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ESS

Attention: Sue Robb

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Dear Sirs

Addendum to Preliminary Site Investigation
Proposed Residential Development
Lot 1 DP 798111, Bungendore

1. Introduction

This report describes the methodology and results of a limited subsurface investigation undertaken as an addendum to the Preliminary Site Investigation (PSI), conducted by Douglas Partners Pty Ltd (DP) for Lot 1 DP 798111, Bungendore (henceforth 'the site'). The work was commissioned by Queanbeyan-Palerang Regional Council. The PSI was completed by DP in December 2016 with the results presented in the report entitled: *Report on Preliminary Site Investigation, Lot 1 DP 798111, Bungendore*, dated December 2016 (DP 2016).

The PSI and this addendum will support the Planning Proposal for the proposed development of the site as a residential estate (i.e. a low density residential land use).

The objectives of the addendum to the PSI were to:

- J Undertake a limited subsurface investigation with sampling and laboratory testing for a suite of common contaminants; and
- J Comment on the need for further investigation and/or management (if required) in order to determine the compatibility of the site with its intended residential development.

This addendum to the PSI comprised a limited investigation with sampling and laboratory testing of soil. This addendum to the PSI was undertaken concurrently with a geotechnical investigation which has been reported separately; *Report on Preliminary Geotechnical Investigation, Proposed Residential Development, Lot 1 DP 798111, North Bungendore*, Project 88336.01, dated June 2017 (DP 2017).

This report must be read in conjunction with the notes *About this Report* which are attached.

2. Scope of Work

The following scope of work was conducted for the assessment:

-) A limited subsurface investigation with sampling and laboratory testing as outlined in Sections 8 and 9; and
-) Preparation of this addendum to the PSI report presenting the findings of the subsurface investigation and an assessment of the need for further investigations and/or management.

3. Site Identification and Description

3.1 Site Identification

The site identification information is summarised as follows:

Table 1: Site Identification Details

Item	Details
Site Owner	Elmslea Land Developments Pty Ltd
Site Address	174 Tarago Road, Bungendore
Current land use	Arable farmland
Lot and Deposited Plan (see Drawing 1, Appendix B)	Lot 1 DP 798111
Palerang Local Environmental Plan 2014	RU1: Primary Production
Council	Queanbeyan-Palerang Regional Council
Approximate Site Area	82 hectares
Proposed future land-use	Low density residential

3.2 Site Layout and Description

The general layout of the site is provided on Drawing 1, Appendix B. The site comprises an irregular shaped area of arable farmland. A shed, two animal shelters and a concrete slab (formerly a separate toilet) are noted in the south western portion of the site near to the entrance off Tarago Road. Mature trees are visible around the structures and along the western, southern and part of the northern boundary of the site. Four dams are located on the site with three creeks entering the site generally in a north to south orientation, two of these creeks pass through dams. A fourth creek line crosses through the site in the north eastern corner.

A local topographic high point is located immediately to the north of the central portion of the site. The site slopes generally to the south west, and to the west in the western portion of the site, from 750 mAHD to 700 mAHD.

The site is bounded by Tarago Road to the west, residential properties to the south, a railway line to the east, and a municipal landfill (Bungendore Landfill Facility)/waste transfer centre and arable farmland to the north. The surrounding land uses are residential to the south, and arable farmland to the north, west and east. DP understands that the Bungendore Landfill Facility currently remains partially open.

4. Regional Soils, Geology and Hydrogeology

4.1 Regional Soils

Reference to the 1:100 000 Canberra Soil Landscape Series Sheet 8727 (Ref 1) indicates that the eastern portion of the site is mapped as being on the Bywong Soil Group. The Bywong Soil Group is characterised by rolling to undulated low hills, rises and minor flats on metasediments. Soils are shallow, well to rapidly drained rudosols (lithosols) on crests and upper slopes, and new rock outcrop, moderately deep, moderately well-drained red chromosols (red podzolic soils) and brown chromosols (yellow podzolic soils and non-calcic brown soils) on midslopes, and deep imperfectly drained bleached sodic chromosols (yellow podzolic soils) and poorly drained sodosols (solodic soils) on lower slopes. This soil group is limited by its infertile, erodible and shallow soils. There are water erosion and salinity hazards.

The western portion of the site is underlain by three different soil groups. The westernmost part of the site is on the Coopers Soil Group. The Coopers Soil Group is characterised by old lake beaches, dunes and sandsheet on Quaternary alluvium. Generally no rock outcrops within this soil group. Soils are deep to very deep, very poorly drained hydrosols and stratic rudosols (alluvial soils) on Lake George, moderately to very deep, imperfectly drained brown chromosols (yellow podzolic soils) on old beaches, well-drained stratic rudosols (siliceous sands) on beach dunes, and moderately deep to very deep, poorly drained stratic rudosols (alluvial soils) on swales. This soil group is limited by its non-cohesive, infertile and highly erodible soils with low available waterholding capacity. Other limitations include groundwater pollution, engineering hazard and poor moisture availability.

The soils to east of the Coopers Soil Group are mapped as the Bungendore Soil Group. The Bungendore Soil Group is characterised by low footslopes on Quaternary alluvium and colluvium. Soils are moderately deep, imperfectly drained mottled yellow chromosols on upper footslopes, and deep, poorly drained sodosols (solodic soils) on lower footslopes. This soil group is limited by its poorly drained, dispersible, hardsetting and highly erodible soils. The third group is also Coopers Soil Group however is a slight variant with heavier textured soils.

4.2 Regional Geology

Reference to the Canberra 1:100 000 Geology of Canberra Geological Series Sheet (Ref 2) indicates that the eastern portion of the site is underlain by Birkenburn beds of Middle-Late Ordovician age. The Birkenburn beds typically comprise interbedded sandstone, siltstone and shale.

The western portion of the site is underlain by three different types of unnamed groups of Quaternary age. The westernmost group typically comprises alluvium of gravels, sand, silty clay and black organic clay. The next group to the east of the alluvium typically comprises colluvium of fanglomerate and poorly cemented conglomerate, gravel and sand. The third group typically comprises strandlines of coarse sand and gravel.

4.3 Hydrogeology

The nearest surface water receptors are the four dams and four creek lines located within the site. The nearest main offsite surface water receptor is a tributary of Turallo Creek located approximately 100 m to the east of the site. It is considered likely the groundwater would flow towards to the south west, conforming with the topographic slope, i.e. towards Turallo Creek.

5. Background Information

The following reports were provided by Queanbeyan-Palerang Council for review:

-) URS Pty Ltd (URS) *Draft Risk Assessment, Bungendore Landfill Closure*, dated 10 December 2014 (URS 2014);
-) Environment and Natural Resource Solutions Pty Ltd (ENRS) *Water & Landfill Gas Monitoring Event, Bungendore Closed Landfill Facility, Tarago Road, Bungendore, NSW 2621*, dated August 2015 (ENRS, 2015); and
-) *Report on Preliminary Site Investigation, Lot 1 DP 798111, Bungendore*, dated December 2016 (DP 2016).

5.1 Draft Risk Assessment (URS, 2014)

The draft risk assessment was completed in December 2014 for the Bungendore Landfill Facility to the north of the western end of the site. The risk assessment and associated risk-based monitoring requirements within the document were to form part of the Bungendore Landfill Closure Plan. The location of the landfill is shown on Drawing 1, attached.

The risk assessment noted that the landfill had been accepting domestic waste since it was designated as a 'garbage depot' in 1905. There is noted to be no engineered liner system and/or leachate and landfill gas management in place.

The assessment outlined the first stage of approach in accordance with regulatory requirements from the NSW Environment Protection Authority (EPA). This involved preliminary screening (development of an initial conceptual site model) and a qualitative risk assessment based on comprehensive hazard identification and subjective professional assessment of probability.

A conceptual site model was developed for the site with the available information. It was noted that groundwater elevations reported for 2009 suggest groundwater flow is directed towards Lake George (i.e. flows to the north of the landfill and not in the direction of the current site).

The assessment noted that future control measures such as active/passive landfill gas management, capping and maintenance may result in decreased residual risks. Periodic monitoring would be required to demonstrate whether the landfill continued to be a source of landfill gas hazards. A buffer zone was not noted in URS (2014). Upon completion of the initial stage of monitoring the site-specific results would be available and the conceptual site model could be reviewed and the risks re-assessed.

5.2 Environmental Monitoring Report (ENRS, 2015)

The environmental monitoring report was prepared for the Bungendore Landfill Facility to the north of the site. The scope involved the drilling of groundwater and landfill gas monitoring wells, and one round of sampling to support the closure of the landfill. The work was undertaken in accordance with the Site Environment Monitoring Program (EMP) prepared by URS in 2014 which has not been reviewed by DP.

Four groundwater monitoring bores (GW01 to GW04), one leachate bore (LG01) and six landfill gas bores (LFG01 to LFG06) were constructed around the landfill. Four surface water samples were collected from dams (SW02 to SW04) outside the boundary of the landfill including one sample from the dam within the north western portion of the site. The figure below shows the sample locations in relation to the landfill. The location of the landfill is shown on Drawing 1, attached.



Figure 1: Location of samples (from ENRS, 2015)

ENRS noted that the results of sampling for landfill gas, surface and groundwater indicated the landfill emissions were suitably contained. ENRS considered that the existing monitoring locations and sampling (specified by the EMP) generally provided suitable assessment of surface water, leachate and groundwater conditions. However, ENRS recommended subsequent monitoring results continue to be reviewed to assess for potential seasonal or temporal changes. In particular, review should be conducted for levels of methane in LFG02 and groundwater chemistry in GW01 which presents similar geochemistry to leachate composition. Minor detections of selected analytes such as trace metals should also continue to be reviewed to establish if levels are associated with background concentrations and the site geology. ERM noted that groundwater was expected to flow to the south west.

A second round of sampling was undertaken in June 2016 by ENRS. No report was produced, however, the laboratory results were reviewed by DP. It is noted that GW02 could not be sampled in August 2015 due to insufficient sample volume, however, this well was re-sampled in June 2016. A leachate sample from LG01 was not analysed in June 2016, however, gas monitoring was undertaken.

The results were generally similar to the previous round for the groundwater and surface water samples collected. Values recorded for sodium and chloride exceeded the ANZECC 2000 – Primary Industries Guidelines and were noted to be above the previous results at GW01. The gas monitoring results were also generally similar to the previous round, however, LG01 recorded higher levels of methane (40.4% in August 2015 to 73.1% in June 2016).

5.3 Preliminary Site Investigation (DP, 2016)

A preliminary site investigation (PSI) was undertaken for the site in December 2016 (DP, 2016) by DP. The PSI comprised a review of historical information and a site walkover to identify potential sources of contamination.

The site history review and walkover indicated that the site has been and is currently arable farmland used for grazing. An area of the south western portion of the site was disturbed between 1976 and 1985 with the disturbance still slightly visible in the 1992 aerial photograph.

Three buildings were constructed between 1985 and 1992 likely used for the running of the farm. Two of these buildings were then demolished and a small building constructed north of the remaining original building between 1992 and 2002. It was noted that asbestos is unlikely to be present within the former and current buildings as they were constructed after 1980. Entrance driveways were visible to the buildings in the 1992 and 2002 aerial photographs with an area of disturbed ground noted adjacent to one of the entrance driveways in 1992. A dirt track crossed through the western portion of the site in a north to south orientation in the 1992 aerial photograph. The Bungendore Landfill Facility was noted to the north of the site between 1967 and 2002, however, the URS (2014) report indicated that it had been operating as a 'garbage depot' since at least 1905. The landfill was currently partially open and going through a closure process at the time of the PSI.

The south western portion of the site included a shed, two animal shelters and a separate toilet with a hole dug in the ground to collect the waste. The shed was constructed on a concrete hardstand surface. It was also noted that the Queanbeyan-Palerang Council and Mr Brinkmeyer indicated that weed control has been undertaken across the site annually. An embankment was noted along the northern boundary with the landfill and a small area of disturbed ground was noted in the south western portion of the site.

Scattered rubbish, mostly pieces of plastic and cardboard such as food wrappers, bags and boxes, were noted particularly near to the landfill to the north of the site. Three old 200 L fuel drums and an old 20 L kerosene drum were also noted within the site, however, these were empty and disused.

The results of the PSI indicated that the site was generally suitable for the intended residential land use subject to an intrusive subsurface investigation to determine the extent (if any) of potential contamination at the site. Specifically soil sampling across the site targeting the agricultural land use including weed control, the unknown filling and the hole dug in the ground for waste from a toilet.

In regards to the scattered rubbish across the site, there was unlikely to be any impacts to the site considering the inert pieces identified however there was an aesthetic impact. Therefore it was recommended that a more secure barrier be placed between the landfill and the site to minimise the rubbish migrating into the site from the landfill. The rubbish could also periodically be collected by hand across the site and should be done just prior to site preparation and earthworks commencing for the development.

DP also recommended that the locked shed be accessed to determine if there was any storage of chemicals or fuel, and on-going monitoring of the Bungendore Landfill Facility to the north of the site

should be undertaken. It also further noted that confirmation should be sought that the landfill was not considered to be impacting the current site and that a 250 m buffer zone should be applied to any proposed development within the subject site, particularly noting the levels of methane registered at the boundary of the landfill and subject site. Further detailed investigation may be required if this cannot be confirmed.

It is noted that the locked shed was accessed during this addendum and contained a few items of furniture, including a table, a chair and a wooden dresser and a bag of cement. There was no evidence of chemicals or fuel storage within the shed.

6. Potential for Contamination

Based on DP (2016) the main sources of potential contamination are considered to be:

-) Potential impacts from agricultural land use including weed control. Potential contaminants associated with agricultural use are: metals: arsenic (As), cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), mercury (Hg), nickel (Ni), zinc (Zn); organochloride pesticides (OCP), organophosphate pesticides (OPP) and herbicides.
-) Potential impacts from filling associated with the historical buildings, disturbed ground (historical), dirt tracks (historical and observed). Potential contaminants associated with fill from unknown and contaminated sources are: metals; total recoverable hydrocarbons (TRH); benzene, toluene, ethylbenzene, xylene (BTEX); polycyclic aromatic hydrocarbons (PAH); polychlorinated biphenyls (PCB); OCP; OPP; phenols and asbestos.
-) Potential impacts from the separate toilet with a hole dug in the ground. Potential contaminants associated with holes dug in the ground for waste from a toilet are: e.coli, faecal coliforms and salmonella.
-) Potential impacts migrating from the adjacent landfill. Potential contaminants associated with a landfill are: landfill gas and leachate (in groundwater).

It is noted that at the time of the investigation the toilet had been removed with the concrete slab remaining.

Potential sources of contamination observed on site are shown on Drawing 1, attached. However, it should be noted that other fill areas not identifiable on aerial photographs or via surface walkover, could be present.

7. Preliminary Conceptual Site Model

A conceptual site model (CSM) is a representation of site-related information regarding potential contamination sources, receptors and exposure pathways between those sources and receptors. The CSM provides the framework for identifying how the site became contaminated 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 (complete pathways).

7.1 Potential Contamination Sources

Based on Section 6 the potential contamination sources are as follows:

- S1 – Agricultural land use and weed control (metals, OCP, OPP, herbicides)
- S2 – Filling (metals, TRH, BTEX, PAH, PCB, OCP, OPP, phenols and asbestos)
- S3 – Hole dug in the ground for waste from a toilet (e.coli, faecal coliforms and salmonella)
- S4 – Landfill in adjacent land (landfill gas, leachate/groundwater)

7.2 Potential Receptors

7.2.1 Human Health Receptors

Potential human health receptors include the following:

- R1 – Current users (unoccupied).
- R2 – Construction and maintenance workers.
- R3 – End users (residential).
- R4 – Land users in adjacent areas (commercial and residential).

7.2.2 Environmental Receptors

Potential environmental receptors include the following:

- R5 – Groundwater.
- R6 – Terrestrial ecology.
- R7 – Surface water.

7.3 Potential Pathways

Potential pathways for contamination present include the following:

- P1 – Ingestion and dermal contact.
- P2 – Inhalation of dust and/or vapours.
- P3 – Surface water run-off.
- P4 – Leaching of contaminants and vertical migration into groundwater.
- P5 – Lateral migration of groundwater providing baseflow to watercourses.
- P6 – Direct contact with terrestrial ecology.
- P7 – Migration of landfill gas on to the current site in particular methane which has explosive properties.

There are buried services along the boundaries of the site however they do not cross through and would not be considered preferential pathways for contamination. There are potential sources of mobile contamination such as hydrocarbons or ground gases (including methane and carbon dioxide

etc) that could migrate onsite from the adjacent landfill through preferential pathways other than buried services (e.g. fractures in bedrock). It is noted that there is a risk of explosion from migrating methane (LFG) when in concentrations between 5-15% v/v. Noting that concentrations at LG01 are very high (~70%) from ENRS (2015) then a gas gradient could extend into the adjacent site.

7.4 Summary of Potential Complete Pathways

A 'source–pathway–receptor' approach has been used to assess the potential risks of harm being caused to human, water or environmental receptors from contamination sources on or in the vicinity of the site, via transport pathways (potential complete pathways). The possible pathways between the above sources (S1 to S3) and receptors (R1 to R7) are provided below in Table 4.

Table 4: Summary of Potential Complete Pathways

Source	Transport Pathway	Receptor	Comments
S1 – Agricultural land use: metals, OCP, OPP, herbicides S2 – Filling: metals, TRH, BTEX, PAH, PCB, OCP, OPP, phenols and asbestos. S3 – Hole dug in the ground for waste from a toilet: e.coli, faecal coliforms and salmonella	P1 – Ingestion and dermal contact. P2 – Inhalation of dust and/or vapours.	R1 – Current users (arable farmland). R2 – Construction and maintenance workers. R3 –End users (residential).	An intrusive investigation is required to assess possible contamination including chemical testing of the soils and groundwater. See Note 1.
	P2 – Inhalation of dust and/or vapours.	R4 – Land users in adjacent areas (residential and arable farmland).	
	P4 – Leaching of contaminants and vertical mitigation into groundwater.	R5 – Groundwater.	
	P3 – Surface water run-off. P5 – Lateral migration of groundwater providing base flow to watercourses.	R7 – Surface water (dams and creek lines).	An intrusive investigation is required to assess the impacts on surface water if the site is found to be contaminated. See Note 2
	P6 – Direct contact with terrestrial ecology.	R6 – Terrestrial ecology.	An intrusive investigation is required to assess possible contamination including chemical testing of the soils, groundwater, leachate and gas.
S4 – Landfill: landfill gas, leachate	P4 – Leaching of contaminants into groundwater and vertical/lateral mitigation of landfill gas .	R5 – Groundwater/ Ground gas.	On-going monitoring of the Bungendore Landfill Facility to the north of the site should be undertaken. Confirmation should be sought that the landfill is not considered to be impacting the current site in particular through LFG or leachate/groundwater contamination. Further detailed investigation may be required if this cannot be confirmed.
	P7 – Migration of landfill gas on to the current site in particular methane which has explosive properties.	R2 – Construction and maintenance workers. R3 –End users (residential).	On-going monitoring of the Bungendore Landfill Facility to the north of the site should be undertaken. Confirmation should be sought that the landfill is not considered to be impacting the current site in particular through LFG or leachate/groundwater contamination. Further detailed investigation may be required if this cannot be confirmed.

1. It is proposed that leachability testing will be undertaken only if a viable complete pathway between on-site soil contamination and groundwater is identified. Should testing indicate a viable complete pathway between on-site soil contamination and groundwater via a leachable migration pathway then leachability testing (ASLP) may be required.

2. The nearest surface water receptors are the four dams and four creek lines within the site which flow south. Should testing indicate a viable complete pathway between on-site soil contamination and surface water, testing of surface water may be required.

8. Fieldwork

8.1 Sampling Rationale

The site area is understood to be approximately 82 ha. For the purpose of this limited subsurface investigation, targeted sampling of the site features identified as AEC was considered appropriate. Forty test locations were selected for targeted sampling. Samples were selected for analysis in order to gain a general representation of the soil/fill conditions across the site.

8.2 Methods and Sampling Locations

The fieldwork comprised the excavation of 40 test pits (Pits 1 to 40) to depths of between 1.1 m and 4.1 m below ground level (bgl) using a Kubota KX057-4 mini-excavator fitted a 450 mm wide bucket for the preliminary geotechnical investigation. Twenty seven of the above test pit locations were selected at targeted locations for the collection of soil samples for environmental testing the remainder were for geotechnical purposes only. Samples were collected directly from the walls of the test pits or from the bucket at regular intervals from the test pits.

Fieldwork was undertaken on 31 May and 1 June 2017 by an environmental scientist who undertook the following:

-) Setting out of the test locations;
-) Logging of the subsurface profile; and
-) Collection of samples to assist in strata identification and for laboratory testing purposes.

A calibrated photo-ionisation detector (PID) was used during the fieldwork to screen the collected soil samples to assess whether volatile organic compounds were present. The approximate test locations are shown on Drawing 1, attached.

8.3 Soil Sampling Procedure

All sample locations were checked for underground services by a review of dial before you dig (DBYD) plans and by a services locator.

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

-) Decontamination of sampling equipment using a 3% solution of phosphate free detergent (Decon 90) and tap water prior to collecting each sample;
-) The use of disposable gloves for each sampling event;
-) Transfer of samples into laboratory-prepared glass jars, and capping immediately;
-) Collection of replicate soil samples in zip-lock plastic bags at each depth for PID screening;
-) Collection of replicate samples for QA/QC purposes;
-) Labelling of sample containers with individual and unique identification, including project number, sample location and sample depth;
-) Placement of the sample jars and replicate sample bags into a cooled, insulated and sealed container for transport to the laboratory; and
-) Use of chain of custody (C-O-C) documentation so that sample tracking and custody could be cross-checked at any point in the transfer of samples from the field to the laboratory.

Samples for environmental purposes were generally collected from the near surface, and at regular depth intervals or changes in strata within each test pit.

Soil samples were collected directly from the side walls of the test pits or from the excavator bucket. Care was taken whilst collecting the samples to remove any extraneous material deposited on the pit walls or soil removed from the pits during the excavation process.

Envirolab Services Pty Ltd (NATA accreditation number: 2901) was used for the analysis of soil samples. The laboratory is required to carry out routine in-house QC procedures.

Field replicates were recovered and analysed by intra-laboratory analysis for a limited suite of contaminants with reference to standard industry practice and guidelines. The comparative results are attached together with other QA/QC evaluations of the assessment, C-O-C documentation (Field and Laboratory) and sample receipt information.

9. Laboratory Testing

The analytical scheme was designed to obtain an indication of the presence of contaminants of potential concern (COPC) that may be attributable to past and present activities and features within the site, as discussed in Section 6. Selected primary soil samples were analysed for the various COPC namely metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn, Mn), PAH, TRH, BTEX, OCP, OPP, PCB, phenols, asbestos, herbicides, E.coli, salmonella and faecal coliforms.

Laboratory analytical methods are as stated in the certificates of analysis attached.

Selected samples were also tested for cation exchange capacity (CEC), pH and clay content to assist with the assessment of ecological investigation levels (EIL) as presented below.

10. Site Assessment Criteria

The proposed land use at the site is for low density residential properties. The specific construction details of the development are not known.

The site assessment criteria (SAC) applied in the current investigation are informed by the Preliminary CSM which identified human and ecological receptors to potential contamination on the site (refer to Section 7). Analytical results were assessed (as a Tier 1 assessment) against the SAC comprising the investigation and screening levels of Schedule B1, *National Environment Protection (Assessment of Site Contamination) Measure* 1999, as amended 2013 (NEPC, 2013). The NEPC guidelines are endorsed by the ACT EPA under the *Environment Protection Act* 1997 (Ref 4). Petroleum based health screening levels for direct contact have been adopted from the *Cooperative Research Centre for Contamination Assessment and Remediation of the Environment (CRC CARE) Technical Report no.10 Health screening levels for petroleum hydrocarbons in soil and groundwater* (2011) as referenced by NEPC (2013) have not been considered in this assessment as these values are significantly higher than the soil vapour HSLs adopted.

The investigation and screening levels are applicable to generic land use settings and include consideration of, where relevant, the soil type and the depth of contamination. The investigation and screening levels are not intended to be used as clean up levels. Rather, they establish concentrations above which further appropriate investigation (e.g. Tier 2 assessment) should be undertaken. They are intentionally conservative and are based on a reasonable worst-case scenario.

The investigation and screening levels applied in the current investigation comprise levels adopted for a generic residential land use scenario.

10.1 Health Investigation and Screening Levels

The Health Investigation Levels (HIL) and Health Screening Levels (HSL) are scientifically-based, generic assessment criteria designed to be used in the first stage (Tier 1) of an assessment of potential human health risk from chronic exposure to contaminants.

HIL are applicable to assessing health risk arising via all relevant pathways of exposure for a range of metals and organic substances. The HIL are generic to all soil types and apply generally to a depth of 3 m below the surface for residential use. Site-specific conditions may determine the depth to which HIL apply for other land uses.

HSL are applicable to selected petroleum compounds and fractions to assess the risk to human health via inhalation and direct contact pathways. HSL have been developed for different land uses, soil types and depths to contamination.

The generic HIL and HSL are considered to be appropriate for the assessment of contamination at the site. Given the proposed land use the adopted HIL and HSL are:

- 1) **HIL A** – residential with garden/accessible soil (home grown produce <10% fruit and vegetable intake, (no poultry), also includes children's day care centres, preschools and primary schools and

) **HSL- AB** – low – high density residential

In addition, the HSL adopted are predicated on the inputs summarised in Table 2.

Table 2: Inputs to the Derivation of HSL

Variable	Input	Rationale
Potential exposure pathway	Soil vapour intrusion (inhalation)	Potential exposure pathways include vapour intrusion through concrete slabs from potentially contaminated fill material beneath the slab. There is also the risk of soil vapours during any excavation of potentially contaminated fill material.
Soil Type	Sand	A conservative approach has been adopted for this investigation
Depth to contamination	0 m to <1 m	A conservative approach has been adopted for this investigation

The adopted soil HIL and HSL for the potential contaminants of concern are presented in Table 3.

Table 3: Health Investigation and Screening Levels (HIL and HSL) in mg/kg unless otherwise indicated

Contaminants		HIL-A,	HSL-A Vapour Intrusion
Metals	Arsenic	100	NC
	Cadmium	20	NC
	Chromium (VI)	100	NC
	Copper	6000	NC
	Lead	300	NC
	Manganese	3800	NC
	Mercury (inorganic)	40	NC
	Nickel	400	NC
	Zinc	7400	NC
PAH	Benzo(a)pyrene TEQ ¹	3	NC
	Naphthalene	NC	3
	Total PAH	300	NC
TRH	C6 – C10 (less BTEX) [F1]	NC	45
	>C10-C16 (less Naphthalene) [F2]	NC	110
	>C16-C34 [F3]	NC	NC

Contaminants		HIL-A,	HSL-A Vapour Intrusion
	>C34-C40 [F4]	NC	NC
BTEX	Benzene	NC	0.5
	Toluene	NC	160
	Ethylbenzene	NC	55
	Xylenes	NC	40
Phenol	Pentachlorophenol (used as an initial screen)	100	NC
OCP	Aldrin + Dieldrin	240	NC
	Chlordane	6	NC
	DDT+DDE+DDD	50	NC
	Endosulfan	270	NC
	Endrin	10	NC
	Heptachlor	6	NC
	HCB	10	NC
	Methoxychlor	300	NC
OPP	Chlorpyrifos	160	NC
PCB²		1	NC

Notes:

- 1 *sum of carcinogenic PAH*
- 2 *non dioxin-like PCBs only.*
- 3 *NC: No Criteria*

10.2 Ecological Investigation 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 (e.g. 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:

$$\text{EIL} = \text{ABC} + \text{ACL},$$

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* may be 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 the *Interactive (Excel) Calculation Spreadsheet* are shown in the following Table 4. The following site specific data and assumptions have been used to determine the EIL:

-) A protection level of 80% for urban residential areas and public open space has been adopted;
-) The EIL will apply to the top 2m of the soil profile;
-) Given the likely source of soil contaminants (i.e. unknown historical /fill) the contamination is considered as “aged” (>2 years);
-) ABCs have been derived using the *Interactive (Excel) Calculation Spreadsheet* using input parameters NSW for the nearest state to which the site is located and low for traffic volumes. No background concentration is assumed for lead (conservative);
-) Site specific pH, CEC and clay content values have been used as input parameters in the *Interactive (Excel) Calculation Spreadsheet*. Based on median pH, CEC and clay content values for soils collected across the site, the soil profile has an average pH of 5.4 (range 5.1 to 5.6), CEC of 3.5 cmol_e/kg (range <1 to 7.2) and clay content of 15.7% (range 8 to 26). The Calculation Spreadsheet is attached.

Table 4: Ecological Investigation Levels (EIL) in mg/kg

Analyte		EIL	Comments
Metals	Arsenic	100	Adopted pH of 5.4, CEC of 3.5 cmol _e /kg and clay content 15.7%
	Copper	80	
	Nickel	20	
	Chromium III	470	
	Lead	1100	
	Zinc	210	

Analyte		EIL	Comments
PAH	Naphthalene	170	
OCP	DDT	180	

10.3 Ecological Screening Levels – Petroleum Hydrocarbons

Ecological Screening Levels (ESL) are used to assess the risk of selected petroleum hydrocarbon compounds, BTEX and benzo(a)pyrene to terrestrial ecosystems. ESL apply to the top 2 m of the soil profile as for EIL.

ESL have been derived in NEPC (2013) for petroleum fractions F1 to F4 as well as BTEX and Benzo(a)pyrene. Site specific data and assumptions as summarised in Table 5 have been used to determine the ESL. The adopted ESL, from Table 1B(6), Schedule B1 of NEPC (2013) are shown in Table 6.

Table 5: Inputs to the derivation of ESL

Variable	Input	Rationale
Depth of ESL application	Top 2 m of the soil profile	The top 2 m depth below ground level corresponds to the root zone and habitation zone of many species.
Land use	Urban residential and public open space	The future land use is proposed to be rural residential properties
Soil Texture	Coarse	A conservative approach has been adopted for this investigation

Table 6: Ecological Screening Levels (ESL) in mg/kg

Analyte		ESL	Comments
TRH	C6 – C10 (less BTEX) [F1]	180*	All ESLs are low reliability apart from those marked with * which are moderate reliability
	>C10-C16 (less Naphthalene) [F2]	120*	
	>C16-C34 [F3]	300	
	>C34-C40 [F4]	2,800	
BTEX	Benzene	50	
	Toluene	85	
	Ethylbenzene	70	
	Xylenes	105	
PAH	Benzo(a)pyrene	0.7	

10.4 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;
-)] Effects on buried infrastructure e.g. penetration of, or damage to, in-ground services.

Management Limits to avoid or minimise these potential effects have been adopted in NEPC (2013) as interim Tier 1 guidance. Management Limits 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 the following Table 7. The following site specific data and assumptions have been used to determine the Management Limits:

-)] The Management Limits will apply to any depth within the soil profile;
-)] The Management Limits for residential, parkland and public open space apply; and
-)] A “coarse” soil texture has been adopted

Table 7: Management Limits in mg/kg

Analyte		Management Limit
TRH	C₆ – C₁₀ (F1) #	700
	>C₁₀-C₁₆ (F2) #	1000
	>C₁₆-C₃₄ (F3)	2500
	>C₃₄-C₄₀ (F4)	10000

Separate management limits for BTEX and naphthalene are not available hence these have not been subtracted from the relevant fractions to obtain F1 and F2

10.5 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 filling on vacant land and development sites; and
-)] Commonly occurring in historical filling 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 was not undertaken as part of these works as asbestos was not identified as a contaminant of concern at the time of writing the proposal. Therefore 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.

10.6 Microbiological Standards

Microbiological Standards Grade A biosolids were adopted as guidelines for the pathogens analysed. Grade A biosolids were considered appropriate due to the unknown history of the process used at the septic tank. The microbiological standards are given on Table 8 below.

Table 8: Microbiological Standards in UCG/100g

Analyte		Stabilisation Grade A (MPN* per gram dry weight)
Biosolids	E.coli	100
	Faecal coliforms	1000
	Salmonella	Not Detected

*Most probable number.

10.7 Gas Screening Value Thresholds

Table 6 in the NSW EPA Guidelines for the Assessment and Management of Sites Impacted by Hazardous Ground Gases (Ref 4) outlines the gas screening value thresholds of methane and carbon dioxide for various characteristic gas situations. These levels determine the corresponding required gas protection guideline values outlined in Table 7 for each of the characteristic gas situations for a low density residential land use.

The levels of methane, carbon dioxide and non-methane organic gases have not been determined however there is a risk that they could impact future development due to the landfill's location adjacent to the site.

11. Results of the Investigation

11.1 Subsurface Observations

Details of the subsurface conditions encountered in the test pits are included on the test pit logs, attached, which must be read in conjunction with the included explanatory notes that define classification methods and terms used to describe the soils. In summary, the test pits encountered variable subsurface conditions underlying the site with the principal succession of strata broadly summarised as follows:

-) TOPSOIL: generally comprising brown, grey and red brown silty sand, sandy silt or silt topsoil with rootlets to depths of 0.1 to 0.3 m bgl. Topsoil filling was encountered in Pit 32 m to 0.6 m depth with natural remnant topsoil then underlying the filling from 1.1 to 1.3 m bgl depth.
-) FILLING: generally comprising grey, brown and light orange sandy or clayey soils with varying amounts of silt and gravel in Pits 25 and 31 to 34 to depths of 0.1 to 1.1 m bgl. It is noted that the filling in Pit 25 was surficial and associated with dam embankments in the other pits.
-) SAND/GRAVEL: variably loose to very dense moist to dry grey, brown, yellow brown, red brown and orange brown sand and gravel with varying amounts of clay and silt in to 0.4 to 2.7 m bgl depth in Pits 1 to 8, 10, 15, 19, 20, 24, 26 and 29 and to the limit of investigation depths of 2.6 to 3.7 m bgl in Pits 25, 27 and 30 and 1.1 m bgl in Pits 35 to 40.
-) CLAY/SILT: variably soft to hard, wet to dry, grey, yellow brown, red brown and orange brown, low to high plasticity clay and silt with varying amounts of sand and gravel to 1.0 to 3.5 m bgl in Pits 3 to 5, 7 to 10, 12 to 17, 20 to 23 and 30 to 32 and to the limit of investigation depths of 2.5 to 3.1 m bgl in Pits 6, 11, 18, 26, 28, 33 and 34.
-) BEDROCK: variably extremely low to high strength, extremely to slightly weathered, grey, yellow, red, orange and brown siltstone, shale and sandstone bedrock in Pits 1 to 5, 7 to 10, 12 to 17, 19 to 24, 27, 29, 31 and 32 below depths of 1.0 to 2.7 m bgl to termination depths of 1.6 to 3.5 m bgl.

No free groundwater was observed during excavation of the test pits to a maximum depth of 4.1 m. However, the pits were backfilled immediately following excavation precluding longer term monitoring of groundwater levels. Groundwater conditions rarely remain constant and can change seasonally due to variations in rainfall, temperature and soil permeability. For these reasons, it is noted that the moisture condition of the site soils may vary considerably from the time of the investigation compared to at the time of construction.

The results of the PID screening testing are included on the test pit logs. The screening tests indicated that the subsurface conditions were generally absent of volatile organic compounds with all recorded values less than 1 ppm.

11.2 Contamination Observations

There was no visual or olfactory evidence (i.e. staining or odours) to suggest the presence of gross contamination within the soils investigated.

11.3 Analytical Results

A summary of the results of the laboratory analysis undertaken on the soil samples is presented in Tables 9 to 11 attached along with the full laboratory certificates for the current assessment.

11.4 Assessment of Laboratory Results

All recorded soil chemical analysis results for TRH, BTEX, PAH, OCP, OPP, PCB and phenols were below the laboratory's practical quantitation limit (PQL) and the SAC for low density residential land use. No asbestos was detected. All recorded soil chemical analysis results for E.coli, faecal coliforms and salmonella were below the laboratory's practical quantitation limit (PQL) with the exception of E.coli at Pit 40/0.05 (200 MPN/100g). All results were below the SAC for low density residential land use.

All recorded soil chemical analysis results for metals were above the PQL, with the exception of cadmium and mercury, but within the SAC for low density residential land use.

12. Revised Conceptual Site Model

The preliminary CSM in Section 7 has been updated to incorporate the findings of this PSI.

A 'source–pathway–receptor' approach has been used to assess the potential risks of harm being caused to human, water or environmental receptors from contamination sources on or in the vicinity of the site, via transport pathways.

The results of the subsurface investigation and laboratory analysis indicate an absence of significant contamination within the soils encountered with most of the recorded concentrations of the COPC being below the laboratory PQL and all recorded concentrations of the COPC being less than the adopted SAC. Therefore the risk to human and environmental receptors based on the results is considered low.

Groundwater testing has not been undertaken as part of this addendum to the PSI, however, the results of the subsurface investigation and laboratory analysis indicate an absence of significant contamination within the filling encountered. However there are risks from off-site sources, in particular the adjacent unlined landfill, including migrating leachate contaminated groundwater and landfill gas (particularly methane) on to the site.

However, an unexpected finds protocol (UFP) is recommended for any future development to address any potential contamination encountered.

13. Conclusions and Recommendations

Areas that may be impacted by potential contamination (from on-site sources) were identified on the basis of the available site information and limited subsurface investigation. Based on the findings of the assessment, the potential for significant contamination to be present within the site from on-site sources is considered to be low. However, risks from off-site sources, in particular the adjacent unlined landfill, include migrating leachate contaminated groundwater and landfill gas (particularly methane) and cannot be discounted. Accordingly these issues require to be fully explored, particularly noting the levels of methane reported on the boundary of the landfill and the subject site and that ground gas (methane) may have the potential to migrate in the substrate for hundreds of metres.

In this regard a suitable no –build buffer zone may be appropriate unless testing can confirm that any potential risks from contaminants potentially migrating from the landfill are minimal.

The results of the investigation indicate that the site is suitable for the intended low density residential subject to the above and the implementation of an unexpected finds protocol (UFP) to address potential contamination and bonded ACM encountered and a “safe working methodology”. It is also noted that during development and after the removal of the concrete slab from the former toilet, any hole used for septic waste should be validated.

As noted in DP (2016), in regards to the scattered rubbish across the site, we would recommend that a more secure barrier be placed between the landfill and the site to minimise the rubbish migrating into the site. The rubbish could also periodically be collected by hand across the site and should be done just prior to site preparation and earthworks commencing for the development.

Also as noted in DP (2016), we would recommend that on-going monitoring of the Bungendore Landfill Facility to the north of the site should be undertaken. Confirmation should be sought that the landfill is not considered to be impacting the current site and that the 250 m buffer applied for any proposed development is appropriate. Further investigation may be required if this cannot be confirmed.

If soil is proposed to be removed from the site it must be stockpiled first and tested for the listed contaminants and subjected to a formal waste classification assessment with reference to the NSW EPA: *Waste Classification Guidelines, Part 1: Classifying Waste* (Ref 4).

14. References

- 1 NSW Department of Land and Water Conservation (2000): *Canberra Soil Landscape Series Sheet 8727* 1:100 000 scale map.
- 2 Bureau of Mineral Resources (1992): *Geology of Canberra Geological Series Sheet 8727, 1:100 000 scale map.*
- 3 Bureau of Mineral Resources, Geology and Geophysics (1984): *Hydrogeology of the Australian Capital Territory and Environs* 1:100,000 scale map.
- 4 NSW EPA. *Waste Classification Guidelines, Part 1: Classifying Waste*, November 2014.

15. Limitations

Douglas Partners (DP) has prepared this report for Lot 1 DP 798111, Bungendore in accordance with DP's email proposal dated 14 September 2016, and email acceptance from Queanbeyan-Palerang Council dated 23 May 2017. This report is provided for the exclusive use of the Queanbeyan-Palerang Council 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.

DP's advice is based upon the conditions observed at the site surface during this investigation. The accuracy of the advice provided by DP in this report may be affected by unobserved variations in ground conditions across the site. The advice may also be limited by budget constraints imposed by others or by site accessibility.

Asbestos-containing materials (ACM) have not been detected by observation or laboratory analysis on the surface of the site or within the test location. The possible presence of hazardous building materials (HBM) including ACM, cannot be precluded in unobserved or untested parts of the site and hence no warranty can be given that HBM is not present.

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.

The contents of this report do not constitute formal design components such as are required, by the Health and Safety Legislation and Regulations, to be included in a Safety Report specifying the hazards likely to be encountered during construction and the controls required to mitigate risk. This design process requires risk assessment to be undertaken, with such assessment being dependent upon factors relating to likelihood of occurrence and consequences of damage to property and to life. This, in turn, requires project data and analysis presently beyond the knowledge and project role respectively of DP. DP may be able, however, to assist the client in carrying out a risk assessment of potential hazards contained in the Comments section of this report, as an extension to the current scope of works, if so requested, and provided that suitable additional information is made available to DP. Any such risk assessment would, however, be necessarily restricted to the environmental components set out in this report and to their application by the project designers to project design, construction, maintenance and demolition

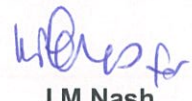
Please contact the undersigned if you have any questions on this matter.

Yours faithfully
Douglas Partners Pty Ltd

Reviewed by

for 

Elyse Storr
Environmental Engineer



J M Nash
Principal

Attachments:

- About this Report
- Drawing 1 – Site Features and Test Location Plan
- Data Quality Assessment
- Chain of Custody (Field and Laboratory)
- Sample Receipt
- Explanatory Notes
- Test Pit Logs (Pits 1 to 40)
- EIL Calculation Spreadsheets
- Tables 9 to 12 (Summary of Laboratory Test Results)
- Laboratory Certificates of Analysis

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.

Client: Quebec-Blanc Regional Council
Project: PST Project No: SS336-02
Location: Bungendore

Field								DP Office	Despatch	Notes
Sample ID	Depth (m)	Duplicate/ Replicate Sample	Sample Type S-soil W-water	Container Type G-glass P-plastic	Sampling			Received by:	☒ Envirolab	
					By	Date	Time	Date:	Date: <u>6/6/17</u>	
PIT 21	0.05		S	G	SDG	1/6/17	—	Fridge		LAB
PIT 21	0.2									
PIT 21	0.5									
PIT 23	0.05	124								LAB
PIT 23	0.2									
PIT 23	0.5									
PIT 19	0.05									
↓	0.2									LAB
↓	0.5									
↓	1.0									
PIT 34	0.05									
↓	0.2									
↓	0.5	125								
↓	1.0									
PIT 13	0.05									
↓	0.2									LAB
↓	0.5									
↓	1.0									
PIT 12	0.05									
↓	0.2									LAB

Default containers for soil: glass = clear 125/250 mL with teflon liner, plastic = press seal bag
*Default storage: Glass containers in fridge, plastic containers shelved, all water samples in fridge

Client: Queanbeyan - Palerang Regional Council
Project: PSI Project No: 88336-02
Location: Bungendore

Field								DP Office	Despatch	Notes
Sample ID	Depth (m)	Duplicate/ Replicate Sample	Sample Type S-soil W-water	Container Type G-glass P-plastic	Sampling			Received by:..... Date:	☒ EnviroLab Date: <u>6/6/17</u>	
					By	Date	Time	Storage Location*		
PIT 12	0.5		S	G	SDG	1/6/17	-	Fridge		
↓	1.0									
PIT 7	0.05									LAB
↓	0.2									
	0.5									
↓	1.0									
PIT 26	0.05									LAB
PIT 26	0.2	R6								
↓	0.5									
↓	1.0									
PIT 27	0.05									LAB
	0.2									
	0.5									
	1.0									
PIT 25	0.05									LAB
↓	0.2									
	0.5									
↓	1.0									
PIT 24	0.05									
LAB 24	0.05									

Default containers for soil: glass = clear 125/250 mL with teflon liner, plastic = press seal bag
*Default storage: Glass containers in fridge, plastic containers shelved, all water samples in fridge

Client: Queanbeyan - Palerang Regional Council
Project: PSI Project No: 88336.02
Location: Bungendore

Sample ID	Depth (m)	Duplicate/ Replicate Sample	Field					DP Office		Despatch	Notes
			Sample Type S-soil W-water	Container Type G-glass P-plastic	Sampling			Received by:.....	Date:.....	☒ EnviroLab	
					By	Date	Time	Storage Location*		Date: <u>6/6/17</u>	
PIT 24	0.5		S	G	SDG	1/6/17		Fridge			
PIT 24	1.0										
PIT 36	0.05										
↓	0.2										
↓	0.5										
↓	1.0										
PIT 35	0.05	R7									LAB
↓	0.2										
↓	0.5										
↓	1.0										
PIT 37	0.05										
↓											
↓											
PIT 40	0.05										LAB
↓	0.2										
↓	0.5										
↓	1.0										
PIT 38	0.05										
↓	0.2	R8									LAB

Default containers for soil: glass = clear 125/250 mL with teflon liner, plastic = press seal bag

*Default storage: Glass containers in fridge, plastic containers shelved, all water samples in fridge

Client: Queanbeyan-Palerang Regional Council
Project: PSI Project No: SR336.02
Location: Bungendore

Field								DP Office	Despatch	Notes
Sample ID	Depth (m)	Duplicate/ Replicate Sample	Sample Type S-soil W-water	Container Type G-glass P-plastic	Sampling			Received by:..... Date:	☒ EnviroLab Date: <u>6/6/17</u>	
					By	Date	Time	Storage Location*		
PIT 38	0.5		S	G	SDG	1/6/17	c	Fridge		
↓	1.0									
PIT 39	0.05									LAB
PIT 34	0.2									
↓	0.5									
↓	1.0									
PIT 40	0.05									
↓	0.2									
↓	0.5									
↓	1.0									
PIT 1	0.05					31/5/17				
↓	0.2									
↓	0.5									
PIT 2	0.05									
↓	0.2									
↓	0.5									
PIT 3	0.05									
↓	0.2									
↓	0.5									
PIT 10	0.05	R3	✓	✓	✓	✓		✓	✓	

Default containers for soil: glass = clear 125/250 mL with teflon liner, plastic = press seal bag

*Default storage: Glass containers in fridge, plastic containers shelved, all water samples in fridge

Client: Oceanbayan - Palerang Regional Council
Project: PSI Project No: 8336.02
Location: Bungendore

Field								DP Office	Despatch	Notes
Sample ID	Depth (m)	Duplicate/ Replicate Sample	Sample Type S-soil W-water	Container Type G-glass P-plastic	Sampling			Received by:..... Date:.....	☒ EnviroLab Date: <u>6/6/17</u>	
					By	Date	Time	Storage Location*		
PIT 10	0.2		S	G	SDG	31/5/17	-	Fridge		
↓	0.5									
PIT 17	0.05									
↓	0.2									
↓	0.5									
PIT 32	0.05									
↓	0.2									
↓	0.5									
↓	1.0	RI								
↓	1.5									
PIT 28	0.05									
↓	0.2									
↓	0.5									
PIT 29	0.05									
↓	0.2									
↓	0.5									
PIT 30	0.05									
↓	0.2									
↓	0.5									
PIT 31	0.05									

Default containers for soil: glass = clear 125/250 mL with teflon liner, plastic = press seal bag
*Default storage: Glass containers in fridge, plastic containers shelved, all water samples in fridge

[illegible]

Rev4/Feb 2005



CHAIN OF CUSTODY DESPATCH SHEET

Project Name: *Surroundone*
 Project No: *88776-02* DP Order No: *130547*
 DP Contact Person: *Simon Dunn* *Simon Goodall*
 Prior Storage: esky / image shelved (circle)

To: Envirolab Services Pty Ltd
 12 Ashley Street
 CHATSWOOD NSW 2067
 Ph: (02) 9910 6200

Attn: Jacinta Hurst

Sample ID	Date Sampled	Sample Type S-soil W-water	Lab ID	metals ocp opp	metals ocp opp	metals ocp opp	Lab ID	As	Fe	Co	Cd	Cu	Pb	Zn	Hg	Ni	Mn	Fe
914/0.05	31/5/17	S	1	X														
914/0.2	↓	↓	2															
914/0.5	↓	↓	1															
914/0.05	↓	↓	1															
914/0.2	↓	↓	1															
914/0.5	↓	↓	1															
914/0.05	↓	↓	3															
914/0.2	↓	↓	4															
914/0.5	↓	↓	5															
914/0.05	1/6/17	↓	6															
914/0.2	↓	↓	7															
914/0.5	↓	↓	8															
PQL (S)		mg/kg																
PQL (W)		mg/L																

PQL = practical quantitation limit *As per Laboratory Method (Detection Limit)

- Metals to Analyse (Please circle): As Cd Cr Cu Pb Zn Hg Ni Mn Fe

Date relinquished: 6/6/17

Total number of samples in container: 11.0

Results required by: Standard 72 hr 48hr 24hr

TAT (Circle):

SAMPLES RECEIVED

Please sign and date to acknowledge receipt of samples and return by fax

Signature: NR

Date: 070617 Lab Ref: 168816

Send results to:

Douglas Partners Pty Ltd

Address:

PO BOX 1487 FYSHWICK

ACT 2609

Fax: (02) 6260 1147



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CHAIN OF CUSTODY DESPATCH SHEET

Project Name: Burges Road To: EnviroLab Services Pty Ltd
Project No: 88336.02 DP Order No: 130557
12 Ashley Street
DP Contact Person: Raymond CHATSWOOD NSW 2067
Ph: (02) 9910 6200
Prior Storage: esky / fridge / shelved (circle) Attn: Jacinta Hurst

Sample ID	Date Sampled	Sample Type S-soil W-water	Lab ID	Analytes			HOLD	TCLP				Notes
				metals, oil, orp	metals, oil, orp, pesticides							
017/1.0	11/6/17	S	9				X					
017/0.05	11/8/17		10		X		X					
017/0.2			11				X					
017/0.5			12				X					
017/2.05	11/6/17		13	X			X					
017/5.2			14				X					
017/10.5			15				X					
017/1.0			16				X					
017/0.05			17		X		X					
017/0.2			18				X					
017/0.5			19				X					
017/1.0			20				X					
PQL (S)		mg/kg										
PQL (W)		mg/L										

PQL = practical quantitation limit *As per Laboratory Method (Detection Limit)
- Metals to Analyse (Please circle): As Cd Cr Cu Pb Zn Hg Ni Mn Fe
Date relinquished: 6/6/17
Total number of samples in container: 112
Results required by: Standard 72 hr 48hr 24hr
TAT (Circle):

Send results to:
Douglas Partners Pty Ltd
Address:
PO BOX 1487 FYSHWICK
ACT 2609
Fax: (02) 6260 1147

SAMPLES RECEIVED
Please sign and date to acknowledge receipt of samples and return by fax
Signature: NR
Date: 070617 Lab Ref: 168816



Douglas Partners
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CHAIN OF CUSTODY DESPATCH SHEET

Project Name: Dunlop
Project No: 88736.02 DP Order No: 130717
DP Contact Person: Elyse Storr s.s. Stanton Goodwell
Prior Storage: esky / fridge / shelved (circle)

To: Envirolab Services Pty Ltd
12 Ashley Street
CHATSWOOD NSW 2067
Ph: (02) 9910 6200
Attn: Jacinta Hurst

Sample ID	Date Sampled	Sample Type S-soil W-water	Lab ID	Analytes			TCLP	Notes
				metals, PCB, OPP	metals, PCB, OPP, hydrocarbons	HOLD		
Pl 17/0.05	31/5/17	S	21	X				
Pl 17/0.2	↓		22					
Pl 17/0.5			23					
Pl 18/0.05	16/17		102		X			
Pl 18/0.2	↓		103					
Pl 18/0.5	↓		104					
Pl 18/1.0	↓		105					
Pl 21/0.05	↓		24	X				
Pl 21/0.2	↓		25					
Pl 21/0.5	↓		26					
Pl 23/0.05	↓		27		X			
Pl 24/0.2	↓		106			X		
PQL (S)		mg/kg						
PQL (W)		mg/L						

PQL = practical quantitation limit *As per Laboratory Method (Detection Limit)

- Metals to Analyse (Please circle): As Cd Cr Cu Pb Zn Hg Ni Mn Fe

Date relinquished: 6/6/17

Total number of samples in container: 110

Results required by: Standard 72 hr 48hr 24hr

TAT (Circle):

SAMPLES RECEIVED

Please sign and date to acknowledge receipt of samples and return by fax

Signature: N.R.

Date: 07/06/17 Lab Ref: 163816

Send results to:

Douglas Partners Pty Ltd

Address:

PO BOX 1487 FYSHWICK

ACT 2609

Fax: (02) 6260 1147



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CHAIN OF CUSTODY DESPATCH SHEET

Project Name: Wangfong To: EnviroLab Services Pty Ltd
Project No: 55376.02 DP Order No: 130547
DP Contact Person: Elaine Ho CHATSWOOD NSW 2067
Prior Storage: esky / fridge / shelved (circle) Ph: (02) 9910 6200
Attn: Jacinta Hurst

Sample ID	Date Sampled	Sample Type S-soil W-water	Lab ID	Analytes				Notes	
				Combustion 8a	Hydrocarbons	H ₂ O ₂	(EC pH Cond. Temp. Conduct)		TCLP
P123/0.5	1/6/17	S	28						
P124/0.5			29	X			X		
P124/0.5			30						
P124/1.0			31						
P125/0.25			32	X					
P125/0.2			33		X				
P125/0.5			34						
P125/1.0			35						
P126/0.5			36	X					
P126/0.2			37						
P126/0.5			38	X					
P126/1.0			39	X					
PQL (S)		mg/kg							
PQL (W)		mg/L							

PQL = practical quantitation limit *As per Laboratory Method (Detection Limit)

- Metals to Analyse (Please circle): As Cd Cr Cu Pb Zn Hg Ni Mn Fe

Date relinquished: 6/6/17

Total number of samples in container: 140

Results required by: Standard 72 hr 48hr 24hr

TAT (Circle): Standard

Send results to:
Douglas Partners Pty Ltd
Address:
PO BOX 1487 FYSHWICK
ACT 2609
Fax: (02) 6260 1147

SAMPLES RECEIVED
Please sign and date to acknowledge receipt of samples and return by fax

Signature: NR
Date: 07/06/17 Lab Ref: 108816



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CHAIN OF CUSTODY DESPATCH SHEET

Project Name: Bungendore
Project No: 88226.0.2 DP Order No: 150742
DP Contact Person: Ellyse Rose, L.A. Manager, Goodwill
Prior Storage: esky / fridge / shelved (circle)

To: EnviroLab Services Pty Ltd
12 Ashley Street
CHATSWOOD NSW 2067
Ph: (02) 9910 6200
Attn: Jacinta Hurst

Sample ID	Date Sampled	Sample Type S-soil W-water	Lab ID	Combustion 8a	HOLD	Analytes										Notes	
Pt 27/0.5	1/6/17	S	40	X													
Pt 27/0.2	↓	↓	41		X												
Pt 27/0.5	↓	↓	42		X												
Pt 27/0.0	↓	↓	43		X												
Pt 28/0.05	31/5/17	↓	44	X													
Pt 28/0.2	↓	↓	45		X												
Pt 28/0.5	↓	↓	46		X												
Pt 29/0.05	↓	↓	47	X													
Pt 29/0.2	↓	↓	48		X												
Pt 29/0.5	↓	↓	49		X												
Pt 30/0.05	↓	↓	50	X													
Pt 30/0.2	↓	↓	51		X												
PQL (S)		mg/kg															
PQL (W)		mg/L															

PQL = practical quantitation limit *As per Laboratory Method (Detection Limit)
- Metals to Analyse (Please circle): As Cd Cr Cu Pb Zn Hg Ni Mn Fe
Date relinquished: 6/6/17
Total number of samples in container: 17
Results required by: Standard 72 hr 48hr 24hr
TAT (Circle):

Send results to:
Douglas Partners Pty Ltd
Address:
PO BOX 1487 FYSHWICK
ACT 2609
Fax: (02) 6260 1147

SAMPLES RECEIVED
Please sign and date to acknowledge receipt of samples and return by fax
Signature: NR
Date: 070617 Lab Ref: 168816



Douglas Partners
Geotechnics - Environment - Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project Name: Wangarua
Project No: SP71602 DP Order No: 130747
DP Contact Person: Elaine Storer cc: Shannon Goodsell
Prior Storage: esky / fridge / shelved (circle)

To: Envirolab Services Pty Ltd
12 Ashley Street
CHATSWOOD NSW 2067
Ph: (02) 9910 6200
Attn: Jacinta Hurst

Sample ID	Date Sampled	Sample Type S-soil W-water	Lab ID	Combustion 8A	HOLD	Analytes				TCLP	Notes
						As	Cd	Cu	Pb		
P120/0.5	21/5/17	S	52		X						
P121/0.05			53		X						
P121/0.2			54		X						
P121/0.5			55	X							
P121/1.0			56		X						
P121/1.5			57		X						
P122/0.05			58		X						
P122/0.2			59		X						
P122/0.5			60	X							
P122/1.0			61		X						
P122/1.5			62		X						
P123/0.05			63		X						
PQL (S)		mg/kg									
PQL (W)		mg/L									

PQL = practical quantitation limit *As per Laboratory Method (Detection Limit)
- Metals to Analyse (Please circle): As Cd Cr Cu Pb Zn Hg Ni Mn Fe
Date relinquished: 6/6/17
Total number of samples in container: 160
Results required by: Standard 72 hr 48hr 24hr
TAT (Circle):

Send results to:
Douglas Partners Pty Ltd
Address:
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Fax: (02) 6260 1147

SAMPLES RECEIVED
Please sign and date to acknowledge receipt of samples and return by fax
Signature: NR
Date: 070617 Lab Ref: 168816

Project Name: Angerona
Project No: 07236-03 DP Order No: 130547
DP Contact Person: Shannon Crowder
Prior Storage: esky / fridge / shelved (circle)

To: Envirolab Services Pty Ltd
12 Ashley Street
CHATSWOOD NSW 2067
Ph: (02) 9910 6200
Attn: Jacinta Hurst

Sample ID	Date Sampled	Sample Type S-soil W-water	Lab ID	Analytes						Notes		
				Combustion 8a	As	Cd	Cu	Pb	Hg		Mn	Fe
Pt 33/0.2	31/5/17	S	64	X								
Pt 33/0.5			65									
Pt 33/1.0			66									
Pt 33/1.5			67									
Pt 34/0.05	1/6/17		68									
Pt 34/0.2			69	X								
Pt 34/0.5			70									
Pt 34/1.0			71									
Pt 35/0.05			72	X								
Pt 35/0.2			73									
Pt 35/0.5			74									
Pt 36/0.05			75	X								
PQL (S)		mg/kg										
PQL (W)		mg/L										

PQL = practical quantitation limit *As per Laboratory Method (Detection Limit)

- Metals to Analyse (Please circle): As Cd Cr Cu Pb Zn Hg Ni Mn Fe

Date relinquished: 6/6/17

Total number of samples in container: 110

Results required by: Standard 72 hr 48hr 24hr

TAT (Circle):

SAMPLES RECEIVED

Please sign and date to acknowledge receipt of samples and return by fax

Signature: N.B.

Date: 070617 Lab Ref: 168816

Send results to:

Douglas Partners Pty Ltd

Address:

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CHAIN OF CUSTODY DESPATCH SHEET

Project Name: Angkor Wat DP Order No: 130557
Project No: 8822602
DP Contact Person: Steph Storr
Prior Storage: esky / fridge / shelved (circle)

To: EnviroLab Services Pty Ltd
12 Ashley Street
CHATSWOOD NSW 2067
Ph: (02) 9910 6200
Attn: Jacinta Hurst

Sample ID	Date Sampled	Sample Type S-soil W-water	Lab ID	Combustion 8h	H ₂ O	Salmonella ecoli	Salmonella faecalis	TCLP	Notes
P136/0.2	1/6/17	S	76						
P136/0.5			77						
P136/1.0			78						
P137/0.05			79	X					
P137/0.2			80						
P137/0.5			81						
P137/1.0			82			X	X		
P138/0.05			83	X		X	X		
P138/0.2			84						
P138/0.5			85						
P138/1.0			86						
P139/0.05			87			X	X		
PQL (S)		mg/kg							
PQL (W)		mg/L							

PQL = practical quantitation limit *As per Laboratory Method (Detection Limit)
- Metals to Analyse (Please circle): As Cd Cr Cu Pb Zn Hg Ni Mn Fe
Date relinquished: 6/6/17
Total number of samples in container: 11.0
Results required by: Standard 72 hr 48hr 24hr
TAT (Circle): Standard

Send results to:
Douglas Partners Pty Ltd
Address:
PO BOX 1487 FYSHWICK
ACT 2609
Fax: (02) 6260 1147

SAMPLES RECEIVED
Please sign and date to acknowledge receipt of samples and return by fax
Signature: NK
Date: 070617 Lab Ref: 168816



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CHAIN OF CUSTODY DESPATCH SHEET

Project Name: Burgundy To: EnviroLab Services Pty Ltd
 Project No: 11206-02 DP Order No: 1307-X
 DP Contact Person: Elaine Skene CHATSWOOD NSW 2067
 Prior Storage: esky / fridge / shelved (circle) Ph: (02) 9910 6200
 Attn: Jacinta Hurst

Sample ID	Date Sampled	Sample Type S-soil W-water	Lab ID	Analytes					Notes	
				etoli	salmonella	faecal coliforms	combination - Sg	antibiotic OCP OPP		TCLP
P1139/0.2	1/6/17	S	88							
P1139/0.5			89							
P1139/1.0			90							
P1140/0.5			91	X	X					
P1140/0.2			92							
P1140/0.5			93							
P1140/1.0			94							
P1			95							
P2			96							
P4			97							
P5			98							
P6			99							
PQL (S)		mg/kg								
PQL (W)		mg/L								

PQL = practical quantitation limit *As per Laboratory Method (Detection Limit)

- Metals to Analyse (Please circle): As Cd Cr Cu Pb Zn Hg Ni Mn Fe

Date relinquished: 9/6/17

Total number of samples in container: 110

Results required by: Standard 72 hr 48hr 24hr

TAT (Circle):

SAMPLES RECEIVED

Please sign and date to acknowledge receipt of samples and return by fax

Signature: NR

Date: 070617 Lab Ref: 168216

Send results to:

Douglas Partners Pty Ltd

Address:

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Fax: (02) 6260 1147



CHAIN OF CUSTODY DESPATCH SHEET

To: Envirolab Services Pty Ltd
12 Ashley Street
CHATSWOOD NSW 2067
Ph: (02) 9910 6200
Attn: Jacinta Hurst

Analytes															TCLP		Notes
Sample ID	Date Sampled	Sample Type S-soil W-water	Lab ID	Concentration g/g	Hold												
L7		S	100	X													
L8		"	101		X												
PIT/02			107														
R3			108														
												</					

Ellen Wandala Gamage

From: Shannon Goodsell <Shannon.Goodsell@douglaspartners.com.au>
Sent: Thursday, 8 June 2017 1:28 PM
To: Ellen Wandala Gamage
Subject: RE: 88336.02, Bungendore

Hi Ellen,

I've been well thanks, hope you have been too!

I have just had a look through my papers and we didn't sample Pit 2 or Pit 19 so they do not need to be worried about. I think we damaged Pit 1/0.5 as well and may be the reason it isn't there.

However Pit 18/0.05 can be sampled (Pit 19 is in fact Pit 18).

Pit 24/0.2 would be Pit 23/0.2.

I'm 99.9% R3 is Pit 10/0.05 and can be tested for metals, OCP, OPP and herbicides.

Sorry for the confusion Ellen.

Kind regards,

Shannon

#168816

Shannon Goodsell | Environmental Scientist
Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au
Unit 2 73 Sheppard Street Hume ACT 2620 | PO Box 1487 Fyshwick ACT 2609
P: 02 6260 2788 | F: 02 6260 1147 | E: Shannon.Goodsell@douglaspartners.com.au



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From: Ellen Wandala Gamage [<mailto:EWandalaGamage@envirolab.com.au>]
Sent: Thursday, 8 June 2017 12:44 PM
To: Shannon Goodsell
Cc: Elyse Storr
Subject: 88336.02, Bungendore

Hi Shannon,

Hope you've been well, just a few discrepancies that require clarification for the above project received:

Samples Not Received:

Pit 1/0.5
Pit 2/0.05
Pit 2/0.2
Pit 2/0.5

Pit 19/0.05

Pit 19/0.2
Pit 19/0.5
Pit 19/1.0

Pit 23/0.2

Extra Samples Received:

Pit 18/0.05
Pit 18/0.2
Pit 18/ 0.5
Pit 18/1.0

Pit 24/0.2

Pit/0.2 (no prefix of a number just the depth)
R3

Would the extra Pit 18 be the missing Pit 19 series? Also does this relate to extra Pit 24/0.2 be that of missing Pit 23/0.2? COC attached to indicate the missing and extras received.

Thank you
Ellen

Regards,

Ellen Wandala Gamage | Customer Service (12pm - 8pm) | Envirolab Services Pty Ltd

Great Science, Great Service.

Chatswood NSW 2067

E EWandalaGamage@envirolab.com.au | W



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Emerging Contaminants ● Forensic Toxicology ● Soil Vap

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CERTIFICATE OF ANALYSIS

168816

Client:

Douglas Partners Canberra
PO Box 1487
Fyshwick
ACT 2609

Attention: Shannon Goodsell, Elyse Storr

Sample log in details:

Your Reference:	88336.02, Bungendore
No. of samples:	108 soils
Date samples received / completed instructions received	07/06/17 / 07/06/17

Analysis Details:

Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	15/06/17 / 20/06/17
Date of Preliminary Report:	Issued

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Results Approved By:

David Springer
General Manager



Envirolab Reference: 168816
Revision No: R 01

vTRH(C6-C10)/BTEXN in Soil Our Reference: Your Reference	UNITS ----- -	168816-29 PIT 24	168816-32 PIT 25	168816-36 PIT 26	168816-40 PIT 27	168816-44 PIT 28
Depth	-----	0.05	0.05	0.05	0.05	0.05
Date Sampled		01/06/2017	01/06/2017	01/06/2017	01/06/2017	31/05/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	10/06/2017	10/06/2017	10/06/2017	10/06/2017	10/06/2017
TRHC ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRHC ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPHC ₆ - C ₁₀ 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	%	97	98	98	97	92

vTRH(C6-C10)/BTEXN in Soil Our Reference: Your Reference	UNITS ----- -	168816-47 PIT 29	168816-50 PIT 30	168816-55 PIT 31	168816-61 PIT 32	168816-64 PIT 33
Depth	-----	0.05	0.05	0.5	1.0	0.2
Date Sampled		31/05/2017	31/05/2017	31/05/2017	31/05/2017	31/05/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	10/06/2017	10/06/2017	10/06/2017	10/06/2017	10/06/2017
TRHC ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRHC ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPHC ₆ - C ₁₀ 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	93	89	83	87

vTRH(C6-C10)/BTEXN in Soil Our Reference: Your Reference	UNITS ----- -	168816-69 PIT 34	168816-72 PIT 35	168816-75 PIT 36	168816-79 PIT 37	168816-83 PIT 38
Depth	-----	0.2	0.05	0.05	0.05	0.05
Date Sampled		01/06/2017	01/06/2017	01/06/2017	01/06/2017	01/06/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	10/06/2017	10/06/2017	10/06/2017	10/06/2017	10/06/2017
TRHC ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRHC ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPHC ₆ - C ₁₀ 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	%	86	97	100	94	103

vTRH(C6-C10)/BTEXN in Soil Our Reference: Your Reference	UNITS ----- -	168816-95 R1	168816-96 R2	168816-100 R7
Depth	-----	-	-	-
Date Sampled		01/06/2017	01/06/2017	31/05/2017
Type of sample		Soil	Soil	Soil
Date extracted	-	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	10/06/2017	10/06/2017	09/06/2017
TRHC ₆ - C ₉	mg/kg	<25	<25	<25
TRHC ₆ - C ₁₀	mg/kg	<25	<25	<25
vTPHC ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	85	100	88

svTRH (C10-C40) in Soil Our Reference: Your Reference	UNITS ----- -	168816-29 PIT 24	168816-32 PIT 25	168816-36 PIT 26	168816-40 PIT 27	168816-44 PIT 28
Depth	-----	0.05	0.05	0.05	0.05	0.05
Date Sampled		01/06/2017	01/06/2017	01/06/2017	01/06/2017	31/05/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	09/06/2017	09/06/2017	10/06/2017	10/06/2017	10/06/2017
TRHC ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRHC ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRHC ₂₉ - C ₃₆	mg/kg	<100	<100	<100	<100	<100
TRH>C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₆ -C ₃₄	mg/kg	<100	<100	<100	<100	<100
TRH>C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	85	96	85	84	84

svTRH (C10-C40) in Soil Our Reference: Your Reference	UNITS ----- -	168816-47 PIT 29	168816-50 PIT 30	168816-55 PIT 31	168816-61 PIT 32	168816-64 PIT 33
Depth	-----	0.05	0.05	0.5	1.0	0.2
Date Sampled		31/05/2017	31/05/2017	31/05/2017	31/05/2017	31/05/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	10/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
TRHC ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRHC ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRHC ₂₉ - C ₃₆	mg/kg	<100	<100	<100	<100	<100
TRH>C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₆ -C ₃₄	mg/kg	<100	<100	<100	<100	<100
TRH>C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	84	86	86	85	86

svTRH (C10-C40) in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- - -----	168816-69 PIT 34 0.2 01/06/2017 Soil	168816-72 PIT 35 0.05 01/06/2017 Soil	168816-75 PIT 36 0.05 01/06/2017 Soil	168816-79 PIT 37 0.05 01/06/2017 Soil	168816-83 PIT 38 0.05 01/06/2017 Soil
Date extracted	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	10/06/2017	10/06/2017	10/06/2017	10/06/2017	10/06/2017
TRHC ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRHC ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRHC ₂₉ - C ₃₆	mg/kg	<100	<100	<100	<100	<100
TRH>C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C ₁₆ -C ₃₄	mg/kg	<100	<100	<100	<100	<100
TRH>C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	88	88	85	87	87

svTRH (C10-C40) in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- - -----	168816-95 R1 - 01/06/2017 Soil	168816-96 R2 - 01/06/2017 Soil	168816-100 R7 - 31/05/2017 Soil
Date extracted	-	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	10/06/2017	10/06/2017	10/06/2017
TRHC ₁₀ - C ₁₄	mg/kg	<50	<50	<50
TRHC ₁₅ - C ₂₈	mg/kg	<100	<100	<100
TRHC ₂₉ - C ₃₆	mg/kg	<100	<100	<100
TRH>C ₁₀ -C ₁₆	mg/kg	<50	<50	<50
TRH>C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50
TRH>C ₁₆ -C ₃₄	mg/kg	<100	<100	<100
TRH>C ₃₄ -C ₄₀	mg/kg	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50
Surrogate o-Terphenyl	%	84	86	86

PAHs in Soil Our Reference: Your Reference	UNITS ----- -	168816-29 PIT 24	168816-32 PIT 25	168816-36 PIT 26	168816-40 PIT 27	168816-44 PIT 28
Depth	-----	0.05	0.05	0.05	0.05	0.05
Date Sampled		01/06/2017	01/06/2017	01/06/2017	01/06/2017	31/05/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	13/06/2017	13/06/2017	13/06/2017	13/06/2017	13/06/2017
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Surrogate p-Terphenyl-d14	%	94	86	89	95	96

PAHs in Soil Our Reference: Your Reference	UNITS ----- -	168816-47 PIT 29	168816-50 PIT 30	168816-55 PIT 31	168816-61 PIT 32	168816-64 PIT 33
Depth	-----	0.05	0.05	0.5	1.0	0.2
Date Sampled		31/05/2017	31/05/2017	31/05/2017	31/05/2017	31/05/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	13/06/2017	13/06/2017	13/06/2017	13/06/2017	13/06/2017
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Surrogate p-Terphenyl-d14	%	90	94	101	98	93

PAHs in Soil Our Reference: Your Reference	UNITS ----- -	168816-69 PIT 34	168816-72 PIT 35	168816-75 PIT 36	168816-79 PIT 37	168816-83 PIT 38
Depth	-----	0.2	0.05	0.05	0.05	0.05
Date Sampled		01/06/2017	01/06/2017	01/06/2017	01/06/2017	01/06/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	13/06/2017	13/06/2017	13/06/2017	13/06/2017	13/06/2017
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Surrogate p-Terphenyl-d14	%	92	91	87	89	97

PAHs in Soil Our Reference: Your Reference	UNITS ----- -	168816-95 R1	168816-96 R2	168816-100 R7
Depth	-----	-	-	-
Date Sampled		01/06/2017	01/06/2017	31/05/2017
Type of sample		Soil	Soil	Soil
Date extracted	-	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	13/06/2017	13/06/2017	13/06/2017
Naphthalene	mg/kg	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05
Surrogate p-Terphenyl-d14	%	91	92	87

Organochlorine Pesticides in soil	UNITS	168816-1	168816-3	168816-6	168816-10	168816-13
Our Reference:	-----	PIT1	PIT3	PIT7	PIT10	PIT12
Your Reference	-					
Depth	-----	0.05	0.05	0.05	0.05	0.05
Date Sampled		31/05/2017	31/05/2017	01/06/2017	31/05/2017	01/06/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
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	%	92	91	92	90	92

Organochlorine Pesticides in soil						
Our Reference:	UNITS	168816-17	168816-21	168816-24	168816-27	168816-29
Your Reference	-----	PIT 13	PIT 17	PIT 21	PIT 23	PIT 24
	-					
Depth	-----	0.05	0.05	0.05	0.05	0.05
Date Sampled		01/06/2017	31/05/2017	01/06/2017	01/06/2017	01/06/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
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	%	91	90	92	91	104

Organochlorine Pesticides in soil	UNITS	168816-32	168816-36	168816-40	168816-44	168816-47
Our Reference:	-----	PIT 25	PIT 26	PIT 27	PIT 28	PIT 29
Your Reference	-					
Depth	-----	0.05	0.05	0.05	0.05	0.05
Date Sampled		01/06/2017	01/06/2017	01/06/2017	31/05/2017	31/05/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
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	101	101	102	100

Organochlorine Pesticides in soil	UNITS	168816-50	168816-55	168816-61	168816-64	168816-69
Our Reference:	-----	PIT 30	PIT 31	PIT 32	PIT 33	PIT 34
Your Reference	-					
Depth	-----	0.05	0.5	1.0	0.2	0.2
Date Sampled		31/05/2017	31/05/2017	31/05/2017	31/05/2017	01/06/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
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	%	100	99	100	100	101

Organochlorine Pesticides in soil	UNITS	168816-72	168816-75	168816-79	168816-83	168816-95
Our Reference:	-----	PIT35	PIT36	PIT37	PIT38	R1
Your Reference	-					
Depth	-----	0.05	0.05	0.05	0.05	-
Date Sampled		01/06/2017	01/06/2017	01/06/2017	01/06/2017	01/06/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
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	97	99	101	98

Organochlorine Pesticides in soil	UNITS	168816-96	168816-97	168816-100	168816-102	168816-108
Our Reference:	-----	R2	R4	R7	PIT 18	R3
Your Reference	-					
Depth	-----	-	-	-	0.05	-
Date Sampled		01/06/2017	01/06/2017	31/05/2017	1/06/2017	31/05/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
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	%	97	95	97	93	97

Organophosphorus Pesticides	UNITS	168816-1	168816-3	168816-6	168816-10	168816-13
Our Reference:	-----	PIT1	PIT3	PIT7	PIT10	PIT12
Your Reference	-					
Depth	-----	0.05	0.05	0.05	0.05	0.05
Date Sampled		31/05/2017	31/05/2017	01/06/2017	31/05/2017	01/06/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
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	%	92	91	92	90	92

Organophosphorus Pesticides	UNITS	168816-17	168816-21	168816-24	168816-27	168816-29
Our Reference:	-----	PIT13	PIT17	PIT21	PIT23	PIT24
Your Reference	-					
Depth	-----	0.05	0.05	0.05	0.05	0.05
Date Sampled		01/06/2017	31/05/2017	01/06/2017	01/06/2017	01/06/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
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	%	91	90	92	91	104

Organophosphorus Pesticides	UNITS	168816-32	168816-36	168816-40	168816-44	168816-47
Our Reference:	-----	PIT 25	PIT 26	PIT 27	PIT 28	PIT 29
Your Reference	-					
Depth	-----	0.05	0.05	0.05	0.05	0.05
Date Sampled		01/06/2017	01/06/2017	01/06/2017	31/05/2017	31/05/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
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	101	101	102	100

Organophosphorus Pesticides	UNITS	168816-50	168816-55	168816-61	168816-64	168816-69
Our Reference:	-----	PIT 30	PIT 31	PIT 32	PIT 33	PIT 34
Your Reference	-					
Depth	-----	0.05	0.5	1.0	0.2	0.2
Date Sampled		31/05/2017	31/05/2017	31/05/2017	31/05/2017	01/06/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
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	%	100	99	100	100	101

Organophosphorus Pesticides	UNITS	168816-72	168816-75	168816-79	168816-83	168816-95
Our Reference:	-----	PIT35	PIT36	PIT37	PIT38	R1
Your Reference	-					
Depth	-----	0.05	0.05	0.05	0.05	-
Date Sampled		01/06/2017	01/06/2017	01/06/2017	01/06/2017	01/06/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
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
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-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	97	99	101	98

Organophosphorus Pesticides	UNITS	168816-96	168816-97	168816-100	168816-102	168816-108
Our Reference:	-----	R2	R4	R7	PIT18	R3
Your Reference	-					
Depth	-----	-	-	-	0.05	-
Date Sampled		01/06/2017	01/06/2017	31/05/2017	1/06/2017	31/05/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
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
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-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	%	97	95	97	93	97

PCBs in Soil Our Reference: Your Reference	UNITS ----- -	168816-29 PIT 24	168816-32 PIT 25	168816-36 PIT 26	168816-40 PIT 27	168816-44 PIT 28
Depth	-----	0.05	0.05	0.05	0.05	0.05
Date Sampled		01/06/2017	01/06/2017	01/06/2017	01/06/2017	31/05/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	104	101	101	101	102

PCBs in Soil Our Reference: Your Reference	UNITS ----- -	168816-47 PIT 29	168816-50 PIT 30	168816-55 PIT 31	168816-61 PIT 32	168816-64 PIT 33
Depth	-----	0.05	0.05	0.5	1.0	0.2
Date Sampled		31/05/2017	31/05/2017	31/05/2017	31/05/2017	31/05/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	100	100	99	100	100

PCBs in Soil Our Reference: Your Reference	UNITS ----- -	168816-69 PIT 34	168816-72 PIT 35	168816-75 PIT 36	168816-79 PIT 37	168816-83 PIT 38
Depth	-----	0.2	0.05	0.05	0.05	0.05
Date Sampled		01/06/2017	01/06/2017	01/06/2017	01/06/2017	01/06/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	101	101	97	99	101

PCBs in Soil Our Reference: Your Reference	UNITS ----- -	168816-95 R1	168816-96 R2	168816-100 R7
Depth	-----	-	-	-
Date Sampled		01/06/2017	01/06/2017	31/05/2017
Type of sample		Soil	Soil	Soil
Date extracted	-	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	09/06/2017	09/06/2017	09/06/2017
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1
Surrogate TCLMX	%	98	97	97

Acid Extractable metals in soil Our Reference: Your Reference	UNITS ----- -	168816-1 PIT1	168816-3 PIT3	168816-6 PIT7	168816-10 PIT10	168816-13 PIT12
Depth Date Sampled Type of sample	----- ----- -----	0.05 31/05/2017 Soil	0.05 31/05/2017 Soil	0.05 01/06/2017 Soil	0.05 31/05/2017 Soil	0.05 01/06/2017 Soil
Date prepared	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	4	14	14	24	28
Copper	mg/kg	2	5	5	4	4
Lead	mg/kg	4	8	8	13	10
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	1	5	6	6	3
Zinc	mg/kg	5	12	8	12	7

Acid Extractable metals in soil Our Reference: Your Reference	UNITS ----- -	168816-17 PIT13	168816-21 PIT17	168816-24 PIT21	168816-27 PIT23	168816-29 PIT24
Depth Date Sampled Type of sample	----- ----- -----	0.05 01/06/2017 Soil	0.05 31/05/2017 Soil	0.05 01/06/2017 Soil	0.05 01/06/2017 Soil	0.05 01/06/2017 Soil
Date prepared	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	21	17	28	11	3
Copper	mg/kg	5	6	6	5	1
Lead	mg/kg	10	10	12	11	4
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	4	5	5	4	1
Zinc	mg/kg	8	8	13	12	5

Acid Extractable metals in soil Our Reference: Your Reference	UNITS ----- -	168816-32 PIT 25	168816-36 PIT 26	168816-40 PIT 27	168816-44 PIT 28	168816-47 PIT 29
Depth Date Sampled Type of sample	----- ----- -----	0.05 01/06/2017 Soil	0.05 01/06/2017 Soil	0.05 01/06/2017 Soil	0.05 31/05/2017 Soil	0.05 31/05/2017 Soil
Date prepared	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Arsenic	mg/kg	6	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	13	5	5	5	6
Copper	mg/kg	34	2	2	2	1
Lead	mg/kg	7	3	3	3	4
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	22	2	2	2	2
Zinc	mg/kg	43	5	5	4	5

Acid Extractable metals in soil Our Reference: Your Reference	UNITS ----- -	168816-50 PIT 30	168816-55 PIT 31	168816-61 PIT 32	168816-64 PIT 33	168816-69 PIT 34
Depth Date Sampled Type of sample	----- ----- -----	0.05 31/05/2017 Soil	0.5 31/05/2017 Soil	1.0 31/05/2017 Soil	0.2 31/05/2017 Soil	0.2 01/06/2017 Soil
Date prepared	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Arsenic	mg/kg	<4	6	5	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	5	24	22	10	23
Copper	mg/kg	2	20	12	4	12
Lead	mg/kg	4	11	12	7	11
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	2	30	11	4	9
Zinc	mg/kg	6	30	20	8	22

Acid Extractable metals in soil						
Our Reference:	UNITS	168816-72	168816-75	168816-79	168816-83	168816-95
Your Reference	-----	PIT 35	PIT 36	PIT 37	PIT 38	R1
	-					
Depth	-----	0.05	0.05	0.05	0.05	-
Date Sampled		01/06/2017	01/06/2017	01/06/2017	01/06/2017	01/06/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Arsenic	mg/kg	<4	<4	<4	<4	4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	5	3	5	5	19
Copper	mg/kg	2	1	3	1	10
Lead	mg/kg	6	3	4	3	10
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	2	<1	2	2	10
Zinc	mg/kg	6	3	11	3	20

Acid Extractable metals in soil						
Our Reference:	UNITS	168816-96	168816-97	168816-100	168816-102	168816-108
Your Reference	-----	R2	R4	R7	PIT 18	R3
	-					
Depth	-----	-	-	-	0.05	-
Date Sampled		01/06/2017	01/06/2017	31/05/2017	1/06/2017	31/05/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	15	13	5	18	18
Copper	mg/kg	5	6	2	4	5
Lead	mg/kg	7	11	3	11	10
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	5	5	2	4	5
Zinc	mg/kg	9	13	7	12	9

Acid Extractable metals in soil		
Our Reference:	UNITS	168816-109
Your Reference	-----	PIT 25 -
	-	[TRIPLICATE]
Depth	-----	0.05
Date Sampled		01/06/2017
Type of sample		Soil
Date prepared	-	09/06/2017
Date analysed	-	09/06/2017
Arsenic	mg/kg	5
Cadmium	mg/kg	<0.4
Chromium	mg/kg	15
Copper	mg/kg	28
Lead	mg/kg	7
Mercury	mg/kg	<0.1
Nickel	mg/kg	19
Zinc	mg/kg	42

Misc Inorg - Soil	UNITS	168816-6	168816-29	168816-69
Our Reference:	-----	PIT 7	PIT 24	PIT 34
Your Reference	-			
Depth	-----	0.05	0.05	0.2
Date Sampled		01/06/2017	01/06/2017	01/06/2017
Type of sample		Soil	Soil	Soil
Date prepared	-	14/06/2017	14/06/2017	14/06/2017
Date analysed	-	14/06/2017	14/06/2017	14/06/2017
pH 1:5 soil:water	pH Units	5.4	5.1	5.6
Clay in soils <2µm	% (w/w)	13	8	26

Misc Soil - Inorg Our Reference: Your Reference	UNITS ----- -	168816-29 PIT 24	168816-32 PIT 25	168816-36 PIT 26	168816-40 PIT 27	168816-44 PIT 28
Depth Date Sampled Type of sample	----- ----- -----	0.05 01/06/2017 Soil	0.05 01/06/2017 Soil	0.05 01/06/2017 Soil	0.05 01/06/2017 Soil	0.05 31/05/2017 Soil
Date prepared	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg Our Reference: Your Reference	UNITS ----- -	168816-47 PIT 29	168816-50 PIT 30	168816-55 PIT 31	168816-61 PIT 32	168816-64 PIT 33
Depth Date Sampled Type of sample	----- ----- -----	0.05 31/05/2017 Soil	0.05 31/05/2017 Soil	0.5 31/05/2017 Soil	1.0 31/05/2017 Soil	0.2 31/05/2017 Soil
Date prepared	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg Our Reference: Your Reference	UNITS ----- -	168816-69 PIT 34	168816-72 PIT 35	168816-75 PIT 36	168816-79 PIT 37	168816-83 PIT 38
Depth Date Sampled Type of sample	----- ----- -----	0.2 01/06/2017 Soil	0.05 01/06/2017 Soil	0.05 01/06/2017 Soil	0.05 01/06/2017 Soil	0.05 01/06/2017 Soil
Date prepared	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg Our Reference: Your Reference	UNITS ----- -	168816-95 R1	168816-96 R2	168816-100 R7
Depth Date Sampled Type of sample	----- ----- -----	- 01/06/2017 Soil	- 01/06/2017 Soil	- 31/05/2017 Soil
Date prepared	-	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	09/06/2017	09/06/2017	09/06/2017
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5

Moisture Our Reference: Your Reference	UNITS ----- -	168816-1 PIT1	168816-3 PIT 3	168816-6 PIT 7	168816-10 PIT 10	168816-13 PIT 12
Depth Date Sampled Type of sample	----- ----- -----	0.05 31/05/2017 Soil	0.05 31/05/2017 Soil	0.05 01/06/2017 Soil	0.05 31/05/2017 Soil	0.05 01/06/2017 Soil
Date prepared	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	13/06/2017	13/06/2017	13/06/2017	13/06/2017	13/06/2017
Moisture	%	11	17	13	11	11

Moisture Our Reference: Your Reference	UNITS ----- -	168816-17 PIT 13	168816-21 PIT 17	168816-24 PIT 21	168816-27 PIT 23	168816-29 PIT 24
Depth Date Sampled Type of sample	----- ----- -----	0.05 01/06/2017 Soil	0.05 31/05/2017 Soil	0.05 01/06/2017 Soil	0.05 01/06/2017 Soil	0.05 01/06/2017 Soil
Date prepared	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	13/06/2017	13/06/2017	13/06/2017	13/06/2017	13/06/2017
Moisture	%	8.8	12	15	17	8.1

Moisture Our Reference: Your Reference	UNITS ----- -	168816-32 PIT 25	168816-36 PIT 26	168816-40 PIT 27	168816-44 PIT 28	168816-47 PIT 29
Depth Date Sampled Type of sample	----- ----- -----	0.05 01/06/2017 Soil	0.05 01/06/2017 Soil	0.05 01/06/2017 Soil	0.05 31/05/2017 Soil	0.05 31/05/2017 Soil
Date prepared	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	13/06/2017	13/06/2017	13/06/2017	13/06/2017	13/06/2017
Moisture	%	6.0	7.6	7.2	6.6	6.6

Moisture Our Reference: Your Reference	UNITS ----- -	168816-50 PIT 30	168816-55 PIT 31	168816-61 PIT 32	168816-64 PIT 33	168816-69 PIT 34
Depth Date Sampled Type of sample	----- ----- -----	0.05 31/05/2017 Soil	0.5 31/05/2017 Soil	1.0 31/05/2017 Soil	0.2 31/05/2017 Soil	0.2 01/06/2017 Soil
Date prepared	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	13/06/2017	13/06/2017	13/06/2017	13/06/2017	13/06/2017
Moisture	%	7.4	15	14	8.2	8.3

Moisture Our Reference: Your Reference	UNITS ----- -	168816-72 PIT 35	168816-75 PIT 36	168816-79 PIT 37	168816-83 PIT 38	168816-95 R1
Depth Date Sampled Type of sample	----- - Soil	0.05 01/06/2017 Soil	0.05 01/06/2017 Soil	0.05 01/06/2017 Soil	0.05 01/06/2017 Soil	- 01/06/2017 Soil
Date prepared	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	13/06/2017	13/06/2017	13/06/2017	13/06/2017	13/06/2017
Moisture	%	5.4	6.2	7.7	6.0	12

Moisture Our Reference: Your Reference	UNITS ----- -	168816-96 R2	168816-97 R4	168816-100 R7	168816-102 PIT 18	168816-108 R3
Depth Date Sampled Type of sample	----- - Soil	- 01/06/2017 Soil	- 01/06/2017 Soil	- 31/05/2017 Soil	0.05 1/06/2017 Soil	- 31/05/2017 Soil
Date prepared	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	13/06/2017	13/06/2017	13/06/2017	13/06/2017	13/06/2017
Moisture	%	8.8	16	5.7	15	13

Asbestos ID - soils Our Reference: Your Reference	UNITS ----- -	168816-29 PIT 24	168816-32 PIT 25	168816-36 PIT 26	168816-40 PIT 27	168816-44 PIT 28
Depth Date Sampled Type of sample	----- ----- -----	0.05 01/06/2017 Soil	0.05 01/06/2017 Soil	0.05 01/06/2017 Soil	0.05 01/06/2017 Soil	0.05 31/05/2017 Soil
Date analysed	-	14/06/2017	14/06/2017	14/06/2017	14/06/2017	14/06/2017
Sample mass tested	g	Approx. 35g	Approx. 35g	Approx. 35g	Approx. 40g	Approx. 40g
Sample Description	-	Brown coarse-grained soil & rocks	Grey coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibre detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibre detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibre detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibre detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibre detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils Our Reference: Your Reference	UNITS ----- -	168816-47 PIT 29	168816-50 PIT 30	168816-55 PIT 31	168816-61 PIT 32	168816-64 PIT 33
Depth Date Sampled Type of sample	----- ----- -----	0.05 31/05/2017 Soil	0.05 31/05/2017 Soil	0.5 31/05/2017 Soil	1.0 31/05/2017 Soil	0.2 31/05/2017 Soil
Date analysed	-	14/06/2017	14/06/2017	14/06/2017	14/06/2017	14/06/2017
Sample mass tested	g	Approx. 35g	Approx. 35g	Approx. 35g	Approx. 35g	Approx. 35g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibre detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibre detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibre detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibre detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibre detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils Our Reference: Your Reference	UNITS ----- -	168816-69 PIT34	168816-72 PIT35	168816-75 PIT36	168816-79 PIT37	168816-83 PIT38
Depth Date Sampled Type of sample	----- ----- -----	0.2 01/06/2017 Soil	0.05 01/06/2017 Soil	0.05 01/06/2017 Soil	0.05 01/06/2017 Soil	0.05 01/06/2017 Soil
Date analysed	-	14/06/2017	14/06/2017	14/06/2017	14/06/2017	14/06/2017
Sample mass tested	g	Approx. 35g	Approx. 40g	Approx. 35g	Approx. 40g	Approx. 40g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibre detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibre detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibre detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibre detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibre detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils Our Reference: Your Reference	UNITS ----- -	168816-95 R1	168816-96 R2	168816-100 R7
Depth Date Sampled Type of sample	----- ----- -----	- 01/06/2017 Soil	- 01/06/2017 Soil	- 31/05/2017 Soil
Date analysed	-	14/06/2017	14/06/2017	14/06/2017
Sample mass tested	g	Approx. 35g	Approx. 40g	Approx. 40g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibre detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibre detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibre detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected

CEC				
Our Reference:	UNITS	168816-6	168816-29	168816-69
Your Reference	-----	PIT 7	PIT 24	PIT 34
	-			
Depth	-----	0.05	0.05	0.2
Date Sampled		01/06/2017	01/06/2017	01/06/2017
Type of sample		Soil	Soil	Soil
Date prepared	-	13/06/2017	13/06/2017	13/06/2017
Date analysed	-	13/06/2017	13/06/2017	13/06/2017
Exchangeable Ca	meq/100g	1.4	0.6	4.3
Exchangeable K	meq/100g	0.4	0.1	0.3
Exchangeable Mg	meq/100g	0.45	0.11	2.5
Exchangeable Na	meq/100g	<0.1	<0.1	<0.1
Cation Exchange Capacity	meq/100g	2.3	<1.0	7.2

Phenoxy Acid Herbicides in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- - -----	168816-1 PIT1 0.05 31/05/2017 Soil	168816-3 PIT 3 0.05 31/05/2017 Soil	168816-10 PIT 10 0.05 31/05/2017 Soil	168816-17 PIT 13 0.05 01/06/2017 Soil	168816-27 PIT 23 0.05 01/06/2017 Soil
Date extracted	-	13/06/2017	13/06/2017	13/06/2017	13/06/2017	13/06/2017
Date analysed	-	13/06/2017	13/06/2017	13/06/2017	13/06/2017	13/06/2017
Clopyralid	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
3,5-Dichlorobenzoic acid	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
o-chlorophenoxy acetic acid	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
4-CPA	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dicamba	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
MCPP	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
MCPA	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dichlorprop	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-D	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoxynil	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Triclopyr	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-TP	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-T	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
MCPB	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dinoseb	mg/kg	<1	<1	<1	<1	<1
2,4-DB	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
loxynil	mg/kg	<1	<1	<1	<1	<1
Picloram	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
DCPA (Chlorthal) Diacid	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acifluorfen	mg/kg	<2	<2	<2	<2	<2
2,4,6-T	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,6-D	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate 2.4- DCPA	%	96	110	108	110	108

Phenoxy Acid Herbicides in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- - -----	168816-32 PIT 25 0.05 01/06/2017 Soil	168816-75 PIT 36 0.05 01/06/2017 Soil	168816-102 PIT 18 0.05 1/06/2017 Soil	168816-108 R3 - 31/05/2017 Soil
Date extracted	-	13/06/2017	13/06/2017	13/06/2017	13/06/2017
Date analysed	-	13/06/2017	13/06/2017	13/06/2017	13/06/2017
Clopyralid	mg/kg	<0.5	<0.5	<0.5	<0.5
3,5-Dichlorobenzoic acid	mg/kg	<0.5	<0.5	<0.5	<0.5
o-chlorophenoxy acetic acid	mg/kg	<0.5	<0.5	<0.5	<0.5
4-CPA	mg/kg	<0.5	<0.5	<0.5	<0.5
Dicamba	mg/kg	<0.5	<0.5	<0.5	<0.5
MCPP	mg/kg	<0.5	<0.5	<0.5	<0.5
MCPA	mg/kg	<0.5	<0.5	<0.5	<0.5
Dichlorprop	mg/kg	<0.5	<0.5	<0.5	<0.5
2,4-D	mg/kg	<0.5	<0.5	<0.5	<0.5
Bromoxynil	mg/kg	<0.5	<0.5	<0.5	<0.5
Triclopyr	mg/kg	<0.5	<0.5	<0.5	<0.5
2,4,5-TP	mg/kg	<0.5	<0.5	<0.5	<0.5
2,4,5-T	mg/kg	<0.5	<0.5	<0.5	<0.5
MCPB	mg/kg	<0.5	<0.5	<0.5	<0.5
Dinoseb	mg/kg	<1	<1	<1	<1
2,4-DB	mg/kg	<0.5	<0.5	<0.5	<0.5
Ioxynil	mg/kg	<1	<1	<1	<1
Picloram	mg/kg	<0.5	<0.5	<0.5	<0.5
DCPA (Chlorthal) Diacid	mg/kg	<0.5	<0.5	<0.5	<0.5
Acifluorfen	mg/kg	<2	<2	<2	<2
2,4,6-T	mg/kg	<0.5	<0.5	<0.5	<0.5
2,6-D	mg/kg	<0.5	<0.5	<0.5	<0.5
Surrogate 2.4- DCPA	%	108	104	86	92

Triazine Herbicides in Soil Our Reference: Your Reference	UNITS ----- -	168816-1 PIT1	168816-3 PIT3	168816-10 PIT10	168816-17 PIT13	168816-27 PIT23
Depth	-----	0.05	0.05	0.05	0.05	0.05
Date Sampled		31/05/2017	31/05/2017	31/05/2017	01/06/2017	01/06/2017
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	13/06/2017	13/06/2017	13/06/2017	13/06/2017	13/06/2017
Atrazine	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ametryn	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Cyanazine	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Hexazinone	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Irgarol	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Metribuzin	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Prometryn	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Propazine	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Simazine	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Terbutryn	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Terbuthylazine	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	111	103	101	99	100

Triazine Herbicides in Soil Our Reference: Your Reference	UNITS ----- -	168816-32 PIT25	168816-75 PIT36	168816-102 PIT18	168816-108 R3
Depth	-----	0.05	0.05	0.05	-
Date Sampled		01/06/2017	01/06/2017	1/06/2017	31/05/2017
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	09/06/2017	09/06/2017	09/06/2017	09/06/2017
Date analysed	-	13/06/2017	13/06/2017	13/06/2017	13/06/2017
Atrazine	mg/kg	<0.5	<0.5	<0.5	<0.5
Ametryn	mg/kg	<0.5	<0.5	<0.5	<0.5
Cyanazine	mg/kg	<0.5	<0.5	<0.5	<0.5
Hexazinone	mg/kg	<0.5	<0.5	<0.5	<0.5
Irgarol	mg/kg	<0.5	<0.5	<0.5	<0.5
Metribuzin	mg/kg	<0.5	<0.5	<0.5	<0.5
Prometryn	mg/kg	<0.5	<0.5	<0.5	<0.5
Propazine	mg/kg	<0.5	<0.5	<0.5	<0.5
Simazine	mg/kg	<0.5	<0.5	<0.5	<0.5
Terbutryn	mg/kg	<0.5	<0.5	<0.5	<0.5
Terbuthylazine	mg/kg	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	102	104	84	113

Micro testing in soil Our Reference: Your Reference	UNITS ----- -	168816-83 PIT 38	168816-87 PIT 39	168816-91 PIT 40
Depth	-----	0.05	0.05	0.05
Date Sampled		01/06/2017	01/06/2017	01/06/2017
Type of sample		Soil	Soil	Soil
Date testing started	-	08/06/2017	08/06/2017	08/06/2017
Date testing completed	-	08/06/2017	08/06/2017	08/06/2017
Faecal Coliforms in soil	MPN/100g	<200	<200	200
E. coli	MPN/100g	<200	<200	<200
Salmonella*	50g	ND	ND	ND

Method ID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-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.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (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).
Org-012	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. 'TEQ 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. 'TEQ 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. 'TEQ 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.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-005	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.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-006	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.

Method ID	Methodology Summary
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Inorg-001	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.
AS1289.3.6.3	Determination Particle Size Analysis using AS1289.3.6.3 and AS1289.3.6.1 and in house method INORG-107. Clay fraction at <2µm reported.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
Metals-009	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-AES analytical finish.
Ext-054	Analysed by MPL Envirolab
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
Ext-008	Subcontracted to Sonic Food & Water Testing. NATA Accreditation No. 4034.

Client Reference: 88336.02, Bungendore

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
vTRH(C6-C10)/BTEXN in Soil						Base II Duplicate II %RPD		
Date extracted	-			09/06/2017	[NT]	[NT]	LCS-3	09/06/2017
Date analysed	-			10/06/2017	[NT]	[NT]	LCS-3	10/06/2017
TRHC ₆ - C ₉	mg/kg	25	Org-016	<25	[NT]	[NT]	LCS-3	106%
TRHC ₆ - C ₁₀	mg/kg	25	Org-016	<25	[NT]	[NT]	LCS-3	106%
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	LCS-3	109%
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	LCS-3	108%
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS-3	101%
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	LCS-3	106%
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS-3	101%
naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	92	[NT]	[NT]	LCS-3	108%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
svTRH (C10-C40) in Soil						Base II Duplicate II %RPD		
Date extracted	-			09/06/2017	[NT]	[NT]	LCS-3	09/06/2017
Date analysed	-			09/06/2017	[NT]	[NT]	LCS-3	09/06/2017
TRHC ₁₀ - C ₁₄	mg/kg	50	Org-003	<50	[NT]	[NT]	LCS-3	103%
TRHC ₁₅ - C ₂₈	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-3	103%
TRHC ₂₈ - C ₃₆	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-3	106%
TRH>C ₁₀ -C ₁₆	mg/kg	50	Org-003	<50	[NT]	[NT]	LCS-3	103%
TRH>C ₁₆ -C ₃₄	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-3	103%
TRH>C ₃₄ -C ₄₀	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-3	106%
Surrogate o-Terphenyl	%		Org-003	83	[NT]	[NT]	LCS-3	91%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Date extracted	-			09/06/2017	[NT]	[NT]	LCS-3	09/06/2017
Date analysed	-			13/06/2017	[NT]	[NT]	LCS-3	13/06/2017
Naphthalene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	LCS-3	106%
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	LCS-3	99%
Phenanthrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	LCS-3	107%
Anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	LCS-3	123%
Pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	LCS-3	122%
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	LCS-3	120%
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	[NT]	[NT]	[NR]	[NR]

Client Reference: 88336.02, Bungendore

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	[NT]	[NT]	LCS-3	100%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012	98	[NT]	[NT]	LCS-3	129%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Organochlorine Pesticides in soil						Base II Duplicate II %RPD		
Date extracted	-			09/06/2017	168816-1	09/06/2017 09/06/2017	LCS-3	09/06/2017
Date analysed	-			09/06/2017	168816-1	09/06/2017 09/06/2017	LCS-3	09/06/2017
HCB	mg/kg	0.1	Org-005	<0.1	168816-1	<0.1 <0.1	[NR]	[NR]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	168816-1	<0.1 <0.1	LCS-3	75%
gamma-BHC	mg/kg	0.1	Org-005	<0.1	168816-1	<0.1 <0.1	[NR]	[NR]
beta-BHC	mg/kg	0.1	Org-005	<0.1	168816-1	<0.1 <0.1	LCS-3	96%
Heptachlor	mg/kg	0.1	Org-005	<0.1	168816-1	<0.1 <0.1	LCS-3	100%
delta-BHC	mg/kg	0.1	Org-005	<0.1	168816-1	<0.1 <0.1	[NR]	[NR]
Aldrin	mg/kg	0.1	Org-005	<0.1	168816-1	<0.1 <0.1	LCS-3	92%
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	168816-1	<0.1 <0.1	LCS-3	96%
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	168816-1	<0.1 <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	168816-1	<0.1 <0.1	[NR]	[NR]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	168816-1	<0.1 <0.1	[NR]	[NR]
pp-DDE	mg/kg	0.1	Org-005	<0.1	168816-1	<0.1 <0.1	LCS-3	92%
Dieldrin	mg/kg	0.1	Org-005	<0.1	168816-1	<0.1 <0.1	LCS-3	104%
Endrin	mg/kg	0.1	Org-005	<0.1	168816-1	<0.1 <0.1	LCS-3	94%
pp-DDD	mg/kg	0.1	Org-005	<0.1	168816-1	<0.1 <0.1	LCS-3	98%
Endosulfan II	mg/kg	0.1	Org-005	<0.1	168816-1	<0.1 <0.1	[NR]	[NR]
pp-DDT	mg/kg	0.1	Org-005	<0.1	168816-1	<0.1 <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	168816-1	<0.1 <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	168816-1	<0.1 <0.1	LCS-3	76%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	168816-1	<0.1 <0.1	[NR]	[NR]
Surrogate TCMX	%		Org-005	99	168816-1	92 93 RPD: 1	LCS-3	119%

Client Reference: 88336.02, Bungendore

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Organophosphorus Pesticides						Base Duplicate %RPD		
Date extracted	-			09/06/2017	168816-1	09/06/2017 09/06/2017	LCS-3	09/06/2017
Date analysed	-			09/06/2017	168816-1	09/06/2017 09/06/2017	LCS-3	09/06/2017
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	168816-1	<0.1 <0.1	[NR]	[NR]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	168816-1	<0.1 <0.1	[NR]	[NR]
Chlorpyrifos	mg/kg	0.1	Org-008	<0.1	168816-1	<0.1 <0.1	LCS-3	87%
Chlorpyrifos-methyl	mg/kg	0.1	Org-008	<0.1	168816-1	<0.1 <0.1	[NR]	[NR]
Diazinon	mg/kg	0.1	Org-008	<0.1	168816-1	<0.1 <0.1	[NR]	[NR]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	168816-1	<0.1 <0.1	LCS-3	85%
Dimethoate	mg/kg	0.1	Org-008	<0.1	168816-1	<0.1 <0.1	[NR]	[NR]
Ethion	mg/kg	0.1	Org-008	<0.1	168816-1	<0.1 <0.1	LCS-3	86%
Fenitrothion	mg/kg	0.1	Org-008	<0.1	168816-1	<0.1 <0.1	LCS-3	102%
Malathion	mg/kg	0.1	Org-008	<0.1	168816-1	<0.1 <0.1	LCS-3	73%
Parathion	mg/kg	0.1	Org-008	<0.1	168816-1	<0.1 <0.1	LCS-3	106%
Ronnel	mg/kg	0.1	Org-008	<0.1	168816-1	<0.1 <0.1	LCS-3	93%
Surrogate TCMX	%		Org-008	99	168816-1	92 93 RPD: 1	LCS-3	97%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PCBs in Soil						Base Duplicate %RPD		
Date extracted	-			09/06/2017	[NT]	[NT]	LCS-3	09/06/2017
Date analysed	-			09/06/2017	[NT]	[NT]	LCS-3	09/06/2017
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	LCS-3	106%
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate TCLMX	%		Org-006	99	[NT]	[NT]	LCS-3	97%

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QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Acid Extractable metals in soil						Base II Duplicate II %RPD		
Date prepared	-			09/06/2017	168816-1	09/06/2017 09/06/2017	LCS-3	09/06/2017
Date analysed	-			09/06/2017	168816-1	09/06/2017 09/06/2017	LCS-3	09/06/2017
Arsenic	mg/kg	4	Metals-020	<4	168816-1	<4 <4	LCS-3	108%
Cadmium	mg/kg	0.4	Metals-020	<0.4	168816-1	<0.4 <0.4	LCS-3	99%
Chromium	mg/kg	1	Metals-020	<1	168816-1	4 4 RPD: 0	LCS-3	102%
Copper	mg/kg	1	Metals-020	<1	168816-1	2 2 RPD: 0	LCS-3	103%
Lead	mg/kg	1	Metals-020	<1	168816-1	4 4 RPD: 0	LCS-3	97%
Mercury	mg/kg	0.1	Metals-021	<0.1	168816-1	<0.1 <0.1	LCS-3	98%
Nickel	mg/kg	1	Metals-020	<1	168816-1	1 1 RPD: 0	LCS-3	95%
Zinc	mg/kg	1	Metals-020	<1	168816-1	5 5 RPD: 0	LCS-3	97%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Misc Inorg - Soil						Base II Duplicate II %RPD		
Date prepared	-			13/06/2017	[NT]	[NT]	LCS-3	13/06/2017
Date analysed	-			14/06/2017	[NT]	[NT]	LCS-3	14/06/2017
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	[NT]	[NT]	LCS-3	102%
Clay in soils <2µm	% (w/w)		AS1289.3.6 .3	[NT]	[NT]	[NT]	[NR]	[NR]
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Misc Soil - Inorg						Base II Duplicate II %RPD		
Date prepared	-			09/06/2017	[NT]	[NT]	LCS-1	09/06/2017
Date analysed	-			09/06/2017	[NT]	[NT]	LCS-1	09/06/2017
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	[NT]	[NT]	LCS-1	98%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
CEC						Base II Duplicate II %RPD		
Date prepared	-			13/06/2017	[NT]	[NT]	LCS-3	13/06/2017
Date analysed	-			13/06/2017	[NT]	[NT]	LCS-3	13/06/2017
Exchangeable Ca	meq/100 g	0.1	Metals-009	<0.1	[NT]	[NT]	LCS-3	94%
Exchangeable K	meq/100 g	0.1	Metals-009	<0.1	[NT]	[NT]	LCS-3	105%
Exchangeable Mg	meq/100 g	0.1	Metals-009	<0.1	[NT]	[NT]	LCS-3	90%
Exchangeable Na	meq/100 g	0.1	Metals-009	<0.1	[NT]	[NT]	LCS-3	102%

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QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Phenoxy Acid Herbicides in Soil						Base II Duplicate II %RPD		
Date extracted	-			13/06/2017	[NT]	[NT]	LCS-3	13/06/2017
Date analysed	-			13/06/2017	[NT]	[NT]	LCS-3	13/06/2017
Clopyralid	mg/kg	0.5	Ext-054	<0.5	[NT]	[NT]	[NR]	[NR]
3,5-Dichlorobenzoic acid	mg/kg	0.5	Ext-054	<0.5	[NT]	[NT]	[NR]	[NR]
o-chlorophenoxy acetic acid	mg/kg	0.5	Ext-054	<0.5	[NT]	[NT]	[NR]	[NR]
4-CPA	mg/kg	0.5	Ext-054	<0.5	[NT]	[NT]	[NR]	[NR]
Dicamba	mg/kg	0.5	Ext-054	<0.5	[NT]	[NT]	LCS-3	88%
MCPP	mg/kg	0.5	Ext-054	<0.5	[NT]	[NT]	LCS-3	96%
MCPA	mg/kg	0.5	Ext-054	<0.5	[NT]	[NT]	LCS-3	111%
Dichlorprop	mg/kg	0.5	Ext-054	<0.5	[NT]	[NT]	[NR]	[NR]
2,4-D	mg/kg	0.5	Ext-054	<0.5	[NT]	[NT]	LCS-3	101%
Bromoxynil	mg/kg	0.5	Ext-054	<0.5	[NT]	[NT]	[NR]	[NR]
Triclopyr	mg/kg	0.5	Ext-054	<0.5	[NT]	[NT]	[NR]	[NR]
2,4,5-TP	mg/kg	0.5	Ext-054	<0.5	[NT]	[NT]	[NR]	[NR]
2,4,5-T	mg/kg	0.5	Ext-054	<0.5	[NT]	[NT]	LCS-3	88%
MCPB	mg/kg	0.5	Ext-054	<0.5	[NT]	[NT]	[NR]	[NR]
Dinoseb	mg/kg	1	Ext-054	<1	[NT]	[NT]	[NR]	[NR]
2,4-DB	mg/kg	0.5	Ext-054	<0.5	[NT]	[NT]	[NR]	[NR]
Ioxynil	mg/kg	1	Ext-054	<1	[NT]	[NT]	[NR]	[NR]
Picloram	mg/kg	0.5	Ext-054	<1	[NT]	[NT]	[NR]	[NR]
DCPA (Chlorthal) Diacid	mg/kg	0.5	Ext-054	<0.5	[NT]	[NT]	[NR]	[NR]
Acifluorfen	mg/kg	2	Ext-054	<2	[NT]	[NT]	[NR]	[NR]
2,4,6-T	mg/kg	0.5	Ext-054	<0.5	[NT]	[NT]	[NR]	[NR]
2,6-D	mg/kg	0.5	Ext-054	<0.5	[NT]	[NT]	[NR]	[NR]
Surrogate 2,4- DCPA	%		Ext-054	100	[NT]	[NT]	LCS-3	104%

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QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Triazine Herbicides in Soil						Base Duplicate %RPD		
Date prepared	-			09/06/2017	168816-1	09/06/2017 09/06/2017	LCS-3	09/06/2017
Date analysed	-			13/06/2017	168816-1	13/06/2017 13/06/2017	LCS-3	13/06/2017
Atrazine	mg/kg	0.5	Org-012	<0.5	168816-1	<0.5 <0.5	[NR]	[NR]
Ametryn	mg/kg	0.5	Org-012	<0.5	168816-1	<0.5 <0.5	LCS-3	109%
Cyanazine	mg/kg	0.5	Org-012	<0.5	168816-1	<0.5 <0.5	[NR]	[NR]
Hexazinone	mg/kg	0.5	Org-012	<0.5	168816-1	<0.5 <0.5	[NR]	[NR]
Irgarol	mg/kg	0.5	Org-012	<0.5	168816-1	<0.5 <0.5	[NR]	[NR]
Metribuzin	mg/kg	0.5	Org-012	<0.5	168816-1	<0.5 <0.5	[NR]	[NR]
Prometryn	mg/kg	0.5	Org-012	<0.5	168816-1	<0.5 <0.5	LCS-3	100%
Propazine	mg/kg	0.5	Org-012	<0.5	168816-1	<0.5 <0.5	LCS-3	76%
Simazine	mg/kg	0.5	Org-012	<0.5	168816-1	<0.5 <0.5	[NR]	[NR]
Terbutryn	mg/kg	0.5	Org-012	<0.5	168816-1	<0.5 <0.5	[NR]	[NR]
Terbutylazine	mg/kg	0.5	Org-012	<0.5	168816-1	<0.5 <0.5	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012	100	168816-1	111 111 RPD: 0	LCS-3	101%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank				
Micro testing in soil								
Date testing started	-			[NT]				
Date testing completed	-			[NT]				
Faecal Coliforms in soil	MPN/100 g	200	Ext-008	[NT]				
E. coli	MPN/100 g	1	Ext-008	[NT]				
Salmonella*	50g	0	Ext-008	[NT]				
QUALITYCONTROL	UNITS	Dup. Sm#		Duplicate				
vTRH(C6-C10)/BTEXNin Soil				Base + Duplicate + %RPD				
Date extracted	-	168816-32		09/06/2017 09/06/2017				
Date analysed	-	168816-32		10/06/2017 10/06/2017				
TRHC6 - C9	mg/kg	168816-32		<25 <25				
TRHC6 - C10	mg/kg	168816-32		<25 <25				
Benzene	mg/kg	168816-32		<0.2 <0.2				
Toluene	mg/kg	168816-32		<0.5 <0.5				
Ethylbenzene	mg/kg	168816-32		<1 <1				
m+p-xylene	mg/kg	168816-32		<2 <2				
o-Xylene	mg/kg	168816-32		<1 <1				
naphthalene	mg/kg	168816-32		<1 <1				
Surrogate aaa-Trifluorotoluene	%	168816-32		98 95 RPD: 3				

QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date extracted	-	168816-32	09/06/2017 09/06/2017
Date analysed	-	168816-32	09/06/2017 10/06/2017
TRHC ₁₀ - C ₁₄	mg/kg	168816-32	<50 <50
TRHC ₁₅ - C ₂₈	mg/kg	168816-32	<100 <100
TRHC ₂₉ - C ₃₆	mg/kg	168816-32	<100 <100
TRH>C ₁₀ -C ₁₆	mg/kg	168816-32	<50 <50
TRH>C ₁₆ -C ₃₄	mg/kg	168816-32	<100 <100
TRH>C ₃₄ -C ₄₀	mg/kg	168816-32	<100 <100
Surrogate o-Terphenyl	%	168816-32	96 85 RPD: 12
QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date extracted	-	168816-32	09/06/2017 09/06/2017
Date analysed	-	168816-32	13/06/2017 13/06/2017
Naphthalene	mg/kg	168816-32	<0.1 <0.1
Acenaphthylene	mg/kg	168816-32	<0.1 <0.1
Acenaphthene	mg/kg	168816-32	<0.1 <0.1
Fluorene	mg/kg	168816-32	<0.1 <0.1
Phenanthrene	mg/kg	168816-32	<0.1 <0.1
Anthracene	mg/kg	168816-32	<0.1 <0.1
Fluoranthene	mg/kg	168816-32	<0.1 <0.1
Pyrene	mg/kg	168816-32	<0.1 <0.1
Benzo(a)anthracene	mg/kg	168816-32	<0.1 <0.1
Chrysene	mg/kg	168816-32	<0.1 <0.1
Benzo(b,j,k)fluoranthene	mg/kg	168816-32	<0.2 <0.2
Benzo(a)pyrene	mg/kg	168816-32	<0.05 <0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	168816-32	<0.1 <0.1
Dibenzo(a,h)anthracene	mg/kg	168816-32	<0.1 <0.1
Benzo(g,h,i)perylene	mg/kg	168816-32	<0.1 <0.1
Surrogate p-Terphenyl-d14	%	168816-32	86 105 RPD: 20

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QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	168816-32	09/06/2017 09/06/2017	LCS-4	09/06/2017
Date analysed	-	168816-32	09/06/2017 09/06/2017	LCS-4	09/06/2017
HCB	mg/kg	168816-32	<0.1 <0.1	[NR]	[NR]
alpha-BHC	mg/kg	168816-32	<0.1 <0.1	LCS-4	75%
gamma-BHC	mg/kg	168816-32	<0.1 <0.1	[NR]	[NR]
beta-BHC	mg/kg	168816-32	<0.1 <0.1	LCS-4	96%
Heptachlor	mg/kg	168816-32	<0.1 <0.1	LCS-4	100%
delta-BHC	mg/kg	168816-32	<0.1 <0.1	[NR]	[NR]
Aldrin	mg/kg	168816-32	<0.1 <0.1	LCS-4	92%
Heptachlor Epoxide	mg/kg	168816-32	<0.1 <0.1	LCS-4	96%
gamma-Chlordane	mg/kg	168816-32	<0.1 <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	168816-32	<0.1 <0.1	[NR]	[NR]
Endosulfan I	mg/kg	168816-32	<0.1 <0.1	[NR]	[NR]
pp-DDE	mg/kg	168816-32	<0.1 <0.1	LCS-4	92%
Dieldrin	mg/kg	168816-32	<0.1 <0.1	LCS-4	104%
Endrin	mg/kg	168816-32	<0.1 <0.1	LCS-4	94%
pp-DDD	mg/kg	168816-32	<0.1 <0.1	LCS-4	98%
Endosulfan II	mg/kg	168816-32	<0.1 <0.1	[NR]	[NR]
pp-DDT	mg/kg	168816-32	<0.1 <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	168816-32	<0.1 <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	168816-32	<0.1 <0.1	LCS-4	76%
Methoxychlor	mg/kg	168816-32	<0.1 <0.1	[NR]	[NR]
Surrogate TCMX	%	168816-32	101 101 RPD: 0	LCS-4	119%

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QUALITY CONTROL Organophosphorus Pesticides	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	168816-32	09/06/2017 09/06/2017	LCS-4	09/06/2017
Date analysed	-	168816-32	09/06/2017 09/06/2017	LCS-4	09/06/2017
Azinphos-methyl (Guthion)	mg/kg	168816-32	<0.1 <0.1	[NR]	[NR]
Bromophos-ethyl	mg/kg	168816-32	<0.1 <0.1	[NR]	[NR]
Chlorpyrifos	mg/kg	168816-32	<0.1 <0.1	LCS-4	77%
Chlorpyrifos-methyl	mg/kg	168816-32	<0.1 <0.1	[NR]	[NR]
Diazinon	mg/kg	168816-32	<0.1 <0.1	[NR]	[NR]
Dichlorvos	mg/kg	168816-32	<0.1 <0.1	LCS-4	74%
Dimethoate	mg/kg	168816-32	<0.1 <0.1	[NR]	[NR]
Ethion	mg/kg	168816-32	<0.1 <0.1	LCS-4	75%
Fenitrothion	mg/kg	168816-32	<0.1 <0.1	LCS-4	83%
Malathion	mg/kg	168816-32	<0.1 <0.1	LCS-4	70%
Parathion	mg/kg	168816-32	<0.1 <0.1	LCS-4	100%
Ronnel	mg/kg	168816-32	<0.1 <0.1	LCS-4	86%
Surrogate TCMX	%	168816-32	101 101 RPD: 0	LCS-4	99%
QUALITY CONTROL PCBs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	168816-32	09/06/2017 09/06/2017	LCS-4	09/06/2017
Date analysed	-	168816-32	09/06/2017 09/06/2017	LCS-4	09/06/2017
Aroclor 1016	mg/kg	168816-32	<0.1 <0.1	[NR]	[NR]
Aroclor 1221	mg/kg	168816-32	<0.1 <0.1	[NR]	[NR]
Aroclor 1232	mg/kg	168816-32	<0.1 <0.1	[NR]	[NR]
Aroclor 1242	mg/kg	168816-32	<0.1 <0.1	[NR]	[NR]
Aroclor 1248	mg/kg	168816-32	<0.1 <0.1	[NR]	[NR]
Aroclor 1254	mg/kg	168816-32	<0.1 <0.1	LCS-4	105%
Aroclor 1260	mg/kg	168816-32	<0.1 <0.1	[NR]	[NR]
Surrogate TCLMX	%	168816-32	101 101 RPD: 0	LCS-4	99%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	168816-32	09/06/2017 09/06/2017	LCS-4	09/06/2017
Date analysed	-	168816-32	09/06/2017 09/06/2017	LCS-4	09/06/2017
Arsenic	mg/kg	168816-32	6 5 RPD: 18	LCS-4	110%
Cadmium	mg/kg	168816-32	<0.4 <0.4	LCS-4	99%
Chromium	mg/kg	168816-32	13 12 RPD: 8	LCS-4	103%
Copper	mg/kg	168816-32	34 17 RPD: 67	LCS-4	103%
Lead	mg/kg	168816-32	7 6 RPD: 15	LCS-4	98%
Mercury	mg/kg	168816-32	<0.1 <0.1	LCS-4	96%
Nickel	mg/kg	168816-32	22 18 RPD: 20	LCS-4	96%
Zinc	mg/kg	168816-32	43 38 RPD: 12	LCS-4	98%

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QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	168816-72	09/06/2017 09/06/2017	168816-36	09/06/2017
Date analysed	-	168816-72	10/06/2017 10/06/2017	168816-36	10/06/2017
TRHC ₆ - C ₉	mg/kg	168816-72	<25 <25	168816-36	103%
TRHC ₆ - C ₁₀	mg/kg	168816-72	<25 <25	168816-36	103%
Benzene	mg/kg	168816-72	<0.2 <0.2	168816-36	102%
Toluene	mg/kg	168816-72	<0.5 <0.5	168816-36	107%
Ethylbenzene	mg/kg	168816-72	<1 <1	168816-36	96%
m+p-xylene	mg/kg	168816-72	<2 <2	168816-36	105%
o-Xylene	mg/kg	168816-72	<1 <1	168816-36	97%
naphthalene	mg/kg	168816-72	<1 <1	[NR]	[NR]
Surrogate aaa- Trifluorotoluene	%	168816-72	97 96 RPD: 1	168816-36	102%
QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	168816-72	09/06/2017 09/06/2017	168816-36	09/06/2017
Date analysed	-	168816-72	10/06/2017 10/06/2017	168816-36	10/06/2017
TRHC ₁₀ - C ₁₄	mg/kg	168816-72	<50 <50	168816-36	101%
TRHC ₁₅ - C ₂₈	mg/kg	168816-72	<100 <100	168816-36	104%
TRHC ₂₉ - C ₃₆	mg/kg	168816-72	<100 <100	168816-36	85%
TRH>C ₁₀ -C ₁₆	mg/kg	168816-72	<50 <50	168816-36	101%
TRH>C ₁₆ -C ₃₄	mg/kg	168816-72	<100 <100	168816-36	104%
TRH>C ₃₄ -C ₄₀	mg/kg	168816-72	<100 <100	168816-36	85%
Surrogate o-Terphenyl	%	168816-72	88 88 RPD: 0	168816-36	89%
QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	168816-72	09/06/2017 09/06/2017	168816-36	09/06/2017
Date analysed	-	168816-72	13/06/2017 13/06/2017	168816-36	13/06/2017
Naphthalene	mg/kg	168816-72	<0.1 <0.1	168816-36	104%
Acenaphthylene	mg/kg	168816-72	<0.1 <0.1	[NR]	[NR]
Acenaphthene	mg/kg	168816-72	<0.1 <0.1	[NR]	[NR]
Fluorene	mg/kg	168816-72	<0.1 <0.1	168816-36	98%
Phenanthrene	mg/kg	168816-72	<0.1 <0.1	168816-36	98%
Anthracene	mg/kg	168816-72	<0.1 <0.1	[NR]	[NR]
Fluoranthene	mg/kg	168816-72	<0.1 <0.1	168816-36	91%
Pyrene	mg/kg	168816-72	<0.1 <0.1	168816-36	102%
Benzo(a)anthracene	mg/kg	168816-72	<0.1 <0.1	[NR]	[NR]
Chrysene	mg/kg	168816-72	<0.1 <0.1	168816-36	115%
Benzo(b,j,k)fluoranthene	mg/kg	168816-72	<0.2 <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	168816-72	<0.05 <0.05	168816-36	107%
Indeno(1,2,3-c,d)pyrene	mg/kg	168816-72	<0.1 <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	168816-72	<0.1 <0.1	[NR]	[NR]

Client Reference: 88336.02, Bungendore

QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Benzo(g,h,i)perylene	mg/kg	168816-72	<0.1 <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%	168816-72	91 91 RPD: 0	168816-36	110%
QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	168816-72	09/06/2017 09/06/2017	168816-36	09/06/2017
Date analysed	-	168816-72	09/06/2017 09/06/2017	168816-36	09/06/2017
HCB	mg/kg	168816-72	<0.1 <0.1	[NR]	[NR]
alpha-BHC	mg/kg	168816-72	<0.1 <0.1	168816-36	80%
gamma-BHC	mg/kg	168816-72	<0.1 <0.1	[NR]	[NR]
beta-BHC	mg/kg	168816-72	<0.1 <0.1	168816-36	96%
Heptachlor	mg/kg	168816-72	<0.1 <0.1	168816-36	97%
delta-BHC	mg/kg	168816-72	<0.1 <0.1	[NR]	[NR]
Aldrin	mg/kg	168816-72	<0.1 <0.1	168816-36	95%
Heptachlor Epoxide	mg/kg	168816-72	<0.1 <0.1	168816-36	96%
gamma-Chlordane	mg/kg	168816-72	<0.1 <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	168816-72	<0.1 <0.1	[NR]	[NR]
Endosulfan I	mg/kg	168816-72	<0.1 <0.1	[NR]	[NR]
pp-DDE	mg/kg	168816-72	<0.1 <0.1	168816-36	95%
Dieldrin	mg/kg	168816-72	<0.1 <0.1	168816-36	105%
Endrin	mg/kg	168816-72	<0.1 <0.1	168816-36	94%
pp-DDD	mg/kg	168816-72	<0.1 <0.1	168816-36	98%
Endosulfan II	mg/kg	168816-72	<0.1 <0.1	[NR]	[NR]
pp-DDT	mg/kg	168816-72	<0.1 <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	168816-72	<0.1 <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	168816-72	<0.1 <0.1	168816-36	77%
Methoxychlor	mg/kg	168816-72	<0.1 <0.1	[NR]	[NR]
Surrogate TCMX	%	168816-72	101 101 RPD: 0	168816-36	122%

Client Reference: 88336.02, Bungendore

QUALITY CONTROL Organophosphorus Pesticides	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	168816-72	09/06/2017 09/06/2017	168816-36	09/06/2017
Date analysed	-	168816-72	09/06/2017 09/06/2017	168816-36	09/06/2017
Azinphos-methyl (Guthion)	mg/kg	168816-72	<0.1 <0.1	[NR]	[NR]
Bromophos-ethyl	mg/kg	168816-72	<0.1 <0.1	[NR]	[NR]
Chlorpyrifos	mg/kg	168816-72	<0.1 <0.1	168816-36	86%
Chlorpyrifos-methyl	mg/kg	168816-72	<0.1 <0.1	[NR]	[NR]
Diazinon	mg/kg	168816-72	<0.1 <0.1	[NR]	[NR]
Dichlorvos	mg/kg	168816-72	<0.1 <0.1	168816-36	82%
Dimethoate	mg/kg	168816-72	<0.1 <0.1	[NR]	[NR]
Ethion	mg/kg	168816-72	<0.1 <0.1	168816-36	93%
Fenitrothion	mg/kg	168816-72	<0.1 <0.1	168816-36	88%
Malathion	mg/kg	168816-72	<0.1 <0.1	168816-36	77%
Parathion	mg/kg	168816-72	<0.1 <0.1	168816-36	103%
Ronnel	mg/kg	168816-72	<0.1 <0.1	168816-36	92%
Surrogate TCMX	%	168816-72	101 101 RPD: 0	168816-36	99%
QUALITY CONTROL PCBs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	168816-72	09/06/2017 09/06/2017	168816-36	09/06/2017
Date analysed	-	168816-72	09/06/2017 09/06/2017	168816-36	09/06/2017
Aroclor 1016	mg/kg	168816-72	<0.1 <0.1	[NR]	[NR]
Aroclor 1221	mg/kg	168816-72	<0.1 <0.1	[NR]	[NR]
Aroclor 1232	mg/kg	168816-72	<0.1 <0.1	[NR]	[NR]
Aroclor 1242	mg/kg	168816-72	<0.1 <0.1	[NR]	[NR]
Aroclor 1248	mg/kg	168816-72	<0.1 <0.1	[NR]	[NR]
Aroclor 1254	mg/kg	168816-72	<0.1 <0.1	168816-36	109%
Aroclor 1260	mg/kg	168816-72	<0.1 <0.1	[NR]	[NR]
Surrogate TCLMX	%	168816-72	101 101 RPD: 0	168816-36	99%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	168816-72	09/06/2017 09/06/2017	168816-36	09/06/2017
Date analysed	-	168816-72	09/06/2017 09/06/2017	168816-36	09/06/2017
Arsenic	mg/kg	168816-72	<4 <4	168816-36	100%
Cadmium	mg/kg	168816-72	<0.4 <0.4	168816-36	109%
Chromium	mg/kg	168816-72	5 5 RPD: 0	168816-36	107%
Copper	mg/kg	168816-72	2 2 RPD: 0	168816-36	108%
Lead	mg/kg	168816-72	6 3 RPD: 67	168816-36	106%
Mercury	mg/kg	168816-72	<0.1 <0.1	168816-36	97%
Nickel	mg/kg	168816-72	2 2 RPD: 0	168816-36	105%
Zinc	mg/kg	168816-72	6 6 RPD: 0	168816-36	105%

Client Reference: 88336.02, Bungendore

QUALITYCONTROL Misc Soil - Inorg	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	168816-29	09/06/2017 09/06/2017	168816-32	09/06/2017
Date analysed	-	168816-29	09/06/2017 09/06/2017	168816-32	09/06/2017
Total Phenolics (as Phenol)	mg/kg	168816-29	<5 <5	168816-32	88%
QUALITYCONTROL Misc Soil - Inorg	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD		
Date prepared	-	168816-69	09/06/2017 09/06/2017		
Date analysed	-	168816-69	09/06/2017 09/06/2017		
Total Phenolics (as Phenol)	mg/kg	168816-69	<5 <5		
QUALITYCONTROL Phenoxy Acid Herbicides in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	168816-3	13/06/2017
Date analysed	-	[NT]	[NT]	168816-3	13/06/2017
Clopyralid	mg/kg	[NT]	[NT]	[NR]	[NR]
3,5-Dichlorobenzoic acid	mg/kg	[NT]	[NT]	[NR]	[NR]
o-chlorophenoxy acetic acid	mg/kg	[NT]	[NT]	[NR]	[NR]
4-CPA	mg/kg	[NT]	[NT]	[NR]	[NR]
Dicamba	mg/kg	[NT]	[NT]	168816-3	88%
MCPP	mg/kg	[NT]	[NT]	168816-3	93%
MCPA	mg/kg	[NT]	[NT]	168816-3	100%
Dichlorprop	mg/kg	[NT]	[NT]	[NR]	[NR]
2,4-D	mg/kg	[NT]	[NT]	168816-3	98%
Bromoxynil	mg/kg	[NT]	[NT]	[NR]	[NR]
Triclopyr	mg/kg	[NT]	[NT]	[NR]	[NR]
2,4,5-TP	mg/kg	[NT]	[NT]	[NR]	[NR]
2,4,5-T	mg/kg	[NT]	[NT]	168816-3	85%
MCPB	mg/kg	[NT]	[NT]	[NR]	[NR]
Dinoseb	mg/kg	[NT]	[NT]	[NR]	[NR]
2,4-DB	mg/kg	[NT]	[NT]	[NR]	[NR]
Ioxynil	mg/kg	[NT]	[NT]	[NR]	[NR]
Picloram	mg/kg	[NT]	[NT]	[NR]	[NR]
DCPA (Chlorthal) Diacid	mg/kg	[NT]	[NT]	[NR]	[NR]
Acifluorfen	mg/kg	[NT]	[NT]	[NR]	[NR]
2,4,6-T	mg/kg	[NT]	[NT]	[NR]	[NR]
2,6-D	mg/kg	[NT]	[NT]	[NR]	[NR]
Surrogate 2.4- DCPA	%	[NT]	[NT]	168816-3	106%

Client Reference: 88336.02, Bungendore

QUALITYCONTROL Triazine Herbicides in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	[NT]	[NT]	168816-3	09/06/2017
Date analysed	-	[NT]	[NT]	168816-3	13/06/2017
Atrazine	mg/kg	[NT]	[NT]	[NR]	[NR]
Ametryn	mg/kg	[NT]	[NT]	168816-3	117%
Cyanazine	mg/kg	[NT]	[NT]	[NR]	[NR]
Hexazinone	mg/kg	[NT]	[NT]	[NR]	[NR]
Irgarol	mg/kg	[NT]	[NT]	[NR]	[NR]
Metribuzin	mg/kg	[NT]	[NT]	[NR]	[NR]
Prometryn	mg/kg	[NT]	[NT]	168816-3	104%
Propazine	mg/kg	[NT]	[NT]	168816-3	88%
Simazine	mg/kg	[NT]	[NT]	[NR]	[NR]
Terbutryn	mg/kg	[NT]	[NT]	[NR]	[NR]
Terbuthylazine	mg/kg	[NT]	[NT]	[NR]	[NR]
Surrogate <i>p</i> -Terphenyl- d ₁₄	%	[NT]	[NT]	168816-3	110%
QUALITYCONTROL Misc Inorg - Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD		
Date prepared	-	168816-6	14/06/2017 14/06/2017		
Date analysed	-	168816-6	14/06/2017 14/06/2017		
pH 1:5 soil:water	pH Units	168816-6	5.4 5.4 RPD: 0		
QUALITYCONTROL CEC	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD		
Date prepared	-	168816-6	13/06/2017 13/06/2017		
Date analysed	-	168816-6	13/06/2017 13/06/2017		
Exchangeable Ca	meq/100 g	168816-6	1.4 1.4 RPD: 0		
Exchangeable K	meq/100 g	168816-6	0.4 0.4 RPD: 0		
Exchangeable Mg	meq/100 g	168816-6	0.45 0.46 RPD: 2		
Exchangeable Na	meq/100 g	168816-6	<0.1 <0.1		
QUALITYCONTROL Phenoxy Acid Herbicides in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	LCS-1	13/06/2017
Date analysed	-	[NT]	[NT]	LCS-1	13/06/2017
Clpyralid	mg/kg	[NT]	[NT]	[NR]	[NR]
3,5-Dichlorobenzoic acid	mg/kg	[NT]	[NT]	[NR]	[NR]
o-chlorophenoxy acetic acid	mg/kg	[NT]	[NT]	[NR]	[NR]
4-CPA	mg/kg	[NT]	[NT]	[NR]	[NR]
Dicamba	mg/kg	[NT]	[NT]	LCS-1	82%
MCPP	mg/kg	[NT]	[NT]	LCS-1	91%

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QUALITY CONTROL Phenoxy Acid Herbicides in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
MCPA	mg/kg	[NT]	[NT]	LCS-1	83%
Dichlorprop	mg/kg	[NT]	[NT]	[NR]	[NR]
2,4-D	mg/kg	[NT]	[NT]	LCS-1	85%
Bromoxynil	mg/kg	[NT]	[NT]	[NR]	[NR]
Triclopyr	mg/kg	[NT]	[NT]	[NR]	[NR]
2,4,5-TP	mg/kg	[NT]	[NT]	[NR]	[NR]
2,4,5-T	mg/kg	[NT]	[NT]	LCS-1	84%
MCPB	mg/kg	[NT]	[NT]	[NR]	[NR]
Dinoseb	mg/kg	[NT]	[NT]	[NR]	[NR]
2,4-DB	mg/kg	[NT]	[NT]	[NR]	[NR]
loxynil	mg/kg	[NT]	[NT]	[NR]	[NR]
Picloram	mg/kg	[NT]	[NT]	[NR]	[NR]
DCPA (Chlorthal) Diacid	mg/kg	[NT]	[NT]	[NR]	[NR]
Acifluorfen	mg/kg	[NT]	[NT]	[NR]	[NR]
2,4,6-T	mg/kg	[NT]	[NT]	[NR]	[NR]
2,6-D	mg/kg	[NT]	[NT]	[NR]	[NR]
Surrogate 2,4- DCPA	%	[NT]	[NT]	LCS-1	86%
QUALITY CONTROL Phenoxy Acid Herbicides in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	168816-102	13/06/2017 13/06/2017	168816-108	13/06/2017
Date analysed	-	168816-102	13/06/2017 13/06/2017	168816-108	13/06/2017
Clopyralid	mg/kg	168816-102	<0.5 <0.5	[NR]	[NR]
3,5-Dichlorobenzoic acid	mg/kg	168816-102	<0.5 <0.5	[NR]	[NR]
o-chlorophenoxy acetic acid	mg/kg	168816-102	<0.5 <0.5	[NR]	[NR]
4-CPA	mg/kg	168816-102	<0.5 <0.5	[NR]	[NR]
Dicamba	mg/kg	168816-102	<0.5 <0.5	168816-108	83%
MCPP	mg/kg	168816-102	<0.5 <0.5	168816-108	94%
MCPA	mg/kg	168816-102	<0.5 <0.5	168816-108	93%
Dichlorprop	mg/kg	168816-102	<0.5 <0.5	[NR]	[NR]
2,4-D	mg/kg	168816-102	<0.5 <0.5	168816-108	94%
Bromoxynil	mg/kg	168816-102	<0.5 <0.5	[NR]	[NR]
Triclopyr	mg/kg	168816-102	<0.5 <0.5	[NR]	[NR]
2,4,5-TP	mg/kg	168816-102	<0.5 <0.5	[NR]	[NR]
2,4,5-T	mg/kg	168816-102	<0.5 <0.5	168816-108	96%
MCPB	mg/kg	168816-102	<0.5 <0.5	[NR]	[NR]
Dinoseb	mg/kg	168816-102	<1 <1	[NR]	[NR]
2,4-DB	mg/kg	168816-102	<0.5 <0.5	[NR]	[NR]
loxynil	mg/kg	168816-102	<1 <1	[NR]	[NR]
Picloram	mg/kg	168816-102	<0.5 <0.5	[NR]	[NR]
DCPA (Chlorthal) Diacid	mg/kg	168816-102	<0.5 <0.5	[NR]	[NR]

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QUALITYCONTROL Phenoxy Acid Herbicides in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Acifluorfen	mg/kg	168816-102	<2 <2	[NR]	[NR]
2,4,6-T	mg/kg	168816-102	<0.5 <0.5	[NR]	[NR]
2,6-D	mg/kg	168816-102	<0.5 <0.5	[NR]	[NR]
Surrogate 2.4- DCPA	%	168816-102	86 92 RPD: 7	168816-108	96%

Report Comments:

Acid Extractable Metals in Soil: The laboratory RPD acceptance criteria has been exceeded for 168816-32 for Cu. Therefore a triplicate result has been issued as laboratory sample number 168816-109.

Faecal Coliform, E.Coli & Salmonella analysed by Sonic Food & Water Testing.
Report No. W1710837 &W1710838

ND = Not Detected

Asbestos: A portion of the supplied sample was sub-sampled for asbestos analysis according to Envirolab procedures. We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab recommends supplying 40-50g of sample in its own container.

Note: Samples requested for asbestos testing were sub-sampled from jars provided by the client.

Acid Herbicides in soil analysed by MPL. Report number 196769 & 197096.

Asbestos ID was analysed by Approved Identifier:	Jessica Hie, Matt Tang
Asbestos ID was authorised by Approved Signatory:	Paul Ching

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

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

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

Quality Control Definitions

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

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

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

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

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

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in 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.



Sampling

Sampling is carried out during drilling or test pitting to allow engineering examination (and laboratory testing where required) of the soil or rock.

Disturbed samples taken during drilling provide information on colour, type, inclusions and, depending upon the degree of disturbance, some information on strength and structure.

Undisturbed samples are taken by pushing a thin-walled sample tube into the soil and withdrawing it to obtain a sample of the soil in a relatively undisturbed state. Such samples yield information on structure and strength, and are necessary for laboratory determination of shear strength and compressibility. Undisturbed sampling is generally effective only in cohesive soils.

Test Pits

Test pits are usually excavated with a backhoe or an excavator, allowing close examination of the in-situ soil if it is safe to enter into the pit. The depth of excavation is limited to about 3 m for a backhoe and up to 6 m for a large excavator. A potential disadvantage of this investigation method is the larger area of disturbance to the site.

Large Diameter Augers

Boreholes can be drilled using a rotating plate or short spiral auger, generally 300 mm or larger in diameter commonly mounted on a standard piling rig. The cuttings are returned to the surface at intervals (generally not more than 0.5 m) and are disturbed but usually unchanged in moisture content. Identification of soil strata is generally much more reliable than with continuous spiral flight augers, and is usually supplemented by occasional undisturbed tube samples.

Continuous Spiral Flight Augers

The borehole is advanced using 90-115 mm diameter continuous spiral flight augers which are withdrawn at intervals to allow sampling or in-situ testing. This is a relatively economical means of drilling in clays and sands above the water table. Samples are returned to the surface, or may be collected after withdrawal of the auger flights, but they are disturbed and may be mixed with soils from the sides of the hole. Information from the drilling (as distinct from specific sampling by SPTs or undisturbed samples) is of relatively low

reliability, due to the remoulding, possible mixing or softening of samples by groundwater.

Non-core Rotary Drilling

The borehole is advanced using a rotary bit, with water or drilling mud being pumped down the drill rods and returned up the annulus, carrying the drill cuttings. Only major changes in stratification can be determined from the cuttings, together with some information from the rate of penetration. Where drilling mud is used this can mask the cuttings and reliable identification is only possible from separate sampling such as SPTs.

Continuous Core Drilling

A continuous core sample can be obtained using a diamond tipped core barrel, usually with a 50 mm internal diameter. Provided full core recovery is achieved (which is not always possible in weak rocks and granular soils), this technique provides a very reliable method of investigation.

Standard Penetration Tests

Standard penetration tests (SPT) are used as a means of estimating the density or strength of soils and also of obtaining a relatively undisturbed sample. The test procedure is described in Australian Standard 1289, Methods of Testing Soils for Engineering Purposes - Test 6.3.1.

The test is carried out in a borehole by driving a 50 mm diameter split sample tube under the impact of a 63 kg hammer with a free fall of 760 mm. It is normal for the tube to be driven in three successive 150 mm increments and the 'N' value is taken as the number of blows for the last 300 mm. In dense sands, very hard clays or weak rock, the full 450 mm penetration may not be practicable and the test is discontinued.

The test results are reported in the following form.

- In the case where full penetration is obtained with successive blow counts for each 150 mm of, say, 4, 6 and 7 as:
4,6,7
N=13
- In the case where the test is discontinued before the full penetration depth, say after 15 blows for the first 150 mm and 30 blows for the next 40 mm as:
15, 30/40 mm

Sampling Methods

The results of the SPT tests can be related empirically to the engineering properties of the soils.

Dynamic Cone Penetrometer Tests / Perth Sand Penetrometer Tests

Dynamic penetrometer tests (DCP or PSP) are carried out by driving a steel rod into the ground using a standard weight of hammer falling a specified distance. As the rod penetrates the soil the number of blows required to penetrate each successive 150 mm depth are recorded. Normally there is a depth limitation of 1.2 m, but this may be extended in certain conditions by the use of extension rods. Two types of penetrometer are commonly used.

- Perth sand penetrometer - a 16 mm diameter flat ended rod is driven using a 9 kg hammer dropping 600 mm (AS 1289, Test 6.3.3). This test was developed for testing the density of sands and is mainly used in granular soils and filling.
- Cone penetrometer - a 16 mm diameter rod with a 20 mm diameter cone end is driven using a 9 kg hammer dropping 510 mm (AS 1289, Test 6.3.2). This test was developed initially for pavement subgrade investigations, and correlations of the test results with California Bearing Ratio have been published by various road authorities.



Description and Classification Methods

The methods of description and classification of soils and rocks used in this report are based on Australian Standard AS 1726, Geotechnical Site Investigations Code. In general, the descriptions include strength or density, colour, structure, soil or rock type and inclusions.

Soil Types

Soil types are described according to the predominant particle size, qualified by the grading of other particles present:

Type	Particle size (mm)
Boulder	>200
Cobble	63 - 200
Gravel	2.36 - 63
Sand	0.075 - 2.36
Silt	0.002 - 0.075
Clay	<0.002

The sand and gravel sizes can be further subdivided as follows:

Type	Particle size (mm)
Coarse gravel	20 - 63
Medium gravel	6 - 20
Fine gravel	2.36 - 6
Coarse sand	0.6 - 2.36
Medium sand	0.2 - 0.6
Fine sand	0.075 - 0.2

The proportions of secondary constituents of soils are described as:

Term	Proportion	Example
And	Specify	Clay (60%) and Sand (40%)
Adjective	20 - 35%	Sandy Clay
Slightly	12 - 20%	Slightly Sandy Clay
With some	5 - 12%	Clay with some sand
With a trace of	0 - 5%	Clay with a trace of sand

Definitions of grading terms used are:

- Well graded - a good representation of all particle sizes
- Poorly graded - an excess or deficiency of particular sizes within the specified range
- Uniformly graded - an excess of a particular particle size
- Gap graded - a deficiency of a particular particle size with the range

Cohesive Soils

Cohesive soils, such as clays, are classified on the basis of undrained shear strength. The strength may be measured by laboratory testing, or estimated by field tests or engineering examination. The strength terms are defined as follows:

Description	Abbreviation	Undrained shear strength (kPa)
Very soft	vs	<12
Soft	s	12 - 25
Firm	f	25 - 50
Stiff	st	50 - 100
Very stiff	vst	100 - 200
Hard	h	>200

Cohesionless Soils

Cohesionless soils, such as clean sands, are classified on the basis of relative density, generally from the results of standard penetration tests (SPT), cone penetration tests (CPT) or dynamic penetrometers (PSP). The relative density terms are given below:

Relative Density	Abbreviation	SPT N value	CPT qc value (MPa)
Very loose	vl	<4	<2
Loose	l	4 - 10	2 - 5
Medium dense	md	10 - 30	5 - 15
Dense	d	30 - 50	15 - 25
Very dense	vd	>50	>25

Soil Descriptions

Soil Origin

It is often difficult to accurately determine the origin of a soil. Soils can generally be classified as:

- Residual soil - derived from in-situ weathering of the underlying rock;
- Transported soils - formed somewhere else and transported by nature to the site; or
- Filling - moved by man.

Transported soils may be further subdivided into:

- Alluvium - river deposits
- Lacustrine - lake deposits
- Aeolian - wind deposits
- Littoral - beach deposits
- Estuarine - tidal river deposits
- Talus - scree or coarse colluvium
- Slopewash or Colluvium - transported downslope by gravity assisted by water. Often includes angular rock fragments and boulders.



Rock Strength

Rock strength is defined by the Point Load Strength Index ($IS_{(50)}$) and refers to the strength of the rock substance and not the strength of the overall rock mass, which may be considerably weaker due to defects. The test procedure is described by Australian Standard 4133.4.1 - 1993. The terms used to describe rock strength are as follows:

Term	Abbreviation	Point Load Index $IS_{(50)}$ MPa	Approx Unconfined Compressive Strength MPa*
Extremely low	EL	<0.03	<0.6
Very low	VL	0.03 - 0.1	0.6 - 2
Low	L	0.1 - 0.3	2 - 6
Medium	M	0.3 - 1.0	6 - 20
High	H	1 - 3	20 - 60
Very high	VH	3 - 10	60 - 200
Extremely high	EH	>10	>200

* Assumes a ratio of 20:1 for UCS to $IS_{(50)}$

Degree of Weathering

The degree of weathering of rock is classified as follows:

Term	Abbreviation	Description
Extremely weathered	EW	Rock substance has soil properties, i.e. it can be remoulded and classified as a soil but the texture of the original rock is still evident.
Highly weathered	HW	Limonite staining or bleaching affects whole of rock substance and other signs of decomposition are evident. Porosity and strength may be altered as a result of iron leaching or deposition. Colour and strength of original fresh rock is not recognisable
Moderately weathered	MW	Staining and discolouration of rock substance has taken place
Slightly weathered	SW	Rock substance is slightly discoloured but shows little or no change of strength from fresh rock
Fresh stained	Fs	Rock substance unaffected by weathering but staining visible along defects
Fresh	Fr	No signs of decomposition or staining

Degree of Fracturing

The following classification applies to the spacing of natural fractures in diamond drill cores. It includes bedding plane partings, joints and other defects, but excludes drilling breaks.

Term	Description
Fragmented	Fragments of <20 mm
Highly Fractured	Core lengths of 20-40 mm with some fragments
Fractured	Core lengths of 40-200 mm with some shorter and longer sections
Slightly Fractured	Core lengths of 200-1000 mm with some shorter and loner sections
Unbroken	Core lengths mostly > 1000 mm

Rock Descriptions

Rock Quality Designation

The quality of the cored rock can be measured using the Rock Quality Designation (RQD) index, defined as:

$$\text{RQD \%} = \frac{\text{cumulative length of 'sound' core sections} \geq 100 \text{ mm long}}{\text{total drilled length of section being assessed}}$$

where 'sound' rock is assessed to be rock of low strength or better. The RQD applies only to natural fractures. If the core is broken by drilling or handling (i.e. drilling breaks) then the broken pieces are fitted back together and are not included in the calculation of RQD.

Stratification Spacing

For sedimentary rocks the following terms may be used to describe the spacing of bedding partings:

Term	Separation of Stratification Planes
Thinly laminated	< 6 mm
Laminated	6 mm to 20 mm
Very thinly bedded	20 mm to 60 mm
Thinly bedded	60 mm to 0.2 m
Medium bedded	0.2 m to 0.6 m
Thickly bedded	0.6 m to 2 m
Very thickly bedded	> 2 m

Symbols & Abbreviations

Douglas Partners



Introduction

These notes summarise abbreviations commonly used on borehole logs and test pit reports.

Drilling or Excavation Methods

C	Core Drilling
R	Rotary drilling
SFA	Spiral flight augers
NMLC	Diamond core - 52 mm dia
NQ	Diamond core - 47 mm dia
HQ	Diamond core - 63 mm dia
PQ	Diamond core - 81 mm dia

Water

▷	Water seep
▽	Water level

Sampling and Testing

A	Auger sample
B	Bulk sample
D	Disturbed sample
E	Environmental sample
U ₅₀	Undisturbed tube sample (50mm)
W	Water sample
pp	pocket penetrometer (kPa)
PID	Photo ionisation detector
PL	Point load strength Is(50) MPa
S	Standard Penetration Test
V	Shear vane (kPa)

Description of Defects in Rock

The abbreviated descriptions of the defects should be in the following order: Depth, Type, Orientation, Coating, Shape, Roughness and Other. Drilling and handling breaks are not usually included on the logs.

Defect Type

B	Bedding plane
Cs	Clay seam
Cv	Cleavage
Cz	Crushed zone
Ds	Decomposed seam
F	Fault
J	Joint
Lam	lamination
Pt	Parting
Sz	Sheared Zone
V	Vein

Orientation

The inclination of defects is always measured from the perpendicular to the core axis.

h	horizontal
v	vertical
sh	sub-horizontal
sv	sub-vertical

Coating or Infilling Term

cln	clean
co	coating
he	healed
inf	infilled
stn	stained
ti	tight
vn	veneer

Coating Descriptor

ca	calcite
cbs	carbonaceous
cly	clay
fe	iron oxide
mn	manganese
slt	silty

Shape

cu	curved
ir	irregular
pl	planar
st	stepped
un	undulating

Roughness

po	polished
ro	rough
sl	slickensided
sm	smooth
vr	very rough

Other

fg	fragmented
bnd	band
qtz	quartz

Symbols & Abbreviations

Graphic Symbols for Soil and Rock

General



Asphalt



Road base



Concrete



Filling

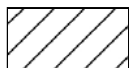
Soils



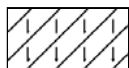
Topsoil



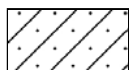
Peat



Clay



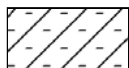
Silty clay



Sandy clay



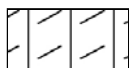
Gravelly clay



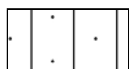
Shaly clay



Silt



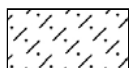
Clayey silt



Sandy silt



Sand



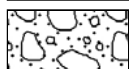
Clayey sand



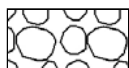
Silty sand



Gravel



Sandy gravel

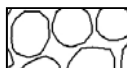


Cobbles, boulders



Talus

Sedimentary Rocks



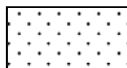
Boulder conglomerate



Conglomerate



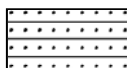
Conglomeratic sandstone



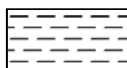
Sandstone



Siltstone



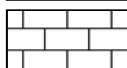
Laminite



Mudstone, claystone, shale

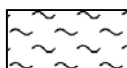


Coal

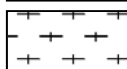


Limestone

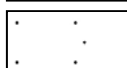
Metamorphic Rocks



Slate, phyllite, schist

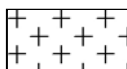


Gneiss

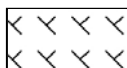


Quartzite

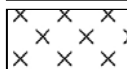
Igneous Rocks



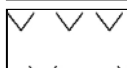
Granite



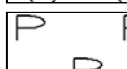
Dolerite, basalt, andesite



Dacite, epidote



Tuff, breccia



Porphyry

TEST PIT LOG

CLIENT: Queanbeyan-Palerang Regional Council
PROJECT: Preliminary Site Investigation - Limited Sampling
LOCATION: Lot 1 DP 798111, North Bungendore

SURFACE LEVEL: --
EASTING: 722430
NORTHING: 6097628

PIT No: 1
PROJECT No: 88336.02
DATE: 31/5/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.15	TOPSOIL-moist, dark brown silty sand with rootlets		E	0.05		PID<1					
		SILTY SAND, moist, light grey, fine grained silty sand		E	0.2		PID<1					
	0.4	SILTY GRAVELLY SAND-moist, light brown, fine to coarse grained silty gravelly sand, rounded gravel up to 60mm		D	0.5		PID<1					
	0.6	CLAYEY SILTY SAND-dense, moist, orange and brown, fine to medium grained clayey silty sand, some gravel		E								
	1											
	1.7	SANDSTONE-extremely low strength, extremely weathered, orange and brown, fine to medium grained sandstone		D	1.3							
	2											
		-from 2.1m, very low strength, highly weathered										
	2.5	Pit discontinued at 2.5m -limit of investigation		D	2.4							
	3											
	4											

RIG: Kubota KX057-4 mini-excavator fitted with a 30mm wide bucket

LOGGED: AZR

SURVEY DATUM: MGA94

WATER OBSERVATIONS:

REMARKS:

☐ 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
		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: Queanbeyan-Palerang Regional Council
PROJECT: Preliminary Site Investigation - Limited Sampling
LOCATION: Lot 1 DP 798111, North Bungendore

SURFACE LEVEL: --
EASTING: 722555
NORTHING: 6097676

PIT No: 2
PROJECT No: 88336.02
DATE: 31/5/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		TOPSOIL-moist, brown silty sand with rootlets										
	0.2	SILTY SAND-moist, light grey, fine to medium grained silty sand										
	0.3	GRAVELY SILTY SAND-medium dense, moist, orange brown gravely silty sand, fine to medium grained sand, fine rounded gravel up to 6mm in size										
	1			D	0.8							
	1.1	SILTY SAND-medium dense to dense, moist, orange brown, fine to medium grained silty sand, slight fine grained gravel										
	2											
	2.1	SANDSTONE-extremely low strength, extremely weathered, light grey and yellow brown sandstone										
		-from 2.3m, very low strength, highly weathered		D	2.3							
	2.5	Pit discontinued at 2.5m -limit of investigation										
	3											
	4											

RIG: Kubota KX057-4 mini-excavator fitted with a 30mm wide bucket

LOGGED: AZR

SURVEY DATUM: MGA94

WATER OBSERVATIONS:

REMARKS:

- ☐ 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: Queanbeyan-Palerang Regional Council
PROJECT: Preliminary Site Investigation - Limited Sampling
LOCATION: Lot 1 DP 798111, North Bungendore

SURFACE LEVEL: --
EASTING: 722883
NORTHING: 6097618

PIT No: 3
PROJECT No: 88336.02
DATE: 31/5/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)
				Type	Depth	Sample	Results & Comments		
	0.15	TOPSOIL-moist, grey brown silt with rootlets		D	0.05				
	0.4	SILTY SAND-medium dense, moist, grey brown, fine to medium grained silty sand, some gravelly seams		D	0.2				
	0.4	SANDY CLAY-very stiff, hard, dry to moist, high plasticity sandy clay		D	0.5				
				B	0.6				
				D	0.7				
1	1.0	SHALE-low to medium strength, highly to moderately weathered, brown and yellow brown shale						1	
	1.6	-from 1.4m, high strength, moderately weathered, fine to medium grained		D	1.5				
	1.6	Pit discontinued at 1.6m -refusal							
2								2	
3								3	
4								4	

RIG: Kubota KX057-4 mini-excavator fitted with a 30mm wide bucket

LOGGED: AZR

SURVEY DATUM: MGA94

WATER OBSERVATIONS:

REMARKS:

☐ 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: Queanbeyan-Palerang Regional Council
PROJECT: Preliminary Site Investigation - Limited Sampling
LOCATION: Lot 1 DP 798111, North Bungendore

SURFACE LEVEL: --
EASTING: 722883
NORTHING: 6097534

PIT No: 4
PROJECT No: 88336.02
DATE: 31/5/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)
				Type	Depth	Sample	Results & Comments		
	0.2	TOPSOIL-moist, grey brown sandy silt with rootlets							
	0.4	CLAYEY SILT-stiff, moist, light yellow brown, low plasticity clayey silt							
	0.5	SILTY CLAY-very stiff, moist to dry, yellow brown and red brown, medium plasticity silty clay		D	0.5				
	0.6	-from 0.6m, hard, dry to moist							
1	1.5	SHALE-extremely low strength, extremely weathered, light yellow brown and grey shale		D	1.8				
2	1.9	-from 1.9m, low strength, highly weathered, highly fractured							
2.3	2.2	-from 2.2m, medium strength, moderately weathered							
	2.3	Pit discontinued at 2.3m -limit of investigation							
3									
4									

RIG: Kubota KX057-4 mini-excavator fitted with a 30mm wide bucket

LOGGED: AZR

SURVEY DATUM: MGA94

WATER OBSERVATIONS:

REMARKS:

☐ 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: Queanbeyan-Palerang Regional Council
PROJECT: Preliminary Site Investigation - Limited Sampling
LOCATION: Lot 1 DP 798111, North Bungendore

SURFACE LEVEL: --
EASTING: 723094
NORTHING: 6097650

PIT No: 5
PROJECT No: 88336.02
DATE: 31/5/2017
SHEET 1 OF 1

[illegible]

RIG: Kubota KX057-4 mini-excavator fitted with a 30mm wide bucket

LOGGED: AZR

SURVEY DATUM: MGA94

WATER OBSERVATIONS:

REMARKS:

- ☐ 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 _s	Water seep
E	Environmental sample	W _l	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test (s(50) (MPa)
		PL(D)	Point load diametral test (s(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



TEST PIT LOG

CLIENT: Queanbeyan-Palerang Regional Council
PROJECT: Preliminary Site Investigation - Limited Sampling
LOCATION: Lot 1 DP 798111, North Bungendore

SURFACE LEVEL: --
EASTING: 723023
NORTHING: 6097394

PIT No: 6
PROJECT No: 88336.02
DATE: 1/6/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		TOPSOIL-dry to moist, grey brown sandy silt with rootlets										
	0.3	SILT-moist to dry, grey brown and orange, low plasticity silt										
	0.5	SILTY GRAVEL-dry to moist, grey brown silty gravel, fine to coarse grained sub-angular quartz gravel up to 50mm in size										
	0.7	SILTY GRAVELLY CLAY-hard, dry to moist, yellow brown and grey, medium to high plasticity silty gravelly clay, quartz gravel up to ??										
	1											
	1.7	SILTY CLAY-very stiff, moist to dry, yellow brown, medium to high plasticity silty clay, some fine grained sand										
	2											
	2.6	Pit discontinued at 2.6m -limit of investigation										
	3											
	4											

RIG: Kubota KX057-4 mini-excavator fitted with a 30mm wide bucket

LOGGED: AZR

SURVEY DATUM: MGA94

WATER OBSERVATIONS:

REMARKS:

- ☐ 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: Queanbeyan-Palerang Regional Council
PROJECT: Preliminary Site Investigation - Limited Sampling
LOCATION: Lot 1 DP 798111, North Bungendore

SURFACE LEVEL: --
EASTING: 723189
NORTHING: 6097449

PIT No: 7
PROJECT No: 88336.02
DATE: 1/6/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.15	TOPSOIL-moist to dry, grey brown silty with rootlets		E	0.05		PID<1					
	0.3	SILT-moist to dry, light grey orange and brown, low plasticity silt		E	0.2		PID<1					
	0.7	CLAYEY SILT-dry to moist, red brown, low plasticity clayey silt, some fine grained sand		E	0.5		PID<1					
	1.0	SILTY CLAY-very stiff, moist to dry, red brown and light grey, medium to high plasticity silty clay		D	0.6							
	1.8			E	1.0		PID<1					
	2.0	GRAVEL-dense, dry to moist, light grey gravel, fine to coarse grained with cobbles up to 100mm in size, quartz sub-angular and angular		D	1.4							
	2.4			D	2.2							
	2.6	SANDY SHALE-very low strength, highly weathered, orange brown and light grey sandy shale										
	2.6	Pit discontinued at 2.6m -limit of investigation										
	3.0											
	4.0											

RIG: Kubota KX057-4 mini-excavator fitted with a 30mm wide bucket

LOGGED: AZR

SURVEY DATUM: MGA94

WATER OBSERVATIONS:

REMARKS:

- ☐ 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: Queanbeyan-Palerang Regional Council
PROJECT: Preliminary Site Investigation - Limited Sampling
LOCATION: Lot 1 DP 798111, North Bungendore

SURFACE LEVEL: --
EASTING: 723297
NORTHING: 6097554

PIT No: 8
PROJECT No: 88336.02
DATE: 31/5/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.2	TOPSOIL-moist, brown and red brown sandy silt with rootlets										
		CLAYEY SILT-stiff, dry to moist, red brown, low plasticity clayey silt										
	1			D	1.0							
	1.8											
2		CLAYEY SILTY GRAVEL-dense, moist to dry, light yellow and brown clayey silty gravel, fine grained up to 100mm in size		D	2.0							
	2.3											
		SANDSTONE-low to medium strength, highly to moderately weathered, orange brown and grey sandstone										
	2.6											
		Pit discontinued at 2.6m -slow progress										
	3											
	4											

RIG: Kubota KX057-4 mini-excavator fitted with a 30mm wide bucket

LOGGED: AZR

SURVEY DATUM: MGA94

WATER OBSERVATIONS:

REMARKS:

☐ 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: Queanbeyan-Palerang Regional Council
PROJECT: Preliminary Site Investigation - Limited Sampling
LOCATION: Lot 1 DP 798111, North Bungendore

SURFACE LEVEL: --
EASTING: 723456
NORTHING: 6097564

PIT No: 9
PROJECT No: 88336.02
DATE: 31/5/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)
				Type	Depth	Sample	Results & Comments		
	0.1	TOPSOIL-moist, light grey brown silt with rootlets							
	0.4	GRAVELLY SILT-very stiff, moist to dry, light grey gravelly silt, some silty gravel seams							
	0.7								
	0.8								
	0.9								
1	1.2	SILTY CLAY-hard, dry to moist, red brown, medium plasticity silty clay, slight gravel (alluvium)							
	1.6	SANDY SHALE-low strength, highly weathered, yellow brown and light grey sandy shale, highly fractured							
2	2.0	Pit discontinued at 2.0m -slow progress							
3									
4									

RIG: Kubota KX057-4 mini-excavator fitted with a 30mm wide bucket

LOGGED: AZR

SURVEY DATUM: MGA94

WATER OBSERVATIONS:

REMARKS:

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

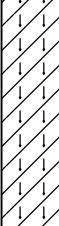
SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial 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: Queanbeyan-Palerang Regional Council
PROJECT: Preliminary Site Investigation - Limited Sampling
LOCATION: Lot 1 DP 798111, North Bungendore

SURFACE LEVEL: --
EASTING: 723619
NORTHING: 6097513

PIT No: 10
PROJECT No: 88336.02
DATE: 31/5/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.1	TOPSOIL-moist to dry, light grey and brown sandy silt with rootlets		E	0.05		PID<1					
		SILTY GRAVELLY SAND- very dense, moist to dry, light grey and brown silty gravelly sand, fine grained		E	0.2		PID<1					
	0.4	SILTY CLAY-hard, dry to moist, red brown and yellow brown, medium plasticity silty clay, slight fine grained sand		D	0.4							
				E	0.5		PID<1					
					0.8		pp=>400					
1	1.3	SANDY SHALE-extremely low strength, extremely weathered, light grey and yellow brown sandy shale										
		-from 1.6m, medium strength, moderately weathered		D	1.6							
2	2.0	Pit discontinued at 2.0m -limit of investigation										
3												
4												

RIG: Kubota KX057-4 mini-excavator fitted with a 30mm wide bucket

LOGGED: AZR

SURVEY DATUM: MGA94

WATER OBSERVATIONS:

REMARKS:

☐ 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	>	Water seep
E	Environmental sample	≡	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: Queanbeyan-Palerang Regional Council
PROJECT: Preliminary Site Investigation - Limited Sampling
LOCATION: Lot 1 DP 798111, North Bungendore

SURFACE LEVEL: --
EASTING: 723506
NORTHING: 6097395

PIT No: 11
PROJECT No: 88336.02
DATE: 1/6/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)
				Type	Depth	Sample	Results & Comments		
	0.1	TOPSOIL-moist to dry, grey and brown silt with rootlets							
	0.3	SANDY SILT-stiff, moist to dry, light grey and brown, low plasticity sandy silt							
		CLAYEY SILT-very stiff, dry to moist, light yellow brown and red brown, low plasticity clayey silt, some ironstone gravel, occasional quartz gravel							
		-from 0.6m, hard							
1	0.8			D	0.8				
	1.1	SILTY CLAY-hard, dry to moist, red brown and light grey, medium plasticity silty clay							
				D	1.6		pp=>400		
2	1.8	SILTY CLAY-very stiff, moist to dry, pink red brown and light grey, medium plasticity silty clay, occasional angular quartz gravel							
					2.0		pp = 240		
	2.5	Pit discontinued at 2.5m -limit of investigation							
3									
4									

RIG: Kubota KX057-4 mini-excavator fitted with a 30mm wide bucket

LOGGED: AZR

SURVEY DATUM: MGA94

WATER OBSERVATIONS:

REMARKS:

- ☐ 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: Queanbeyan-Palerang Regional Council
PROJECT: Preliminary Site Investigation - Limited Sampling
LOCATION: Lot 1 DP 798111, North Bungendore

SURFACE LEVEL: --
EASTING: 723538
NORTHING: 6097289

PIT No: 12
PROJECT No: 88336.02
DATE: 1/6/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)
				Type	Depth	Sample	Results & Comments		
	0.15	TOPSOIL-moist to dry, light grey and brown silt with rootlets		E	0.05		PID<1		
	0.3	SILT-soft to firm, moist, light grey, low plasticity silt		E	0.2		PID<1		
		SILTY CLAY-stiff to very stiff, moist to dry, light yellow brown, medium plasticity silty clay, some sub-rounded gravel		D	0.4				
				E	0.5		PID<1		
	0.9	CLAYEY SILT-very stiff, moist to dry, light yellow brown and orange brown, low plasticity clayey silt		E	1.0		PID<1		
	1.4	CLAY-stiff, moist, yellow and light grey, high plasticity clay			1.2		pp = 260 check depth		
					1.7		pp = 180 check depth		
	2.1	SILTY CLAY-very stiff, moist to dry, light grey and pink red brown, medium plasticity silty clay			2.1		pp = 230 check depth		
		-from 2.3m, rounded gravelly quartz							
	2.7	SANDY SHALE-low to medium strength, highly to moderately weathered, orange brown and light grey sandy shale							
3	3.0	Pit discontinued at 3.0m -limit of investigation							
4									

RIG: Kubota KX057-4 mini-excavator fitted with a 30mm wide bucket

LOGGED: AZR

SURVEY DATUM: MGA94

WATER OBSERVATIONS:

REMARKS:

☐ 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	>	Water seep
E	Environmental sample	≡	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: Queanbeyan-Palerang Regional Council
PROJECT: Preliminary Site Investigation - Limited Sampling
LOCATION: Lot 1 DP 798111, North Bungendore

SURFACE LEVEL: --
EASTING: 723425
NORTHING: 6097145

PIT No: 13
PROJECT No: 88336.02
DATE: 1/6/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.15	TOPSOIL-moist to dry, grey brown silt with rootlets		E	0.05		PID<1					
	0.3	SILT-firm to stiff, moist to dry, light grey and brown, low plasticity silt, fine grained sand		E	0.2		PID<1					
	0.6	SILT-very stiff, dry to moist, light yellow brown, low plasticity silt		E	0.5		PID<1					
	0.8	GRAVELLY SILT-very stiff, dry to moist, light grey gravelly silt, fine to medium grained ironstone gravel										
	1.1	SANDY SILT-very stiff, dry to moist, light yellow brown, low plasticity sandy silt		E	1.0		PID<1					
	1.4	SILTY CLAY-very stiff, moist to dry, light grey and orange brown, medium plasticity silty clay		D	1.2							
	2.2	CLAY-stiff, moist, yellow brown and light grey, high plasticity clay		E	1.5		PID<1					
	2.4	GRAVELLY SILTY CLAY-very stiff, moist to dry, orange brown and grey, medium plasticity gravelly silty clay (residual)										
	2.6	SANDY SHALE-low to medium strength, highly to moderately weathered, orange brown and grey brown sandy shale										
		Pit discontinued at 2.6m -limit of investigation										

RIG: Kubota KX057-4 mini-excavator fitted with a 30mm wide bucket

LOGGED: AZR

SURVEY DATUM: MGA94

WATER OBSERVATIONS:

REMARKS:

☐ 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: Queanbeyan-Palerang Regional Council
PROJECT: Preliminary Site Investigation - Limited Sampling
LOCATION: Lot 1 DP 798111, North Bungendore

SURFACE LEVEL: --
EASTING: 723615
NORTHING: 6097104

PIT No: 14
PROJECT No: 88336.02
DATE: 1/6/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)
				Type	Depth	Sample	Results & Comments		
	0.15	TOPSOIL-dry to moist, brown and grey silt with rootlets							5
	0.3	SANDY SILT-very stiff, moist to dry, light grey, low plasticity sandy silt							10
		SILTY CLAY-hard, dry to moist, red brown, high plasticity silty clay			0.5				15
				B	0.7				20
				D	0.9				
1	1.2	SHALE-extremely low strength, extremely weathered, orange brown and grey brown shale							
		-from 1.4m, medium strength moderately weathered							
	1.6	Pit discontinued at 1.6m -near refusal							
2									
3									
4									

RIG: Kubota KX057-4 mini-excavator fitted with a 30mm wide bucket

LOGGED: AZR

SURVEY DATUM: MGA94

WATER OBSERVATIONS:

REMARKS:

☐ 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: Queanbeyan-Palerang Regional Council
PROJECT: Preliminary Site Investigation - Limited Sampling
LOCATION: Lot 1 DP 798111, North Bungendore

SURFACE LEVEL: --
EASTING: 723733
NORTHING: 6097356

PIT No: 15
PROJECT No: 88336.02
DATE: 31/5/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.2	TOPSOIL-moist, brown silt with rootlets										
	0.7	SANDY SILTY GRAVEL-loose, moist to dry, brown and orange brown sandy silty gravel, fine grained sub-angular (colluvium)		D	0.6							
	1.4	SILTY CLAY-hard, dry to moist, red brown and grey, medium plasticity silty clay										
	1.4	SHALE-extremely low strength, extremely weathered, light grey and yellow brown shale		D	1.5							
		-from 1.6m, low strength, highly weathered, highly fractured										
		-from 1.9m, medium strength, moderately weathered										
	2.0	Pit discontinued at 2.0m -limit of investigation										

RIG: Kubota KX057-4 mini-excavator fitted with a 30mm wide bucket

LOGGED: AZR

SURVEY DATUM: MGA94

WATER OBSERVATIONS:

REMARKS:

- ☐ 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: Queanbeyan-Palerang Regional Council
PROJECT: Preliminary Site Investigation - Limited Sampling
LOCATION: Lot 1 DP 798111, North Bungendore

SURFACE LEVEL: --
EASTING: 723925
NORTHING: 6097412

PIT No: 16
PROJECT No: 88336.02
DATE: 31/5/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)
				Type	Depth	Sample	Results & Comments		
		TOPSOIL-moist to dry, light brown silt with rootlets							
	0.25	SILT-stiff to very stiff, dry to moist, light red brown, low plasticity silt, slight clay							
1	1.0	SHALE-low strength, highly weathered, light grey shale, highly fractured		D	0.9				
		-from 1.3m, extremely low strength, extremely weathered, orange brown		D	1.6				
		-from 1.7m, low to medium strength, high to moderately weathered seams							
2	2.0	Pit discontinued at 2.0m -limit of investigation							
3									
4									

RIG: Kubota KX057-4 mini-excavator fitted with a 30mm wide bucket

LOGGED: AZR

SURVEY DATUM: MGA94

WATER OBSERVATIONS:

REMARKS:

☐ 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: Queanbeyan-Palerang Regional Council
PROJECT: Preliminary Site Investigation - Limited Sampling
LOCATION: Lot 1 DP 798111, North Bungendore

SURFACE LEVEL: --
EASTING: 723969
NORTHING: 6097266

PIT No: 17
PROJECT No: 88336.02
DATE: 31/5/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)
				Type	Depth	Sample	Results & Comments		
		TOPSOIL-moist, light brown silt with rootlets		E	0.05		PID<1		
	0.25	SANDY SILT-stiff, moist to dry, light orange brown sandy silt		E	0.2		PID<1		
				E	0.5		PID<1		
				D	0.6				
	0.9	SILTY CLAY-very stiff, yellow brown and orange brown, high plasticity silty clay							
	1			D	1.4		pp = 280		
	2	-from 1.9m, gravelly (sub-rounded quartz gravel)							
	2.1	SANDSTONE-very low strength, highly weathered, orange brown sandstone, fine to medium grained							
	2.4	-from 2.3m, low strength, highly weathered							
		Pit discontinued at 2.4m -limit of investigation							
	3								
	4								

RIG: Kubota KX057-4 mini-excavator fitted with a 30mm wide bucket

LOGGED: AZR

SURVEY DATUM: MGA94

WATER OBSERVATIONS:

REMARKS:

- ☐ 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 _s	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W _s	Water seep
E	Environmental sample	W _l	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: Queanbeyan-Palerang Regional Council
PROJECT: Preliminary Site Investigation - Limited Sampling
LOCATION: Lot 1 DP 798111, North Bungendore

SURFACE LEVEL: --
EASTING: 723923
NORTHING: 6097035

PIT No: 18
PROJECT No: 88336.02
DATE: 1/6/2017
SHEET 1 OF 1

[illegible]

RIG: Kubota KX057-4 mini-excavator fitted with a 30mm wide bucket

LOGGED: AZR

SURVEY DATUM: MGA94

WATER OBSERVATIONS:

REMARKS:

- ☐ 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 (s(50) (MPa)
		PL(D)	Point load diametral test (s(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



TEST PIT LOG

CLIENT: Queanbeyan-Palerang Regional Council
PROJECT: Preliminary Site Investigation - Limited Sampling
LOCATION: Lot 1 DP 798111, North Bungendore

SURFACE LEVEL: --
EASTING: 724046
NORTHING: 6097148

PIT No: 19
PROJECT No: 88336.02
DATE: 1/6/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)
				Type	Depth	Sample	Results & Comments		
	0.3	TOPSOIL-moist, grey brown silt with rootlets		D	0.5				
		GRAVELLY SILT-stiff, moist, light orange brown, low plasticity gravelly silt, some sand, fine to ??, sub-rounded quartz gravel up to 50mm in size, some quartz cobbles							
	1.1	SANDY SHALE-extremely low strength, extremely weathered, orange brown and red brown sandy shale		D	1.3				
		-from 1.6m, high strength, moderately to slightly weathered, grey brown and some orange brown							
	1.8	Pit discontinued at 1.8m -refusal							
	2								
	3								
	4								

RIG: Kubota KX057-4 mini-excavator fitted with a 30mm wide bucket

LOGGED: AZR

SURVEY DATUM: MGA94

WATER OBSERVATIONS:

REMARKS:

☐ 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	>	Water seep
E	Environmental sample	≡	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: Queanbeyan-Palerang Regional Council
PROJECT: Preliminary Site Investigation - Limited Sampling
LOCATION: Lot 1 DP 798111, North Bungendore

SURFACE LEVEL: --
EASTING: 724148
NORTHING: 6097282

PIT No: 20
PROJECT No: 88336.02
DATE: 1/6/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)
				Type	Depth	Sample	Results & Comments		
	0.3	TOPSOIL-moist to dry, grey brown sandy silt with rootlets							
	0.7	SANDY SILT-hard, dry to moist, light red and brown, low plasticity sandy silt, fine grained sand							
	0.9	SILTY GRAVEL-medium dense, dry to moist, light grey silty gravel, fine grained, ironstone gravel							
	1.8	SILTY CLAY-very stiff, moist to dry, yellow and brown, high plasticity silty clay		D	1.3				
	2.2	SHALE-medium strength, moderately weathered, grey brown and orange brown shale, highly fractured		D	2.0				
	2.2	Pit discontinued at 2.2m -limit of investigation							

RIG: Kubota KX057-4 mini-excavator fitted with a 30mm wide bucket

LOGGED: AZR

SURVEY DATUM: MGA94

WATER OBSERVATIONS:

REMARKS:

- ☐ 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 (s(50) (MPa)
		PL(D)	Point load diametral test (s(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



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TEST PIT LOG

CLIENT: Queanbeyan-Palerang Regional Council
PROJECT: Preliminary Site Investigation - Limited Sampling
LOCATION: Lot 1 DP 798111, North Bungendore

SURFACE LEVEL: --
EASTING: 724108
NORTHING: 6097436

PIT No: 21
PROJECT No: 88336.02
DATE: 1/6/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.15	TOPSOIL-dry to moist, grey brown silt with rootlets		E	0.05		PID<1					
		SANDY SILT-stiff, moist to dry, light grey sandy silt, fine grained sand		E	0.2		PID<1					
	0.4	GRAVELLY SILT-very stiff to hard, dry to moist, orange brown gravelly silt, ironstone gravel		E	0.5		PID<1					
		-from 0.7m, light yellow and brown		D	0.6							
1	1.0	SILTY CLAY-very stiff, moist to dry, yellow and light grey, high plasticity silty clay		D	1.5		pp = 140-180					
2	2.2	SHALE-low strength, highly weathered, yellow orange and brown shale, highly fractured										
	2.4	Pit discontinued at 2.4m -limit of investigation										
3												
4												

RIG: Kubota KX057-4 mini-excavator fitted with a 30mm wide bucket

LOGGED: AZR

SURVEY DATUM: MGA94

WATER OBSERVATIONS:

REMARKS:

- ☐ 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 _s	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W _s	Water seep
E	Environmental sample	W _l	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: Queanbeyan-Palerang Regional Council
PROJECT: Preliminary Site Investigation - Limited Sampling
LOCATION: Lot 1 DP 798111, North Bungendore

SURFACE LEVEL: --
EASTING: 724281
NORTHING: 6097325

PIT No: 22
PROJECT No: 88336.02
DATE: 1/6/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		TOPSOIL-dry to moist, grey brown sandy silt with rootlets										
	0.2	SANDY SILT-firm to stiff, moist to dry, light grey and brown sandy silt										
	0.3	CLAY-stiff, moist, yellow brown, high plasticity clay, some silt (alluvial)										
				B	0.4							
					0.6							
	1	-from 1.2m, stiff		D	1.0							
	1.6	SILTY CLAY-very stiff, moist to dry, light orange and brown low to medium plasticity silty clay (residual)		D	1.7		pp = 370					
	1.9	SANDY SHALE-low to medium strength, highly to moderately weathered, light grey and orange brown sandy shale, highly fractured										
	2.1	Pit discontinued at 2.1m -limit of investigation										
	3											
	4											

RIG: Kubota KX057-4 mini-excavator fitted with a 30mm wide bucket

LOGGED: AZR

SURVEY DATUM: MGA94

WATER OBSERVATIONS:

REMARKS:

☐ 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: Queanbeyan-Palerang Regional Council
PROJECT: Preliminary Site Investigation - Limited Sampling
LOCATION: Lot 1 DP 798111, North Bungendore

SURFACE LEVEL: --
EASTING: 724523
NORTHING: 6097375

PIT No: 23
PROJECT No: 88336.02
DATE: 1/6/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		TOPSOIL-moist to dry, grey and brown silt with rootlets		E	0.05		PID<1					
	0.25			E	0.2		PID<1					
	0.35	SILT-firm to stiff, moist, red brown, low plasticity silt, some sand										
		GRAVELLY SILTY CLAY-hard, dry to moist, red brown, medium plasticity gravelly silty clay, quartz gravels, slight sand (alluvial)		E	0.5		PID<1					
				D	0.6							
1	1.0	SANDSTONE-medium strength, moderately weathered, light yellow brown and grey sandstone, highly fractured						1				
				D	1.3							
	1.6	Pit discontinued at 1.6m -near refusal										
2								2				
3								3				
4								4				

RIG: Kubota KX057-4 mini-excavator fitted with a 30mm wide bucket

LOGGED: AZR

SURVEY DATUM: MGA94

WATER OBSERVATIONS:

REMARKS:

☐ 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: Queanbeyan-Palerang Regional Council
PROJECT: Preliminary Site Investigation - Limited Sampling
LOCATION: Lot 1 DP 798111, North Bungendore

SURFACE LEVEL: --
EASTING: 722393
NORTHING: 6097512

PIT No: 24
PROJECT No: 88336.02
DATE: 1/6/2017
SHEET 1 OF 1

[illegible]

RIG: Kubota KX057-4 mini-excavator fitted with a 30mm wide bucket

LOGGED: AZR

SURVEY DATUM: MGA94

WATER OBSERVATIONS:

REMARKS:

- ☐ 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 (s(50) (MPa)
		PL(D)	Point load diametral test (s(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



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TEST PIT LOG

CLIENT: Queanbeyan-Palerang Regional Council
PROJECT: Preliminary Site Investigation - Limited Sampling
LOCATION: Lot 1 DP 798111, North Bungendore

SURFACE LEVEL: --
EASTING: 722573
NORTHING: 6097487

PIT No: 25
PROJECT No: 88336.02
DATE: 1/6/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.1	FILLING-dry to moist, light grey silty sand		E	0.05		PID<1					
		SILTY GRAVELLY SAND-moist, brown silty gravelly sand, fine to coarse grained		E	0.2		PID<1					
	0.3	SILTY SAND-moist, red brown and brown silty sand, fine to medium grained		E	0.5		PID<1					
				E	1.0		PID<1					
	1.2	SILTY SANDY GRAVEL-dense, moist, yellow brown silty sandy gravel, fine to medium grained, rounded gravel										
	2.1	SILTY SAND-medium dense, moist, light grey and yellow brown silty sand, fine grained										
	2.6	Pit discontinued at 2.6m -limit of investigation										
	3											
	4											

RIG: Kubota KX057-4 mini-excavator fitted with a 30mm wide bucket

LOGGED: AZR

SURVEY DATUM: MGA94

WATER OBSERVATIONS:

REMARKS:

☐ 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: Queanbeyan-Palerang Regional Council
PROJECT: Preliminary Site Investigation - Limited Sampling
LOCATION: Lot 1 DP 798111, North Bungendore

SURFACE LEVEL: --
EASTING: 722660
NORTHING: 6097470

PIT No: 26
PROJECT No: 88336.02
DATE: 1/6/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.1	TOPSOIL-moist, grey brown silty sand with rootlets		E	0.05		PID<1					
		GRAVEL-very dense, moist, light yellow brown, gravel, fine to coarse grained, rounded, some silt and sand		E	0.2		PID<1					
				D	0.4							
				E	0.5		PID<1					
1	1.1	SILTY CLAY-firm to stiff, wet to moist, light grey and orange brown, low to medium plasticity silty clay, some soft, wet seams		E	1.0		PID<1	1				
2				D	2.0			2				
3	3.0	Pit discontinued at 3.0m -limit of investigation						3				
4								4				

RIG: Kubota KX057-4 mini-excavator fitted with a 30mm wide bucket

LOGGED: AZR

SURVEY DATUM: MGA94

WATER OBSERVATIONS:

REMARKS:

☐ 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: Queanbeyan-Palerang Regional Council
PROJECT: Preliminary Site Investigation - Limited Sampling
LOCATION: Lot 1 DP 798111, North Bungendore

SURFACE LEVEL: --
EASTING: 722642
NORTHING: 6097553

PIT No: 27
PROJECT No: 88336.02
DATE: 1/6/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		TOPSOIL-moist to wet, grey brown silty sand with rootlets		E	0.05		PID<1					
	0.25	SILTY GRAVELLY SAND-medium dense, moist, red brown silty gravelly sand, fine to coarse grained, round gravel		E	0.2		PID<1					
	0.4	SILTY SAND-dense, moist, orange brown silty sand, fine grained, some rounded gravel		E	0.5		PID<1					
	1			E	1.0		PID<1					
	1.5	SILTY SAND-medium dense, moist, light grey and orange brown silty sand		D	1.7							
	2											
	3	-from 2.7m, dense, yellow brown										
	3.3	Pit discontinued at 3.3m -limit of investigation										
	4											

RIG: Kubota KX057-4 mini-excavator fitted with a 30mm wide bucket

LOGGED: AZR

SURVEY DATUM: MGA94

WATER OBSERVATIONS:

REMARKS:

☐ 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: Queanbeyan-Palerang Regional Council
PROJECT: Preliminary Site Investigation - Limited Sampling
LOCATION: Lot 1 DP 798111, North Bungendore

SURFACE LEVEL: --
EASTING: 722706
NORTHING: 6097519

PIT No: 28
PROJECT No: 88336.02
DATE: 31/5/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)
				Type	Depth	Sample	Results & Comments		
	0.15	TOPSOIL-moist, brown silty sand with rootlets		E	0.05		PID<1		
		SILTY SAND-moist, light yellow brown silty sand, fine to medium grained		E	0.2		PID<1		
	0.5	SANDY GRAVEL-very dense, moist, light yellow brown sandy gravel, fine to medium grained		D	0.4				
				E	0.5		PID<1		
				B	0.7				
1	1.1	SILTY CLAY-stiff, moist, yellow brown and light grey, low to medium plasticity silty clay		D	1.2				
				D	1.5				
2	1.9	SAND-medium dense, moist, light orange and brown sand, fine to medium grained, some silt							
3	2.9	SILT-stiff, moist, light grey, low plasticity silt, slight sand and clayey seams							
	3.1	Pit discontinued at 3.1m -limit of investigation							
4									

RIG: Kubota KX057-4 mini-excavator fitted with a 30mm wide bucket

LOGGED: AZR

SURVEY DATUM: MGA94

WATER OBSERVATIONS:

REMARKS:

☐ 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: Queanbeyan-Palerang Regional Council
PROJECT: Preliminary Site Investigation - Limited Sampling
LOCATION: Lot 1 DP 798111, North Bungendore

SURFACE LEVEL: --
EASTING: 722503
NORTHING: 6097772

PIT No: 29
PROJECT No: 88336.02
DATE: 31/5/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.15	TOPSOIL-moist, brown silty sand with rootlets		E	0.05		PID<1					
		SILTY SAND-loose, moist, light grey brown silty sand, fine to medium grained		E	0.2		PID<1					
	0.4	SILTY GRAVELLY SAND-medium dense, moist to wet, orange brown silty gravelly sand, fine to coarse grained, rounded gravel up to 60mm in size		E	0.5		PID<1					
				D	0.6							
1	1.0	SILTY GRAVELLY SAND-medium dense, moist, light yellow brown silty gravelly sand, fine gravel up to 10mm in size		D	1.3		PID<1					
		-from 1.4m, medium dense to dense, orange brown										
2	2.7	SANDY SILTSTONE-extremely low strength, extremely weathered, light grey and some orange brown sandy siltstone, fine grained sand										
3	3.0	Pit discontinued at 3.0m -limit of investigation										
4												

RIG: Kubota KX057-4 mini-excavator fitted with a 30mm wide bucket

LOGGED: AZR

SURVEY DATUM: MGA94

WATER OBSERVATIONS:

REMARKS:

☐ 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: Queanbeyan-Palerang Regional Council
PROJECT: Preliminary Site Investigation - Limited Sampling
LOCATION: Lot 1 DP 798111, North Bungendore

SURFACE LEVEL: --
EASTING: 722739
NORTHING: 6097745

PIT No: 30
PROJECT No: 88336.02
DATE: 31/5/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.15	TOPSOIL-moist, brown silty sand with rootlets		E	0.05							
	0.3	SILTY SAND-moist, grey brown silty sand, fine to medium grained		E	0.2							
	0.6	SILTY GRAVELLY SAND-moist, red brown silty gravelly sand, fine to coarse grained, rounded gravel up to 6mm in size		E	0.5							
	1.1	SILTY SANDY GRAVEL-medium dense to dense, moist to wet, red brown silty sandy gravel, fine to medium grained, rounded		D	0.7							
	1.8	SILTY CLAY-very stiff, moist, light grey and yellow brown, medium plasticity silty clay		D	1.5							
	2.6	CLAY-stiff, moist, light grey and yellow brown, high plasticity clay		D	1.9							
	3.5	SILTY GRAVELLY SAND-dense, moist to wet, light yellow brown and grey silty gravelly sand, fine to coarse grained										
	3.7	Pit discontinued at 3.7m -limit of investigation										

RIG: Kubota KX057-4 mini-excavator fitted with a 30mm wide bucket

LOGGED: AZR

SURVEY DATUM: MGA94

WATER OBSERVATIONS:

REMARKS:

☐ 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
		PLD	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: Queanbeyan-Palerang Regional Council
PROJECT: Preliminary Site Investigation - Limited Sampling
LOCATION: Lot 1 DP 798111, North Bungendore

SURFACE LEVEL: --
EASTING: 722838
NORTHING: 6097696

PIT No: 31
PROJECT No: 88336.02
DATE: 31/5/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		TOPSOIL FILLING-moist, light grey silty sand with rootlets		E	0.05		PID<1					
	0.25	FILLING-stiff, moist, grey brown silty sandy clay		E	0.2		PID<1					
	0.4	FILLING-generally comprising very stiff, brown sandy gravelly clay with some silt		E	0.5		PID<1					
1	1.0	SILTY GRAVELLY SAND-dense, dry to moist, light grey silty gravelly sand, lightly cemented -rootlets to 1.1m		E	1.0		PID<1	1				
	1.4	SANDY GRAVELLY CLAY-very stiff, moist to dry, grey brown, high plasticity sand gravelly clay		D	1.2							
				E	1.5		PID<1					
2				D	1.8							
	2.3	SILTSTONE-extremely low strength, extremely weathered, light yellow brown siltstone, some low to medium strength high to moderately weathered seams										
3												
	3.5	Pit discontinued at 3.5m -limit of investigation										
4												

RIG: Kubota KX057-4 mini-excavator fitted with a 30mm wide bucket

LOGGED: AZR

SURVEY DATUM: MGA94

WATER OBSERVATIONS:

REMARKS:

☐ 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: Queanbeyan-Palerang Regional Council
PROJECT: Preliminary Site Investigation - Limited Sampling
LOCATION: Lot 1 DP 798111, North Bungendore

SURFACE LEVEL: --
EASTING: 722862
NORTHING: 6097420

PIT No: 32
PROJECT No: 88336.02
DATE: 31/5/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		TOPSOIL FILLING-moist, grey brown sandy silt with rootlets		E	0.05		PID<1					
				E	0.2		PID<1					
	0.6			E	0.5		PID<1					
		FILLING-generally comprising moist to dry, grey brown silty sandy gravel filling, siltstone gravel										
1				E	1.0		PID<1	1				
	1.1	SANDY SILT-moist, light grey brown sandy silt, trace rootlets (remnant topsoil)										
	1.3	SANDY SILT-stiff, moist, light grey and orange brown sandy silt, fine grained sand		E	1.5		PID<1					
	1.8											
2		GRAVELLY SILTY CLAY-very stiff, moist to dry, orange brown, medium plasticity gravelly silty clay, siltstone gravel		D	2.0			2				
	2.5											
		SILTSTONE-medium strength, moderately weathered, light grey and orange brown siltstone										
	2.8											
3		Pit discontinued at 2.8m -limit of investigation						3				
4								4				

RIG: Kubota KX057-4 mini-excavator fitted with a 30mm wide bucket

LOGGED: AZR

SURVEY DATUM: MGA94

WATER OBSERVATIONS:

REMARKS:

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

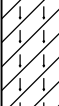
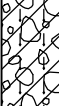
SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	>	Water seep
E	Environmental sample	≡	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial 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: Queanbeyan-Palerang Regional Council
PROJECT: Preliminary Site Investigation - Limited Sampling
LOCATION: Lot 1 DP 798111, North Bungendore

SURFACE LEVEL: --
EASTING: 722336
NORTHING: 6097426

PIT No: 33
PROJECT No: 88336.02
DATE: 31/5/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
		TOPSOIL FILLING-moist, light grey sandy silt with rootlets		E	0.05		PID<1					
	0.3	FILLING*-generally comprising moist to dry, light orange silty sandy gravel		E	0.2		PID<1					
	0.6	SILTY CLAY-stiff, moist, light yellow brown and grey, medium plasticity silty clay, some fine grained quartz gravel		E	0.5		PID<1					
	1			E	1.0		PID<1					
				E	1.5		PID<1					
2	2.0	CLAYEY SILT-firm, wet, light grey and orange brown, low plasticity clayey silt, some ironstone gravel										
				D	2.3		pp = 70					
	2.7	GRAVELLY SILTY CLAY-very stiff, moist to dry, orange brown and light grey, medium plasticity gravelly silty clay										
3												
4	4.1	Pit discontinued at 4.1m -limit of investigation										

RIG: Kubota KX057-4 mini-excavator fitted with a 30mm wide bucket

LOGGED: AZR

SURVEY DATUM: MGA94

WATER OBSERVATIONS:

REMARKS:

☐ 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: Queanbeyan-Palerang Regional Council
PROJECT: Preliminary Site Investigation - Limited Sampling
LOCATION: Lot 1 DP 798111, North Bungendore

SURFACE LEVEL: --
EASTING: 723772
NORTHING: 6097134

PIT No: 34
PROJECT No: 88336.02
DATE: 1/6/2017
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per 150mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.1	TOPSOIL FILLING-generally comprising moist to dry, light grey sandy gravelly silt with rootlets		E	0.05		PID<1					
		FILLING-generally comprising moist, brown, medium plasticity silty gravelly clay		E	0.2		PID<1					
				E	0.5		PID<1					
	0.6	SANDY SILT-hard, dry to moist, light grey sandy silt, trace rootlets (remnant topsoil)										
	0.8	SILTY GRAVELLY CLAY-hard, dry to moist, yellow brown, medium plasticity silty gravelly clay, ironstone gravel										
1	1.0	SILT-moist to dry, light grey, low plasticity silt		E	1.0		PID<1	1				
					1.2		PP=>400					
	1.4	SILTY CLAY-very stiff, moist to dry, light yellow orange and brown, medium plasticity silty clay, fine grained sand, some rounded fine grained gravel										
2				D	2.0			2				
	2.2	SILTY GRAVELLY CLAY-stiff, moist, grey brown and orange grey, medium plasticity silty gravelly clay, ironstone gravel			2.3		pp = 120					
3	3.0	Pit discontinued at 3.0m -limit of investigation						3				
4								4				

RIG: Kubota KX057-4 mini-excavator fitted with a 30mm wide bucket

LOGGED: AZR

SURVEY DATUM: MGA94

WATER OBSERVATIONS:

REMARKS:

- ☐ 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 _s	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W _s	Water seep
E	Environmental sample	W _l	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: Queanbeyan-Palerang Regional Council
PROJECT: Preliminary Site Investigation - Limited Sampling
LOCATION: Lot 1 DP 798111, North Bungendore

SURFACE LEVEL: --
EASTING: 722468
NORTHING: 6097516

PIT No: 35
PROJECT No: 88336.02
DATE: 1/6/2017
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-moist, brown silty sand with rootlets		E	0.05		PID<1					
	0.3	SILTY SAND-loose, moist, red brown silty sand, fine grained		E	0.2		PID = 3					
	0.45	SILTY SANDY GRAVEL-dense, moist, light grey and red brown silty sandy gravel, fine to medium grained, rounded gravel		E	0.5		PID<1					
	1.0	SILTY SAND-dense, dry to moist, light grey and orange brown silty sand, fine to medium grained		E	1.0		PID<1					
	1.1	Pit discontinued at 1.1m -limit of investigation										
	2											
	3											
	4											

RIG: Kubota KX057-4 mini-excavator fitted with a 30mm wide bucket

LOGGED: AZR

SURVEY DATUM: MGA94

WATER OBSERVATIONS:

REMARKS:

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

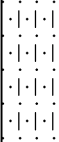
SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	>	Water seep
E	Environmental sample	≡	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial 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: Queanbeyan-Palerang Regional Council
PROJECT: Preliminary Site Investigation - Limited Sampling
LOCATION: Lot 1 DP 798111, North Bungendore

SURFACE LEVEL: --
EASTING: 722433
NORTHING: 6097493

PIT No: 36
PROJECT No: 88336.02
DATE: 1/6/2017
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-moist, light grey brown silty sand with rootlets		E	0.05		PID<1					
		SILTY SAND-loose, light grey brown silty sand, fine to medium grained		E	0.2		PID<1					
	0.6			E	0.5		PID<1					
		SILTY SANDY GRAVEL-dense, moist, red brown silty sandy gravel, rounded quartz gravel										
	1.1			E	1.0		PID<1					
	1.1	Pit discontinued at 1.1m -limit of investigation										
	2											
	3											
	4											

RIG: Kubota KX057-4 mini-excavator fitted with a 30mm wide bucket

LOGGED: AZR

SURVEY DATUM: MGA94

WATER OBSERVATIONS:

REMARKS:

☐ 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: Queanbeyan-Palerang Regional Council
PROJECT: Preliminary Site Investigation - Limited Sampling
LOCATION: Lot 1 DP 798111, North Bungendore

SURFACE LEVEL: --
EASTING: 722494
NORTHING: 6097549

PIT No: 37
PROJECT No: 88336.02
DATE: 1/6/2017
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-moist, brown silty sand with rootlets		E	0.05		PID<1					
		SILTY SAND-medium dense, moist, light grey brown silty sand		E	0.2		PID<1					
	0.4	SILTY SANDY GRAVEL-dense, moist to dry, red brown silty sandy gravel, fine to coarse grained, rounded quartz gravel, silty sand seams		E	0.5		PID<1					
	0.8	SILTY GRAVELLY SAND-dense, dry to moist, light yellow brown silty gravelly sand, fine grained, coarse rounded quartz gravel up to 50mm in size		E	1.0		PID<1					
1	1.1	Pit discontinued at 1.1m -limit of investigation										
2												
3												
4												

RIG: Kubota KX057-4 mini-excavator fitted with a 30mm wide bucket

LOGGED: AZR

SURVEY DATUM: MGA94

WATER OBSERVATIONS:

REMARKS:

☐ 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: Queanbeyan-Palerang Regional Council
PROJECT: Preliminary Site Investigation - Limited Sampling
LOCATION: Lot 1 DP 798111, North Bungendore

SURFACE LEVEL: --
EASTING: 722485
NORTHING: 6097492

PIT No: 38
PROJECT No: 88336.02
DATE: 1/6/2017
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-moist, grey brown silty sand with roots and rootlets		E	0.05		PID<1					
		GRAVELLY SILTY SAND-medium dense, moist, red brown gravelly silty sand, fine grained, rounded gravel		E	0.2		PID<1					
	0.45	SILTY GRAVELLY SAND/SANDY GRAVEL-dense, dry to moist, light yellow brown silty gravelly sand/sandy gravel, fine to coarse grained, rounded gravel		E	0.5		PID<1					
1	1.1	Pit discontinued at 1.1m -limit of investigation		E	1.0		PID = 4	-1				
2								-2				
3								-3				
4								-4				

RIG: Kubota KX057-4 mini-excavator fitted with a 30mm wide bucket

LOGGED: AZR

SURVEY DATUM: MGA94

WATER OBSERVATIONS:

REMARKS:

☐ 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: Queanbeyan-Palerang Regional Council
PROJECT: Preliminary Site Investigation - Limited Sampling
LOCATION: Lot 1 DP 798111, North Bungendore

SURFACE LEVEL: --
EASTING: 722490
NORTHING: 6097498

PIT No: 39
PROJECT No: 88336.02
DATE: 1/6/2017
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-moist, grey brown silty sand with roots and rootlets		E	0.05		PID = 6.5					
		SILTY SAND-dense, dry to moist, light red brown silty sand, fine to medium grained		E	0.2		PID = 1					
	0.45	SILTY GRAVELLY SAND-dense, dry to moist, yellow brown silty gravelly sand, fine to coarse grained, rounded quartz gravel		E	0.5		PID = 1					
	1			E	1.0		PID<1					
	1.1	Pit discontinued at 1.1m -limit of investigation										
	2											
	3											
	4											

RIG: Kubota KX057-4 mini-excavator fitted with a 30mm wide bucket

LOGGED: AZR

SURVEY DATUM: MGA94

WATER OBSERVATIONS:

REMARKS:

- ☐ 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: Queanbeyan-Palerang Regional Council
PROJECT: Preliminary Site Investigation - Limited Sampling
LOCATION: Lot 1 DP 798111, North Bungendore

SURFACE LEVEL: --
EASTING: 722481
NORTHING: 6097490

PIT No: 40
PROJECT No: 88336.02
DATE: 1/6/2017
SHEET 1 OF 1

[illegible]

RIG: Kubota KX057-4 mini-excavator fitted with a 30mm wide bucket

LOGGED: AZR

SURVEY DATUM: MGA94

WATER OBSERVATIONS:

REMARKS:

- ☐ 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)



Douglas Partners
Geotechnics | Environment | Groundwater

Inputs
Select contaminant from list below
Cu
Below needed to calculate fresh and aged ACLs
Enter cation exchange capacity (silver thiourea method) (values from 0 to 100 cmolc/kg dwt)
3.5
Enter soil pH (calcium chloride method) (values from 1 to 14)
5.4
Enter organic carbon content (%OC) (values from 0 to 50%)
1
Below needed to calculate fresh and aged ABCs
Measured background concentration (mg/kg). Leave blank if no measured value
or for fresh ABCs only
Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration
or for aged ABCs only
Enter State (or closest State)
NSW
Enter traffic volume (high or low)
low

Outputs		
Land use	Cu soil-specific EILs	
	(mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	#NUM!	40
Urban residential and open public spaces	#NUM!	80
Commercial and industrial	#NUM!	110

Inputs
Select contaminant from list below
As
Below needed to calculate fresh and aged ACLs
Below needed to calculate fresh and aged ABCs
or for fresh ABCs only
or for aged ABCs only

Outputs		
Land use	Arsenic generic EILs	
	(mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	20	40
Urban residential and open public spaces	50	100
Commercial and industrial	80	160

Inputs
Select contaminant from list below
DDT
Below needed to calculate fresh and aged ACLs
Below needed to calculate fresh and aged ABCs
or for fresh ABCs only
or for aged ABCs only

Outputs		
Land use	DDT generic EILs	
	(mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	3	3
Urban residential and open public spaces	180	180
Commercial and industrial	640	640

Inputs
Select contaminant from list below
Naphthalene
Below needed to calculate fresh and aged ACLs
Below needed to calculate fresh and aged ABCs
or for fresh ABCs only
or for aged ABCs only

Outputs		
Land use	Naphthalene generic EILs	
	(mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	10	10
Urban residential and open public spaces	170	170
Commercial and industrial	370	370

Inputs
Select contaminant from list below
Pb
Below needed to calculate fresh and aged ACLs
Below needed to calculate fresh and aged ABCs
or for fresh ABCs only
or for aged ABCs only

Outputs		
Land use	Lead generic EILs	
	(mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	110	470
Urban residential and open public spaces	270	1100
Commercial and industrial	440	1800

Inputs
Select contaminant from list below
Ni
Below needed to calculate fresh and aged ACLs
Enter cation exchange capacity (silver thiourea method) (values from 0 to 100 cmolc/kg dwt)
3.5
Below needed to calculate fresh and aged ABCs
Measured background concentration (mg/kg). Leave blank if no measured value
or for fresh ABCs only
Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration
or for aged ABCs only
Enter State (or closest State)
NSW
Enter traffic volume (high or low)
low

Outputs		
Land use	Ni soil-specific EILs	
	(mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	#NUM!	7
Urban residential and open public spaces	#NUM!	20
Commercial and industrial	#NUM!	30

Inputs
Select contaminant from list below
Cr_III
Below needed to calculate fresh and aged ACLs
Enter % clay (values from 0 to 100%)
15.7
Below needed to calculate fresh and aged ABCs
Measured background concentration (mg/kg). Leave blank if no measured value
or for fresh ABCs only
Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration
or for aged ABCs only
Enter State (or closest State)
NSW
Enter traffic volume (high or low)
low

Outputs		
Land use	Cr III soil-specific EILs	
	(mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	#NUM!	160
Urban residential and open public spaces	#NUM!	470
Commercial and industrial	#NUM!	780

Inputs
Select contaminant from list below
Zn
Below needed to calculate fresh and aged ACLs
Enter cation exchange capacity (silver thiourea method) (values from 0 to 100 cmolc/kg dwt)
3.5
Enter soil pH (calcium chloride method) (values from 1 to 14)
5.4
Below needed to calculate fresh and aged ABCs
Measured background concentration (mg/kg). Leave blank if no measured value
or for fresh ABCs only
Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration
or for aged ABCs only
Enter State (or closest State)
NSW
Enter traffic volume (high or low)
low

Outputs		
Land use	Zn soil-specific EILs	
	(mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	#NUM!	110
Urban residential and open public spaces	#NUM!	210
Commercial and industrial	#NUM!	280

TABLE 9
SUMMARY OF LABORATORY TEST RESULTS - INORGANICS (mg/kg)

Sample ID	Depth (m)	Sample Date	Material Type	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
Pit 1	0.05	31/05/2017	Silty Sand (Topsoil)	<PQL	<PQL	4	2	4	<PQL	1	5
Pit 3	0.05	31/05/2017	Silt (Topsoil)	<PQL	<PQL	14	5	8	<PQL	5	12
Pit 7	0.05	1/06/2017	Silt (Topsoil)	<PQL	<PQL	14	5	8	<PQL	6	8
Pit 10	0.05	31/05/2017	Sandy Silt (Topsoil)	<PQL	<PQL	24	4	13	<PQL	6	12
Pit 12	0.05	1/06/2017	Silt (Topsoil)	<PQL	<PQL	28	4	10	<PQL	3	7
Pit 13	0.05	1/06/2017	Silt (Topsoil)	<PQL	<PQL	21	5	10	<PQL	4	8
Pit 17	0.05	31/05/2017	Silt (Topsoil)	<PQL	<PQL	17	6	10	<PQL	5	8
Pit 18	0.05	1/06/2017	Silt (Topsoil)	<PQL	<PQL	18	4	11	<PQL	4	12
Pit 21	0.05	1/06/2017	Silt (Topsoil)	<PQL	<PQL	28	6	12	<PQL	5	13
Pit 23	0.05	1/06/2017	Silt (Topsoil)	<PQL	<PQL	11	5	11	<PQL	4	12
R4	0.05	1/06/2017	Silt (Topsoil)	<PQL	<PQL	13	6	11	<PQL	5	13
Pit 24	0.05	1/06/2017	Silty Sand (Topsoil)	<PQL	<PQL	3	1	4	<PQL	1	5
Pit 25	0.05	1/06/2017	Silty Sand (Filling)	6	<PQL	13	34	7	<PQL	22	43
Pit 26	0.05	1/06/2017	Silty Sand (Topsoil)	<PQL	<PQL	5	2	3	<PQL	2	5
Pit 27	0.05	1/06/2017	Silty Sand (Topsoil)	<PQL	<PQL	5	2	3	<PQL	2	5
Pit 28	0.05	31/05/2017	Silty Sand (Topsoil)	<PQL	<PQL	5	2	3	<PQL	2	4
Pit 29	0.05	31/05/2017	Silty Sand (Topsoil)	<PQL	<PQL	6	1	4	<PQL	2	5
Pit 30	0.05	31/05/2017	Silty Sand (Topsoil)	<PQL	<PQL	5	2	4	<PQL	2	6
Pit 31	0.5	31/05/2017	Sandy Gravelly Clay (Filling)	6	<PQL	24	20	11	<PQL	30	30
Pit 32	1.00	31/05/2017	Silty Sandy Gravel (Filling)	5	<PQL	22	12	12	<PQL	11	20
R1	1.00	31/05/2017	Silty Sandy Gravel (Filling)	4	<PQL	19	10	10	<PQL	10	20
Pit 33	0.2	31/05/2017	Sandy Silt (Topsoil Filling)	<PQL	<PQL	10	4	7	<PQL	4	8
R2	0.2	31/05/2017	Sandy Silt (Topsoil Filling)	<PQL	<PQL	15	5	7	<PQL	5	9
Pit 34	0.2	1/06/2017	Silty Gravelly Clay (Filling)	<PQL	<PQL	23	12	11	<PQL	9	22
Pit 35	0.05	1/06/2017	Silty Sand (Topsoil)	<PQL	<PQL	5	2	6	<PQL	2	6
Pit 36	0.05	1/06/2017	Silty Sand (Topsoil)	<PQL	<PQL	3	1	3	<PQL	<PQL	3
Pit 37	0.05	1/06/2017	Silty Sand (Topsoil)	<PQL	<PQL	5	3	4	<PQL	2	11
R7	0.05	1/06/2017	Silty Sand (Topsoil)	<PQL	<PQL	5	2	3	<PQL	2	7
Pit 38	0.05	1/06/2017	Silty Sand (Topsoil)	<PQL	<PQL	5	1	3	<PQL	2	3
Pit 39	0.05	1/06/2017	Silty Sand (Topsoil)	NT	NT	NT	NT	NT	NT	NT	NT
Pit 40	0.05	1/06/2017	Silty Sand (Topsoil)	NT	NT	NT	NT	NT	NT	NT	NT
PQL				4	0.4	1	1	1	0.1	1	1
HIL				100	20	100	6000	300	40	400	7400
EIL				100	NC	470	80	1100	NC	20	210

Notes:

HIL - Health Based Soil Investigation Levels for Low Density Residential Landuse Values
 EIL - Environmental Soil Investigation Levels for lower bound Low Density Residential Landuse Values
 PQL - Practical Quantitation Limit

NC	- No Criteria
NT	- Not Tested

R1 - replicate of Pit 32/1.0
 R2 - replicate of Pit 33/0.2
 R4 - replicate of Pit 23/0.05
 R7 - replicate of Pit 35/0.05

TABLE 10
SUMMARY OF LABORATORY TEST RESULTS - ORGANICS (PETROLEUM HYDROCARBONS - mg/kg)

Sample ID	Depth (m)	Sample Date	Material Type	Benzene	Toluene	Ethylbenzene	Xylene	F1	F2	F3	F4
Pit 1	0.05	31/05/2017	Silty Sand (Topsoil)	NT	NT	NT	NT	NT	NT	NT	NT
Pit 3	0.05	31/05/2017	Silt (Topsoil)	NT	NT	NT	NT	NT	NT	NT	NT
Pit 7	0.05	1/06/2017	Silt (Topsoil)	NT	NT	NT	NT	NT	NT	NT	NT
Pit 10	0.05	31/05/2017	Sandy Silt (Topsoil)	NT	NT	NT	NT	NT	NT	NT	NT
Pit 12	0.05	1/06/2017	Silt (Topsoil)	NT	NT	NT	NT	NT	NT	NT	NT
Pit 13	0.05	1/06/2017	Silt (Topsoil)	NT	NT	NT	NT	NT	NT	NT	NT
Pit 17	0.05	31/05/2017	Silt (Topsoil)	NT	NT	NT	NT	NT	NT	NT	NT
Pit 18	0.05	1/06/2017	Silt (Topsoil)	NT	NT	NT	NT	NT	NT	NT	NT
Pit 21	0.05	1/06/2017	Silt (Topsoil)	NT	NT	NT	NT	NT	NT	NT	NT
Pit 23	0.05	1/06/2017	Silt (Topsoil)	NT	NT	NT	NT	NT	NT	NT	NT
R4	0.05	1/06/2017	Silt (Topsoil)	NT	NT	NT	NT	NT	NT	NT	NT
Pit 24	0.05	1/06/2017	Silty Sand (Topsoil)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
Pit 25	0.05	1/06/2017	Silty Sand (Filling)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
Pit 26	0.05	1/06/2017	Silty Sand (Topsoil)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
Pit 27	0.05	1/06/2017	Silty Sand (Topsoil)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
Pit 28	0.05	31/05/2017	Silty Sand (Topsoil)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
Pit 29	0.05	31/05/2017	Silty Sand (Topsoil)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
Pit 30	0.05	31/05/2017	Silty Sand (Topsoil)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
Pit 31	0.5	31/05/2017	Sandy Gravelly Clay (Filling)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
Pit 32	1.00	31/05/2017	Silty Sandy Gravel (Filling)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
R1	1.00	31/05/2017	Silty Sandy Gravel (Filling)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
Pit 33	0.2	31/05/2017	Sandy Silt (Topsoil Filling)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
R2	0.2	31/05/2017	Sandy Silt (Topsoil Filling)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
Pit 34	0.2	1/06/2017	Silty Gravelly Clay (Filling)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
Pit 35	0.05	1/06/2017	Silty Sand (Topsoil)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
R7	0.05	1/06/2017	Silty Sand (Topsoil)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
Pit 36	0.05	1/06/2017	Silty Sand (Topsoil)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
Pit 37	0.05	1/06/2017	Silty Sand (Topsoil)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
Pit 38	0.05	1/06/2017	Silty Sand (Topsoil)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL
Pit 39	0.05	1/06/2017	Silty Sand (Topsoil)	NT	NT	NT	NT	NT	NT	NT	NT
Pit 40	0.05	1/06/2017	Silty Sand (Topsoil)	NT	NT	NT	NT	NT	NT	NT	NT
PQL				0.2	0.5	1	3	25	50	100	100
HSL				0.5	160	55	40	45	110	NC	NC
ESL				50	85	70	105	180	120	300	2800
ML				NC	NC	NC	NC	700	1000	2500	10000

Notes:

HSL - Health Based Soil Screening Levels for Low Density Residential Landuse Values
 ESL - Environmental Soil Screening Levels for lower bound Low Density Residential Landuse Values
 ML - Management Limits for petroleum hydrocarbons
 PQL - Practical Quantitation Limit

NC	- No Criteria
NT	- Not Tested

R1 - replicate of Pit 32/1.0
 R2- replicate of Pit 33/0.2
 R4 - replicate of Pit 23/0.05
 R7 - replicate of Pit 35/0.05

TABLE 11
SUMMARY OF LABORATORY TEST RESULTS - ORGANICS (PAH, Phenol, OCP, OPP, PCB - mg/kg) and ASBESTOS

Sample ID	Depth (m)	Sample Date	Material Type	BaP	BaP TEQ	Naphthalene	Total PAHs	Phenol	DDT+ DDE+ DDD	Aldrin+ dieldrin	Chlordane	Endosulfan	Endrin	Heptachlor	HCB	Methoxychlor	Chlorpyrifos	Total OCPs	Total OPPs	Total PCBs	Asbestos ID in soil <0.1g/kg
Pit 1	0.05	31/05/2017	Silty Sand (Topsoil)	NT	NT	NT	NT	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	NT	NT
Pit 3	0.05	31/05/2017	Silt (Topsoil)	NT	NT	NT	NT	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	NT	NT
Pit 7	0.05	1/06/2017	Silt (Topsoil)	NT	NT	NT	NT	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	NT	NT
Pit 10	0.05	31/05/2017	Sandy Silt (Topsoil)	NT	NT	NT	NT	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	NT	NT
Pit 12	0.05	1/06/2017	Silt (Topsoil)	NT	NT	NT	NT	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	NT	NT
Pit 13	0.05	1/06/2017	Silt (Topsoil)	NT	NT	NT	NT	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	NT	NT
Pit 17	0.05	31/05/2017	Silt (Topsoil)	NT	NT	NT	NT	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	NT	NT
Pit 18	0.05	1/06/2017	Silt (Topsoil)	NT	NT	NT	NT	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	NT	NT
Pit 21	0.05	1/06/2017	Silt (Topsoil)	NT	NT	NT	NT	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	NT	NT
Pit 23	0.05	1/06/2017	Silt (Topsoil)	NT	NT	NT	NT	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	NT	NT
R4	0.05	1/06/2017	Silt (Topsoil)	NT	NT	NT	NT	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	NT	NT
Pit 24	0.05	1/06/2017	Silty Sand (Topsoil)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	ND
Pit 25	0.05	1/06/2017	Silty Sand (Filling)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	ND
Pit 26	0.05	1/06/2017	Silty Sand (Topsoil)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	ND
Pit 27	0.05	1/06/2017	Silty Sand (Topsoil)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	ND
Pit 28	0.05	31/05/2017	Silty Sand (Topsoil)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	ND
Pit 29	0.05	31/05/2017	Silty Sand (Topsoil)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	ND
Pit 30	0.05	31/05/2017	Silty Sand (Topsoil)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	ND
Pit 31	0.5	31/05/2017	Sandy Gravelly Clay (Filling)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	ND
Pit 32	1.00	31/05/2017	Silty Sandy Gravel (Filling)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	ND
R1	1.00	31/05/2017	Silty Sandy Gravel (Filling)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	ND
Pit 33	0.2	31/05/2017	Sandy Silt (Topsoil Filling)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	ND
R2	0.2	31/05/2017	Sandy Silt (Topsoil Filling)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	ND
Pit 34	0.2	1/06/2017	Silty Gravelly Clay (Filling)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	ND
Pit 35	0.05	1/06/2017	Silty Sand (Topsoil)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	ND
R7	0.05	1/06/2017	Silty Sand (Topsoil)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	ND
Pit 36	0.05	1/06/2017	Silty Sand (Topsoil)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	ND
Pit 37	0.05	1/06/2017	Silty Sand (Topsoil)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	ND
Pit 38	0.05	1/06/2017	Silty Sand (Topsoil)	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	ND
Pit 39	0.05	1/06/2017	Silty Sand (Topsoil)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
Pit 40	0.05	1/06/2017	Silty Sand (Topsoil)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
PQL				0.05	0.5	0.1	1.55	5	0.3	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	2	0.8	0.7	0.1
HIL/HSL				NC	3	3	300	100	240	6	50	270	10	6	10	300	160	NC	NC	1	NC
EIL/ESL				0.7	NC	170	NC	NC	180#	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

Notes:

HIL - Health Based Soil Investigation/Screening Levels for Low Density Residential Landuse Values

EIL - Environmental Soil Investigation/Screening Levels for lower bound Low Density Residential Landuse Values

PQL - Practical Quantitation Limit

- Generic EIL for fresh DDT only

NC	- No Criteria
NT	- Not Tested
ND	- Not Detected

R1 - replicate of Pit 32/1.0

R2- replicate of Pit 33/0.2

R4 - replicate of Pit 23/0.05

R7 - replicate of Pit 35/0.05

TABLE 12
SUMMARY OF LABORATORY TEST RESULTS - BIOSOLIDS (MPN/100g)

Sample ID	Depth (m)	Sample Date	Material Type	E. Coli	Faecal Coiforms	Salmonella
Pit 1	0.05	31/05/2017	Silty Sand (Topsoil)	NT	NT	NT
Pit 3	0.05	31/05/2017	Silt (Topsoil)	NT	NT	NT
Pit 7	0.05	1/06/2017	Silt (Topsoil)	NT	NT	NT
Pit 10	0.05	31/05/2017	Sandy Silt (Topsoil)	NT	NT	NT
Pit 12	0.05	1/06/2017	Silt (Topsoil)	NT	NT	NT
Pit 13	0.05	1/06/2017	Silt (Topsoil)	NT	NT	NT
Pit 17	0.05	31/05/2017	Silt (Topsoil)	NT	NT	NT
Pit 18	0.05	1/06/2017	Silt (Topsoil)	NT	NT	NT
Pit 21	0.05	1/06/2017	Silt (Topsoil)	NT	NT	NT
Pit 23	0.05	1/06/2017	Silt (Topsoil)	NT	NT	NT
R4	0.05	1/06/2017	Silt (Topsoil)	NT	NT	NT
Pit 24	0.05	1/06/2017	Silty Sand (Topsoil)	NT	NT	NT
Pit 25	0.05	1/06/2017	Silty Sand (Filling)	NT	NT	NT
Pit 26	0.05	1/06/2017	Silty Sand (Topsoil)	NT	NT	NT
Pit 27	0.05	1/06/2017	Silty Sand (Topsoil)	NT	NT	NT
Pit 28	0.05	31/05/2017	Silty Sand (Topsoil)	NT	NT	NT
Pit 29	0.05	31/05/2017	Silty Sand (Topsoil)	NT	NT	NT
Pit 30	0.05	31/05/2017	Silty Sand (Topsoil)	NT	NT	NT
Pit 31	0.5	31/05/2017	Sandy Gravelly Clay (Filling)	NT	NT	NT
Pit 32	1.00	31/05/2017	Silty Sandy Gravel (Filling)	NT	NT	NT
R1	1.00	31/05/2017	Silty Sandy Gravel (Filling)	NT	NT	NT
Pit 33	0.2	31/05/2017	Sandy Silt (Topsoil Filling)	NT	NT	NT
R2	0.2	31/05/2017	Sandy Silt (Topsoil Filling)	NT	NT	NT
Pit 34	0.2	1/06/2017	Silty Gravelly Clay (Filling)	NT	NT	NT
Pit 35	0.05	1/06/2017	Silty Sand (Topsoil)	NT	NT	NT
R7	0.05	1/06/2017	Silty Sand (Topsoil)	NT	NT	NT
Pit 36	0.05	1/06/2017	Silty Sand (Topsoil)	NT	NT	NT
Pit 37	0.05	1/06/2017	Silty Sand (Topsoil)	NT	NT	NT
Pit 38	0.05	1/06/2017	Silty Sand (Topsoil)	<PQL	<PQL	ND
Pit 39	0.05	1/06/2017	Silty Sand (Topsoil)	<PQL	<PQL	ND
Pit 40	0.05	1/06/2017	Silty Sand (Topsoil)	200	<PQL	ND
PQL				200	200	50
Stabisation Grade A Microbiological Standards (MPN/100g)				10000	100000	NC

Notes:

Stabisation Grade A Microbiological Standards - NSW EPA Use and Disposal of Biosolids Products

PQL - Practical Quantitation Limit

NC	- No Criteria
ND	- Not Detected
NT	- Not Tested
*	- Result recorded in MPN per gram

R1 - replicate of Pit 32/1.0

R2- replicate of Pit 33/0.2

R4 - replicate of Pit 23/0.05

R7 - replicate of Pit 35/0.05