WAVE PARK GROUP

Environmental Site Investigation - Urbnsurf Sydney: Cnr Hill Road and Holker Busway, Sydney Olympic Park NSW, 2127

WSP | PARSONS BRINCKERHOFF

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GLOSSARY

ABC	Ambient background concentration
ACL	Added contaminant level
ACM	Asbestos containing material
ANZECC	Australian & New Zealand Environment & Conservation Council
ARMCANZ	Agriculture and Resource Management Council of Australia and New Zealand
AS	Australian Standard
AST	Aboveground storage tank
BTEX compounds	Benzene, toluene, ethylbenzene, xylene
DNAPL	Dense non-aqueous phase liquid
DP	Deposited Plan
DQI	Data quality indicator
DQO	Data quality objective
EPA	NSW Environment Protection Authority (formerly, OEH, DECCW, DECC and DEC)
GIL	Groundwater investigation level
HIL	Health investigation level
HSL	Health screening level
LNAPL	Light non-aqueous phase liquid
mBGL	Metres below ground level
NATA	National Association of Testing Authorities
NEPM	National Environment Protection Measures
PAHs	Polycyclic aromatic hydrocarbon
PID	Photoionisation detector
PQL	Practical quantitation limit (of chemical concentration)
QA/QC	Quality assurance & quality control
RPD	Relative per cent difference
SOP	Standard operating procedure
TRH	Total recoverable hydrocarbons

EXECUTIVE SUMMARY

Wave Park Group (WPG) commissioned Parsons Brinckerhoff Australia Pty Ltd (trading as WSP | Parsons Brinckerhoff) to undertake an environmental site investigation for the conceptual design of the proposed Urbnsurf Sydney, to be located on the corner of Hill Road and Holker Busway, Sydney Olympic Park NSW, 2127 (the site).

The investigation was undertaken to assess:

- whether the site has been impacted by filling of potentially contaminated materials, and if impacted, the nature of the impact
- if the site is suitable for the proposed land use as a surf park and what management may be required during the construction process, if any.

The environmental investigation included a contemporary desktop study to obtain up to date information on the site history as well as an intrusive investigation comprising a soil assessment. The scope of works comprised:

- a desktop study and preliminaries including a review of available site documents held by Sydney Olympic Park Authority (SOPA) including any previous environmental investigations and construction details for the landfill cells, and a review of available topography, soil, geological and hydrogeological data to describe the environmental setting
- an initial environmental site assessment including the drilling of 30 boreholes as a mixture of systematic and targeted sampling across the site until refusal, 0.5 m into natural soil or to a maximum depth of 3 metres below ground level (mBGL), logging and screening, soil sampling and laboratory analysis of selected soil samples from each borehole
- additional intrusive investigation to delineate asbestos identified in two locations during the initial drilling work, which comprised drilling of 55 boreholes to a maximum depth of 3 mBGL, soil logging and collecting samples for asbestos analysis, and collecting and analysing asbestos from two additional geotechnical boreholes.

Historically Sydney Olympic Park was subject to uncontrolled tipping of power station ash, demolition waste and other waste from the late 1950s until the late 1980s. Containment works were undertaken in the 1990s and, although the site has been subject to filling, the site is not located within one of these containment cells.

Asbestos was identified above the adopted criteria (of no asbestos detected) in soil samples obtained from locations BH01, BH02, A7, B8, E2, F6 and D7 at depths between 1 mBGL and 3 mBGL. Asbestos identified comprised small fragments of bonded asbestos sheeting, friable asbestos fibreboard and fibre bundles.

The confluence of asbestos detections and presence of foreign material in the soil indicate that during historical filling of the site some imported or reused material containing a variety of foreign material including asbestos waste was placed in some areas of the site, principally in the northern corner but in other localised areas as well.

The asbestos-impacted material represents a potential risk to construction workers during the proposed redevelopment work at the site, as well as a potential risk to nearby site users or passers-by in the event of dust generation during excavation or construction work.

Based on the proposed site layout for the redevelopment the identified asbestos impact is not considered to represent a risk to future site users after construction work is completed, as the area will

be covered by structures or landscaping, although in landscaped areas some management may be required to control risk in the event of minor excavation work.

The impacts identified may be remediated prior to construction works by excavation and removal to a suitably licensed landfill. Alternatively, the asbestos-impacted soil may be managed during construction in accordance with a construction environmental management plan (CEMP) and after redevelopment a longer-term environmental management plan may be developed for the site to prevent future exposure. It is recommended that a class B asbestos removalist be present on-site during redevelopment works, in the vicinity of the identified asbestos impact and in the vicinity of the inferred extent of potential asbestos impact, to ensure asbestos is removed in accordance with the CEMP.

Based on the delineation of foreign material descried as black clayey sand with an organic odour with a large amount of foreign material comprising tree roots, plastic, timber, wire, steel, bricks, building rubble and cloth fabric, it is considered that three areas within the development area are potentially impacted and will require site management through construction. These areas are presented on Figure 3. The volumes of fill material estimated to be within these areas are presented below:

- Area A: a total volume to be cut of approximately 1,954 m^3 and a total volume to be filled of approximately 2,265 m^3 over an area of approximately 6,825 m^2. The current concept design plan proposes to reuse this material on site at depth.
- Area B: a total volume to be cut of approximately 1,500 m^3 over an area of area of approximately 1,125 m^2
- Area C: a total area to be filled of approximately 2,840 m^3 over an area of approximately 1,500 m^2. It should be noted that under the current concept design that no material excavation is proposed in this area and the elevation in this area is to be increased by filling with clean backfill material.

Based on the current concept design model for the site the total volume of potential ACM to be disturbed through the earthworks program is 3,457 m^3.

It is recommended that after excavation the material be stockpiled and resampled for waste classification and re-use and, depending upon laboratory analytical results, some of the surplus material may be used for filling on-site at depth. It is further recommended that a CEMP be developed to guide the management if impact on site during construction works.

1 INTRODUCTION

1.1 Purpose and objective

Wave Park Group (WPG) commissioned Parsons Brinckerhoff Australia Pty Ltd (trading as WSP | Parsons Brinckerhoff) to undertake an environmental site investigation for the conceptual design of the proposed Urbnsurf Sydney, to be located on the corner of Hill Road and Holker Busway, Sydney Olympic Park NSW, 2127 (the site).

The investigation was undertaken to assess:

- whether the site has been impacted by filling of potentially contaminated materials, and if impacted, the nature of the impact
- if the site is suitable for the proposed land use as a surf park and what management may be required during the construction process, if any.

The results of the investigation will be used to revise the commercial terms of the long term ground lease, should significant contamination of the site be identified which potentially affects the proposed land use or level of remediation/management required (beyond the provisional allowances made by WPG).

1.2 Background

WPG are in the process of undertaking feasibility investigations for the site for the purposes of developing the area into a wave park and general recreational area identified as the Urbnsurf Sydney project. The design plans indicate that the site will predominantly be converted into a large artificial water body, through which a wave-generating pier is to be constructed. Landscaped seating and recreational areas are to be constructed around the water body, with a series of retail, recreational and commercial buildings to be constructed to the west. The total site area is approximately 32,000 m^2.

The site is currently managed by the Sydney Olympic Park Authority (SOPA). The SOPA has land-filling records that indicate the development site's ground conditions are generally suitable for the proposed development and operation, although some designated contamination containment cells exist beyond the leasehold boundary.

Minimal site-specific analytical information is available on the Pod B P5 Carpark (beyond the Remediated Lands Management Plan, 2009). Based on additional information received from consultants who previously worked on the site, it is understood that the P5 Carpark area was remediated through separation of inert materials and flyash/other contamination. The inert material was reportedly crushed and built up in compacted layers.

1.3 Technical framework

The works were generally undertaken in accordance with the following guidelines:

- Acid Sulphate Soil Management Advisory Committee NSW 1998, *Acid Sulfate Soil Manual*.
- Australian and New Zealand Environment Conservation Council (ANZECC)/Agriculture, and Resource Management Council of Australia and New Zealand (ARMCANZ) 2000, *Australian and New Zealand Guidelines for Fresh and Marine Water Quality.*
- AS 4482 1-2005 *Guide to Sampling and Investigation of Potentially Contaminated Soil – Part 1: Non-volatile and Semi-volatile compounds.*

- *Contaminated Land Management Act 1997* (NSW; CLM Act).
- Department of Health and Ageing and EnHealth Council, Commonwealth of Australia 2002, *Environmental Health Risk Assessment: Guidelines for assessing human health risks from environmental hazards.*
- NSW Department of Environment and Conservation (DEC) 2006, *Guidelines for the NSW Site Auditors Scheme (2nd edition).*
- NSW Department of Environment and Climate Change 2009, *Guidelines on the duty to report contamination under the Contaminated Land Management Act 1997.*
- NSW Department of Urban Affairs and Planning (DUAP) 1998, *Managing Land Contamination: Planning Guidelines SEPP 55 Remediation of Land.*
- NSW Environmental Protection Authority (EPA) 2000, *Guidelines for Consultants Reporting on Contaminated Sites.*
- NSW EPA 1995, *Sampling Design Guidelines*.
- *National Environment Protection (Assessment of Site Contamination) Measure 1999* (NEPM; as amended 2013).
- *Protection of the Environment Operations Act 1997* (NSW; POEO Act).
- WA Department of Health (DoH) 2009, *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*.

2 SCOPE OF WORKS

The environmental investigation included a contemporary desktop study to obtain up to date information on the site history as well as an intrusive investigation. The scope of works comprised:

- an initial desktop study and preliminaries including:
  - a review of available site documents held by SOPA including any previous environmental investigations and construction details for the landfill cells
  - a review available topography, soil, geological and hydrogeological data to describe the environmental setting
- an initial environmental site investigation including:
  - clearing of underground utilities by reviewing available service plans (e.g. Dial Before You Dig) and using an experienced cable locator
  - intrusive soil investigating by drilling 30 boreholes, as a mixture of systematic and targeted sampling, across the site until refusal, 0.5 m into natural soil or to a maximum depth of 3 metres below ground level (mBGL) which is the maximum depth of the proposed excavation works during the park construction
  - logging each soil bore and providing a description of each soil layer including whether it is fill or natural, texture, colour, odours, moisture, foreign or natural inclusions, measurement of volatile organic compounds (VOCs) using a photo-ionisation detector (PID), field pH and any other relevant information
  - soil sampling from each borehole at nominal depths of the surface (0.1-0.2 m, immediately below the bitumen), 0.4-0.5 m, 0.9-1.0 m and each 1.0 m interval thereafter
  - laboratory analysis of selected soil samples from each borehole, based on field screening, including PID readings and sample appearance (visual and olfactory).
- additional site assessment to delineate asbestos encountered during the initial soil sampling, including:
  - confirmation of underground services using service plans and an experienced cable locator
  - drilling 51 boreholes in a grid across the site
  - soil logging and sampling of different fill units across the site which will be encountered during the proposed earthworks
  - laboratory analysis of selected soil samples for asbestos.

3 SITE SETTING

3.1 Site details

The site is an active car parking facility located on the corner of Hill Road and Holker Busway, Sydney Olympic Park NSW, 2127 (Figure 1) and is roughly rectangular in shape. General site information is provided in Table 3.1.

Table 3.1 Site location information

ITEM	DESCRIPTION
Site address	Cnr Hill Road and Holker Busway, Sydney Olympic Park NSW, 2127
Site land size	3.2 ha
Title identification details	Part Lot 71 in Deposited Plan 1191648
Property owner	Sydney Olympic Park Authority
Current site use	Car park
Zoning	RE1 Public Recreation Zones (under the State Environmental Planning Policy (Major Development) Amendment (Sydney Olympic Park) 2009).
Proposed site use	Long term ground lease from SOPA

Site photographs taken during the works have been included in Appendix E.

3.2 Site description

The site was inspected on 23 May 2016 by a WSP | Parsons Brinckerhoff environmental scientist. The site was a public car park, identified by the SOPA as the Pod B P5 Carpark. The site was accessed via a roadway leading off Hill Road and a set of boom gates to the south of the site. The site was predominately covered in bitumen with some landscaped areas and curbing throughout.

Through the centre of the site, running west to east, was a footpath bounded by landscaping (trees, bushes and gravel coverage). To the north of the site was a parking and turning area for busses. To the south of the bus area was a stormwater diversion channel constructed from packed rocks and vegetation.

The site is not listed in the NSW Planning Portal online map as being an environmental conservation area. Haslams Creek (immediately south) has been designated as an important estuarine ecosystem with extensive replacement of saltmarsh containing the threatened species Wilsonia backhousei. Narawang Wetland directly to the north is a 1.6 km network of irrigation ponds with 22 habitat ponds and native plantings. It supports the native Green and Golden Bell Frog and Latham's Snipe.

3.3 Surrounding site uses

Other surrounding land uses include the following:

- To the north – the Millennium Parklands, the Newington Armory and a mixture of commercial and residential buildings
- To the east – a car park, recreational facilities (BMX track, archery centre) and a wetland area

- To the south – Haslams Creek, parklands, a conservation area and Sydney Olympic Park facilities (commercial buildings, stadiums and arenas)
- To the west – a car park and vacant private land with some commercial operations.

3.4 Topography and drainage

Surface contours across the site range from approximately 9 meters Australian Height Datum (mAHD) in the south to 5 mAHD in the north, with an approximate 3% grade. Surface water is expected to drain towards the stormwater drainage channels located in the centre and north-west of the site. Surface water and groundwater is anticipated to flow east towards Haslams Creek approximately 150 m east of the site and the Parramatta River 750 m east of the site, which ultimately discharges into Wentworth and Homebush Bay.

3.5 Geology and soils

The Department Industry, Resources and Energy, 1983, 1:100,000 Geological Series Sheet 9130 (Edition 1) indicates that the site comprises of man-made fill including dredged estuarine sand, demolition rubble, industrial and household waste. This material is underlain by silty to peaty quartz sand, silt and clay with ferruginous and humic cementation and common shell layers.

The geology encountered during the investigation comprised mixed fill material from beneath surface asphalt/concrete to the maximum depth of the investigation at 3 mBGL. The most predominant fill material units observed were a brown gravelly sand and a brown gravelly clay. Fill material comprising of anthropogenic materials was also observed predominantly in the north-east portion of the site.

3.6 Hydrology and hydrogeology

The nearby Newington and Bicentennial Park Wetlands (located approximately 30 m north of the site) are nationally significant, although based on the NSW Planning Portal the site is not considered to include wetlands. The site is surrounded by constructed drainage basins (Narawang Wetland to the north) and estuaries (Haslams Creek to the south) connecting to the tide-dominated Parramatta River (approximately 750 m east). Given the close proximity to Haslams Creek, groundwater is considered to flow east towards the creek.

3.7 Previous investigations

A review of historical information provided by WPG has indicated that the local area of Sydney Olympic Park, specifically the Haslams Creek North precinct in which the site is located, was used for the uncontrolled tipping of power station ash, demolition waste and small amounts of other waste from the late 1950s until the late 1980s. Containment works in the area commenced in 1995 and were completed in 1997. Demolition waste was excavated from the entire site and separated into material suitable for reuse (defined as hardfill) and unusable material (timbers and plastic). The hardfill was crushed and placed in the northern region of the precinct and a layer of geo-fabric was installed every 750 mm in the fill. The unusable material was placed with fly ash and other waste in a 4-5 m high disposal mound at the south-eastern corner of the precinct. An additional 5-6 m high disposal mound was constructed in the south-western corner of the precinct from contaminants imported from other Homebush Bay sites. Both disposal mounds were capped with 1–2 m clean imported clay. A vertical cut-off wall and leachate collection drain was installed along the eastern and southern boundaries, with an additional clay barrier along the western boundary. The drain also receives leachate from nearby Archery Park. Leachate is pumped to a storage tank then discharged into a series of evaporation ponds located on the southern edge of the precinct. The depth of waste in this precinct ranges from 4 to 12 mBGL.

Current available information suggests the footprint of the proposed development does not extend into the areas historically filled with waste and a site inspection confirmed that the contamination mounds were located approximately 70 m south of the development area.

3.8 Preliminary conceptual site model

Based on the site inspection and the desktop review of site setting and historical land use information, a preliminary conceptual site model (CSM) has been prepared. This is summarised in Table 3.2.

Table 3.2 Preliminary CSM

Likely sources of impact	Likely sources of impact at the site include: → uncontrolled fill materials used historically to level the site and surrounding area → historical or recent waste dumping → potential ACM or hazardous building materials from imported materials or building debris → possible minor leaks/spills of oil/petrol from vehicle activity on or adjacent to the site → pesticides used historically and recently to maintain the site.
Potentially impacted media	Soil: Impacts from contaminated fill, building debris or waste materials, fuel/oil leaks, asbestos dust or from pesticides used on-site. Groundwater: Migration from soil impacts or from off-site groundwater plumes. Groundwater was not assessed as part of this work as it was not encountered within the proposed depth of excavation and risk of impact is considered to be low.
Contaminants of concern	Contaminants of concern at the site comprise: → petroleum compounds including total recoverable hydrocarbons (TRH) and benzene, toluene, ethylbenzene and xylene (BTEX compounds) → polycyclic aromatic hydrocarbons (PAHs) → heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc) → organochlorine pesticides (OCPs) → polychlorinated biphenyls (PCBs) → asbestos.
Migration pathways	Potential migration pathways include: → vertical migration of contaminants in soil from infiltration of rain water → migration of contaminants through underground service trenches → run-off of surface contaminants in rain water → volatilisation of hydrocarbon contamination → airborne migration of contamination in dust or vapour.
Exposure pathways	Potential exposure pathways include: → inhalation of dust or vapours by site users or nearby site users → ingestion or dermal contact with contaminated surface soils or near surface soils by recreational occupants or excavation/maintenance workers.

Sensitive receptors	Based on the site setting, sensitive receptors potentially include: → underlying soil and groundwater → future recreational users of the site → users of extracted groundwater in the vicinity of the site → surface water bodies receiving groundwater from the site → occupiers of commercial properties surrounding and downgradient of the site → on-site and off-site construction or utility workers (those working within service pit trenches).

4 FIELD METHODOLOGY

4.1 Sampling rationale

Based on the NSW EPA (1995) sampling guidelines, a total of 42 investigation locations would be required to characterise the site by systematic sampling. However, given the primary objective of the work was to determine the type(s) of material that will be encountered during construction, it was proposed that 30 sampling locations would be suitable to adequately classify the material at the site, with particular focus on the area highlighted for excavation.

It was recommended that one sample from each location be analysed, targeting the presence of fill material and the areas where excavation will be required. This aimed to provide a picture of the nature of the material across the site, the likely suitability for the site's intended use and whether the excavated material is suitable for use as fill across the site (for levelling) from a contamination perspective.

Following the completion of the initial sampling, asbestos was identified in two locations, BH1 and BH2, in the northern part of the site. As no other indications of potential asbestos were found at the site additional sampling was undertaken to further assess the extent of the impact and delineate the asbestos-impacted area if possible. To this end, a systematic sampling grid of twice the density of the sampling design guidelines was proposed, as detailed in the WA DoH (2009) asbestos guidelines for sites with known asbestos impact. The additional sampling grid was designed to increase the number of sampling locations to 90, incorporating the previous location in the grid.

Several locations which were proposed for the asbestos delineation were not completed due to the presence of an irrigation line and compacted road base in some areas in the northern part of the site which prevented clearing the holes.

4.2 Preliminaries and occupational health and safety

Liaison with various private landowners for site access was undertaken by WSP | Parsons Brinckerhoff upon issue of the authority by WPG and the SOPA. The proposed borehole locations were initially located and assessed through a site walkover to determine drill rig access. Prior to undertaking any component of the investigation, WSP | Parsons Brinckerhoff prepared a ground penetration plan, an environmental management plan, a traffic management plan and applied for a permit to work through the SOPA.

The health and environmental safety plan (HESP) was produced in accordance with the WSP | Parsons Brinckerhoff occupational health and safety guidelines, and included safe work method statements (SWMS) and detailed the work methodology in chronological order, assigning a risk to each activity before and after control measures were implemented.

4.3 Drilling methodology

The initial fieldwork was carried out between 23 May and 26 May 2016, comprising 30 boreholes. The additional fieldwork, comprising 51 boreholes, was carried out between 19 July and 22 July 2016, with an additional two boreholes undertaken for geotechnical investigation from which samples for asbestos delineation were also collected on 26 July 2016. The locations of the boreholes are presented on Figure 2, Appendix A. All field work was carried out in accordance with the Australian standard AS1726-1993, Geotechnical Site Investigations, and WSP | Parsons Brinckerhoff's in house field exploration manual. The drilling was supervised on a full time basis by a WSP | Parsons Brinckerhoff site supervisor, who was responsible for logging the subsurface conditions, collecting samples for laboratory testing and assessment and undertaking field screening. The drilling and soil sampling methodology has been summarised in Table 4.1.

Table 4.1 Borehole drilling and soil sampling

ITEM	DESCRIPTION
Site location	Prior to the commencement of each drilling event a Dial Before You Dig online search was completed, and plans for services collected. Then, proposed borehole locations were scanned and cleared for services by a professional services locating contractor.
Sampling constraints	There were a number of constraints at the site, particularly the presence of existing the stormwater diversion channels, site structures (kerbing and lighting), underground services and vegetated areas. The sampling locations were selected to accommodate these constraints while adequately covering the site.
Soil investigation method	The drilling works were carried out using a truck-mounted rig under the full-time supervision of an experienced WSP | Parsons Brinckerhoff consultant. Eighty seven soil testing locations were drilled in total, with systematic and targeted sampling locations across the site and extended to the target depth. Boreholes were extended until refusal or to a maximum depth of 3 metres.
Field logging/screening	Subsurface conditions were logged by an experienced environmental scientist and included: → the recording of all environmentally relevant observations including olfactory and PID evidence of contamination → a description of each soil layer including whether it is fill or natural and the texture, colour, odours, moisture, foreign or natural inclusions and any other relevant information → the preparation of borehole logs → detailed photographic records of drilling locations and excavations → the documentation of all work undertaken → the collection of soil samples. Any other relevant information during drilling (e.g. in situ testing and any groundwater inflow) were also recorded.
Soil sampling	Soil samples were collected from the following depths during the initial investigation: → the surface immediately below the bitumen hard stand (0.1-0.2 mm) → 0.4-0.5 m → 1.0 m and every metre to the base of the hole → where any changes in lithology, evidence of contamination (including tar), or elevated PID readings are noted. During the additional investigation samples were collected from each fill unit and where evidence of potential contamination was noted. Soil samples were placed in 250 mL laboratory supplied glass jars, leaving no headspace, and closed using Teflon-coated lids, or in plastic bags for asbestos analysis. A duplicate sample was screened by headspace analysis with a PID to analyse for VOCs during the initial investigation. The PID was calibrated daily prior to works using a 100 ppm isobutylene in air calibration standard. Samples with elevated readings were selected for laboratory analysis. Primary samples and intra-laboratory duplicate samples were analysed by Australian Laboratory Services Pty Ltd (ALS) in Smithfield, NSW, with inter-laboratory duplicate samples analysed by Envirolab Services Pty Ltd (Envirolab) in Chatswood, NSW. Both laboratories are accredited by the National Association of Testing Authorities (NATA) for the analytical suites requested.

4.4 Sampling program and laboratory analysis

4.4.1 Environmental sampling and laboratory analysis

WSP | Parsons Brinckerhoff submitted one soil sample from each borehole for laboratory analysis. Samples were selected based on field screening, including PID readings (volatiles) and sample appearance (visual and olfactory). Other samples obtained were retained for further analysis if required.

Two analytical suites were used to assess soils across the site. A generic suite of contaminants often found in fill material were analysed in one sample from each sampling location (30 in total) and included eight heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), TRHs, BTEX compounds, PAHs and asbestos. Additional analytes were also selected for 10 of the 30 samples, comprising OCPs and PCBs.

During the additional investigation samples were analysed for asbestos only.

5 ENVIRONMENTAL SAMPLING AND ASSESSMENT

5.1 Data quality objectives

Systematic planning is critical to successful implementation of an environmental assessment and is used to define the type, quantity and quality of data needed to inform decisions. The United States Environmental Protection Agency (US EPA) has defined a process for establishing data quality objectives (DQOs), which has been referenced in the NEPM (2013).

DQOs ensure that:

- the study objectives are set
- appropriate types of data are collected (based on contemporary land use and chemicals of concern)
- the tolerance levels are set for potential decision making errors.

The DQO process is a seven-step iterative planning approach. The outputs of the DQO process are qualitative and quantitative statements which are developed in the first six steps. They define the purpose of the data collection effort, clarify what the data should represent to satisfy this purpose and specify the performance requirements for the quality of information to be obtained from the data. The output from the first six steps is then used in the seventh step to develop the data collection design that meets all performance criteria and other design requirements and constraints. The DQO process adopted for the assessment and validation works is outlined in Table 5.1.

Table 5.1 DQO process

STEP	DESCRIPTION	OUTCOMES
1	State the problem	The objective of this environmental assessment is to investigate the condition of soil across the site.
2	Identify the decisions/ goal of the investigation	Does the condition of soil at the site pose an unacceptable risk to potential receptors? Is the site suitable for the proposed development in its current condition? If not, what remediation would be required to render the site suitable?
3	Identify the inputs to the decision	The inputs required to make the above decisions are: → desktop analysis → field and analytical data to be collected during the works → national and NSW EPA endorsed or approved criteria for assessing the results.
4	Define the study boundaries/ constraints on data	The boundaries of the investigation have been identified as follows: Spatial boundaries: the boundaries shown on the site layout plan (Figure 1, Appendix A) and the maximum depth of exploration (3 mBGL). Temporal boundaries: the date of the project inception to the completion of the fieldwork under the proposed investigation plan.

STEP	DESCRIPTION	OUTCOMES
5	Develop a decision rule	The purpose of this step is to define the parameters of interest, specify the action levels and combine the outputs of the previous DQO steps into an 'if…then…' decision rule that defines the conditions that would cause the decision maker to choose alternative actions. The parameters of interest are concentrations of contaminants of concern and interest in soil. Soil results were compared to a range of assessment criteria to determine the potential risks from various exposure routes to potential receptors. If concentrations exceeded the adopted criteria, further assessment was recommended or undertaken to define the potential risks.
6	Specify limits on decision errors	The acceptable limits on decision errors to be applied in the investigation and the manner of addressing possible decision errors have been developed based on the data quality indicators (DQIs) of precision, accuracy, representativeness, comparability and completeness and are presented in Tables 5.2 and 5.3.
7	Optimise the design for obtaining data	The purpose of this step is to identify a resource-effective data collection design for generating data that satisfies the DQOs. This assessment has been designed considering the information and data from the previous assessments. The resource effective data collection design that is expected to satisfy the DQOs is described in Section 4.

DQIs for sampling techniques and laboratory analyses of collected soil samples define the acceptable level of error required for this validation assessment. The adopted field methodologies and data obtained have been assessed by reference to DQIs as follows:

- precision: a quantitative measure of the variability (or reproducibility) of data
- accuracy: a quantitative measure of the closeness of reported data to the true value
- representativeness: the confidence (expressed qualitatively) that data are representative of each media present on the site
- comparability: a qualitative parameter expressing the confidence with which one data set can be compared with another
- completeness: a measure of the amount of useable data (expressed as a percentage) from a data collection activity.

A summary of the field and laboratory DQIs for the validation assessment are provided in Table 5.2 and Table 5.3.

Table 5.2 DQIs for field techniques

DQI	TECHNIQUE
Precision	WSP | Parsons Brinckerhoff standard operating procedures (SOPs) appropriate and complied with.
	Collection of intra-laboratory duplicates
Accuracy	WSP | Parsons Brinckerhoff SOPs appropriate and complied with
	Collection and analysis of inter-laboratory duplicates

DQI	TECHNIQUE
	Collection of rinsate blanks, trip blanks and spikes
Representativeness	Appropriate media sampled
	All required samples collected
Comparability	Same SOPs used on each occasion
	Experienced sampler
	Climatic conditions (temperature, rainfall, wind)
	Same type of samples collected
Completeness	SOPs appropriate and complied with
	All required samples collected

Table 5.3 DQIs for laboratories

DQI	DESCRIPTION	ACCEPTABLE LIMIT
Precision	Analysis of laboratory duplicates	<10 x practical quantitation limit (PQL) – no limit 10 to 20 x PQL – 50% relative percentage difference (RPD) >20 x PQL – 20% RPD
	Analysis of laboratory prepared trip spikes (one per sample batch for volatiles)	70-130%
	National Association of Testing Authorities (NATA) certified laboratories	NATA accreditation for analyses performed
Accuracy	Analysis of laboratory prepared trip blanks (one per sample batch)	Below PQLs for contaminants analysed
	Analysis of rinsate blanks (one per day) when non-dedicated sampling equipment is being used	Below PQLs for contaminants analysed
	Analysis of laboratory blanks	Below PQLs for contaminants analysed
	Analysis of laboratory matrix spikes, laboratory control samples and surrogate recoveries	70-30% inorganics/metals 60-140% organics 10-40% semi-volatile organic compounds
	Analysis of laboratory duplicates	<10 x practical quantitation limit (PQL) – no limit 10 to 20 x PQL – 50% relative percentage difference (RPD) >20 x PQL – 20% RPD
Representativeness	All required samples analysed	As per Section 4
Comparability	Sample analytical methods used (including clean-up)	As per NEPM (2013)

DQI	DESCRIPTION	ACCEPTABLE LIMIT
	Same units (justify/quantify if different)	-
	Same laboratories (justify/quantify if different)	-
	Sample Practical quantification limits (PQL)s (justify/quantify if different)	Less than nominated criteria
Completeness	All critical samples analysed	As per Section 4
	All required analytes analysed	As per Section 4
	Appropriate methods and PQLs	As per NEPM (2013)
	Sample documentation complete	As per NEPM (2013)
	Sample holding times complied with	As per NEPM (2013)

5.2 Assessment criteria

5.2.1 Health based criteria

Schedule B1 of the NEPM (2013) defines health investigation levels (HILs) that have been developed for a broad range of metals and organic contaminants in soil. HILs are scientifically based, generic assessment criteria designed to be used in the first stage (Tier 1 or 'screening') of an assessment of potential risks to human health from chronic exposure to contaminants. They are intentionally conservative and are based on a reasonable worst-case scenario for four generic land use settings:

- 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)
- HIL B: Residential with minimal opportunities for soil access includes dwellings with fully and permanently paved yard space such as high-rise buildings and flats
- HIL C: Public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary school fields and footpaths. It does not include undeveloped public open space (such as urban bushland and reserves) which should be subject to a site-specific assessment where appropriate
- HIL D: Commercial/industrial such as shops, offices, factories and industrial sites.

Taking into consideration the objectives and purpose of the investigation, it is considered appropriate to assess the site based on its proposed future land use. Assessing the proposed development, there are two distinct areas that will need to be examined, as follows:

- Area 1 – the general water park area. The development in this area will comprise the artificial water body, landscaped areas and seating. Although the site is zoned for recreational use the majority of the site will comprise concrete hardstand or tiling/paving with only a small portion of the site comprising topsoil and grass which differs from the NEPM exposure scenario for recreational use which assumes limited handstand. Therefore, of the generic scenarios, the most comparable exposure parameters would be that for residential with minimal soil access, HIL B (residential with minimal opportunities for soil access, includes dwellings with fully and permanently paved yard space such as high-rise buildings and flats). This scenario considers both adults and children as receptors (unlike the commercial/industrial exposure scenario) and assumes a lower ingestion rate where soils are covered with hardstand or other cover (as opposed to low-density residential or public open space).
- Area 2 is the footprint of proposed site buildings. This area will be assessed against the commercial/industrial assessment criteria (HIL D).

Health screening levels (HSLs) for asbestos in soils for bonded asbestos containing material (ACM), friable asbestos (FA) and asbestos fibres (AF) are presented in the NEPM (2013). However, the asbestos analysis undertaken was presence/absence as opposed to qualitative (as detailed in the NEPM (2013) and WA DoH (200) guidelines). Because of this, the threshold values published in the NEPM (2013) cannot be directly used. As a conservative approach, for the purposes of this investigation a criterion of no asbestos (bonded or fibres) in soil was adopted for assessment purposes.

The adopted health investigation levels for soil have been summarised in Table 5.4.

Table 5.4 Soil HILs

ANALYTE	RESIDENTIAL, MINIMAL ACCESS TO SOIL, HIL B[1] (MG/KG)	COMMERCIAL/INDUSTRIAL, HIL D[1] (MG/KG)
Arsenic	500	3,000
Cadmium	150	900
Chromium[2]	500	3,600
Copper	30,000	240,000
Lead	1,200	1,500
Nickel	1,200	6,000
Zinc	60,000	400,000
Mercury	120	730
Benzo(a)pyrene toxicity equivalence quotient (BaP TEQ)	4	40
Total PAHs	400	4,000
Heptachlor	10	50
Aldrin and dieldrin	10	45
Chlordane	90	530
DDT + DDE + DDD	600	3,600
Endrin	20	100
Endosulfan	400	2,000
Methoxychlor	500	2,500
Total PCBs	1	7
Asbestos in soil[3]	None	None

Notes:
(1) NEPM (2013) Schedule B1 investigation Levels for Soil and Groundwater
(2) HIL for chromium VI adopted for total chromium as a conservative approach
(3) Criteria adopted for asbestos identification is non-detect

HSLs have also been included in the NEPM for assessment of vapour intrusion risks arising from petroleum sources. The adopted carbon fraction ranges for the HSLs are based on TRH analysis after subtraction of BTEX compounds and naphthalene.

The HSLs have been developed for sand, silt and clay soils based on soil texture classifications. Where there is reasonable doubt as to the appropriate soil texture to select, either a conservative selection should be made (i.e. select coarsest applicable grain size such as sand) or laboratory analysis carried out to determine particle size and hence soil texture sub-class. For the purposes of this remediation and validation work, the most conservative approach will be selected and the adopted assessment criteria will be based on a subsurface profile comprising sand. The HSLs have been incorporated in Schedule B1 in the context of a wider site assessment framework for petroleum hydrocarbon contamination.

The adopted petroleum assessment criteria for soil have been provided in Table 5.5. Given the site's current and future use, residential with minimal access to soil and commercial/industrial land criteria have been adopted (HSL B and HSL D). Additional HSLs for direct contact and intrusive maintenance workers (through inhalation or direct contact) have been specified in 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, Part 2: Application Document* (Friebel and Nadebaum, 2011). The dermal contact HSLs for commercial/industrial land use (HSL D) and residential land use with minimal access to soil (HSL B) have also been adopted to the top 3.0 m of soil. To assess the exposure of site workers to contaminated soils during the site development works the HSLs for Intrusive maintenance workers (shallow trench) have been adopted.

Table 5.5 Soil HSLs

ANALYTE	DEPTH[1]				DERMAL CONTACT[2]
	0 M TO <1 M	1 M TO <2 M	2 M TO <4 M	>4 M	
Commercial/industrial land use HSL-D in sand (mg/kg)					
TRH C_6-C_{10} minus BTEX (F1)[3]	260	370	630	NL	-
TRH C_6-C_{10}	-	-	-	-	26,000
TRH >C_{10}-C_{16} minus naphthalene (F2)[4]	NL	NL	NL	NL	-
TRH >C_{10}-C_{16}	-	-	-	-	20,000
TRH >C_{16}-C_{34}	-	-	-	-	27,000
TRH >C_{34}-C_{40}	-	-	-	-	38,000
Benzene	3	3	3	3	430
Toluene	NL	NL	NL	NL	99,000
Ethylbenzene	NL	NL	NL	NL	27,000
Total xylene	230	NL	NL	NL	81,000
Naphthalene	NL	NL	NL	NL	11,000
Recreational/open space land use HSL-B in sand (mg/kg)					
TRH C_6-C_{10} minus BTEX (F1)[3]	45	70	110	200	-
TRH C_6-C_{10}	-	-	-	-	5,600
TRH >C_{10}-C_{16} minus naphthalene (F2)[4]	110	240	440	NL	-
TRH >C_{10}-C_{16}	-	-	-	-	4,200

ANALYTE	DEPTH[1]				DERMAL CONTACT[2]
	0 M TO <1 M	1 M TO <2 M	2 M TO <4 M	>4 M	
TRH >C_{16}-C_{34}	-	-	-	-	5,800
TRH >C_{34}-C_{40}	-	-	-	-	8,100
Benzene	0.5	0.5	0.5	0.5	140
Toluene	160	220	310	540	21,000
Ethylbenzene	55	NL	NL	NL	5,900
Total xylene	40	60	95	170	17,000
Naphthalene	3	NL	NL	NL	1,400
HSL for Intrusive maintenance workers (mg/kg)					
TRH C_6-C_{10}	NL		NL	NL	82,000
TRH >C_{10}-C_{16}	NL		NL	NL	62,000
TRH >C_{16}-C_{34}	-		-	-	85,000
TRH >C_{34}-C_{40}	-		-	-	120,000
Benzene	77		160	NL	1,100
Toluene	NL		NL	NL	120,000
Ethylbenzene	NL		NL	NL	85,000
Total xylene	NL		NL	NL	130,000
Naphthalene	NL		NL	NL	29,000

Notes:
(1) Health-based screening levels – Commercial/Industrial in sand, Schedule B1 Investigation Levels for Soil and Groundwater (NEPM, as amended 2013)
(2) Dermal contact levels – Commercial/Industrial in sand, Schedule B1 Investigation Levels for Soil and Groundwater (Friebel and Nadebaum, 2011)
(3) As per NEPM (2103), BTEX concentrations should be subtracted from the TPH C_6-C_{10} concentration prior to comparing with the HSLs
(4) As per NEPM (2013), naphthalene concentrations should be subtracted from the >TPH C_{10}-C_{16} concentration prior to comparing with the HSLs
NL Not limiting

These criteria are screening criteria only; exceedances of these criteria are triggers to undertake additional assessment of the risk to receptors.

6 RESULTS

6.1 Soil sample analysis results

The number of primary soil samples collected, analytes tested for, minimum/maximum constituent concentrations and those samples that exceeded the adopted HILs and HSLs are presented in Table 6.1.

Table 6.1 Soil validation results (health based assessment)

NO. SAMPLES	ANALYTE	MIN. CONC. (MG/KG)	MAX. CONC. (MG/KG)	EXCEEDANCES
30	TRH C_6-C_{10} minus BTEX (F1)[3]	<10	<10	None
30	TRH C_6-C_{10}	<10	<10	None
30	TRH >C_{10}-C_{16} minus naphthalene (F2)[4]	<50	<50	None
30	TRH >C_{10}-C_{16}	<50	<50	None
30	TRH >C_{16}-C_{34}	<100	720	None
30	TRH >C_{34}-C_{40}	<100	370	None
30	Benzene	<0.2	<0.2	None
30	Toluene	<0.5	<0.5	None
30	Ethylbenzene	<0.5	<0.5	None
30	Total xylene	<0.5	<0.5	None
30	Naphthalene (volatile)	<1	<1	None
30	Arsenic	<5	42	None
30	Cadmium	<1	<1	None
30	Chromium	3	58	None
30	Copper	<5	190	None
30	Lead	<5	893	None
30	Nickel	<2	90	None
30	Zinc	6	805	None
30	Mercury	<0.1	0.9	None
30	BaP TEQ	<0.5	2	None
30	Total PAHs	<0.5	17.5	None
10	Heptachlor	<0.05	<0.05	None
10	Aldrin and dieldrin	<0.05	<0.05	None
10	Chlordane	<0.05	<0.05	None

NO. SAMPLES	ANALYTE	MIN. CONC. (MG/KG)	MAX. CONC. (MG/KG)	EXCEEDANCES
10	DDT + DDE + DDD	<0.2	<0.2	None
10	Endrin	<0.05	<0.05	None
10	Endosulfan	<0.05	<0.05	None
10	Methoxychlor	<0.2	<0.2	None
10	Total PCBs	<1	<1	None
87	Asbestos	Not detected	Detected	**BH01_1.0m, BH02_2.0m, A7_1.5, B8_3.0, E2_2.5, F6_2.0, D7_2.0**

Notes
(1) As per the NEPM (2013), BTEX concentrations should be subtracted from the TRH C_6-C_{10} concentration prior to comparing with the HSLs
(2) As per NEPM (2013), naphthalene concentrations should be subtracted from the TRH >C_{10}-C_{16} concentration prior to comparing with the HSLs

6.2 Quality assurance and quality control results

Project specific quality assurance and quality control (QA/QC) procedures were implemented to improve transparency, consistency, comparability, completeness, and confidence in the data collected. DQOs for the project are presented in Section 5.1. QA/QC sample results are presented in Appendix C as well as an overview of field QA/QC samples collected and the adopted QA/QC data assessment criteria.

6.2.1 Sampling procedure

WSP | Parsons Brinckerhoff standard procedures, which are based on industry accepted standard practice, were followed throughout the investigation and contamination assessment to prevent cross-contamination, preserve sample integrity and allow for collection of a suitable data set from which to make technically sound and justifiable decisions with data of satisfactory useability. The work was undertaken by appropriately qualified and experienced personnel.

6.2.2 Field QA/QC samples

Field methodologies were consistent with WSP | Parsons Brinckerhoff field procedures. The results of internal laboratory QA/QC procedures have been provided within the laboratory analytical reports (Appendix C). The details of conformance to specific QA/QC requirements is summarised in Table 6.2.

Table 6.2 Field quality indicators

QA/QC REQUIREMENT	COMPLETED	COMMENTS
Fieldwork was undertaken by experienced field engineers and/or scientists	Yes	Qualified and experienced environmental scientists completed the fieldwork.
Standard field sampling sheets used	Yes	Details recorded included WSP | Parsons Brinckerhoff staff and contractors present, time on- and off-site, weather conditions, equipment used and calibration records, reason for the field visit, and comments.

QA/QC REQUIREMENT	COMPLETED	COMMENTS
Samples delivered to laboratory within sample holding times and with correct preservative	Yes	Appropriate holding times were met in all batches. Samples were analysed by the laboratory within 7 days of sampling or within holding times for the particular analyte.
All analyses NATA accredited	Yes	None
Required number of sample duplicates and blanks taken	Yes	Field intra-laboratory duplicates were analysed for all contaminants of concern at the rate of approximately 1 in 20 of primary investigation samples. Field inter-laboratory duplicate samples were analysed for contaminants of concern at the rate of approximately 1 in 20 of primary samples.
Sample blanks (rinsates, trip blanks and field blanks) reported results below detection limits	Yes	Sample blanks were below the laboratory limit of reporting.
Soil sample duplicates reported RPDs within limits set by AS4482.1	Mostly	Field soil duplicates were within the acceptable RPD limits with the following exceptions: → Copper (80%), lead (51%) and mercury (127%) between primary sample BH06_3.0m and duplicate sample QAQC01. → Zinc (111%) between primary sample BH06_3.0m and triplicate sample QAQA01a → Nickel (67%) between primary sample BH22_1.0m and duplicate sample QAQC02. → Nickel (67%) between primary sample BH22_1.0m and triplicate sample QAQC02a. It is likely that the RPD exceedances between the primary and duplicate/triplicate samples is due to the heterogeneity of the soils, particularly considering the soils sampled were largely fill material. Furthermore, some RPD exceedance were attributed to the low detection concentration exaggerating the result. Considering none of these above analytes were detected above the health assessment criteria at any location, the laboratory results are considered to be acceptable and representative of site conditions.

6.2.3 Summary of laboratory QA/QC

WSP | Parsons Brinckerhoff considers that the sample collection, documentation, handling, storage and transportation procedures utilised are of an acceptable standard and that the analytical results provided by the laboratories are deemed reliable and complete based on:

- NATA certification
- the results of field and laboratory QA/QC samples demonstrated levels of precision and accuracy with sufficient repeatability and completeness in accordance with specified RPDs
- the laboratory detection limits are less than the assessment criteria
- samples were analysed for a range of contaminants with all testing undertaken within recommended holding times.

Table 6.3 summarises conformance to specific laboratory QA/QC procedures.

Table 6.3 Laboratory quality indicators

QUALITY ASSURANCE	CONFORMED	COMMENT
Laboratory duplicates	Yes	Laboratory duplicate samples conformed to the laboratory data assessment criteria.
Laboratory control samples	Yes	Laboratory control samples analysis results conformed to the laboratory data assessment criteria.
Surrogates	Yes	Surrogate samples analysis results conformed to the laboratory data assessment criteria.
Matrix spikes	Yes	All matrix spike data conformed to the data assessment criteria.

6.2.4 Quality statement

The sampling methods (including sample preservation, transport and decontamination procedures) and laboratory methods followed during the remediation and validation works were consistent with WSP | Parsons Brinckerhoff protocols and were found to meet the DQOs for this project. It is therefore considered that the data is sufficiently precise and accurate and that the results can be used for the purpose of this project.

7 ENVIRONMENTAL CONCLUSIONS AND RECOMMENDATIONS

7.1 Summary of soil analysis results

Asbestos was identified above the adopted criteria (of no asbestos detected) in soil samples obtained from locations BH01, BH02, A7, B8, E2, F6 and D7 at depths between 1 mBGL and 3 mBGL. Asbestos identified comprised small fragments of bonded asbestos sheeting, friable asbestos fibreboard and fibre bundles.

Asbestos was identified in boreholes containing a large amount of other foreign material. These borehole locations can be characterised by the presence of black clayey sand with a slight organic odour with a large amount of foreign material comprising tree roots, plastic, timber, wire, steel, bricks, building rubble and cloth fabric whereas the fill material recovered from those boreholes with no asbestos identified can be characterised by reworked red, grey brown sandy clay or crushed sandstone with little (if any) foreign material. The additional delineation assessment undertaken identified a significant amount of foreign material in boreholes in the northern and western corners of the site, where samples containing asbestos were collected. Foreign material was also noted in two locations in the south-eastern portion of the site. These locations are presented on Figure 3.

Concentrations of all other contaminants in the soil samples were assessed against health-based criteria (HILs and HSLs) adopted from the NEPM (2013) for residential with limited access to soil land use and commercial/industrial land use (depending on the site area).

7.1.1 HIL/HSL exceedances

No concentration of TRH, BTEX compounds, PAHs, heavy metals, OCPs or PCBs were reported above the adopted assessment criteria in any of the samples analysed.

7.2 Updated CSM

Table 7.1 provides an updated CSM, which has been revised based on the findings of the environmental site investigation work.

Table 7.1 Updated CSM

Sources of impact	Likely sources of impact at the site include: → uncontrolled fill materials (potentially historically used to level the site) or waste dumping
Impacted media	Soil impacts were identified in fill, considered likely to be due to uncontrolled filling with landfill materials. Groundwater impact was not assessed, however migration from soil impacts is considered unlikely given the identified contamination.
Contaminants of concern	Based on the assessment results the revised contaminant of concerns for the site are considered to be: → asbestos.

Migration pathways	Potential migration pathways include: → run-off of surface contaminants in rain water → airborne migration of contamination in dust.
Potential exposure pathways	Potential exposure pathways include: → inhalation of dust by site users or nearby site users.
Potential sensitive receptors	Based on the site setting, sensitive receptors potentially include: → recreational users of the site → occupiers of commercial properties surrounding the site → on-site and off-site construction or utility workers (those working within service pit trenches).
Data gaps	The volume of asbestos impacted fill material has been estimated based on this assessment but can be refined during construction works by visually assessing, stockpiling and collecting samples for laboratory analysis.

7.3 Conclusions and recommendations

The site is zoned RE1 Public Recreation Zones under the State Environmental Planning Policy (Major Development) Amendment (Sydney Olympic Park) 2009 and the proposed future recreational land is consistent with this zoning.

The confluence of asbestos detections and presence of foreign material in the soil indicate that during historical filling of the site some imported or reused material containing a variety of foreign material including asbestos waste was placed in some areas of the site, principally in the northern corner but in other localised areas as well. The locations of asbestos detections and inferred extent of potential asbestos impact, based on presence of asbestos and presence of foreign materials, are shown on Figure 3, Appendix A.

The asbestos-impacted material represents a potential risk to construction workers during the proposed redevelopment work at the site, as well as a potential risk to nearby site users or passers-by in the event of dust generation during excavation or construction work.

Based on the proposed site layout for the redevelopment the identified asbestos impact is not considered to represent a risk to future site users after construction work is completed, as the area will be covered by structures or landscaping, although in landscaped areas some management may be required to control risk in the event of minor excavation work.

It is considered that the site is suitable for its current zoning (public recreation works) and proposed recreational land use provided that the following are undertaken:

- the impacts identified are remediated prior to construction works by excavation and removal to a suitably licensed landfill, or
- the asbestos-impacted soil may is managed during construction in accordance with a construction environmental management plan (CEMP) and after redevelopment a longer-term environmental management plan may be developed for the site to prevent future exposure.

It is recommended that a class B asbestos removalist be present on-site during redevelopment works, in the vicinity of the identified asbestos impact and in the vicinity of the inferred extent of potential asbestos impact, to ensure asbestos is removed in accordance with the CEMP.

Based on the delineation of foreign material descried as black clayey sand with an organic odour with a large amount of foreign material comprising tree roots, plastic, timber, wire, steel, bricks, building rubble and cloth

fabric, it is considered that three areas within the development area are potentially impacted and will require site management through construction. These areas are presented on Figure 3. The volumes of fill material estimated to be within these areas are presented below:

- Area A: a total volume to be cut of approximately 1,954 m^3 and a total volume to be filled of approximately 2,265 m^3 over an area of approximately 6,825 m^2. The current concept design plan proposes to reuse this material on site at depth.
- Area B: a total volume to be cut of approximately 1,500 m^3 over an area of area of approximately 1,125 m^2
- Area C: a total area to be filled of approximately 2,840 m^3 over an area of approximately 1,500 m^2. It should be noted that under the current concept design that no material excavation is proposed in this area and the elevation in this area is to be increased by filling with clean backfill material.

Based on the current concept design model for the site the total volume of potential ACM to be disturbed through the earthworks program is 3,457 m^3.

It is recommended that after excavation the material be stockpiled and resampled for waste classification and re-use and, depending upon laboratory analytical results, some of the surplus material may be used for filling on-site at depth. It is further recommended that a CEMP be developed to guide the management if impact on site during construction works.

8 LIMITATIONS

SCOPE OF SERVICES

This environmental site assessment report (the report) has been prepared in accordance with the scope of services set out in the contract, or as otherwise agreed, between the client and WSP | Parsons Brinckerhoff (scope of services). In some circumstances the scope of services may have been limited by a range of factors such as time, budget, access and/or site disturbance constraints.

RELIANCE ON DATA

In preparing the report, WSP | Parsons Brinckerhoff has relied upon data, surveys, analyses, designs, plans and other information provided by the client and other individuals and organisations, most of which are referred to in the report (the data). Except as otherwise stated in the report, WSP | Parsons Brinckerhoff has not verified the accuracy or completeness of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the report (conclusions) are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data. WSP | Parsons Brinckerhoff will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to WSP | Parsons Brinckerhoff.

ENVIRONMENTAL CONCLUSIONS

In accordance with the scope of services, WSP | Parsons Brinckerhoff has relied upon the data and has conducted environmental field monitoring and/or testing in the preparation of the report. The nature and extent of monitoring and/or testing conducted is described in the report.

On all sites, varying degrees of non-uniformity of the vertical and horizontal soil or groundwater conditions are encountered. Hence no monitoring, common testing or sampling technique can eliminate the possibility that monitoring or testing results/samples are not totally representative of soil and/or groundwater conditions encountered. The conclusions are based upon the data and the environmental field monitoring and/or testing and are therefore merely indicative of the environmental condition of the site at the time of preparing the report, including the presence or otherwise of contaminants or emissions.

Also, it should be recognised that site conditions, including the extent and concentration of contaminants, can change with time.

Within the limitations imposed by the scope of services, the monitoring, testing, sampling and preparation of this report have been undertaken and performed in a professional manner, in accordance with generally accepted practices and using a degree of skill and care ordinarily exercised by reputable environmental consultants under similar circumstances. No other warranty, expressed or implied, is made.

REPORT FOR BENEFIT OF CLIENT

The report has been prepared for the benefit of the client and no other party. WSP | Parsons Brinckerhoff assumes no responsibility and will not be liable to any other person or organisation for or in relation to any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report (including without limitation matters arising from any negligent act or omission of WSP | Parsons Brinckerhoff or for any loss or damage suffered by any other party relying upon the matters dealt with or conclusions expressed in the report). Other parties should not rely upon the report or the accuracy or completeness of any conclusions and should make their own enquiries and obtain independent advice in relation to such matters.

OTHER LIMITATIONS

WSP | Parsons Brinckerhoff will not be liable to update or revise the report to take into account any events or emergent circumstances or facts occurring or becoming apparent after the date of the report.

The scope of services did not include any assessment of the title to or ownership of the properties, buildings and structures referred to in the report nor the application or interpretation of laws in the jurisdiction in which those properties, buildings and structures are located.

9 References

- Australian and New Zealand Environment Conservation Council (ANZECC) (2000) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality.*
- ANZECC/NHMRC (1992) *Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites*.
- Australian Standard AS4482 1-2005 (2005), *Guide to Sampling and Investigation of Potentially Contaminated Soil – Part 1: Non-volatile and Semi-volatile compounds*.
- Australian Standard AS4482.1 (1999) *Guide to the sampling and investigation of potentially contaminated soil - Part 2: Volatile substances*.
- Australian Standard AS5667 (1998) *Water Quality – Sampling – Guidance on Sampling of Groundwaters*.
- Coffey Partners International (1991) *Homebush Bay Soils and Groundwater Contamination Investigation, Volume 7*
- Department of Health and Ageing and EnHealth Council, Commonwealth of Australia 2002, Environmental Health Risk Assessment: Guidelines for assessing human health risks from environmental hazards.
- DUAP (1998) *SEPP 55 – Managing Land Contamination*.
- GHD (1999) *Homebush Bay Infrastructure Development Project, Handover – Systems Report Stormwater Drainage*
- GHD (1999) *Homebush Bay Infrastructure Development Project, Handover – Systems Report Sydney Water Corporation systems (potable Water Supply)*
- GHD (1999) *Homebush Bay Infrastructure Development Project, Handover – Systems Report Recycled Water*
- GHD (1999) *Homebush Bay Infrastructure Development Project, Handover – Systems Report Leachate Collection*
- National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013
- NSW Department of Environment and Conservation Guidelines for the NSW Site Auditor Scheme (2nd edition).
- NSW Department of Environment and Conservation 2006, Guidelines for the Assessment and Management of Groundwater Contamination.
- NSW Department of Environment, Climate Change and Water (DECCW, now NSW EPA) (Sep 2008) *Guidelines for implementing the Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2008 (UPSS Regulation).*
- NSW DECCW (Jan 2010) *UPSS Technical Note: Site Validation Reporting.*
- NSW Department of Urban Affairs and Planning (DUAP) (1998) *Managing Land Contamination: Planning Guidelines SEPP 55 Remediation of Land.*
- NSW EPA (1994) *Guidelines for Assessing Service Station Sites*.
- NSW EPA (1995) *Sampling Design Guidelines*.
- NSW EPA (2000) *Guidelines for Consultants Reporting on Contaminated Sites*.
- SOPA (2002) *Initial Assessment of Development and Remediation Issues*
- SOPA (2009) *Remediated Lands Management Plan*

- SOPA (2003) *Remediated Landfill Areas*, figure number 001-G-G-0061 RevA
- SOPA (2003) *'Maintenance of Remediation Notice' Areas under the Contaminated Lands Management Act 1997*, figure number 001-G-G-0112 Rev N

Appendix A

FIGURES

LEGEND

Site boundary

Drilling locations

Figure 1 Initial investigation plan
Wave Park Group, P5 Car Park
Corner Hill Road and Holker Street, Sydney Olympic Park NSW, 2127

LEGEND

- Site boundary
- Initial drilling locations
- Additional drilling locations

Figure 2 Additional investigation plan
Wave Park Group, P5 Car Park
Corner Hill Road and Holker Street, Sydney Olympic Park NSW, 2127

LEGEND

- Site boundary
- Drilling location – asbestos identified
- Drilling location – No asbestos identified
- Management area (inferred area of potential asbestos impact)

Figure 3 Inferred extent of asbestos impact
Wave Park Group, P5 Car Park
Corner Hill Road and Holker Street, Sydney Olympic Park NSW, 2127

Appendix B

BORELOGS AND EXPLANATORY NOTES

BOREHOLE ENGINEERING LOG

BOREHOLE NO.

BH01

SHEET : 1 OF 1

Client:	**Wave Park Group Pty Ltd**	Date Commenced:	**25/5/16**
Project:	**Wave Park ESA and Getoechnical Investigation**	Date Completed:	**25/5/16**
Borehole Location:	**Sydney Olympic Park Carpark 5B**	Recorded By:	**DW**
Project Number:	**2270089A**	Log Checked By:	**AH**

Drill Model/Mounting:	**Geoprobe 66200DT/ Track**	Hole Angle:	**-90°**	Surface RL:	
Borehole Diameter:	**110 mm**	Bearing:	**---**	Co-ords:	**E 321185.608 N 6254516.555 MGA94 56**

Borehole Information | **Field Material Description**

METHOD	SUPPORT	WATER	RL (m AHD)	DEPTH (m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	POCKET PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
AS	Nil			0.10					FILL: ASPHALT				ROAD SURFACE
									FILL: Gravelly SAND; fine to medium grained, brown, well graded, sub-rounded to angular gravel, with medium to high plasticity clay.	M			FILL
				1	SPT 5, 3, 4 N=7								
				1.50					FILL: CLAY; medium to high plasticity, dark brown, with medium to coarse grained sand, fine sub-rounded to sub-angular gravel.	MC<PL		270 - 350	
				2									
					SPT 3, 2, 3 N=5							50 - 190	
				3					As above, but brown-grey, trace medium to coarse grained sand	MC<PL to MC=PL			
				4	SPT 2, 2, 5 N=7								
		25/05/16		5									
									END OF BOREHOLE AT 5.50 m				Refusal on inferred metal bars

This Borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENVIRONMENTAL LOG

PARSONS BRINCKERHOFF

BOREHOLE NO.

BH02

Client:		Date Commenced:	**26/5/16**
Project:	**Wave Park Group Sydney Olympic Park**	Date Completed:	**26/5/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**DS**
Project Number:	**2270089A**	Log Checked By:	**AV**

Drill Model/Mounting:	**GeoProbe 7822**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**50 mm**	Bearing:	**---**	Co-ords:	

Borehole Information | **Field Material Description**

1 METHOD	2 SUPPORT	3 WATER	4 RL(m) / DEPTH(m)	5 FIELD TEST	6 SAMPLE	7 GRAPHIC LOG	8 USC SYMBOL	9 SOIL/ROCK MATERIAL FIELD DESCRIPTION	10 MOISTURE	11 RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	12 HAND PENETROMETER (kPa)	13 STRUCTURE AND ADDITIONAL OBSERVATIONS
PT				PID=1.2 ppm	J			Asphalt/Concrete				
			0.20					FILL: Road base, brown, sandy clay, angular gravel inclusions				
			0.40	PID=0.8 ppm	J			FILL: Clayey SAND, brown, coarse grained, brick fragments				
			1	PID=0 ppm	J							
			1.10					FILL: Sandy CLAY, grey with red mottling, low plasticity, coarse grained sands, dry				
			2									
			3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENGINEERING LOG

BOREHOLE NO.

BH03

Client:	**Wave Park Group Pty Ltd**	Date Commenced:	**23/5/16**
Project:	**Wave Park ESA and Getoechnical Investigation**	Date Completed:	**23/5/16**
Borehole Location:	**Sydney Olympic Park Carpark 5B**	Recorded By:	**DW**
Project Number:	**2270089A**	Log Checked By:	**AH**

Drill Model/Mounting:	**Geoprobe 66200DT/ Track**	Hole Angle:	**-90°**	Surface RL:	
Borehole Diameter:	**110 mm**	Bearing:	**---**	Co-ords:	**E 321198.572 N 6254483.517 MGA94 56**

Borehole Information | **Field Material Description**

METHOD	SUPPORT	WATER	RL (m AHD)	DEPTH (m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	POCKET PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
AS	Nil			0.10					FILL: ASPHALT				ROAD SURFACE
									FILL: Gravelly CLAY; high plasticity, red-brown-black, fine angular gravel, with fine to coarse grained sand.	MC<PL			FILL
				0.50					Sandy CLAY; medium to high plasticity, brown, fine to coarse grained sand, with fine to coarse, angular gravel.				
				1	SPT 4, 1, 3 N=4								
									As above, but dark brown-grey, low to medium plasticity				
				2					As above, but brown, medium to high plasticity				
					SPT 9, 8, 12 N=20							120 - 200	
				3									concrete aggregate
													trace wood, plastic and copper pipe fragments
				4	SPT 5, 7, 3 N=10							30 - 130	
		23/05/16		5									
				5.50				CI-CH	Silty CLAY; medium to high plasticity, dark grey-black.	MC>PL		10 - 20	ESTUARINE
				6	SPT 1, 1, 1 N=2				As above, but trace fine to medium grained sand				
				7	SPT 0, 1, 1 N=2				As above, but dark brown-black, trace shell fragments			20 - 40	
				8									
				9	SPT 0, 0, 0 N=0								

This Borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENGINEERING LOG

BOREHOLE NO.

BH03

Client:	**Wave Park Group Pty Ltd**	Date Commenced:	**23/5/16**
Project:	**Wave Park ESA and Getoechnical Investigation**	Date Completed:	**23/5/16**
Borehole Location:	**Sydney Olympic Park Carpark 5B**	Recorded By:	**DW**
Project Number:	**2270089A**	Log Checked By:	**AH**

Drill Model/Mounting:	**Geoprobe 66200DT/ Track**	Hole Angle:	**-90°**	Surface RL:	
Borehole Diameter:	**110 mm**	Bearing:	**---**	Co-ords:	**E 321198.572 N 6254483.517 MGA94 56**

Borehole Information							Field Material Description							
METHOD	SUPPORT	WATER	RL (m AHD)	DEPTH (m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	POCKET PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
AS	Nil				SPT 3, 3, 3 N=6			CI-CH	Silty CLAY; medium to high plasticity, dark grey-black.	MC>PL			ESTUARINE
									END OF BOREHOLE AT 10.45 m				No refusal

This Borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENVIRONMENTAL LOG

PARSONS BRINCKERHOFF

BOREHOLE NO.

BH04

Client:		Date Commenced:	**26/5/16**
Project:	**Wave Park Group Sydney Olympic Park**	Date Completed:	**26/5/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**DS**
Project Number:	**2270089A**	Log Checked By:	**AV**

Drill Model/Mounting:	**GeoProbe 7822**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**50 mm**	Bearing:	**---**	Co-ords:	

Borehole Information | **Field Material Description**

1 METHOD	2 SUPPORT	3 WATER	4 RL(m)	4 DEPTH(m)	5 FIELD TEST	6 SAMPLE	7 GRAPHIC LOG	8 USC SYMBOL	9 SOIL/ROCK MATERIAL FIELD DESCRIPTION	10 MOISTURE	11 RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	12 HAND PENETROMETER (kPa)	13 STRUCTURE AND ADDITIONAL OBSERVATIONS
PT									Asphalt				
				0.10	PID=3.8 ppm	J			FILL: Road base				
				0.30					FILL: CLAY, orgnge, high plastiscity, coarse grained sands and gravels				
					PID=5.7 ppm	J							
				0.70					FILL: SAND, white/red, some clay inclusions				
				1	PID=1.9 ppm	J							
				1.80					FILL: CLAY, low plasticity, red/grey/orange mottling with sands and gravel inclusions.				
				2	PID=3.6 ppm	J							
				2.85					FILL: SAND, Fine to medium grained, red, dry				
				3	PID=0 ppm	J							
									END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENVIRONMENTAL LOG

PARSONS BRINCKERHOFF

BOREHOLE NO.

BH05

Client:		Date Commenced:	**26/5/16**
Project:	**Wave Park Group Sydney Olympic Park**	Date Completed:	**26/5/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**DS**
Project Number:	**2270089A**	Log Checked By:	**AV**

Drill Model/Mounting:	**GeoProbe 7822**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**50 mm**	Bearing:	**---**	Co-ords:	

Borehole Information | **Field Material Description**

1 METHOD	2 SUPPORT	3 WATER	4 RL(m)	4 DEPTH(m)	5 FIELD TEST	6 SAMPLE	7 GRAPHIC LOG	8 USC SYMBOL	9 SOIL/ROCK MATERIAL FIELD DESCRIPTION	10 MOISTURE	11 RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / VL L MD D VD)	12 HAND PENETROMETER (kPa)	13 STRUCTURE AND ADDITIONAL OBSERVATIONS
PT									Asphalt				
				0.10	PID=3.8 ppm				FILL: Road base	D			
				0.30	PID=5.7 ppm				FILL: CLAY, orange, high plasticity, coarse grained sand and gravel inclusions				
				0.70	PID=1.9 ppm				FILL: SAND, fine grained with red clay				
				1									
				1.80	PID=3.6 ppm				FILL: CLAY, red / orange and grey, low plasticity, coarse grained sand inclusions				
				2									
				2.80	PID=0.0 ppm				FILL: SAND, fine to medium grained, red				
				3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENVIRONMENTAL LOG

PARSONS BRINCKERHOFF

BOREHOLE NO.

BH06

Client:		Date Commenced:	**26/5/16**
Project:	**Wave Park Group Sydney Olympic Park**	Date Completed:	**26/5/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**DS**
Project Number:	**2270089A**	Log Checked By:	**AV**

Drill Model/Mounting:	**GeoProbe 7822**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**50 mm**	Bearing:	**---**	Co-ords:	

Borehole Information | **Field Material Description**

1 METHOD	2 SUPPORT	3 WATER	4 RL(m) / DEPTH(m)	5 FIELD TEST	6 SAMPLE	7 GRAPHIC LOG	8 USC SYMBOL	9 SOIL/ROCK MATERIAL FIELD DESCRIPTION	10 MOISTURE	11 RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	12 HAND PENETROMETER (kPa)	13 STRUCTURE AND ADDITIONAL OBSERVATIONS
PT								Asphalt				
			0.10	PID=1.7 ppm	J			FILL: Road base				
			0.20					FILL: SAND with coarse grained gravel, white				
				PID=2.1 ppm	J							
			0.80					FILL: SAND, fine grained, black, dry, gravel inclusions				
			1	PID=1.9 ppm	J							
			1.60					FILL: CLAY, brown and grey, low plasticity, coarse grained sand inclusions				
			2	PID=2.6 ppm	J							
				PID=0.0 ppm	J							
			3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENVIRONMENTAL LOG

PARSONS BRINCKERHOFF

BOREHOLE NO.

BH07

Client:		Date Commenced:	**26/5/16**
Project:	**Wave Park Group Sydney Olympic Park**	Date Completed:	**26/5/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**DS**
Project Number:	**2270089A**	Log Checked By:	**AV**

Drill Model/Mounting:	**GeoProbe 7822**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**50 mm**	Bearing:	**---**	Co-ords:	

Borehole Information | **Field Material Description**

1 METHOD	2 SUPPORT	3 WATER	4 RL(m) / DEPTH(m)	5 FIELD TEST	6 SAMPLE	7 GRAPHIC LOG	8 USC SYMBOL	9 SOIL/ROCK MATERIAL FIELD DESCRIPTION	10 MOISTURE	11 RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	12 HAND PENETROMETER (kPa)	13 STRUCTURE AND ADDITIONAL OBSERVATIONS
PT								Asphalt				
			0.10	PID=14.3 ppm	J			FILL: CLAY, grey/brown, some gravel				
			0.30					FILL: Clayey SAND, orange/red, coarse grained gravel				
				PID=28.9 ppm	J							
			0.60					FILL: CLAY, low plasticity, red/orange				
			1	PID=7.4 ppm	J							
			2	PID=1.0 ppm	J							
			2.30					Sand and gravel inclusions				
				PID=0.0 ppm	J							
			3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENVIRONMENTAL LOG

PARSONS BRINCKERHOFF

BOREHOLE NO.

BH08

Client:		Date Commenced:	**26/5/16**
Project:	**Wave Park Group Sydney Olympic Park**	Date Completed:	**26/5/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**DS**
Project Number:	**2270089A**	Log Checked By:	**AV**

Drill Model/Mounting:	**GeoProbe 7822**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**50 mm**	Bearing:	**---**	Co-ords:	

Borehole Information | **Field Material Description**

1 METHOD	2 SUPPORT	3 WATER	4 RL(m)	4 DEPTH(m)	5 FIELD TEST	6 SAMPLE	7 GRAPHIC LOG	8 USC SYMBOL	9 SOIL/ROCK MATERIAL FIELD DESCRIPTION	10 MOISTURE	11 RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	12 HAND PENETROMETER (kPa)	13 STRUCTURE AND ADDITIONAL OBSERVATIONS
PT									Asphalt				
				0.10	PID=5.6 ppm	J			FILL: Road base				
				0.30	PID=7.3 ppm	J			FILL: SAND, fine grained, grey/white, gravel inclusions				
				0.80					FILL: CLAY, red/grey, with sand, gravel, sandstone and ironstone inclusions				
				1	PID=0 ppm	J							
				1.90					FILL: Clayey SAND. brown/black, coarse grained, gravel inclusions				
				2	PID=0 ppm	J							
				2.50					FILL: CLAY red/grey, high plasticity				
					PID=0.0 ppm	J							
				3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENVIRONMENTAL LOG

PARSONS BRINCKERHOFF

BOREHOLE NO.

BH09

Client:		Date Commenced:	**26/5/16**
Project:	**Wave Park Group Sydney Olympic Park**	Date Completed:	**26/5/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**DS**
Project Number:	**2270089A**	Log Checked By:	**AV**

Drill Model/Mounting:	**GeoProbe 7822**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**50 mm**	Bearing:	**---**	Co-ords:	

Borehole Information | **Field Material Description**

1 METHOD	2 SUPPORT	3 WATER	4 RL(m) / DEPTH(m)	5 FIELD TEST	6 SAMPLE	7 GRAPHIC LOG	8 USC SYMBOL	9 SOIL/ROCK MATERIAL FIELD DESCRIPTION	10 MOISTURE	11 RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	12 HAND PENETROMETER (kPa)	13 STRUCTURE AND ADDITIONAL OBSERVATIONS
PT								Asphalt				
			0.10	PID=1.1 ppm	J			FILL: Road base				
			0.30					FILL: SAND, coarse grained, white/yellow, gravel inclusions, loose				
				PID=0.7 ppm	J							
			0.70					FILL: CLAY, red/grey, some coarse grained sand, rock and gravel inclusions, low plasticity, brick fragrments				
			1	PID=6.4 ppm	J							
			2	PID=8.4 ppm	J							
			2.60					FILL: Clayey SAND, white/yellow, sandstone and gravel inclusions, loose, coarse grained				
				PID=1.7 ppm	J							
			3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENVIRONMENTAL LOG

PARSONS BRINCKERHOFF

BOREHOLE NO.

BH10

Client:		Date Commenced:	**26/5/16**
Project:	**Wave Park Group Sydney Olympic Park**	Date Completed:	**26/5/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**DS**
Project Number:	**2270089A**	Log Checked By:	**AV**

Drill Model/Mounting:	**GeoProbe 7822**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**50 mm**	Bearing:	**---**	Co-ords:	

Borehole Information | **Field Material Description**

1 METHOD	2 SUPPORT	3 WATER	4 RL(m) / DEPTH(m)	5 FIELD TEST	6 SAMPLE	7 GRAPHIC LOG	8 USC SYMBOL	9 SOIL/ROCK MATERIAL FIELD DESCRIPTION	10 MOISTURE	11 RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / VL L MD D VD)	12 HAND PENETROMETER (kPa)	13 STRUCTURE AND ADDITIONAL OBSERVATIONS
PT								Asphalt				
			0.10	PID=3.7 ppm	J			FILL: Road base				
			0.30					FILL: SAND, fine grained, brown/grey/white, angular, dry				
				PID=4.1 ppm	J							
			1	PID=0 ppm	J							
			1.80					FILL: CLAY, red/grey, low plastisity, sand inclusions				
			2	PID=0 ppm	J							
				PID=0 ppm	J							
			3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENVIRONMENTAL LOG

PARSONS BRINCKERHOFF

BOREHOLE NO.

BH11

SHEET 1 OF 1

Client:		Date Commenced:	**26/5/16**
Project:	**Wave Park Group Sydney Olympic Park**	Date Completed:	**26/5/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**DS**
Project Number:	**2270089A**	Log Checked By:	**AV**

Drill Model/Mounting:	**GeoProbe 7822**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**50 mm**	Bearing:	**---**	Co-ords:	

Borehole Information | **Field Material Description**

1 METHOD	2 SUPPORT	3 WATER	4 RL(m)	4 DEPTH(m)	5 FIELD TEST	6 SAMPLE	7 GRAPHIC LOG	8 USC SYMBOL	9 SOIL/ROCK MATERIAL FIELD DESCRIPTION	10 MOISTURE	11 RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	12 HAND PENETROMETER (kPa)	13 STRUCTURE AND ADDITIONAL OBSERVATIONS
PT									Asphalt				
				0.10	PID=8.7 ppm	J			FILL: Road base				
				0.30					FILL: Clayey SAND, coarse grained, brown/white/yellow				
					PID=33.6 ppm	J							
				1	PID=7.7 ppm	J							
				1.20					FILL: Sandy CLAY, grey with red mottling, low plastisity				
				2	PID=0 ppm	J							
					PID=0.2 ppm	J							
				2.80					FILL: Sandy CLAY, black with red mottling, low plastisity				
				3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENVIRONMENTAL LOG

PARSONS BRINCKERHOFF

BOREHOLE NO.

BH12

Client:		Date Commenced:	**26/5/16**
Project:	**Wave Park Group Sydney Olympic Park**	Date Completed:	**26/5/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**DS**
Project Number:	**2270089A**	Log Checked By:	**AV**

Drill Model/Mounting:	**GeoProbe 7822**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**50 mm**	Bearing:	**---**	Co-ords:	

Borehole Information | **Field Material Description**

1 METHOD	2 SUPPORT	3 WATER	4 RL(m) / DEPTH(m)	5 FIELD TEST	6 SAMPLE	7 GRAPHIC LOG	8 USC SYMBOL	9 SOIL/ROCK MATERIAL FIELD DESCRIPTION	10 MOISTURE	11 RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	12 HAND PENETROMETER (kPa)	13 STRUCTURE AND ADDITIONAL OBSERVATIONS
PT								Asphalt				
			0.10	PID=0.8 ppm	J			FILL: Road base				
			0.30					FILL: Clayey SAND, grey/white, coarse grained, dry				
				PID=7.6 ppm	J							
			0.90					FILL: CLAY, sand inclusions, low plasticity, brown				
			1	PID=2.2 ppm	J							
			1.80					FILL: CLAY, brown/black, high plasticity				
			2	PID=4.1 ppm	J							
				PID=1.7 ppm	J							
			2.80					FILL: CLAY, grey, high plasticity				
			3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENVIRONMENTAL LOG

PARSONS BRINCKERHOFF

BOREHOLE NO.

BH13

SHEET 1 OF 1

Client:		Date Commenced:	**26/5/16**
Project:	**Wave Park Group Sydney Olympic Park**	Date Completed:	**26/5/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**DS**
Project Number:	**2270089A**	Log Checked By:	**AV**

Drill Model/Mounting:	**GeoProbe 7822**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**50 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
PT								FILL: Sandy GRAVEL, brown, angular				
			0.10	PID=1.6 ppm	J			FILL: Road base				
			0.30					FILL: Sandy CLAY, Coarse grained, brown/grey, low plasticity, some gravels				
				PID=0 ppm	J							
			1	PID=0 ppm	J							
			1.35					FILL: Sandy CLAY, red/grey, sand inclusions yellow/white, coarse grained, low plasticity				
			2	PID=0 ppm	J							
				PID=0 ppm	J							
			3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENVIRONMENTAL LOG

PARSONS BRINCKERHOFF

BOREHOLE NO.

BH14

Client:		Date Commenced:	**26/5/16**
Project:	**Wave Park Group Sydney Olympic Park**	Date Completed:	**26/5/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**DS**
Project Number:	**2270089A**	Log Checked By:	**AV**

Drill Model/Mounting:	**GeoProbe 7822**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**50 mm**	Bearing:	**---**	Co-ords:	

Borehole Information | **Field Material Description**

1 METHOD	2 SUPPORT	3 WATER	4 RL(m) / DEPTH(m)	5 FIELD TEST	6 SAMPLE	7 GRAPHIC LOG	8 USC SYMBOL	9 SOIL/ROCK MATERIAL FIELD DESCRIPTION	10 MOISTURE	11 RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	12 HAND PENETROMETER (kPa)	13 STRUCTURE AND ADDITIONAL OBSERVATIONS
PT								Asphalt				
			0.10	PID=4.8 ppm	J			FILL: Road base				
			0.30					FILL: Clayey SAND, coarse grained, yellow/white, dry				
				PID=5.1 ppm	J							
			1	PID=7.1 ppm	J							
			1.90					FILL: CLAY, grey/red, with gravel and sand inclusions, high plasticity				
			2	PID=0 ppm	J							
				PID=0 ppm	J							
			3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENVIRONMENTAL LOG

PARSONS BRINCKERHOFF

BOREHOLE NO.

BH15

Client:		Date Commenced:	**26/5/16**
Project:	**Wave Park Group Sydney Olympic Park**	Date Completed:	**26/5/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**DS**
Project Number:	**2270089A**	Log Checked By:	**AV**

Drill Model/Mounting:	**GeoProbe 7822**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**50 mm**	Bearing:	**---**	Co-ords:	

Borehole Information | **Field Material Description**

1 METHOD	2 SUPPORT	3 WATER	4 RL(m) / DEPTH(m)	5 FIELD TEST	6 SAMPLE	7 GRAPHIC LOG	8 USC SYMBOL	9 SOIL/ROCK MATERIAL FIELD DESCRIPTION	10 MOISTURE	11 RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	12 HAND PENETROMETER (kPa)	13 STRUCTURE AND ADDITIONAL OBSERVATIONS
PT								Asphalt				
			0.10	PID=3.3 ppm	J			FILL: Road base				
			0.30					FILL: Sandy CLAY, grey, high plasticity, angular gravel inclusions				
				PID=2.9 ppm	J							
								Brown/white/black, coarse grained, low plasticity, sandstone fragments				
			1	PID=16.4 ppm	J							
			1.50					FILL: CLAY, red/grey, high plasticity, ironstone inclusions				
			2	PID=7.6 ppm	J							
			2.10					FILL: Clayey SAND, coarse grained sand, low plasticity clay, brown/white/black, gravel and sandstone inclusions				
				PID=1.9 ppm	J							
			3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENGINEERING LOG

BOREHOLE NO.

BH16

SHEET : 1 OF 1

Client:	**Wave Park Group Pty Ltd**	Date Commenced:	**24/5/16**
Project:	**Wave Park ESA and Getoechnical Investigation**	Date Completed:	**24/5/16**
Borehole Location:	**Sydney Olympic Park Carpark 5B**	Recorded By:	**DW**
Project Number:	**2270089A**	Log Checked By:	**AH**

Drill Model/Mounting:	**Geoprobe 66200DT/ Track**	Hole Angle:	**-90°**	Surface RL:	
Borehole Diameter:	**110 mm**	Bearing:	**---**	Co-ords:	**E 321176.22 N 6254359.216 MGA94 56**

Borehole Information | **Field Material Description**

METHOD	SUPPORT	WATER	RL (m AHD)	DEPTH (m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	POCKET PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
AS	Nil	NFGWE		0.10					FILL: ASPHALT				ROAD SURFACE
									FILL: Sandy CLAY; medium to high plasticity, brown, fine to medium grained sand, with fine, sub-rounded to angular gravel.	MC<PL			FILL
									As above, but brown mottled orange				
				1					As above, but brown-grey				
				2									
				3					END OF BOREHOLE AT 3.00 m				No refusal

This Borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENVIRONMENTAL LOG

PARSONS BRINCKERHOFF

BOREHOLE NO.

BH17

Client:		Date Commenced:	**26/5/16**
Project:	**Wave Park Group Sydney Olympic Park**	Date Completed:	**26/5/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**DS**
Project Number:	**2270089A**	Log Checked By:	**AV**

Drill Model/Mounting:	**GeoProbe 7822**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**50 mm**	Bearing:	**---**	Co-ords:	

Borehole Information | **Field Material Description**

1 METHOD	2 SUPPORT	3 WATER	4 RL(m)	4 DEPTH(m)	5 FIELD TEST	6 SAMPLE	7 GRAPHIC LOG	8 USC SYMBOL	9 SOIL/ROCK MATERIAL FIELD DESCRIPTION	10 MOISTURE	11 RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	12 HAND PENETROMETER (kPa)	13 STRUCTURE AND ADDITIONAL OBSERVATIONS
PT									Asphalt				
				0.10	PID=14.6 ppm	J			FILL: Road base				
				0.30					FILL: Clayey SAND, white, dry, medium grained				
					PID=39.8 ppm	J							
				0.80					FILL: Sandy CLAY, coarse grained, low plasticity,				
				1	PID=0 ppm	J							
				1.80					FILL: CLAY, grey with red gravel inclusions				
				2	PID=0 ppm	J							
				2.60					FILL: Clayey SAND, coarse grained, grey				
					PID=0 ppm	J							
				3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENGINEERING LOG

BOREHOLE NO.

BH18

Client:	**Wave Park Group Pty Ltd**	Date Commenced:	**24/5/16**
Project:	**Wave Park ESA and Getoechnical Investigation**	Date Completed:	**24/5/16**
Borehole Location:	**Sydney Olympic Park Carpark 5B**	Recorded By:	**DW**
Project Number:	**2270089A**	Log Checked By:	**AH**

Drill Model/Mounting:	**Geoprobe 66200DT/ Track**	Hole Angle:	**-90°**	Surface RL:	
Borehole Diameter:	**110 mm**	Bearing:	**---**	Co-ords:	**E 321152.166 N 6254325.482 MGA94 56**

Borehole Information | **Field Material Description**

METHOD	SUPPORT	WATER	RL (m AHD)	DEPTH (m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	POCKET PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
AS	Nil			0.10					FILL: ASPHALT				ROAD SURFACE
									FILL: Gravelly SAND; fine to medium grained, brown, fine, sub-rounded to angular gravel, with high plasticity clay.	D			FILL
				0.50					FILL: Gravelly CLAY; medium to high plasticity, grey-brown with red, fine to medium, sub-angular to angular gravel, with fine to coarse grained sand.	MC<PL			
				1	SPT 8, 6, 5 N=11							=150 =130	
				2									
					SPT 5, 6, 6 N=12				As above, but dark brown with orange			=340 =270 =310	
				3									
				4	SPT 4, 1, 3 N=4				As above, but brown			=130 =160 =150	
				5									
					SPT 2, 3, 3 N=6							=60 =50 =100	
				6									
		24/05/16		7	SPT 4, 18, 42 N=60				As above, but white-red gravel	MC>PL		=130 =150 =180	
				7.50					FILL: Silty CLAY; medium plasticity, grey-brown, with medium to coarse grained sand, trace fine gravel.				trace metal fragment
				8					As above, but grey-brown				
					SPT 2, 3, 7 N=10							=170 =250 =110	
				9.00 9				CI-CH	Silty CLAY; medium to high plasticity, dark brown-black, with fine gravel, with shell fragments.				ALLUVIAL SOIL

This Borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENGINEERING LOG

BOREHOLE NO.

BH18

Client:	**Wave Park Group Pty Ltd**	Date Commenced:	**24/5/16**
Project:	**Wave Park ESA and Getoechnical Investigation**	Date Completed:	**24/5/16**
Borehole Location:	**Sydney Olympic Park Carpark 5B**	Recorded By:	**DW**
Project Number:	**2270089A**	Log Checked By:	**AH**

Drill Model/Mounting:	**Geoprobe 66200DT/ Track**	Hole Angle:	**-90°**	Surface RL:	
Borehole Diameter:	**110 mm**	Bearing:	**---**	Co-ords:	**E 321152.166 N 6254325.482 MGA94 56**

Borehole Information							Field Material Description							
METHOD	SUPPORT	WATER	RL (m AHD)	DEPTH (m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	POCKET PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
AS	Nil				SPT 0, 2, 3 N=5			CI-CH	Silty CLAY; medium to high plasticity, dark brown-black, with fine gravel, with shell fragments.	MC>PL			ALLUVIAL SOIL
									END OF BOREHOLE AT 10.45 m				No refusal

This Borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENVIRONMENTAL LOG

PARSONS BRINCKERHOFF

BOREHOLE NO.

BH19

SHEET 1 OF 1

Client:		Date Commenced:	**26/5/16**
Project:	**Wave Park Group Sydney Olympic Park**	Date Completed:	**26/5/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**DS**
Project Number:	**2270089A**	Log Checked By:	**AV**

Drill Model/Mounting:	**GeoProbe 7822**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**50 mm**	Bearing:	**---**	Co-ords:	

Borehole Information | **Field Material Description**

1 METHOD	2 SUPPORT	3 WATER	4 RL(m)	4 DEPTH(m)	5 FIELD TEST	6 SAMPLE	7 GRAPHIC LOG	8 USC SYMBOL	9 SOIL/ROCK MATERIAL FIELD DESCRIPTION	10 MOISTURE	11 RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	12 HAND PENETROMETER (kPa)	13 STRUCTURE AND ADDITIONAL OBSERVATIONS
PT									Asphalt				
				0.10	PID=41.3 ppm	J			FILL: Sandy CLAY, brown/black, coarse grained, high plasticity, angular gravel inclusions (road base)				
					PID=18.9 ppm	J							
				0.90					FILL: Sandy CLAY, black/grey, high plasticity, gravel inclusions, coarse grained				
				1	PID=9.8 ppm	J							
				1.90					FILL: Sandy CLAY, red/black, low plasticity, coarse grained sand				
				2	PID=16.4 ppm	J							
					PID=9.2 ppm	J							
				3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENVIRONMENTAL LOG

PARSONS BRINCKERHOFF

BOREHOLE NO.

BH20

SHEET 1 OF 1

Client:		Date Commenced:	**26/5/16**
Project:	**Wave Park Group Sydney Olympic Park**	Date Completed:	**26/5/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**DS**
Project Number:	**2270089A**	Log Checked By:	**AV**

Drill Model/Mounting:	**GeoProbe 7822**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**50 mm**	Bearing:	**---**	Co-ords:	

Borehole Information | **Field Material Description**

1 METHOD	2 SUPPORT	3 WATER	4 RL(m) / DEPTH(m)	5 FIELD TEST	6 SAMPLE	7 GRAPHIC LOG	8 USC SYMBOL	9 SOIL/ROCK MATERIAL FIELD DESCRIPTION	10 MOISTURE	11 RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	12 HAND PENETROMETER (kPa)	13 STRUCTURE AND ADDITIONAL OBSERVATIONS
PT								Asphalt				
			0.10	PID=4.5 ppm	J			FILL: Road base				
			0.30					FILL: Clayey SAND, brown/white, coarse grained, loose				
				PID=1.6 ppm	J							
			0.80					FILL: Sandy CLAY, grey/red/yellow, with gravel, sand and sandstone inclusions, low plasticity				
				PID=0 ppm	J							
			1									
			2	PID=0 ppm	J							
				PID=0 ppm	J							
			3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENVIRONMENTAL LOG

PARSONS BRINCKERHOFF

BOREHOLE NO.

BH21

SHEET 1 OF 1

Client:		Date Commenced:	**26/5/16**
Project:	**Wave Park Group Sydney Olympic Park**	Date Completed:	**26/5/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**DS**
Project Number:	**2270089A**	Log Checked By:	**AV**

Drill Model/Mounting:	**GeoProbe 7822**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**50 mm**	Bearing:	**---**	Co-ords:	

Borehole Information | **Field Material Description**

1 METHOD	2 SUPPORT	3 WATER	4 RL(m)	4 DEPTH(m)	5 FIELD TEST	6 SAMPLE	7 GRAPHIC LOG	8 USC SYMBOL	9 SOIL/ROCK MATERIAL FIELD DESCRIPTION	10 MOISTURE	11 RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	12 HAND PENETROMETER (kPa)	13 STRUCTURE AND ADDITIONAL OBSERVATIONS
PT				0.10	PID=0 ppm	J			Asphalt				
									FILL: Road base				
				0.30					FILL: Sandy CLAY, high plasticity, grey/red, ironstone and sandstone inclusions, coarse grained sand				
					PID=0 ppm	J							
				1	PID=0 ppm	J							
					PID=0 ppm	J							
				2									
					PID=0 ppm	J							
				3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENVIRONMENTAL LOG

PARSONS BRINCKERHOFF

BOREHOLE NO.

BH22

Client:		Date Commenced:	**26/5/16**
Project:	**Wave Park Group Sydney Olympic Park**	Date Completed:	**26/5/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**DS**
Project Number:	**2270089A**	Log Checked By:	**AV**

Drill Model/Mounting:	**GeoProbe 7822**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**50 mm**	Bearing:	**---**	Co-ords:	

Borehole Information | **Field Material Description**

1 METHOD	2 SUPPORT	3 WATER	4 RL(m)	4 DEPTH(m)	5 FIELD TEST	6 SAMPLE	7 GRAPHIC LOG	8 USC SYMBOL	9 SOIL/ROCK MATERIAL FIELD DESCRIPTION	10 MOISTURE	11 RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	12 HAND PENETROMETER (kPa)	13 STRUCTURE AND ADDITIONAL OBSERVATIONS
PT									Asphalt				
				0.10	PID=9.1 ppm	J			FILL: Road base				
				0.30					FILL: SAND, grey, fine to medium grained, loose				
					PID=6.0 ppm	J							
				0.90					FILL: SAND, coarse grained, grey / red				
				1	PID=15.9 ppm	J							
				1.80					FILL: Sandy CLAY, low plasticity, gravel inclusions				
					PID=0 ppm	J							
				2									
					PID=0 ppm	J							
				3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENVIRONMENTAL LOG

PARSONS BRINCKERHOFF

BOREHOLE NO.

BH23

Client:		Date Commenced:	**26/5/16**
Project:	**Wave Park Group Sydney Olympic Park**	Date Completed:	**26/5/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**DS**
Project Number:	**2270089A**	Log Checked By:	**AV**

Drill Model/Mounting:	**GeoProbe 7822**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**50 mm**	Bearing:	**---**	Co-ords:	

Borehole Information | **Field Material Description**

1 METHOD	2 SUPPORT	3 WATER	4 RL(m) / DEPTH(m)	5 FIELD TEST	6 SAMPLE	7 GRAPHIC LOG	8 USC SYMBOL	9 SOIL/ROCK MATERIAL FIELD DESCRIPTION	10 MOISTURE	11 RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	12 HAND PENETROMETER (kPa)	13 STRUCTURE AND ADDITIONAL OBSERVATIONS
PT								Asphalt				
			0.10	PID=8.4 ppm	J			FILL: Road base				
			0.30					FILL: SAND, fine grained, white/red/grey, loose				
				PID=16.4 ppm	J							
			1	PID=11.1 ppm	J							
			1.50					FILL: Sandy CLAY, grey, orange/yellow sand inclusions				
			2	PID=14.9 ppm	J							
				PID=3.6 ppm	J							
			3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENGINEERING LOG

BOREHOLE NO.

BH24

Client:	**Wave Park Group Pty Ltd**	Date Commenced:	**24/5/16**
Project:	**Wave Park ESA and Getoechnical Investigation**	Date Completed:	**24/5/16**
Borehole Location:	**Sydney Olympic Park Carpark 5B**	Recorded By:	**DW**
Project Number:	**2270089A**	Log Checked By:	**AH**

Drill Model/Mounting:	**Geoprobe 66200DT/ Track**	Hole Angle:	**-90°**	Surface RL:	
Borehole Diameter:	**110 mm**	Bearing:	**---**	Co-ords:	**E 321094.229 N 6254370.618 MGA94 56**

Borehole Information | **Field Material Description**

METHOD	SUPPORT	WATER	RL (m AHD)	DEPTH (m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	POCKET PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
AS	Nil			0.10					FILL: ASPHALT				ROAD SURFACE
									FILL: Sandy CLAY; medium to high plasticity, brown-grey, fine to coarse grained sand, with fine, angular to sub-rounded gravel.	MC<PL			FILL
				1	SPT 11, 11, 10 N=21							500 600 300	
				2					As above, but sub-rounded to sub-angular gravel	MC=PL			
					SPT 2, 2, 2 N=4							100 140 150	
				3						MC>PL			
				4	SPT 3, 4, 4 N=8							140 120 130	
				5									
					SPT 5, 5, 6 N=11				As above, but brown with orange			200 210 180	
		24/05/16		6									
				7	SPT 8, 6, 6 N=12							110 210 130	
				7.50				CI-CH	Silty CLAY; medium to high plasticity, brown.				ESTUARINE
				8									
					SPT 0, 0, 0 N=0				As above, but trace shell fragments			20 30	
				9									

This Borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENGINEERING LOG

BOREHOLE NO.

BH24

Client:	**Wave Park Group Pty Ltd**	Date Commenced:	**24/5/16**
Project:	**Wave Park ESA and Getoechnical Investigation**	Date Completed:	**24/5/16**
Borehole Location:	**Sydney Olympic Park Carpark 5B**	Recorded By:	**DW**
Project Number:	**2270089A**	Log Checked By:	**AH**

Drill Model/Mounting:	**Geoprobe 66200DT/ Track**	Hole Angle:	**-90°**	Surface RL:	
Borehole Diameter:	**110 mm**	Bearing:	**---**	Co-ords:	**E 321094.229 N 6254370.618 MGA94 56**

Borehole Information							Field Material Description							
METHOD	SUPPORT	WATER	RL (m AHD)	DEPTH (m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	POCKET PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
AS	Nil				SPT 0, 0, 0 N=0			CI-CH	Silty CLAY; medium to high plasticity, brown.	MC>PL		10 30	ESTUARINE
									END OF BOREHOLE AT 10.45 m				No refusal

This Borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENVIRONMENTAL LOG

PARSONS BRINCKERHOFF

BOREHOLE NO.

BH25

Client:		Date Commenced:	**26/5/16**
Project:	**Wave Park Group Sydney Olympic Park**	Date Completed:	**26/5/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**DS**
Project Number:	**2270089A**	Log Checked By:	**AV**

Drill Model/Mounting:	**GeoProbe 7822**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**50 mm**	Bearing:	**---**	Co-ords:	

Borehole Information | **Field Material Description**

1 METHOD	2 SUPPORT	3 WATER	4 RL(m)	4 DEPTH(m)	5 FIELD TEST	6 SAMPLE	7 GRAPHIC LOG	8 USC SYMBOL	9 SOIL/ROCK MATERIAL FIELD DESCRIPTION	10 MOISTURE	11 RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	12 HAND PENETROMETER (kPa)	13 STRUCTURE AND ADDITIONAL OBSERVATIONS
PT									Asphalt				
				0.10	PID=36.6 ppm	J			FILL: Road base				
				0.30					FILL: Sandy CLAY, grey/red, low plasticity				
					PID=19.4 ppm	J							
				0.90					CONCRETE				
				1.00 1	PID=0 ppm	J			FILL: Clayey SAND, red, low plasticity				
				1.30					FILL: CLAY, red/brown, low plasticity, rock and brick inclusions with loose coarse grained sand				
				2	PID=0 ppm	J							
					PID=0 ppm	J							
				3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENVIRONMENTAL LOG

PARSONS BRINCKERHOFF

BOREHOLE NO.

BH26

Client:		Date Commenced:	**26/5/16**
Project:	**Wave Park Group Sydney Olympic Park**	Date Completed:	**26/5/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**DS**
Project Number:	**2270089A**	Log Checked By:	**AV**

Drill Model/Mounting:	**GeoProbe 7822**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**50 mm**	Bearing:	**---**	Co-ords:	

Borehole Information | **Field Material Description**

1 METHOD	2 SUPPORT	3 WATER	4 RL(m) / DEPTH(m)	5 FIELD TEST	6 SAMPLE	7 GRAPHIC LOG	8 USC SYMBOL	9 SOIL/ROCK MATERIAL FIELD DESCRIPTION	10 MOISTURE	11 RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	12 HAND PENETROMETER (kPa)	13 STRUCTURE AND ADDITIONAL OBSERVATIONS
PT								Asphalt				
			0.10	PID=48.1 ppm	J			FILL: Road base				
			0.30					FILL: Sand, coarse grained, loose, gravel inclusions				
			0.60	PID=16.9 ppm	J			FILL: CLAY, low plasticity, red/grey/brown				
			1	PID=7.7 ppm	J							
			1.80					FILL: SAND, brown, fine to medium grained, dry				
			2	PID=4.8 ppm	J							
			2.20					FILL: CLAY, gravel and sand inclusions, brown/grey				
				PID=1.1 ppm	J							
			3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENGINEERING LOG

BOREHOLE NO.

BH27

Client:	**Wave Park Group Pty Ltd**	Date Commenced:	**25/5/16**
Project:	**Wave Park ESA and Getoechnical Investigation**	Date Completed:	**25/5/16**
Borehole Location:	**Sydney Olympic Park Carpark 5B**	Recorded By:	**DW**
Project Number:	**2270089A**	Log Checked By:	**AH**

Drill Model/Mounting:	**Geoprobe 66200DT/ Track**	Hole Angle:	**-90°**	Surface RL:	
Borehole Diameter:	**110 mm**	Bearing:	**---**	Co-ords:	**E 321065.318 N 6254431.09 MGA94 56**

Borehole Information | **Field Material Description**

METHOD	SUPPORT	WATER	RL (m AHD)	DEPTH (m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	POCKET PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
AS	Nil								FILL: CONCRETE; fine to medium grained, angular gravel				ROAD SURFACE
				0.30					FILL: Gravelly Sandy CLAY; medium to high plasticity, dark brown, fine to coarse grained sand, fine, angular to sub-angular gravel.	MC<PL			FILL
				0.70					FILL: CLAY; medium to high plasticity, red-brown, with fine, sub-angular to sub-rounded gravel.				
				1	SPT 3, 4, 10 N=14				As above, but trace fine to coarse, white-red gravel			=230 =170 =240	
				2									
					SPT 8, 7, 7 N=14				As above, but trace medium to coarse grained sand			=250 =150 =90	trace terracotta fragments
				3						MC=PL			
		25/05/16		4	SPT 4, 3, 2 N=5							=60 =70 =200	
										MC>PL			trace wood fragments
				5									
				5.50	SPT 2, 1, 1 N=2			CL-CI	Silty CLAY; low to medium plasticity, grey-brown-black, trace fine, sub-angular to sub-rounded gravel, with shell fragments.				ESTUARINE
				6									
				7	SPT 0, 1, 1 N=2							=40 =50 =60	
									As above, but with fine to medium grained sand				
				8									
					SPT 0, 0, 0 N=0							=30 =20	
				9									

This Borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENGINEERING LOG

BOREHOLE NO.

BH27

Client:	**Wave Park Group Pty Ltd**	Date Commenced:	**25/5/16**
Project:	**Wave Park ESA and Getoechnical Investigation**	Date Completed:	**25/5/16**
Borehole Location:	**Sydney Olympic Park Carpark 5B**	Recorded By:	**DW**
Project Number:	**2270089A**	Log Checked By:	**AH**

Drill Model/Mounting:	**Geoprobe 66200DT/ Track**	Hole Angle:	**-90°**	Surface RL:	
Borehole Diameter:	**110 mm**	Bearing:	**---**	Co-ords:	**E 321065.318 N 6254431.09 MGA94 56**

Borehole Information							Field Material Description						
METHOD	SUPPORT	WATER	RL (m AHD)	DEPTH (m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	POCKET PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
AS	Nil				SPT 0, 0, 0 N=0			CL-CI	Silty CLAY; low to medium plasticity, grey-brown-black, trace fine, sub-angular to sub-rounded gravel, with shell fragments.	MC>PL			ESTUARINE
									END OF BOREHOLE AT 10.45 m				No refusal

This Borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENVIRONMENTAL LOG

PARSONS BRINCKERHOFF

BOREHOLE NO.

BH28

SHEET 1 OF 1

Client:		Date Commenced:	**26/5/16**
Project:	**Wave Park Group Sydney Olympic Park**	Date Completed:	**26/5/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**DS**
Project Number:	**2270089A**	Log Checked By:	**AV**

Drill Model/Mounting:	**GeoProbe 7822**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**50 mm**	Bearing:	**---**	Co-ords:	

Borehole Information | **Field Material Description**

1 METHOD	2 SUPPORT	3 WATER	4 RL(m)	4 DEPTH(m)	5 FIELD TEST	6 SAMPLE	7 GRAPHIC LOG	8 USC SYMBOL	9 SOIL/ROCK MATERIAL FIELD DESCRIPTION	10 MOISTURE	11 RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	12 HAND PENETROMETER (kPa)	13 STRUCTURE AND ADDITIONAL OBSERVATIONS
PT									Asphalt/concrete				
				0.10	PID=48.6 ppm	J			FILL: Road base, with clayey sand, black				
				0.30	PID=19.8 ppm	J			FILL: Sandy CLAY, brown/orange. high plasticity, coarse grained sand inclusions				
				0.90	PID=0.1 ppm	J			FILL: Sandy CLAY, grey/orange/red/brown, brick and gravel inclusions, high plasticity, loose grained sand				
				1									
				2	PID=0.9 ppm	J							
					PID=0 ppm	J							
				3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENGINEERING LOG

BOREHOLE NO.

BH29

SHEET : 1 OF 1

Client:	**Wave Park Group Pty Ltd**	Date Commenced:	**25/5/16**
Project:	**Wave Park ESA and Getoechnical Investigation**	Date Completed:	**25/5/16**
Borehole Location:	**Sydney Olympic Park Carpark 5B**	Recorded By:	**DW**
Project Number:	**2270089A**	Log Checked By:	**AH**

Drill Model/Mounting:	**Geoprobe 66200DT/ Track**	Hole Angle:	**-90°**	Surface RL:	
Borehole Diameter:	**110 mm**	Bearing:	**---**	Co-ords:	**E 321138.417 N 6254482.386 MGA94 56**

Borehole Information							Field Material Description							
METHOD	SUPPORT	WATER	RL (m AHD)	DEPTH (m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USCS SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	POCKET PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
AS	Nil	NFGWE		0.30					FILL: CONCRETE; fine to medium grained, angular gravel				ROAD SURFACE
				1 2					FILL: Sandy CLAY; medium to high plasticity, brown, fine to coarse grained sand, with fine to medium gravel.	MC<PL			FILL with wood, plastic and copper pipe fragments
									END OF BOREHOLE AT 2.50 m				Refusal on inferred wood object

This Borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENVIRONMENTAL LOG

PARSONS BRINCKERHOFF

BOREHOLE NO.

BH30

Client:		Date Commenced:	**26/5/16**
Project:	**Wave Park Group Sydney Olympic Park**	Date Completed:	**26/5/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**DS**
Project Number:	**2270089A**	Log Checked By:	**AV**

Drill Model/Mounting:	**GeoProbe 7822**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**50 mm**	Bearing:	**---**	Co-ords:	

Borehole Information | **Field Material Description**

1 METHOD	2 SUPPORT	3 WATER	4 RL(m)	4 DEPTH(m)	5 FIELD TEST	6 SAMPLE	7 GRAPHIC LOG	8 USC SYMBOL	9 SOIL/ROCK MATERIAL FIELD DESCRIPTION	10 MOISTURE	11 RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	12 HAND PENETROMETER (kPa)	13 STRUCTURE AND ADDITIONAL OBSERVATIONS
PT									Asphalt/concrete				
					PID=19.9 ppm	J							
				0.20					FILL: Road base				
				0.40					FILL: Gravelly CLAY, red, low plasticity, angular gravel				
					PID=17.6 ppm	J							
				0.60					FILL: CLAY, sand and gravel inclusions, high plasticity, angular gravel, coarse grained with rock and brick inclusions				
				1	PID=0 ppm	J							
				2	PID=0 ppm	J							
					PID=0 ppm	J							
				3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

A7

SHEET 1 OF 1

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**21/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**21/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / L MD D VD FB)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
SS								**ASPHALT/ROADBASE**				
			0.20					**FILL**: **Gravelly SAND** fine to coarse grained, brown SAND with gravels 5-30mm	D			Foreign material observed (brick / steel / plastic)
			1									Organic matter observed
			1.60					**FILL**: **Clayey SAND** fine to coarse grained, brown / black SAND	M			
			2									
			2.50					**FILL**:**Sandy CLAY** medium plasticity, brown / black CLAY				30mm red ironstone gravels observed
			3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

B8

SHEET 1 OF 1

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**21/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**21/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
SS								**ASPHALT/ROADBASE**				
			0.20					**FILL**: **Gravelly SAND** fine to coarse grained, brown SAND with gravels 5-30mm	D			Foreign material observed (brick / tile / plastic / wire) Organic matter observed
			1									Hard layer observed
			2.00 2					increasing clay content, becoming black	M			
			3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

C4

SHEET 1 OF 1

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**22/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**22/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
CC								**CONCRETE / ASPHALT**				
			0.30									
SS								**FILL**: **GRAVEL** medium to coarse grained, grey / brown GRAVEL	W			
			0.60					**FILL**: **Gravelly SAND** fine to coarse grained, brown SAND with gravels 5-30mm				
			1.00 1					**UNDERGROUND SERVICE STRIKE**				Underground service strike
								END OF BOREHOLE AT 1.30 m				
			2									
			3									

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

C5

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**22/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**22/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
CC								**CONCRETE / ASPHALT**				
SS			0.30					**FILL**: **GRAVEL** medium to coarse grained, grey / brown GRAVEL	W			
			0.50					**FILL**: **Clayey SAND** fine to coarse grained, brown SAND with gravels 5 - 10mm	M			
			1									
			1.50					**FILL**: **Clayey SAND** fine to coarse grained, grey SAND with gravels 1 - 5mm	W			
			2									
			2.50					**FILL**:**Sandy CLAY** medium plasticity, grey / brown / white CLAY with gravels 5 - 10mm				Some red sands observed
			3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

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WSP | PARSONS BRINCKERHOFF

BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

C9

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**21/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**21/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
SS								**ASPHALT/ROADBASE**				
			0.20					**FILL**: **Gravelly SAND** fine to coarse grained, brown SAND with gravels 5-30mm	D			Foreign material observed (plastic / timber)
			1									
			1.70					becoming brown / black with orange sand inclusions				
			2									
			3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

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WSP | PARSONS BRINCKERHOFF

BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

D10

SHEET 1 OF 1

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**21/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**21/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
SS								**ASPHALT/ROADBASE**				
			0.20					**FILL**: **Gravelly SAND** fine to coarse grained, brown SAND with gravels 1 - 10mm	D			
			1									Organic matter observed (tree roots / timber)
			1.30					**FILL**: **Gravelly SAND** fine to coarse grained, red SAND with minor ironstone gravels 5 - 10mm				
			1.80					**FILL**:**Sandy CLAY** medium plasticity, brown CLAY with minor 1 - 5mm gravels	M			
			2									
			3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

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WSP | PARSONS BRINCKERHOFF

BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

D3

SHEET 1 OF 1

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**22/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**22/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / L MD D VD FB)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
CC								**CONCRETE / ASPHALT**				Steel in concrete
			0.30					**FILL**: **GRAVEL** medium to coarse grained, grey / brown GRAVEL	W			Compacted roadbase
SS												
			0.70					**FILL**: **Gravelly SAND** fine to coarse grained, grey SAND with gravels 5-15mm				
			1									
								Refusal on unknown material END OF BOREHOLE AT 1.20 m				
			2									
			3									

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WSP | PARSONS BRINCKERHOFF

BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

D5

SHEET 1 OF 1

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**22/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**22/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / L MD D VD FB VL)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
CC								**CONCRETE / ASPHALT**				
SS			0.30					**FILL**: **GRAVEL** medium to coarse grained, grey GRAVEL	W			
			0.60					**FILL**: **Clayey SAND** fine to coarse grained, brown SAND with gravels 1 - 5mm	M			
			1									
			1.50					**FILL**: **Clayey SAND** fine to coarse grained, grey SAND with trace gravels 1 - 5mm	W			
			2									
			2.50					**FILL**:**Sandy CLAY** medium plasticity, grey / brown / white CLAY with gravels 5 - 10mm				
			3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

D8

SHEET 1 OF 1

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**21/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**21/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
SS								**ASPHALT/ROADBASE**				
			0.20					**FILL**: **Gravelly SAND** fine to coarse grained, brown SAND with gravels 5-30mm	D			Foreign material observed (styrofoam / cloth / plastic)
			1									
			1.20					**FILL**:**CLAY** medium plasticity, brown / black CLAY with minor gravels 1 - 5mm				
			1.90					**FILL**: **Gravelly SAND** fine to coarse grained, brown / black SAND with gravels 5-10mm				Hard layer observed
			2									
			3					END OF BOREHOLE AT 3.00 m				

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BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

D9

SHEET 1 OF 1

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**21/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**21/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
SS								**ASPHALT/ROADBASE**				
			0.20					**FILL**: **Clayey SAND** fine to coarse grained, brown SAND	W			Foreign material observed (fabric) Wet material
			1									
			1.50					**FILL**:**SAND** fine to coarse grained, grey SAND				Hard layer observed
			2					Refusal on hard layer END OF BOREHOLE AT 2.00 m				
			3									

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BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

E10

SHEET 1 OF 1

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**21/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**21/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
SS								**ASPHALT/ROADBASE**				
			0.20					**FILL**:**SAND** fine to coarse grained, brown / yellow SAND with gravels 1-5mm	D			Sandstone material
			1									
			1.20					**FILL**: **CLAY** medium plasticity, brown / orange CLAY with minor gravel 5 - 30mm				Trace ironstone gravels 30mm
			1.80					**FILL**: **Gravelly SAND** fine to coarse grained, brown SAND with gravels 5-10mm				
			2									
			2.80					**FILL**:**Sandy CLAY** medium plasticity, brown CLAY				
			3					END OF BOREHOLE AT 3.00 m				

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BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

E11

SHEET 1 OF 1

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**21/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**21/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
SS								**ASPHALT/ROADBASE**				
			0.20					**FILL**: **Gravelly SAND** fine to coarse grained, dark brown SAND with gravels 5-30mm	D			
			1									
			1.30					**FILL**:**Clayey SAND** fine to coarse grained, brown SAND with gravels 1-10mm				
			2									
			2.20					**FILL**:**SAND** fine to coarse grained, grey SAND with trace gravels 5-10mm and minor clays				Hard layer observed
			3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

E2

SHEET 1 OF 1

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**22/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**22/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
CC								**CONCRETE / ASPHALT**				Large amount of streel in concrete
SS			0.30					**FILL**: **Sandy GRAVEL** fine to coarse grained, brown GRAVEL	W			Compacted roadbase
			0.50					**FILL**: **Clayey SAND** fine to coarse grained, brown SAND with gravels 1 - 5mm				
			1									
			1.30					increasing clay and gravel size				
			2									
			2.50					decreasing gravel content				
			3					END OF BOREHOLE AT 3.00 m				

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BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

E6

SHEET 1 OF 1

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**21/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**21/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
SS								**ASPHALT/ROADBASE**				
			0.20					**FILL**: **Gravelly SAND** fine to coarse grained, brown SAND with gravels 1-10mm	D			
			1									
			1.30					**FILL**: **Clayey SAND** fine to coarse grained, brown / red SAND with trace gravel 1 - 10mm	M			
			2.00 2					**FILL**: **Clayey SAND** fine to coarse grained, brown SAND with trace gravel 5 - 20mm	D			Foreign material observed (tile)
			2.50					Decreasing gravel size				
			3					END OF BOREHOLE AT 3.00 m				

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BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

E8

SHEET 1 OF 1

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**21/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**21/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
SS								**ASPHALT/ROADBASE**				
			0.20					**FILL**: **Gravelly SAND** fine to coarse grained, brown / yellow SAND with gravels 5-30mm	D			Lense of red gravel material
			1									Sandstone cobbles
			1.70					**FILL**: **Gravelly SAND** fine to coarse grained, dark brown SAND with gravels 5-30mm				
			2									
			2.40					**FILL**: **CLAY** medium plasticity, grey CLAY with minor grave; 1 - 5mm	M			
			2.80					**FILL**: **Gravelly SAND** fine to coarse grained, brown SAND with gravels 5-30mm				
			3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

F1

SHEET 1 OF 1

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**22/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**22/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
CC								**CONCRETE / ASPHALT**				
SS			0.30					**FILL**:**GRAVEL** medium to coarse grained, brown GRAVEL 5 - 15mm	W			Compacted roadbase gravels
			0.70					**FILL**:**Sandy CLAY** medium plasticity, brown CLAY with gravel 5 - 10mm	M			
			1									
			1.30					**FILL**:**SAND** fine to coarse grained, brown / orange SAND	D			
			1.80					**FILL**:**Sandy CLAY** high plasticity, light brown CLAY with fine to coarse grained SANDS	M			
			2									
			2.50					Becoming dark brown / grey				
			3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

F10

SHEET 1 OF 1

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**21/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**21/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
SS								**ASPHALT/ROADBASE**				
			0.30					**FILL**: **Gravelly SAND** fine to coarse grained, brown / grey SAND with gravels 5-20mm	D			
			0.90					becoming yellow / white				Sandstone material
			1									
			1.20					**FILL**:**CLAY** medium plasticity, brown / white / red CLAY with gravels 5 - 10mm	M			
			1.80					becoming brown / red with no gravels				
			2									
			2.50					**FILL**:**Gravelly CLAY** medium plasticity, brown / grey CLAY with gravels 5 - 10mm	W			
			3					END OF BOREHOLE AT 3.00 m				

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BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

F3

SHEET 1 OF 1

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**22/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**22/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
CC								**CONCRETE / ASPHALT**				
SS			0.30					**FILL**:**GRAVEL** medium to coarse grained, grey GRAVEL	W			
			0.60					**FILL**: **Clayey SAND** fine to coarse grained, light brown SAND	D			
			1									
			1.50					**FILL**:**Sandy CLAY** medium plasticity, brown CLAY with gravels 5 - 10mm	M			
			2									
			3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

F4

SHEET 1 OF 1

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**22/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**22/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
CC								**CONCRETE / ASPHALT**				
SS			0.30					**FILL**:**GRAVEL** medium to coarse grained, grey / brown GRAVEL	W			
			0.50					**FILL**:**Sandy CLAY** medium plasticity, brown / orange CLAY with gravels 5 - 10mm				
			1.00 1					**FILL**:**Sandy CLAY** medium plasticity, brown / grey CLAY	M			Organic matter observed (tree roots)
			2.00 2					increase gravel size 5-10mm				
			3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

F6

SHEET 1 OF 1

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**21/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**21/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
SS								**ASPHALT/ROADBASE**				
			0.20					**FILL**: **Gravelly SAND** fine to coarse grained, brown SAND with gravels 5-10mm and minor clays	D			
			0.90					increasing clay content				
			1									
			1.30					decreasing clay content and becoming grey				Foreign material observed (plastic)
			1.90					**FILL**: **Gravelly SAND** fine to coarse grained, white / yellow SAND with gravels 5-30mm and minor clays				
			2									
			2.80					**FILL**:**Clayey SAND** fine to coarse grained, brown / black SAND with gravels 5-10mm				
			3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

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WSP | PARSONS BRINCKERHOFF

BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

F8

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**21/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**21/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / L MD D VD FB VL)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
SS								**ASPHALT/ROADBASE**				
			0.20					**FILL**:**CLAY** medium plasticity, red / grey CLAY	D			
			1									
			1.70					**FILL**: **Gravelly SAND** fine to coarse grained, brown SAND with gravels 5-30mm				
			2									
								Refusal on white sandstone END OF BOREHOLE AT 2.30 m				
			3									

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

F9

SHEET 1 OF 1

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**21/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**21/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
SS								**ASPHALT/ROADBASE**				
			0.20					**FILL**: **Gravelly SAND** fine to coarse grained, brown SAND with gravels 5-30mm	D			Sandstone material
			1									
			1.20					**FILL**:**CLAY** medium plasticity, orange / brown CLAY	M			Trace ironstone gravels 30mm
			1.90					**FILL**:**Clayey SAND** fine to coarse grained, brown SAND with gravels	D			
			2									
			2.70					becoming brown / grey and increasing clay content				
			3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

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WSP | PARSONS BRINCKERHOFF

BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

G1

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**22/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**22/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
CC								**CONCRETE / ASPHALT**				
SS			0.30					**FILL**:**GRAVEL** medium to coarse grained, grey / brown GRAVEL	W			
			0.80					**FILL**:**Clayey SAND** fine to coarse grained, red / grey SAND	D			
			1									
			1.20					increasing clay content and becoming brown				
			1.60					**FILL**:**Sandy CLAY** low plasticity, brown / grey CLAY with minor gravels 5 - 10mm				
			2									
			2.50					becoming high plasticity with minor 1 - 5mm gravels	W			
			3					END OF BOREHOLE AT 3.00 m				

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BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

G10

SHEET 1 OF 1

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**21/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**21/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
SS								**ASPHALT/ROADBASE**				
			0.30					**FILL**: **Gravelly SAND** fine to coarse grained, brown / red SAND with gravels 1-10mm	D			
			0.70					**FILL**: **Gravelly SAND** fine to coarse grained, white / grey SAND with trace gravels 1-5mm				Sandstone material
			1									
			1.20					**FILL**:**Gravelly CLAY** medium plasticity, brown / grey CLAY with gravels 1 - 10mm				
			2.00 2					**FILL**:**Gravelly CLAY** medium plasticity, brown CLAY with gravels 1 - 30mm	M			
			3					END OF BOREHOLE AT 3.00 m				

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BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

G11

SHEET 1 OF 1

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**21/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**21/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / L MD D VD FB VL)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
SS								**ASPHALT/ROADBASE**				
			0.20					**FILL**: **Gravelly SAND** fine to coarse grained, grey / white SAND with gravels 1-5mm	D			Sandstone material
			1									
			1.50					**FILL**:**Gravelly CLAY** high plasticity, brown / red CLAY	M			
			2.00 2					**FILL**: **Gravelly SAND** fine to coarse grained, brown / red SAND with gravels 1-5mm	D			Sandstone material
			3					END OF BOREHOLE AT 3.00 m				

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BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

G3

SHEET 1 OF 1

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**22/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**22/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
								CONCRETE / ASPHALT				
			0.30					**FILL**:**GRAVEL** medium to coarse grained, grey / brown GRAVEL	W			
			0.50					**FILL**:**Sandy CLAY** medium plasticity, brown / orange CLAY with gravels 5 - 10mm				
			1.00 1					**FILL**:**Sandy CLAY** medium plasticity, brown / grey CLAY	M			
			2.00 2					increase gravel size 5-10mm				
			3					END OF BOREHOLE AT 3.00 m				

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BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

G4

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**21/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**21/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
SS								**ASPHALT/ROADBASE**				
			0.20					**FILL**: **Gravelly SAND** fine to coarse grained, brown SAND with gravels 5-15mm	M			
			1.00 1					**FILL**:**Sandy CLAY** medium plasticity, grey CLAY with gravels 5 - 30mm	D			
			1.30					**FILL**: **Gravelly CLAY** low plasticity, orange / red CLAY with gravels 1 - 20mm				
			1.70					becoming grey / brown				
			1.90 2					**FILL**: **Gravelly SAND** fine to coarse grained, brown / red SAND with gravels 1-15mm				Sandstone material
			2.30					**FILL**:**SAND** fine to coarse grained, brown SAND with gravels 1-15mm				
			2.80					**FILL**:**SAND** fine to coarse grained, grey / white SAND with gravels 1-15mm				
			3					END OF BOREHOLE AT 3.00 m				

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BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

G5

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**21/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**21/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
SS								**ASPHALT/ROADBASE**				
			0.20					**FILL**: **Gravelly SAND** fine to coarse grained, brown / orange SAND with gravels 1-10mm	D			Sandstone material
			1									
			1.20					**FILL**: **Gravelly CLAY** medium plasticity, brown / black / orange CLAY with gravels 1 - 10mm	M			
			2									
			3					END OF BOREHOLE AT 3.00 m				

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BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

G6

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**21/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**21/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
SS								**ASPHALT/ROADBASE**				
			0.20					**FILL**: **Gravelly SAND** fine to coarse grained, brown / orange SAND with gravels 5-25mm	M			Sandstone material
			1									
			1.20					**FILL**: **Gravelly CLAY** medium plasticity, brown / red / grey CLAY with gravels 1 - 5mm				
			2									
			3					END OF BOREHOLE AT 3.00 m				

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BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

G8

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**21/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**21/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
SS								**ASPHALT/ROADBASE**				
			0.20					**FILL**: **Gravelly SAND** fine to coarse grained, brown / yellow SAND with gravels 1-5mm	D			Sandstone material
			1.00 1					**FILL**:**SAND** fine to coarse grained, red SAND with minor clays				
			1.30					**FILL**:**CLAY** medium plasticity, brown / red CLAY				
			2.00 2					**FILL**:**Clayey SAND** fine to coarse grained, brown / red SAND with trace gravels 1-10mm and minor clays				
			2.50					**FILL**:**CLAY** medium to high plasticity, brown / red / grey CLAY	M			
			3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

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WSP | PARSONS BRINCKERHOFF

BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

H1

SHEET 1 OF 1

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**22/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**22/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
CC								**CONCRETE / ASPHALT**				
SS			0.30					**FILL**:**GRAVEL** medium to coarse grained, brown GRAVEL 5 - 40mm	W			Compacted road base
			0.80					**FILL**:**Sandy CLAY** medium plasticity, brown CLAY with gravels 1 - 5mm	M			
			1									
			1.30					**FILL**: **Gravelly SAND** fine to coarse grained, grey / red SAND with gravels 5 - 10mm	D			
			2.00 2					**FILL**: **Gravelly CLAY** high plasticity, brown CLAY with gravels 1 - 5mm	W			
			3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

H10

SHEET 1 OF 1

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**21/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**21/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
SS								**ASPHALT/ROADBASE**				
			0.20					**FILL**: **Gravelly SAND** fine to coarse grained, brown / white SAND with gravels 1-5mm	D			
			1.00 1					**FILL**:**CLAY** high plasticity, brown / red CLAY				
			1.30					**FILL**: **Gravelly SAND** fine to coarse grained, red SAND with gravels 1-30mm				Foreign material observed (plastic / tile)
			2.00 2					becoming brown				
			2.80					becoming red				
			3					END OF BOREHOLE AT 3.00 m				

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BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

H11

SHEET 1 OF 1

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**21/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**21/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
SS								**ASPHALT/ROADBASE**				
			0.20					**FILL**: **Clayey SAND** fine to coarse grained, brown SAND with trace gravels 1-5mm	D			
			0.90					**FILL**: **Gravelly SAND** fine to coarse grained, brown / grey SAND with gravels 1-30mm				Sandstone material
			1									
			1.50					**FILL**:**CLAY** high plasticity, brown / red CLAY	M			
			2									
			2.50					**FILL**:**Clayey GRAVEL** fine to coarse grained, brown GRAVEL with gravels 1 - 20mm	D			
			3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

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WSP | PARSONS BRINCKERHOFF

BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

H2

SHEET 1 OF 1

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**22/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**22/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
CC								**CONCRETE / ASPHALT**				
SS			0.30					**FILL**:**GRAVEL** medium to coarse grained, brown GRAVEL 5 - 40mm	W			
			0.80					**FILL**:**Sandy CLAY** medium plasticity, brown CLAY with gravels 1 - 5mm	M			
			1									
			1.30					**FILL**: **Gravelly SAND** fine to coarse grained, grey / red SAND with gravels 5 - 10mm	D			
			2.00 2					**FILL**: **Gravelly CLAY** high plasticity, brown CLAY with gravels 1 - 5mm	W			
			3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

H4

SHEET 1 OF 1

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**21/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**21/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
SS								**ASPHALT/ROADBASE**				
			0.20					**FILL**: **Gravelly SAND** fine to coarse grained, brown / grey SAND with gravels 1 - 25mm and minor clay pockets	D			
			1									
			1.50					**FILL**:**CLAY** medium plasticity, orange / grey CLAY with minor 1 - 5mm				
			2									
			3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

H6

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**21/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**21/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / L MD D VD FB)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
SS								**ASPHALT/ROADBASE**				Sandstone material
			0.30					**FILL**:**SAND** fine to coarse grained, brown / yellow SAND with gravel 1 - 5mm	D			
			1									
			1.30					**FILL**: **Gravelly SAND** fine to coarse grained, red SAND with gravels 5 - 25mm				Ironstone observed
			1.60					**FILL**: **Gravelly CLAY** medium plasticity, brown / red / grey CLAY	M			
			2									
			3					END OF BOREHOLE AT 3.00 m				

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BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

H8

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**21/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**21/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
SS								**ASPHALT/ROADBASE**				
			0.20					**FILL**: **Gravelly SAND** fine to coarse grained, brown SAND with gravels 1 - 10mm	D			
			1									
			1.30					**FILL**: **Gravelly CLAY** medium plasticity, brown / red / grey CLAY with gravel 1 - 5mm	M			
			1.80					**FILL**: **Gravelly CLAY** medium plasticity, brown CLAY				
			2									
			2.70					**FILL**:**SILTSTONE** grey	D			
			3					END OF BOREHOLE AT 3.00 m				

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BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

H9

SHEET 1 OF 1

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**21/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**21/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
SS								**ASPHALT/ROADBASE**				
			0.25					**FILL**: **Gravelly SAND** fine to coarse grained, brown SAND with gravels 1 - 10mm	D			
								Refusal on white sandstone END OF BOREHOLE AT 0.70 m				
			1									
			2									
			3									

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BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

I10

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**21/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**21/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
SS								**ASPHALT/ROADBASE**				
			0.20					**FILL**: **Gravelly SAND** fine to coarse grained, brown SAND with gravels 1 - 10mm	D			Sandstone material
			1									
								Refusal on white sandstone END OF BOREHOLE AT 1.30 m				
			2									
			3									

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BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO. **I4**

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**21/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**21/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
SS								**ASPHALT/ROADBASE**				
			0.20					**FILL**: **Gravelly SAND** fine to coarse grained, brown / grey SAND with gravels 1 - 25mm	D			
			1									
			1.30					**FILL**: **Gravelly CLAY** medium plasticity, brown / red / grey CLAY with gravel 1 - 10mm				Sandstone cobbles present
			1.50					**FILL**: **Gravelly SAND** fine to coarse grained, yellow SAND with gravels 1 - 5mm and minor clays				Sandstone material
			2									
			2.10					**FILL**: **Gravelly CLAY** low plasticity, brown / red / grey CLAY with gravel 5 - 25mm				
			2.80					**FILL**: **Gravelly SAND** fine to coarse grained, brown SAND with gravels 1 - 15mm				
			3					END OF BOREHOLE AT 3.00 m				

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BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO. **I6**

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**21/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**21/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / L MD D VD FB VL)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
SS								**ASPHALT/ROADBASE**				
			0.20					**FILL**: **Gravelly SAND** fine to coarse grained, yellow SAND with gravels 5 - 25mm	D			Sandstone material
			1.00 1					**FILL**:**SAND** fine to coarse grained, red SAND with gravels 5 - 10mm				
			1.30					**FILL**:**Sandy CLAY** medium plasticity, red / orange CLAY with gravel 1 - 5mm				
			1.60					**FILL**: **Gravelly SAND** fine to coarse grained, yellow SAND with gravels 5 - 25mm				Sandstone material
			2									
			2.20					**FILL**: **Gravelly SAND** fine to coarse grained, brown / grey SAND with gravels 1 - 10mm and minor clays	M			
			2.70					**FILL**:**CLAY** medium plasticity, brown CLAY with gravel 1 - 5mm				
			3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO. **I7**

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**21/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**21/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
SS								**ASPHALT/ROADBASE**				
			0.20					**FILL**: **Gravelly SAND** fine to coarse grained, brown SAND with gravels 1 - 5mm	S			Sandstone material
			0.70					**FILL**:**CLAY** medium plasticity, brown / red CLAY with gravel 1 - 5mm	M			
			1									
			1.50					**FILL**:**SAND** fine to coarse grained, brown / orange SAND with gravels 1 - 5mm	D			Sandstone material
			2									
			2.70					**FILL**:**CLAY** low plasticity, brown / red CLAY with gravel 1 - 5mm				
			3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

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BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO. **18**

SHEET 1 OF 1

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**21/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**21/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / L MD D VD FB VL)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
SS								**ASPHALT/ROADBASE**				
			0.20					**FILL**: **Gravelly SAND** fine to coarse grained, brown / white SAND with gravels 1 - 20mm	D			
			0.70					increasing clay contnent				
			1									
			1.50					**FILL**: **Gravelly SAND** fine to coarse grained, brown / white SAND with gravels 1 - 25mm				Sandstone material
			2									
			2.70					**FILL**:**Sandy CLAY** medium plasticity, brown / red CLAY				
			3					END OF BOREHOLE AT 3.00 m				

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BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

J5

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**21/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**21/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
SS								**ASPHALT/ROADBASE**				
			0.20					**FILL**:**Clayey SAND** fine to coarse grained, brown / grey SAND with gravels 1 - 5mm	M			
			0.90					increasing gravel size 1- 25mm				
			1									
			1.30					becoming brown / red	D			
								END OF BOREHOLE AT 1.70 m				
			2									
			3									

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BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

J6

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**21/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**21/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
SS								**ASPHALT/ROADBASE**				Footpath
			0.20					**FILL**: **Gravelly SAND** fine to coarse grained, brown / orange SAND with gravels 1 - 20mm	M			
			1.00 1					**FILL**: **Gravelly SAND** fine to coarse grained, grey / white SAND with gravels 1 - 20mm	D			Sandstone material
			1.30					**FILL**:**Sandy CLAY** medium plasticity, brown / red / grey CLAY	M			
			1.70					**FILL**: **Gravelly SAND** fine to coarse grained, grey SAND with gravels 1 - 5mm				
			2									
			2.20					**FILL**: **Gravelly SAND** fine to coarse grained, brown SAND with gravels 1 - 20mm	D			
			2.70					**FILL**: **Gravelly SAND** fine to coarse grained, red SAND with gravels 1 - 5mm				
			3					END OF BOREHOLE AT 3.00 m				

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BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

J7

SHEET 1 OF 1

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**21/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**21/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / L MD D VD FB)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
SS								**ASPHALT/ROADBASE**				
			0.20					**FILL**: **Gravelly SAND** fine to coarse grained, brown / yellow SAND with gravels 1 - 10mm	D			
			0.90					**FILL**: **Gravelly CLAY** low plasticity, brown / red CLAY				
			1									
			2									
			2.20					**FILL**: **Gravelly SAND** fine to coarse grained, brown SAND				
			2.70					**FILL**: **Clayey SAND** fine to coarse grained, grey / brown SAND with minor gravels				
			3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

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WSP | PARSONS BRINCKERHOFF

BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

J9

SHEET 1 OF 1

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**21/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**21/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
SS								**ASPHALT/ROADBASE**	D			
			0.50					**FILL**: **Gravelly SAND** fine to coarse grained, yellow SAND				Sandstone material
			1									
			1.50					**FILL**: **Gravelly CLAY** medium plasticity, brown CLAY with gravels 1 - 20mm	M			
			2									
			2.30					**FILL**: **Gravelly SAND** fine to coarse grained, grey SAND	D			
			2.80					increasing clay content				
			3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

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WSP | PARSONS BRINCKERHOFF

BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

K5

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**21/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**21/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
SS								**ASPHALT/ROADBASE**				
			0.20					**FILL**: **Gravelly SAND** fine to coarse grained, brown SAND 1 - 5mm	D			
			0.50					increasing gravel size 1 - 10mm				
			1									
			2.00 2					**FILL**:**Clayey SAND** fine to coarse grained, grey / brown SAND with minor gravels	M			
			2.50					**FILL**:**Sandy CLAY** medium plasticity, brown / red CLAY with minor gravels	D			
			2.80					**FILL**: **Gravelly SAND** fine to coarse grained, brown SAND				
			3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

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WSP | PARSONS BRINCKERHOFF

BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

K6

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**21/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**21/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY VS S F ST VST H / FB VL L MD D VD	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
SS								**ASPHALT/ROADBASE**				
			0.20					**FILL**: **Gravelly SAND** fine to coarse grained, brown / yellow SAND	D			
			1									
			2.00 2					**FILL**:**Sandy CLAY** medium plasticity, brown / red CLAY				
			2.30					**FILL**:**SAND** fine to medium grained, yellow SAND				
			3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

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WSP | PARSONS BRINCKERHOFF

BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

K7

SHEET 1 OF 1

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**21/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**21/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
SS								**ASPHALT/ROADBASE**				
			0.10					**FILL**: **Gravelly SAND** fine to coarse grained, brown SAND	D			
			1									
			1.50					**FILL**:**Sandy CLAY** medium plasticity, brown / red CLAY	M			
			1.90					increasing clay content				
			2									
			2.10					**FILL**:**SAND** fine to medium grained, brown / yellow SAND with minor gravels				
			3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

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WSP | PARSONS BRINCKERHOFF

BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

L8

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**21/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**21/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
SS								**ASPHALT/ROADBASE**	D			
			0.40					**FILL**: **Gravelly SAND** fine to coarse grained, brown SAND with gravels 1-20mm				
			1.00 1					**FILL**:**Clayey SAND** fine to coarse grained, brown SAND with ironstone gravels 40mm	M			
			1.70					**FILL**:**CLAY** medium plasticity, grey CLAY	D			
			2.00 2					**FILL**: **Gravelly SAND** fine to coarse grained, brown / black SAND with gravels 1-5mm				
			3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

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WSP | PARSONS BRINCKERHOFF

BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

M6

Client:	**WAVE PARK GROUP Pty Ltd**	Date Commenced:	**21/7/16**
Project:	**NSW WAVE PARK ESA**	Date Completed:	**21/7/16**
Borehole Location:	**Carpark P5 - Hill Road**	Recorded By:	**MB**
Project Number:	**2270089A**	Log Checked By:	**IP**

Drill Model/Mounting:	**Track Mounted**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:	**100 mm**	Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS
SS								**ASPHALT/ROADBASE**				
			0.20					**FILL**: **Gravelly SAND** fine to coarse grained, brown SAND	D			
			1									
			1.50					**FILL**: **Gravelly SAND** fine to coarse grained, grey SAND				Large cobbles present
			2									Well compacted material
			3					END OF BOREHOLE AT 3.00 m				

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

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Appendix C

RESULTS SUMMARY TABLES

Appendix A - Table 1
Cnr. Hill Road and Holker Street, Sydney Olympic Park NSW, 2127
WSP | Parsons Brinckerhoff Project Reference: 2270089A
Soil analytical results for TRHs and BTEX compounds

Sample ID	Sample depth	Sample date	Laboratory report reference	TRH						BTEXN						
				C_6-C_{10}	F1	>C_{10}-C_{16}	F2	>C_{16}-C_{34}	>C_{34}-C_{40}	Benzene	Toluene	Ethyl benzene	Xylene (m&p)	Xylene (o)	Total xylene	Naphthalene
Practical quantitation limit				**10**	**10**	**50**	**50**	**100**	**100**	**0.2**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**
Recreational/open space areas																
BH01_1.0m	1.0-1.1	25-May-16	ES1611617	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1
BH02_2.0m	1.9-2.0	26-May-16	ES1611617	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1
BH03_0.1m	0.2-0.3	24-May-16	ES1611617	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1
BH04_0.5m	0.5-0.6	26-May-16	ES1611617	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1
BH05_2.0m	2.0-2.1	26-May-16	ES1611617	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1
BH06_3.0m	2.9-3.0	26-May-16	ES1611617	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1
BH07_3.0m	2.9-3.0	26-May-16	ES1611617	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1
BH08_2.0m	2.-2.1	26-May-16	ES1611617	<10	<10	<50	<50	720	370	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1
BH09_1.0m	0.9-1.0	26-May-16	ES1611617	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1
BH10_0.1m	0.2-0.3	26-May-16	ES1611617	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1
BH11_3.0m	0.9-1.0	26-May-16	ES1611617	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1
BH12_2.0m	0.2-0.3	26-May-16	ES1611617	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1
BH13_0.5m	2.0-2.1	26-May-16	ES1611617	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1
BH14_0.1m	0.2-0.3	26-May-16	ES1611617	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1
BH15_1.0m	0.9-1.0	26-May-16	ES1611617	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1
BH16_2.0m	2.0-2.1	25-May-16	ES1611617	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1
BH17_2.0m	2.0-2.1	26-May-16	ES1611617	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1
BH21_1.0m	1.0-1.1	26-May-16	ES1611617	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1
BH22_1.0m	1.0-1.1	26-May-16	ES1611617	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1
BH23_3.0m	2.9-3.0	26-May-16	ES1611617	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1
BH25_2.0m	2.0-2.1	26-May-16	ES1611617	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1
BH26_0.5m	0.5-0.6	26-May-16	ES1611617	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1
BH27_0.5m	0.4-0.5	25-May-16	ES1611617	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1
BH28_3.0m	3.0-3.1	26-May-16	ES1611617	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1
BH29_1.0m	0.9-1.0	25-May-16	ES1611617	<10	<10	<50	<50	160	<100	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1
BH30_0.5m	0.5-0.6	26-May-16	ES1611617	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1
Soil HSLs for vapour intrusion - HSL B, sand, 0 m to <1 m[1]				**-**	**45**	**-**	**110**	**-**	**-**	**0.5**	**130**	**55**	**-**	**-**	**40**	**3**
Soil HSLs for vapour intrusion - HSL B, sand, 1 m to <2 m[1]				**-**	**70**	**-**	**240**	**-**	**-**	**0.5**	**220**	**NL**	**-**	**-**	**60**	**NL**
Soil HSLs for vapour intrusion - HSL B, sand, 2 m to <3 m[1]				**-**	**110**	**-**	**440**	**-**	**-**	**0.5**	**310**	**NL**	**-**	**-**	**95**	**NL**
Soil HSLs for vapour intrusion - HSL B, sand, >4 m[1]				**-**	**200**	**-**	**NL**	**-**	**-**	**0.5**	**540**	**NL**	**-**	**-**	**170**	**NL**
Soil HSLs for Dermal Contact - HSL B, sand[2]				**5,600**	**-**	**4,200**	**-**	**5,800**	**8,100**	**140**	**21,000**	**5,900**	**-**	**-**	**17,000**	**1,400**
Soil HSLs for intrusive maintenance workers (shallow trench) - sand, 0 m to <2m[2]				**NL**	**-**	**NL**	**-**	**-**		**77**	**NL**	**NL**	**-**	**-**	**NL**	**NL**
Soil HSLs for intrusive maintenance workers (shallow trench) - sand, 2 m to <4m[2]				**NL**	**-**	**NL**	**-**	**-**		**160**	**NL**	**NL**	**-**	**-**	**NL**	**NL**
Soil HSLs for intrusive maintenance workers (shallow trench) - sand, >4m[2]				**NL**	**-**	**NL**	**-**	**-**		**NL**	**NL**	**NL**	**-**	**-**	**NL**	**NL**
Soil HSLs for Dermal Contact - Maintenance workers (shallow trench), sand[2]				**82,000**	**-**	**62,000**	**-**	**85,000**	**120,000**	**1,100**	**120,000**	**85,000**	**-**	**-**	**130,000**	**29,000**
Commercial areas																
BH18_3.0m	3.0-3.1	25-May-16	ES1611617	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1
BH19_1.0m	0.9-1.0	26-May-16	ES1611617	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1
BH20_3.0m	3.0-3.1	26-May-16	ES1611617	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1
BH24_0.1m	0.2-0.3	25-May-16	ES1611617	<10	<10	<50	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<1
Soil HSLs for vapour intrusion - HSL D, sand, 0 m to <1 m[1]				**-**	**260**	**-**	**NL**	**-**	**-**	**3.0**	**NL**	**NL**	**-**	**-**	**230**	**NL**
Soil HSLs for vapour intrusion - HSL D, sand, 1 m to <2 m[1]				**-**	**370**	**-**	**NL**	**-**	**-**	**3.0**	**NL**	**NL**	**-**	**-**	**NL**	**NL**
Soil HSLs for vapour intrusion - HSL D, sand, 2 m to <3 m[1]				**-**	**630**	**-**	**NL**	**-**	**-**	**3.0**	**NL**	**NL**	**-**	**-**	**NL**	**NL**
Soil HSLs for vapour intrusion - HSL D, sand, >4 m[1]				**-**	**NL**	**-**	**NL**	**-**	**-**	**3.0**	**NL**	**NL**	**-**	**-**	**NL**	**NL**
Soil HSLs for Dermal Contact[1]				**26,000**	**-**	**20,000**	**-**	**27,000**	**38,000**	**430**	**99,000**	**27,000**	**-**	**-**	**81,000**	**11,000**
Soil HSLs for intrusive maintenance workers (shallow trench) - sand, 0 m to <2m[2]				**NL**	**-**	**NL**	**-**	**-**		**77**	**NL**	**NL**	**-**	**-**	**NL**	**NL**
Soil HSLs for intrusive maintenance workers (shallow trench) - sand, 2 m to <4m[2]				**NL**	**-**	**NL**	**-**	**-**		**160**	**NL**	**NL**	**-**	**-**	**NL**	**NL**
Soil HSLs for intrusive maintenance workers (shallow trench) - sand, >4m[2]				**NL**	**-**	**NL**	**-**	**-**		**NL**	**NL**	**NL**	**-**	**-**	**NL**	**NL**
Soil HSLs for Dermal Contact - Maintenance workers (shallow trench), sand[2]				**82,000**	**-**	**62,000**	**-**	**85,000**	**120,000**	**1,100**	**120,000**	**85,000**	**-**	**-**	**130,000**	**29,000**

Notes:
All results expressed as mg/kg with the exception of RB which is expressed in µg/L.
F1 = C_6-C_{10} Fraction minus BTEX
F2 = TRH >C_{10}-C_{16} less naphthalene
NL = non limiting
nd = not detected

[1] NEPM National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1) (NEPC, 2013) - soil health screening levels for vapour intrusion
[2] Cooperative Research Centre for Contamination Assessment and Remediation of the Environment (CRC CARE) Technical Report
[3] Ecological screening levels – Commercial and industrial in sands, Schedule B1 Investigation Levels for Soil and Groundwater NEPM (2013).

Bold	Sample concentration exceeds the health criteria
Bold	Sample concentration exceeds the dermal contact criteria

Appendix A - Table 2
Cnr. Hill Road and Holker Street, Sydney Olympic Park NSW, 2127
WSP | Parsons Brinckerhoff Project Reference: 2270089A
Soil analytical results for PAHs

Sample ID	Sample Depth	Sample Date	Laboratory report reference	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benz(a)anthracene	Chrysene	Benzo(b+j)fluoranthene	Benzo(k)fluoranthene	Benzo(a)pyrene	Indeno(1.2.3.cd)pyrene	Dibenz(a.h)anthracene	Benzo(g.h.i)perylene	Sum of PAHs	Benzo(a)pyrene TEQ (zero)
Practical quantitation limit				**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**
Recreational/open space areas																					
BH01_1.0m	1.0-1.1	25-May-16	ES1611617	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH02_2.0m	1.9-2.0	26-May-16	ES1611617	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH03_0.1m	0.2-0.3	24-May-16	ES1611617	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH04_0.5m	0.5-0.6	26-May-16	ES1611617	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH05_2.0m	2.0-2.1	26-May-16	ES1611617	<0.5	<0.5	<0.5	<0.5	3.2	0.8	3.4	2.8	1.3	1.2	1.3	0.6	1	0.5	<0.5	0.7	16.8	1.4
BH06_3.0m	2.9-3.0	26-May-16	ES1611617	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH07_3.0m	2.9-3.0	26-May-16	ES1611617	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH08_2.0m	2.-2.1	26-May-16	ES1611617	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.8	0.8	0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	2.7	<0.5
BH09_1.0m	0.9-1.0	26-May-16	ES1611617	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH10_0.1m	0.2-0.3	26-May-16	ES1611617	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH11_3.0m	0.9-1.0	26-May-16	ES1611617	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH12_2.0m	0.2-0.3	26-May-16	ES1611617	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH13_0.5m	2.0-2.1	26-May-16	ES1611617	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH14_0.1m	0.2-0.3	26-May-16	ES1611617	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH15_1.0m	0.9-1.0	26-May-16	ES1611617	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH16_2.0m	2.0-2.1	25-May-16	ES1611617	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH17_2.0m	2.0-2.1	26-May-16	ES1611617	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH21_1.0m	1.0-1.1	26-May-16	ES1611617	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH22_1.0m	1.0-1.1	26-May-16	ES1611617	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH23_3.0m	2.9-3.0	26-May-16	ES1611617	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH25_2.0m	2.0-2.1	26-May-16	ES1611617	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH26_0.5m	0.5-0.6	26-May-16	ES1611617	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH27_0.5m	0.4-0.5	25-May-16	ES1611617	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.1	<0.5
BH28_3.0m	3.0-3.1	26-May-16	ES1611617	<0.5	<0.5	<0.5	<0.5	1.9	<0.5	3.5	3.4	1.7	1.4	1.8	0.8	1.5	0.7	<0.5	0.8	17.5	2
BH29_1.0m	0.9-1.0	25-May-16	ES1611617	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	1.3	1.2	0.6	<0.5	0.6	<0.5	0.5	<0.5	<0.5	<0.5	4.9	0.6
BH30_0.5m	0.5-0.6	26-May-16	ES1611617	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
HILs for soil contaminants - HIL B[1]				**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**400**	**4**
Commercial areas																					
BH18_3.0m	3.0-3.1	25-May-16	ES1611617	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH19_1.0m	0.9-1.0	26-May-16	ES1611617	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH20_3.0m	3.0-3.1	26-May-16	ES1611617	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH24_0.1m	0.2-0.3	25-May-16	ES1611617	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
HILs for soil contaminants - HIL D[1]				**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**4,000**	**40**

Notes:
All results expressed as mg/kg with the exception of RB which is expressed in µg/L.
NL = non limiting
nd = not detected

[1] NEPM National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1) (NEPC, 2013) - health investigation levels for soil contaminants
[4] Ecological investigation levels – Commercial and industrial in sands, Schedule B1 Investigation Levels for Soil and Groundwater NEPM (2013).
[5] Ecological screening levels – Commercial and industrial in sands, Schedule B1 Investigation Levels for Soil and Groundwater NEPM (2013).

Bold	Sample concentration exceeds the health criteria

Appendix A - Table 3
Cnr. Hill Road and Holker Street, Sydney Olympic Park NSW, 2127
WSP | Parsons Brinckerhoff Project Reference: 2270089A
Soil analytical results for metals and asbestos

Sample ID	Sample Depth	Sample Date	Laboratory report reference	Arsenic	Cadmium	Chromium	Copper	Lead	Nickel	Zinc	Mercury	Asbestos ID in soil
Practical quantitation limit				**5**	**1**	**2**	**5**	**5**	**2**	**5**	**0.1**	**None**
Recreational/open space areas												
BH01_1.0m	1.0-1.1	25-May-16	ES1611617	42	<1	20	92	106	26	116	0.2	**Yes**
BH02_2.0m	1.9-2.0	26-May-16	ES1611617	12	<1	18	71	301	9	448	0.9	**Yes**
BH03_0.1m	0.2-0.3	24-May-16	ES1611617	<5	<1	12	77	5	73	67	<0.1	None
BH04_0.5m	0.5-0.6	26-May-16	ES1611617	10	<1	19	14	29	12	42	0.1	None
BH05_2.0m	2.0-2.1	26-May-16	ES1611617	6	<1	12	38	43	44	87	<0.1	None
BH06_3.0m	2.9-3.0	26-May-16	ES1611617	8	<1	14	68	248	11	209	0.9	None
BH07_3.0m	2.9-3.0	26-May-16	ES1611617	7	<1	22	22	68	6	383	0.1	None
BH08_2.0m	2.-2.1	26-May-16	ES1611617	9	<1	58	42	54	60	258	<0.1	None
BH09_1.0m	0.9-1.0	26-May-16	ES1611617	10	<1	19	18	14	8	40	<0.1	None
BH10_0.1m	0.2-0.3	26-May-16	ES1611617	<5	<1	3	<5	<5	<2	6	<0.1	None
BH11_3.0m	0.9-1.0	26-May-16	ES1611617	10	<1	9	35	32	9	53	<0.1	None
BH12_2.0m	0.2-0.3	26-May-16	ES1611617	6	<1	14	18	43	6	60	<0.1	None
BH13_0.5m	2.0-2.1	26-May-16	ES1611617	<5	<1	9	13	40	10	51	0.2	None
BH14_0.1m	0.2-0.3	26-May-16	ES1611617	<5	<1	12	107	<5	85	37	<0.1	None
BH15_1.0m	0.9-1.0	26-May-16	ES1611617	7	<1	9	8	21	6	21	<0.1	None
BH16_2.0m	2.0-2.1	25-May-16	ES1611617	<5	<1	19	12	77	4	58	<0.1	None
BH17_2.0m	2.0-2.1	26-May-16	ES1611617	16	<1	16	104	893	14	333	0.7	None
BH21_1.0m	1.0-1.1	26-May-16	ES1611617	<5	<1	12	16	27	<2	13	<0.1	None
BH22_1.0m	1.0-1.1	26-May-16	ES1611617	<5	<1	7	<5	18	6	30	<0.1	None
BH23_3.0m	2.9-3.0	26-May-16	ES1611617	<5	<1	9	17	49	6	40	<0.1	None
BH25_2.0m	2.0-2.1	26-May-16	ES1611617	17	<1	18	32	24	6	33	<0.1	None
BH26_0.5m	0.5-0.6	26-May-16	ES1611617	<5	<1	6	5	22	2	30	0.2	None
BH27_0.5m	0.4-0.5	25-May-16	ES1611617	<5	<1	15	42	35	39	242	<0.1	None
BH28_3.0m	3.0-3.1	26-May-16	ES1611617	13	<1	20	57	327	21	805	0.2	None
BH29_1.0m	0.9-1.0	25-May-16	ES1611617	<5	<1	10	190	51	6	171	<0.1	None
BH30_0.5m	0.5-0.6	26-May-16	ES1611617	12	<1	23	26	82	14	60	<0.1	None
B8_1.5	1.5	21-Jul-16	ES1616026	-	-	-	-	-	-	-	-	None
B8_3.0	3.0	21-Jul-16	ES1616026	-	-	-	-	-	-	-	-	**Yes**
C9_0.5	0.5	20-Jul-16	ES1616026	-	-	-	-	-	-	-	-	None
D8_0.5	0.5	20-Jul-16	ES1616026	-	-	-	-	-	-	-	-	None
D8_1.5	1.5	20-Jul-16	ES1616026	-	-	-	-	-	-	-	-	None
D9_0.5	0.5	21-Jul-16	ES1616026	-	-	-	-	-	-	-	-	None
D10_2.0	2.0	21-Jul-16	ES1616026	-	-	-	-	-	-	-	-	None
E6_1.5	1.5	21-Jul-16	ES1616026	-	-	-	-	-	-	-	-	None
E8_2.7	2.7	21-Jul-16	ES1616026	-	-	-	-	-	-	-	-	None
E10_1.5	1.5	20-Jul-16	ES1616026	-	-	-	-	-	-	-	-	None
E11_3.0	3.0	20-Jul-16	ES1616026	-	-	-	-	-	-	-	-	None
F6_2.0	2.0	20-Jul-16	ES1616026	-	-	-	-	-	-	-	-	**Yes**
F8_0.5	0.5	21-Jul-16	ES1616026	-	-	-	-	-	-	-	-	None
F9_1.5	1.5	20-Jul-16	ES1616026	-	-	-	-	-	-	-	-	None
F10_2.0	2.0	20-Jul-16	ES1616026	-	-	-	-	-	-	-	-	None
G4_1.5	1.5	21-Jul-16	ES1616026	-	-	-	-	-	-	-	-	None
G5_3.0	3.0	21-Jul-16	ES1616026	-	-	-	-	-	-	-	-	None
G6_0.5	0.5	21-Jul-16	ES1616026	-	-	-	-	-	-	-	-	None
G8_1.5	1.5	21-Jul-16	ES1616026	-	-	-	-	-	-	-	-	None
G10_0.5	0.5	20-Jul-16	ES1616026	-	-	-	-	-	-	-	-	None
G11_1.0	1.0	20-Jul-16	ES1616026	-	-	-	-	-	-	-	-	None
H4_2.0	2.0	21-Jul-16	ES1616026	-	-	-	-	-	-	-	-	None
H6_1.5	1.5	21-Jul-16	ES1616026	-	-	-	-	-	-	-	-	None
H8_3.0	3.0	21-Jul-16	ES1616026	-	-	-	-	-	-	-	-	None
H9_0.5	0.5	20-Jul-16	ES1616026	-	-	-	-	-	-	-	-	None
H10_1.5	1.5	20-Jul-16	ES1616026	-	-	-	-	-	-	-	-	None
H10_2.5	2.5	20-Jul-16	ES1616026	-	-	-	-	-	-	-	-	None
H11_2.0	2.0	20-Jul-16	ES1616026	-	-	-	-	-	-	-	-	None
I4_3.0	3.0	21-Jul-16	ES1616026	-	-	-	-	-	-	-	-	None
I6_0.5	0.5	21-Jul-16	ES1616026	-	-	-	-	-	-	-	-	None
I7_2.0	2.0	21-Jul-16	ES1616026	-	-	-	-	-	-	-	-	None
I8_2.0	2.0	20-Jul-16	ES1616026	-	-	-	-	-	-	-	-	None
I10_0.5	0.5	20-Jul-16	ES1616026	-	-	-	-	-	-	-	-	None
J5_1.5	1.5	21-Jul-16	ES1616026	-	-	-	-	-	-	-	-	None
J6_0.5	0.5	20-Jul-16	ES1616026	-	-	-	-	-	-	-	-	None
J7_1.0	1.0	20-Jul-16	ES1616026	-	-	-	-	-	-	-	-	None
J9_3.0	3.0	20-Jul-16	ES1616026	-	-	-	-	-	-	-	-	None
K5_3.0	3.0	20-Jul-16	ES1616026	-	-	-	-	-	-	-	-	None
K6_0.5	0.5	20-Jul-16	ES1616026	-	-	-	-	-	-	-	-	None
K7_2.5	2.5	20-Jul-16	ES1616026	-	-	-	-	-	-	-	-	None
A7_1.5	1.5	22-Jul-16	EN1602639	-	-	-	-	-	-	-	-	**Yes**
A7_3.0	3.0	22-Jul-16	EN1602639	-	-	-	-	-	-	-	-	None
C5_1.0	1.0	22-Jul-16	EN1602639	-	-	-	-	-	-	-	-	None
D3_1.2	1.2	22-Jul-16	EN1602639	-	-	-	-	-	-	-	-	None
D5_2.0	2.0	22-Jul-16	EN1602639	-	-	-	-	-	-	-	-	None
E2_2.5	2.5	22-Jul-16	EN1602639	-	-	-	-	-	-	-	-	**Yes**
F1_0.5	0.5	22-Jul-16	EN1602639	-	-	-	-	-	-	-	-	None
F3_1.0	1.0	22-Jul-16	EN1602639	-	-	-	-	-	-	-	-	None
F4_2.0	2.0	22-Jul-16	EN1602639	-	-	-	-	-	-	-	-	None
G1_3.0	3.0	22-Jul-16	EN1602639	-	-	-	-	-	-	-	-	None
G3_0.5	0.5	22-Jul-16	EN1602639	-	-	-	-	-	-	-	-	None
H1_1.0	1.0	22-Jul-16	EN1602639	-	-	-	-	-	-	-	-	None
H2_2.0	2.0	22-Jul-16	EN1602639	-	-	-	-	-	-	-	-	None
D7_2.0	2.0	26-Jul-16	ES1616402	-	-	-	-	-	-	-	-	**Yes**
HILs for soil contaminants - HIL B[1]				**500**	**90**	**500**	**30,000**	**1,200**	**1,200**	**60,000**	**120**	**None**
Commercial areas												
BH18_3.0m	3.0-3.1	25-May-16	ES1611617	13	<1	28	47	87	15	124	0.2	None
BH19_1.0m	0.9-1.0	26-May-16	ES1611617	<5	<1	8	<5	8	<2	10	<0.1	None
BH20_3.0m	3.0-3.1	26-May-16	ES1611617	<5	<1	8	30	13	17	74	<0.1	None
BH24_0.1m	0.2-0.3	25-May-16	ES1611617	<5	<1	13	97	<5	90	38	<0.1	None
L8_1.2	1.2	20-Jul-16	ES1616026	-	-	-	-	-	-	-	-	None
M6_1.8	1.8	20-Jul-16	ES1616026	-	-	-	-	-	-	-	-	None
J3_2.0	2	26-Jul-16	ES1616402	-	-	-	-	-	-	-	-	None
HILs for soil contaminants - HIL D[1]				**3,000**	**900**	**3,600**	**240,000**	**1,500**	**730**	**6000**	**730**	**None**

Notes:
All results expressed as mg/kg with the exception of RB which is expressed in µg/L.
NL = non limiting
nd = not detected
NAD = No Asbestos Detected
CH = Chrysotile Asbestos Detected

[1] NEPM National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1) (NEPC, 2013) - health investigation levels for soil contaminants
[2] Ecological investigation levels – Commercial and industrial in sands, Schedule B1 Investigation Levels for Soil and Groundwater NEPM (2013).
[3] NEPM National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1) (NEPC, 2013) - health investigation levels for soil contaminants
[4] Ecological investigation levels – Residential A in sands, Schedule B1 Investigation Levels for Soil and Groundwater NEPM (2013).

Bold	Sample concentration exceeds the health criteria

Appendix A - Table 4
Cnr. Hill Road and Holker Street, Sydney Olympic Park NSW, 2127
WSP | Parsons Brinckerhoff Project Reference: 2270089A
Soil analytical results for OCPs and PCBs

Sample ID	Sample depth	Sample Date	Laboratory report reference	Pesticides																					Total PCBs
				a-BHC	Hexachlorobenzene	b-BHC	g-BHC (Lindane)	d-BHC	Heptachlor	Heptachlor epoxide	Aldrin	Dieldrin	trans-Chlordane	cis-Chlordane	4,4'-DDT	4,4'-DDE	4,4'-DDD	Endrin	Endrin aldehyde	Endrin ketone	alpha-Endosulfan	beta-Endosulfan	Endosulfan sulfate	Methoxychlor	
Practical quantitation limit				**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.20**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.2**	**0.1**
Recreational/open space areas																									
BH01_1.0m	1.0-1.1	25-May-16	ES1611617	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.1
BH05_2.0m	2.0-2.1	26-May-16	ES1611617	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.1
BH06_3.0m	2.9-3.0	26-May-16	ES1611617	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.1
BH10_0.1m	0.2-0.3	26-May-16	ES1611617	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.1
BH14_0.1m	0.2-0.3	26-May-16	ES1611617	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.1
BH22_1.0m	1.0-1.1	26-May-16	ES1611617	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.1
BH28_3.0m	3.0-3.1	26-May-16	ES1611617	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.1
BH29_1.0m	0.9-1.0	25-May-16	ES1611617	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.1
HILs for soil contaminants - HIL B[1]				**-**	**-**	**-**	**-**	**-**	**10**		**10**		**90**		**600**			**20**			**400**			**500**	**1**
Commercial areas																									
BH18_3.0m	3.0-3.1	25-May-16	ES1611617	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.1
HILs for soil contaminants - HIL D[1]				**-**	**-**	**-**	**-**	**-**	**50**		**45**		**530**		**3600**			**100**			**2000**			**2500**	**7**

Notes:
All results expressed as mg/kg with the exception of RB which is expressed in µg/L.
NL = non limiting
nd = not detected

[1] NEPM National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1) (NEPC, 2013) - health investigation levels for soil contaminants

Bold Sample concentration exceeds the health criteria

Appendix A - Table 5
Cnr. Hill Road and Holker Street, Sydney Olympic Park NSW, 2127
WSP | Parsons Brinckerhoff Project Reference: 2270089A
QAQC results

Chem Group	Chem ID	Well ID Sample Date EQL	BH06_3.0m 26-May-16	QAQC01 26-May-16	RPD	BH22_1.0m 26-May-16	QAQC01a 26-May-16	RPD	BH06_3.0m 26-May-16	QAQC02 26-May-16	RPD	BH22_1.0m 26-May-16	QAQC02a 26-May-16	RPD
TRH	C6-C10	10	<10	<10	0%	<10	<25	0%	<10	<10	0%	<10	<25	0%
	>C10-C16	50	<50	<50	0%	<50	<50	0%	<50	<50	0%	<50	<50	0%
	>C16-C34	100	<100	<100	0%	<100	<100	0%	<100	<100	0%	<100	<100	0%
	>C34-C40	100	<100	<100	0%	<100	<100	0%	<100	<100	0%	<100	<100	0%
BTEX	Benzene	0.2	<0.2	<0.2	0%	<0.2	<0.2	0%	<0.2	<0.2	0%	<0.1	<0.2	0%
	Toluene	0.5	<0.5	<0.5	0%	<0.5	<0.5	0%	<0.5	<0.5	0%	<0.1	<0.5	0%
	Ethyl benzene	0.5	<0.5	<0.5	0%	<0.5	<1	0%	<0.5	<0.5	0%	<0.1	<1	0%
	Xylene (m&p)	0.5	<0.5	<0.5	0%	<0.5	<2	0%	<0.5	<0.5	0%	<0.2	<2	0%
	Xylene (o)	0.5	<0.5	<0.5	0%	<0.5	<1	0%	<0.5	<0.5	0%	<0.1	<1	0%
PAHs	Naphthalene	0.5	<0.5	<0.5	0%	<0.5	<0.1	0%	<0.5	<0.5	0%	<0.5	<0.1	0%
	Acenaphthylene	0.5	<0.5	<0.5	0%	<0.5	<0.1	0%	<0.5	<0.5	0%	<0.5	<0.1	0%
	Acenaphthene	0.5	<0.5	<0.5	0%	<0.5	<0.1	0%	<0.5	<0.5	0%	<0.5	<0.1	0%
	Fluorene	0.5	<0.5	<0.5	0%	<0.5	<0.1	0%	<0.5	<0.5	0%	<0.5	<0.1	0%
	Phenanthrene	0.5	<0.5	<0.5	0%	<0.5	0.5	0%	<0.5	<0.5	0%	<0.5	<0.1	0%
	Anthracene	0.5	<0.5	<0.5	0%	<0.5	<0.1	0%	<0.5	<0.5	0%	<0.5	<0.1	0%
	Fluoranthene	0.5	<0.5	<0.5	0%	<0.5	0.5	0%	<0.5	<0.5	0%	<0.5	<0.1	0%
	Pyrene	0.5	<0.5	<0.5	0%	<0.5	0.5	0%	<0.5	<0.5	0%	<0.5	<0.1	0%
	Benz(a)anthracene	0.5	<0.5	<0.5	0%	<0.5	0.2	0%	<0.5	<0.5	0%	<0.5	<0.1	0%
	Chrysene	0.5	<0.5	<0.5	0%	<0.5	0.2	0%	<0.5	<0.5	0%	<0.5	<0.1	0%
	Benzo(b+j)fluoranthene	0.5	<0.5	<0.5	0%	<0.5	0.3	0%	<0.5	<0.5	0%	<0.5	<0.1	0%
	Benzo(k)fluoranthene	0.5	<0.5	<0.5	0%	<0.5	0.3	0%	<0.5	<0.5	0%	<0.5	<0.1	0%
	Benzo(a)pyrene	0.5	<0.5	<0.5	0%	<0.5	0.1	0%	<0.5	<0.5	0%	<0.5	0.1	0%
	Indeno(1.2.3.cd)pyrene	0.5	<0.5	<0.5	0%	<0.5	<0.1	0%	<0.5	<0.5	0%	<0.5	<0.1	0%
	Dibenz(a.h)anthracene	0.5	<0.5	<0.5	0%	<0.5	<0.1	0%	<0.5	<0.5	0%	<0.5	<0.1	0%
	Benzo(g.h.i)perylene	0.5	<0.5	<0.5	0%	<0.5	<0.1	0%	<0.5	<0.5	0%	<0.5	<0.1	0%
Metals	Arsenic	5	8	8	0%	7	9	25%	<5	<5	-	<5	<5	-
	Cadmium	1	<1	<1	-	<1	<0.4	-	<1	<1	-	<1	<0.4	-
	Chromium	2	14	16	13%	22	29	27%	7	8	13%	7	7	0%
	Copper	5	68	29	**80%**	22	16	32%	<5	<5	-	<5	2	-
	Lead	5	248	148	**51%**	68	63	8%	18	15	18%	18	18	0%
	Nickel	5	11	12	9%	6	9	40%	6	3	**67%**	6	3	**67%**
	Zinc	2	209	258	21%	383	110	**111%**	30	24	22%	30	24	22%
	Mercury	0.1	0.9	0.2	**127%**	0.1	<0.1	-	<0.1	<0.1	-	<0.1	<0.1	-

Notes:
All results expressed as mg/kg with the exception of RB which is expressed in µg/L.

Bold	Result exceeds RPD criteria

Appendix D

LABORATORY REPORTS AND DOCUMENTATION

PARSONS BRINCKERHOFF

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☒ **Sydney** Level 27, Ernst & Young Centre 680 George Street, GPO Box 5394, Sydney NSW 2001 Tel: (02) 9272 5100 Fax: (02) 9272 5101

Chain of Custody

CoC 1 of 6

Order No: 81685

Job Title: Wave Park Group DSI	PB Job Number: 22700089A	Job Location: Sydney Olympic Park	Project Manager: Daniel Smith
Laboratory Name: ALS	Terms of Business / PB / Other / Checked		Results Expected by/on: 06/06/16
Address: Smithfield			Fax Results to: Smith.D2@pbworld.com
Fax Number:			Fax Number:
Phone Number:			Phone Number:
Contact Name:			Spreadsheet of Results Required: (Y) / N
Delivery Method: Courier			Format: Excel
Quote Number: EN-085-15			Turnaround Time Required: Standard
			Invoice to:
			Comments:

Date Sampled	Time	Sample I.D.	Container Size	Sample Location	Medium*	Preservative Type	Filtered (X)	TPH	BTEX	PAH's	OC/OP/PCB's	Metals**	S-26	S-12	KP066	Asbestos*			Initials	Comments/Additional Information and/or Analysis Required
25/05/16	1	BH01 - 1.0m											X	X	X	X				S-26: TRH/BTEX/PAH/Metals(8)
26/05/16	2	BH02 - 2.0m											X			X				S-12: OCP, OPP,
24/05/16	3	BH03 - 0.1m											X			X				KP066: PCBs
24/05/16	4	BH04 - 0.5m											X			X				Asbestos: Presence/Absence.
26/05/16	5	BH05 - 2.0m											X	X	X	X				
"	6	BH06 - 3.0m											X	X	X	X				
"	7	BH07 - 3.0m											X			X				
"	8	BH08 - 2.0m											X			X				Quote EN-085-15
"	9	BH09 - 1.0m											X			X				
"	10	BH10 - 0.1m											X	X	X	X				
"	11	BH11 - 3.0m											X			X				
"	12	BH12 - 2.0m											X			X				

SPLIT INTO ES1611618

Subcon / Forwarded Lab / Split WO
Lab / Analysis: Newcastle Asbestos
Organised by / Date: ENVIROLAB: 26/05/16
Relinquished by / Date:
Connote / Courier:
WO No: ES1611617
Attach Pink Slip / Additional Sheet:

Relinquished by:	Relinquished by:	Relinquished by:
Date & Time: 26/05/16	Date & Time:	Date & Time:
Company: PB	Company:	Company:
Signature:	Signature:	Signature:
Received in Good Order & Condition by (Name): Frank	Received in Good Order & Condition by (N	Received in Good Order & Condition by (Name):
Date & Time: 30-5-16 1500	Date & Time:	Date & Time:
Company: ALS	Company:	Company:
Signature:	Signature:	Signature:

Environmental Division
Sydney
Work Order Reference
ES1611617

Telephone : +61-2-8784 8555

Medium*: S = Soil, W = Water, V = Vapour

Legend**: (circle the following to be tested)

Metals: Al As Be Cd Co Cr Cu Fe Hg Li Mg Mn Ni Pb Se Sn V Zn

Samples on Ice: ☒ Yes ☐ No

Please fax back a signed copy when samples are received at the laboratory

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COC 2 of 6

Chain of Custody

Order No: 81686

Job Title:	PB Job Number:	Job Location:	Project Manager:
			Results Expected by/on:
Laboratory Name:	Terms of Business	PB / Other	Checked	Fax Results to:
Address:				Fax Number:
				Phone Number:
Fax Number:				Spreadsheet of Results Required: Y / N
Phone Number:				Format:
Contact Name:				Turnaround Time Required:
Delivery Method:				Invoice to:
Quote Number:				Comments:

COC 1

Date Sampled	Time	Sample I.D.	Container Size	Sample Location	Medium*	Preservative Type	Filtered (X)	TPH	BTEX	PAHs	OC/OP/PCBs	Metals**	S-26	S-12	KP066	Asbestos			Initials	Comments/Additional Information and/or Analysis Required
26/05/16	13	BH13 - 0.5m											X			X				
"	14	BH14 - 0.1m											X	X	X	X				
"	15	BH15 - 1.0m											X			X				
25/05/16	16	BH16 - 2.0m											X			X				
26/05/16	17	BH17 - 2.0m											X			X				
25/05/16	18	BH18 - 3.0m											X	X	X	X				
26/05/16	19	BH19 - 1.0m											X			X				
"	20	BH20 - 3.0m											X			X				
"	21	BH21 - 1.0m											X			X				
"	22	BH22 - 1.0m											X	X	X	X				
"	23	BH23 - 3.0m											X			X				
25/05/16	24	BH24 - 0.1m											X			X				

Relinquished by:	Relinquished by:	Relinquished by:	Medium*: S = Soil, W = Water, V = Vapour
Date & Time:	Date & Time:	Date & Time:	Legend**: (circle the following to be tested)
Company:	Company:	Company:	Metals: Al As Be Cd Co Cr Cu Fe Hg Li Mg Mn Ni Pb Se Sn V Zn
Signature:	Signature:	Signature:	
Received in Good Order & Condition by (Name): Frank	Received in Good Order & Condition by (Name):	Received in Good Order & Condition by (Name):	Samples on Ice: ☐ Yes ☐ No
Date & Time: 30-5-16 1500	Date & Time:	Date & Time:	***Please fax back a signed copy when samples are received at the laboratory***
Company: ACS	Company:	Company:	
Signature:	Signature:	Signature:	

PARSONS BRINCKERHOFF

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❑ **Sydney** Level 27, Ernst & Young Centre 680 George Street, GPO Box 5394, Sydney NSW 2001 Tel: (02) 9272 5100 Fax: (02) 9272 5101

COC 3 of 6

Chain of Custody

Order No: 81687

Job Title: Wax Park Grap DSI	PB Job Number: 2270089A	Job Location: Sydney Olympic Park	Project Manager: Daniel Smith
Laboratory Name: ALS	Terms of Business: PB X	Other	Checked	Results Expected by/on: 06/06/16
Address: Smithfield			Fax Results to: DSmith@pbworld.com
Fax Number:			Fax Number:
Phone Number:			Phone Number:
Contact Name:			Spreadsheet of Results Required: (Y) / N
Delivery Method:			Format:
Quote Number:			Turnaround Time Required: STANDARD
			Invoice to:
			Comments:

Date Sampled	Time	Sample I.D.	Container Size	Sample Location	Medium*	Preservative Type	Filtered (X)	TPH	BTEX	PAH's	OC/OP/PCBs	Metals**	S-26/HW26	S-12	EP066	Asbestos*			Initials	Comments/Additional Information and/or Analysis Required
26/05/16	25	BH25-2.0m											X			X				S-26: TRH/BTEX/PAH/8 heavy Metals
26/05/16	26	BH26-0.5m											X	X	X	X				S-12: OCP/OPP
25/05/16	27	BH27-0.5m											X			X				EP066: PCBs
26/05/16	28	BH28-3.0m											X	X	X	X				Asbestos: presence/absence.
25/05/16	29	BH29-1.0m											X	X	X	X				
26/05/16	30	BH30-0.5m											X			X				
26/05/16	31	QAQC01											X	X	X	X				
26/05/16	32	QAQC02											X	X	X	X				
26/05/16	—	QAQC01a											X	X	X	X				Please forward to Envirolab
26/05/16	—	QAQC02a											X	X	X	X				
25/05/16	33	RB01											X							
24/05/16	34	RB02											X							

Relinquished by: Daniel Smith	Relinquished by:	Relinquished by:
Date & Time: 26/05/16	Date & Time:	Date & Time:
Company: PB	Company:	Company:
Signature:	Signature:	Signature:
Received in Good Order & Condition by (Name): Frank	Received in Good Order & Condition by (Name):	Received in Good Order & Condition by (Name):
Date & Time: 30-5-16 1500	Date & Time:	Date & Time:
Company: ALS	Company:	Company:
Signature:	Signature:	Signature:

Medium*: S = Soil, W = Water, V = Vapour

Legend**: (circle the following to be tested)

Metals: Al As Be Cd Co Cr Cu Fe Hg Li Mg Mn Ni Pb Se Sn V Zn

Samples on Ice: ☒ Yes ☐ No

Please fax back a signed copy when samples are received at the laboratory

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❑ **Sydney** Level 27, Ernst & Young Centre 680 George Street, GPO Box 5394, Sydney NSW 2001 Tel: (02) 9272 5100 Fax: (02) 9272 5101

Chain of Custody

COC 4 of 6

Order No: 81688

Job Title:	PB Job Number:	Job Location:	Project Manager:
			Results Expected by/on:
Laboratory Name:	Terms of Business	PB / Other	Checked	Fax Results to:
Address:			Fax Number:
			Phone Number:
Fax Number:			Spreadsheet of Results Required: Y / N
Phone Number:			Format:
Contact Name:			Turnaround Time Required:
Delivery Method:			Invoice to:
Quote Number:			Comments:

Date Sampled	Time	Sample I.D.	Container Size	Sample Location	Medium*	Preservative Type	Filtered (X)	TPH	BTEX	PAH's	OC/OP/PCB's	Metals**								Initials	Comments/Additional Information and/or Analysis Required
													6W-26	Hold							
25/05/16	35	RB03											X								
26/05/16	36	RB04											X								
26/05/16	37-39	TB01 | TS01 | TSC						X	X												
25/05/16		BH01_0.1/0.5/2.0/3.0												X							
26/05/16		BH02_0.1/0.5/1.0/3.0												X							
24/05/16		BH03_0.5/1.0/2.0/3.0												X							
24/05/16		BH04_0.1/1.0/2.0/3.0												X							
26/05/16		BH05_0.1/0.5/1.0/3.0												X							
"		BH06_0.1/0.5/1.0/2.0												X							
"		BH07_0.1/0.5/1.0/2.0												X							
"		BH08_0.1/0.5/1.0/3.0												X							
"		BH09_0.1/0.5/2.0/3.0												X							

Relinquished by:	Relinquished by:	Relinquished by:	Medium*: S = Soil, W = Water, V = Vapour
Date & Time:	Date & Time:	Date & Time:	Legend**: (circle the following to be tested)
Company:	Company:	Company:	Metals: Al As Be Cd Co Cr Cu Fe Hg Li Mg Mn Ni Pb Se Sn V Zn
Signature:	Signature:	Signature:	
Received in Good Order & Condition by (Name): Frank	Received in Good Order & Condition by (Name):	Received in Good Order & Condition by (Name):	Samples on Ice: ☐ Yes ☐ No
Date & Time: 30-5-16 1500	Date & Time:	Date & Time:	***Please fax back a signed copy when samples are received at the laboratory***
Company: PS	Company:	Company:	
Signature:	Signature:	Signature:	

PARSONS BRINCKERHOFF

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Yellow Page - Project File Copy
Pink Page - Remains in Book

ABN 80 078 004 798

❑ **Adelaide** Level 16, 1 King William Street, GPO Box 398 Adelaide SA 5001 Tel: (08) 8405 4300 Fax: (08) 8405 4301

❑ **Perth** Level 5, 503 Murray Street, PO Box 7181 Cloisters Square WA 6850 Tel: (08) 9489 9700 Fax: (08) 9489 9777

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Chain of Custody

COC 5 of 6

Order No: 81689

Job Title:

PB Job Number:

Job Location:

Project Manager:

Results Expected by/on:

Laboratory Name:

Address:

Fax Number:

Phone Number:

Contact Name:

Delivery Method:

Quote Number:

Terms of Business	PB	Other	Checked

Fax Results to:

Fax Number:

Phone Number:

Spreadsheet of Results Required: Y / N

Format:

Turnaround Time Required:

Invoice to:

Comments:

See COC 1

Date Sampled	Time	Sample I.D.	Container Size	Sample Location	Medium*	Preservative Type	Filtered (X)	TPH	BTEX	PAHs	OC/OP/PCBs	Metals**	Hold						Initials	Comments/Additional Information and/or Analysis Required
26/05/16		BH10_0.5/1.0/2.0/3.0											X							
"		BH11_0.1/0.5/1.0/2.0											X							
"		BH12_0.1/0.5/1.0/3.0											X							
"		BH13_0.1/1.0/2.0/3.0											X							
"		BH14_0.5/1.0/2.0/3.0											X							
"		BH15_0.1/0.5/2.0/3.0											X							
27/05/16		BH16_0.1/0.5/1.0/3.0											X							
26/05/16		BH17_0.1/0.5/1.0/3.0											X							
27/05/16		BH18_0.1/0.5/1.0/2.0											X							
26/05/16		BH19_0.1/0.5/2.0/3.0											X							
"		BH20_0.1/0.5/1.0/2.0											X							
"		BH21_0.1/0.5/2.0/3.0											X							

Relinquished by:	Relinquished by:	Relinquished by:	Medium*: S = Soil, W = Water, V = Vapour
Date & Time:	Date & Time:	Date & Time:	Legend**: (circle the following to be tested)
Company:	Company:	Company:	Metals: Al As Be Cd Co Cr Cu Fe Hg Li Mg Mn Ni Pb Se Sn V Zn
Signature:	Signature:	Signature:	
Received in Good Order & Condition by (Name): Frank	Received in Good Order & Condition by (Name):	Received in Good Order & Condition by (Name):	Samples on Ice: ☐ Yes ☐ No
Date & Time: 30-5-16 1500	Date & Time:	Date & Time:	***Please fax back a signed copy when samples are received at the laboratory***
Company: Arg	Company:	Company:	
Signature:	Signature:	Signature:	

PARSONS BRINCKERHOFF

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Pink Page - Remains in Book

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Chain of Custody

COC 6 of 6

Order No: 81690

Job Title:	PB Job Number:	Job Location:	Project Manager:
			Results Expected by/on:
Laboratory Name:	Terms of Business	PB / Other / Checked	Fax Results to:
Address:			Fax Number:
			Phone Number:
Fax Number:			Spreadsheet of Results Required: Y / N
Phone Number:			Format:
Contact Name:			Turnaround Time Required:
Delivery Method:			Invoice to:
Quote Number:			Comments:

SAC COC1

SAC COC1

Date Sampled	Time	Sample I.D.	Container Size	Sample Location	Medium*	Preservative Type	Filtered (X)	TPH	BTEX	PAH's	OC/OP/PCBs	Metals**	Hold						Initials	Comments/Additional Information and/or Analysis Required
26/05/16		BH22_0.1/0.5/2.0/3.0											X							
26/05/16		BH23_0.1/0.5/1.0/2.0											X							
25/05/16		BH24_0.5/1.0/2.0/3.0											X							
26/05/16		BH25_0.1/0.5/1.0/3.0											X							
"		BH26_0.1/1.0/2.0/3.0											X							
25/05/16		BH27_0.1/1.0/2.0/3.0											X							
26/05/16		BH28_0.1/0.5/1.0/2.0											X							
25/05/16		BH29_0.1/0.5/2.0/3.0											X							
26/05/16		BH30_0.1/1.0/2.0/3.0											X							

Relinquished by:	Relinquished by:	Relinquished by:	Medium*: S = Soil, W = Water, V = Vapour
Date & Time:	Date & Time:	Date & Time:	Legend**: (circle the following to be tested)
Company:	Company:	Company:	Metals: Al As Be Cd Co Cr Cu Fe Hg
Signature:	Signature:	Signature:	Li Mg Mn Ni Pb Se Sn V Zn
Received in Good Order & Condition by (Name): Frank	Received in Good Order & Condition by (Name):	Received in Good Order & Condition by (Name):	Samples on Ice: ❑ Yes ❑ No
Date & Time: 30-5-16 1500	Date & Time:	Date & Time:	***Please fax back a signed copy when samples are received at the laboratory***
Company: ASS	Company:	Company:	
Signature:	Signature:	Signature:	

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1611617**	Page	: 1 of 34
Client	: **PARSONS BRINCKERHOFF AUSTRALIA PTY LIMITED**	Laboratory	: Environmental Division Sydney
Contact	: DANIEL SMITH	Contact	: Loren Schiavon
Address	: ABN: 80 078 004 798 GPO BOX 5394 SYDNEY NSW, AUSTRALIA 2001	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 92725100	Telephone	: +61 2 8784 8503
Project	: 2270089A WAVE PARK GROUP DSI	Date Samples Received	: 30-May-2016 15:00
Order number	: ----	Date Analysis Commenced	: 31-May-2016
C-O-C number	: 81685-90	Issue Date	: 06-Jun-2016 16:25
Sampler	: ----		
Site	: SYDNEY OLYMPIC PARK		
Quote number	: ----		
No. of samples received	: 39		
No. of samples analysed	: 39		

NATA Accredited Laboratory 825
Accredited for compliance with
ISO/IEC 17025.

NATA
WORLD RECOGNISED ACCREDITATION

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Pabi Subba	Senior Organic Chemist	Sydney Organics, Smithfield, NSW
Shaun Spooner	Asbestos Identifier	Newcastle - Asbestos, Mayfield West, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP071: Samples not received in a suitable time frame to conduct the analysis TPH within the recommended holding time.
- EP080: The trip spike and its control have been analysed for volatile TPH and BTEX only. The trip spike and control were prepared in the lab using reagent grade sand spiked with petrol. The spike was dispatched from the lab and the control retained.
- **EA200: As only one sample container was submitted for multiple tests, sub sampling was conducted prior to Asbestos analysis. As this has the potential to understate detection, results should be scrutinised accordingly and NATA accreditation does not apply to analysis on these samples.**
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Trace' - Asbestos fibres ("Free Fibres") detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200 Legend
- EA200 'Ch' Chrysotile (white asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EA200: For samples larger than 30g, the <2mm fraction may be sub-sampled prior to trace analysis as outlined in ISO23909:2008(E) Sect 6.3.2-2
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	BH01_1.0m	BH02_2.0m	BH03_0.1m	BH04_0.5m	BH05_2.0m
			Client sampling date / time	[25-May-2016]	[26-May-2016]	[24-May-2016]	[24-May-2016]	[26-May-2016]
Compound	CAS Number	LOR	Unit	ES1611617-001	ES1611617-002	ES1611617-003	ES1611617-004	ES1611617-005
				Result	Result	Result	Result	Result
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1	%	12.6	13.7	7.8	16.1	15.1
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	Yes	Yes	No	No	No
Asbestos Type	1332-21-4	-	--	Ch + Am	Ch	-	-	-
Sample weight (dry)	----	0.01	g	38.8	49.7	67.1	39.6	55.8
APPROVED IDENTIFIER:	----	-	--	S.SPOONER	S.SPOONER	S.SPOONER	S.SPOONER	S.SPOONER
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	42	12	<5	10	6
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	20	18	12	19	12
Copper	7440-50-8	5	mg/kg	92	71	77	14	38
Lead	7439-92-1	5	mg/kg	106	301	5	29	43
Nickel	7440-02-0	2	mg/kg	26	9	73	12	44
Zinc	7440-66-6	5	mg/kg	116	448	67	42	87
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	0.2	0.9	<0.1	0.1	<0.1
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	----	----	----	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	----	----	----	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	----	----	----	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	----	----	----	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	----	----	----	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	----	----	----	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	----	----	----	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	----	----	----	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	----	----	----	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	----	----	----	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	----	----	----	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	----	----	----	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	----	----	----	<0.05
Dieldrin	60-57-1	0.05	mg/kg	<0.05	----	----	----	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	----	----	----	<0.05
Endrin	72-20-8	0.05	mg/kg	<0.05	----	----	----	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	BH01_1.0m	BH02_2.0m	BH03_0.1m	BH04_0.5m	BH05_2.0m
			Client sampling date / time	[25-May-2016]	[26-May-2016]	[24-May-2016]	[24-May-2016]	[26-May-2016]
Compound	CAS Number	LOR	Unit	ES1611617-001	ES1611617-002	ES1611617-003	ES1611617-004	ES1611617-005
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	----	----	----	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	----	----	----	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	----	----	----	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	----	----	----	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	----	----	----	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	----	----	----	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	----	----	----	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	----	----	----	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	----	----	----	<0.05
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg	<0.05	----	----	----	<0.05
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	----	----	----	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	----	----	----	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	----	----	----	<0.2
Dimethoate	60-51-5	0.05	mg/kg	<0.05	----	----	----	<0.05
Diazinon	333-41-5	0.05	mg/kg	<0.05	----	----	----	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	----	----	----	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	----	----	----	<0.2
Malathion	121-75-5	0.05	mg/kg	<0.05	----	----	----	<0.05
Fenthion	55-38-9	0.05	mg/kg	<0.05	----	----	----	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	----	----	----	<0.05
Parathion	56-38-2	0.2	mg/kg	<0.2	----	----	----	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	----	----	----	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	----	----	----	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	----	----	----	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	----	----	----	<0.05
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	----	----	----	<0.05
Ethion	563-12-2	0.05	mg/kg	<0.05	----	----	----	<0.05
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	----	----	----	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	----	----	----	<0.05
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	BH01_1.0m	BH02_2.0m	BH03_0.1m	BH04_0.5m	BH05_2.0m
			Client sampling date / time	[25-May-2016]	[26-May-2016]	[24-May-2016]	[24-May-2016]	[26-May-2016]
Compound	CAS Number	LOR	Unit	ES1611617-001	ES1611617-002	ES1611617-003	ES1611617-004	ES1611617-005
				Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	3.2
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	0.8
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	3.4
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	2.8
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	1.3
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	1.2
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	1.3
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	0.6
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	1.0
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	0.7
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	16.8
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	1.4
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	0.6	0.6	0.6	0.6	1.6
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	1.2	1.2	1.2	1.2	1.9
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080: BTEXN								

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	BH01_1.0m	BH02_2.0m	BH03_0.1m	BH04_0.5m	BH05_2.0m
			Client sampling date / time	[25-May-2016]	[26-May-2016]	[24-May-2016]	[24-May-2016]	[26-May-2016]
Compound	CAS Number	LOR	Unit	ES1611617-001	ES1611617-002	ES1611617-003	ES1611617-004	ES1611617-005
				Result	Result	Result	Result	Result
EP080: BTEXN - Continued								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	105	----	----	----	99.2
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	108	----	----	----	122
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	71.4	----	----	----	70.8
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	89.1	82.1	90.9	89.1	100
2-Chlorophenol-D4	93951-73-6	0.5	%	91.0	85.8	82.2	81.1	90.8
2.4.6-Tribromophenol	118-79-6	0.5	%	88.2	99.6	94.0	89.3	100
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	88.7	88.2	87.5	85.4	86.4
Anthracene-d10	1719-06-8	0.5	%	96.0	95.7	104	101	91.9
4-Terphenyl-d14	1718-51-0	0.5	%	80.7	83.8	83.9	84.2	81.8
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	92.6	107	98.7	99.7	114
Toluene-D8	2037-26-5	0.2	%	118	122	116	115	130
4-Bromofluorobenzene	460-00-4	0.2	%	106	111	107	106	122

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	BH06_3.0m	BH07_3.0m	BH08_2.0m	BH09_1.0m	BH10_0.1m
			Client sampling date / time	[26-May-2016]	[26-May-2016]	[26-May-2016]	[26-May-2016]	[26-May-2016]
Compound	CAS Number	LOR	Unit	ES1611617-006	ES1611617-007	ES1611617-008	ES1611617-009	ES1611617-010
				Result	Result	Result	Result	Result
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1	%	16.5	15.4	8.5	19.4	1.6
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	No	No
Asbestos Type	1332-21-4	-	--	-	-	-	-	-
Sample weight (dry)	----	0.01	g	37.7	33.1	38.1	38.2	74.2
APPROVED IDENTIFIER:	----	-	--	S.SPOONER	S.SPOONER	S.SPOONER	S.SPOONER	S.SPOONER
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	8	7	6	10	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	14	22	58	19	3
Copper	7440-50-8	5	mg/kg	68	22	42	18	<5
Lead	7439-92-1	5	mg/kg	248	68	54	14	<5
Nickel	7440-02-0	2	mg/kg	11	6	60	8	<2
Zinc	7440-66-6	5	mg/kg	209	383	258	40	6
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	0.9	0.1	<0.1	<0.1	<0.1
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	----	----	----	<0.1
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	----	----	----	<0.05
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	----	----	----	<0.05
beta-BHC	319-85-7	0.05	mg/kg	<0.05	----	----	----	<0.05
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	----	----	----	<0.05
delta-BHC	319-86-8	0.05	mg/kg	<0.05	----	----	----	<0.05
Heptachlor	76-44-8	0.05	mg/kg	<0.05	----	----	----	<0.05
Aldrin	309-00-2	0.05	mg/kg	<0.05	----	----	----	<0.05
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	----	----	----	<0.05
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	----	----	----	<0.05
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	----	----	----	<0.05
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	----	----	----	<0.05
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	----	----	----	<0.05
Dieldrin	60-57-1	0.05	mg/kg	<0.05	----	----	----	<0.05
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	----	----	----	<0.05
Endrin	72-20-8	0.05	mg/kg	<0.05	----	----	----	<0.05

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	BH06_3.0m	BH07_3.0m	BH08_2.0m	BH09_1.0m	BH10_0.1m
			Client sampling date / time	[26-May-2016]	[26-May-2016]	[26-May-2016]	[26-May-2016]	[26-May-2016]
Compound	CAS Number	LOR	Unit	ES1611617-006	ES1611617-007	ES1611617-008	ES1611617-009	ES1611617-010
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	----	----	----	<0.05
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	----	----	----	<0.05
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	----	----	----	<0.05
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	----	----	----	<0.05
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	----	----	----	<0.05
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	----	----	----	<0.2
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	----	----	----	<0.05
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	----	----	----	<0.2
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	----	----	----	<0.05
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg	<0.05	----	----	----	<0.05
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	----	----	----	<0.05
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	----	----	----	<0.05
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	----	----	----	<0.2
Dimethoate	60-51-5	0.05	mg/kg	<0.05	----	----	----	<0.05
Diazinon	333-41-5	0.05	mg/kg	<0.05	----	----	----	<0.05
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	----	----	----	<0.05
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	----	----	----	<0.2
Malathion	121-75-5	0.05	mg/kg	<0.05	----	----	----	<0.05
Fenthion	55-38-9	0.05	mg/kg	<0.05	----	----	----	<0.05
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	----	----	----	<0.05
Parathion	56-38-2	0.2	mg/kg	<0.2	----	----	----	<0.2
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	----	----	----	<0.05
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	----	----	----	<0.05
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	----	----	----	<0.05
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	----	----	----	<0.05
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	----	----	----	<0.05
Ethion	563-12-2	0.05	mg/kg	<0.05	----	----	----	<0.05
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	----	----	----	<0.05
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	----	----	----	<0.05
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	BH06_3.0m	BH07_3.0m	BH08_2.0m	BH09_1.0m	BH10_0.1m
			Client sampling date / time	[26-May-2016]	[26-May-2016]	[26-May-2016]	[26-May-2016]	[26-May-2016]
Compound	CAS Number	LOR	Unit	ES1611617-006	ES1611617-007	ES1611617-008	ES1611617-009	ES1611617-010
				Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	**0.8**	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	**0.8**	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	**0.5**	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	**0.6**	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	**2.7**	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	**0.6**	**0.6**	**0.7**	**0.6**	**0.6**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	**1.2**	**1.2**	**1.2**	**1.2**	**1.2**
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	**380**	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	**500**	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	**880**	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	**720**	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	**370**	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	**1090**	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080: BTEXN								

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	BH06_3.0m	BH07_3.0m	BH08_2.0m	BH09_1.0m	BH10_0.1m
			Client sampling date / time	[26-May-2016]	[26-May-2016]	[26-May-2016]	[26-May-2016]	[26-May-2016]
Compound	CAS Number	LOR	Unit	ES1611617-006	ES1611617-007	ES1611617-008	ES1611617-009	ES1611617-010
				Result	Result	Result	Result	Result
EP080: BTEXN - Continued								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	105	----	----	----	95.3
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	96.5	----	----	----	86.1
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	67.4	----	----	----	61.9
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	93.0	86.8	90.2	83.3	90.2
2-Chlorophenol-D4	93951-73-6	0.5	%	83.6	83.3	83.9	83.1	82.7
2.4.6-Tribromophenol	118-79-6	0.5	%	91.7	99.2	98.0	87.1	81.4
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	86.9	86.3	88.6	85.8	87.4
Anthracene-d10	1719-06-8	0.5	%	100	95.9	98.9	101	104
4-Terphenyl-d14	1718-51-0	0.5	%	85.6	83.5	83.1	81.3	85.6
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	100	89.3	92.2	86.6	94.8
Toluene-D8	2037-26-5	0.2	%	118	106	110	99.1	110
4-Bromofluorobenzene	460-00-4	0.2	%	107	98.0	97.2	97.6	101

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	BH11_3.0m	BH12_2.0m	BH13_0.5m	BH14_0.1m	BH15_1.0m
			Client sampling date / time	[26-May-2016]	[26-May-2016]	[26-May-2016]	[26-May-2016]	[26-May-2016]
Compound	CAS Number	LOR	Unit	ES1611617-011	ES1611617-012	ES1611617-013	ES1611617-014	ES1611617-015
				Result	Result	Result	Result	Result
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1	%	13.9	12.9	10.6	5.3	9.1
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	No	No
Asbestos Type	1332-21-4	-	--	-	-	-	-	-
Sample weight (dry)	----	0.01	g	40.3	36.4	49.2	61.6	29.9
APPROVED IDENTIFIER:	----	-	--	S.SPOONER	S.SPOONER	S.SPOONER	S.SPOONER	S.SPOONER
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	10	6	<5	<5	7
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	9	14	9	12	9
Copper	7440-50-8	5	mg/kg	35	18	13	107	8
Lead	7439-92-1	5	mg/kg	32	43	40	<5	21
Nickel	7440-02-0	2	mg/kg	9	6	10	85	6
Zinc	7440-66-6	5	mg/kg	53	60	51	37	21
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	----	----	----	<0.1	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	----	----	----	<0.05	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	----	----	----	<0.05	----
beta-BHC	319-85-7	0.05	mg/kg	----	----	----	<0.05	----
gamma-BHC	58-89-9	0.05	mg/kg	----	----	----	<0.05	----
delta-BHC	319-86-8	0.05	mg/kg	----	----	----	<0.05	----
Heptachlor	76-44-8	0.05	mg/kg	----	----	----	<0.05	----
Aldrin	309-00-2	0.05	mg/kg	----	----	----	<0.05	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	----	----	----	<0.05	----
^ Total Chlordane (sum)	----	0.05	mg/kg	----	----	----	<0.05	----
trans-Chlordane	5103-74-2	0.05	mg/kg	----	----	----	<0.05	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	----	----	----	<0.05	----
cis-Chlordane	5103-71-9	0.05	mg/kg	----	----	----	<0.05	----
Dieldrin	60-57-1	0.05	mg/kg	----	----	----	<0.05	----
4.4`-DDE	72-55-9	0.05	mg/kg	----	----	----	<0.05	----
Endrin	72-20-8	0.05	mg/kg	----	----	----	<0.05	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	BH11_3.0m	BH12_2.0m	BH13_0.5m	BH14_0.1m	BH15_1.0m
			Client sampling date / time	[26-May-2016]	[26-May-2016]	[26-May-2016]	[26-May-2016]	[26-May-2016]
Compound	CAS Number	LOR	Unit	ES1611617-011	ES1611617-012	ES1611617-013	ES1611617-014	ES1611617-015
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
beta-Endosulfan	33213-65-9	0.05	mg/kg	----	----	----	<0.05	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	----	----	----	<0.05	----
4.4`-DDD	72-54-8	0.05	mg/kg	----	----	----	<0.05	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	----	----	----	<0.05	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	----	----	----	<0.05	----
4.4`-DDT	50-29-3	0.2	mg/kg	----	----	----	<0.2	----
Endrin ketone	53494-70-5	0.05	mg/kg	----	----	----	<0.05	----
Methoxychlor	72-43-5	0.2	mg/kg	----	----	----	<0.2	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	----	----	----	<0.05	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg	----	----	----	<0.05	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	----	----	----	<0.05	----
Demeton-S-methyl	919-86-8	0.05	mg/kg	----	----	----	<0.05	----
Monocrotophos	6923-22-4	0.2	mg/kg	----	----	----	<0.2	----
Dimethoate	60-51-5	0.05	mg/kg	----	----	----	<0.05	----
Diazinon	333-41-5	0.05	mg/kg	----	----	----	<0.05	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	----	----	----	<0.05	----
Parathion-methyl	298-00-0	0.2	mg/kg	----	----	----	<0.2	----
Malathion	121-75-5	0.05	mg/kg	----	----	----	<0.05	----
Fenthion	55-38-9	0.05	mg/kg	----	----	----	<0.05	----
Chlorpyrifos	2921-88-2	0.05	mg/kg	----	----	----	<0.05	----
Parathion	56-38-2	0.2	mg/kg	----	----	----	<0.2	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	----	----	----	<0.05	----
Chlorfenvinphos	470-90-6	0.05	mg/kg	----	----	----	<0.05	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg	----	----	----	<0.05	----
Fenamiphos	22224-92-6	0.05	mg/kg	----	----	----	<0.05	----
Prothiofos	34643-46-4	0.05	mg/kg	----	----	----	<0.05	----
Ethion	563-12-2	0.05	mg/kg	----	----	----	<0.05	----
Carbophenothion	786-19-6	0.05	mg/kg	----	----	----	<0.05	----
Azinphos Methyl	86-50-0	0.05	mg/kg	----	----	----	<0.05	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	BH11_3.0m	BH12_2.0m	BH13_0.5m	BH14_0.1m	BH15_1.0m
			Client sampling date / time	[26-May-2016]	[26-May-2016]	[26-May-2016]	[26-May-2016]	[26-May-2016]
Compound	CAS Number	LOR	Unit	ES1611617-011	ES1611617-012	ES1611617-013	ES1611617-014	ES1611617-015
				Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	**1.2**	**1.2**	**1.2**	**1.2**	**1.2**
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080: BTEXN								

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	BH11_3.0m	BH12_2.0m	BH13_0.5m	BH14_0.1m	BH15_1.0m
			Client sampling date / time	[26-May-2016]	[26-May-2016]	[26-May-2016]	[26-May-2016]	[26-May-2016]
Compound	CAS Number	LOR	Unit	ES1611617-011	ES1611617-012	ES1611617-013	ES1611617-014	ES1611617-015
				Result	Result	Result	Result	Result
EP080: BTEXN - Continued								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	----	----	----	94.6	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	----	----	----	83.1	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	----	----	----	61.5	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	88.6	90.6	87.5	86.0	88.0
2-Chlorophenol-D4	93951-73-6	0.5	%	90.4	97.1	82.9	81.6	95.7
2.4.6-Tribromophenol	118-79-6	0.5	%	86.4	98.8	94.0	98.6	89.9
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	81.0	91.2	88.2	84.9	91.5
Anthracene-d10	1719-06-8	0.5	%	100.0	92.5	106	99.6	91.7
4-Terphenyl-d14	1718-51-0	0.5	%	91.0	96.9	87.1	82.7	94.3
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	99.3	91.4	93.7	95.2	90.0
Toluene-D8	2037-26-5	0.2	%	110	108	108	105	99.2
4-Bromofluorobenzene	460-00-4	0.2	%	94.2	91.0	89.9	92.1	88.0

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	BH16_2.0m	BH17_2.0m	BH18_3.0m	BH19_1.0m	BH20_3.0m
			Client sampling date / time	[25-May-2016]	[26-May-2016]	[25-May-2016]	[26-May-2016]	[26-May-2016]
Compound	CAS Number	LOR	Unit	ES1611617-016	ES1611617-017	ES1611617-018	ES1611617-019	ES1611617-020
				Result	Result	Result	Result	Result
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1	%	11.5	9.9	15.3	10.1	10.1
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	No	No
Asbestos Type	1332-21-4	-	--	-	-	-	-	-
Sample weight (dry)	----	0.01	g	45.4	29.3	37.8	36.2	62.3
APPROVED IDENTIFIER:	----	-	--	S.SPOONER	S.SPOONER	S.SPOONER	S.SPOONER	S.SPOONER
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	16	13	<5	<5
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	19	16	28	8	8
Copper	7440-50-8	5	mg/kg	12	104	47	<5	30
Lead	7439-92-1	5	mg/kg	77	893	87	8	13
Nickel	7440-02-0	2	mg/kg	4	14	15	<2	17
Zinc	7440-66-6	5	mg/kg	58	333	124	10	74
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	0.7	0.2	<0.1	<0.1
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	----	----	<0.1	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	----	----	<0.05	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	----	----	<0.05	----	----
beta-BHC	319-85-7	0.05	mg/kg	----	----	<0.05	----	----
gamma-BHC	58-89-9	0.05	mg/kg	----	----	<0.05	----	----
delta-BHC	319-86-8	0.05	mg/kg	----	----	<0.05	----	----
Heptachlor	76-44-8	0.05	mg/kg	----	----	<0.05	----	----
Aldrin	309-00-2	0.05	mg/kg	----	----	<0.05	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	----	----	<0.05	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg	----	----	<0.05	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	----	----	<0.05	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	----	----	<0.05	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	----	----	<0.05	----	----
Dieldrin	60-57-1	0.05	mg/kg	----	----	<0.05	----	----
4.4`-DDE	72-55-9	0.05	mg/kg	----	----	<0.05	----	----
Endrin	72-20-8	0.05	mg/kg	----	----	<0.05	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	BH16_2.0m	BH17_2.0m	BH18_3.0m	BH19_1.0m	BH20_3.0m
			Client sampling date / time	[25-May-2016]	[26-May-2016]	[25-May-2016]	[26-May-2016]	[26-May-2016]
Compound	CAS Number	LOR	Unit	ES1611617-016	ES1611617-017	ES1611617-018	ES1611617-019	ES1611617-020
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
beta-Endosulfan	33213-65-9	0.05	mg/kg	----	----	<0.05	----	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	----	----	<0.05	----	----
4.4`-DDD	72-54-8	0.05	mg/kg	----	----	<0.05	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	----	----	<0.05	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	----	----	<0.05	----	----
4.4`-DDT	50-29-3	0.2	mg/kg	----	----	<0.2	----	----
Endrin ketone	53494-70-5	0.05	mg/kg	----	----	<0.05	----	----
Methoxychlor	72-43-5	0.2	mg/kg	----	----	<0.2	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	----	----	<0.05	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg	----	----	<0.05	----	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	----	----	<0.05	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg	----	----	<0.05	----	----
Monocrotophos	6923-22-4	0.2	mg/kg	----	----	<0.2	----	----
Dimethoate	60-51-5	0.05	mg/kg	----	----	<0.05	----	----
Diazinon	333-41-5	0.05	mg/kg	----	----	<0.05	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	----	----	<0.05	----	----
Parathion-methyl	298-00-0	0.2	mg/kg	----	----	<0.2	----	----
Malathion	121-75-5	0.05	mg/kg	----	----	<0.05	----	----
Fenthion	55-38-9	0.05	mg/kg	----	----	<0.05	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg	----	----	<0.05	----	----
Parathion	56-38-2	0.2	mg/kg	----	----	<0.2	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	----	----	<0.05	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg	----	----	<0.05	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg	----	----	<0.05	----	----
Fenamiphos	22224-92-6	0.05	mg/kg	----	----	<0.05	----	----
Prothiofos	34643-46-4	0.05	mg/kg	----	----	<0.05	----	----
Ethion	563-12-2	0.05	mg/kg	----	----	<0.05	----	----
Carbophenothion	786-19-6	0.05	mg/kg	----	----	<0.05	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg	----	----	<0.05	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	BH16_2.0m	BH17_2.0m	BH18_3.0m	BH19_1.0m	BH20_3.0m
			Client sampling date / time	[25-May-2016]	[26-May-2016]	[25-May-2016]	[26-May-2016]	[26-May-2016]
Compound	CAS Number	LOR	Unit	ES1611617-016	ES1611617-017	ES1611617-018	ES1611617-019	ES1611617-020
				Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	**1.2**	**1.2**	**1.2**	**1.2**	**1.2**
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080: BTEXN								

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	BH16_2.0m	BH17_2.0m	BH18_3.0m	BH19_1.0m	BH20_3.0m
			Client sampling date / time	[25-May-2016]	[26-May-2016]	[25-May-2016]	[26-May-2016]	[26-May-2016]
Compound	CAS Number	LOR	Unit	ES1611617-016	ES1611617-017	ES1611617-018	ES1611617-019	ES1611617-020
				Result	Result	Result	Result	Result
EP080: BTEXN - Continued								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	----	----	93.8	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	----	----	92.9	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	----	----	62.6	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	85.9	85.1	90.6	85.7	86.2
2-Chlorophenol-D4	93951-73-6	0.5	%	82.8	85.5	81.9	90.9	82.0
2.4.6-Tribromophenol	118-79-6	0.5	%	90.3	94.2	92.5	97.0	83.9
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	84.0	85.5	84.6	84.1	84.8
Anthracene-d10	1719-06-8	0.5	%	100	97.8	94.4	98.2	96.1
4-Terphenyl-d14	1718-51-0	0.5	%	88.6	82.1	81.2	81.0	81.5
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	89.3	90.0	84.8	99.5	93.2
Toluene-D8	2037-26-5	0.2	%	102	99.1	103	104	102
4-Bromofluorobenzene	460-00-4	0.2	%	86.2	85.8	81.1	91.0	87.9

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	BH21_1.0m	BH22_1.0m	BH23_3.0m	BH24_0.1m	BH25_2.0m
			Client sampling date / time	[26-May-2016]	[26-May-2016]	[26-May-2016]	[25-May-2016]	[26-May-2016]
Compound	CAS Number	LOR	Unit	ES1611617-021	ES1611617-022	ES1611617-023	ES1611617-024	ES1611617-025
				Result	Result	Result	Result	Result
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1	%	23.7	6.6	18.2	4.9	21.9
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	No	No
Asbestos Type	1332-21-4	-	--	-	-	-	-	-
Sample weight (dry)	----	0.01	g	42.4	38.0	34.3	38.3	28.5
APPROVED IDENTIFIER:	----	-	--	S.SPOONER	S.SPOONER	S.SPOONER	S.SPOONER	S.SPOONER
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	<5	<5	17
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	12	7	9	13	18
Copper	7440-50-8	5	mg/kg	16	<5	17	97	32
Lead	7439-92-1	5	mg/kg	27	18	49	<5	24
Nickel	7440-02-0	2	mg/kg	<2	6	6	90	6
Zinc	7440-66-6	5	mg/kg	13	30	40	38	33
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	----	<0.1	----	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	----	<0.05	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	----	<0.05	----	----	----
beta-BHC	319-85-7	0.05	mg/kg	----	<0.05	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg	----	<0.05	----	----	----
delta-BHC	319-86-8	0.05	mg/kg	----	<0.05	----	----	----
Heptachlor	76-44-8	0.05	mg/kg	----	<0.05	----	----	----
Aldrin	309-00-2	0.05	mg/kg	----	<0.05	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	----	<0.05	----	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg	----	<0.05	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	----	<0.05	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	----	<0.05	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	----	<0.05	----	----	----
Dieldrin	60-57-1	0.05	mg/kg	----	<0.05	----	----	----
4.4`-DDE	72-55-9	0.05	mg/kg	----	<0.05	----	----	----
Endrin	72-20-8	0.05	mg/kg	----	<0.05	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	BH21_1.0m	BH22_1.0m	BH23_3.0m	BH24_0.1m	BH25_2.0m
			Client sampling date / time	[26-May-2016]	[26-May-2016]	[26-May-2016]	[25-May-2016]	[26-May-2016]
Compound	CAS Number	LOR	Unit	ES1611617-021	ES1611617-022	ES1611617-023	ES1611617-024	ES1611617-025
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
beta-Endosulfan	33213-65-9	0.05	mg/kg	----	<0.05	----	----	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	----	<0.05	----	----	----
4.4`-DDD	72-54-8	0.05	mg/kg	----	<0.05	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	----	<0.05	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	----	<0.05	----	----	----
4.4`-DDT	50-29-3	0.2	mg/kg	----	<0.2	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg	----	<0.05	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg	----	<0.2	----	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	----	<0.05	----	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg	----	<0.05	----	----	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	----	<0.05	----	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg	----	<0.05	----	----	----
Monocrotophos	6923-22-4	0.2	mg/kg	----	<0.2	----	----	----
Dimethoate	60-51-5	0.05	mg/kg	----	<0.05	----	----	----
Diazinon	333-41-5	0.05	mg/kg	----	<0.05	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	----	<0.05	----	----	----
Parathion-methyl	298-00-0	0.2	mg/kg	----	<0.2	----	----	----
Malathion	121-75-5	0.05	mg/kg	----	<0.05	----	----	----
Fenthion	55-38-9	0.05	mg/kg	----	<0.05	----	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg	----	<0.05	----	----	----
Parathion	56-38-2	0.2	mg/kg	----	<0.2	----	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	----	<0.05	----	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg	----	<0.05	----	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg	----	<0.05	----	----	----
Fenamiphos	22224-92-6	0.05	mg/kg	----	<0.05	----	----	----
Prothiofos	34643-46-4	0.05	mg/kg	----	<0.05	----	----	----
Ethion	563-12-2	0.05	mg/kg	----	<0.05	----	----	----
Carbophenothion	786-19-6	0.05	mg/kg	----	<0.05	----	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg	----	<0.05	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	BH21_1.0m	BH22_1.0m	BH23_3.0m	BH24_0.1m	BH25_2.0m
			Client sampling date / time	[26-May-2016]	[26-May-2016]	[26-May-2016]	[25-May-2016]	[26-May-2016]
Compound	CAS Number	LOR	Unit	ES1611617-021	ES1611617-022	ES1611617-023	ES1611617-024	ES1611617-025
				Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	**1.2**	**1.2**	**1.2**	**1.2**	**1.2**
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080: BTEXN								

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	BH21_1.0m	BH22_1.0m	BH23_3.0m	BH24_0.1m	BH25_2.0m
			Client sampling date / time	[26-May-2016]	[26-May-2016]	[26-May-2016]	[25-May-2016]	[26-May-2016]
Compound	CAS Number	LOR	Unit	ES1611617-021	ES1611617-022	ES1611617-023	ES1611617-024	ES1611617-025
				Result	Result	Result	Result	Result
EP080: BTEXN - Continued								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	----	83.4	----	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	----	87.6	----	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	----	74.3	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	85.9	79.6	85.4	87.2	86.8
2-Chlorophenol-D4	93951-73-6	0.5	%	84.6	79.0	85.3	89.7	83.2
2.4.6-Tribromophenol	118-79-6	0.5	%	68.4	56.1	69.2	64.2	71.4
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	90.2	84.9	91.8	95.5	93.7
Anthracene-d10	1719-06-8	0.5	%	97.2	89.4	101	103	100
4-Terphenyl-d14	1718-51-0	0.5	%	86.6	80.6	89.4	90.4	90.5
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	109	115	106	113	105
Toluene-D8	2037-26-5	0.2	%	105	114	115	114	99.2
4-Bromofluorobenzene	460-00-4	0.2	%	89.9	96.0	91.5	96.0	86.1

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	BH26_0.5m	BH27_0.5m	BH28_3.0m	BH29_1.0m	BH30_0.5m
			Client sampling date / time	[26-May-2016]	[25-May-2016]	[26-May-2016]	[25-May-2016]	[26-May-2016]
Compound	CAS Number	LOR	Unit	ES1611617-026	ES1611617-027	ES1611617-028	ES1611617-029	ES1611617-030
				Result	Result	Result	Result	Result
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1	%	8.4	10.7	15.0	12.7	12.6
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	No	No	No
Asbestos Type	1332-21-4	-	--	-	-	-	-	-
Sample weight (dry)	----	0.01	g	29.4	40.3	37.4	38.8	36.9
APPROVED IDENTIFIER:	----	-	--	S.SPOONER	S.SPOONER	S.SPOONER	S.SPOONER	S.SPOONER
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	13	<5	12
Cadmium	7440-43-9	1	mg/kg	<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg	6	15	20	10	23
Copper	7440-50-8	5	mg/kg	5	42	57	190	26
Lead	7439-92-1	5	mg/kg	22	35	327	51	82
Nickel	7440-02-0	2	mg/kg	2	39	21	6	14
Zinc	7440-66-6	5	mg/kg	30	242	805	171	60
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	0.2	<0.1	0.2	<0.1	<0.1
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	----	<0.1	<0.1	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	----	<0.05	<0.05	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	----	<0.05	<0.05	----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	----	<0.05	<0.05	----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	----	<0.05	<0.05	----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	----	<0.05	<0.05	----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	----	<0.05	<0.05	----
Aldrin	309-00-2	0.05	mg/kg	<0.05	----	<0.05	<0.05	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	----	<0.05	<0.05	----
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	----	<0.05	<0.05	----
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	----	<0.05	<0.05	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	----	<0.05	<0.05	----
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	----	<0.05	<0.05	----
Dieldrin	60-57-1	0.05	mg/kg	<0.05	----	<0.05	<0.05	----
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	----	<0.05	<0.05	----
Endrin	72-20-8	0.05	mg/kg	<0.05	----	<0.05	<0.05	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	BH26_0.5m	BH27_0.5m	BH28_3.0m	BH29_1.0m	BH30_0.5m
			Client sampling date / time	[26-May-2016]	[25-May-2016]	[26-May-2016]	[25-May-2016]	[26-May-2016]
Compound	CAS Number	LOR	Unit	ES1611617-026	ES1611617-027	ES1611617-028	ES1611617-029	ES1611617-030
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	----	<0.05	<0.05	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	----	<0.05	<0.05	----
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	----	<0.05	<0.05	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	----	<0.05	<0.05	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	----	<0.05	<0.05	----
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	----	<0.2	<0.2	----
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	----	<0.05	<0.05	----
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	----	<0.2	<0.2	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	----	<0.05	<0.05	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg	<0.05	----	<0.05	<0.05	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	----	<0.05	<0.05	----
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	----	<0.05	<0.05	----
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	----	<0.2	<0.2	----
Dimethoate	60-51-5	0.05	mg/kg	<0.05	----	<0.05	<0.05	----
Diazinon	333-41-5	0.05	mg/kg	<0.05	----	<0.05	<0.05	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	----	<0.05	<0.05	----
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	----	<0.2	<0.2	----
Malathion	121-75-5	0.05	mg/kg	<0.05	----	<0.05	<0.05	----
Fenthion	55-38-9	0.05	mg/kg	<0.05	----	<0.05	<0.05	----
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	----	<0.05	<0.05	----
Parathion	56-38-2	0.2	mg/kg	<0.2	----	<0.2	<0.2	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	----	<0.05	<0.05	----
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	----	<0.05	<0.05	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	----	<0.05	<0.05	----
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	----	<0.05	<0.05	----
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	----	<0.05	<0.05	----
Ethion	563-12-2	0.05	mg/kg	<0.05	----	<0.05	<0.05	----
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	----	<0.05	<0.05	----
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	----	<0.05	<0.05	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	BH26_0.5m	BH27_0.5m	BH28_3.0m	BH29_1.0m	BH30_0.5m
			Client sampling date / time	[26-May-2016]	[25-May-2016]	[26-May-2016]	[25-May-2016]	[26-May-2016]
Compound	CAS Number	LOR	Unit	ES1611617-026	ES1611617-027	ES1611617-028	ES1611617-029	ES1611617-030
				Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	**1.9**	**0.7**	<0.5
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	**0.6**	**3.5**	**1.3**	<0.5
Pyrene	129-00-0	0.5	mg/kg	<0.5	**0.6**	**3.4**	**1.2**	<0.5
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	**1.7**	**0.6**	<0.5
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	**1.4**	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	**1.8**	**0.6**	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	**0.8**	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	**1.5**	**0.5**	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	**0.7**	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	**0.8**	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	**1.2**	**17.5**	**4.9**	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	**2.0**	**0.6**	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	**0.6**	**0.6**	**2.3**	**0.9**	**0.6**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	**1.2**	**1.2**	**2.5**	**1.2**	**1.2**
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg	<100	<100	<100	**140**	<100
C29 - C36 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	<50	**140**	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	<10	<10
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	<100	**160**	<100
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	<50	**160**	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	<50	<50	<50
EP080: BTEXN								

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	BH26_0.5m	BH27_0.5m	BH28_3.0m	BH29_1.0m	BH30_0.5m
			Client sampling date / time	[26-May-2016]	[25-May-2016]	[26-May-2016]	[25-May-2016]	[26-May-2016]
Compound	CAS Number	LOR	Unit	ES1611617-026	ES1611617-027	ES1611617-028	ES1611617-029	ES1611617-030
				Result	Result	Result	Result	Result
EP080: BTEXN - Continued								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	88.5	----	75.3	84.3	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	91.0	----	118	105	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	75.3	----	74.7	67.6	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	83.0	87.9	87.6	88.4	81.9
2-Chlorophenol-D4	93951-73-6	0.5	%	86.0	87.8	84.8	89.5	83.5
2.4.6-Tribromophenol	118-79-6	0.5	%	64.8	62.8	84.3	78.5	69.9
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	92.6	93.1	91.2	94.0	88.0
Anthracene-d10	1719-06-8	0.5	%	99.2	99.0	99.9	101	95.6
4-Terphenyl-d14	1718-51-0	0.5	%	89.2	89.2	86.6	88.1	85.2
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	112	110	114	107	110
Toluene-D8	2037-26-5	0.2	%	107	109	118	103	111
4-Bromofluorobenzene	460-00-4	0.2	%	91.4	88.9	93.4	84.7	89.9

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	QAQC01	QAQC02	TB01	TS01	TSC
			Client sampling date / time	[26-May-2016]	[26-May-2016]	[26-May-2016]	[26-May-2016]	[26-May-2016]
Compound	CAS Number	LOR	Unit	ES1611617-031	ES1611617-032	ES1611617-037	ES1611617-038	ES1611617-039
				Result	Result	Result	Result	Result
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1	%	11.8	7.9	----	----	----
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	No	No	----	----	----
Asbestos Type	1332-21-4	-	--	-	-	----	----	----
Sample weight (dry)	----	0.01	g	25.2	44.6	----	----	----
APPROVED IDENTIFIER:	----	-	--	S.SPOONER	S.SPOONER	----	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	8	<5	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	----	----
Chromium	7440-47-3	2	mg/kg	16	8	----	----	----
Copper	7440-50-8	5	mg/kg	29	<5	----	----	----
Lead	7439-92-1	5	mg/kg	148	15	----	----	----
Nickel	7440-02-0	2	mg/kg	12	3	----	----	----
Zinc	7440-66-6	5	mg/kg	258	24	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	0.2	<0.1	----	----	----
EP066: Polychlorinated Biphenyls (PCB)								
Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	----	----	----
EP068A: Organochlorine Pesticides (OC)								
alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	----	----	----
beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	----	----	----
delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	----	----	----
Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	----	----	----
Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	----	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg	<0.05	<0.05	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	----	----	----
Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	----	----	----
4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	----	----	----
Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	QAQC01	QAQC02	TB01	TS01	TSC
			Client sampling date / time	[26-May-2016]	[26-May-2016]	[26-May-2016]	[26-May-2016]	[26-May-2016]
Compound	CAS Number	LOR	Unit	ES1611617-031	ES1611617-032	ES1611617-037	ES1611617-038	ES1611617-039
				Result	Result	Result	Result	Result
EP068A: Organochlorine Pesticides (OC) - Continued								
beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	----	----	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg	<0.05	<0.05	----	----	----
4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	----	----	----
4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	----	----	----
Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	----	----	----
^ Sum of Aldrin + Dieldrin	309-00-2/60-57-1	0.05	mg/kg	<0.05	<0.05	----	----	----
^ Sum of DDD + DDE + DDT	72-54-8/72-55-9/50-2	0.05	mg/kg	<0.05	<0.05	----	----	----
EP068B: Organophosphorus Pesticides (OP)								
Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	----	----	----
Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	----	----	----
Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	----	----	----
Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	----	----	----
Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	----	----	----
Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	----	----	----
Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	----	----	----
Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	----	----	----
Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	----	----	----
Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	----	----	----
Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	----	----	----
Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	----	----	----
Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	----	----	----
Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	----	----	----
Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	----	----	----
Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	----	----	----
Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	----	----	----
Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	----	----	----
Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	QAQC01	QAQC02	TB01	TS01	TSC
			Client sampling date / time	[26-May-2016]	[26-May-2016]	[26-May-2016]	[26-May-2016]	[26-May-2016]
Compound	CAS Number	LOR	Unit	ES1611617-031	ES1611617-032	ES1611617-037	ES1611617-038	ES1611617-039
				Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	**0.6**	<0.5	----	----	----
Pyrene	129-00-0	0.5	mg/kg	**0.6**	<0.5	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	**1.2**	<0.5	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	**0.6**	**0.6**	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	**1.2**	**1.2**	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	<10	**34**	**45**
C10 - C14 Fraction	----	50	mg/kg	<50	<50	----	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	<100	----	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	<100	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	<50	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	<10	**40**	**52**
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	<10	<10	**21**	**27**
>C10 - C16 Fraction	----	50	mg/kg	<50	<50	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	<100	<100	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	<100	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	<50	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	<50	----	----	----
EP080: BTEXN								

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	QAQC01	QAQC02	TB01	TS01	TSC
			Client sampling date / time	[26-May-2016]	[26-May-2016]	[26-May-2016]	[26-May-2016]	[26-May-2016]
Compound	CAS Number	LOR	Unit	ES1611617-031	ES1611617-032	ES1611617-037	ES1611617-038	ES1611617-039
				Result	Result	Result	Result	Result
EP080: BTEXN - Continued								
Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	<0.2	<0.2	0.3
Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	<0.5	8.8	11.7
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	<0.5	1.2	1.6
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	<0.5	7.0	8.6
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	<0.5	2.7	3.2
^ Sum of BTEX	----	0.2	mg/kg	<0.2	<0.2	<0.2	19.7	25.4
^ Total Xylenes	1330-20-7	0.5	mg/kg	<0.5	<0.5	<0.5	9.7	11.8
Naphthalene	91-20-3	1	mg/kg	<1	<1	<1	<1	<1
EP066S: PCB Surrogate								
Decachlorobiphenyl	2051-24-3	0.1	%	83.6	118	----	----	----
EP068S: Organochlorine Pesticide Surrogate								
Dibromo-DDE	21655-73-2	0.05	%	107	106	----	----	----
EP068T: Organophosphorus Pesticide Surrogate								
DEF	78-48-8	0.05	%	63.0	69.6	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	97.2	82.0	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	92.7	84.6	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%	84.6	72.0	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	88.0	89.0	----	----	----
Anthracene-d10	1719-06-8	0.5	%	108	97.9	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%	95.6	107	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	109	130	109	110	103
Toluene-D8	2037-26-5	0.2	%	105	114	104	98.4	103
4-Bromofluorobenzene	460-00-4	0.2	%	84.7	100	88.5	91.6	90.0

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	RB01	RB02	RB03	RB04	----
			Client sampling date / time	[23-May-2016]	[24-May-2016]	[25-May-2016]	[26-May-2016]	----
Compound	CAS Number	LOR	Unit	ES1611617-033	ES1611617-034	ES1611617-035	ES1611617-036	--------
				Result	Result	Result	Result	----
EG020F: Dissolved Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	<0.005	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
Acenaphthylene	208-96-8	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
Acenaphthene	83-32-9	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
Fluorene	86-73-7	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
Phenanthrene	85-01-8	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
Anthracene	120-12-7	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
Fluoranthene	206-44-0	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
Pyrene	129-00-0	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
Benz(a)anthracene	56-55-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
Chrysene	218-01-9	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	<1.0	<1.0	<1.0	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	----
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	----
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	----
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	----
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	<50	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Client sample ID	RB01	RB02	RB03	RB04	----
			Client sampling date / time	[23-May-2016]	[24-May-2016]	[25-May-2016]	[26-May-2016]	----
Compound	CAS Number	LOR	Unit	ES1611617-033	ES1611617-034	ES1611617-035	ES1611617-036	--------
				Result	Result	Result	Result	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	----
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	<100	----
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	<100	----
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	<100	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	<100	----
EP080: BTEXN								
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	----
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	----
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	----
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	----
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	<2	<2	----
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	----
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	1	%	17.8	17.7	18.2	18.0	----
2-Chlorophenol-D4	93951-73-6	1	%	35.7	40.7	42.4	41.2	----
2.4.6-Tribromophenol	118-79-6	1	%	45.7	39.2	40.0	35.9	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	1	%	53.8	76.4	68.4	65.0	----
Anthracene-d10	1719-06-8	1	%	61.4	81.7	80.7	79.0	----
4-Terphenyl-d14	1718-51-0	1	%	67.7	81.9	63.0	68.4	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	2	%	98.9	95.5	97.7	96.0	----
Toluene-D8	2037-26-5	2	%	110	109	109	111	----
4-Bromofluorobenzene	460-00-4	2	%	104	103	104	104	----

Analytical Results

Descriptive Results

Sub-Matrix: **SOIL**

Method: Compound	Client sample ID - Client sampling date / time	Analytical Results
EA200: AS 4964 - 2004 Identification of Asbestos in Soils		
EA200: Description	BH01_1.0m - [25-May-2016]	Mid brown clay soil with one piece of bonded asbestos cement sheeting approx 15 x 12 x 5 mm.
EA200: Description	BH02_2.0m - [26-May-2016]	Mid brown clay soil with one loose bundle of friable asbestos fibres approx 8 x 3 x 2 mm.
EA200: Description	BH03_0.1m - [24-May-2016]	Mid grey clay soil with grey rocks.
EA200: Description	BH04_0.5m - [24-May-2016]	Pale red - brown clay soil with grey rocks.
EA200: Description	BH05_2.0m - [26-May-2016]	Mid brown clay soil with grey rocks.
EA200: Description	BH06_3.0m - [26-May-2016]	Mid brown clay soil with grey rocks.
EA200: Description	BH07_3.0m - [26-May-2016]	Mid brown clay soil with grey rocks.
EA200: Description	BH08_2.0m - [26-May-2016]	Mid grey clay soil with grey rocks.
EA200: Description	BH09_1.0m - [26-May-2016]	Mid brown clay soil with grey rocks.
EA200: Description	BH10_0.1m - [26-May-2016]	Mid brown sandy soil with grey rocks.
EA200: Description	BH11_3.0m - [26-May-2016]	Mid grey clay soil with grey rocks.
EA200: Description	BH12_2.0m - [26-May-2016]	Mid brown clay soil with grey rocks.
EA200: Description	BH13_0.5m - [26-May-2016]	Pale brown sandy soil with grey rocks.
EA200: Description	BH14_0.1m - [26-May-2016]	Mid grey clay soil with grey rocks.
EA200: Description	BH15_1.0m - [26-May-2016]	Pale brown clay soil with grey rocks.
EA200: Description	BH16_2.0m - [25-May-2016]	Mid brown clay soil with grey rocks.
EA200: Description	BH17_2.0m - [26-May-2016]	Mid red - brown clay soil with grey rocks.
EA200: Description	BH18_3.0m - [25-May-2016]	Mid brown clay soil with grey rocks.
EA200: Description	BH19_1.0m - [26-May-2016]	Mid brown sandy soil with grey rocks.
EA200: Description	BH20_3.0m - [26-May-2016]	Pale grey sandy soil with grey rocks.
EA200: Description	BH21_1.0m - [26-May-2016]	Mid brown clay soil with grey rocks.
EA200: Description	BH22_1.0m - [26-May-2016]	Pale grey clay soil with grey rocks.
EA200: Description	BH23_3.0m - [26-May-2016]	Mid brown clay soil with grey rocks.
EA200: Description	BH24_0.1m - [25-May-2016]	Mid brown clay soil with grey rocks.
EA200: Description	BH25_2.0m - [26-May-2016]	Mid brown clay soil with grey rocks.
EA200: Description	BH26_0.5m - [26-May-2016]	Mid brown clay soil with grey rocks.
EA200: Description	BH27_0.5m - [25-May-2016]	Mid brown clay soil with grey rocks.
EA200: Description	BH28_3.0m - [26-May-2016]	Mid brown clay soil with grey rocks.
EA200: Description	BH29_1.0m - [25-May-2016]	Mid brown clay soil with grey rocks.
EA200: Description	BH30_0.5m - [26-May-2016]	Mid brown clay soil with grey rocks.
EA200: Description	QAQC01 - [26-May-2016]	Mid brown clay soil with grey rocks.
EA200: Description	QAQC02 - [26-May-2016]	Pale brown sandy soil with grey rocks.

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	Recovery Limits (%) High
EP066S: PCB Surrogate			
Decachlorobiphenyl	2051-24-3	39	149
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	147
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	35	143
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%) Low	Recovery Limits (%) High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2.4.6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

QUALITY CONTROL REPORT

Work Order	: **ES1611617**	Page	: 1 of 20
Client	: **PARSONS BRINCKERHOFF AUSTRALIA PTY LIMITED**	Laboratory	: Environmental Division Sydney
Contact	: DANIEL SMITH	Contact	: Loren Schiavon
Address	: ABN: 80 078 004 798 GPO BOX 5394 SYDNEY NSW, AUSTRALIA 2001	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 92725100	Telephone	: +61 2 8784 8503
Project	: 2270089A WAVE PARK GROUP DSI	Date Samples Received	: 30-May-2016
Order number	: ----	Date Analysis Commenced	: 31-May-2016
C-O-C number	: 81685-90	Issue Date	: 06-Jun-2016
Sampler	: ----		
Site	: SYDNEY OLYMPIC PARK		
Quote number	: ----		
No. of samples received	: 39		
No. of samples analysed	: 39		

NATA Accredited Laboratory 825
Accredited for compliance with
ISO/IEC 17025.

WORLD RECOGNISED ACCREDITATION

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Pabi Subba	Senior Organic Chemist	Sydney Organics, Smithfield, NSW
Shaun Spooner	Asbestos Identifier	Newcastle - Asbestos, Mayfield West, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (QC Lot: 470821)									
ES1611617-001	BH01_1.0m	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	12.6	12.6	0.00	0% - 50%
ES1611617-012	BH12_2.0m	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	12.9	13.7	6.05	0% - 50%
EA055: Moisture Content (QC Lot: 470822)									
ES1611617-021	BH21_1.0m	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	23.7	20.4	14.9	0% - 20%
ES1611617-032	QAQC02	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	7.9	7.1	10.9	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 472141)									
ES1611617-001	BH01_1.0m	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	20	17	14.6	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	26	23	9.14	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	42	30	30.7	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	92	84	9.57	0% - 50%
		EG005T: Lead	7439-92-1	5	mg/kg	106	95	11.6	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	116	103	11.4	0% - 20%
ES1611617-011	BH11_3.0m	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	9	10	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	9	7	25.1	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	10	10	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	35	27	26.6	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	32	25	22.9	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	53	52	2.19	0% - 50%
EG005T: Total Metals by ICP-AES (QC Lot: 472142)									
ES1611617-021	BH21_1.0m	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	12	15	28.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.00	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG005T: Total Metals by ICP-AES (QC Lot: 472142) - continued									
ES1611617-021	BH21_1.0m	EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	16	28	57.5	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	27	38	34.7	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	13	21	48.1	No Limit
ES1611617-031	QAQC01	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	16	19	16.1	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	12	11	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	8	8	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	29	31	6.57	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	148	128	14.3	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	258	247	4.00	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 472140)									
ES1611617-001	BH01_1.0m	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.2	0.2	0.00	No Limit
ES1611617-011	BH11_3.0m	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 472143)									
ES1611617-021	BH21_1.0m	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES1611617-031	QAQC01	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.2	0.1	0.00	No Limit
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 470097)									
ES1611617-001	BH01_1.0m	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP066: Polychlorinated Biphenyls (PCB) (QC Lot: 470109)									
ES1611617-022	BH22_1.0m	EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 470096)									
ES1611617-001	BH01_1.0m	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
				Laboratory Duplicate (DUP) Report					
EP068A: Organochlorine Pesticides (OC) (QC Lot: 470096) - continued									
ES1611617-001	BH01_1.0m	EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 470108)									
ES1611617-022	BH22_1.0m	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 470096)									
ES1611617-001	BH01_1.0m	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
				Laboratory Duplicate (DUP) Report					
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 470096) - continued									
ES1611617-001	BH01_1.0m	EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP068B: Organophosphorus Pesticides (OP) (QC Lot: 470108)									
ES1611617-022	BH22_1.0m	EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	<0.05	0.00	No Limit
		EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 470095)									
ES1611617-011	BH11_3.0m	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 470095) - continued									
ES1611617-011	BH11_3.0m	EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES1611617-001	BH01_1.0m	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 470107)									
ES1611617-031	QAQC01	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	0.6	<0.5	24.8	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	0.6	<0.5	27.3	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
				Laboratory Duplicate (DUP) Report					
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 470107) - continued									
ES1611617-031	QAQC01	EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	1.2	<0.5	82.4	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES1611617-022	BH22_1.0m	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 469843)									
ES1611617-001	BH01_1.0m	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
ES1611617-011	BH11_3.0m	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 469861)									
ES1611617-021	BH21_1.0m	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
ES1611617-028	BH28_3.0m	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 470094)									
ES1611617-011	BH11_3.0m	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES1611617-001	BH01_1.0m	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
				Laboratory Duplicate (DUP) Report					
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 470094) - continued									
ES1611617-001	BH01_1.0m	EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 470106)									
ES1611617-031	QAQC01	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES1611617-022	BH22_1.0m	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 469843)									
ES1611617-001	BH01_1.0m	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
ES1611617-011	BH11_3.0m	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 469861)									
ES1611617-021	BH21_1.0m	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
ES1611617-028	BH28_3.0m	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 470094)									
ES1611617-011	BH11_3.0m	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES1611617-001	BH01_1.0m	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 470106)									
ES1611617-031	QAQC01	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES1611617-022	BH22_1.0m	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080: BTEXN (QC Lot: 469843)									
ES1611617-001	BH01_1.0m	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
ES1611617-011	BH11_3.0m	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080: BTEXN (QC Lot: 469843) - continued									
ES1611617-011	BH11_3.0m	EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
EP080: BTEXN (QC Lot: 469861)									
ES1611617-021	BH21_1.0m	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
ES1611617-028	BH28_3.0m	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 471682)									
ES1611686-004	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.003	0.003	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.018	0.006	97.8	No Limit
EW1602021-002	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	0.006	0.006	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.006	0.006	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	0.017	0.017	0.00	0% - 50%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.003	0.003	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.026	0.031	18.1	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 471683)									
ES1611617-034	RB02	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 470402)									

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
				Laboratory Duplicate (DUP) Report					
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 470402) - continued									
ES1611419-016	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
ES1611617-034	RB02	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 470402)									
ES1611419-016	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
ES1611617-034	RB02	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.00	No Limit
EP080: BTEXN (QC Lot: 470402)									
ES1611419-016	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit
ES1611617-034	RB02	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.00	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.00	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 472141)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	99.7	86	126
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	94.5	83	113
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	95.4	76	128
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	97.0	86	120
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	97.0	80	114
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	100	87	123
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	102	80	122
EG005T: Total Metals by ICP-AES (QCLot: 472142)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	97.9	86	126
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	94.4	83	113
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	94.8	76	128
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	97.8	86	120
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	95.3	80	114
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	101	87	123
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	102	80	122
EG035T: Total Recoverable Mercury by FIMS (QCLot: 472140)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	93.9	70	105
EG035T: Total Recoverable Mercury by FIMS (QCLot: 472143)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	96.0	70	105
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 470097)								
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	102	62	126
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 470109)								
EP066: Total Polychlorinated biphenyls	----	0.1	mg/kg	<0.1	1 mg/kg	101	62	126
EP068A: Organochlorine Pesticides (OC) (QCLot: 470096)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	92.5	69	113
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	95.0	65	117
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	90.8	67	119
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	88.0	68	116
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	78.0	65	117
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	90.1	67	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	81.8	69	115
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	85.3	62	118
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	85.4	63	117

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP068A: Organochlorine Pesticides (OC) (QCLot: 470096) - continued								
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	88.0	66	116
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	87.8	64	116
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	84.3	66	116
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	83.8	67	115
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	81.2	67	123
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	87.5	69	115
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	88.6	69	121
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	103	56	120
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	99.8	62	124
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	102	66	120
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	101	64	122
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	94.1	54	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 470108)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	89.8	69	113
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	91.6	65	117
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	107	67	119
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	86.9	68	116
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	78.1	65	117
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	92.7	67	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	86.1	69	115
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	81.9	62	118
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	82.3	63	117
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	91.4	66	116
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	86.7	64	116
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	81.2	66	116
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	85.6	67	115
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	83.0	67	123
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	89.8	69	115
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	86.8	69	121
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	108	56	120
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	81.0	62	124
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	98.4	66	120
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	104	64	122
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	106	54	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 470096)								
EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	0.5 mg/kg	103	59	119
EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	99.0	62	128
EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	0.5 mg/kg	81.4	54	126
EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	0.5 mg/kg	82.6	67	119

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low	Recovery Limits (%) High
EP068B: Organophosphorus Pesticides (OP) (QCLot: 470096) - continued								
EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	0.5 mg/kg	89.6	70	120
EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	0.5 mg/kg	87.7	72	120
EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	0.5 mg/kg	74.9	68	120
EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	0.5 mg/kg	86.9	68	122
EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	0.5 mg/kg	88.2	69	117
EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	0.5 mg/kg	84.3	76	118
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	0.5 mg/kg	74.0	64	122
EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	0.5 mg/kg	85.6	70	116
EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	0.5 mg/kg	84.4	69	121
EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	0.5 mg/kg	92.1	66	118
EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	0.5 mg/kg	86.2	68	124
EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	0.5 mg/kg	85.6	62	112
EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	0.5 mg/kg	86.5	68	120
EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	0.5 mg/kg	107	65	127
EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	0.5 mg/kg	76.4	41	123
EP068B: Organophosphorus Pesticides (OP) (QCLot: 470108)								
EP068: Dichlorvos	62-73-7	0.05	mg/kg	<0.05	0.5 mg/kg	107	59	119
EP068: Demeton-S-methyl	919-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	87.6	62	128
EP068: Monocrotophos	6923-22-4	0.2	mg/kg	<0.2	0.5 mg/kg	87.2	54	126
EP068: Dimethoate	60-51-5	0.05	mg/kg	<0.05	0.5 mg/kg	96.6	67	119
EP068: Diazinon	333-41-5	0.05	mg/kg	<0.05	0.5 mg/kg	92.3	70	120
EP068: Chlorpyrifos-methyl	5598-13-0	0.05	mg/kg	<0.05	0.5 mg/kg	93.4	72	120
EP068: Parathion-methyl	298-00-0	0.2	mg/kg	<0.2	0.5 mg/kg	83.8	68	120
EP068: Malathion	121-75-5	0.05	mg/kg	<0.05	0.5 mg/kg	98.8	68	122
EP068: Fenthion	55-38-9	0.05	mg/kg	<0.05	0.5 mg/kg	92.2	69	117
EP068: Chlorpyrifos	2921-88-2	0.05	mg/kg	<0.05	0.5 mg/kg	89.7	76	118
EP068: Parathion	56-38-2	0.2	mg/kg	<0.2	0.5 mg/kg	81.8	64	122
EP068: Pirimphos-ethyl	23505-41-1	0.05	mg/kg	<0.05	0.5 mg/kg	90.0	70	116
EP068: Chlorfenvinphos	470-90-6	0.05	mg/kg	<0.05	0.5 mg/kg	94.6	69	121
EP068: Bromophos-ethyl	4824-78-6	0.05	mg/kg	<0.05	0.5 mg/kg	86.8	66	118
EP068: Fenamiphos	22224-92-6	0.05	mg/kg	<0.05	0.5 mg/kg	95.6	68	124
EP068: Prothiofos	34643-46-4	0.05	mg/kg	<0.05	0.5 mg/kg	86.7	62	112
EP068: Ethion	563-12-2	0.05	mg/kg	<0.05	0.5 mg/kg	86.9	68	120
EP068: Carbophenothion	786-19-6	0.05	mg/kg	<0.05	0.5 mg/kg	109	65	127
EP068: Azinphos Methyl	86-50-0	0.05	mg/kg	<0.05	0.5 mg/kg	103	41	123
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 470095)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	91.1	77	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	95.7	72	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	93.0	73	127

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 470095) - continued								
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	90.6	72	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	93.0	75	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	95.2	77	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	91.9	73	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	95.1	74	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	97.7	69	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	93.6	75	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	94.1	68	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	94.2	74	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	93.0	70	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	93.0	61	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	92.0	62	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	89.5	63	121
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 470107)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	94.6	77	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	90.1	72	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	91.4	73	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	92.5	72	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	96.2	75	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	96.4	77	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	97.7	73	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	97.7	74	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	87.9	69	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	93.4	75	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	84.6	68	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	89.2	74	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	95.2	70	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	73.9	61	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	78.8	62	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	72.5	63	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 469843)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	89.9	68	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 469861)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	102	68	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 470094)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	91.5	75	129

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 470094) - continued								
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	104	77	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	92.7	71	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 470106)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	91.5	75	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	108	77	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	107	71	129
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 469843)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	90.7	68	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 469861)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	102	68	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 470094)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	250 mg/kg	101	77	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	105	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	150 mg/kg	94.4	63	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 470106)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	250 mg/kg	98.4	77	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	105	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	150 mg/kg	98.6	63	131
EP080: BTEXN (QCLot: 469843)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	93.2	62	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	96.9	67	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	91.0	65	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	91.3	66	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	92.5	68	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	93.2	63	119
EP080: BTEXN (QCLot: 469861)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	91.8	62	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	93.6	67	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	89.0	65	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	96.0	66	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	91.4	68	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	100	63	119

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EG020F: Dissolved Metals by ICP-MS (QCLot: 471682)								
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	103	85	114
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	98.3	84	110
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	95.6	85	111
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	101	81	111
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	97.4	83	111
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	102	82	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	103	81	117
EG035F: Dissolved Mercury by FIMS (QCLot: 471683)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	98.0	83	105
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 470083)								
EP075(SIM): Naphthalene	91-20-3	1	µg/L	<1.0	5 µg/L	76.4	50	94
EP075(SIM): Acenaphthylene	208-96-8	1	µg/L	<1.0	5 µg/L	76.3	64	114
EP075(SIM): Acenaphthene	83-32-9	1	µg/L	<1.0	5 µg/L	75.9	62	113
EP075(SIM): Fluorene	86-73-7	1	µg/L	<1.0	5 µg/L	77.5	64	115
EP075(SIM): Phenanthrene	85-01-8	1	µg/L	<1.0	5 µg/L	75.2	63	116
EP075(SIM): Anthracene	120-12-7	1	µg/L	<1.0	5 µg/L	80.8	64	116
EP075(SIM): Fluoranthene	206-44-0	1	µg/L	<1.0	5 µg/L	84.6	64	118
EP075(SIM): Pyrene	129-00-0	1	µg/L	<1.0	5 µg/L	84.8	63	118
EP075(SIM): Benz(a)anthracene	56-55-3	1	µg/L	<1.0	5 µg/L	73.0	64	117
EP075(SIM): Chrysene	218-01-9	1	µg/L	<1.0	5 µg/L	76.5	63	116
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	5 µg/L	71.5	62	119
EP075(SIM): Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	5 µg/L	85.8	63	115
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	5 µg/L	82.4	63	117
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	5 µg/L	90.5	60	118
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	1	µg/L	<1.0	5 µg/L	89.6	61	117
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	1	µg/L	<1.0	5 µg/L	81.5	59	118
EP080/071: Total Petroleum Hydrocarbons (QCLot: 470084)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	2000 µg/L	90.6	76	116
EP071: C15 - C28 Fraction	----	100	µg/L	<100	3000 µg/L	98.1	83	109
EP071: C29 - C36 Fraction	----	50	µg/L	<50	2000 µg/L	94.2	75	113
EP080/071: Total Petroleum Hydrocarbons (QCLot: 470402)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	85.9	75	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 470084)								
EP071: >C10 - C16 Fraction	----	100	µg/L	<100	2500 µg/L	96.3	76	114
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	3500 µg/L	99.0	81	111
EP071: >C34 - C40 Fraction	----	100	µg/L	<100	1500 µg/L	105	77	119
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 470402)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 470402) - continued								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	87.6	75	127
EP080: BTEXN (QCLot: 470402)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	103	70	122
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	104	69	123
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	102	70	120
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	99.5	69	121
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	103	72	122
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	102	70	120

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EG005T: Total Metals by ICP-AES (QCLot: 472141)							
ES1611617-002	BH02_2.0m	EG005T: Arsenic	7440-38-2	50 mg/kg	89.7	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	99.6	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	98.4	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	116	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	120	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	94.8	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	82.0	70	130
EG005T: Total Metals by ICP-AES (QCLot: 472142)							
ES1611617-022	BH22_1.0m	EG005T: Arsenic	7440-38-2	50 mg/kg	98.6	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	99.9	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	97.1	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	95.1	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	97.5	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	101	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	101	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 472140)							
ES1611617-001	BH01_1.0m	EG035T: Mercury	7439-97-6	5 mg/kg	113	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 472143)							
ES1611617-021	BH21_1.0m	EG035T: Mercury	7439-97-6	5 mg/kg	115	70	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 470097)							
ES1611617-001	BH01_1.0m	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	91.0	70	130
EP066: Polychlorinated Biphenyls (PCB) (QCLot: 470109)							
ES1611617-022	BH22_1.0m	EP066: Total Polychlorinated biphenyls	----	1 mg/kg	101	70	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 470096)							
ES1611617-001	BH01_1.0m	EP068: gamma-BHC	58-89-9	0.5 mg/kg	79.8	70	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	76.9	70	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	79.2	70	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	75.9	70	130
		EP068: Endrin	72-20-8	2 mg/kg	86.4	70	130
		EP068: 4.4`-DDT	50-29-3	2 mg/kg	92.1	70	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 470108)							
ES1611617-022	BH22_1.0m	EP068: gamma-BHC	58-89-9	0.5 mg/kg	82.5	70	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	83.6	70	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	88.0	70	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	90.2	70	130
		EP068: Endrin	72-20-8	2 mg/kg	91.9	70	130
		EP068: 4.4`-DDT	50-29-3	2 mg/kg	92.5	70	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 470096)							
ES1611617-001	BH01_1.0m	EP068: Diazinon	333-41-5	0.5 mg/kg	92.7	70	130
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	77.6	70	130
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	85.2	70	130
		EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	86.6	70	130
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	88.3	70	130
EP068B: Organophosphorus Pesticides (OP) (QCLot: 470108)							
ES1611617-022	BH22_1.0m	EP068: Diazinon	333-41-5	0.5 mg/kg	91.8	70	130
		EP068: Chlorpyrifos-methyl	5598-13-0	0.5 mg/kg	78.4	70	130
		EP068: Pirimphos-ethyl	23505-41-1	0.5 mg/kg	81.2	70	130
		EP068: Bromophos-ethyl	4824-78-6	0.5 mg/kg	87.1	70	130
		EP068: Prothiofos	34643-46-4	0.5 mg/kg	86.0	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 470095)							
ES1611617-001	BH01_1.0m	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	83.6	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	93.1	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 470107)							
ES1611617-022	BH22_1.0m	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	78.2	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	85.9	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 469843)							

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 469843) - continued							
ES1611617-001	BH01_1.0m	EP080: C6 - C9 Fraction	----	32.5 mg/kg	118	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 469861)							
ES1611617-021	BH21_1.0m	EP080: C6 - C9 Fraction	----	32.5 mg/kg	123	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 470094)							
ES1611617-001	BH01_1.0m	EP071: C10 - C14 Fraction	----	523 mg/kg	94.3	73	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	91.0	53	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	108	52	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 470106)							
ES1611617-022	BH22_1.0m	EP071: C10 - C14 Fraction	----	523 mg/kg	92.0	73	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	97.7	53	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	109	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 469843)							
ES1611617-001	BH01_1.0m	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	112	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 469861)							
ES1611617-021	BH21_1.0m	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	121	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 470094)							
ES1611617-001	BH01_1.0m	EP071: >C10 - C16 Fraction	----	860 mg/kg	87.7	73	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	109	53	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	110	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 470106)							
ES1611617-022	BH22_1.0m	EP071: >C10 - C16 Fraction	----	860 mg/kg	90.6	73	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	105	53	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	105	52	132
EP080: BTEXN (QCLot: 469843)							
ES1611617-001	BH01_1.0m	EP080: Benzene	71-43-2	2.5 mg/kg	93.1	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	101	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	101	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	97.6	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	98.6	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	84.2	70	130
EP080: BTEXN (QCLot: 469861)							
ES1611617-021	BH21_1.0m	EP080: Benzene	71-43-2	2.5 mg/kg	95.0	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	98.8	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	101	70	130

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%) Low	High
EP080: BTEXN (QCLot: 469861) - continued							
ES1611617-021	BH21_1.0m	EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	103	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	101	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	94.5	70	130

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%) Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 471682)							
ES1611686-005	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	124	70	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	126	70	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	126	70	130
		EG020A-F: Copper	7440-50-8	1 mg/L	129	70	130
		EG020A-F: Lead	7439-92-1	1 mg/L	118	70	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	130	70	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	130	70	130
EG035F: Dissolved Mercury by FIMS (QCLot: 471683)							
ES1611617-033	RB01	EG035F: Mercury	7439-97-6	0.01 mg/L	77.3	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 470402)							
ES1611419-016	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	106	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 470402)							
ES1611419-016	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	102	70	130
EP080: BTEXN (QCLot: 470402)							
ES1611419-016	Anonymous	EP080: Benzene	71-43-2	25 µg/L	91.2	70	130
		EP080: Toluene	108-88-3	25 µg/L	96.7	70	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	97.0	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	94.0	70	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	98.1	70	130
		EP080: Naphthalene	91-20-3	25 µg/L	94.9	70	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES1611617**	Page	: 1 of 12
Client	: **PARSONS BRINCKERHOFF AUSTRALIA PTY LIMITED**	Laboratory	: Environmental Division Sydney
Contact	: DANIEL SMITH	Telephone	: +61 2 8784 8503
Project	: 2270089A WAVE PARK GROUP DSI	Date Samples Received	: 30-May-2016
Site	: SYDNEY OLYMPIC PARK	Issue Date	: 06-Jun-2016
Sampler	: ----	No. of samples received	: 39
Order number	: ----	No. of samples analysed	: 39

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **Quality Control Sample Frequency Outliers exist - please see following pages for full details.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons						
Amber Glass Bottle - Unpreserved						
RB01	31-May-2016	30-May-2016	**0**	----	----	----
EP080/071: Total Petroleum Hydrocarbons						
Amber Glass Bottle - Unpreserved						
RB01	31-May-2016	30-May-2016	**0**	----	----	----

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
PAH/Phenols (GC/MS - SIM)	0	13	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	5	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
PAH/Phenols (GC/MS - SIM)	0	13	0.00	5.00	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	0	5	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content								
Soil Glass Jar - Unpreserved (EA055-103)								
BH03_0.1m,	BH04_0.5m	**24-May-2016**	**----**	----	----	**31-May-2016**	07-Jun-2016	✓
Soil Glass Jar - Unpreserved (EA055-103)								
BH01_1.0m,	BH16_2.0m,	**25-May-2016**	**----**	----	----	**31-May-2016**	08-Jun-2016	✓
BH18_3.0m,	BH24_0.1m,							
BH27_0.5m,	BH29_1.0m							
Soil Glass Jar - Unpreserved (EA055-103)								
BH02_2.0m,	BH05_2.0m,	**26-May-2016**	**----**	----	----	**31-May-2016**	09-Jun-2016	✓
BH06_3.0m,	BH07_3.0m,							
BH08_2.0m,	BH09_1.0m,							
BH10_0.1m,	BH11_3.0m,							
BH12_2.0m,	BH13_0.5m,							
BH14_0.1m,	BH15_1.0m,							
BH17_2.0m,	BH19_1.0m,							
BH20_3.0m,	BH21_1.0m,							
BH22_1.0m,	BH23_3.0m,							
BH25_2.0m,	BH26_0.5m,							
BH28_3.0m,	BH30_0.5m,							
QAQC01,	QAQC02							
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Snap Lock Bag - Subsampled by ALS (EA200)								
BH03_0.1m,	BH04_0.5m	**24-May-2016**	**----**	----	----	**02-Jun-2016**	20-Nov-2016	✓
Snap Lock Bag - Subsampled by ALS (EA200)								
BH01_1.0m,	BH16_2.0m,	**25-May-2016**	**----**	----	----	**02-Jun-2016**	21-Nov-2016	✓
BH18_3.0m,	BH24_0.1m,							
BH27_0.5m,	BH29_1.0m							
Snap Lock Bag - Subsampled by ALS (EA200)								
BH02_2.0m,	BH05_2.0m,	**26-May-2016**	**----**	----	----	**02-Jun-2016**	22-Nov-2016	✓
BH06_3.0m,	BH07_3.0m,							
BH08_2.0m,	BH09_1.0m,							
BH10_0.1m,	BH11_3.0m,							
BH12_2.0m,	BH13_0.5m,							
BH14_0.1m,	BH15_1.0m,							
BH17_2.0m,	BH19_1.0m,							
BH20_3.0m,	BH21_1.0m,							
BH22_1.0m,	BH23_3.0m,							
BH25_2.0m,	BH26_0.5m,							
BH28_3.0m,	BH30_0.5m,							
QAQC01,	QAQC02							

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG005T: Total Metals by ICP-AES								
Soil Glass Jar - Unpreserved (EG005T)								
BH03_0.1m,	BH04_0.5m	**24-May-2016**	**01-Jun-2016**	20-Nov-2016	✓	**02-Jun-2016**	20-Nov-2016	✓
Soil Glass Jar - Unpreserved (EG005T)								
BH01_1.0m,	BH16_2.0m,	**25-May-2016**	**01-Jun-2016**	21-Nov-2016	✓	**02-Jun-2016**	21-Nov-2016	✓
BH18_3.0m,	BH24_0.1m,							
BH27_0.5m,	BH29_1.0m							
Soil Glass Jar - Unpreserved (EG005T)								
BH02_2.0m,	BH05_2.0m,	**26-May-2016**	**01-Jun-2016**	22-Nov-2016	✓	**02-Jun-2016**	22-Nov-2016	✓
BH06_3.0m,	BH07_3.0m,							
BH08_2.0m,	BH09_1.0m,							
BH10_0.1m,	BH11_3.0m,							
BH12_2.0m,	BH13_0.5m,							
BH14_0.1m,	BH15_1.0m,							
BH17_2.0m,	BH19_1.0m,							
BH20_3.0m,	BH21_1.0m,							
BH22_1.0m,	BH23_3.0m,							
BH25_2.0m,	BH26_0.5m,							
BH28_3.0m,	BH30_0.5m,							
QAQC01,	QAQC02							
EG035T: Total Recoverable Mercury by FIMS								
Soil Glass Jar - Unpreserved (EG035T)								
BH03_0.1m,	BH04_0.5m	**24-May-2016**	**01-Jun-2016**	21-Jun-2016	✓	**02-Jun-2016**	21-Jun-2016	✓
Soil Glass Jar - Unpreserved (EG035T)								
BH01_1.0m,	BH16_2.0m,	**25-May-2016**	**01-Jun-2016**	22-Jun-2016	✓	**02-Jun-2016**	22-Jun-2016	✓
BH18_3.0m,	BH24_0.1m,							
BH27_0.5m,	BH29_1.0m							
Soil Glass Jar - Unpreserved (EG035T)								
BH02_2.0m,	BH05_2.0m,	**26-May-2016**	**01-Jun-2016**	23-Jun-2016	✓	**02-Jun-2016**	23-Jun-2016	✓
BH06_3.0m,	BH07_3.0m,							
BH08_2.0m,	BH09_1.0m,							
BH10_0.1m,	BH11_3.0m,							
BH12_2.0m,	BH13_0.5m,							
BH14_0.1m,	BH15_1.0m,							
BH17_2.0m,	BH19_1.0m,							
BH20_3.0m,	BH21_1.0m,							
BH22_1.0m,	BH23_3.0m,							
BH25_2.0m,	BH26_0.5m,							
BH28_3.0m,	BH30_0.5m,							
QAQC01,	QAQC02							

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP066: Polychlorinated Biphenyls (PCB)							
Soil Glass Jar - Unpreserved (EP066) BH01_1.0m, BH18_3.0m, BH29_1.0m	**25-May-2016**	**01-Jun-2016**	08-Jun-2016	✓	**02-Jun-2016**	11-Jul-2016	✓
Soil Glass Jar - Unpreserved (EP066) BH05_2.0m, BH06_3.0m, BH10_0.1m, BH14_0.1m, BH22_1.0m, BH26_0.5m, BH28_3.0m, QAQC01, QAQC02	**26-May-2016**	**01-Jun-2016**	09-Jun-2016	✓	**02-Jun-2016**	11-Jul-2016	✓
EP068A: Organochlorine Pesticides (OC)							
Soil Glass Jar - Unpreserved (EP068) BH01_1.0m, BH18_3.0m, BH29_1.0m	**25-May-2016**	**01-Jun-2016**	08-Jun-2016	✓	**02-Jun-2016**	11-Jul-2016	✓
Soil Glass Jar - Unpreserved (EP068) BH05_2.0m, BH06_3.0m, BH10_0.1m, BH14_0.1m, BH22_1.0m, BH26_0.5m, BH28_3.0m, QAQC01, QAQC02	**26-May-2016**	**01-Jun-2016**	09-Jun-2016	✓	**02-Jun-2016**	11-Jul-2016	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP071) BH03_0.1m, BH04_0.5m	**24-May-2016**	**01-Jun-2016**	07-Jun-2016	✓	**01-Jun-2016**	11-Jul-2016	✓
Soil Glass Jar - Unpreserved (EP071) BH01_1.0m, BH16_2.0m, BH18_3.0m, BH24_0.1m, BH27_0.5m, BH29_1.0m	**25-May-2016**	**01-Jun-2016**	08-Jun-2016	✓	**01-Jun-2016**	11-Jul-2016	✓
Soil Glass Jar - Unpreserved (EP071) BH02_2.0m, BH05_2.0m, BH06_3.0m, BH07_3.0m, BH08_2.0m, BH09_1.0m, BH10_0.1m, BH11_3.0m, BH12_2.0m, BH13_0.5m, BH14_0.1m, BH15_1.0m, BH17_2.0m, BH19_1.0m, BH20_3.0m, BH21_1.0m, BH22_1.0m, BH23_3.0m, BH25_2.0m, BH26_0.5m, BH28_3.0m, BH30_0.5m, QAQC01, QAQC02	**26-May-2016**	**01-Jun-2016**	09-Jun-2016	✓	**01-Jun-2016**	11-Jul-2016	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Soil Glass Jar - Unpreserved (EP075(SIM))								
BH03_0.1m,	BH04_0.5m	**24-May-2016**	**01-Jun-2016**	07-Jun-2016	✓	**01-Jun-2016**	11-Jul-2016	✓
Soil Glass Jar - Unpreserved (EP075(SIM))								
BH01_1.0m,	BH16_2.0m,	**25-May-2016**	**01-Jun-2016**	08-Jun-2016	✓	**01-Jun-2016**	11-Jul-2016	✓
BH18_3.0m,	BH24_0.1m,							
BH27_0.5m,	BH29_1.0m							
Soil Glass Jar - Unpreserved (EP075(SIM))								
BH02_2.0m,	BH05_2.0m,	**26-May-2016**	**01-Jun-2016**	09-Jun-2016	✓	**01-Jun-2016**	11-Jul-2016	✓
BH06_3.0m,	BH07_3.0m,							
BH08_2.0m,	BH09_1.0m,							
BH10_0.1m,	BH11_3.0m,							
BH12_2.0m,	BH13_0.5m,							
BH14_0.1m,	BH15_1.0m,							
BH17_2.0m,	BH19_1.0m,							
BH20_3.0m,	BH21_1.0m,							
BH22_1.0m,	BH23_3.0m,							
BH25_2.0m,	BH26_0.5m,							
BH28_3.0m,	BH30_0.5m,							
QAQC01,	QAQC02							

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080) BH03_0.1m, BH04_0.5m	**24-May-2016**	**31-May-2016**	07-Jun-2016	✓	**01-Jun-2016**	07-Jun-2016	✓
Soil Glass Jar - Unpreserved (EP080) BH24_0.1m, BH27_0.5m, BH29_1.0m	**25-May-2016**	**01-Jun-2016**	08-Jun-2016	✓	**01-Jun-2016**	08-Jun-2016	✓
Soil Glass Jar - Unpreserved (EP080) BH01_1.0m, BH16_2.0m, BH18_3.0m	**25-May-2016**	**31-May-2016**	08-Jun-2016	✓	**01-Jun-2016**	08-Jun-2016	✓
Soil Glass Jar - Unpreserved (EP080) BH21_1.0m, BH22_1.0m, BH23_3.0m, BH25_2.0m, BH26_0.5m, BH28_3.0m, BH30_0.5m, QAQC01, QAQC02, TB01, TS01, TSC	**26-May-2016**	**01-Jun-2016**	09-Jun-2016	✓	**01-Jun-2016**	09-Jun-2016	✓
Soil Glass Jar - Unpreserved (EP080) BH02_2.0m, BH05_2.0m, BH06_3.0m, BH07_3.0m, BH08_2.0m, BH09_1.0m, BH10_0.1m, BH11_3.0m, BH12_2.0m, BH13_0.5m, BH14_0.1m, BH15_1.0m, BH17_2.0m, BH19_1.0m, BH20_3.0m	**26-May-2016**	**31-May-2016**	09-Jun-2016	✓	**01-Jun-2016**	09-Jun-2016	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020F: Dissolved Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F) RB01	**23-May-2016**	**----**	----	----	**01-Jun-2016**	19-Nov-2016	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F) RB02	**24-May-2016**	**----**	----	----	**01-Jun-2016**	20-Nov-2016	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F) RB03	**25-May-2016**	**----**	----	----	**01-Jun-2016**	21-Nov-2016	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG020A-F) RB04	**26-May-2016**	**----**	----	----	**01-Jun-2016**	22-Nov-2016	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG035F: Dissolved Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F) RB01	**23-May-2016**	**----**	----	----	**03-Jun-2016**	20-Jun-2016	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F) RB02	**24-May-2016**	**----**	----	----	**03-Jun-2016**	21-Jun-2016	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F) RB03	**25-May-2016**	**----**	----	----	**03-Jun-2016**	22-Jun-2016	✓
Clear Plastic Bottle - Nitric Acid; Filtered (EG035F) RB04	**26-May-2016**	**----**	----	----	**03-Jun-2016**	23-Jun-2016	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071) RB01	**23-May-2016**	**31-May-2016**	30-May-2016	×	**31-May-2016**	10-Jul-2016	✓
Amber Glass Bottle - Unpreserved (EP071) RB02	**24-May-2016**	**31-May-2016**	31-May-2016	✓	**31-May-2016**	10-Jul-2016	✓
Amber Glass Bottle - Unpreserved (EP071) RB03	**25-May-2016**	**31-May-2016**	01-Jun-2016	✓	**31-May-2016**	10-Jul-2016	✓
Amber Glass Bottle - Unpreserved (EP071) RB04	**26-May-2016**	**31-May-2016**	02-Jun-2016	✓	**31-May-2016**	10-Jul-2016	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM)) RB01	**23-May-2016**	**31-May-2016**	30-May-2016	×	**31-May-2016**	10-Jul-2016	✓
Amber Glass Bottle - Unpreserved (EP075(SIM)) RB02	**24-May-2016**	**31-May-2016**	31-May-2016	✓	**31-May-2016**	10-Jul-2016	✓
Amber Glass Bottle - Unpreserved (EP075(SIM)) RB03	**25-May-2016**	**31-May-2016**	01-Jun-2016	✓	**31-May-2016**	10-Jul-2016	✓
Amber Glass Bottle - Unpreserved (EP075(SIM)) RB04	**26-May-2016**	**31-May-2016**	02-Jun-2016	✓	**31-May-2016**	10-Jul-2016	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber VOC Vial - Sulfuric Acid (EP080) RB01	**23-May-2016**	**31-May-2016**	06-Jun-2016	✓	**31-May-2016**	06-Jun-2016	✓
Amber VOC Vial - Sulfuric Acid (EP080) RB02	**24-May-2016**	**31-May-2016**	07-Jun-2016	✓	**31-May-2016**	07-Jun-2016	✓
Amber VOC Vial - Sulfuric Acid (EP080) RB03	**25-May-2016**	**31-May-2016**	08-Jun-2016	✓	**31-May-2016**	08-Jun-2016	✓
Amber VOC Vial - Sulfuric Acid (EP080) RB04	**26-May-2016**	**31-May-2016**	09-Jun-2016	✓	**31-May-2016**	09-Jun-2016	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	4	40	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	4	32	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	2	12	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	2	12	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	4	39	10.26	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	4	40	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	4	32	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	4	39	10.26	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	2	32	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	2	12	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	2	12	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	39	5.13	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	32	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	39	5.13	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	2	32	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	2	12	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	2	12	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	39	5.13	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	32	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	39	5.13	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	2	32	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Pesticides by GCMS	EP068	2	12	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Polychlorinated Biphenyls (PCB)	EP066	2	12	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	39	5.13	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	40	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	32	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	39	5.13	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Dissolved Mercury by FIMS	EG035F	1	4	**25.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	9	**22.22**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	13	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	5	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Dissolved Mercury by FIMS	EG035F	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Dissolved Mercury by FIMS	EG035F	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Dissolved Mercury by FIMS	EG035F	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	0	13	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	0	5	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Asbestos Identification in Soils	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples Analysis by Polarised Light Microscopy including dispersion staining
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Polychlorinated Biphenyls (PCB)	EP066	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 504)
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique is compliant with NEPM (2013) Schedule B(3) (Method 504,505)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40.
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260B Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve.
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)

Analytical Methods	Method	Matrix	Method Descriptions
TRH - Semivolatile Fraction	EP071	WATER	In house: Referenced to USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	In house: Referenced to USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	In house: Referenced to USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.
Separatory Funnel Extraction of Liquids	ORG14	WATER	In house: Referenced to USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (2013) Schedule B(3) . ALS default excludes sediment which may be resident in the container.
Volatiles Water Preparation	ORG16-W	WATER	A 5 mL aliquot or 5 mL of a diluted sample is added to a 40 mL VOC vial for sparging.

PARSONS BRINCKERHOFF

White Page - Laboratory Copy
Yellow Page - Project File Copy
Pink Page - Remains in Book

ABN 80 078 004 798

☐ **Adelaide** Level 16, 1 King William Street, GPO Box 398 Adelaide SA 5001 Tel: (08) 8405 4300 Fax: (08) 8405 4301

☐ **Brisbane** Level 3, Northbank Plaza 69 Ann Street, GPO Box 2907 Brisbane QLD 4001 Tel: (07) 3854 6200 Fax: (07) 3854 6500

☐ **Melbourne** Level 15, 28 Freshwater Place, PO Box 19016 Southbank VIC 3006 Tel: (03) 9861 1111 Fax: (03) 9861 1144

☑ **Sydney** Level 27, Ernst & Young Centre 680 George Street, GPO Box 5394, Sydney NSW 2001 Tel: (02) 9272 5100 Fax: (02) 9272 5101

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☐ **Newcastle** Level 3, 51-55 Bolton Street, PO Box 1162 Newcastle NSW, 2300 Tel: (02) 4929 8300 Fax: (02) 4929 8382

29-7-16

Chain of Custody

Order No: 81815

Job Title: WAVE PARK	PB Job Number: 2270089 A	Job Location: SYD OLYM PARK	Project Manager: Amy Valentine
Laboratory Name: ALS			Results Expected by/on: 29/07/16
Address:			~~Fax Results to:~~ email. IPowell@pb.com.au
			Fax Number:
Fax Number:			Phone Number: 02 9272 5139
Phone Number:			Spreadsheet of Results Required: (Y) / N
Contact Name:			Format:
Delivery Method:			Turnaround Time Required: 48 hr
Quote Number:			Invoice to:
			Comments:

Terms of Business	PB	Other	Checked
	X		

Date Sampled	Time	Sample I.D.	Container Size	Sample Location	Medium*	Preservative Type	Filtered (X)	TPH	BTEX	PAH's	OC/OP/PCB's	Metals**	Asbestos - Presence/absence				HOLD	Initials	Comments/Additional Information and/or Analysis Required
26/7/16	1	D7_2.0			S	nil							X					AV	
26/7/16	2	J3_2.0			S	nil							X					AV	
26/7/16	3	G11_2.0			S	nil											X	AV	

TAT

Environmental Division
Sydney
Work Order Reference
ES1616402

Telephone : + 61-2-8784 8555

~~Sub-contract / Forward Lab / Split WO~~
Lab / Analysis: Newcastle. Asbestos
Organised By / Date: Frank.
Relinquished By / Date:
Connote / Courier:
WO No: ES1616402
Attach By PO / Internal Sheet:

Relinquished by: Amy Valentine	Relinquished by:	Relinquished by:	Medium*: S = Soil, W = Water, V = Vapour
Date & Time: 27/7/16	Date & Time:	Date & Time:	Legend**: (circle the following to be tested)
Company: PB	Company:	Company:	Metals: Al As Be Cd Co Cr Cu Fe Hg Li Mg Mn Ni Pb Se Sn V Zn
Signature:	Signature:	Signature:	
Received in Good Order & Condition by (Name): Frank 21-9	Received in Good Order & Condition by (Name):	Received in Good Order & Condition by (Name):	Samples on Ice: ☐ Yes ☒ No
Date & Time: 27-7-16 1540	Date & Time:	Date & Time:	***Please fax back a signed copy when samples are received at the laboratory***
Company: ALS	Company:	Company:	
Signature:	Signature:	Signature:	

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1616402**	Page	: 1 of 3
Client	: **PARSONS BRINCKERHOFF AUSTRALIA PTY LIMITED**	Laboratory	: Environmental Division Sydney
Contact	: MS AMY VALENTINE	Contact	:
Address	: ABN: 80 078 004 798 GPO BOX 5394 SYDNEY NSW, AUSTRALIA 2001	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 92725100	Telephone	: +61-2-8784 8555
Project	: 2270089A WAVE PARK	Date Samples Received	: 27-Jul-2016 15:40
Order number	: ----	Date Analysis Commenced	: 29-Jul-2016
C-O-C number	: 81815	Issue Date	: 29-Jul-2016 13:13
Sampler	: ----		
Site	: SYD OLYMPIC PARK		
Quote number	: ----		
No. of samples received	: 3		
No. of samples analysed	: 2		

NATA Accredited Laboratory 825
Accredited for compliance with
ISO/IEC 17025.

NATA
WORLD RECOGNISED ACCREDITATION

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Shaun Spooner	Asbestos Identifier	Newcastle - Asbestos, Mayfield West, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- Exxxx: LOR raised for (TEST NAME) due to sample matrix.
- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Trace' - Asbestos fibres ("Free Fibres") detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200 Legend
- EA200 'Ch' Chrysotile (white asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.
- EA200: For samples larger than 30g, the <2mm fraction may be sub-sampled prior to trace analysis as outlined in ISO23909:2008(E) Sect 6.3.2-2

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	D7_2.0	J3_2.0	----	----	----
			Client sampling date / time	[26-Jul-2016]	[26-Jul-2016]	----	----	----
Compound	CAS Number	LOR	Unit	ES1616402-001	ES1616402-002	--------	--------	--------
				Result	Result	----	----	----
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	**Yes**	**No**	**----**	**----**	**----**
Asbestos Type	1332-21-4	-	--	**Ch**	**-**	**----**	**----**	**----**
Sample weight (dry)	----	0.01	g	**274**	**310**	**----**	**----**	**----**
APPROVED IDENTIFIER:	----	-	--	**S.SPOONER**	**S.SPOONER**	**----**	**----**	**----**

Analytical Results

Descriptive Results

Sub-Matrix: **SOIL**

Method: Compound	*Client sample ID - Client sampling date / time*	*Analytical Results*
EA200: AS 4964 - 2004 Identification of Asbestos in Soils		
EA200: Description	D7_2.0 - [26-Jul-2016]	Mid grey soil plus one piece of bonded asbestos cement sheeting approx 20 x 20 x 5 mm.
EA200: Description	J3_2.0 - [26-Jul-2016]	Mid brown sandy soil.

QUALITY CONTROL REPORT

Work Order	: **ES1616402**	Page	: 1 of 3
Client	: **PARSONS BRINCKERHOFF AUSTRALIA PTY LIMITED**	Laboratory	: Environmental Division Sydney
Contact	: MS AMY VALENTINE	Contact	:
Address	: ABN: 80 078 004 798 GPO BOX 5394 SYDNEY NSW, AUSTRALIA 2001	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 92725100	Telephone	: +61-2-8784 8555
Project	: 2270089A WAVE PARK	Date Samples Received	: 27-Jul-2016
Order number	: ----	Date Analysis Commenced	: 29-Jul-2016
C-O-C number	: 81815	Issue Date	: 29-Jul-2016
Sampler	: ----		
Site	: SYD OLYMPIC PARK		
Quote number	: ----		
No. of samples received	: 3		
No. of samples analysed	: 2		

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Accredited for compliance with
ISO/IEC 17025.

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Shaun Spooner	Asbestos Identifier	Newcastle - Asbestos, Mayfield West, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

- **No Laboratory Duplicate (DUP) Results are required to be reported.**

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

- **No Method Blank (MB) or Laboratory Control Spike (LCS) Results are required to be reported.**

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES1616402**	Page	: 1 of 4
Client	: **PARSONS BRINCKERHOFF AUSTRALIA PTY LIMITED**	Laboratory	: Environmental Division Sydney
Contact	: MS AMY VALENTINE	Telephone	: +61-2-8784 8555
Project	: 2270089A WAVE PARK	Date Samples Received	: 27-Jul-2016
Site	: SYD OLYMPIC PARK	Issue Date	: 29-Jul-2016
Sampler	: ----	No. of samples received	: 3
Order number	: ----	No. of samples analysed	: 2

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / ***Container*** / *Client Sample ID(s)*	***Sample Date***	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*
EA200: AS 4964 - 2004 Identification of Asbestos in Soils							
Snap Lock Bag: Separate bag received (EA200)							
D7_2.0, J3_2.0	**26-Jul-2016**	**----**	----	----	**29-Jul-2016**	22-Jan-2017	✓

Quality Control Parameter Frequency Compliance

- **No Quality Control data available for this section.**

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Asbestos Identification in Soils	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples Analysis by Polarised Light Microscopy including dispersion staining

PB 125 YEARS ABN 80 078 004 798

White Page - Laboratory Copy
Yellow Page - Project File Copy
Pink Page - Remains in Book

☐ **Adelaide** Level 16, 1 King William Street, GPO Box 398 Adelaide SA 5001 Tel: (08) 8405 4300 Fax: (08) 8405 4301

☐ **Brisbane** Level 4, Northbank Plaza 69 Ann Street, GPO Box 2907 Brisbane QLD 4001 Tel: (07) 3854 6200 Fax: (07) 3854 6500

☐ **Melbourne** Level 15, 28 Freshwater Place, PO Box 19016 Southbank VIC 3006 Tel: (03) 9861 1111 Fax: (03) 9861 1144

☑ **Sydney** Level 27, Ernst & Young Centre 680 George Street, GPO Box 5394, Sydney NSW 2001 Tel: (02) 9272 5100 Fax: (02) 9272 5101

☐ **Perth** Level 5, 503 Murray Street, PO Box 7181 Cloisters Square WA 6850 Tel: (08) 9489 9700 Fax: (08) 9489 9777

☐ **Singleton** 188 John Street, PO Box 115 Singleton NSW 2330 Tel: (02) 6572 3377 Fax: (02) 6572 4080

☐ **Newcastle** Level 3, 51-55 Bolton Street, PO Box 1162 Newcastle NSW, 2300 Tel: (02) 4929 8300 Fax: (02) 4929 8382

PG 1/1

Chain of Custody

Order No: 69671

Job Title: NSW WAVE PARK	PB Job Number: 22700894	Job Location: Sydney	Project Manager: AMY VALENTINE
Laboratory Name: ALS	Terms of Business / PB / Other / Checked		Results Expected by/on: 3 DAY TAT
Address:			Fax Results to:
Fax Number:			Fax Number:
Phone Number:			Phone Number:
Contact Name:			Spreadsheet of Results Required: Y / N
Delivery Method:			Format:
Quote Number:			Turnaround Time Required: 3 DAY TAT
			Invoice to:
			Comments:

	Date Sampled	Time	Sample I.D.	Container Size	Sample Location	Medium*	Preservative Type	Filtered (X)	TPH	BTEX	PAHs	OC/OP/PCBs	Metals**	Asbestos (p/a)					Initials	Comments/Additional Information and/or Analysis Required
1	22/7/16	22/7	A7_1.5											/						
2			A7_3.0											/						
3			E2_2.5											/						
4			H1_1.0											/						
5			F1_0.5											/						
6			G1_3.0											/						
7			D3_1.2											/						
8			C5_1.0											/						
9			D5_2.0											/						
10			F3_1.0											/						
11			F4_2.0											/						
12			H2_2.0											/						
13			G3_0.5											/						

Environmental Division
Newcastle
Work Order Reference
EN1602639

Telephone : +61 2 4014 2500

Relinquished by:	Relinquished by:	Relinquished by:
Date & Time:	Date & Time:	Date & Time:
Company: M. BARRY 22/7/16 13:00	Company:	Company:
Signature:	Signature:	Signature:
Received in Good Order & Condition by (Name):	Received in Good Order & Condition by (Name):	Received in Good Order & Condition by (Name):
Date & Time: 22/7/16 16:55	Date & Time:	Date & Time:
Company: ALS	Company:	Company:
Signature:	Signature:	Signature:

Medium*: S = Soil, W = Water, V = Vapour

Legend**: (circle the following to be tested)

Metals: Al As Be Cd Co Cr Cu Fe Hg Li Mg Mn Ni Pb Se Sn V Zn

Samples on Ice: ☐ Yes ☐ No

Please fax back a signed copy when samples are received at the laboratory

ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EN1602639**

Client	: **PARSONS BRINCKERHOFF AUSTRALIA PTY LIMITED**	Laboratory	: Environmental Division Newcastle
Contact	: MS AMY VALENTINE	Contact	:
Address	: ABN: 80 078 004 798 GPO BOX 5394 SYDNEY NSW, AUSTRALIA 2001	Address	: 5/585 Maitland Road Mayfield West NSW Australia 2304
E-mail	: avalentine@pb.com.au	E-mail	:
Telephone	: +61 02 92725100	Telephone	: +61 2 4014 2500
Facsimile	: +61 02 92725101	Facsimile	: +61 2 4967 7382
Project	: 2270089A NSW WAVE PARK	Page	: 1 of 2
Order number	: ----	Quote number	: ES2015PARBRINSW0260 (EN/008/15)
C-O-C number	: 69671	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Sydney		
Sampler	:		

Dates

Date Samples Received	: 22-Jul-2016 4:55 PM	Issue Date	: 22-Jul-2016
Client Requested Due Date	: 27-Jul-2016	Scheduled Reporting Date	: **27-Jul-2016**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not intact.
No. of coolers/boxes	: ----	Temperature	: ----
Receipt Detail	:	No. of samples received / analysed	: 13 / 13

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	SOIL - EA200 Asbestos Identification in Soils -
EN1602639-001	[22-Jul-2016]	A7_1.5	✓
EN1602639-002	[22-Jul-2016]	A7_3.0	✓
EN1602639-003	[22-Jul-2016]	E2_2.5	✓
EN1602639-004	[22-Jul-2016]	H1_1.0	✓
EN1602639-005	[22-Jul-2016]	F1_0.5	✓
EN1602639-006	[22-Jul-2016]	G1_3.0	✓
EN1602639-007	[22-Jul-2016]	D3_1.2	✓
EN1602639-008	[22-Jul-2016]	C5_1.0	✓
EN1602639-009	[22-Jul-2016]	D5_2.0	✓
EN1602639-010	[22-Jul-2016]	F3_1.0	✓
EN1602639-011	[22-Jul-2016]	F4_2.0	✓
EN1602639-012	[22-Jul-2016]	H2_2.0	✓
EN1602639-013	[22-Jul-2016]	G3_0.5	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

ACCOUNTS PAYABLE(AP INVOICES)

- A4 - AU Tax Invoice (INV)	Email	apinvoices@pb.com.au

AMY VALENTINE

- *AU Certificate of Analysis - NATA (COA)	Email	avalentine@pb.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	avalentine@pb.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	avalentine@pb.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	avalentine@pb.com.au
- Chain of Custody (CoC) (COC)	Email	avalentine@pb.com.au
- EDI Format - ENMRG (ENMRG)	Email	avalentine@pb.com.au
- EDI Format - ESDAT (ESDAT)	Email	avalentine@pb.com.au

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EN1602639**	Page	: 1 of 5
Client	: **PARSONS BRINCKERHOFF AUSTRALIA PTY LIMITED**	Laboratory	: Environmental Division Newcastle
Contact	: MS AMY VALENTINE	Contact	:
Address	: ABN: 80 078 004 798 GPO BOX 5394 SYDNEY NSW, AUSTRALIA 2001	Address	: 5/585 Maitland Road Mayfield West NSW Australia 2304
Telephone	: +61 02 92725100	Telephone	: +61 2 4014 2500
Project	: 2270089A NSW WAVE PARK	Date Samples Received	: 22-Jul-2016 16:55
Order number	: ----	Date Analysis Commenced	: 25-Jul-2016
C-O-C number	: 69671	Issue Date	: 27-Jul-2016 12:14
Sampler	: ----		
Site	: Sydney		
Quote number	: ----		
No. of samples received	: 13		
No. of samples analysed	: 13		

NATA Accredited Laboratory 825
Accredited for compliance with
ISO/IEC 17025.

NATA
WORLD RECOGNISED ACCREDITATION

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Christopher Owler	Team Leader - Asbestos	Newcastle - Asbestos, Mayfield West, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Trace' - Asbestos fibres ("Free Fibres") detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200 Legend
- EA200 'Ch' Chrysotile (white asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.
- EA200: For samples larger than 30g, the <2mm fraction may be sub-sampled prior to trace analysis as outlined in ISO23909:2008(E) Sect 6.3.2-2

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	A7_1.5	A7_3.0	E2_2.5	H1_1.0	F1_0.5
			Client sampling date / time	[22-Jul-2016]	[22-Jul-2016]	[22-Jul-2016]	[22-Jul-2016]	[22-Jul-2016]
Compound	CAS Number	LOR	Unit	EN1602639-001	EN1602639-002	EN1602639-003	EN1602639-004	EN1602639-005
				Result	Result	Result	Result	Result
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	**Yes**	**No**	**Yes**	**No**	**No**
Asbestos Type	1332-21-4	-	--	**Ch**	**-**	**Ch + Cr**	**-**	**-**
Sample weight (dry)	----	0.01	g	**116**	**81.2**	**132**	**63.7**	**202**
APPROVED IDENTIFIER:	----	-	--	**S.SPOONER**	**S.SPOONER**	**S.SPOONER**	**S.SPOONER**	**C.OWLER**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	G1_3.0	D3_1.2	C5_1.0	D5_2.0	F3_1.0
			Client sampling date / time	[22-Jul-2016]	[22-Jul-2016]	[22-Jul-2016]	[22-Jul-2016]	[22-Jul-2016]
Compound	CAS Number	LOR	Unit	EN1602639-006	EN1602639-007	EN1602639-008	EN1602639-009	EN1602639-010
				Result	Result	Result	Result	Result
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	**No**	**No**	**No**	**No**	**No**
Asbestos Type	1332-21-4	-	--	**-**	**-**	**-**	**-**	**-**
Sample weight (dry)	----	0.01	g	**98.1**	**78.5**	**79.2**	**126**	**133**
APPROVED IDENTIFIER:	----	-	--	**C.OWLER**	**C.OWLER**	**C.OWLER**	**C.OWLER**	**C.OWLER**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	F4_2.0	H2_2.0	G3_0.5	----	----
			Client sampling date / time	[22-Jul-2016]	[22-Jul-2016]	[22-Jul-2016]	----	----
Compound	CAS Number	LOR	Unit	EN1602639-011	EN1602639-012	EN1602639-013	--------	--------
				Result	Result	Result	----	----
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	**No**	**No**	**No**	**----**	**----**
Asbestos Type	1332-21-4	-	--	**-**	**-**	**-**	**----**	**----**
Sample weight (dry)	----	0.01	g	**51.3**	**138**	**61.1**	**----**	**----**
APPROVED IDENTIFIER:	----	-	--	**C.OWLER**	**C.OWLER**	**S.SPOONER**	**----**	**----**

Analytical Results

Descriptive Results

Sub-Matrix: **SOIL**

Method: Compound	Client sample ID - Client sampling date / time	Analytical Results
EA200: AS 4964 - 2004 Identification of Asbestos in Soils		
EA200: Description	A7_1.5 - [22-Jul-2016]	Mid grey sandy soil plus one fragment of friable asbestos cmement sheeting approx 2 x 1 x 1mm
EA200: Description	A7_3.0 - [22-Jul-2016]	Mid brown sandy soil
EA200: Description	E2_2.5 - [22-Jul-2016]	Mid brown clay soil with one fragment of friable asbestos cement sheeting approx 2 x 2 x 1mm
EA200: Description	H1_1.0 - [22-Jul-2016]	Mid brown clay soil
EA200: Description	F1_0.5 - [22-Jul-2016]	Mid brown sandy soil
EA200: Description	G1_3.0 - [22-Jul-2016]	Mid brown sandy soil
EA200: Description	D3_1.2 - [22-Jul-2016]	Mid brown sandy soil
EA200: Description	C5_1.0 - [22-Jul-2016]	Mid brown sandy soil
EA200: Description	D5_2.0 - [22-Jul-2016]	Mid brown sandy soil
EA200: Description	F3_1.0 - [22-Jul-2016]	Mid brown sandy soil
EA200: Description	F4_2.0 - [22-Jul-2016]	Mid brown sandy soil
EA200: Description	H2_2.0 - [22-Jul-2016]	Mid brown sandy soil
EA200: Description	G3_0.5 - [22-Jul-2016]	Mid orange clay soil

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EN1602639**	Page	: 1 of 3
Client	: **PARSONS BRINCKERHOFF AUSTRALIA PTY LIMITED**	Laboratory	: Environmental Division Newcastle
Contact	: MS AMY VALENTINE	Contact	:
Address	: ABN: 80 078 004 798 GPO BOX 5394 SYDNEY NSW, AUSTRALIA 2001	Address	: 5/585 Maitland Road Mayfield West NSW Australia 2304
Telephone	: +61 02 92725100	Telephone	: +61 2 4014 2500
Project	: 2270089A NSW WAVE PARK	Date Samples Received	: 22-Jul-2016
Order number	: ----	Date Analysis Commenced	: 25-Jul-2016
C-O-C number	: 69671	Issue Date	: 27-Jul-2016
Sampler	: ----		
Site	: Sydney		
Quote number	: ----		
No. of samples received	: 13		
No. of samples analysed	: 13		

NATA Accredited Laboratory 825
Accredited for compliance with
ISO/IEC 17025.

NATA
WORLD RECOGNISED ACCREDITATION

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Christopher Owler	Team Leader - Asbestos	Newcastle - Asbestos, Mayfield West, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

- **No Laboratory Duplicate (DUP) Results are required to be reported.**

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

- **No Method Blank (MB) or Laboratory Control Spike (LCS) Results are required to be reported.**

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EN1602639**	Page	: 1 of 4
Client	: **PARSONS BRINCKERHOFF AUSTRALIA PTY LIMITED**	Laboratory	: Environmental Division Newcastle
Contact	: MS AMY VALENTINE	Telephone	: +61 2 4014 2500
Project	: 2270089A NSW WAVE PARK	Date Samples Received	: 22-Jul-2016
Site	: Sydney	Issue Date	: 27-Jul-2016
Sampler	: ----	No. of samples received	: 13
Order number	: ----	No. of samples analysed	: 13

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / ***Container*** / *Client Sample ID(s)*	***Sample Date***	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*
EA200: AS 4964 - 2004 Identification of Asbestos in Soils							
Snap Lock Bag - Friable Asbestos/PSD Bag (EA200)							
A7_1.5, A7_3.0, E2_2.5, H1_1.0, F1_0.5, G1_3.0, D3_1.2, C5_1.0, D5_2.0, F3_1.0, F4_2.0, H2_2.0, G3_0.5	**22-Jul-2016**	**----**	----	----	**25-Jul-2016**	18-Jan-2017	✓

Quality Control Parameter Frequency Compliance

- **No Quality Control data available for this section.**

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Asbestos Identification in Soils	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples Analysis by Polarised Light Microscopy including dispersion staining

PB 125 YEARS ABN 80 078 004 798

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Chain of Custody

Order No: 69671

Job Title: NSW WAVE PARK	PB Job Number: 22700894	Job Location: Sydney	Project Manager: Amy Valentine
Laboratory Name: ALS	Terms of Business	PB	Other	Checked	Results Expected by/on: 25/7/16 - 5pm
Address:					Fax Results to:
					Fax Number:
Fax Number:					Phone Number:
Phone Number:					Spreadsheet of Results Required: (Y) / N
Contact Name:					Format:
Delivery Method:					Turnaround Time Required: 25/7/16 - 5pm
Quote Number:					Invoice to: AP.invoices@pb.com.au
					Comments:

Date Sampled	Time	Sample I.D.	Container Size	Sample Location	Medium*	Preservative Type	Filtered (X)	TPH	BTEX	PAH's	OC/OP/PCB's	Metals**	Asbestos (p/a)						Initials	Comments/Additional Information and/or Analysis Required
21/7	1	E6_0.5																		Please place all other
	2	_1.5											/							samples not listed on
	3	_2.2																		COC on hold
	4	_2.7																		
	5	E8_1.0																		
	6	_2.0																		
	7	_2.7											/							
	8	F8_0.5											/							
	9	_1.8																		
	10	G8_0.5																		
	11	_1.0																		
	12	_1.5											/							

Subcon / Forward Lab / Split WO
Lab / Analysis: Newcal
Organised By / Date:
Relinquished By / Date: Asbestos
Connote / Courier:
WO No:
Attach By PO Internal Sheet:

FA

Environmental Division Sydney
Work Order Reference
ES1616026

Telephone : + 61-2-8784 8555

Relinquished by: M. Barry	Relinquished by:	Relinquished by:	Medium*: S = Soil, W = Water, V = Vapour
Date & Time: 21/7/16 - 3:00pm	Date & Time:	Date & Time:	Legend**: (circle the following to be tested)
Company:	Company: BONLY	Company:	Metals: Al As Be Cd Co Cr Cu Fe Hg Li Mg Mn Ni Pb Se Sn V Zn
Signature:	Signature:	Signature:	
Received in Good Order & Condition by (Name): Stacy Hayes	Received in Good Order & Condition by (Name):	Received in Good Order & Condition by (Name):	Samples on Ice: ☐ Yes ☐ No
Date & Time: 21/7/16 - 1500	Date & Time:	Date & Time:	
Company: AES 2032	Company:	Company:	***Please fax back a signed copy when samples are received at the laboratory***
Signature:	Signature:	Signature:	

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Chain of Custody

Order No: 69671

Job Title: NSW WAVE PARK	PB Job Number: 22700089A	Job Location:	Project Manager: AMY VALENTINE
Laboratory Name: ALS	Terms of Business: PB ✓	Other:	Results Expected by/on: 25/7/16 - 5pm
Address:		Checked:	Fax Results to:
Fax Number:			Fax Number:
Phone Number:			Phone Number:
Contact Name:			Spreadsheet of Results Required: Y / N
Delivery Method:			Format:
Quote Number:			Turnaround Time Required:
			Invoice to:
			Comments:

Date Sampled	Time	Sample I.D.	Container Size	Sample Location	Medium*	Preservative Type	Filtered (X)	TPH	BTEX	PAH's	OC/OP/PCB's	Metals**	Asbestos (p/a)						Initials	Comments/Additional Information and/or Analysis Required
21/7/16	13	G8 _ 2.3																		Please place all other samples not listed on COC on hold
	14	↓ _ 3.0																		
	15	H8 _ 3.0											/							
	16	I6 _ 0.5											/							
	17	I7 _ 2.0											/							
	18	H6 _ 1.5											/							
	19	G6 _ 0.5											/							
	20	G5 _ 3.0											/							
	21	G4 _ 1.5											/							
	22	H4 _ 2.0											/							
	23	I4 _ 3.0											/							
	24	J5 _ 1.5											/							

Relinquished by: M. Barrat	Relinquished by:	Relinquished by:
Date & Time: 21/7/16 - 3:00	Date & Time:	Date & Time:
Company:	Company: BONDI	Company:
Signature:	Signature:	Signature:
Received in Good Order & Condition by (Name):	Received in Good Order & Condition by (Name):	Received in Good Order & Condition by (Name):
Date & Time: 21/7/16 1500	Date & Time:	Date & Time:
Company: ALS 20-3c	Company:	Company:
Signature:	Signature:	Signature:

Medium*: S = Soil, W = Water, V = Vapour

Legend**: (circle the following to be tested)

Metals: Al As Be Cd Co Cr Cu Fe Hg Li Mg Mn Ni Pb Se Sn V Zn

Samples on Ice: ☐ Yes ☐ No

Please fax back a signed copy when samples are received at the laboratory

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Chain of Custody

Order No: 69671

Job Title: NSW WAVE PARK	PB Job Number: 22700891A	Job Location: Sydney	Project Manager: AMY VALENTINE
Laboratory Name: ALS	Terms of Business / PB / Other / Checked		Results Expected by/on: 25/7/16 - 5pm
Address:			Fax Results to:
Fax Number:			Fax Number:
Phone Number:			Phone Number:
Contact Name:			Spreadsheet of Results Required: Y / N
Delivery Method:			Format:
Quote Number:			Turnaround Time Required:
			Invoice to:
			Comments:

Date Sampled	Time	Sample I.D.	Container Size	Sample Location	Medium*	Preservative Type	Filtered (X)	TPH	BTEX	PAHs	OC/OP/PCBs	Metals**	Asbestos (y/a)						Initials	Comments/Additional Information and/or Analysis Required
20/7/16	25	J6_0.5											/							please place all other samples
	26	L8_1.2											/							not listed on COC on hold
	27	G11_1.0											/							
	28	H11_2.0											/							
	29	G10_0.5											/							
	30	H10_1.5											/							
	31	H10_2.5											/							
	32	I10_0.5											/							
	33	H9_0.5											/							
	34	J9_3.0											/							
	35	I8_2.0											/							
	36	J7_1.0											/							

Relinquished by: M. BRADY	Relinquished by:	Relinquished by:	Medium*: S = Soil, W = Water, V = Vapour
Date & Time: 21/7/16 - 3:00pm	Date & Time:	Date & Time:	Legend**: (circle the following to be tested)
Company:	Company: Bonds	Company:	Metals: Al As Be Cd Co Cr Cu Fe Hg Li Mg Mn Ni Pb Se Sn V Zn
Signature:	Signature:	Signature:	
Received in Good Order & Condition by (Name):	Received in Good Order & Condition by (Name):	Received in Good Order & Condition by (Name):	Samples on Ice: ☐ Yes ☐ No
Date & Time: 21/7/16. 1500	Date & Time:	Date & Time:	***Please fax back a signed copy when samples are received at the laboratory***
Company: ALS 20.3°C	Company:	Company:	
Signature:	Signature:	Signature:	

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Chain of Custody

Order No: 69671

Job Title: NSW WAVE PARK	PB Job Number: 2270089A	Job Location: Sydney	Project Manager: Amy Valentine
Laboratory Name: ALS	Terms of Business / PB / Other / Checked		Results Expected by/on: 25/7/16 – 5pm
Address:			Fax Results to:
Fax Number:			Fax Number:
Phone Number:			Phone Number:
Contact Name:			Spreadsheet of Results Required: Y / N
Delivery Method:			Format:
Quote Number:			Turnaround Time Required:
			Invoice to:
			Comments:

Date Sampled	Time	Sample I.D.	Container Size	Sample Location	Medium*	Preservative Type	Filtered (X)	TPH	BTEX	PAH's	OC/OP/PCB's	Metals**	Asbestos (g/a)						Initials	Comments/Additional Information and/or Analysis Required
20/7/16	37	K7 – 2.5											/							Please place all other samples
	38	K6 – 0.5											/							not listed on COC on hold
	39	K5 – 3.0											/							
	40	M6 – 1.8											/							
	41	F10 – 2.0											/							
	42	E11 – 3.0											/							
	43	E10 – 1.5											/							
	44	F9 – 1.5											/							
	45	F6 – 2.0											/							
	46	D8 – 0.5											/							
	47	D8 – 1.5											/							
	48	C9 – 0.5											/							

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Relinquished by: M. Barral	Relinquished by:	Relinquished by:	Medium*: S = Soil, W = Water, V = Vapour
Date & Time: 21/7/16 – 3:00pm	Date & Time:	Date & Time:	Legend**: (circle the following to be tested)
Company:	Company: Bonds	Company:	Metals: Al As Be Cd Co Cr Cu Fe Hg Li Mg Mn Ni Pb Se Sn V Zn
Signature:	Signature:	Signature:	
Received in Good Order & Condition by (Name):	Received in Good Order & Condition by (Name):	Received in Good Order & Condition by (Name):	Samples on Ice: ☐ Yes ☐ No
Date & Time: 21/7/16 1500	Date & Time:	Date & Time:	***Please fax back a signed copy when samples are received at the laboratory***
Company: ALS 2034	Company:	Company:	
Signature:	Signature:	Signature:	

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PJ 5/8

Chain of Custody

Order No: 69671

Job Title: NSW WANG PARK	PB Job Number: 2270089A	Job Location: Sydney	Project Manager: Amy Valentine
Laboratory Name: ALS	Terms of Business / PB / Other / Checked		Results Expected by/on: 25/7/16 - 5pm
Address:			Fax Results to:
Fax Number:			Fax Number:
Phone Number:			Phone Number:
Contact Name:			Spreadsheet of Results Required: Y / N
Delivery Method:			Format:
Quote Number:			Turnaround Time Required:
			Invoice to:
			Comments:

Date Sampled	Time	Sample I.D.	Container Size	Sample Location	Medium*	Preservative Type	Filtered (X)	TPH	BTEX	PAHs	OC/OP/PCBs	Metals**	Asbestos (p/a)						Initials	Comments/Additional Information and/or Analysis Required
21/7	49	D10-2.0											/							
	50	D9-0.5											/							
	51	B8-1.5											/							
	52	B8-3.0											/							

Relinquished by: M BARRY	Relinquished by:	Relinquished by:	Medium*: S = Soil, W = Water, V = Vapour
Date & Time: 21/7/16 - 3:00pm	Date & Time:	Date & Time:	Legend**: (circle the following to be tested)
Company:	Company: BONDS	Company:	Metals: Al As Be Cd Co Cr Cu Fe Hg Li Mg Mn Ni Pb Se Sn V Zn
Signature:	Signature:	Signature:	
Received in Good Order & Condition by (Name):	Received in Good Order & Condition by (Name):	Received in Good Order & Condition by (Name):	Samples on Ice: ☐ Yes ☐ No
Date & Time: 21/7/16 1500	Date & Time:	Date & Time:	***Please fax back a signed copy when samples are received at the laboratory***
Company: PJS 20-3C	Company:	Company:	
Signature:	Signature:	Signature:	

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **ES1616026**

Client	: **PARSONS BRINCKERHOFF AUSTRALIA PTY LIMITED**	Laboratory	: Environmental Division Sydney
Contact	: MS AMY VALENTINE	Contact	:
Address	: ABN: 80 078 004 798 GPO BOX 5394 SYDNEY NSW, AUSTRALIA 2001	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: avalentine@pb.com.au	E-mail	:
Telephone	: +61 02 92725100	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 92725101	Facsimile	: +61-2-8784 8500
Project	: 2270089A NSW WAVE PARK	Page	: 1 of 5
Order number	: 69671	Quote number	: ES2015PARBRINSW0260 (EN/008/15)
C-O-C number	: 69671	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	:		

Dates

Date Samples Received	: 21-Jul-2016 3:00 PM	Issue Date	: 22-Jul-2016
Client Requested Due Date	: 25-Jul-2016	Scheduled Reporting Date	: **25-Jul-2016**

Delivery Details

Mode of Delivery	: Undefined	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 20.3'C
Receipt Detail	:	No. of samples received / analysed	: 119 / 42

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Sample #53-119 received extra and place on hold as per COC**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Asbestos analysis will be conducted by ALS Newcastle.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (14 days), Solid (60 days) from date of completion of work order.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default to 15:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory for processing purposes and will be shown bracketed without a time component.

Matrix: **SOIL**

Laboratory sample ID	Client sampling date / time	Client sample ID	(On Hold) SOIL No analysis requested	SOIL - EA200 Asbestos Identification in Soils -
ES1616026-001	[21-Jul-2016]	E6_0.5	✓	
ES1616026-002	[21-Jul-2016]	E6_1.5		✓
ES1616026-003	[21-Jul-2016]	E6_2.2	✓	
ES1616026-004	[21-Jul-2016]	E6_2.7	✓	
ES1616026-005	[21-Jul-2016]	E8_1.0	✓	
ES1616026-006	[21-Jul-2016]	E8_2.0	✓	
ES1616026-007	[21-Jul-2016]	E8_2.7		✓
ES1616026-008	[21-Jul-2016]	F8_0.5		✓
ES1616026-009	[21-Jul-2016]	F8_1.8	✓	
ES1616026-010	[21-Jul-2016]	G8_0.5	✓	
ES1616026-011	[21-Jul-2016]	G8_1.0	✓	
ES1616026-012	[21-Jul-2016]	G8_1.5		✓
ES1616026-013	[21-Jul-2016]	G8_2.3	✓	
ES1616026-014	[21-Jul-2016]	G8_3.0	✓	
ES1616026-015	[21-Jul-2016]	H8_3.0		✓
ES1616026-016	[21-Jul-2016]	I6_0.5		✓
ES1616026-017	[21-Jul-2016]	I7_2.0		✓
ES1616026-018	[21-Jul-2016]	H6_1.5		✓
ES1616026-019	[21-Jul-2016]	G6_0.5		✓
ES1616026-020	[21-Jul-2016]	G5_3.0		✓
ES1616026-021	[21-Jul-2016]	G4_1.5		✓
ES1616026-022	[21-Jul-2016]	H4_2.0		✓
ES1616026-023	[21-Jul-2016]	I4_3.0		✓
ES1616026-024	[21-Jul-2016]	J5_1.5		✓
ES1616026-025	[20-Jul-2016]	J6_0.5		✓
ES1616026-026	[20-Jul-2016]	L8_1.2		✓
ES1616026-027	[20-Jul-2016]	G11_1.0		✓
ES1616026-028	[20-Jul-2016]	H11_2.0		✓
ES1616026-029	[20-Jul-2016]	G10_0.5		✓
ES1616026-030	[20-Jul-2016]	H10_1.5		✓
ES1616026-031	[20-Jul-2016]	H10_2.5		✓
ES1616026-032	[20-Jul-2016]	I10_0.5		✓
ES1616026-033	[20-Jul-2016]	H9_0.5		✓
ES1616026-034	[20-Jul-2016]	J9_3.0		✓
ES1616026-035	[20-Jul-2016]	I8_2.0		✓

			(On Hold) SOIL No analysis requested	SOIL - EA200 Asbestos Identification in Soils -
ES1616026-036	[20-Jul-2016]	J7_1.0		✓
ES1616026-037	[20-Jul-2016]	K7_2.5		✓
ES1616026-038	[20-Jul-2016]	K6_0.5		✓
ES1616026-039	[20-Jul-2016]	K5_3.0		✓
ES1616026-040	[20-Jul-2016]	M6_1.8		✓
ES1616026-041	[20-Jul-2016]	F10_2.0		✓
ES1616026-042	[20-Jul-2016]	E11_3.0		✓
ES1616026-043	[20-Jul-2016]	E10_1.5		✓
ES1616026-044	[20-Jul-2016]	F9_1.5		✓
ES1616026-045	[20-Jul-2016]	F6_2.0		✓
ES1616026-046	[20-Jul-2016]	D8_0.5		✓
ES1616026-047	[20-Jul-2016]	D8_1.5		✓
ES1616026-048	[20-Jul-2016]	C9_0.5		✓
ES1616026-049	[21-Jul-2016]	D10_2.0		✓
ES1616026-050	[21-Jul-2016]	D9_0.5		✓
ES1616026-051	[21-Jul-2016]	B8_1.5		✓
ES1616026-052	[21-Jul-2016]	B8_3.0		✓
ES1616026-053	[21-Jul-2016]	H4_0.5	✓	
ES1616026-054	[21-Jul-2016]	H6_0.5	✓	
ES1616026-055	[21-Jul-2016]	H6_1.5	✓	
ES1616026-056	[21-Jul-2016]	H8_0.5	✓	
ES1616026-057	[21-Jul-2016]	H8_1.5	✓	
ES1616026-058	[21-Jul-2016]	H8_2.2	✓	
ES1616026-059	[20-Jul-2016]	H10_0.5	✓	
ES1616026-060	[20-Jul-2016]	H10_1.2	✓	
ES1616026-061	[20-Jul-2016]	H11_0.5	✓	
ES1616026-062	[20-Jul-2016]	H11_1.0	✓	
ES1616026-063	[20-Jul-2016]	H11_3.0	✓	
ES1616026-064	[21-Jul-2016]	J5_0.5	✓	
ES1616026-065	[20-Jul-2016]	J6_1.2	✓	
ES1616026-066	[20-Jul-2016]	J6_1.5	✓	
ES1616026-067	[20-Jul-2016]	J6_1.8	✓	
ES1616026-068	[20-Jul-2016]	J6_2.5	✓	
ES1616026-069	[20-Jul-2016]	J6_2.8	✓	
ES1616026-070	[20-Jul-2016]	J7_0.1	✓	
ES1616026-071	[20-Jul-2016]	J7_0.5	✓	
ES1616026-072	[20-Jul-2016]	J7_3.0	✓	
ES1616026-073	[20-Jul-2016]	J7_2.5	✓	
ES1616026-074	[20-Jul-2016]	J9_0.3	✓	
ES1616026-075	[20-Jul-2016]	J9_1.0	✓	
ES1616026-076	[20-Jul-2016]	J9_2.0	✓	

			(On Hold) SOIL No analysis requested	SOIL - EA200 Asbestos Identification in Soils -
ES1616026-077	[20-Jul-2016]	M6_0.2	✓	
ES1616026-078	[21-Jul-2016]	F6_0.5	✓	
ES1616026-079	[20-Jul-2016]	L8_0.6	✓	
ES1616026-080	[20-Jul-2016]	L8_1.8	✓	
ES1616026-081	[20-Jul-2016]	L8_2.5	✓	
ES1616026-082	[21-Jul-2016]	G4_0.5	✓	
ES1616026-083	[21-Jul-2016]	G4_1.2	✓	
ES1616026-084	[21-Jul-2016]	G4_2.0	✓	
ES1616026-085	[21-Jul-2016]	G4_3.0	✓	
ES1616026-086	[21-Jul-2016]	G5_0.5	✓	
ES1616026-087	[21-Jul-2016]	G5_1.5	✓	
ES1616026-088	[21-Jul-2016]	G6_1.5	✓	
ES1616026-089	[21-Jul-2016]	G6_0.1	✓	
ES1616026-090	[20-Jul-2016]	G10_2.5	✓	
ES1616026-091	[20-Jul-2016]	G10_1.0	✓	
ES1616026-092	[20-Jul-2016]	G10_1.5	✓	
ES1616026-093	[20-Jul-2016]	G11_0.1	✓	
ES1616026-094	[20-Jul-2016]	G11_1.7	✓	
ES1616026-095	[20-Jul-2016]	G11_2.5	✓	
ES1616026-096	[20-Jul-2016]	K5_0.3	✓	
ES1616026-097	[20-Jul-2016]	K5_2.1	✓	
ES1616026-098	[20-Jul-2016]	K5_2.6	✓	
ES1616026-099	[20-Jul-2016]	K6_0.1	✓	
ES1616026-100	[20-Jul-2016]	K6_2.1	✓	
ES1616026-101	[20-Jul-2016]	K6_2.5	✓	
ES1616026-102	[21-Jul-2016]	K7_0.5	✓	
ES1616026-103	[21-Jul-2016]	K7_1.5	✓	
ES1616026-104	[21-Jul-2016]	K7_2.1	✓	
ES1616026-105	[21-Jul-2016]	I4_0.5	✓	
ES1616026-106	[21-Jul-2016]	I4_1.5	✓	
ES1616026-107	[21-Jul-2016]	I4_2.0	✓	
ES1616026-108	[21-Jul-2016]	I4_2.5	✓	
ES1616026-109	[21-Jul-2016]	I6_1.2	✓	
ES1616026-110	[21-Jul-2016]	I6_2.0	✓	
ES1616026-111	[21-Jul-2016]	I6_2.5	✓	
ES1616026-112	[21-Jul-2016]	I6_3.0	✓	
ES1616026-113	[21-Jul-2016]	I7_0.5	✓	
ES1616026-114	[21-Jul-2016]	I7_1.0	✓	
ES1616026-115	[21-Jul-2016]	I7_3.0	✓	
ES1616026-116	[20-Jul-2016]	I8_0.5	✓	
ES1616026-117	[20-Jul-2016]	I8-3.0	✓	

			(On Hold) SOIL No analysis requested	SOIL - EA200 Asbestos Identification in Soils -
ES1616026-118	[20-Jul-2016]	I10_0.1	✓	
ES1616026-119	[21-Jul-2016]	G4_2.5	✓	

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

ACCOUNTS PAYABLE(AP INVOICES)

- A4 - AU Tax Invoice (INV)	Email	apinvoices@pb.com.au

AMY VALENTINE

- *AU Certificate of Analysis - NATA (COA)	Email	avalentine@pb.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	avalentine@pb.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	avalentine@pb.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	avalentine@pb.com.au
- Chain of Custody (CoC) (COC)	Email	avalentine@pb.com.au
- EDI Format - ENMRG (ENMRG)	Email	avalentine@pb.com.au
- EDI Format - ESDAT (ESDAT)	Email	avalentine@pb.com.au

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1616026**	Page	: 1 of 13
Client	: **PARSONS BRINCKERHOFF AUSTRALIA PTY LIMITED**	Laboratory	: Environmental Division Sydney
Contact	: MS AMY VALENTINE	Contact	:
Address	: ABN: 80 078 004 798 GPO BOX 5394 SYDNEY NSW, AUSTRALIA 2001	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 92725100	Telephone	: +61-2-8784 8555
Project	: 2270089A NSW WAVE PARK	Date Samples Received	: 21-Jul-2016 15:00
Order number	: 69671	Date Analysis Commenced	: 25-Jul-2016
C-O-C number	: 69671	Issue Date	: 25-Jul-2016 13:20
Sampler	: ----		
Site	: SYDNEY		
Quote number	: ----		
No. of samples received	: 119		
No. of samples analysed	: 42		

NATA Accredited Laboratory 825
Accredited for compliance with
ISO/IEC 17025.

NATA
WORLD RECOGNISED ACCREDITATION

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Shaun Spooner	Asbestos Identifier	Newcastle - Asbestos, Mayfield West, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Trace' - Asbestos fibres ("Free Fibres") detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200 Legend
- EA200 'Ch' Chrysotile (white asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.
- EA200: For samples larger than 30g, the <2mm fraction may be sub-sampled prior to trace analysis as outlined in ISO23909:2008(E) Sect 6.3.2-2

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	E6_1.5	E8_2.7	F8_0.5	G8_1.5	H8_3.0
			Client sampling date / time	[21-Jul-2016]	[21-Jul-2016]	[21-Jul-2016]	[21-Jul-2016]	[21-Jul-2016]
Compound	CAS Number	LOR	Unit	ES1616026-002	ES1616026-007	ES1616026-008	ES1616026-012	ES1616026-015
				Result	Result	Result	Result	Result
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	**No**	**No**	**No**	**No**	**No**
Asbestos Type	1332-21-4	-	--	**-**	**-**	**-**	**-**	**-**
Sample weight (dry)	----	0.01	g	**109**	**191**	**130**	**72.6**	**157**
APPROVED IDENTIFIER:	----	-	--	**C.OWLER**	**C.OWLER**	**C.OWLER**	**C.OWLER**	**S.SPOONER**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	I6_0.5	I7_2.0	H6_1.5	G6_0.5	G5_3.0
			Client sampling date / time	[21-Jul-2016]	[21-Jul-2016]	[21-Jul-2016]	[21-Jul-2016]	[21-Jul-2016]
Compound	CAS Number	LOR	Unit	ES1616026-016	ES1616026-017	ES1616026-018	ES1616026-019	ES1616026-020
				Result	Result	Result	Result	Result
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	**No**	**No**	**No**	**No**	**No**
Asbestos Type	1332-21-4	-	--	**-**	**-**	**-**	**-**	**-**
Sample weight (dry)	----	0.01	g	**65.3**	**141**	**147**	**152**	**119**
APPROVED IDENTIFIER:	----	-	--	**S.SPOONER**	**S.SPOONER**	**S.SPOONER**	**C.OWLER**	**C.OWLER**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	G4_1.5	H4_2.0	I4_3.0	J5_1.5	J6_0.5
			Client sampling date / time	[21-Jul-2016]	[21-Jul-2016]	[21-Jul-2016]	[21-Jul-2016]	[20-Jul-2016]
Compound	CAS Number	LOR	Unit	ES1616026-021	ES1616026-022	ES1616026-023	ES1616026-024	ES1616026-025
				Result	Result	Result	Result	Result
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	**No**	**No**	**No**	**No**	**No**
Asbestos Type	1332-21-4	-	--	**-**	**-**	**-**	**-**	**-**
Sample weight (dry)	----	0.01	g	**152**	**135**	**78.3**	**118**	**157**
APPROVED IDENTIFIER:	----	-	--	**C.OWLER**	**C.OWLER**	**S.SPOONER**	**S.SPOONER**	**S.SPOONER**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	L8_1.2	G11_1.0	H11_2.0	G10_0.5	H10_1.5
			Client sampling date / time	[20-Jul-2016]	[20-Jul-2016]	[20-Jul-2016]	[20-Jul-2016]	[20-Jul-2016]
Compound	CAS Number	LOR	Unit	ES1616026-026	ES1616026-027	ES1616026-028	ES1616026-029	ES1616026-030
				Result	Result	Result	Result	Result
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	**No**	**No**	**No**	**No**	**No**
Asbestos Type	1332-21-4	-	--	**-**	**-**	**-**	**-**	**-**
Sample weight (dry)	----	0.01	g	**115**	**155**	**108**	**84.8**	**138**
APPROVED IDENTIFIER:	----	-	--	**S.SPOONER**	**C.OWLER**	**C.OWLER**	**C.OWLER**	**C.OWLER**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	H10_2.5	I10_0.5	H9_0.5	J9_3.0	I8_2.0
			Client sampling date / time	[20-Jul-2016]	[20-Jul-2016]	[20-Jul-2016]	[20-Jul-2016]	[20-Jul-2016]
Compound	CAS Number	LOR	Unit	ES1616026-031	ES1616026-032	ES1616026-033	ES1616026-034	ES1616026-035
				Result	Result	Result	Result	Result
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	**No**	**No**	**No**	**No**	**No**
Asbestos Type	1332-21-4	-	--	**-**	**-**	**-**	**-**	**-**
Sample weight (dry)	----	0.01	g	**178**	**75.0**	**123**	**126**	**163**
APPROVED IDENTIFIER:	----	-	--	**S.SPOONER**	**S.SPOONER**	**S.SPOONER**	**S.SPOONER**	**S.SPOONER**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	J7_1.0	K7_2.5	K6_0.5	K5_3.0	M6_1.8
			Client sampling date / time	[20-Jul-2016]	[20-Jul-2016]	[20-Jul-2016]	[20-Jul-2016]	[20-Jul-2016]
Compound	CAS Number	LOR	Unit	ES1616026-036	ES1616026-037	ES1616026-038	ES1616026-039	ES1616026-040
				Result	Result	Result	Result	Result
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	**No**	**No**	**No**	**No**	**No**
Asbestos Type	1332-21-4	-	--	**-**	**-**	**-**	**-**	**-**
Sample weight (dry)	----	0.01	g	**116**	**82.0**	**179**	**175**	**163**
APPROVED IDENTIFIER:	----	-	--	**S.SPOONER**	**S.SPOONER**	**S.SPOONER**	**C.OWLER**	**C.OWLER**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	F10_2.0	E11_3.0	E10_1.5	F9_1.5	F6_2.0
			Client sampling date / time	[20-Jul-2016]	[20-Jul-2016]	[20-Jul-2016]	[20-Jul-2016]	[20-Jul-2016]
Compound	CAS Number	LOR	Unit	ES1616026-041	ES1616026-042	ES1616026-043	ES1616026-044	ES1616026-045
				Result	Result	Result	Result	Result
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	**No**	**No**	**No**	**No**	**Yes**
Asbestos Type	1332-21-4	-	--	**-**	**-**	**-**	**-**	**Ch + Cr**
Sample weight (dry)	----	0.01	g	**149**	**221**	**156**	**90.8**	**112**
APPROVED IDENTIFIER:	----	-	--	**C.OWLER**	**C.OWLER**	**C.OWLER**	**C.OWLER**	**C.OWLER**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	D8_0.5	D8_1.5	C9_0.5	D10_2.0	D9_0.5
			Client sampling date / time	[20-Jul-2016]	[20-Jul-2016]	[20-Jul-2016]	[21-Jul-2016]	[21-Jul-2016]
Compound	CAS Number	LOR	Unit	ES1616026-046	ES1616026-047	ES1616026-048	ES1616026-049	ES1616026-050
				Result	Result	Result	Result	Result
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	**No**	**No**	**No**	**No**	**No**
Asbestos Type	1332-21-4	-	--	**-**	**-**	**-**	**-**	**-**
Sample weight (dry)	----	0.01	g	**106**	**107**	**98.5**	**106**	**141**
APPROVED IDENTIFIER:	----	-	--	**C.OWLER**	**S.SPOONER**	**S.SPOONER**	**S.SPOONER**	**S.SPOONER**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	B8_1.5	B8_3.0	----	----	----
			Client sampling date / time	[21-Jul-2016]	[21-Jul-2016]	----	----	----
Compound	CAS Number	LOR	Unit	ES1616026-051	ES1616026-052	--------	--------	--------
				Result	Result	----	----	----
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Asbestos Detected	1332-21-4	0.1	g/kg	**No**	**Yes**	**----**	**----**	**----**
Asbestos Type	1332-21-4	-	--	**-**	**Ch**	**----**	**----**	**----**
Sample weight (dry)	----	0.01	g	**124**	**148**	**----**	**----**	**----**
APPROVED IDENTIFIER:	----	-	--	**S.SPOONER**	**S.SPOONER**	**----**	**----**	**----**

Analytical Results

Descriptive Results

Sub-Matrix: **SOIL**

Method: Compound	Client sample ID - Client sampling date / time	Analytical Results
EA200: AS 4964 - 2004 Identification of Asbestos in Soils		
EA200: Description	E6_1.5 - [21-Jul-2016]	Mid brown clay soil.
EA200: Description	E8_2.7 - [21-Jul-2016]	Mid brown clay soil.
EA200: Description	F8_0.5 - [21-Jul-2016]	Mid grey clay soil.
EA200: Description	G8_1.5 - [21-Jul-2016]	Mid brown clay soil.
EA200: Description	H8_3.0 - [21-Jul-2016]	Mid grey clay soil.
EA200: Description	I6_0.5 - [21-Jul-2016]	Mid brown soil.
EA200: Description	I7_2.0 - [21-Jul-2016]	Mid brown soil.
EA200: Description	H6_1.5 - [21-Jul-2016]	Mid brown soil.
EA200: Description	G6_0.5 - [21-Jul-2016]	Mid brown clay soil.
EA200: Description	G5_3.0 - [21-Jul-2016]	Mid brown clay soil.
EA200: Description	G4_1.5 - [21-Jul-2016]	Mid brown clay soil.
EA200: Description	H4_2.0 - [21-Jul-2016]	Mid brown clay soil.
EA200: Description	I4_3.0 - [21-Jul-2016]	Mid brown soil.
EA200: Description	J5_1.5 - [21-Jul-2016]	Mid brown soil.
EA200: Description	J6_0.5 - [20-Jul-2016]	Mid brown soil.
EA200: Description	L8_1.2 - [20-Jul-2016]	Mid brown soil.
EA200: Description	G11_1.0 - [20-Jul-2016]	Pale brown sandy soil.
EA200: Description	H11_2.0 - [20-Jul-2016]	Mid brown sandy soil.
EA200: Description	G10_0.5 - [20-Jul-2016]	Pale brown sandy soil.
EA200: Description	H10_1.5 - [20-Jul-2016]	Pale red - brown sandy soil.
EA200: Description	H10_2.5 - [20-Jul-2016]	Mid brown soil.
EA200: Description	I10_0.5 - [20-Jul-2016]	Mid brown soil.
EA200: Description	H9_0.5 - [20-Jul-2016]	Mid brown soil.
EA200: Description	J9_3.0 - [20-Jul-2016]	Mid grey soil.
EA200: Description	I8_2.0 - [20-Jul-2016]	Mid brown soil.
EA200: Description	J7_1.0 - [20-Jul-2016]	Mid red clay soil.
EA200: Description	K7_2.5 - [20-Jul-2016]	Mid brown soil.
EA200: Description	K6_0.5 - [20-Jul-2016]	Mid brown soil.
EA200: Description	K5_3.0 - [20-Jul-2016]	Mid brown sandy soil.
EA200: Description	M6_1.8 - [20-Jul-2016]	Mid brown sandy soil.
EA200: Description	F10_2.0 - [20-Jul-2016]	Mid brown sandy soil.
EA200: Description	E11_3.0 - [20-Jul-2016]	Mid brown sandy soil.
EA200: Description	E10_1.5 - [20-Jul-2016]	Mid brown clay soil.
EA200: Description	F9_1.5 - [20-Jul-2016]	Mid brown clay soil.
EA200: Description	F6_2.0 - [20-Jul-2016]	Mid brown clay soil with building debris plus one small fragment of friable asbestos fibre board approx 4 x 3 x 3 mm and one friable asbestos fibre bundle approx 3 x 1 x 1 mm.
EA200: Description	D8_0.5 - [20-Jul-2016]	Mid brown clay soil.
EA200: Description	D8_1.5 - [20-Jul-2016]	Mid brown soil.

Sub-Matrix: **SOIL**

Method: Compound	*Client sample ID - Client sampling date / time*	*Analytical Results*
EA200: Description	C9_0.5 - [20-Jul-2016]	Mid brown soil.
EA200: Description	D10_2.0 - [21-Jul-2016]	Mid brown soil.
EA200: Description	D9_0.5 - [21-Jul-2016]	Mid brown soil.
EA200: Description	B8_1.5 - [21-Jul-2016]	Mid brown soil.
EA200: Description	B8_3.0 - [21-Jul-2016]	Mid brown soil with one fragment of bonded asbestos cement sheeting approx 12 x 7 x 5 mm plus four fragments of friable asbestos cement sheeting approx 6 x 5 x 2 mm.

QUALITY CONTROL REPORT

Work Order	: **ES1616026**	Page	: 1 of 3
Client	: **PARSONS BRINCKERHOFF AUSTRALIA PTY LIMITED**	Laboratory	: Environmental Division Sydney
Contact	: MS AMY VALENTINE	Contact	:
Address	: ABN: 80 078 004 798 GPO BOX 5394 SYDNEY NSW, AUSTRALIA 2001	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 92725100	Telephone	: +61-2-8784 8555
Project	: 2270089A NSW WAVE PARK	Date Samples Received	: 21-Jul-2016
Order number	: 69671	Date Analysis Commenced	: 25-Jul-2016
C-O-C number	: 69671	Issue Date	: 25-Jul-2016
Sampler	: ----		
Site	: SYDNEY		
Quote number	: ----		
No. of samples received	: 119		
No. of samples analysed	: 42		

NATA Accredited Laboratory 825
Accredited for compliance with
ISO/IEC 17025.

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Shaun Spooner	Asbestos Identifier	Newcastle - Asbestos, Mayfield West, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

- **No Laboratory Duplicate (DUP) Results are required to be reported.**

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

- **No Method Blank (MB) or Laboratory Control Spike (LCS) Results are required to be reported.**

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES1616026**	Page	: 1 of 4
Client	: **PARSONS BRINCKERHOFF AUSTRALIA PTY LIMITED**	Laboratory	: Environmental Division Sydney
Contact	: MS AMY VALENTINE	Telephone	: +61-2-8784 8555
Project	: 2270089A NSW WAVE PARK	Date Samples Received	: 21-Jul-2016
Site	: SYDNEY	Issue Date	: 25-Jul-2016
Sampler	: ----	No. of samples received	: 119
Order number	: 69671	No. of samples analysed	: 42

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA200: AS 4964 - 2004 Identification of Asbestos in Soils								
Snap Lock Bag: Separate bag received (EA200)								
J6_0.5,	L8_1.2,	**20-Jul-2016**	**----**	----	----	**25-Jul-2016**	16-Jan-2017	✓
G11_1.0,	H11_2.0,							
G10_0.5,	H10_1.5,							
H10_2.5,	I10_0.5,							
H9_0.5,	J9_3.0,							
I8_2.0,	J7_1.0,							
K7_2.5,	K6_0.5,							
K5_3.0,	M6_1.8,							
F10_2.0,	E11_3.0,							
E10_1.5,	F9_1.5,							
F6_2.0,	D8_0.5,							
D8_1.5,	C9_0.5							
Snap Lock Bag: Separate bag received (EA200)								
E6_1.5,	E8_2.7,	**21-Jul-2016**	**----**	----	----	**25-Jul-2016**	17-Jan-2017	✓
F8_0.5,	G8_1.5,							
H8_3.0,	I6_0.5,							
I7_2.0,	H6_1.5,							
G6_0.5,	G5_3.0,							
G4_1.5,	H4_2.0,							
I4_3.0,	J5_1.5,							
D10_2.0,	D9_0.5,							
B8_1.5,	B8_3.0							

Quality Control Parameter Frequency Compliance

- **No Quality Control data available for this section.**

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Asbestos Identification in Soils	EA200	SOIL	AS 4964 - 2004 Method for the qualitative identification of asbestos in bulk samples Analysis by Polarised Light Microscopy including dispersion staining

Envirolab

PARSONS BRINCKERHOFF

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Pink Page - Remains in Book

ABN 80 078 004 798

☐ Adelaide
Level 16, 1 King William Street,
GPO Box 398 Adelaide SA 5001
Tel: (08) 8405 4300 Fax: (08) 8405 4301

☐ Perth
Level 5, 503 Murray Street,
PO Box 7181 Cloisters Square WA 6850
Tel: (08) 9489 9700 Fax: (08) 9489 9777

☐ Melbourne
Level 15, 28 Freshwater Place
Tel: (03) 9861 1111 Fax: (03) 9861 1144

☐ Newcastle
Level 8, 61-65 Bolton Street,
PO Box 1138 Newcastle NSW, 2300
Tel: (02) 4929 8300 Fax: (02) 4929 8388

☒ Sydney
Level 5, Australia Young Centre
50 Holt Street,
GPO Box 5024, Sydney NSW 2001
Tel: (02) 9272 5100 Fax: (02) 9272 5101

Chain of Custody

CoC (of) 6

Order No: 81685

Job Title: Gwang Pharmacy DSI

Laboratory Name: ALS

Address: Smithfield

Fax Number:

Phone Number:

Contact Name:

Delivery Method: Courier

Quote Number: EN-085-15

PB Job Number: 2270085

Terms of Business:

Project Manager: Daniel Smith

Results Expected by/on: 06/06/16

Fax Results to: Smith.D2@pbworld.com

Fax Number:

Phone Number:

Spreadsheet of Results Required: (Y) / N

Format: Excel

Turnaround Time Required: STANDARD

Invoice to:

Comments:

Date Sampled	Time	Sample I.D.	Container Size	Sample Location	Medium*	Preservative Type	Filtered	TPH	BTEX	PAH's	OC/OP/PCB's	Metals**	S-26	S-12	KP066	Asbestos*	Initials	Comments/Additional Information and/or Analysis Required
25/05/16	1	BH01_1.0m											X	X	X	X		S-26: TRH/BTEX/PAH/Metals(8)
26/05/16	2	BH02_2.0m											X			X		S-12: OCPs/OPPs
24/05/16	3	BH03_0.1m											X			X		KP066: PCBs
24/05/16	4	BH04_0.5m											X			X		Asbestos: Presence/Absence.
26/05/16	5	BH05_2.0m											X	X	X	X		
"	6	BH06_3.0m											X	X	X	X		
"	7	BH07_3.0m											X			X		
"	8	BH08_2.0m											X			X		Quote EN-085-15
"	9	BH09_1.0m											X			X		
"	10	BH10_0.1m											X	X	X	X		
"	11	BH11_3.0m											X			X		
"	12	BH12_2.0m											X			X		

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

Job No: 147653
Date Received: 31/5
Time Received: 14:15
Received by: PH
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Quote ES1611618

Subcon / Forwarded Lab / Split WO
Lab / Analysis: Newcastle Asbestos
Organised By / Date: ENVIROLAB: 26/05/16
Relinquished By / Date:
Connote / Courier:
WO No: ES1611617
Attach Pro Job / Additional Sheet:

Environmental Division
Sydney
Work Order Reference
ES1611617

Telephone : + 61-2-8784 8555

Relinquished by:	Daniel Smith	Relinquished by:	
Date & Time:	26/05/16	Date & Time:	
Company:	PB	Company:	
Signature:		Signature:	
Received in Good Order & Condition by (Name):	Frank	Received in Good Order & Condition by (Name):	PH
Date & Time:	30-5-16 1500	Date & Time:	31/5 14:15
Company:	ALS	Company:	ELS
Signature:		Signature:	

Medium*: S = Soil, W = Water, V = Vapour

Legend**: (circle the following to be tested)

Metals: Al As Be Cd Co Cr Cu Fe Hg Li Mg Mn Ni Pb Se Sn V Zn

Samples on Ice: ☒ Yes ☐ No

Please fax back a signed copy when samples are received at the laboratory

PARSONS BRINCKERHOFF

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- ☐ **Perth** Level 5, 503 Murray Street, PO Box 7181 Cloisters Square WA 6850 Tel: (08) 9489 9700 Fax: (08) 9489 9777
- ☐ **Brisbane** Level 3, Northbank Plaza 69 Ann Street, GPO Box 2907 Brisbane QLD 4001 Tel. (07) 3854 6200 Fax. (07) 3854 6500
- ☐ **Singleton** 188 John Street, PO Box 115 Singleton NSW 2330 Tel: (02) 6572 3377 Fax: (02) 6572 4080
- ☐ **Melbourne** Level 15, 28 Freshwater Place, PO Box 19016 Southbank VIC 3006 Tel. (03) 9861 1111 Fax: (03) 9861 1144
- ☐ **Newcastle** Level 3, 51-55 Bolton Street, PO Box 1162 Newcastle NSW, 2300 Tel: (02) 4929 8300 Fax: (02) 4929 8382
- ☐ **Sydney** Level 27, Ernst & Young Centre 680 George Street, GPO Box 5094, Sydney NSW 2001 Tel: (02) 9272 5100 Fax: (02) 9272 5101

Chain of Custody

COC 3 of 6

Order No: 81687

Job Title: WAK Park Group DSI

Laboratory Name: ALS

Address: Smithfield

Fax Number:

Phone Number:

Contact Name:

Delivery Method:

Quote Number: 147653

PB Job Number: 2270089A

Job Location: Sydney Olympic Park

Terms of Business	PB	Other	Checked
	X		

Project Manager: Daniel Smith

Results Expected by/on: 06/06/16

Fax Results to: DSmith@pbworld.com

Fax Number:

Phone Number:

Spreadsheet of Results Required: (Y) / N

Format: Batch

Turnaround Time Required: STANDARD

Invoice to:

Comments:

Date Sampled	Time	Sample I.D.	Container Size	Sample Location	Medium*	Preservative Type	Filtered (X)	TPH	BTEX	PAH's	OC/OP/PCB's	Metals**	S-26/W-26	S-12	EP066	Asbestos			Initials	Comments/Additional Information and/or Analysis Required
26/05/16	25	BH25-2.0m											X			X				S-26: TRH/BTEX/PAH/8 heavy Metals
26/05/16	26	BH26-0.5m											X	X	X	X				S-12: OCP/OPP
25/05/16	27	BH27-0.5m											X			X				EP066: PCBs
26/05/16	28	BH28-3.0m											X	X	X	X				Asbestos: presence/absence.
25/05/16	29	BH29-1.0m											X	X	X	X				
26/05/16	30	BH30-0.5m											X			X				
26/05/16	31	QAQC01											X	X	X	X				
26/05/16	32	QAQC02											X	X	X	X				
26/05/16	1-—	QAQC01a											X	X	X	X				Please forward to Envirolab
26/05/16	2-—	QAQC02a											X	X	X	X				
25/05/16	33	RB01											X			[redacted]				
25/05/16	34	RB02											X			[redacted]				

Relinquished by:	Daniel Smith	Relinquished by:		Relinquished by:	
Date & Time:	26/05/16	Date & Time:		Date & Time:	
Company:	PB	Company:		Company:	
Signature:		Signature:		Signature:	
Received in Good Order & Condition by (Name):	Frank	Received in Good Order & Condition by (Name):		Received in Good Order & Condition by (Name):	Pit
Date & Time:	30-5-16 1500	Date & Time:		Date & Time:	31/5 14:15
Company:	ALS	Company:		Company:	ELS
Signature:		Signature:		Signature:	

Medium*: S = Soil, W = Water, V = Vapour

Legend**: (circle the following to be tested)

Metals: Al As Be Cd Co Cr Cu Fe Hg Li Mg Mn Ni Pb Se Sn V Zn

Samples on Ice: ☒ Yes ☐ No

Please fax back a signed copy when samples are received at the laboratory

12 Ashley Street, Chatswood, NSW 2067
tel: +61 2 9910 6200

email: sydney@envirolab.com.au
envirolab.com.au

Envirolab Services Pty Ltd - Sydney | ABN 37 112 535 645

CERTIFICATE OF ANALYSIS 147653

Client:
WSP Parsons Brinkerhoff
GPO Box 5394
Sydney
NSW 2001

Attention: Daniel Smith

Sample log in details:

Your Reference:	**2270089A, Sydney Olympic Park**		
No. of samples:	2 soils		
Date samples received / completed instructions received	31/05/16	/	31/05/16

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:	7/06/16	/	2/06/16
Date of Preliminary Report:	Not Issued		

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

Results Approved By:

Jacinta Hurst
Laboratory Manager

ACCREDITED FOR TECHNICAL COMPETENCE

vTRH(C6-C10)/BTEXN in Soil			
Our Reference:	UNITS	147653-1	147653-2
Your Reference	---------- -	QAQC01a	QAQC02a
Date Sampled	----------	26/05/2016	26/05/2016
Type of sample		soil	soil
Date extracted	-	01/06/2016	01/06/2016
Date analysed	-	02/06/2016	02/06/2016
TRH C_6 - C_9	mg/kg	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25
Benzene	mg/kg	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1
m+p-xylene	mg/kg	<2	<2
o-Xylene	mg/kg	<1	<1
naphthalene	mg/kg	<1	<1
Surrogate aaa-Trifluorotoluene	%	96	109

svTRH (C10-C40) in Soil			
Our Reference:	UNITS	147653-1	147653-2
Your Reference	---------- -	QAQC01a	QAQC02a
Date Sampled	----------	26/05/2016	26/05/2016
Type of sample		soil	soil
Date extracted	-	1/06/2016	1/06/2016
Date analysed	-	01/06/2016	01/06/2016
TRHC_{10} - C_{14}	mg/kg	<50	<50
TRHC_{15} - C_{28}	mg/kg	<100	<100
TRHC_{29} - C_{36}	mg/kg	<100	<100
TRH>C_{10}-C_{16}	mg/kg	<50	<50
TRH>C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50
TRH>C_{16}-C_{34}	mg/kg	<100	<100
TRH>C_{34}-C_{40}	mg/kg	<100	<100
Surrogate o-Terphenyl	%	85	84

PAHs in Soil Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- - ----------	147653-1 QAQC01a 26/05/2016 soil	147653-2 QAQC02a 26/05/2016 soil
Date extracted	-	01/06/2016	01/06/2016
Date analysed	-	01/06/2016	01/06/2016
Naphthalene	mg/kg	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1
Phenanthrene	mg/kg	0.5	<0.1
Anthracene	mg/kg	<0.1	<0.1
Fluoranthene	mg/kg	0.5	<0.1
Pyrene	mg/kg	0.5	<0.1
Benzo(a)anthracene	mg/kg	0.2	<0.1
Chrysene	mg/kg	0.2	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	0.3	<0.2
Benzo(a)pyrene	mg/kg	0.1	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5
Total Positive PAHs	mg/kg	2.3	NIL (+)VE
Surrogate p-Terphenyl-d14	%	103	100

Organochlorine Pesticides in soil Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- - ---------- 	147653-1 QAQC01a 26/05/2016 soil	147653-2 QAQC02a 26/05/2016 soil
Date extracted	-	01/06/2016	01/06/2016
Date analysed	-	01/06/2016	01/06/2016
HCB	mg/kg	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1
Surrogate TCMX	%	108	87

Organophosphorus Pesticides Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- - ---------- 	147653-1 QAQC01a 26/05/2016 soil	147653-2 QAQC02a 26/05/2016 soil
Date extracted	-	01/06/2016	01/06/2016
Date analysed	-	01/06/2016	01/06/2016
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1
Surrogate TCMX	%	108	87

PCBs in Soil Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- - ----------	147653-1 QAQC01a 26/05/2016 soil	147653-2 QAQC02a 26/05/2016 soil
Date extracted	-	01/06/2016	01/06/2016
Date analysed	-	01/06/2016	01/06/2016
Aroclor 1016	mg/kg	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1
Surrogate TCLMX	%	108	87

Acid Extractable metals in soil				
Our Reference:	UNITS	147653-1	147653-2	147653-3
Your Reference	---------- -	QAQC01a	QAQC02a	QAQC01a - TRIPLICATE
Date Sampled	----------	26/05/2016	26/05/2016	26/05/2016
Type of sample		soil	soil	soil
Date prepared	-	01/06/2016	01/06/2016	01/06/2016
Date analysed	-	01/06/2016	01/06/2016	01/06/2016
Arsenic	mg/kg	9	<4	5
Cadmium	mg/kg	<0.4	<0.4	<0.4
Chromium	mg/kg	29	7	22
Copper	mg/kg	16	2	11
Lead	mg/kg	63	18	36
Mercury	mg/kg	<0.1	<0.1	<0.1
Nickel	mg/kg	9	3	5
Zinc	mg/kg	110	24	43

Moisture			
Our Reference:	UNITS	147653-1	147653-2
Your Reference	---------- -	QAQC01a	QAQC02a
Date Sampled	----------	26/05/2016	26/05/2016
Type of sample		soil	soil
Date prepared	-	1/06/2016	1/06/2016
Date analysed	-	2/06/2016	2/06/2016
Moisture	%	16	8.4

Asbestos ID - soils			
Our Reference:	UNITS	147653-1	147653-2
Your Reference	---------- -	QAQC01a	QAQC02a
Date Sampled	----------	26/05/2016	26/05/2016
Type of sample		soil	soil
Date analysed	-	2/06/2016	2/06/2016
Sample mass tested	g	Approx 45g	Approx 40g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected

Method ID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
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-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.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Inorg-008	Moisture content determined by heating at 105+/-5 deg 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.

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			01/06/2016	147653-1	01/06/2016 || 01/06/2016	LCS-1	01/06/2016
Date analysed	-			02/06/2016	147653-1	02/06/2016 || 02/06/2016	LCS-1	02/06/2016
TRHC6 - C9	mg/kg	25	Org-016	<25	147653-1	<25 || <25	LCS-1	106%
TRHC6 - C10	mg/kg	25	Org-016	<25	147653-1	<25 || <25	LCS-1	106%
Benzene	mg/kg	0.2	Org-016	<0.2	147653-1	<0.2 || <0.2	LCS-1	91%
Toluene	mg/kg	0.5	Org-016	<0.5	147653-1	<0.5 || <0.5	LCS-1	116%
Ethylbenzene	mg/kg	1	Org-016	<1	147653-1	<1 || <1	LCS-1	106%
m+p-xylene	mg/kg	2	Org-016	<2	147653-1	<2 || <2	LCS-1	108%
o-Xylene	mg/kg	1	Org-016	<1	147653-1	<1 || <1	LCS-1	100%
naphthalene	mg/kg	1	Org-014	<1	147653-1	<1 || <1	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	99	147653-1	96 || 91 || RPD: 5	LCS-1	117%

QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			01/06/2016	147653-1	1/06/2016 || 1/06/2016	LCS-1	01/06/2016
Date analysed	-			01/06/2016	147653-1	01/06/2016 || 01/06/2016	LCS-1	01/06/2016
TRHC10 - C14	mg/kg	50	Org-003	<50	147653-1	<50 || <50	LCS-1	101%
TRHC15 - C28	mg/kg	100	Org-003	<100	147653-1	<100 || <100	LCS-1	76%
TRHC29 - C36	mg/kg	100	Org-003	<100	147653-1	<100 || <100	LCS-1	123%
TRH>C10-C16	mg/kg	50	Org-003	<50	147653-1	<50 || <50	LCS-1	101%
TRH>C16-C34	mg/kg	100	Org-003	<100	147653-1	<100 || <100	LCS-1	76%
TRH>C34-C40	mg/kg	100	Org-003	<100	147653-1	<100 || <100	LCS-1	123%
Surrogate o-Terphenyl	%		Org-003	84	147653-1	85 || 84 || RPD: 1	LCS-1	91%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			01/06/2016	147653-1	01/06/2016 || 01/06/2016	LCS-1	01/06/2016
Date analysed	-			01/06/2016	147653-1	01/06/2016 || 01/06/2016	LCS-1	01/06/2016
Naphthalene	mg/kg	0.1	Org-012	<0.1	147653-1	<0.1 || <0.1	LCS-1	99%
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	147653-1	<0.1 || <0.1	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	147653-1	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012	<0.1	147653-1	<0.1 || <0.1	LCS-1	100%
Phenanthrene	mg/kg	0.1	Org-012	<0.1	147653-1	0.5 || <0.1	LCS-1	109%
Anthracene	mg/kg	0.1	Org-012	<0.1	147653-1	<0.1 || <0.1	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	147653-1	0.5 || 0.1 || RPD: 133	LCS-1	103%
Pyrene	mg/kg	0.1	Org-012	<0.1	147653-1	0.5 || 0.1 || RPD: 133	LCS-1	110%
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	147653-1	0.2 || <0.1	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012	<0.1	147653-1	0.2 || <0.1	LCS-1	80%
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	147653-1	0.3 || <0.2	[NR]	[NR]

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	147653-1	0.1 || <0.05	LCS-1	110%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	147653-1	<0.1 || <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	147653-1	<0.1 || <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	147653-1	<0.1 || <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012	104	147653-1	103 || 105 || RPD: 2	LCS-1	131%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			01/06/2016	147653-1	01/06/2016 || 01/06/2016	LCS-1	01/06/2016
Date analysed	-			01/06/2016	147653-1	01/06/2016 || 01/06/2016	LCS-1	01/06/2016
HCB	mg/kg	0.1	Org-005	<0.1	147653-1	<0.1 || <0.1	[NR]	[NR]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	147653-1	<0.1 || <0.1	LCS-1	71%
gamma-BHC	mg/kg	0.1	Org-005	<0.1	147653-1	<0.1 || <0.1	[NR]	[NR]
beta-BHC	mg/kg	0.1	Org-005	<0.1	147653-1	<0.1 || <0.1	LCS-1	99%
Heptachlor	mg/kg	0.1	Org-005	<0.1	147653-1	<0.1 || <0.1	LCS-1	76%
delta-BHC	mg/kg	0.1	Org-005	<0.1	147653-1	<0.1 || <0.1	[NR]	[NR]
Aldrin	mg/kg	0.1	Org-005	<0.1	147653-1	<0.1 || <0.1	LCS-1	92%
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	147653-1	<0.1 || <0.1	LCS-1	98%
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	147653-1	<0.1 || <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	147653-1	<0.1 || <0.1	[NR]	[NR]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	147653-1	<0.1 || <0.1	[NR]	[NR]
pp-DDE	mg/kg	0.1	Org-005	<0.1	147653-1	<0.1 || <0.1	LCS-1	83%
Dieldrin	mg/kg	0.1	Org-005	<0.1	147653-1	<0.1 || <0.1	LCS-1	108%
Endrin	mg/kg	0.1	Org-005	<0.1	147653-1	<0.1 || <0.1	LCS-1	116%
pp-DDD	mg/kg	0.1	Org-005	<0.1	147653-1	<0.1 || <0.1	LCS-1	83%
Endosulfan II	mg/kg	0.1	Org-005	<0.1	147653-1	<0.1 || <0.1	[NR]	[NR]
pp-DDT	mg/kg	0.1	Org-005	<0.1	147653-1	<0.1 || <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	147653-1	<0.1 || <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	147653-1	<0.1 || <0.1	LCS-1	86%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	147653-1	<0.1 || <0.1	[NR]	[NR]
Surrogate TCMX	%		Org-005	99	147653-1	108 || 88 || RPD: 20	LCS-1	106%

QUALITY CONTROL Organophosphorus Pesticides	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			01/06/2016	147653-1	01/06/2016 || 01/06/2016	LCS-1	01/06/2016
Date analysed	-			01/06/2016	147653-1	01/06/2016 || 01/06/2016	LCS-1	01/06/2016
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	147653-1	<0.1 || <0.1	[NR]	[NR]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	147653-1	<0.1 || <0.1	[NR]	[NR]
Chlorpyriphos	mg/kg	0.1	Org-008	<0.1	147653-1	<0.1 || <0.1	LCS-1	92%
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	<0.1	147653-1	<0.1 || <0.1	[NR]	[NR]
Diazinon	mg/kg	0.1	Org-008	<0.1	147653-1	<0.1 || <0.1	[NR]	[NR]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	147653-1	<0.1 || <0.1	LCS-1	102%
Dimethoate	mg/kg	0.1	Org-008	<0.1	147653-1	<0.1 || <0.1	[NR]	[NR]
Ethion	mg/kg	0.1	Org-008	<0.1	147653-1	<0.1 || <0.1	LCS-1	85%
Fenitrothion	mg/kg	0.1	Org-008	<0.1	147653-1	<0.1 || <0.1	LCS-1	92%
Malathion	mg/kg	0.1	Org-008	<0.1	147653-1	<0.1 || <0.1	LCS-1	88%
Parathion	mg/kg	0.1	Org-008	<0.1	147653-1	<0.1 || <0.1	LCS-1	100%
Ronnel	mg/kg	0.1	Org-008	<0.1	147653-1	<0.1 || <0.1	LCS-1	96%
Surrogate TCMX	%		Org-008	99	147653-1	108 || 88 || RPD: 20	LCS-1	91%

QUALITY CONTROL PCBs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			01/06/2016	147653-1	01/06/2016 || 01/06/2016	LCS-1	01/06/2016
Date analysed	-			01/06/2016	147653-1	01/06/2016 || 01/06/2016	LCS-1	01/06/2016
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	147653-1	<0.1 || <0.1	[NR]	[NR]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	147653-1	<0.1 || <0.1	[NR]	[NR]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	147653-1	<0.1 || <0.1	[NR]	[NR]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	147653-1	<0.1 || <0.1	[NR]	[NR]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	147653-1	<0.1 || <0.1	[NR]	[NR]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	147653-1	<0.1 || <0.1	LCS-1	113%
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	147653-1	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%		Org-006	99	147653-1	108 || 88 || RPD: 20	LCS-1	91%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			01/06/2016	147653-1	01/06/2016 || 01/06/2016	LCS-1	01/06/2016
Date analysed	-			01/06/2016	147653-1	01/06/2016 || 01/06/2016	LCS-1	01/06/2016
Arsenic	mg/kg	4	Metals-020	<4	147653-1	9 || 6 || RPD: 40	LCS-1	112%
Cadmium	mg/kg	0.4	Metals-020	<0.4	147653-1	<0.4 || <0.4	LCS-1	104%
Chromium	mg/kg	1	Metals-020	<1	147653-1	29 || 27 || RPD: 7	LCS-1	108%
Copper	mg/kg	1	Metals-020	<1	147653-1	16 || 20 || RPD: 22	LCS-1	112%
Lead	mg/kg	1	Metals-020	<1	147653-1	63 || 42 || RPD: 40	LCS-1	107%
Mercury	mg/kg	0.1	Metals-021	<0.1	147653-1	<0.1 || <0.1	LCS-1	92%
Nickel	mg/kg	1	Metals-020	<1	147653-1	9 || 15 || RPD: 50	LCS-1	104%
Zinc	mg/kg	1	Metals-020	<1	147653-1	110 || 110 || RPD: 0	LCS-1	108%

Report Comments:

PAH_S:The RPD for duplicate results is accepted due to the non homogenous nature of the sample/s.

Acid Extractable Metals in Soil: The laboratory RPD acceptance criteria has been exceeded for 147653-1 for Ni. Therefore a triplicate result has been issued as laboratory sample number 147653-3.

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

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

Quality Control Definitions

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

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

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

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

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

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.
Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.
Spikes for Physical and Aggregate Tests are not applicable.
For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-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.

Appendix E

SITE PHOTOGRAPHS

WSP PARSONS BRINCKERHOFF	PHOTOGRAPHIC LOG	
	Site Location corner of Hill Road and Holker Busway, Sydney Olympic Park NSW, 2127	2270089A

Photo No.	Date
1	21 July 2016

Description

Foreign Material in fill material at borehole B8

Photo No.	Date
2	21 July 2016

Description

Asphalt and concrete along the northern boundary of the site

WSP PARSONS BRINCKERHOFF	PHOTOGRAPHIC LOG	
	Site Location corner of Hill Road and Holker Busway, Sydney Olympic Park NSW, 2127	2270089A

Photo No.	Date
3	21 July 2016

Description

Steel reinforcement in concrete located on northern boundary of site

Photo No.	Date
4	21 July 2016

Description

Fill material with foreign material at location A7

WSP PARSONS BRINCKERHOFF	PHOTOGRAPHIC LOG	
	Site Location corner of Hill Road and Holker Busway, Sydney Olympic Park NSW, 2127	2270089A

Photo No.	Date
5	21 July 2016

Description

Location service strike at borehole C4 on the northern boundary

Photo No.	Date
6	21 July 2016

Description

Rubber material retrieved from drill auger following service strike at borehole C4.