08/2017	08/08/2017	08/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Date analysed	-	16/08/2017	16/08/2017	16/08/2017	16/08/2017	16/08/2017
Arsenic	mg/kg	8	7	7	5	8
Cadmium	mg/kg	<0.4	<0.4	<0.4	1	<0.4
Chromium	mg/kg	16	11	18	17	10
Lead	mg/kg	20	18	21	390	15
Mercury	mg/kg	<0.1	<0.1	<0.1	3.7	<0.1
Nickel	mg/kg	7	19	19	16	16
Zinc	mg/kg	21	46	38	750	46
Copper	mg/kg	16	22	19	100	22
Manganese	mg/kg	[NA]	2,500	2,200	[NA]	290

Acid Extractable metals in soil		
Our Reference		173257-41
Your Reference	UNITS	41
Depth		0.0-0.15
Date Sampled		08/08/2017
Type of sample		Soil
Date prepared	-	15/08/2017
Date analysed	-	16/08/2017
Arsenic	mg/kg	7
Cadmium	mg/kg	2
Chromium	mg/kg	19
Lead	mg/kg	170
Mercury	mg/kg	<0.1
Nickel	mg/kg	21
Zinc	mg/kg	1,300
Copper	mg/kg	94

Misc Soil - Inorg						
Our Reference	UNITS	173257-1	173257-4	173257-5	173257-6	173257-7
Your Reference		1	4	5	6	7
Depth		0.0-0.2	0.0-0.2	0.0-0.4	0.0-0.2	0.0-0.3
Date Sampled		07/08/2017	07/08/2017	07/08/2017	08/08/2017	07/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	18/08/2017	18/08/2017	18/08/2017	18/08/2017	18/08/2017
Date analysed	-	18/08/2017	18/08/2017	18/08/2017	18/08/2017	18/08/2017
Hexavalent Chromium, Cr <sup>6+</sup>	mg/kg	<1	<1	<1	<1	<1

Misc Soil - Inorg						
Our Reference	UNITS	173257-8	173257-9	173257-10	173257-11	173257-12
Your Reference		8	9	10	11	12
Depth		0.0-0.5	0.0-0.2	0.0-0.3	0.0-0.5	0.0-0.2
Date Sampled		07/08/2017	07/08/2017	07/08/2017	07/08/2017	07/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	18/08/2017	18/08/2017	18/08/2017	18/08/2017	18/08/2017
Date analysed	-	18/08/2017	18/08/2017	18/08/2017	18/08/2017	18/08/2017
Hexavalent Chromium, Cr <sup>6+</sup>	mg/kg	<1	<1	<1	<1	<1

Misc Soil - Inorg						
Our Reference	UNITS	173257-13	173257-22	173257-23	173257-24	173257-25
Your Reference		13	22	23	24	25
Depth		0.0-0.3	0.0-0.2	0.0-0.4	0.0-0.4	0.0-0.6
Date Sampled		07/08/2017	07/08/2017	07/08/2017	04/08/2017	04/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	18/08/2017	18/08/2017	18/08/2017	18/08/2017	18/08/2017
Date analysed	-	18/08/2017	18/08/2017	18/08/2017	18/08/2017	18/08/2017
Hexavalent Chromium, Cr <sup>6+</sup>	mg/kg	<1	<1	<1	<1	<1

Misc Soil - Inorg						
Our Reference	UNITS	173257-26	173257-28	173257-29	173257-30	173257-31
Your Reference		26	28	29	30	31
Depth		0.0-0.4	0.0-0.4	0.0-0.2	0.0-0.3	0.0-0.2
Date Sampled		04/08/2017	04/08/2017	04/08/2017	04/08/2017	04/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	18/08/2017	18/08/2017	18/08/2017	18/08/2017	18/08/2017
Date analysed	-	18/08/2017	18/08/2017	18/08/2017	18/08/2017	18/08/2017
Hexavalent Chromium, Cr <sup>6+</sup>	mg/kg	<1	<1	<1	<1	<1



**Misc Soil - Inorg**

Our Reference		173257-32	173257-33	173257-34	173257-35	173257-37
Your Reference	UNITS	32	33	34	35	37
Depth		0.0-0.2	0.0-0.1	0.1-0.3	0.0-0.5	0.0-0.5
Date Sampled		04/08/2017	04/08/2017	04/08/2017	04/08/2017	04/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	18/08/2017	18/08/2017	18/08/2017	18/08/2017	18/08/2017
Date analysed	-	18/08/2017	18/08/2017	18/08/2017	18/08/2017	18/08/2017
Hexavalent Chromium, Cr <sup>6+</sup>	mg/kg	<1	<1	<1	<1	<1

**Misc Soil - Inorg**

Our Reference		173257-38	173257-40
Your Reference	UNITS	38	40
Depth		0.0-0.15	0.0-0.2
Date Sampled		04/08/2017	08/08/2017
Type of sample		Soil	Soil
Date prepared	-	18/08/2017	18/08/2017
Date analysed	-	18/08/2017	18/08/2017
Hexavalent Chromium, Cr <sup>6+</sup>	mg/kg	<1	<1

Moisture						
Our Reference	UNITS	173257-1	173257-2	173257-3	173257-4	173257-5
Your Reference		1	2	3	4	5
Depth		0.0-0.2	0.0-0.2	0.0-0.3	0.0-0.2	0.0-0.4
Date Sampled		07/08/2017	07/08/2017	07/08/2017	07/08/2017	07/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Date analysed	-	16/08/2017	16/08/2017	16/08/2017	16/08/2017	16/08/2017
Moisture	%	19	21	19	13	19

Moisture						
Our Reference	UNITS	173257-6	173257-7	173257-8	173257-9	173257-10
Your Reference		6	7	8	9	10
Depth		0.0-0.2	0.0-0.3	0.0-0.5	0.0-0.2	0.0-0.3
Date Sampled		08/08/2017	07/08/2017	07/08/2017	07/08/2017	07/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Date analysed	-	16/08/2017	16/08/2017	16/08/2017	16/08/2017	16/08/2017
Moisture	%	17	19	13	15	15

Moisture						
Our Reference	UNITS	173257-11	173257-12	173257-13	173257-14	173257-15
Your Reference		11	12	13	14	15
Depth		0.0-0.5	0.0-0.2	0.0-0.3	0.0-0.05	0.0-0.1
Date Sampled		07/08/2017	07/08/2017	07/08/2017	07/08/2017	04/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Date analysed	-	16/08/2017	16/08/2017	16/08/2017	16/08/2017	16/08/2017
Moisture	%	16	20	15	7.3	9.3

Moisture						
Our Reference	UNITS	173257-16	173257-17	173257-18	173257-19	173257-20
Your Reference		16	17	18	19	20
Depth		0.0-0.08	0.0-0.15	0.0-0.2	0.0-0.15	0.0-0.1
Date Sampled		04/08/2017	07/08/2017	07/08/2017	07/08/2017	07/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Date analysed	-	16/08/2017	16/08/2017	16/08/2017	16/08/2017	16/08/2017
Moisture	%	9.1	22	29	16	9.2

Moisture						
Our Reference	UNITS	173257-21	173257-22	173257-23	173257-24	173257-25
Your Reference		21	22	23	24	25
Depth		0.0-0.1	0.0-0.2	0.0-0.4	0.0-0.4	0.0-0.6
Date Sampled		04/08/2017	07/08/2017	07/08/2017	04/08/2017	04/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Date analysed	-	16/08/2017	16/08/2017	16/08/2017	16/08/2017	16/08/2017
Moisture	%	10	16	15	13	17

Moisture						
Our Reference	UNITS	173257-26	173257-27	173257-28	173257-29	173257-30
Your Reference		26	27	28	29	30
Depth		0.0-0.4	0.0-0.3	0.0-0.4	0.0-0.2	0.0-0.3
Date Sampled		04/08/2017	04/08/2017	04/08/2017	04/08/2017	04/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Date analysed	-	16/08/2017	16/08/2017	16/08/2017	16/08/2017	16/08/2017
Moisture	%	15	17	12	17	17

Moisture						
Our Reference	UNITS	173257-31	173257-32	173257-33	173257-34	173257-35
Your Reference		31	32	33	34	35
Depth		0.0-0.2	0.0-0.2	0.0-0.1	0.1-0.3	0.0-0.5
Date Sampled		04/08/2017	04/08/2017	04/08/2017	04/08/2017	04/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Date analysed	-	16/08/2017	16/08/2017	16/08/2017	16/08/2017	16/08/2017
Moisture	%	13	22	23	25	21

Moisture						
Our Reference	UNITS	173257-36	173257-37	173257-38	173257-39	173257-40
Your Reference		36	37	38	39	40
Depth		0.0-0.4	0.0-0.5	0.0-0.15	0.0-0.15	0.0-0.2
Date Sampled		07/08/2017	04/08/2017	04/08/2017	08/08/2017	08/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Date analysed	-	16/08/2017	16/08/2017	16/08/2017	16/08/2017	16/08/2017
Moisture	%	14	22	19	16	12

Moisture		
Our Reference		173257-41
Your Reference	UNITS	41
Depth		0.0-0.15
Date Sampled		08/08/2017
Type of sample		Soil
Date prepared	-	15/08/2017
Date analysed	-	16/08/2017
Moisture	%	19



**Misc Soil - Inorg**

Our Reference		173257-3	173257-14	173257-15	173257-16	173257-17
Your Reference	UNITS	3	14	15	16	17
Depth		0.0-0.3	0.0-0.05	0.0-0.1	0.0-0.08	0.0-0.15
Date Sampled		07/08/2017	07/08/2017	04/08/2017	04/08/2017	07/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Date analysed	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	8

**Misc Soil - Inorg**

Our Reference		173257-18	173257-19	173257-20	173257-21
Your Reference	UNITS	18	19	20	21
Depth		0.0-0.2	0.0-0.15	0.0-0.1	0.0-0.1
Date Sampled		07/08/2017	07/08/2017	07/08/2017	04/08/2017
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Date analysed	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5

Asbestos ID - soils						
Our Reference	UNITS	173257-2	173257-3	173257-14	173257-15	173257-16
Your Reference		2	3	14	15	16
Depth		0.0-0.2	0.0-0.3	0.0-0.05	0.0-0.1	0.0-0.08
Date Sampled		07/08/2017	07/08/2017	07/08/2017	04/08/2017	04/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	17/08/2017	17/08/2017	17/08/2017	17/08/2017	17/08/2017
Sample mass tested	g	Approx. 35g	Approx. 25g	Approx. 30g	Approx. 35g	Approx. 70g
Sample Description	-	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg  Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg  Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg  Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg  Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg  Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils						
Our Reference	UNITS	173257-17	173257-18	173257-19	173257-27	173257-36
Your Reference		17	18	19	27	36
Depth		0.0-0.15	0.0-0.2	0.0-0.15	0.0-0.3	0.0-0.4
Date Sampled		07/08/2017	07/08/2017	07/08/2017	04/08/2017	07/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	17/08/2017	17/08/2017	17/08/2017	17/08/2017	17/08/2017
Sample mass tested	g	Approx. 25g	Approx. 25g	Approx. 25g	Approx. 45g	Approx. 50g
Sample Description	-	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg  Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg  Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg  Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg  Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg  Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils			
Our Reference		173257-39	173257-41
Your Reference	UNITS	39	41
Depth		0.0-0.15	0.0-0.15
Date Sampled		08/08/2017	08/08/2017
Type of sample		Soil	Soil
Date analysed	-	17/08/2017	17/08/2017
Sample mass tested	g	Approx. 10g	Approx. 15g
Sample Description	-	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg  Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg  Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected

Asbestos ID - materials		
Our Reference		173257-42
Your Reference	UNITS	39
Depth		0.15
Date Sampled		08/08/2017
Type of sample		Material
Date analysed	-	16/08/2017
Mass / Dimension of Sample	-	70x42x4mm
Sample Description	-	Grey compressed fibre cement material
Asbestos ID in materials	-	Chrysotile asbestos detected



**Misc Inorg - Soil**

Our Reference		173257-43	173257-44	173257-45	173257-46	173257-47
Your Reference	UNITS	1	1	1	1	1
Depth		0.5	1.0	1.5	2.0	2.5
Date Sampled		07/08/2017	07/08/2017	07/08/2017	07/08/2017	07/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/08/2017	14/08/2017	14/08/2017	14/08/2017	14/08/2017
Date analysed	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
pH 1:5 soil:water	pH Units	5.6	5.8	6.6	6.7	7.4
Electrical Conductivity 1:5 soil:water	µS/cm	110	580	810	750	650
Chloride, Cl 1:5 soil:water	mg/kg	30	[NA]	960	[NA]	[NA]
Sulphate, SO4 1:5 soil:water	mg/kg	81	[NA]	360	[NA]	[NA]

**Misc Inorg - Soil**

Our Reference		173257-48	173257-49	173257-50	173257-51	173257-52
Your Reference	UNITS	1	2	2	2	2
Depth		3.0	0.5	1.0	1.5	2.0
Date Sampled		07/08/2017	07/08/2017	07/08/2017	07/08/2017	07/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/08/2017	14/08/2017	14/08/2017	14/08/2017	14/08/2017
Date analysed	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
pH 1:5 soil:water	pH Units	7.8	5.2	4.8	5.0	5.5
Electrical Conductivity 1:5 soil:water	µS/cm	610	74	410	880	510
Chloride, Cl 1:5 soil:water	mg/kg	720	[NA]	510	[NA]	[NA]
Sulphate, SO4 1:5 soil:water	mg/kg	230	[NA]	160	[NA]	[NA]

**Misc Inorg - Soil**

Our Reference		173257-53	173257-54	173257-55	173257-56	173257-57
Your Reference	UNITS	2	2	3	3	3
Depth		2.5	3.0	0.5	1.0	1.5
Date Sampled		07/08/2017	07/08/2017	07/08/2017	07/08/2017	07/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/08/2017	14/08/2017	14/08/2017	14/08/2017	14/08/2017
Date analysed	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
pH 1:5 soil:water	pH Units	6.5	6.7	6.3	5.5	4.6
Electrical Conductivity 1:5 soil:water	µS/cm	340	340	48	79	490
Chloride, Cl 1:5 soil:water	mg/kg	[NA]	[NA]	[NA]	[NA]	530
Sulphate, SO4 1:5 soil:water	mg/kg	[NA]	[NA]	[NA]	[NA]	280

**Misc Inorg - Soil**

Our Reference		173257-58	173257-59	173257-60	173257-61	173257-62
Your Reference	UNITS	3	3	3	4	4
Depth		2.0	2.5	3.0	0.5	1.0
Date Sampled		07/08/2017	07/08/2017	07/08/2017	07/08/2017	07/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/08/2017	14/08/2017	14/08/2017	14/08/2017	14/08/2017
Date analysed	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
pH 1:5 soil:water	pH Units	4.7	4.6	4.7	5.6	5.2
Electrical Conductivity 1:5 soil:water	µS/cm	660	750	640	58	140

**Misc Inorg - Soil**

Our Reference		173257-63	173257-64	173257-65	173257-66	173257-67
Your Reference	UNITS	4	4	4	4	5
Depth		1.5	2.0	2.5	3.0	0.5
Date Sampled		07/08/2017	07/08/2017	07/08/2017	07/08/2017	07/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/08/2017	14/08/2017	14/08/2017	14/08/2017	14/08/2017
Date analysed	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
pH 1:5 soil:water	pH Units	5.1	5.0	4.9	5.0	7.0
Electrical Conductivity 1:5 soil:water	µS/cm	260	390	650	620	120
Chloride, Cl 1:5 soil:water	mg/kg	[NA]	460	[NA]	[NA]	[NA]
Sulphate, SO4 1:5 soil:water	mg/kg	[NA]	180	[NA]	[NA]	[NA]

**Misc Inorg - Soil**

Our Reference		173257-68	173257-69	173257-70	173257-71	173257-72
Your Reference	UNITS	5	5	5	5	5
Depth		1.0	1.5	2.0	2.5	3.0
Date Sampled		07/08/2017	07/08/2017	07/08/2017	07/08/2017	07/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/08/2017	14/08/2017	14/08/2017	14/08/2017	14/08/2017
Date analysed	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
pH 1:5 soil:water	pH Units	6.1	7.0	8.1	8.1	8.4
Electrical Conductivity 1:5 soil:water	µS/cm	660	600	320	280	280
Chloride, Cl 1:5 soil:water	mg/kg	[NA]	[NA]	[NA]	250	[NA]
Sulphate, SO4 1:5 soil:water	mg/kg	[NA]	[NA]	[NA]	90	[NA]

**Misc Inorg - Soil**

Our Reference		173257-73	173257-74	173257-75	173257-76	173257-77
Your Reference	UNITS	6	6	6	7	7
Depth		0.5	1.0	1.5	0.5	1.0
Date Sampled		08/08/2017	08/08/2017	08/08/2017	07/08/2017	07/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/08/2017	14/08/2017	14/08/2017	14/08/2017	14/08/2017
Date analysed	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
pH 1:5 soil:water	pH Units	5.2	5.1	5.2	5.7	5.9
Electrical Conductivity 1:5 soil:water	µS/cm	36	96	100	42	400
Chloride, Cl 1:5 soil:water	mg/kg	[NA]	28	78	[NA]	[NA]
Sulphate, SO4 1:5 soil:water	mg/kg	[NA]	73	54	[NA]	[NA]

**Misc Inorg - Soil**

Our Reference		173257-78	173257-79	173257-80	173257-81	173257-82
Your Reference	UNITS	7	7	7	7	8
Depth		1.5	2.0	2.5	3.0	0.5
Date Sampled		07/08/2017	07/08/2017	07/08/2017	07/08/2017	07/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/08/2017	14/08/2017	14/08/2017	14/08/2017	14/08/2017
Date analysed	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
pH 1:5 soil:water	pH Units	7.0	8.1	8.3	8.4	5.9
Electrical Conductivity 1:5 soil:water	µS/cm	570	330	540	330	62
Chloride, Cl 1:5 soil:water	mg/kg	[NA]	[NA]	[NA]	370	31
Sulphate, SO4 1:5 soil:water	mg/kg	[NA]	[NA]	[NA]	63	10

**Misc Inorg - Soil**

Our Reference		173257-83	173257-84	173257-85	173257-86	173257-87
Your Reference	UNITS	8	8	9	9	9
Depth		1.0	1.5	0.5	1.0	1.5
Date Sampled		07/08/2017	07/08/2017	07/08/2017	07/08/2017	07/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/08/2017	14/08/2017	14/08/2017	14/08/2017	14/08/2017
Date analysed	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
pH 1:5 soil:water	pH Units	9.5	7.9	5.7	5.2	5.0
Electrical Conductivity 1:5 soil:water	µS/cm	510	250	42	70	180
Chloride, Cl 1:5 soil:water	mg/kg	[NA]	270	[NA]	40	[NA]
Sulphate, SO4 1:5 soil:water	mg/kg	[NA]	47	[NA]	39	[NA]

Misc Inorg - Soil						
Our Reference		173257-88	173257-89	173257-90	173257-91	173257-92
Your Reference	UNITS	9	10	10	10	10
Depth		2.0	0.5	1.0	1.5	2.0
Date Sampled		07/08/2017	07/08/2017	07/08/2017	07/08/2017	07/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/08/2017	14/08/2017	14/08/2017	14/08/2017	14/08/2017
Date analysed	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
pH 1:5 soil:water	pH Units	5.0	5.7	5.5	5.3	6.9
Electrical Conductivity 1:5 soil:water	µS/cm	240	59	66	22	54
Chloride, Cl 1:5 soil:water	mg/kg	230	[NA]	[NA]	<10	[NA]
Sulphate, SO4 1:5 soil:water	mg/kg	84	[NA]	[NA]	<10	[NA]

Misc Inorg - Soil						
Our Reference		173257-93	173257-94	173257-95	173257-96	173257-97
Your Reference	UNITS	11	11	11	11	11
Depth		0.5	1.0	1.5	2.0	2.5
Date Sampled		07/08/2017	07/08/2017	07/08/2017	07/08/2017	07/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/08/2017	14/08/2017	14/08/2017	14/08/2017	14/08/2017
Date analysed	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
pH 1:5 soil:water	pH Units	5.3	5.5	5.1	5.1	5.1
Electrical Conductivity 1:5 soil:water	µS/cm	33	32	170	190	220
Chloride, Cl 1:5 soil:water	mg/kg	[NA]	[NA]	[NA]	190	[NA]
Sulphate, SO4 1:5 soil:water	mg/kg	[NA]	[NA]	[NA]	69	[NA]

Misc Inorg - Soil						
Our Reference		173257-98	173257-99	173257-100	173257-101	173257-102
Your Reference	UNITS	12	12	12	12	12
Depth		0.5	1.0	1.5	2.0	2.5
Date Sampled		07/08/2017	07/08/2017	07/08/2017	07/08/2017	07/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/08/2017	14/08/2017	14/08/2017	14/08/2017	14/08/2017
Date analysed	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
pH 1:5 soil:water	pH Units	6.6	6.9	7.0	7.2	7.4
Electrical Conductivity 1:5 soil:water	µS/cm	23	23	26	48	79
Chloride, Cl 1:5 soil:water	mg/kg	[NA]	[NA]	[NA]	[NA]	31
Sulphate, SO4 1:5 soil:water	mg/kg	[NA]	[NA]	[NA]	[NA]	21



Misc Inorg - Soil						
Our Reference		173257-103	173257-104	173257-105	173257-106	173257-107
Your Reference	UNITS	13	13	13	13	13
Depth		0.5	1.0	1.5	2.0	2.5
Date Sampled		07/08/2017	07/08/2017	07/08/2017	07/08/2017	07/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/08/2017	14/08/2017	14/08/2017	14/08/2017	14/08/2017
Date analysed	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
pH 1:5 soil:water	pH Units	5.8	5.1	5.6	5.9	6.9
Electrical Conductivity 1:5 soil:water	µS/cm	94	110	60	49	56
Chloride, Cl 1:5 soil:water	mg/kg	[NA]	[NA]	10	[NA]	20
Sulphate, SO4 1:5 soil:water	mg/kg	[NA]	[NA]	71	[NA]	10

Misc Inorg - Soil		
Our Reference		173257-108
Your Reference	UNITS	13
Depth		3.0
Date Sampled		07/08/2017
Type of sample		Soil
Date prepared	-	14/08/2017
Date analysed	-	15/08/2017
pH 1:5 soil:water	pH Units	8.0
Electrical Conductivity 1:5 soil:water	µS/cm	130
Chloride, Cl 1:5 soil:water	mg/kg	52
Sulphate, SO4 1:5 soil:water	mg/kg	20

ESP/CEC						
Our Reference		173257-50	173257-69	173257-77	173257-82	173257-83
Your Reference	UNITS	2	5	7	8	8
Depth		1.0	1.5	1.0	0.5	1.0
Date Sampled		07/08/2017	07/08/2017	07/08/2017	07/08/2017	07/08/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/08/2017	14/08/2017	14/08/2017	14/08/2017	14/08/2017
Date analysed	-	15/08/2017	15/08/2017	15/08/2017	15/08/2017	15/08/2017
Exchangeable Ca	meq/100g	0.3	1.5	0.2	4.9	15
Exchangeable K	meq/100g	0.2	0.1	<0.1	0.3	0.2
Exchangeable Mg	meq/100g	8.3	7.1	4.9	9.7	11
Exchangeable Na	meq/100g	2.5	2.6	3.2	1.2	2.2
Cation Exchange Capacity	meq/100g	11	11	8.5	16	29
ESP	%	22	23	38	8	7

ESP/CEC				
Our Reference		173257-88	173257-90	173257-94
Your Reference	UNITS	9	10	11
Depth		2.0	1.0	1.0
Date Sampled		07/08/2017	07/08/2017	07/08/2017
Type of sample		Soil	Soil	Soil
Date prepared	-	14/08/2017	14/08/2017	14/08/2017
Date analysed	-	15/08/2017	15/08/2017	15/08/2017
Exchangeable Ca	meq/100g	0.5	5.4	0.6
Exchangeable K	meq/100g	0.2	0.2	0.2
Exchangeable Mg	meq/100g	7.0	4.0	4.5
Exchangeable Na	meq/100g	3.0	1.0	1.4
Cation Exchange Capacity	meq/100g	11	11	6.6
ESP	%	28	10	20

Method ID	Methodology Summary
<b>ASB-001</b>	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
<b>Inorg-001</b>	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
<b>Inorg-002</b>	Conductivity and Salinity - measured using a conductivity cell at 25°C in accordance with APHA latest edition 2510 and Rayment & Lyons.
<b>Inorg-008</b>	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
<b>Inorg-024</b>	Hexavalent Chromium (Cr6+) - determined colourimetrically.
<b>Inorg-031</b>	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
<b>Inorg-081</b>	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
<b>Metals-009</b>	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-AES analytical finish.
<b>Metals-020</b>	Determination of various metals by ICP-AES.
<b>Metals-021</b>	Determination of Mercury by Cold Vapour AAS.
<b>Org-003</b>	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 (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
<b>Org-003</b>	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 (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.  Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
<b>Org-005</b>	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
<b>Org-005</b>	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
<b>Org-006</b>	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
<b>Org-006</b>	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PCBs" is simply a sum of the positive individual PCBs.
<b>Org-008</b>	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
<b>Org-012</b>	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. For soil results:- 1. 'EQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
<b>Org-014</b>	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
<b>Org-016</b>	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)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
<b>Org-016</b>	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)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	173257-14
Date extracted	-			15/08/2017	3	15/08/2017	15/08/2017		15/08/2017	15/08/2017
Date analysed	-			16/08/2017	3	16/08/2017	16/08/2017		16/08/2017	16/08/2017
TRH C <sub>6</sub> - C <sub>9</sub>	mg/kg	25	Org-016	<25	3	<25	<25	0	104	99
TRH C <sub>6</sub> - C <sub>10</sub>	mg/kg	25	Org-016	<25	3	<25	<25	0	104	99
Benzene	mg/kg	0.2	Org-016	<0.2	3	<0.2	<0.2	0	102	90
Toluene	mg/kg	0.5	Org-016	<0.5	3	<0.5	<0.5	0	97	85
Ethylbenzene	mg/kg	1	Org-016	<1	3	<1	<1	0	103	98
m+p-xylene	mg/kg	2	Org-016	<2	3	<2	<2	0	108	112
o-Xylene	mg/kg	1	Org-016	<1	3	<1	<1	0	112	127
naphthalene	mg/kg	1	Org-014	<1	3	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	106	3	102	96	6	108	97

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	15	15/08/2017	15/08/2017		[NT]	[NT]
Date analysed	-			[NT]	15	16/08/2017	16/08/2017		[NT]	[NT]
TRH C <sub>6</sub> - C <sub>9</sub>	mg/kg	25	Org-016	[NT]	15	<25	<25	0	[NT]	[NT]
TRH C <sub>6</sub> - C <sub>10</sub>	mg/kg	25	Org-016	[NT]	15	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-016	[NT]	15	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-016	[NT]	15	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-016	[NT]	15	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-016	[NT]	15	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-016	[NT]	15	<1	<1	0	[NT]	[NT]
naphthalene	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	[NT]	15	101	103	2	[NT]	[NT]



QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	173257-14
Date extracted	-			14/08/2017	3	15/08/2017	15/08/2017		14/08/2017	14/08/2017
Date analysed	-			15/08/2017	3	15/08/2017	15/08/2017		15/08/2017	15/08/2017
TRH C <sub>10</sub> - C <sub>14</sub>	mg/kg	50	Org-003	<50	3	<50	<50	0	107	#
TRH C <sub>15</sub> - C <sub>28</sub>	mg/kg	100	Org-003	<100	3	<100	<100	0	106	#
TRH C <sub>29</sub> - C <sub>36</sub>	mg/kg	100	Org-003	<100	3	<100	<100	0	106	#
TRH >C <sub>10</sub> -C <sub>16</sub>	mg/kg	50	Org-003	<50	3	<50	<50	0	107	#
TRH >C <sub>16</sub> -C <sub>34</sub>	mg/kg	100	Org-003	<100	3	<100	<100	0	106	#
TRH >C <sub>34</sub> -C <sub>40</sub>	mg/kg	100	Org-003	<100	3	<100	<100	0	106	#
Surrogate o-Terphenyl	%		Org-003	94	3	97	94	3	101	#

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	15	15/08/2017	15/08/2017		[NT]	[NT]
Date analysed	-			[NT]	15	15/08/2017	15/08/2017		[NT]	[NT]
TRH C <sub>10</sub> - C <sub>14</sub>	mg/kg	50	Org-003	[NT]	15	<50	<50	0	[NT]	[NT]
TRH C <sub>15</sub> - C <sub>28</sub>	mg/kg	100	Org-003	[NT]	15	<100	<100	0	[NT]	[NT]
TRH C <sub>29</sub> - C <sub>36</sub>	mg/kg	100	Org-003	[NT]	15	<100	<100	0	[NT]	[NT]
TRH >C <sub>10</sub> -C <sub>16</sub>	mg/kg	50	Org-003	[NT]	15	<50	<50	0	[NT]	[NT]
TRH >C <sub>16</sub> -C <sub>34</sub>	mg/kg	100	Org-003	[NT]	15	<100	<100	0	[NT]	[NT]
TRH >C <sub>34</sub> -C <sub>40</sub>	mg/kg	100	Org-003	[NT]	15	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-003	[NT]	15	94	93	1	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	173257-14
Date extracted	-			15/08/2017	3	15/08/2017	15/08/2017		15/08/2017	15/08/2017
Date analysed	-			15/08/2017	3	15/08/2017	15/08/2017		15/08/2017	15/08/2017
Naphthalene	mg/kg	0.1	Org-012	<0.1	3	<0.1	<0.1	0	84	#
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	3	<0.1	<0.1	0	96	#
Phenanthrene	mg/kg	0.1	Org-012	<0.1	3	<0.1	<0.1	0	94	#
Anthracene	mg/kg	0.1	Org-012	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	3	<0.1	<0.1	0	86	#
Pyrene	mg/kg	0.1	Org-012	<0.1	3	<0.1	<0.1	0	88	#
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	3	<0.1	<0.1	0	79	66
Benzo(b,j,k)fluoranthene	mg/kg	0.2	Org-012	<0.2	3	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	3	<0.05	<0.05	0	85	94
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	95	3	90	92	2	116	81

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	15	15/08/2017	15/08/2017		[NT]	[NT]
Date analysed	-			[NT]	15	15/08/2017	15/08/2017		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j,k)fluoranthene	mg/kg	0.2	Org-012	[NT]	15	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	[NT]	15	<0.05	<0.05	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	[NT]	15	99	99	0	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	173257-14
Date extracted	-			15/08/2017	3	15/08/2017	15/08/2017		15/08/2017	15/08/2017
Date analysed	-			15/08/2017	3	15/08/2017	15/08/2017		15/08/2017	15/08/2017
HCB	mg/kg	0.1	Org-005	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	3	<0.1	<0.1	0	76	66
gamma-BHC	mg/kg	0.1	Org-005	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	<0.1	3	<0.1	<0.1	0	80	62
Heptachlor	mg/kg	0.1	Org-005	<0.1	3	<0.1	<0.1	0	89	71
delta-BHC	mg/kg	0.1	Org-005	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	<0.1	3	<0.1	<0.1	0	97	74
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	3	<0.1	<0.1	0	91	71
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	<0.1	3	<0.1	<0.1	0	82	63
Dieldrin	mg/kg	0.1	Org-005	<0.1	3	<0.1	<0.1	0	101	82
Endrin	mg/kg	0.1	Org-005	<0.1	3	<0.1	<0.1	0	87	73
pp-DDD	mg/kg	0.1	Org-005	<0.1	3	<0.1	<0.1	0	78	69
Endosulfan II	mg/kg	0.1	Org-005	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	3	<0.1	<0.1	0	95	81
Methoxychlor	mg/kg	0.1	Org-005	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	94	3	96	94	2	105	83

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	173257-31
Date extracted	-			[NT]	15	15/08/2017	15/08/2017		15/08/2017	15/08/2017
Date analysed	-			[NT]	15	15/08/2017	15/08/2017		15/08/2017	15/08/2017
HCB	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	80	86
gamma-BHC	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	78	81
Heptachlor	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	81	78
delta-BHC	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	97	101
Heptachlor Epoxide	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	91	94
gamma-Chlordane	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	82	85
Dieldrin	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	102	104
Endrin	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	81	81
pp-DDD	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	79	82
Endosulfan II	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	66	72
Methoxychlor	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	[NT]	15	94	95	1	109	92



QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	30	15/08/2017	15/08/2017		[NT]	[NT]
Date analysed	-			[NT]	30	15/08/2017	15/08/2017		[NT]	[NT]
HCB	mg/kg	0.1	Org-005	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-005	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-005	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-005	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-005	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-005	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-005	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-005	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-005	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-005	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-005	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	[NT]	30	93	93	0	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	17	15/08/2017	16/08/2017		[NT]	[NT]
Date analysed	-			[NT]	17	15/08/2017	17/08/2017		[NT]	[NT]
HCB	mg/kg	0.1	Org-005	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-005	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-005	[NT]	17	0.5	0.4	22	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-005	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	[NT]	17	1.2	0.8	40	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-005	[NT]	17	1.1	1	10	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-005	[NT]	17	2.6	2.5	4	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	[NT]	17	0.4	0.4	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-005	[NT]	17	25	24	4	[NT]	[NT]
Endrin	mg/kg	0.1	Org-005	[NT]	17	0.1	0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-005	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-005	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	[NT]	17	<0.3	<0.1	100	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-005	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	[NT]	17	126	118	7	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	173257-14
Date extracted	-			15/08/2017	3	15/08/2017	15/08/2017		15/08/2017	15/08/2017
Date analysed	-			15/08/2017	3	15/08/2017	15/08/2017		15/08/2017	15/08/2017
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos	mg/kg	0.1	Org-008	<0.1	3	<0.1	<0.1	0	87	85
Chlorpyrifos-methyl	mg/kg	0.1	Org-008	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	3	<0.1	<0.1	0	86	111
Dimethoate	mg/kg	0.1	Org-008	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	<0.1	3	<0.1	<0.1	0	97	99
Fenitrothion	mg/kg	0.1	Org-008	<0.1	3	<0.1	<0.1	0	91	77
Malathion	mg/kg	0.1	Org-008	<0.1	3	<0.1	<0.1	0	78	81
Parathion	mg/kg	0.1	Org-008	<0.1	3	<0.1	<0.1	0	88	63
Ronnel	mg/kg	0.1	Org-008	<0.1	3	<0.1	<0.1	0	97	88
Surrogate TCMX	%		Org-008	94	3	96	94	2	91	65

QUALITY CONTROL: Organophosphorus Pesticides					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	173257-31
Date extracted	-			[NT]	15	15/08/2017	15/08/2017		15/08/2017	15/08/2017
Date analysed	-			[NT]	15	15/08/2017	15/08/2017		15/08/2017	15/08/2017
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	94	91
Chlorpyrifos-methyl	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	96	94
Dimethoate	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	104	101
Fenitrothion	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	97	88
Malathion	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	76	74
Parathion	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	91	90
Ronnel	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	101	97
Surrogate TCMX	%		Org-008	[NT]	15	94	95	1	92	91

QUALITY CONTROL: Organophosphorus Pesticides						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	30	15/08/2017	15/08/2017		[NT]	[NT]
Date analysed	-			[NT]	30	15/08/2017	15/08/2017		[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos	mg/kg	0.1	Org-008	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-008	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-008	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-008	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-008	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-008	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-008	[NT]	30	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-008	[NT]	30	93	93	0	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	17	15/08/2017	16/08/2017		[NT]	[NT]
Date analysed	-			[NT]	17	15/08/2017	17/08/2017		[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos	mg/kg	0.1	Org-008	[NT]	17	0.2	0.2	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-008	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-008	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-008	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-008	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-008	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-008	[NT]	17	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-008	[NT]	17	126	118	7	[NT]	[NT]



QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	173257-14
Date extracted	-			15/08/2017	3	15/08/2017	15/08/2017		15/08/2017	15/08/2017
Date analysed	-			15/08/2017	3	15/08/2017	15/08/2017		15/08/2017	15/08/2017
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	3	<0.1	<0.1	0	102	102
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	3	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	94	3	96	94	2	91	65

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	15	15/08/2017	15/08/2017		[NT]	[NT]
Date analysed	-			[NT]	15	15/08/2017	15/08/2017		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	[NT]	15	94	95	1	[NT]	[NT]

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	17	15/08/2017	16/08/2017		[NT]	[NT]
Date analysed	-			[NT]	17	15/08/2017	17/08/2017		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	[NT]	17	<1	<1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	[NT]	17	<1	<1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	[NT]	17	<1	<1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	[NT]	17	<1	<1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	[NT]	17	<1	<1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	[NT]	17	<1	<1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	[NT]	17	<1	<1	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	[NT]	17	126	118	7	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	173257-14
Date prepared	-			15/08/2017	3	15/08/2017	15/08/2017		15/08/2017	15/08/2017
Date analysed	-			16/08/2017	3	16/08/2017	16/08/2017		16/08/2017	16/08/2017
Arsenic	mg/kg	4	Metals-020	<4	3	8	7	13	105	106
Cadmium	mg/kg	0.4	Metals-020	<0.4	3	<0.4	<0.4	0	95	98
Chromium	mg/kg	1	Metals-020	<1	3	15	15	0	101	104
Lead	mg/kg	1	Metals-020	<1	3	21	19	10	102	100
Mercury	mg/kg	0.1	Metals-021	<0.1	3	<0.1	<0.1	0	104	102
Nickel	mg/kg	1	Metals-020	<1	3	16	16	0	97	103
Zinc	mg/kg	1	Metals-020	<1	3	53	51	4	99	84
Copper	mg/kg	1	Metals-020	<1	3	26	26	0	105	109
Manganese	mg/kg	1	Metals-020	<1	30	940	800	16	120	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	173257-31
Date prepared	-			[NT]	15	15/08/2017	15/08/2017		15/08/2017	15/08/2017
Date analysed	-			[NT]	15	16/08/2017	16/08/2017		16/08/2017	16/08/2017
Arsenic	mg/kg	4	Metals-020	[NT]	15	9	8	12	112	103
Cadmium	mg/kg	0.4	Metals-020	[NT]	15	<0.4	<0.4	0	98	97
Chromium	mg/kg	1	Metals-020	[NT]	15	15	13	14	107	105
Lead	mg/kg	1	Metals-020	[NT]	15	27	21	25	105	103
Mercury	mg/kg	0.1	Metals-021	[NT]	15	<0.1	<0.1	0	104	103
Nickel	mg/kg	1	Metals-020	[NT]	15	16	13	21	102	107
Zinc	mg/kg	1	Metals-020	[NT]	15	42	41	2	104	116
Copper	mg/kg	1	Metals-020	[NT]	15	24	22	9	109	124
Manganese	mg/kg	1	Metals-020	[NT]	37	2500	2000	22	126	#

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date prepared	-			[NT]	30	15/08/2017	15/08/2017		15/08/2017	[NT]
Date analysed	-			[NT]	30	16/08/2017	16/08/2017		16/08/2017	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	30	8	7	13	106	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	30	<0.4	<0.4	0	95	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	30	13	13	0	103	[NT]
Lead	mg/kg	1	Metals-020	[NT]	30	19	18	5	102	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	30	<0.1	<0.1	0	100	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	30	10	12	18	100	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	30	46	48	4	101	[NT]
Copper	mg/kg	1	Metals-020	[NT]	30	11	12	9	106	[NT]
Manganese	mg/kg	1	Metals-020	[NT]	[NT]	[NT]	[NT]	[NT]	119	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	37	15/08/2017	15/08/2017		[NT]	[NT]
Date analysed	-			[NT]	37	16/08/2017	16/08/2017		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	37	7	6	15	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	37	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	37	11	11	0	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	37	18	15	18	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	37	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	37	19	20	5	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	37	46	51	10	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	37	22	17	26	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	41	15/08/2017	15/08/2017		[NT]	[NT]
Date analysed	-			[NT]	41	16/08/2017	16/08/2017		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	41	7	9	25	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	41	2	2	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	41	19	24	23	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	41	170	200	16	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	41	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	41	21	21	0	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	41	1300	2000	42	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	41	94	65	36	[NT]	[NT]

QUALITY CONTROL: Misc Soil - Inorg					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	173257-31
Date prepared	-			18/08/2017	30	18/08/2017	18/08/2017		18/08/2017	18/08/2017
Date analysed	-			18/08/2017	30	18/08/2017	18/08/2017		18/08/2017	18/08/2017
Hexavalent Chromium, Cr <sup>6+</sup>	mg/kg	1	Inorg-024	<1	30	<1	<1	0	85	#

QUALITY CONTROL: Misc Soil - Inorg					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	173257-4
Date prepared	-			[NT]	37	18/08/2017	18/08/2017		18/08/2017	18/08/2017
Date analysed	-			[NT]	37	18/08/2017	18/08/2017		18/08/2017	18/08/2017
Hexavalent Chromium, Cr <sup>6+</sup>	mg/kg	1	Inorg-024	[NT]	37	<1	<1	0	84	#

QUALITY CONTROL: Misc Soil - Inorg					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	1	18/08/2017	18/08/2017		[NT]	[NT]
Date analysed	-			[NT]	1	18/08/2017	18/08/2017		[NT]	[NT]
Hexavalent Chromium, Cr <sup>6+</sup>	mg/kg	1	Inorg-024	[NT]	1	<1	<1	0	[NT]	[NT]



QUALITY CONTROL: Misc Soil - Inorg					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	173257-14
Date prepared	-			15/08/2017	3	15/08/2017	15/08/2017		15/08/2017	15/08/2017
Date analysed	-			15/08/2017	3	15/08/2017	15/08/2017		15/08/2017	15/08/2017
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	3	<5	<5	0	99	107

QUALITY CONTROL: Misc Soil - Inorg					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	21	15/08/2017	15/08/2017		[NT]	[NT]
Date analysed	-			[NT]	21	15/08/2017	15/08/2017		[NT]	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	[NT]	21	<5	<5	0	[NT]	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	173257-45
Date prepared	-			14/08/2017	43	14/08/2017	14/08/2017		14/08/2017	14/08/2017
Date analysed	-			14/08/2017	43	15/08/2017	15/08/2017		14/08/2017	14/08/2017
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	43	5.6	5.4	4	101	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	<1	43	110	140	24	103	[NT]
Chloride, Cl 1:5 soil:water	mg/kg	10	Inorg-081	<10	43	30	42	33	94	#
Sulphate, SO4 1:5 soil:water	mg/kg	10	Inorg-081	<10	43	81	110	30	110	#

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date prepared	-			[NT]	57	14/08/2017	14/08/2017		14/08/2017	[NT]
Date analysed	-			[NT]	57	15/08/2017	15/08/2017		14/08/2017	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	57	4.6	4.7	2	101	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	[NT]	57	490	460	6	102	[NT]
Chloride, Cl 1:5 soil:water	mg/kg	10	Inorg-081	[NT]	57	530	510	4	98	[NT]
Sulphate, SO4 1:5 soil:water	mg/kg	10	Inorg-081	[NT]	57	280	290	4	114	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-3	[NT]
Date prepared	-			[NT]	64	14/08/2017	14/08/2017		14/08/2017	[NT]
Date analysed	-			[NT]	64	15/08/2017	15/08/2017		14/08/2017	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	64	5.0	5.0	0	101	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	[NT]	64	390	430	10	101	[NT]
Chloride, Cl 1:5 soil:water	mg/kg	10	Inorg-081	[NT]	64	460	530	14	97	[NT]
Sulphate, SO4 1:5 soil:water	mg/kg	10	Inorg-081	[NT]	64	180	180	0	112	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	74	14/08/2017	14/08/2017		[NT]	[NT]
Date analysed	-			[NT]	74	15/08/2017	15/08/2017		[NT]	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	74	5.1	5.3	4	[NT]	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	[NT]	74	96	73	27	[NT]	[NT]
Chloride, Cl 1:5 soil:water	mg/kg	10	Inorg-081	[NT]	74	28	23	20	[NT]	[NT]
Sulphate, SO4 1:5 soil:water	mg/kg	10	Inorg-081	[NT]	74	73	53	32	[NT]	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	84	14/08/2017	14/08/2017		[NT]	[NT]
Date analysed	-			[NT]	84	15/08/2017	15/08/2017		[NT]	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	84	7.9	6.9	14	[NT]	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	[NT]	84	250	230	8	[NT]	[NT]
Chloride, Cl 1:5 soil:water	mg/kg	10	Inorg-081	[NT]	84	270	270	0	[NT]	[NT]
Sulphate, SO4 1:5 soil:water	mg/kg	10	Inorg-081	[NT]	84	47	45	4	[NT]	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	96	14/08/2017	14/08/2017		[NT]	[NT]
Date analysed	-			[NT]	96	15/08/2017	15/08/2017		[NT]	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	96	5.1	5.2	2	[NT]	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	[NT]	96	190	190	0	[NT]	[NT]
Chloride, Cl 1:5 soil:water	mg/kg	10	Inorg-081	[NT]	96	190	190	0	[NT]	[NT]
Sulphate, SO4 1:5 soil:water	mg/kg	10	Inorg-081	[NT]	96	69	70	1	[NT]	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	102	14/08/2017	14/08/2017		[NT]	[NT]
Date analysed	-			[NT]	102	15/08/2017	15/08/2017		[NT]	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	102	7.4	7.5	1	[NT]	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	[NT]	102	79	74	7	[NT]	[NT]
Chloride, Cl 1:5 soil:water	mg/kg	10	Inorg-081	[NT]	102	31	[NT]		[NT]	[NT]
Sulphate, SO4 1:5 soil:water	mg/kg	10	Inorg-081	[NT]	102	21	[NT]		[NT]	[NT]

QUALITY CONTROL: ESP/CEC						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			14/08/2017	94	14/08/2017	14/08/2017		14/08/2017	[NT]
Date analysed	-			15/08/2017	94	15/08/2017	15/08/2017		15/08/2017	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-009	<0.1	94	0.6	0.6	0	103	[NT]
Exchangeable K	meq/100g	0.1	Metals-009	<0.1	94	0.2	0.2	0	115	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-009	<0.1	94	4.5	4.3	5	101	[NT]
Exchangeable Na	meq/100g	0.1	Metals-009	<0.1	94	1.4	1.3	7	116	[NT]
ESP	%	1	Metals-009	[NT]	94	20	21	5	[NT]	[NT]



## Result Definitions

<b>NT</b>	Not tested
<b>NA</b>	Test not required
<b>INS</b>	Insufficient sample for this test
<b>PQL</b>	Practical Quantitation Limit
<b>&lt;</b>	Less than
<b>&gt;</b>	Greater than
<b>RPD</b>	Relative Percent Difference
<b>LCS</b>	Laboratory Control Sample
<b>NS</b>	Not specified
<b>NEPM</b>	National Environmental Protection Measure
<b>NR</b>	Not Reported

## Quality Control Definitions

<b>Blank</b>	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.
<b>Duplicate</b>	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.
<b>Matrix Spike</b>	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.
<b>LCS (Laboratory Control Sample)</b>	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.
<b>Surrogate Spike</b>	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.
Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.	

## 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 (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

## Report Comments

OC/OP/PCB in soil: PQL has been raised due to interference from analytes(other than those being tested) in the sample/s.

vTRH & BTEXN in Soil NEPM - PQL has been raised due to interference from analytes(other than those being tested) in the sample/s.

TRH Soil C10-C40 NEPM - PQL has been raised due to the high concentration of analytes in the sample/s, resulting in the sample/s requiring dilution.

PAHs in Soil - PQL has been raised due to the high concentration of analytes in the sample/s, resulting in the sample/s requiring dilution.

# Percent recovery is not possible to report due to interference from analytes (other than those being tested) in the sample/s.

# Percent recovery is not possible to report as the high concentration of analytes in the sample/s have caused interference.

PQL has been raised due to interference from analytes(other than those being tested) in the sample/s.

Acid Extractable Metals in Soils:

# Percent recovery is not possible to report due to the high concentration of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.

Asbestos: Excessive sample volume was provided for asbestos analysis. A portion of the supplied sample was sub-sampled according to Envirolab procedures. We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab recommends supplying 40-50g (50mL) of sample in its own container as per AS4964-2004.

Note: Samples for asbestos testing were sub-sampled from bags provided by the client.

MISC INORG

# Percent recovery is not possible to report due to the high concentration of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.

MISC\_INORG\_CRVI: # Percent recovery is not possible to report due to matrix interference. Sample was diluted and reanalysed and the poor recovery was confirmed. However an acceptable recovery was obtained for the LCS.

## Aileen Hie

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**From:** Nancy Zhang  
**Sent:** Wednesday, 23 August 2017 4:21 PM  
**To:** Emily McGinty  
**Cc:** Hugh Goymour; Chamali Nagodavithane; Customer Service  
**Subject:** RE: Results for Registration 173257 92237.00, 167-170 St Andrews, Varroville

Hi Emily,

No problem.

Envirolab Ref: 173257 A  
Due: 28/8/17  
3 day TIA.

Regards,

Nancy Zhang | Assistant Lab Manager | Envirolab Services Pty Ltd

*Great Science, Great Service.*

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T 612 9910 6200 F 612 9910 6201  
E [nzhang@envirolab.com.au](mailto:nzhang@envirolab.com.au) | W [www.envirolab.com.au](http://www.envirolab.com.au)

**Please note that all samples submitted to the Envirolab Group laboratories will be analysed under the Envirolab Group Terms and Conditions. The Terms and Conditions are accessible by clicking this link**

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**From:** Emily McGinty [mailto:[Emily.McGinty@douglaspartners.com.au](mailto:Emily.McGinty@douglaspartners.com.au)]  
**Sent:** Wednesday, 23 August 2017 3:45 PM  
**To:** Nancy Zhang <[NZhang@envirolab.com.au](mailto:NZhang@envirolab.com.au)>  
**Cc:** Hugh Goymour <[hugh.goymour@douglaspartners.com.au](mailto:hugh.goymour@douglaspartners.com.au)>; Chamali Nagodavithane <[Chamali.Nagodavithane@douglaspartners.com.au](mailto:Chamali.Nagodavithane@douglaspartners.com.au)>  
**Subject:** RE: Results for Registration 173257 92237.00, 167-170 St Andrews, Varroville

Hi Nancy,

Please can we carry out the following additional analysis on a 3 day turnaround (so results to come in by end Monday):

Sample 14 – TPH silica gel clean up  
Sample 17 – TPH silica gel clean up  
Sample 21 – TPH silica gel clean up

Thanks,

Emily.

---



**Emily McGinty** | Environmental Scientist  
**Douglas Partners Pty Ltd** | ABN 75 053 980 117 | [www.douglaspartners.com.au](http://www.douglaspartners.com.au)  
18 Waler Crescent Smeaton Grange NSW 2567  
P: 02 4647 0075 | F: 02 4646 1886 | E: [Emily.McGinty@douglaspartners.com.au](mailto:Emily.McGinty@douglaspartners.com.au)

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**From:** Nancy Zhang [<mailto:NZhang@envirolab.com.au>]  
**Sent:** Friday, 18 August 2017 5:07 PM  
**To:** Hugh Goymour; Emily McGinty  
**Subject:** Results for Registration 173257 92237.00, 167-170 St Andrews, Varroville

Please refer to attached for:  
a copy of the Certificate of Analysis  
a copy of the COC/paperwork received from you  
ESDAT Extracts  
an Excel or .csv file containing the results  
Please note that a hard copy will not be posted.

Enquiries should be made directly to:  
[customerservice@envirolab.com.au](mailto:customerservice@envirolab.com.au)

Regards

Envirolab Services  
12 Ashley St Chatswood NSW 2067  
ph 02 9910 6200 fax 02 9910 6201  
[customerservice@envirolab.com.au](mailto:customerservice@envirolab.com.au)  
[www.envirolab.com.au](http://www.envirolab.com.au)

Regards,

Nancy Zhang | Assistant Lab Manager | Envirolab Services Pty Ltd

*Great Science, Great Service.*

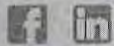
12 Ashley Street Chatswood NSW 2067  
T 612 9910 6200 F 612 9910 6201  
E [nzhang@envirolab.com.au](mailto:nzhang@envirolab.com.au) | W [www.envirolab.com.au](http://www.envirolab.com.au)



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PLEASE CONSIDER THE ENVIRONMENT BEFORE PRINTING THIS EMAIL

**Please note that all samples submitted to the Envirolab Group laboratories will be analysed under the Envirolab Conditions. The Terms and Conditions are accessible by clicking this link**

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## CERTIFICATE OF ANALYSIS 173257-A

### Client Details

<b>Client</b>	Douglas Partners Pty Ltd Smeaton Grange
<b>Attention</b>	Hugh Goymour, Emily McGinty
<b>Address</b>	18 Waler Crescent, Smeaton Grange, NSW, 2567

### Sample Details

<b>Your Reference</b>	<b>92237.00, 167-170 St Andrews, Varroville</b>
<b>Number of Samples</b>	Additional Testing on 3 Soils
<b>Date samples received</b>	11/08/2017
<b>Date completed instructions received</b>	23/08/2017

### 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.

### Report Details

<b>Date results requested by</b>	28/08/2017
<b>Date of Issue</b>	28/08/2017
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. <b>Tests not covered by NATA are denoted with *</b>	

### Report Comments

Both pre and post silica results reported as the extraction had to be repeated. Gives a better indication of clean up process.

TRH Soil C10-C40 NEPM/Silica - # Percent recovery is not possible to report as the high concentration of analytes in the sample/s have caused interference.

#### Asbestos Approved By

Analysed by Asbestos Approved Identifier: Jessica Hie, Paul Ching  
 Authorised by Asbestos Approved Signatory: Lulu Scott

#### Results Approved By

Jeremy Faircloth, Organics Supervisor

#### Authorised By



David Springer, General Manager

svTRH (C10-C40) in Soil				
Our Reference		173257-A-14	173257-A-17	173257-A-21
Your Reference	UNITS	14	17	21
Depth		0.0-0.05	0.0-0.15	0.0-0.1
Date Sampled		07/08/2017	07/08/2017	04/08/2017
Type of sample		Soil	Soil	Soil
Date extracted	-	24/08/2017	24/08/2017	24/08/2017
Date analysed	-	24/08/2017	24/08/2017	24/08/2017
TRH C <sub>10</sub> - C <sub>14</sub>	mg/kg	29,000	180	150
TRH C <sub>15</sub> - C <sub>28</sub>	mg/kg	220,000	1,100	4,200
TRH C <sub>29</sub> - C <sub>36</sub>	mg/kg	66,000	1,000	3,200
TRH >C <sub>10</sub> -C <sub>16</sub>	mg/kg	81,000	270	230
TRH >C <sub>16</sub> -C <sub>34</sub>	mg/kg	220,000	1,600	6,800
TRH >C <sub>34</sub> -C <sub>40</sub>	mg/kg	41,000	680	930
Total +ve TRH (>C <sub>10</sub> -C <sub>40</sub> )	mg/kg	340,000	2,600	8,000
Surrogate o-Terphenyl	%	#	100	#



sTPH in Soil (C10-C40)-Silica				
Our Reference		173257-A-14	173257-A-17	173257-A-21
Your Reference	UNITS	14	17	21
Depth		0.0-0.05	0.0-0.15	0.0-0.1
Date Sampled		07/08/2017	07/08/2017	04/08/2017
Type of sample		Soil	Soil	Soil
Date extracted	-	25/08/2017	25/08/2017	25/08/2017
Date analysed	-	28/08/2017	28/08/2017	28/08/2017
TPH C <sub>10</sub> - C <sub>14</sub>	mg/kg	16,000	<50	<50
TPH C <sub>15</sub> - C <sub>28</sub>	mg/kg	170,000	<100	960
TPH C <sub>29</sub> - C <sub>36</sub>	mg/kg	42,000	<100	120
TPH >C <sub>10</sub> -C <sub>16</sub>	mg/kg	55,000	<50	<50
TPH >C <sub>16</sub> -C <sub>34</sub>	mg/kg	160,000	<100	1,100
TPH >C <sub>34</sub> -C <sub>40</sub>	mg/kg	15,000	<100	<100
Surrogate o-Terphenyl	%	#	62	#

Method ID	Methodology Summary
<b>Org-003</b>	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 (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
<b>Org-003</b>	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 (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.  Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			24/08/2017	[NT]	[NT]	[NT]	[NT]	24/08/2017	[NT]
Date analysed	-			24/08/2017	[NT]	[NT]	[NT]	[NT]	24/08/2017	[NT]
TRH C <sub>10</sub> - C <sub>14</sub>	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	94	[NT]
TRH C <sub>15</sub> - C <sub>28</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	98	[NT]
TRH C <sub>29</sub> - C <sub>36</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	106	[NT]
TRH >C <sub>10</sub> -C <sub>16</sub>	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	94	[NT]
TRH >C <sub>16</sub> -C <sub>34</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	98	[NT]
TRH >C <sub>34</sub> -C <sub>40</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	106	[NT]
Surrogate o-Terphenyl	%		Org-003	85	[NT]	[NT]	[NT]	[NT]	88	[NT]

QUALITY CONTROL: sTPH in Soil (C10-C40)-Silica					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			24/08/2017	[NT]	[NT]	[NT]	[NT]	24/08/2017	[NT]
Date analysed	-			28/08/2017	[NT]	[NT]	[NT]	[NT]	24/08/2017	[NT]
TPH C <sub>10</sub> - C <sub>14</sub>	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	94	[NT]
TPH C <sub>15</sub> - C <sub>28</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	98	[NT]
TPH C <sub>29</sub> - C <sub>36</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	106	[NT]
TPH >C <sub>10</sub> -C <sub>16</sub>	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	94	[NT]
TPH >C <sub>16</sub> -C <sub>34</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	98	[NT]
TPH >C <sub>34</sub> -C <sub>40</sub>	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	106	[NT]
Surrogate o-Terphenyl	%		Org-003	70	[NT]	[NT]	[NT]	[NT]	88	[NT]



## Result Definitions

<b>NT</b>	Not tested
<b>NA</b>	Test not required
<b>INS</b>	Insufficient sample for this test
<b>PQL</b>	Practical Quantitation Limit
<b>&lt;</b>	Less than
<b>&gt;</b>	Greater than
<b>RPD</b>	Relative Percent Difference
<b>LCS</b>	Laboratory Control Sample
<b>NS</b>	Not specified
<b>NEPM</b>	National Environmental Protection Measure
<b>NR</b>	Not Reported

## Quality Control Definitions

<b>Blank</b>	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.
<b>Duplicate</b>	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.
<b>Matrix Spike</b>	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.
<b>LCS (Laboratory Control Sample)</b>	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.
<b>Surrogate Spike</b>	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.
Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.	

## 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 (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

## SAMPLE RECEIPT ADVICE

### Client Details

<b>Client</b>	Douglas Partners Pty Ltd Smeaton Grange
<b>Attention</b>	Hugh Goymour, Emily McGinty

### Sample Login Details

<b>Your reference</b>	92237.00, 167-170 St Andrews, Varroville
<b>Envirolab Reference</b>	173257-A
<b>Date Sample Received</b>	11/08/2017
<b>Date Instructions Received</b>	23/08/2017
<b>Date Results Expected to be Reported</b>	28/08/2017

### Sample Condition

<b>Samples received in appropriate condition for analysis</b>	YES
<b>No. of Samples Provided</b>	Additional Testing on 3 Soils
<b>Turnaround Time Requested</b>	Standard
<b>Temperature on Receipt (°C)</b>	18.1
<b>Cooling Method</b>	Ice Pack
<b>Sampling Date Provided</b>	Not Provided on the COC

### Comments

Nil

Please direct any queries to:

#### Aileen Hie

**Phone:** 02 9910 6200  
**Fax:** 02 9910 6201  
**Email:** ahie@envirolab.com.au

#### Jacinta Hurst

**Phone:** 02 9910 6200  
**Fax:** 02 9910 6201  
**Email:** jhurst@envirolab.com.au

*Analysis Underway, details on the following page:*



**Envirolab Services Pty Ltd**

ABN 37 112 535 645

12 Ashley St Chatswood NSW 2067

ph 02 9910 6200 fax 02 9910 6201

customerservice@envirolab.com.au

www.envirolab.com.au

Sample ID	sTPH in Soil (C10-C40)-Silica	On Hold
1-0.0-0.2		✓
2-0.0-0.2		✓
3-0.0-0.3		✓
4-0.0-0.2		✓
5-0.0-0.4		✓
6-0.0-0.2		✓
7-0.0-0.3		✓
8-0.0-0.5		✓
9-0.0-0.2		✓
10-0.0-0.3		✓
11-0.0-0.5		✓
12-0.0-0.2		✓
13-0.0-0.3		✓
14-0.0-0.05	✓	
15-0.0-0.1		✓
16-0.0-0.08		✓
17-0.0-0.15	✓	
18-0.0-0.2		✓
19-0.0-0.15		✓
20-0.0-0.1		✓
21-0.0-0.1	✓	
22-0.0-0.2		✓
23-0.0-0.4		✓
24-0.0-0.4		✓
25-0.0-0.6		✓
26-0.0-0.4		✓
27-0.0-0.3		✓
28-0.0-0.4		✓
29-0.0-0.2		✓
30-0.0-0.3		✓
31-0.0-0.2		✓
32-0.0-0.2		✓



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Sample ID	sTPH in Soil (C10-C40)-Silica	On Hold
33-0.0-0.1		✓
34-0.1-0.3		✓
35-0.0-0.5		✓
36-0.0-0.4		✓
37-0.0-0.5		✓
38-0.0-0.15		✓
39-0.0-0.15		✓
40-0.0-0.2		✓
41-0.0-0.15		✓
39-0.15		✓
1-0.5		✓
1-1.0		✓
1-1.5		✓
1-2.0		✓
1-2.5		✓
1-3.0		✓
2-0.5		✓
2-1.0		✓
2-1.5		✓
2-2.0		✓
2-2.5		✓
2-3.0		✓
3-0.5		✓
3-1.0		✓
3-1.5		✓
3-2.0		✓
3-2.5		✓
3-3.0		✓
4-0.5		✓
4-1.0		✓
4-1.5		✓
4-2.0		✓





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12 Ashley St Chatswood NSW 2067

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Sample ID	sTPH in Soil (C10-C40)-Silica	On Hold
4-2.5		✓
4-3.0		✓
5-0.5		✓
5-1.0		✓
5-1.5		✓
5-2.0		✓
5-2.5		✓
5-3.0		✓
6-0.5		✓
6-1.0		✓
6-1.5		✓
7-0.5		✓
7-1.0		✓
7-1.5		✓
7-2.0		✓
7-2.5		✓
7-3.0		✓
8-0.5		✓
8-1.0		✓
8-1.5		✓
9-0.5		✓
9-1.0		✓
9-1.5		✓
9-2.0		✓
10-0.5		✓
10-1.0		✓
10-1.5		✓
10-2.0		✓
11-0.5		✓
11-1.0		✓
11-1.5		✓
11-2.0		✓

Sample ID	sTPH in Soil (C10-C40)-Silica	On Hold
11-2.5		✓
12-0.5		✓
12-1.0		✓
12-1.5		✓
12-2.0		✓
12-2.5		✓
13-0.5		✓
13-1.0		✓
13-1.5		✓
13-2.0		✓
13-2.5		✓
13-3.0		✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**


### Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.

<b>Project Name:</b> 167-170 St Andrews, Varroville, NSW	<b>To:</b> Envirolab Services
<b>Project No:</b> 92237.00	<b>Sampler:</b> Hugh Goymour
<b>Project Mgr:</b> Emily McGinty	<b>Attn:</b> Tania Notaras
<b>Email:</b> hugh.goymour@douglaspartners.com.au	<b>Phone:</b> (02) 9910 6200 <b>Fax:</b> (02) 9910 6201
<b>Date Required:</b> Standard time	<b>Email:</b> tnotaras@envirolabservices.com.au

Sample ID	Lab ID	Date Sampled	Sample Type		Container Type	Analytes				Notes/preservation
			S - soil	W - water		Combo 3	Combo 3a	Combo 8a	Combo 4	
1/0-0.2	1	7.8.17	S		G & P					All other samples collected at depth to be put on HOLD
2/0-0.2	2	7.8.17	S		G & P		X			
3/0-0.3	3	7.8.17	S		G & P			X		
4/0-0.2	4	7.8.17	S		G & P					
5/0-0.4	5	7.8.17	S		G & P					
6/0-0.2	6	8.8.17	S		G & P					
7/0-0.3	7	7.8.17	S		G & P					
8/0-0.5	8	7.8.17	S		G & P					
9/0-0.2	9	7.8.17	S		G & P					
10/0-0.3	10	7.8.17	S		G & P					
11/0-0.5	11	7.8.17	S		G & P					
12/0-0.2	12	7.8.17	S		G & P					
13/0-0.3	13	7.8.17	S		G & P					


<b>Lab Report No:</b>	<b>Send Results to:</b> Douglas Partners Pty Ltd	<b>Address:</b> 18 Water Crescent, Smeaton Grange 2567	<b>Phone:</b> (02) 4647 0075	<b>Fax:</b> (02) 4646 1886
<b>Relinquished by:</b> Hugh Goymour	<b>Transported to laboratory by:</b>			
<b>Signed:</b> 	<b>Date &amp; Time:</b> 10.8.17 10.8.17 <b>Received by:</b>			



<b>Project Name:</b> 167-170 St Andrews, Varroville, NSW	<b>To:</b> Envirolab Services
<b>Project No:</b> 92237.00	<b>Sampler:</b> Hugh Goymour
<b>Project Mgr:</b> Emily McGinty	<b>Attn:</b> Tania Notaras
<b>Email:</b> hugh.goymour@douglaspartners.com.au	<b>Phone:</b> (02) 9910 6200
<b>Date Required:</b> Standard time	<b>Fax:</b> (02) 9910 6201
	<b>Email:</b> tnotaras@envirolabservices.com.au

Sample ID	Lab ID	Date Sampled	Sample Type		Container Type	Analytes					Notes/preservation
			S - soil	W - water	m - material	Combo 3	Combo 3a	Combo 8a	Combo 4	9 metals (As, Cd, total Cr, hex Cr, Pb, Hg, Ni, Zn, Mn, Cu), OCP& POP	
14/0-0.05	14	8.8.17	S					X			All other samples collected at depth to be put on HOLD
15/0-0.1	15	4.8.17	S					X			
16/0-0.08	16	4.8.17	S					X			
17/0-0.15	17	8.8.17	S					X			
18/0-0.2	18	8.8.17	S					X			
19/0-0.15	19	8.8.17	S					X			
20/0-0.1	20	8.8.17	S						X		
21/0-0.1	21	4.8.17	S						X		
22/0-0.2	22	8.8.17	S							X	
23/0-0.4	23	8.8.17	S							X	
24/0-0.4	24	4.8.17	S							X	
25/0-0.6	25	4.8.17	S							X	

Lab Report No:

<b>Send Results to:</b> Douglas Partners Pty Ltd	<b>Address:</b> 18 Waler Crescent, Smeaton Grange 2567	<b>Phone:</b> (02) 4647 0075	<b>Fax:</b> (02) 4646 1886
<b>Relinquished by:</b> Hugh Goymour	<b>Transported to laboratory by:</b>		
<b>Signed:</b> 	<b>Date &amp; Time:</b> 10.8.17	<b>10.8.17</b>	<b>Received by:</b>



<b>Project No:</b> 92237.00	<b>Sampler:</b> Hugh Goymour	<b>12 Ashley Street, Chatswood NSW 2067</b>
<b>Project Mgr:</b> Emily McGinty	<b>Mob. Phone:</b> 0447 976 999	<b>Attn:</b> Tania Notaras
<b>Email:</b> hugh.goymour@douglaspartners.com.au		<b>Phone:</b> (02) 9910 6200 <b>Fax:</b> (02) 9910 6201
<b>Date Required:</b> Standard time		<b>Email:</b> tnotaras@envirolabservices.com.au

Sample ID		Lab ID	Date Sampled	Sample Type		Container Type	Analytes					Notes/preservation							
				S - soil	W - water	m - material	G - glass	P - plastic	Combo 3	Combo 3a	Combo 8a	Combo 4	9 metals (As, Cd, total Cr, hex Cr, Pb, Hg, Ni, Zn, Mn, Cu), OCP& OPP						
26/0-0.4		26	4.8.17	S			G & P						X						
27/0-0.3		27	4.8.17	S			G & P			X									
28/0-0.4		28	4.8.17	S			G & P						X						
29/0-0.2		29	4.8.17	S			G & P						X						
30/0-0.3		30	4.8.17	S			G & P						X						
31/0-0.2		31	4.8.17	S			G & P						X						
32/0-0.2		32	4.8.17	S			G & P						X						
33/0-0.1		33	4.8.17	S			G & P						X						
				S			G & P												
34/0.1-0.3		34	4.8.17	S			G & P						X						
35/0-0.5		35	4.8.17	S			G & P						X						
36/0-0.4		36	7.8.17	S			G & P			X									
37/0-0.5		37	4.8.17	S			G & P						X						
38/0-0.15		38	4.8.17	S			G & P						X						
All other samples collected at depth to be put on HOLD																			
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Transported to laboratory by:

Received by:

Date & Time: 10.8.17 10.8.17

Address 18 Waler Crescent, Smeaton Grange 2567

Phone: (02) 4647 0075 Fax: (02) 4646 1886

Lab Report No:

Send Results to: Douglas Partners Pty Ltd

Relinquished by: Hugh Goymour

Signed: *[Signature]*



**CHAIN OF CUSTODY**

<b>Project No:</b> 92237.00	<b>Sampler:</b> Hugh Goymour	<b>Address:</b> 12 Ashley Street, Chatswood NSW 2067
<b>Project Mgr:</b> Emily McGinty	<b>Mob. Phone:</b> 0447 976 999	<b>Attn:</b> Tania Notaras
<b>Email:</b> hugh.goymour@douglaspartners.com.au	<b>Phone:</b> (02) 9910 6200	<b>Fax:</b> (02) 9910 6201
<b>Date Required:</b> Standard time	<b>Email:</b> tnotaras@envirolabservices.com.au	

Sample ID		Lab ID	Date Sampled		Sample Type		Container Type	Analytes						Notes/preservation						
					S - soil	W - water	m - material		Combo 3	Combo 3a	Combo 8a	Combo 4	9 metals (As, Cd, total Cr, hex Cr, Pb, Hg, Ni, Zn, Mn, Cu), OCP& OPP	Asbestos ID						
39/0-0.15		39	8.8.17		S			G & P		X										All other samples collected at depth to be put on HOLD
40/0-0.2		40	8.8.17		S			G & P					X							
41/0-0.15		41	8.8.17		S			G & P		X										
41/0-0.15		41/R	8.8.17		M			P						X						
39/0.15 ACM		42			M			P						X						
Lab Report No:																				
Send Results to:					Douglas Partners Pty Ltd			Address 18 Waler Crescent, Smeaton Grange 2567					Phone: (02) 4647 0075 Fax: (02) 4646 1886							
Relinquished by:					Hugh Goymour			Transported to laboratory by:												
Signed:					Date & Time: 18.8.17 10.8.17			Received by:												



<b>Project Name:</b> 167-170 St Andrews, Varroville, NSW		<b>To:</b> Envirolab Services	
<b>Project No:</b> 92237.00		<b>Sampler:</b> Hugh Goymour	
<b>Project Mgr:</b> Emily McGinty		<b>Attn:</b> Tania Notaras	
<b>Email:</b> hugh.goymour@douglaspartners.com.au		<b>Phone:</b> (02) 9910 6200 <b>Fax:</b> (02) 9910 6201	
<b>Date Required:</b> Standard time		<b>Email:</b> tnotaras@envirolabservices.com.au	

Sample ID	Lab ID	Date Sampled	Sample Type		Container Type	Analytes						Notes/preservation	
			S - soil	W - water		G - glass	P - plastic	pH	EC	Chloride	Sulphate		Sodicity
1/0.5	43	7.8.17	S	S	P	X	X	X	X				
1/1	44	7.8.17	S	S	P	X	X						
1/1.5	45	7.8.17	S	S	P	X	X	X	X				
1/2	46	7.8.17	S	S	P	X	X						
1/2.5	47	7.8.17	S	S	P	X	X						
1/3	48	7.8.17	S	S	P	X	X	X	X				
2/0.5	49	7.8.17	S	S	P	X	X						
2/1	50	7.8.17	S	S	P	X	X	X	X				
2/1.5	51	7.8.17	S	S	P	X	X						
2/2	52	7.8.17	S	S	P	X	X						
2/2.5	53	7.8.17	S	S	P	X	X						

<b>Lab Report No:</b>		<b>Address</b> 18 Water Crescent, Smeaton Grange 2567		<b>Phone:</b> (02) 4647 0075	<b>Fax:</b> (02) 4646 1886
<b>Send Results to:</b> Douglas Partners Pty Ltd					
<b>Relinquished by:</b> Hugh Goymour					
<b>Signed:</b> <i>[Signature]</i>	<b>Date &amp; Time:</b> 10.8.17 10.8.17				
			<b>Transported to laboratory by:</b>		
			<b>Received by:</b>		



<b>Project Name:</b> 167-170 St Andrews, Varroville, NSW		<b>To:</b> Envirolab Services	
<b>Project No:</b> 92237.00		<b>Sampler:</b> Hugh Goymour	
<b>Project Mgr:</b> Emily McGinty		<b>Attn:</b> Tania Notaras	
<b>Email:</b> hugh.goymour@douglaspartners.com.au		<b>Phone:</b> (02) 9910 6200	
<b>Date Required:</b> Standard time		<b>Fax:</b> (02) 9910 6201	
<b>Email:</b> tnotaras@envirolabservices.com.au			

Sample ID	Lab ID	Date Sampled	Sample Type	Container Type	Analytes					Notes/preservation					
					S - soil	W - water	G - glass	P - plastic	pH		EC	Chloride	Sulphate	Sodicity	Hold
2/3	54	7.8.17	S	P											
3/0.5	55	7.8.17	S	P											
3/1	56	7.8.17	S	P											
3/1.5	57	7.8.17	S	P											
3/2	58	7.8.17	S	P											
3/2.5	59	7.8.17	S	P											
3/3	60	7.8.17	S	P											
4/0.5	61	7.8.17	S	P											
4/1	62	7.8.17	S	P											
4/1.5	63	7.8.17	S	P											
4/2	64	7.8.17	S	P											

<b>Lab Report No:</b>		<b>Address:</b> 18 Waler Crescent, Smeaton Grange 2567	
<b>Send Results to:</b> Douglas Partners Pty Ltd	<b>Phone:</b> (02) 4647 0075	<b>Fax:</b> (02) 4646 1886	
<b>Relinquished by:</b> Hugh Goymour	<b>Transported to laboratory by:</b>		
<b>Signed:</b> <i>[Signature]</i>	<b>Date &amp; Time:</b> 10.8.17	<b>10.8.17</b>	<b>Received by:</b>



<b>Project Name:</b> 167-170 St Andrews, Varroville, NSW		<b>To:</b> Envirolab Services	
<b>Project No:</b> 92237.00		<b>Sampler:</b> Hugh Goymour	
<b>Project Mgr:</b> Emily McGinty		<b>Mob. Phone:</b> 0447 976 999	
<b>Email:</b> hugh.goymour@douglaspartners.com.au		<b>Attn:</b> Tania Notaras	
<b>Date Required:</b> Standard time		<b>Phone:</b> (02) 9910 6200 <b>Fax:</b> (02) 9910 6201	
		<b>Email:</b> tnotaras@envirolabservices.com.au	

Sample ID	Lab ID	Date Sampled	Sample Type		Container Type	Analytes					Hold	Notes/preservation
			S - soil	W - water		pH	EC	Chloride	Sulphate	Sodicity		
4/2.5	65	7.8.17	S		P	X	X					
4/3	66	7.8.17	S		P	X	X					
5/0.5	67	7.8.17	S		P	X	X					
5/1	68	7.8.17	S		P	X	X					
5/1.5	69	7.8.17	S		P	X	X					
5/2	70	7.8.17	S		P	X	X			X		
5/2.5	71	7.8.17	S		P	X	X	X	X			
5/3	72	7.8.17	S		P	X	X					
6/0.5	73	08/08/17	S		P	X	X					
6/1	74	08/08/17	S		P	X	X	X	X			
6/1.5	75	08/08/17	S		P	X	X	X	X			

<b>Lab Report No:</b>		<b>Address:</b> 18 Water Crescent, Smeaton Grange 2567	
<b>Send Results to:</b> Douglas Partners Pty Ltd	<b>Phone:</b> (02) 4647 0075	<b>Fax:</b> (02) 4646 1886	
<b>Relinquished by:</b> Hugh Goymour	<b>Transported to laboratory by:</b>		
<b>Signed:</b> <i>[Signature]</i>	<b>Date &amp; Time:</b> 10.8.17 10.8.17	<b>Received by:</b>	




<b>Project Name:</b> 167-170 St Andrews, Varroville, NSW		<b>To:</b> Envirolab Services	
<b>Project No:</b> 92237.00		<b>Sampler:</b> Hugh Goymour	
<b>Project Mgr:</b> Emily McGinty		<b>Attn:</b> Tania Notaras	
<b>Email:</b> hugh.goymour@douglaspartners.com.au		<b>Phone:</b> (02) 9910 6200 <b>Fax:</b> (02) 9910 6201	
<b>Date Required:</b> Standard time		<b>Email:</b> tnotaras@envirolabservices.com.au	

Sample ID	Lab ID	Date Sampled	Sample Type		Container Type	Analytes					Notes/preservation	
			S - soil	W - water		pH	EC	Chloride	Sulphate	Sodicity		Hold
7/0.5	76	7.8.17	S		P		X					
7/1	77	7.8.17	S		P		X					
7/1.5	78	7.8.17	S		P		X					
7/2	79	7.8.17	S		P		X					
7/2.5	80	7.8.17	S		P		X					
7/3	81	7.8.17	S		P		X					
8/0.5	82	7.8.17	S		P		X	X				
8/1	83	7.8.17	S		P		X	X				
8/1.5	84	7.8.17	S		P		X	X				
9/0.5	85	7.8.17	S		P		X	X				
9/1	86	7.8.17	S		P		X	X				

<b>Lab Report No:</b>		<b>Address:</b> 18 Water Crescent, Smeaton Grange 2567	
<b>Send Results to:</b> Douglas Partners Pty Ltd	<b>Phone:</b> (02) 4647 0075	<b>Fax:</b> (02) 4646 1886	
<b>Relinquished by:</b> Hugh Goymour	<b>Transported to laboratory by:</b>		
<b>Signed:</b> 	<b>Date &amp; Time:</b> 10.8.17 10.8.17 <b>Received by:</b>		




<b>Project Name:</b> 167-170 St Andrews, Varroville, NSW		<b>To:</b> Envirolab Services	
<b>Project No:</b> 92237.00		<b>Sampler:</b> Hugh Goymour	
<b>Project Mgr:</b> Emily McGinty		<b>Attn:</b> Tania Notaras	
<b>Email:</b> hugh.goymour@douglaspartners.com.au		<b>Phone:</b> (02) 9910 6200 <b>Fax:</b> (02) 9910 6201	
<b>Date Required:</b> Standard time		<b>Email:</b> tnotaras@envirolabservices.com.au	

Sample ID	Lab ID	Date Sampled	Sample Type		Container Type	Analytes					Hold	Notes/preservation	
			S - soil	W - water		pH	EC	Chloride	Sulphate	Sodicity			
9/1.5	87	7.8.17	S	P	P - plastic	X	X						
9/2	88	7.8.17	S	P	P	X	X	X					
10/0.5	89	7.8.17	S	P	P	X	X						
10/1	90	7.8.17	S	P	P	X	X						
10/1.5	91	7.8.17	S	P	P	X	X	X					
10/2	92	7.8.17	S	P	P	X	X						
11/0.5	93	7.8.17	S	P	P	X	X						
11/1	94	7.8.17	S	P	P	X	X						
11/1.5	95	7.8.17	S	P	P	X	X						
11/2	96	7.8.17	S	P	P	X	X	X					
11/2.5	97	7.8.17	S	P	P	X	X						


  

<b>Lab Report No:</b>		<b>Address:</b> 18 Waler Crescent, Smeaton Grange 2567	
<b>Send Results to:</b> Douglas Partners Pty Ltd	<b>Phone:</b> (02) 4647 0075	<b>Fax:</b> (02) 4646 1886	
<b>Relinquished by:</b> Hugh Goymour	<b>Transported to laboratory by:</b>		
<b>Signed:</b> 	<b>Date &amp; Time:</b> 10.8.17	<b>Received by:</b>	



<b>Project Name:</b> 167-170 St Andrews, Varroville, NSW	<b>To:</b> EnviroLab Services
<b>Project No:</b> 92237.00	<b>Sampler:</b> Hugh Goymour
<b>Project Mgr:</b> Emily McGinty	<b>Attn:</b> Tania Notaras
<b>Email:</b> hugh.goymour@douglaspartners.com.au	<b>Phone:</b> (02) 9910 6200 <b>Fax:</b> (02) 9910 6201
<b>Date Required:</b> Standard time	<b>Email:</b> tnotaras@envirolabservices.com.au

Sample ID	Lab ID	Date Sampled	Sample Type		Container Type		Analytes					Hold	Notes/preservation		
			S - soil	W - water	G - glass	P - plastic	pH	EC	Chloride	Sulphate	Sodicity				
12/0.5	98	7.8.17	S	S	P	P	X	X							
12/1	99	7.8.17	S	S	P	P	X	X							
12/1.5	100	7.8.17	S	S	P	P	X	X							
12/2	101	7.8.17	S	S	P	P	X	X							
12/2.5	102	7.8.17	S	S	P	P	X	X	X	X					
13/0.5	103	7.8.17	S	S	P	P	X	X							
13/1	104	7.8.17	S	S	P	P	X	X							
13/1.5	105	7.8.17	S	S	P	P	X	X	X	X					
13/2	106	7.8.17	S	S	P	P	X	X							
13/2.5	107	7.8.17	S	S	P	P	X	X	X	X					
13/3	108	7.8.17	S	S	P	P	X	X	X	X					

<b>Lab Report No:</b>	<b>Send Results to:</b> Douglas Partners Pty Ltd	<b>Address:</b> 18 Waler Crescent, Smeaton Grange 2567	<b>Phone:</b> (02) 4647 0075	<b>Fax:</b> (02) 4646 1886
<b>Relinquished by:</b> Hugh Goymour	<b>Transported to laboratory by:</b>			
<b>Signed:</b> 	<b>Date &amp; Time:</b> 10.8.17 10.8.17 <b>Received by:</b>			

## Jessica Hie

---

**From:** Hugh Goymour <hugh.goymour@douglaspartners.com.au>  
**Sent:** Monday, 14 August 2017 9:06 AM  
**To:** Jessica Hie  
**Subject:** RE: excel copy of COC

Hi Jessica

Yes – Please test 39 in the meantime and I will work out the issue is with 41 on my end.

Cheers

---

**Hugh Goymour** | Environmental Scientist  
**Douglas Partners Pty Ltd** | ABN 75 053 980 117 | [www.douglaspartners.com.au](http://www.douglaspartners.com.au)  
18 Waler Crescent Smeaton Grange NSW 2567  
P: 02 4647 0075 | F: 02 4646 1886 | E: [hugh.goymour@douglaspartners.com.au](mailto:hugh.goymour@douglaspartners.com.au)



FINANCIAL REVIEW  
**CLIENT CHOICE**  
WINNER

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**From:** Jessica Hie [<mailto:JHie@envirolab.com.au>]  
**Sent:** Friday, 11 August 2017 6:55 PM  
**To:** Hugh Goymour  
**Cc:** Emily McGinty  
**Subject:** RE: excel copy of COC

Hi Hugh,

Actually, no need for the electronic copy now.

Another issue however: there was no 41/0-0.15 material received  
Instead, there was a 39/0.15 material received – should we analyse this?

Regards,

Jessica Hie | Customer Service/Asbestos Analyst | Envirolab Services Pty Ltd

*Great Science, Great Service.*

12 Ashley Street Chatswood NSW 2067  
T 612 9910 6200 F 612 9910 6201  
E [jhie@envirolab.com.au](mailto:jhie@envirolab.com.au) | W [www.envirolab.com.au](http://www.envirolab.com.au)



Please note that all samples submitted to the Envirolab Group laboratories will be analysed under the Envirolab Group Terms and Conditions. The Terms and Conditions are accessible by clicking this link

---

**From:** Jessica Hie

**Sent:** Friday, 11 August 2017 5:10 PM

**To:** 'hugh.goymour@douglaspartners.com.au' <[hugh.goymour@douglaspartners.com.au](mailto:hugh.goymour@douglaspartners.com.au)>

**Cc:** Emily McGinty <[Emily.McGinty@douglaspartners.com.au](mailto:Emily.McGinty@douglaspartners.com.au)>

**Subject:** excel copy of COC

Hi Hugh,

Would you happen to have the excel copy of the Varroville job (108 samples) you could email through?  
thanks

### Disclaimer

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## SAMPLE RECEIPT ADVICE

### Client Details

<b>Client</b>	Douglas Partners Pty Ltd Smeaton Grange
<b>Attention</b>	Hugh Goymour, Emily McGinty

### Sample Login Details

<b>Your reference</b>	92237.00, 167-170 St Andrews, Varroville
<b>Envirolab Reference</b>	173257
<b>Date Sample Received</b>	11/08/2017
<b>Date Instructions Received</b>	11/08/2017
<b>Date Results Expected to be Reported</b>	18/08/2017

### Sample Condition

<b>Samples received in appropriate condition for analysis</b>	YES
<b>No. of Samples Provided</b>	107 Soils, 1 Material
<b>Turnaround Time Requested</b>	Standard
<b>Temperature on Receipt (°C)</b>	18.1
<b>Cooling Method</b>	Ice Pack
<b>Sampling Date Provided</b>	Not Provided on the COC

### Comments

Nil

Please direct any queries to:

<b>Aileen Hie</b>	<b>Jacinta Hurst</b>
<b>Phone:</b> 02 9910 6200	<b>Phone:</b> 02 9910 6200
<b>Fax:</b> 02 9910 6201	<b>Fax:</b> 02 9910 6201
<b>Email:</b> ahie@envirolab.com.au	<b>Email:</b> jhurst@envirolab.com.au

*Analysis Underway, details on the following page:*



**EnviroLab Services Pty Ltd**

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Sample ID	VTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides	PCBs in Soil	Acid Extractable metals in soil	Misc Soil - Inorg	Misc Soil - Inorg	Asbestos ID - soils	Asbestos ID - materials	Misc Inorg - Soil	ESP/CEC
1-0.0-0.2				✓	✓		✓	✓					
2-0.0-0.2	✓	✓	✓				✓			✓			
3-0.0-0.3	✓	✓	✓	✓	✓	✓	✓		✓	✓			
4-0.0-0.2				✓	✓		✓	✓					
5-0.0-0.4				✓	✓		✓	✓					
6-0.0-0.2				✓	✓		✓	✓					
7-0.0-0.3				✓	✓		✓	✓					
8-0.0-0.5				✓	✓		✓	✓					
9-0.0-0.2				✓	✓		✓	✓					
10-0.0-0.3				✓	✓		✓	✓					
11-0.0-0.5				✓	✓		✓	✓					
12-0.0-0.2				✓	✓		✓	✓					
13-0.0-0.3				✓	✓		✓	✓					
14-0.0-0.05	✓	✓	✓	✓	✓	✓	✓		✓	✓			
15-0.0-0.1	✓	✓	✓	✓	✓	✓	✓		✓	✓			
16-0.0-0.08	✓	✓	✓	✓	✓	✓	✓		✓	✓			
17-0.0-0.15	✓	✓	✓	✓	✓	✓	✓		✓	✓			
18-0.0-0.2	✓	✓	✓	✓	✓	✓	✓		✓	✓			
19-0.0-0.15	✓	✓	✓	✓	✓	✓	✓		✓	✓			
20-0.0-0.1	✓	✓	✓				✓		✓				
21-0.0-0.1	✓	✓	✓				✓		✓				
22-0.0-0.2				✓	✓		✓	✓					
23-0.0-0.4				✓	✓		✓	✓					
24-0.0-0.4				✓	✓		✓	✓					
25-0.0-0.6				✓	✓		✓	✓					
26-0.0-0.4				✓	✓		✓	✓					
27-0.0-0.3	✓	✓	✓				✓			✓			
28-0.0-0.4				✓	✓		✓	✓					
29-0.0-0.2				✓	✓		✓	✓					
30-0.0-0.3				✓	✓		✓	✓					
31-0.0-0.2				✓	✓		✓	✓					
32-0.0-0.2				✓	✓		✓	✓					



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33-0.0-0.1				✓	✓		✓	✓					
34-0.1-0.3				✓	✓		✓	✓					
35-0.0-0.5				✓	✓		✓	✓					
36-0.0-0.4	✓	✓	✓				✓			✓			
37-0.0-0.5				✓	✓		✓	✓					
38-0.0-0.15				✓	✓		✓	✓					
39-0.0-0.15	✓	✓	✓				✓			✓			
40-0.0-0.2				✓	✓		✓	✓					
41-0.0-0.15	✓	✓	✓				✓			✓			
39-0.15											✓		
1-0.5												✓	
1-1.0												✓	
1-1.5												✓	
1-2.0												✓	
1-2.5												✓	
1-3.0												✓	
2-0.5												✓	
2-1.0												✓	✓
2-1.5												✓	
2-2.0												✓	
2-2.5												✓	
2-3.0												✓	
3-0.5												✓	
3-1.0												✓	
3-1.5												✓	
3-2.0												✓	
3-2.5												✓	
3-3.0												✓	
4-0.5												✓	
4-1.0												✓	
4-1.5												✓	
4-2.0												✓	



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4-2.5												✓	
4-3.0												✓	
5-0.5												✓	
5-1.0												✓	
5-1.5												✓	✓
5-2.0												✓	
5-2.5												✓	
5-3.0												✓	
6-0.5												✓	
6-1.0												✓	
6-1.5												✓	
7-0.5												✓	
7-1.0												✓	✓
7-1.5												✓	
7-2.0												✓	
7-2.5												✓	
7-3.0												✓	
8-0.5												✓	✓
8-1.0												✓	✓
8-1.5												✓	
9-0.5												✓	
9-1.0												✓	
9-1.5												✓	
9-2.0												✓	✓
10-0.5												✓	
10-1.0												✓	✓
10-1.5												✓	
10-2.0												✓	
11-0.5												✓	
11-1.0												✓	✓
11-1.5												✓	
11-2.0												✓	





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11-2.5												✓	
12-0.5												✓	
12-1.0												✓	
12-1.5												✓	
12-2.0												✓	
12-2.5												✓	
13-0.5												✓	
13-1.0												✓	
13-1.5												✓	
13-2.0												✓	
13-2.5												✓	
13-3.0												✓	

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

### Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.